CKD

Many forms and variations are provided

Pneumatic Piping Components

PNEUMATIC AUXILIARY COMPONENTS

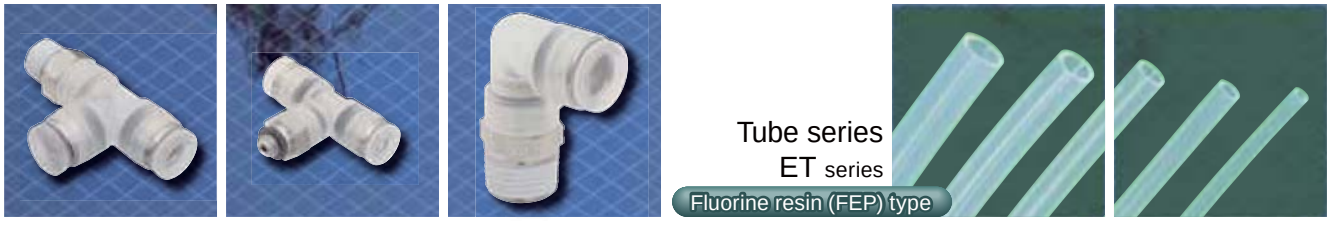
Speed control valve (line type)
SCLF-P4 series
Polypropylene resin type

Speed control valve (elbow type)
SC3F-P4 series
Polypropylene resin type

Optimal for environments that require limitations on raw materials and protection from particle occurrence due to corrosion.

Fittings
ZSF-P4 series
Polypropylene resin type

Tube series
PFH-P4 series (standard)
PFS-P4 series (soft)
Polyolefin resin type

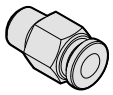
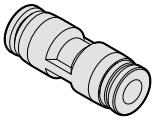
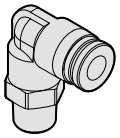
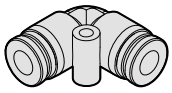
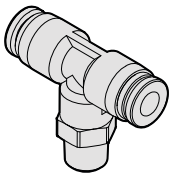


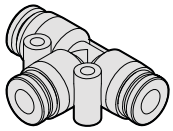
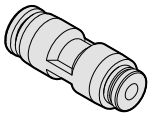
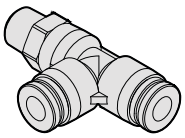
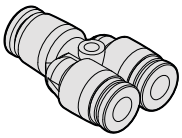
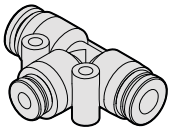
Tube series
ET series
Fluorine resin (FEP) type

- LiB manufacturing process
  (mainly for liquid injection process)
- Semiconductor/LED/FPD manufacturing process
- Solar battery manufacturing process, analysis devices, etc.

CKD Corporation
CC-1101A 2

Fittings PP (polypropylene resin) type

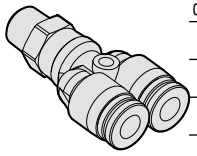
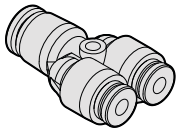
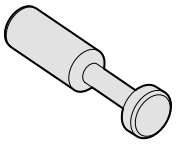
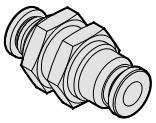
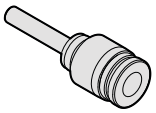
Straight ZSF-C□-□-P4	Straight union ZSF-U□-□-P4	Elbow ZSF-L□-□-P4	Union elbow ZSF-V□-P4	Tee ZSF-B□-□-P4
				
Applicable tube outer diameter ø 4 6 8 10 12	Applicable tube outer diameter ø 4 6 8 10 12	Applicable tube outer diameter ø 4 6 8 10 12	Applicable tube outer diameter ø 4 6 8 10 12	Applicable tube outer diameter ø 4 6 8 10 12
- Page: 2	- Page: 2	- Page: 2	- Page: 2	- Page: 3

Union Tee ZSF-E□-P4	Different dia. straight union ZSF-G□-□-P4	Branch Tee ZSF-D□-□-P4	Branch union Y ZSF-Y□-P4	Different dia. union Tee ZSF-EG□-□-P4
				
