

P Cylinder (Cylinder with Positioner)

CPA2/CPS1 Series

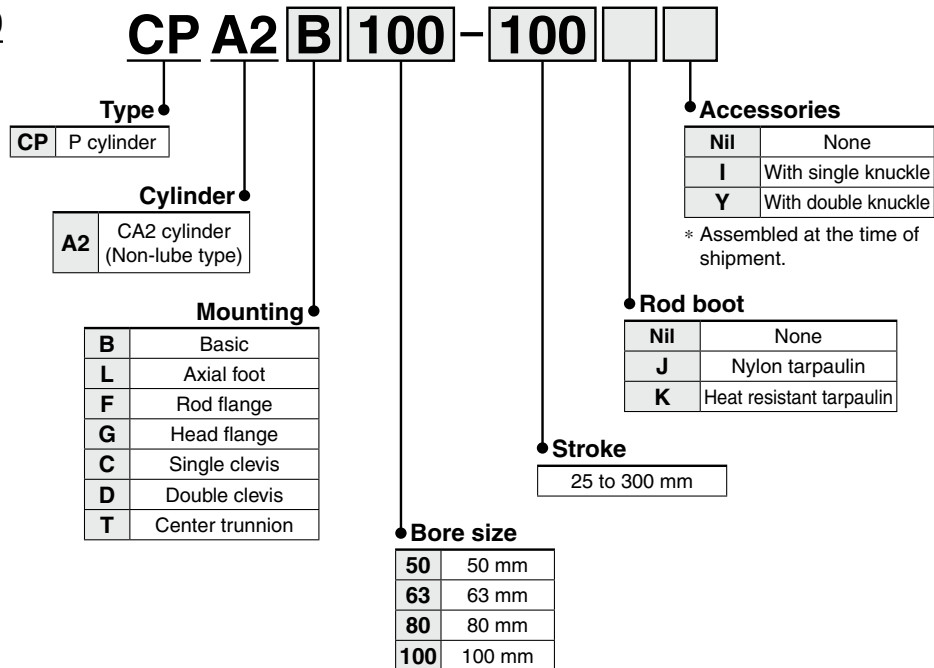
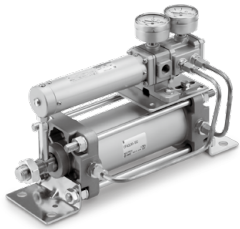
CPA2 $\varnothing 50, \varnothing 63, \varnothing 80, \varnothing 100$

CPS1 $\varnothing 125, \varnothing 140, \varnothing 160, \varnothing 180, \varnothing 200, \varnothing 250, \varnothing 300$

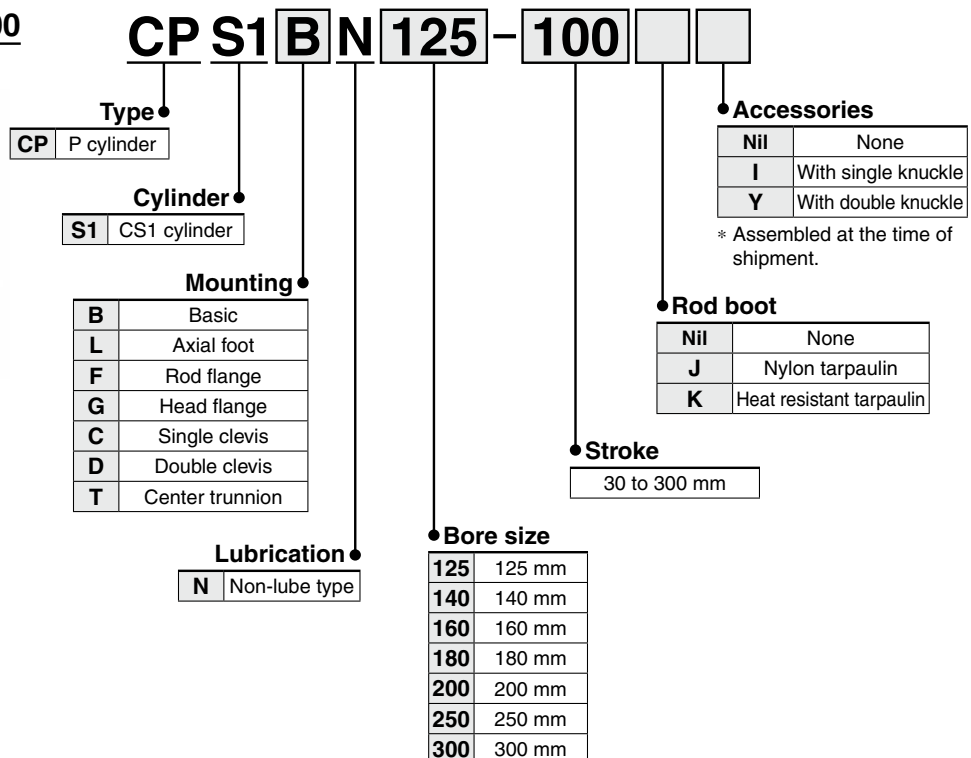
- The cylinder positioning in proportion to the input signal (air pressure) is possible.
- Correction operation function: Returns to the initial setting position even when the position deviates due to load variations.

How to Order

Bore size $\varnothing 50$ to 100



Bore size $\varnothing 125$ to 300



CPA2/CPS1 Series

Specifications ^{Note 1)}

Item	Model	
	CPA2	CPS1
Input pressure	0.02 to 0.1 MPa	
Supply pressure	0.3 to 0.7 MPa	
Linearity ^{Note 2)}	Within $\pm 2\%$ F.S.	
Hysteresis ^{Note 2)}	Within 1% F.S.	
Repeatability ^{Note 2)}	Within $\pm 1\%$ F.S.	
Sensitivity ^{Note 3)}	Within 0.5% F.S.	
Air consumption ^{Note 3)}	18 L/min (ANR) or less (SUP = 0.5 MPa)	
Ambient and fluid temperature	-5°C to 60°C (No freezing)	0°C to 60°C (No freezing)
Coefficient of temperature	0.1% F.S./°C	
Stroke adjustment margin	Within 10% F.S.	
Applicable cylinder stroke	25 mm (Min.) to 300 mm (Max.)	30 mm (Min.) to 300 mm (Max.)
Air connection port	Rc1/4 female thread	

Note 1) Specification values are given at normal temperature (20°C).

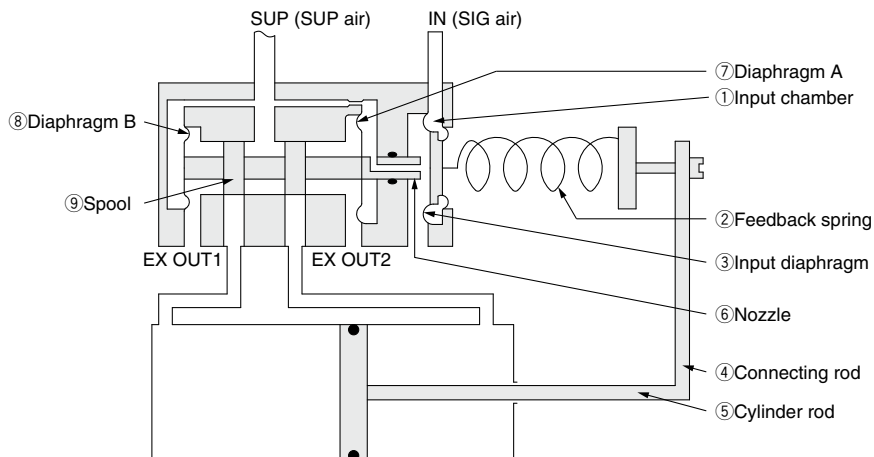
Note 2) Characteristics relating to accuracy differ depending on combination with other constituent loop equipment, such as positioners and actuators.

Note 3) Air consumption is due to exhaust from nozzle. And (ANR) indicates JIS B0120 standard air.

Construction/Principle of Operation

When input pressure enters input chamber ①, the input diaphragm ③ is deflected left. Clearance of the nozzle ⑥ is reduced causing higher back pressure at diaphragm A ⑦.

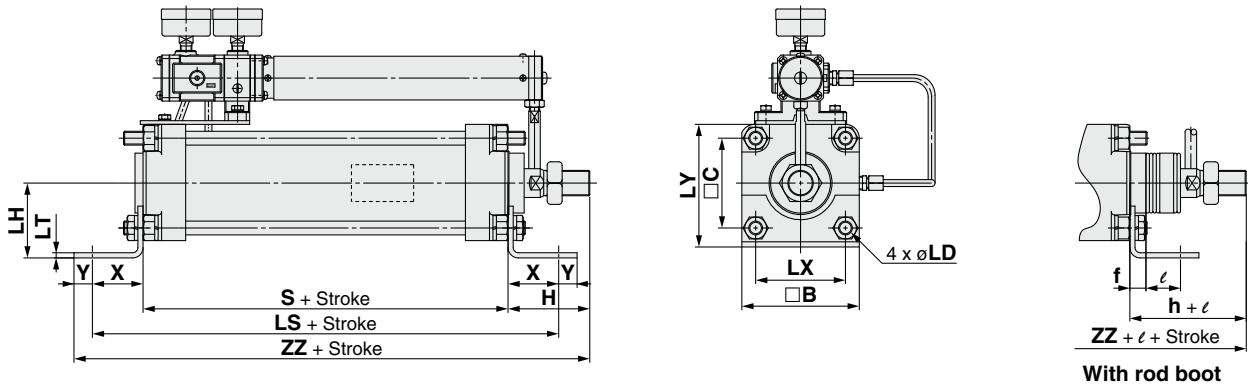
This diaphragm A ⑦ has larger area than diaphragm B ⑧ resulting in movement of the spool to the left. Supply pressure then flows to OUT1 ① and the air inside the cylinder is exhausted from OUT2, resulting in cylinder rod ⑤ movement to the right. The movement is linked via connecting rod ④ and feedback spring ② to the input diaphragm ③ balancing the higher pressure. When this occurs nozzle ⑥ clearance increases allowing centralizing of the spool ⑨ to take place. This holds the piston rod in the new position. Input signal increase results in proportional movement of the piston rod.



CPA2 Series

Dimensions

Axial foot: CPA2L



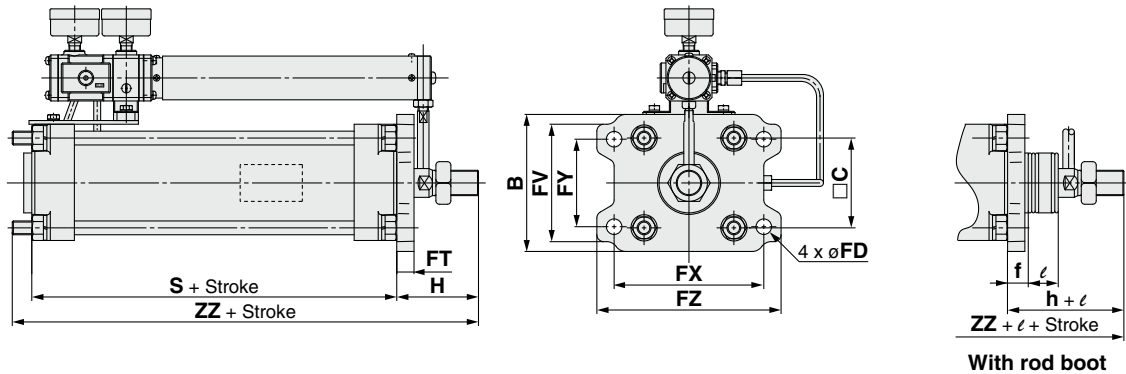
Dimensions

Bore size	□B	□C	S	X	Y	øLD	LH	LS	LT	LX	LY	Without rod boot		With rod boot			
												H	ZZ	f	h	ℓ	ZZ
50	70	52	90	27	13	9	45	144	3.2	50	80	58	188	11.2	66	1/4 stroke	196
63	85	64	98	34	16	11.5	50	166	3.2	59	93	58	206	11.2	66		214
80	102	78	116	44	16	13.5	65	204	4.5	76	116	71	247	12.5	80		256
100	116	92	126	43	17	13.5	75	212	6	92	133	72	258	14	81		267

- Note 1) Use only dehumidified and dust extracted clean compressed air as the air supply.
 Note 2) Install a cylinder so that the cylinder rod might not be twisted.
 Note 3) Do not apply force to the protective cover of the feedback spring.
 Note 4) The zero point is subject to the mounting position. Adjust zero point after installation on the site.

- Note 5) Do not use a lubricator.
 Note 6) Cylinder dimensions are the same as those of the CA2 series. Please contact SMC for details.
 Note 7) When using the cylinder outdoors, take measures to avoid wind and rain.