Applicable tube outer diameter ø 4 6 8 10 12	Applicable tube outer diameter ø 6, 4 8, 6 10, 8 12, 10	Applicable tube outer diameter ø 4 6 8 10 12	Applicable tube outer diameter ø 4 6 8 10 12	Applicable tube outer diameter ø 6, 4 8, 6 10, 8 12, 10
- Page: 3	- Page: 3	- Page: 3	- Page: 4	- Page: 4

Speed control valve PP (polypropylene resin) type

Model / appearance	Model no.	Bore size (Rc or R)						Applicable tube outer diameter					Effective sectional area (mm^2)		Flow (ℓ/min) ANR For 0.5 MPa		Applicable cylinder bore size (mm)	Page
		M3	M5	1/8	1/4	3/8	1/2	ø4	ø6	ø8	ø10	ø12	Free flow	Controlled flow	Free flow	Controlled flow		
● Elbow type / push-in fitting 	SC3F-M3-4	●						●					0.6	0.95	40	65	ø4 to ø8	7
	SC3F-M5-4		●					●					0.8	1	55	70	ø6 to ø25	
	SC3F-M5-6		●						●				0.8	1	55	70	ø6 to ø25	
	SC3F-6-4			●				●					3	2.2	200	150	ø15 to ø32	
	SC3F-6-6			●					●				3	2.2	200	150	ø15 to ø32	
	SC3F-6-8			●						●			3.4	2.2	230	150	ø15 to ø32	
	SC3F-8-6				●				●				5.8	4	390	270	ø20 to ø50	
	SC3F-8-8				●					●			5.9	4	400	270	ø20 to ø50	
	SC3F-8-10				●						●		5.9	4	400	270	ø20 to ø50	
	SC3F-10-6					●			●				8.8	8	600	550	ø32 to ø75	
	SC3F-10-8					●				●			12	12.5	800	850	ø32 to ø75	
	SC3F-10-10					●					●		12	13.5	800	920	ø32 to ø75	
	SC3F-10-12					●						●	12.4	13.5	840	920	ø32 to ø75	
	SC3F-15-10						●				●		20.5	21.5	1380	1450	ø40 to ø100	
	SC3F-15-12						●					●	20.5	23.5	1380	1600	ø40 to ø100	
● Line type / push-in fitting 	SCLF-H44S-P4							●					2.1	1.4	145	95	ø4 to ø25	11
	SCLF-H66S-P4								●				4.6	3.7	310	250	ø6 to ø32	
	SCLF-H88S-P4									●			8.2	6.0	550	410	ø15 to ø50	
	SCLF-H1010S-P4										●		14	13	950	880	ø20 to ø75	
	SCLF-H1212S-P4											●	20.5	19	1380	1300	ø32 to ø100	

Fittings PP (polypropylene resin) type

Branch Y ZSF-X□-□-P4	Different dia. union Y ZSF-W□-□-P4	Plug ZSF-BP□-P4	Bulk head union ZSF-MP□-P4	Reducer ZSF-J□-□-P4
				
Applicable tube outer diameter ø	Applicable tube outer diameter ø	Applicable tube outer diameter ø	Applicable tube outer diameter ø	Applicable tube outer diameter ø
4	6, 4	4	4	4
6	8, 6	6	6	6
8	10, 8	8	8	8
10	12, 10	10	10	10
12		12	12	
- Page: 4	- Page: 4	- Page: 5	- Page: 5	- Page: 5

- The sales unit is 10 pieces / pack

Tube

Model	Collar	Tube size (O.D. × I.D.)											Page
		ø4 × ø2	ø4 × ø2.5	ø6 × ø4	ø8 × ø5	ø8 × ø6	ø10 × ø6.5	ø10 × ø7.5	ø10 × ø8	ø12 × ø8	ø12 × ø9	ø12 × ø10	
● Polyolefin tube Standard type / 100 m PFH	Black		●	●		●		●			●		15
	Transparent white		●	●		●		●			●		
	Transparent red		●	●		●		●			●		
	Transparent blue		●	●		●		●			●		
	Transparent green		●	●		●		●			●		
	Transparent yellow		●	●		●		●			●		
● Polyolefin tube Soft type / 100 m PFS	Black		●	●	●		●			●			15
	Transparent white		●	●	●		●			●			
	Transparent red		●	●	●		●			●			
	Transparent blue		●	●	●		●			●			
	Transparent green		●	●	●		●			●			
	Transparent yellow		●	●	●		●			●			
● Fluorine resin tube / 20 m ET	Transparent	●	●	●		●		●	●		●	●	16