Rod flange: CPA2F



Dimensions

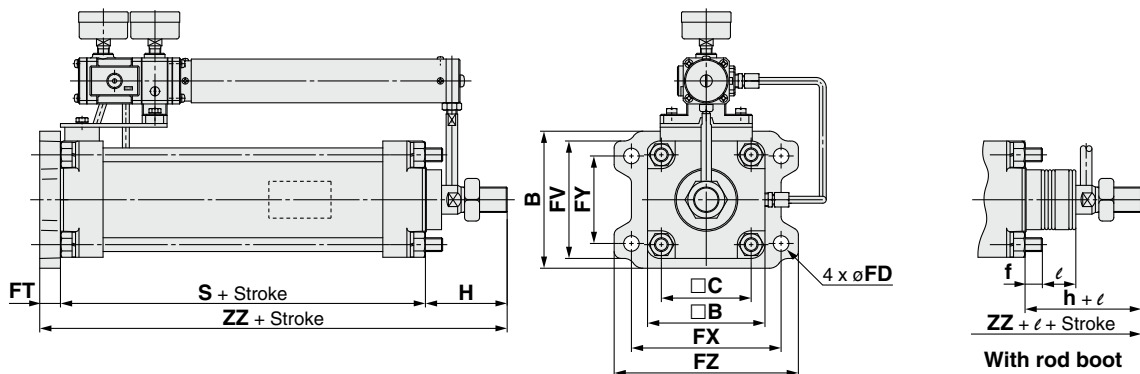
Bore size	B	□C	S	FV	øFD	FT	FX	FY	FZ	Without rod boot		With rod boot			
										H	ZZ	f	h	ℓ	ZZ
50	81	52	90	70	9	12	90	50	110	58	159	15	66	1/4 stroke	167
63	101	64	98	86	11.5	15	105	59	130	58	170	17.5	66		178
80	119	78	116	102	13.5	18	130	76	160	71	204	21.5	80		213
100	133	92	126	116	13.5	18	150	92	180	72	215	21.5	81		224

- Note 1) Use only dehumidified and dust extracted clean compressed air as the air supply.
 Note 2) Install a cylinder so that the cylinder rod might not be twisted.
 Note 3) Do not apply force to the protective cover of the feedback spring.
 Note 4) The zero point is subject to the mounting position. Adjust zero point after installation on the site.

- Note 5) Do not use a lubricator.
 Note 6) Cylinder dimensions are the same as those of the CA2 series. Please contact SMC for details.
 Note 7) When using the cylinder outdoors, take measures to avoid wind and rain.

Dimensions

Head flange: CPA2G



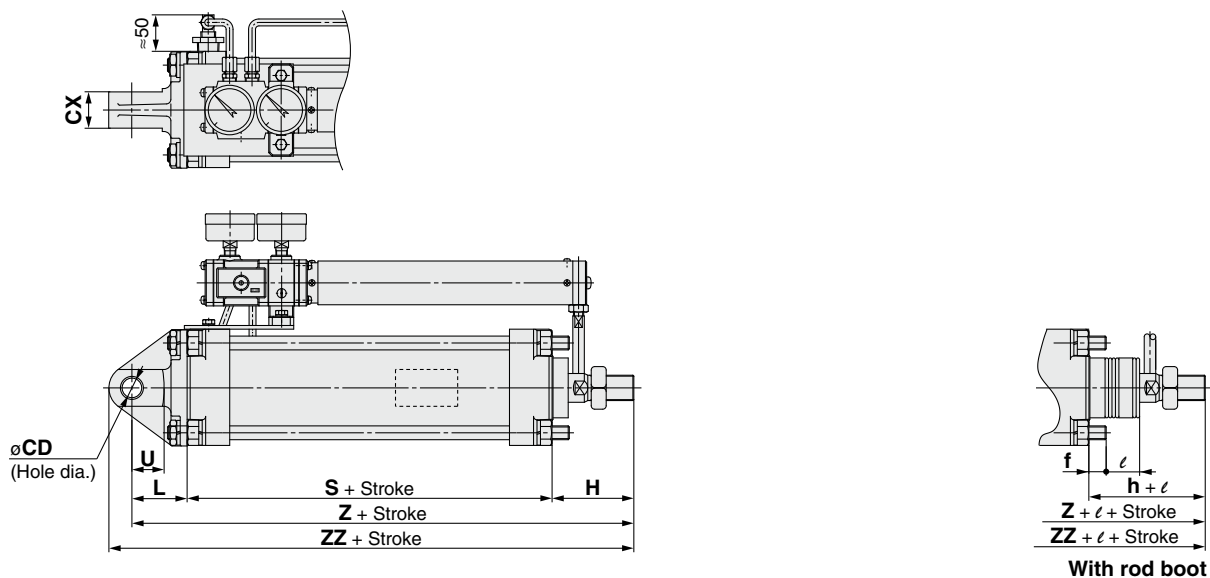
Dimensions

Bore size	B	□B	□C	S	FV	øFD	FT	FX	FY	FZ	Without rod boot		With rod boot			
											H	ZZ	f	h	ℓ	ZZ
50	81	70	52	90	70	9	12	90	50	110	58	160	11.2	66	1/4 stroke	168
63	101	85	64	98	86	11.5	15	105	59	130	58	171	11.2	66		179
80	119	102	78	116	102	13.5	18	130	76	160	71	205	12.5	80		214
100	133	116	92	126	116	13.5	18	150	92	180	72	216	14	81		225

Note 1) Use only dehumidified and dust extracted clean compressed air as the air supply.
 Note 2) Install a cylinder so that the cylinder rod might not be twisted.
 Note 3) Do not apply force to the protective cover of the feedback spring.
 Note 4) The zero point is subject to the mounting position. Adjust zero point after installation on the site.

Note 5) Do not use a lubricator.
 Note 6) Cylinder dimensions are the same as those of the CA2 series. Please contact SMC for details.
 Note 7) When using the cylinder outdoors, take measures to avoid wind and rain.

Single clevis: CPA2C



Dimensions

Bore size	L	S	U	øCD _{H10}	CX	Without rod boot			With rod boot				
						H	Z	ZZ	f	h	ℓ	Z	ZZ
50	35	90	19	12 ^{+0.070} ₀	18.0 ^{-0.1} _{-0.3}	58	183	195	11.2	66	1/4 stroke	191	203
63	40	98	23	16 ^{+0.070} ₀	25.0 ^{-0.1} _{-0.3}	58	196	212	11.2	66		204	220
80	48	116	28	20 ^{+0.084} ₀	31.5 ^{-0.1} _{-0.3}	71	235	255	12.5	80		244	264
100	58	126	36	25 ^{+0.084} ₀	35.5 ^{-0.1} _{-0.3}	72	256	281	14	81		265	290

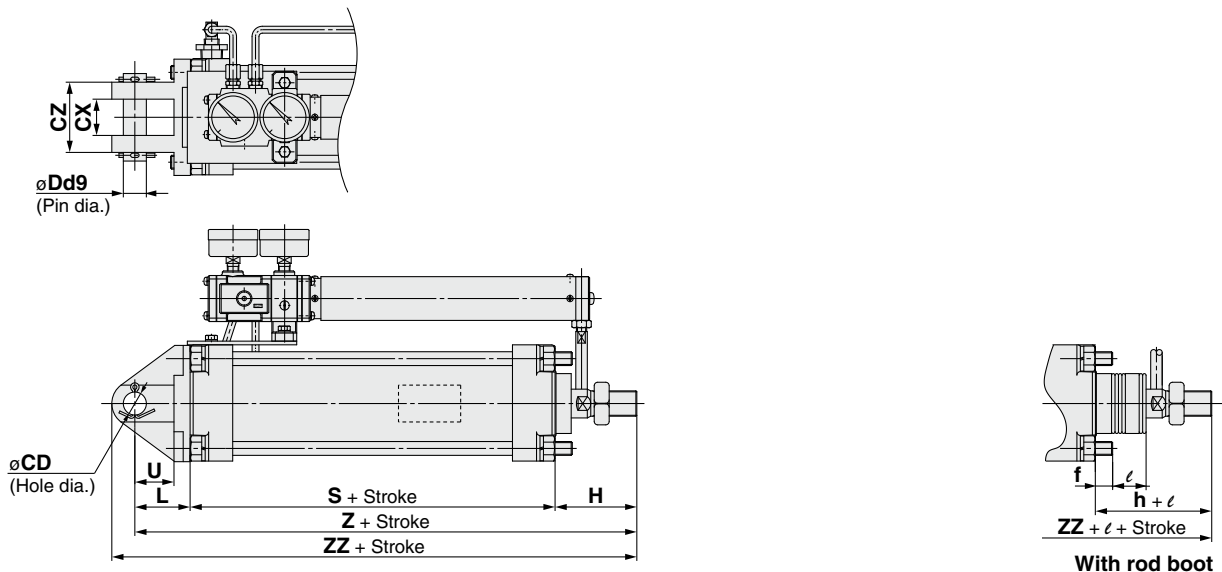
Note 1) Use only dehumidified and dust extracted clean compressed air as the air supply.
 Note 2) Install a cylinder so that the cylinder rod might not be twisted.
 Note 3) Do not apply force to the protective cover of the feedback spring.
 Note 4) The zero point is subject to the mounting position. Adjust zero point after installation on the site.

Note 5) Do not use a lubricator.
 Note 6) Cylinder dimensions are the same as those of the CA2 series. Please contact SMC for details.
 Note 7) When using the cylinder outdoors, take measures to avoid wind and rain.

CPA2 Series

Dimensions

Double clevis: CPA2D



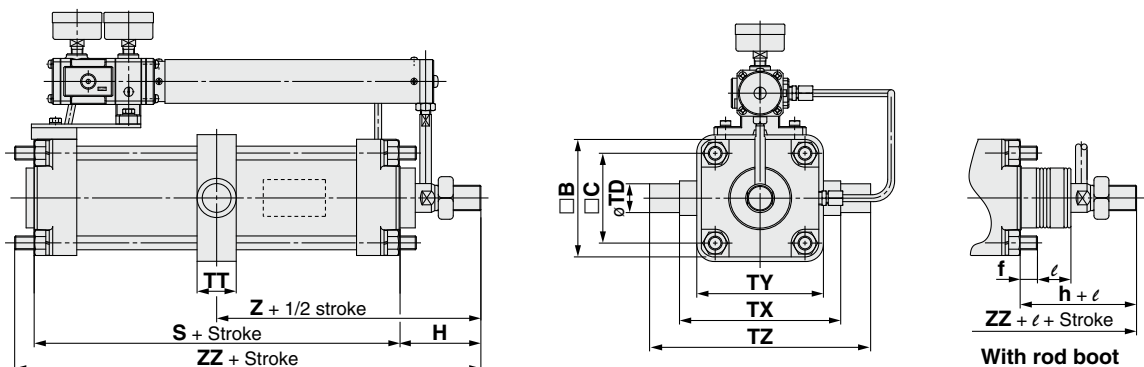
Dimensions

Bore size	L	S	U	øCD _{H10}	CX	CZ	øDd9	Without rod boot			With rod boot				
								H	Z	ZZ	f	h	ℓ	Z	ZZ
50	35	90	19	12 ^{+0.070} ₀	18.0 ^{+0.3} _{+0.1}	38	12 ^{-0.050} _{-0.093}	58	183	195	11.2	66	1/4 stroke	191	203
63	40	98	23	16 ^{+0.070} ₀	25.0 ^{+0.3} _{+0.1}	49	16 ^{-0.050} _{-0.093}	58	196	212	11.2	66		204	220
80	48	116	28	20 ^{+0.084} ₀	31.5 ^{+0.3} _{+0.1}	61	20 ^{-0.065} _{-0.117}	71	235	255	12.5	80		244	264
100	58	126	36	25 ^{+0.084} ₀	35.5 ^{+0.3} _{+0.1}	64	25 ^{-0.065} _{-0.117}	72	256	281	14	81	265	290	

- Note 1) Use only dehumidified and dust extracted clean compressed air as the air supply.
 Note 2) Install a cylinder so that the cylinder rod might not be twisted.
 Note 3) Do not apply force to the protective cover of the feedback spring.
 Note 4) The zero point is subject to the mounting position. Adjust zero point after installation on the site.

- Note 5) Do not use a lubricator.
 Note 6) Cylinder dimensions are the same as those of the CA2 series. Please contact SMC for details.
 Note 7) When using the cylinder outdoors, take measures to avoid wind and rain.