Enclosed related parts

Tube binding band ZSF-TB□-□ (custom order)	Insert ring ZSF-WR□ (custom order)
- Tubes can be bound just by fitting them to the band. - Tubes can be fixed on the wall with fixing holes.  - Applicable tube outer size ø4/ø6/ø8/ø10/ø12 - Number of tubes bound 2, 3, or 4	- Prevents tube contraction from inside.  - Applicable bore size ø2/ø2.5/ø4/ø5/ø6/ø6.5 /ø7.5/ø8/ø9/ø10
- Page: 21	- Page: 21
- Sales unit is 10 sets (10 pieces / set).	- Sales unit is 5 sets (10 pieces / set).

PP (polypropylene resin) type Fitting

ZSF-P4 Series

- For blow circuit
- Grease free specification
- Port size M3, M5, R1/8 to R1/2
- Applicable tube ø4 to ø12

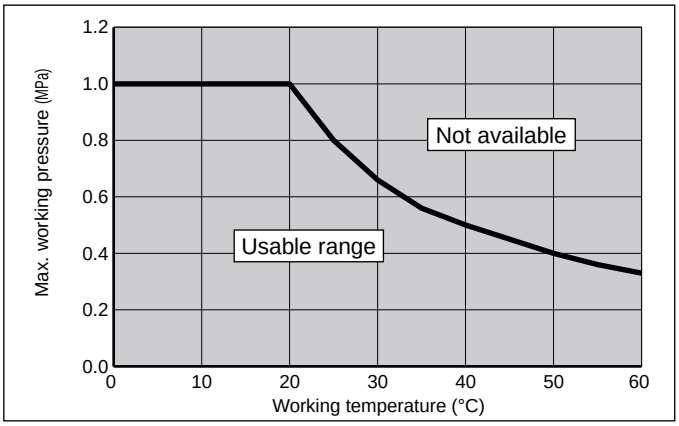
RoHS

Specifications

Descriptions		ZSF-P4
Working fluid		Air (Note 1)
Max. working pressure	MPa	1.0 (Note 2)
Working vacuum	kPa	-100
Proof pressure	MPa	1.5 (Note 3)
Ambient temperature/fluid temperature	°C	0 to 60 (No freezing) (Note 4)

Note 1: Rubber EPDM material is used, so this product cannot be used with fluids that contain mineral oil.
Note 2: The value for the max. working pressure is when the temperature is at 20°C. When using the valve in different temperature regions, refer to the right diagram, "Relationship diagram between working temperature and max. working pressure".
Note 3: The value of the withstanding pressure is when the temperature is at 20°C. Withstanding pressure becomes 1.5 times of the max. working pressure.
Note 4: Freezing could occur by adiabatic expansion depending on air character (dew point).

Relationship diagram between working temperature and max. working pressure



How to order

* Refer to the section for model number in the dimensions pages (pages 2 to 5) to find the combination of model numbers.

ZSF - C 4 - 6 -P4
(A) (B) (C)

(A) Shape	
C	Straight
U	Straight union
L	Elbow
V	Union elbow
B	Tee
E	Union Tee
G	Different dia. straight union
D	Branch Tee
Y	Branch union Y
EG	Different dia. union Tee
X	Branch Y
W	Different dia. union Y
BP	Plug
MP	Bulk head union
J	Reducer