Center trunnion: CPA2T



Dimensions

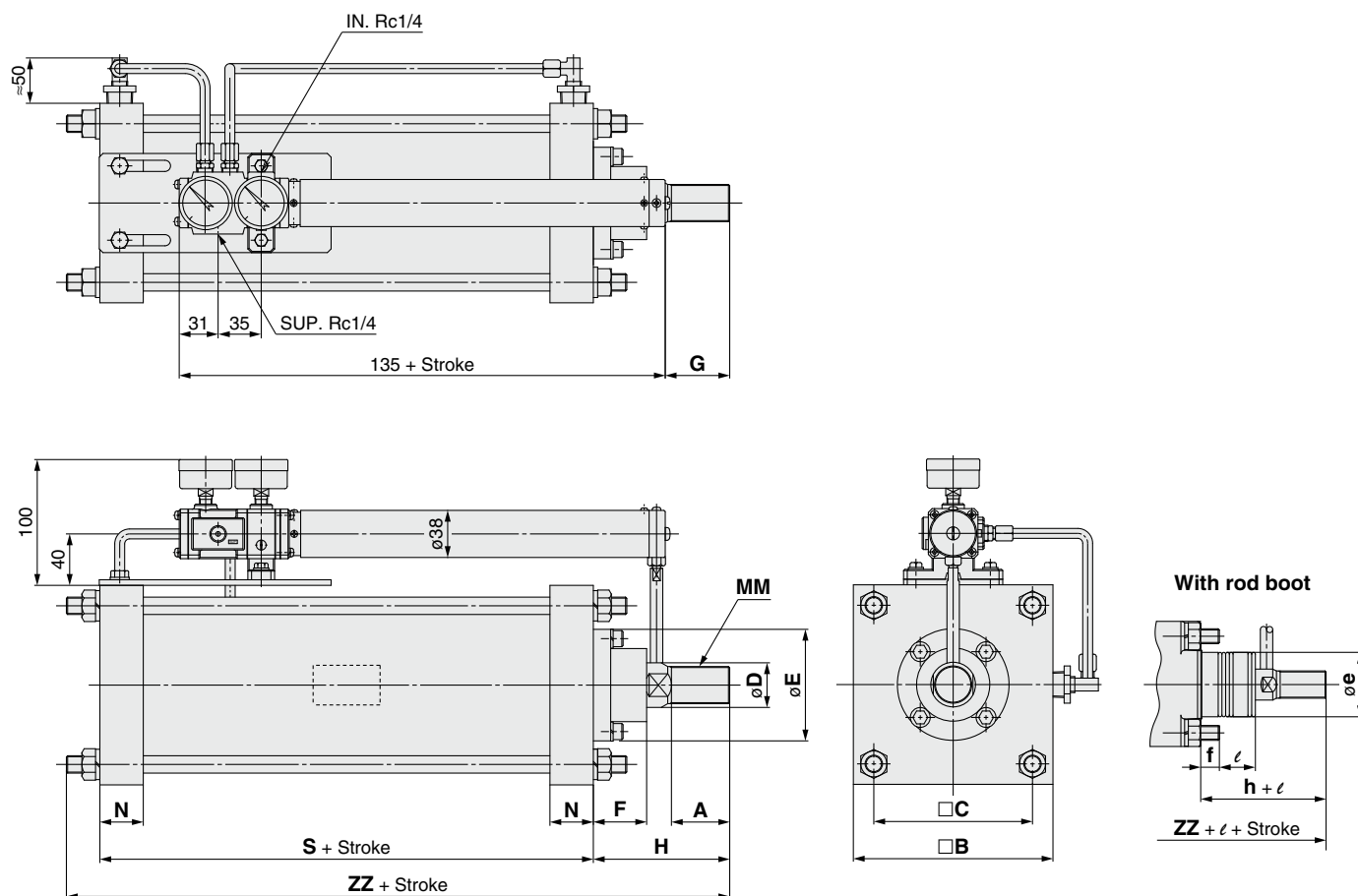
Bore size	□B	□C	S	øTD _{e8}	TT	TX	TY	TZ	Without rod boot			With rod boot				
									H	Z	ZZ	f	h	ℓ	Z	ZZ
50	70	52	90	15 ^{-0.032} _{-0.059}	22	95	74	127	58	103	154	11.2	66	1/4 stroke	111	162
63	85	64	98	18 ^{-0.032} _{-0.059}	28	110	90	148	58	107	162	11.2	66		115	170
80	102	78	116	25 ^{-0.040} _{-0.073}	34	140	110	192	71	129	194	12.5	80		138	203
100	116	92	126	25 ^{-0.040} _{-0.073}	40	162	130	214	72	135	206	14	81	144	215	

- Note 1) Use only dehumidified and dust extracted clean compressed air as the air supply.
 Note 2) Install a cylinder so that the cylinder rod might not be twisted.
 Note 3) Do not apply force to the protective cover of the feedback spring.
 Note 4) The zero point is subject to the mounting position. Adjust zero point after installation on the site.

- Note 5) Do not use a lubricator.
 Note 6) Cylinder dimensions are the same as those of the CA2 series. Please contact SMC for details.
 Note 7) When using the cylinder outdoors, take measures to avoid wind and rain.

Dimensions

Basic: CPS1B



Dimensions

(mm)

Bore size	A	□B	□C	øD	øE	F	G	MM	N	S	Without rod boot		With rod boot				
											H	ZZ	øe	f	h	ℓ	ZZ
125	50	145	115	36	90	43	52	M30 x 1.5	35	98	110	235	75	40	133	0.2 stroke	258
140	50	161	128	36	90	43	52	M30 x 1.5	35	98	110	235	75	40	133		258
160	56	182	144	40	90	43	59	M36 x 1.5	39	106	120	256.5	75	40	141		277.5
180	63	204	162	45	115	48	66	M40 x 1.5	39	111	135	281	85	45	153		299
200	63	226	182	50	115	48	66	M45 x 1.5	39	111	135	281	90	45	153		299
250	71	277	225	60	140	60	77	M56 x 2.0	49	141	160	342.5	105	55	176	0.17 stroke	358.5
300	80	330	270	70	140	60	88	M64 x 2.0	49	146	175	372.5	115	55	190		387.5

Note 1) Use only dehumidified and dust extracted clean compressed air as the air supply.

Note 2) Install a cylinder so that the cylinder rod might not be twisted.

Note 3) Do not apply force to the protective cover of the feedback spring.

Note 4) The zero point is subject to the mounting position. Adjust zero point after installation on the site.

Note 5) Do not use a lubricator.

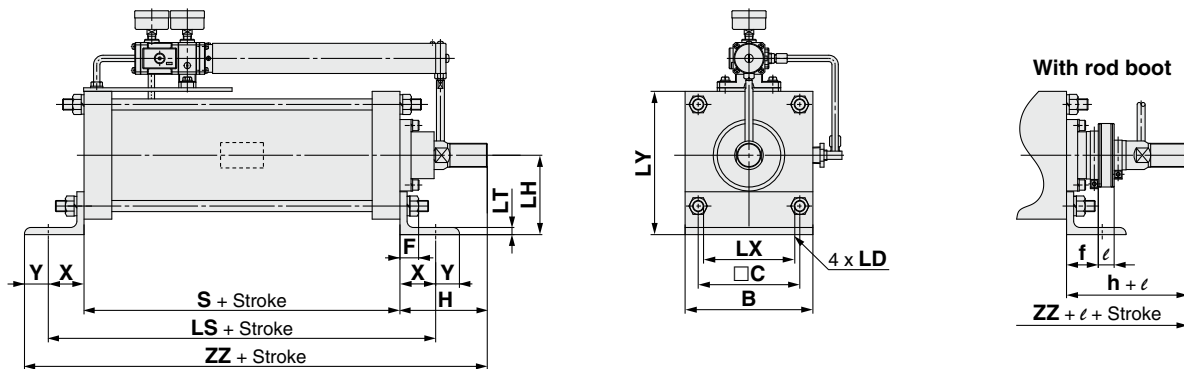
Note 6) Cylinder dimensions are the same as those of the CS1 series. For details, refer to the **Web Catalog**.

Note 7) When using the cylinder outdoors, take measures to avoid wind and rain.

CPS1 Series

Dimensions

Axial foot: CPS1L



Dimensions

Bore size	B	□C	F	S	X	Y	LD	LH	LS	LT	LX	LY	Without rod boot		With rod boot			
													H	ZZ	f	h	ℓ	ZZ
125	145	115	43	98	45	20	19	85	188	8	100	157.5	110	273	40	133	0.2 stroke	296
140	161	128	43	98	45	30	19	100	188	9	112	180.5	110	283	40	133		306
160	182	144	43	106	50	25	19	106	206	9	118	197.0	120	301	40	141		322
180	204	162	48	111	60	30	24	125	231	10	132	227.0	135	336	45	153		354
200	226	182	48	111	60	30	24	132	231	10	150	245.0	135	336	45	153	354	
250	277	225	60	141	80	40	29	160	301	12	180	298.5	160	421	55	176	0.17 stroke	437
300	330	270	60	146	90	40	33	200	326	15	212	365.0	175	451	55	190		466

Note 1) Use only dehumidified and dust extracted clean compressed air as the air supply.