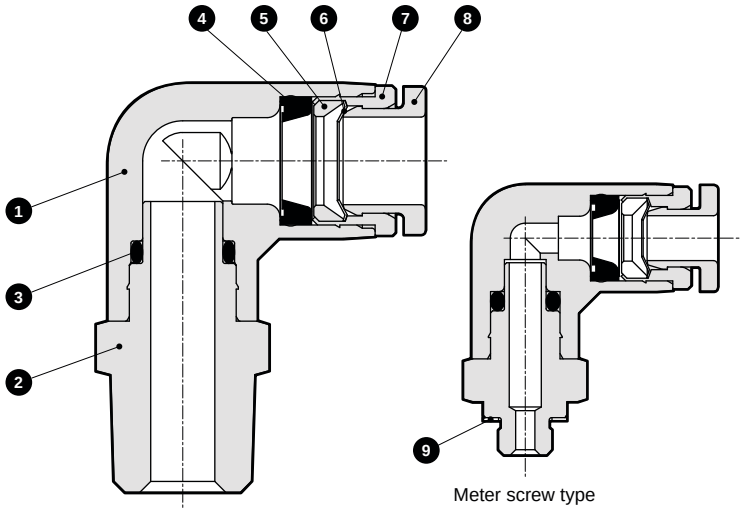
(B) Applicable tube outer diameter	
4	ø4
6	ø6
8	ø8
10	ø10
12	ø12

(C) Piping size Note 1	
M3	M3 × 0.5
M5	M5 × 0.8
6	R1/8
8	R1/4
10	R3/8
15	R1/2

Note 1: When (C) is applicable tube outer diameter, select from the list of (B).

* The sales unit is 10 pieces/pack.

Internal structure and parts list



Meter screw type

No.	Parts name	Material
1	Resin body	Polypropylene
2	Metal body *1	Stainless steel (SUS304)
3	O ring	Ethylene propylene diene rubber (EPDM)
4	Rubber sleeve	Ethylene propylene diene rubber (EPDM)
5	Lock ring	Stainless steel (SUS304)
6	Lock jaw	Stainless steel (SUS301)
7	Guide ring	Stainless steel (SUS304)
8	Release ring	Polypropylene
9	Gasket	Stainless steel (SUS304), Ethylene propylene diene rubber (EPDM)

*1: R screw is a type with screw sealant.

CAUTION

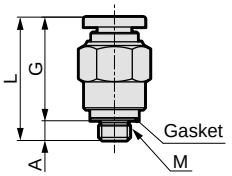
The durability of the ZSF-P4 Series packing (material: EPDM) is susceptible to mineral oil, so it cannot be used to pipe general pneumatic components. Please use ZSP Series for piping general pneumatic components.

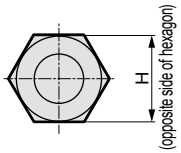
CKD

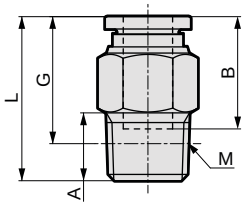
Dimensions

Straight

● ZSF-C□-□P4





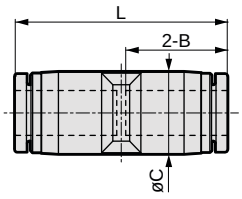


Model no.	Applicable tube O.D.	M	A	L	G	B	H	Effective sectional area mm²	Weight g
ZSF-C4-M3-P4	ø4	M3 × 0.5	2.5	20.2	17.7	15	10	0.9	5.5
ZSF-C4-M5-P4		M5 × 0.8	3	20.1	17.1	15	10	1.9	6
ZSF-C4-6-P4		R1/8	8	21.1	17.1	15	10	5.3	8
ZSF-C4-8-P4		R1/4	11	21.1	15.1	15	14	5.3	15
ZSF-C6-M5-P4	ø6	M5 × 0.8	3	22.2	19.2	17.1	12	1.9	8.5
ZSF-C6-6-P4		R1/8	8	22.7	18.7	17.1	12	12.5	8.5
ZSF-C6-8-P4		R1/4	11	24.7	18.7	17.1	14	12.5	16
ZSF-C6-10-P4		R3/8	12	23.7	17.4	17.1	17	12.5	25
ZSF-C8-6-P4	ø8	R1/8	8	27.9	23.9	18.2	14	20	14.5
ZSF-C8-8-P4		R1/4	11	26.6	20.6	18.2	14	20	14.5
ZSF-C8-10-P4		R3/8	12	23.9	17.6	18.2	17	20	21.5
ZSF-C10-8-P4	ø10	R1/4	11	30	24	20.9	17	35	18.5
ZSF-C10-10-P4		R3/8	12	29.5	23.2	20.9	17	35	24
ZSF-C12-10-P4	ø12	R3/8	12	32.1	25.8	23.5	21	59	32.5
ZSF-C12-15-P4		R1/2	15	34.1	25.9	23.5	21	59	46

Note: The G dimension of taper screw type is the reference dimension after screw tightening.