Note 2) Install a cylinder so that the cylinder rod might not be twisted.

Note 3) Do not apply force to the protective cover of the feedback spring.

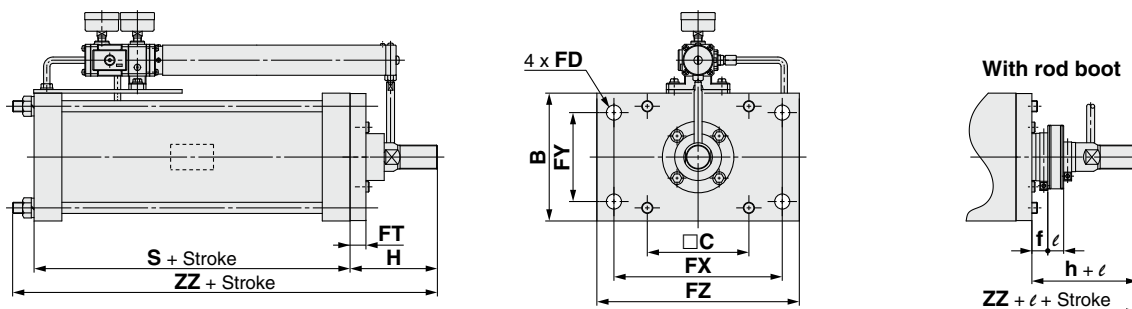
Note 4) The zero point is subject to the mounting position. Adjust zero point after installation on the site.

Note 5) Do not use a lubricator.

Note 6) Cylinder dimensions are the same as those of the CS1 series. For details, refer to the **Web Catalog**.

Note 7) When using the cylinder outdoors, take measures to avoid wind and rain.

Rod flange: CPS1F



Dimensions

Bore size	B	□C	S	FD	FT	FX	FY	FZ	Without rod boot		With rod boot			
									H	ZZ	f	h	ℓ	ZZ
125	145	115	98	19	14	190	100	230	110	238	40	133	0.2 stroke	261
140	160	128	98	19	20	212	112	255	110	232	40	133		255
160	180	144	106	19	20	236	118	275	120	252	40	141		273
180	200	162	111	24	25	265	132	320	135	277	45	153		295
200	225	182	111	24	25	280	150	335	135	277	45	153	295	
250	275	225	141	29	30	355	180	420	160	336	55	176	0.17 stroke	352
300	330	270	146	33	30	400	212	475	175	369	55	190		384

Note 1) Use only dehumidified and dust extracted clean compressed air as the air supply.

Note 2) Install a cylinder so that the cylinder rod might not be twisted.

Note 3) Do not apply force to the protective cover of the feedback spring.

Note 4) The zero point is subject to the mounting position. Adjust zero point after installation on the site.

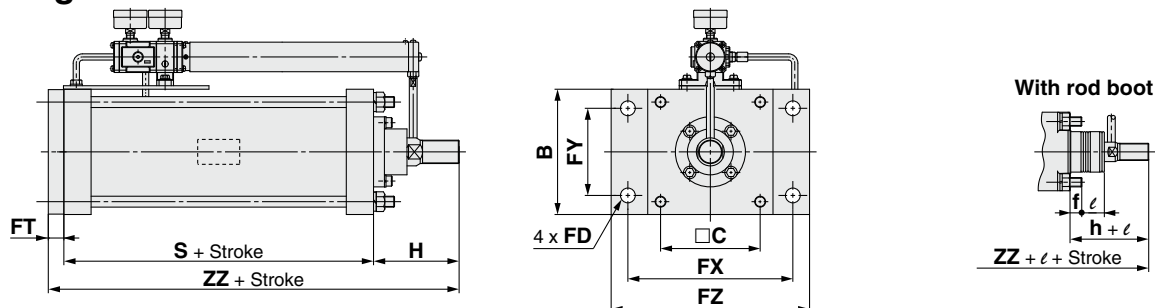
Note 5) Do not use a lubricator.

Note 6) Cylinder dimensions are the same as those of the CS1 series. For details, refer to the **Web Catalog**.

Note 7) When using the cylinder outdoors, take measures to avoid wind and rain.

Dimensions

Head flange: CPS1G



Dimensions

(mm)

Bore size	B	□C	FD	FT	FX	FY	FZ	S	Without rod boot		With rod boot			
									H	ZZ	f	h	ℓ	ZZ
125	145	115	19	14	190	100	230	98	110	235	40	133	0.2 stroke	258
140	160	128	19	20	212	112	255	98	110	235	40	133		258
160	180	144	19	20	236	118	275	106	120	256.5	40	141		277.5
180	200	162	24	25	265	132	320	111	135	281	45	153		299
200	225	182	24	25	280	150	335	111	135	281	45	153		299
250	275	225	29	30	355	180	420	141	160	342.5	55	176	0.17 stroke	358.5
300	330	270	33	30	400	212	475	146	175	372.5	55	190		387.5

Note 1) Use only dehumidified and dust extracted clean compressed air as the air supply.

Note 2) Install a cylinder so that the cylinder rod might not be twisted.

Note 3) Do not apply force to the protective cover of the feedback spring.

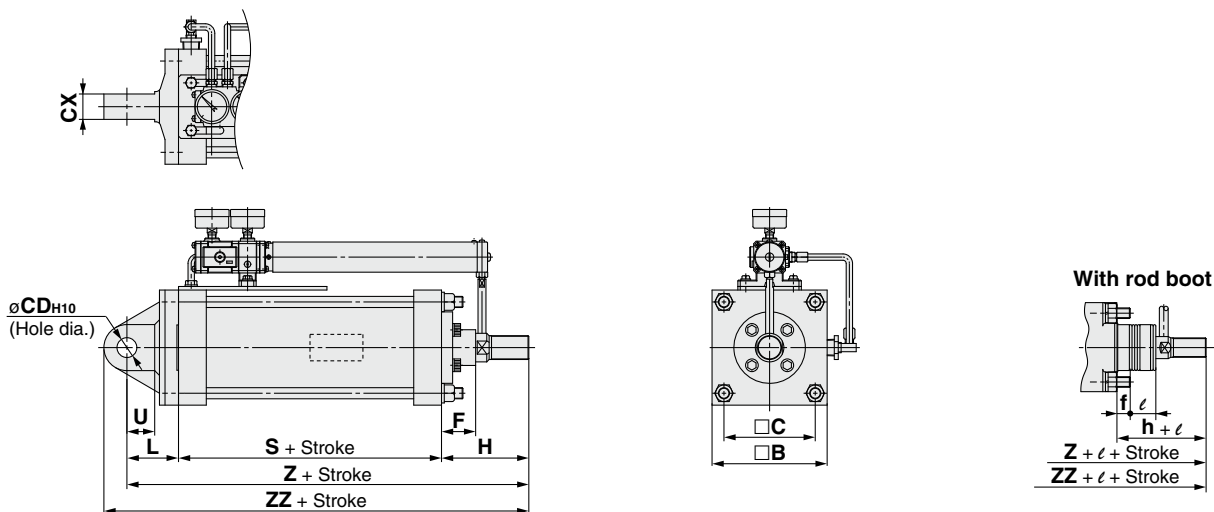
Note 4) The zero point is subject to the mounting position. Adjust zero point after installation on the site.

Note 5) Do not use a lubricator.

Note 6) Cylinder dimensions are the same as those of the CS1 series. For details, refer to the **Web Catalog**.

Note 7) When using the cylinder outdoors, take measures to avoid wind and rain.

Single clevis: CPS1C



Dimensions

(mm)

Bore size	□B	□C	F	L	S	U	∅CD _{H10}	CX	Without rod boot			With rod boot				
									H	Z	ZZ	f	h	ℓ	Z	ZZ
125	145	115	43	65	98	35	25 ^{+0.084} ₀	32 ^{-0.3} _{-0.1}	110	273	302	40	133	0.2 stroke	296	325
140	161	128	43	75	98	40	28 ^{+0.084} ₀	36 ^{-0.3} _{-0.1}	110	283	315	40	133		306	338
160	182	144	43	80	106	45	32 ^{+0.100} ₀	40 ^{-0.3} _{-0.1}	120	306	342	40	141		327	363
180	204	162	48	90	111	50	40 ^{+0.100} ₀	50 ^{-0.3} _{-0.1}	135	336	380	45	153		354	398
200	226	182	48	90	111	50	40 ^{+0.100} ₀	50 ^{-0.3} _{-0.1}	135	336	380	45	153		354	398
250	277	225	60	110	141	65	50 ^{+0.100} ₀	63 ^{-0.3} _{-0.1}	160	411	466	55	176	0.17 stroke	427	482
300	330	270	60	130	146	80	63 ^{+0.120} ₀	80 ^{-0.3} _{-0.1}	175	451	519	55	190		466	534

Note 1) Use only dehumidified and dust extracted clean compressed air as the air supply.

Note 2) Install a cylinder so that the cylinder rod might not be twisted.

Note 3) Do not apply force to the protective cover of the feedback spring.

Note 4) The zero point is subject to the mounting position. Adjust zero point after installation on the site.

Note 5) Do not use a lubricator.

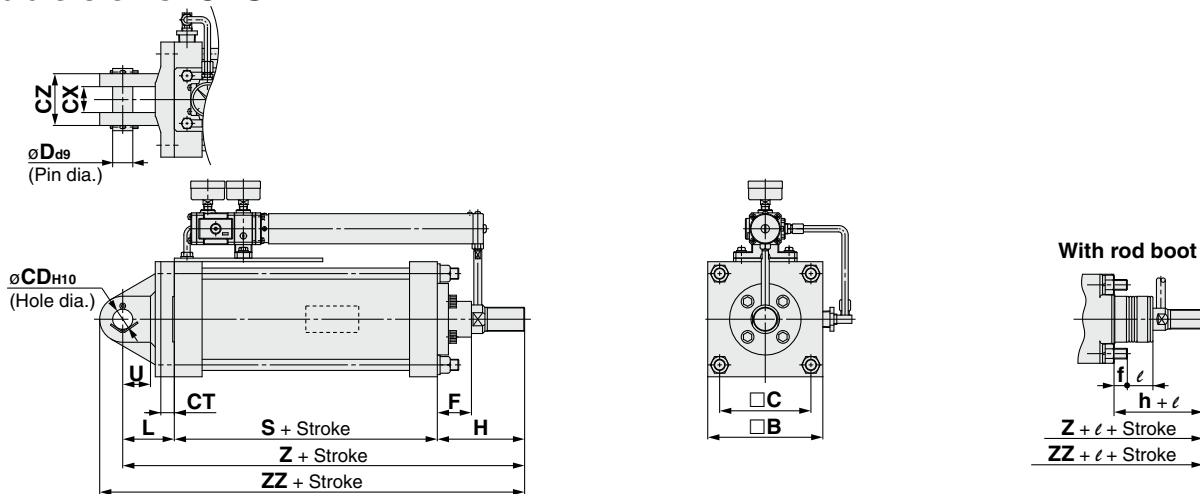
Note 6) Cylinder dimensions are the same as those of the CS1 series. For details, refer to the **Web Catalog**.

Note 7) When using the cylinder outdoors, take measures to avoid wind and rain.

CPS1 Series

Dimensions

Double clevis: CPS1D



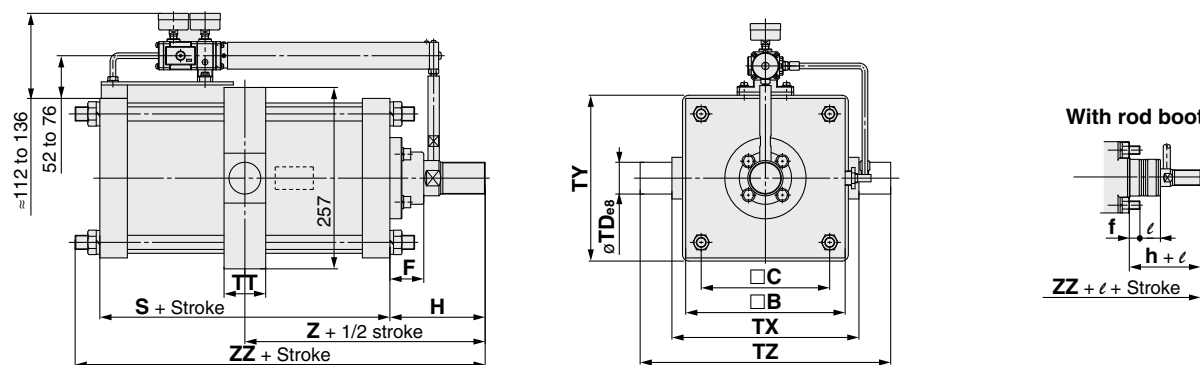
Dimensions

Bore size	□B	□C	F	L	S	U	∅CD _{H10}	CT	CX	CZ	∅D _{d9}	Without rod boot			With rod boot				
												H	Z	ZZ	f	h	ℓ	Z	ZZ
125	145	115	43	65	98	35	25 ^{+0.084} ₀	17	32 ^{+0.3} _{+0.1}	64 ⁻⁰ _{-0.2}	25 ^{-0.065} _{-0.117}	110	273	302	40	133	0.2 stroke	296	325
140	161	128	43	75	98	40	28 ^{+0.084} ₀	17	36 ^{+0.3} _{+0.1}	72 ⁻⁰ _{-0.2}	28 ^{-0.065} _{-0.117}	110	283	315	40	133		306	338
160	182	144	43	80	106	45	32 ^{+0.100} ₀	20	40 ^{+0.3} _{+0.1}	80 ⁻⁰ _{-0.2}	32 ^{-0.080} _{-0.142}	120	306	342	40	141		327	363
180	204	162	48	90	111	50	40 ^{+0.100} ₀	23	50 ^{+0.3} _{+0.1}	100 ^{-0.1} _{-0.3}	40 ^{-0.080} _{-0.142}	135	336	380	45	153		354	398
200	226	182	48	90	111	50	40 ^{+0.100} ₀	25	50 ^{+0.3} _{+0.1}	100 ^{-0.1} _{-0.3}	40 ^{-0.080} _{-0.142}	135	336	380	45	153	354	398	
250	277	225	60	110	141	65	50 ^{+0.100} ₀	30	63 ^{+0.3} _{+0.1}	126 ^{-0.1} _{-0.3}	50 ^{-0.080} _{-0.142}	160	411	466	55	176	0.17 stroke	427	482
300	330	270	60	130	146	80	63 ^{+0.120} ₀	37	80 ^{+0.3} _{+0.1}	160 ^{-0.1} _{-0.3}	63 ^{-0.100} _{-0.174}	175	451	519	55	190		466	534