Straight union

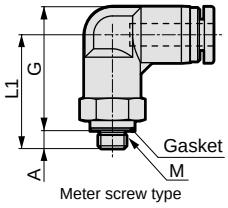
● ZSF-U□-□-P4

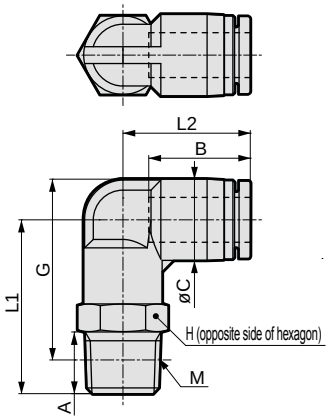


Model no.	Applicable tube O.D.	L	C	B	Effective sectional area mm²	Weight g
ZSF-U4-P4	ø4	31	10	15	5.3	4
ZSF-U6-P4	ø6	35.2	12.5	17.1	12.5	5.5
ZSF-U8-P4	ø8	37.8	14.5	18.1	20	8
ZSF-U10-P4	ø10	43.8	17.5	20.4	35	13
ZSF-U12-P4	ø12	48.2	21	23.6	59	19

Elbow

● ZSF-L□-□-P4



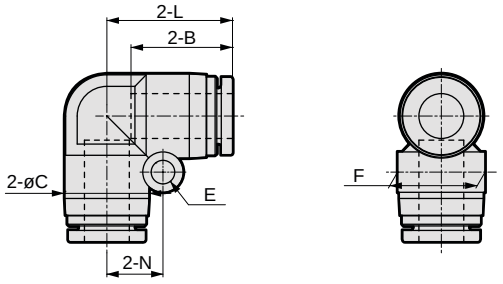


Model no.	Applicable tube O.D.	M	A	L1	L2	G	C	B	H	Effective sectional area mm²	Weight g
ZSF-L4-M5-P4	ø4	M5 × 0.8	3	20.3	18.1	22.3	10	15	10	1.5	7
ZSF-L4-6-P4		R1/8	8	23.3	18.1	24.3	10	15	10	4.2	10
ZSF-L4-8-P4		R1/4	11	26.3	18.1	25.3	10	15	14	4.2	18.5
ZSF-L6-M5-P4	ø6	M5 × 0.8	3	22	19.9	25.3	12.5	16.9	12	1.5	11
ZSF-L6-6-P4		R1/8	8	25	19.9	27.3	12.5	16.9	12	10	12.5
ZSF-L6-8-P4		R1/4	11	28	19.9	28.2	12.5	16.9	14	10	20
ZSF-L6-10-P4		R3/8	12	29.8	19.9	29.7	12.5	16.9	17	10	33
ZSF-L8-6-P4	ø8	R1/8	8	28	22.7	31.3	14.5	18.1	14	16.5	16
ZSF-L8-8-P4		R1/4	11	31	22.7	32.2	14.5	18.1	14	16.5	21.5
ZSF-L8-10-P4		R3/8	12	32.8	22.7	33.7	14.5	18.1	17	16.5	35
ZSF-L10-8-P4	ø10	R1/4	11	36	26.4	38.7	17.5	20.4	17	30	30.5
ZSF-L10-10-P4		R3/8	12	37	26.4	39.4	17.5	20.4	17	30	38
ZSF-L12-10-P4	ø12	R3/8	12	39	29.6	43.2	21	23.6	21	47	45.5
ZSF-L12-15-P4		R1/2	15	42	29.6	44.3	21	23.6	21	47	60

Note: The G dimension of taper screw type is the reference dimension after screw tightening.