- Note 1) Use only dehumidified and dust extracted clean compressed air as the air supply.
 Note 2) Install a cylinder so that the cylinder rod might not be twisted.
 Note 3) Do not apply force to the protective cover of the feedback spring.
 Note 4) The zero point is subject to the mounting position. Adjust zero point after installation on the site.

- Note 5) Do not use a lubricator.
 Note 6) Cylinder dimensions are the same as those of the CS1 series. For details, refer to the **Web Catalog**.
 Note 7) When using the cylinder outdoors, take measures to avoid wind and rain.

Center trunnion: CPS1T



Dimensions

Bore size	□B	□C	F	S	TT	TX	TY	TZ	∅TD _{e8}	Without rod boot			With rod boot				
										H	Z	ZZ	f	h	ℓ	Z	ZZ
125	145	115	43	98	50	170	164	234	32 ^{-0.050} _{-0.089}	110	159	227	40	133	0.2 stroke	182	250
140	161	128	43	98	55	190	184	262	36 ^{-0.050} _{-0.089}	110	159	227	40	133		182	250
160	182	144	43	106	60	212	204	292	40 ^{-0.050} _{-0.089}	120	173	248	40	141		194	269
180	204	162	48	111	59	236	228	326	45 ^{-0.050} _{-0.089}	135	190.5	272	45	153		208.5	290
200	226	182	48	111	59	265	257	355	45 ^{-0.050} _{-0.089}	135	190.5	272	45	153	208.5	290	
250	277	225	60	141	69	335	325	447	56 ^{-0.060} _{-0.106}	160	230.5	331	55	176	0.17 stroke	246.5	347
300	330	270	60	146	79	400	390	534	67 ^{-0.060} _{-0.106}	175	248	357	55	190		263.0	372

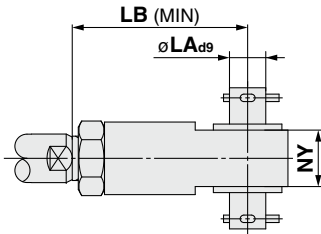
- Note 1) Use only dehumidified and dust extracted clean compressed air as the air supply.
 Note 2) Install a cylinder so that the cylinder rod might not be twisted.
 Note 3) Do not apply force to the protective cover of the feedback spring.
 Note 4) The zero point is subject to the mounting position. Adjust zero point after installation on the site.

- Note 5) Do not use a lubricator.
 Note 6) Cylinder dimensions are the same as those of the CS1 series. For details, refer to the **Web Catalog**.
 Note 7) When using the cylinder outdoors, take measures to avoid wind and rain.

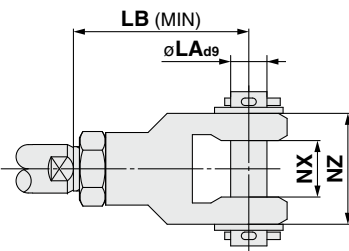
CPA2/CPS1 Series

Dimensions of Accessories

CPA2 Series



Single knuckle joint assembly

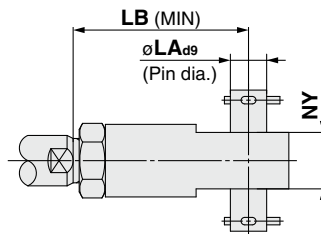


Double knuckle joint assembly

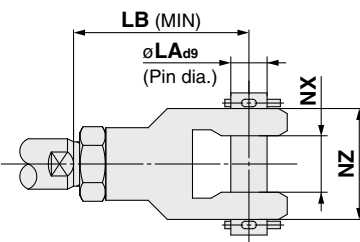
Bore size	Dimensions of accessories				
	ϕLA_{d9}	LB	NX	NY	NZ
50	12 ^{-0.050} _{-0.093}	74	16 ^{+0.3} _{+0.1}	16 ^{-0.1} _{-0.3}	38
63	12 ^{-0.050} _{-0.093}	74	16 ^{+0.3} _{+0.1}	16 ^{-0.1} _{-0.3}	38
80	18 ^{-0.050} _{-0.093}	87	28 ^{+0.3} _{+0.1}	28 ^{-0.1} _{-0.3}	55
100	20 ^{-0.065} _{-0.117}	102	30 ^{+0.3} _{+0.1}	30 ^{-0.1} _{-0.3}	61

- * A knuckle pin, split pins and flat washers are included with the double knuckle joint.
- * Rod end nut is included with the cylinder.

CPS1 Series



Single knuckle joint



Double knuckle joint assembly

Bore size	Dimensions of accessories				
	ϕLA_{d9}	LB	NX	NY	NZ
125	25 ^{-0.065} _{-0.117}	121	32 ^{+0.3} _{+0.1}	32 ^{-0.1} _{-0.3}	64 ^{-0.1} _{-0.3}
140	28 ^{-0.065} _{-0.117}	126	36 ^{+0.3} _{+0.1}	36 ^{-0.1} _{-0.3}	72 ^{-0.1} _{-0.3}
160	32 ^{-0.080} _{-0.142}	134	40 ^{+0.3} _{+0.1}	40 ^{-0.1} _{-0.3}	80 ^{-0.1} _{-0.3}
180	40 ^{-0.080} _{-0.142}	151	50 ^{+0.3} _{+0.1}	50 ^{-0.1} _{-0.3}	100 ^{-0.1} _{-0.3}
200	40 ^{-0.080} _{-0.142}	155	50 ^{+0.3} _{+0.1}	50 ^{-0.1} _{-0.3}	100 ^{-0.1} _{-0.3}
250	50 ^{-0.080} _{-0.142}	198	63 ^{+0.3} _{+0.1}	63 ^{-0.1} _{-0.3}	126 ^{-0.1} _{-0.3}
300	63 ^{-0.100} _{-0.174}	217	80 ^{+0.3} _{+0.1}	80 ^{-0.1} _{-0.3}	160 ^{-0.1} _{-0.3}

- * A pin and split pins are included with the double knuckle joint.
- * Rod end nut is not included. Order it separately if necessary.