Union elbow

● ZSF-V□-P4

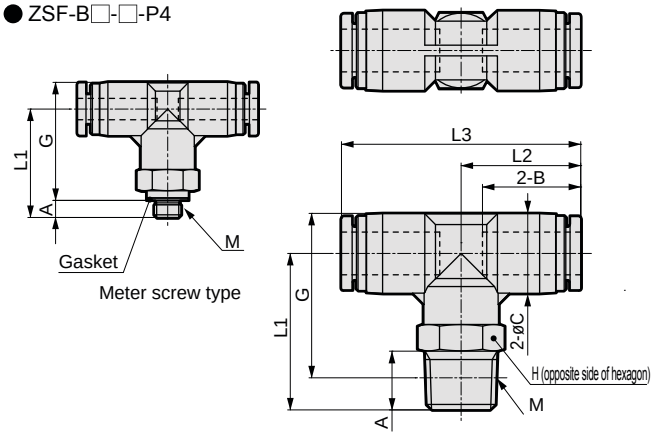


Model no.	Applicable tube O.D.	L	C	B	E	N	F	Effective sectional area mm²	Weight g
ZSF-V4-P4	ø4	17	10	15	3.2	6.5	10	4.2	4.5
ZSF-V6-P4	ø6	20.2	12.5	17	3.2	8	12.5	10	6
ZSF-V8-P4	ø8	22.4	15	18.1	4.2	10	15.6	16.5	9
ZSF-V10-P4	ø10	26.4	17.5	20.9	4.2	12	18.2	30	14
ZSF-V12-P4	ø12	29.6	21	23.6	4.2	14	21.7	47	20

Dimensions

Tee

● ZSF-B□-□-P4

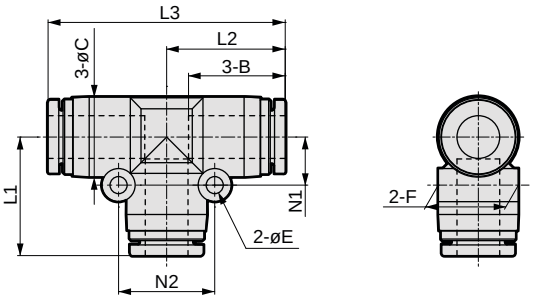


Model no.	Applicable tube O.D.	M	A	L1	L2	L3	G	C	B	H	Effective sectional area mm²	Weight g
ZSF-B4-M5-P4	ø4	M5 × 0.8	3	20.2	17	34	22.2	10	15	10	1.5	9
ZSF-B4-6-P4		R1/8	8	23.2	17	34	24.2	10	15	10	4.1	12
ZSF-B4-8-P4		R1/4	11	26.2	17	34	26.5	10	15	14	4.1	20.5
ZSF-B6-M5-P4	ø6	M5 × 0.8	3	23	20.3	40.6	26.3	13	17.1	12	1.5	14
ZSF-B6-6-P4		R1/8	8	26	20.3	40.6	28.5	13	17.1	12	10	15.5
ZSF-B6-8-P4		R1/4	11	29	20.3	40.6	29.5	13	17.1	14	10	23
ZSF-B6-10-P4		R3/8	12	30.8	20.3	40.6	31	13	17.1	17	10	35.5
ZSF-B8-6-P4	ø8	R1/8	8	26.3	22.4	44.8	29.8	15	18.4	14	16.5	19.5
ZSF-B8-8-P4		R1/4	11	29.3	22.4	44.8	30.8	15	18.4	14	16.5	25
ZSF-B8-10-P4		R3/8	12	31.1	22.4	44.8	32.3	15	18.4	17	16.5	37.5
ZSF-B10-8-P4	ø10	R1/4	11	36	25.4	50.8	38.7	17.5	20.4	17	30	36.5
ZSF-B10-10-P4		R3/8	12	37	25.4	50.8	39.4	17.5	20.4	17	30	44
ZSF-B12-10-P4	ø12	R3/8	12	39	28.6	57.2	43.2	21	23.1	21	47	54.5
ZSF-B12-15-P4		R1/2	15	42	28.6	57.2	44.3	21	23.1	21	47	69

Note: The G dimension of taper screw type is the reference dimension after screw tightening.

Union Tee

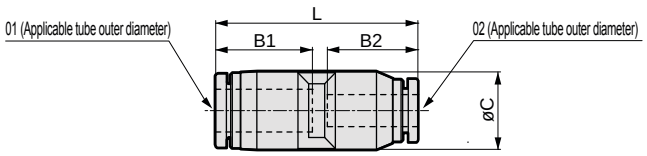
● ZSF-E□-P4



Model no.	Applicable tube O.D.	C	B	L2	L3	E	N1	N2	L1	F	Effective sectional area mm²	Weight g
ZSF-E4-P4	ø4	10	15	17	34	3.2	6.5	13	17	10	5.3	6.5
ZSF-E6-P4	ø6	13	17.1	20.2	40.4	3.2	8	16	20.2	13.5	12.5	9
ZSF-E8-P4	ø8	15	18.1	22.2	44.4	3.2	9	18	22.2	15.6	20	13
ZSF-E10-P4	ø10	17.5	19.8	25.4	50.8	4.2	12	24	25.4	18.2	35	21
ZSF-E12-P4	ø12	21	23.1	28.6	57.2	4.2	14	28	28.4	21.7	59	30

Different diameter straight union

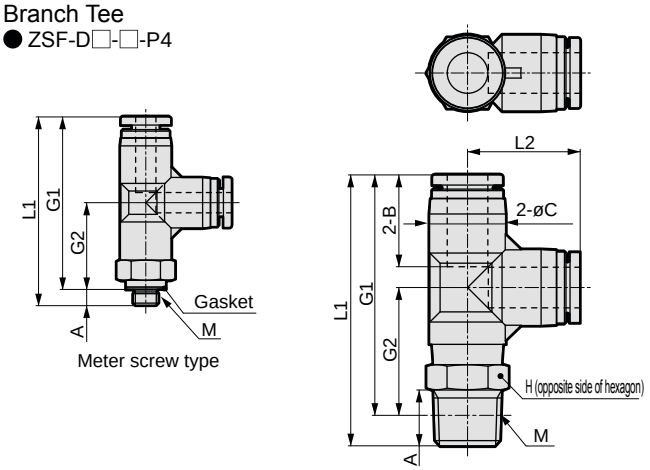
● ZSF-G□-□-P4



Model no.	Applicable tube O.D.		L	C	B1	B2	Effective sectional area mm²	Weight g
	Q1	Q2						
ZSF-G6-4-P4	ø6	ø4	34.6	12.5	17.1	15	5.3	5.5
ZSF-G8-6-P4	ø8	ø6	38	14.5	18.1	17.1	12.5	7
ZSF-G10-8-P4	ø10	ø8	43.3	17.5	20.4	18.4	20	12
ZSF-G12-10-P4	ø12	ø10	48	21	23.6	20.4	35	18

Branch Tee

● ZSF-D□-□-P4

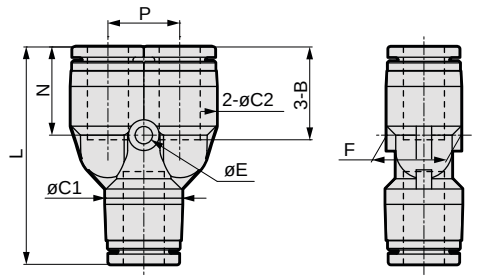


Model no.	Applicable tube O.D.	M	A	L1	L2	G1	G2	C2	B	H	Effective sectional area mm²	Weight g
ZSF-D4-M5-P4	ø4	M5 × 0.8	3	37.2	17	34.2	17.2	10	15	10	1.9	9
ZSF-D4-6-P4		R1/8	8	40.2	17	36.2	19.2	10	15	10	5.3	12
ZSF-D4-8-P4		R1/4	11	43.2	17	37.2	20.2	10	15	14	5.3	20.5
ZSF-D6-M5-P4	ø6	M5 × 0.8	3	43.3	20.2	40.3	20	13	17.1	12	1.9	14
ZSF-D6-6-P4		R1/8	8	46.3	20.2	42.3	22	13	17.1	12	12.5	15.5
ZSF-D6-8-P4		R1/4	11	49.3	20.2	43.3	23	13	17.1	14	12.5	23
ZSF-D6-10-P4		R3/8	12	51.1	20.2	44.8	24.5	13	17.1	17	12.5	35.5
ZSF-D8-6-P4	ø8	R1/8	8	50.4	22.2	46.4	24.2	15	18.1	14	20	20
ZSF-D8-8-P4		R1/4	11	53.4	22.2	47.4	25.2	15	18.1	14	20	25.5
ZSF-D8-10-P4		R3/8	12	55.2	22.2	48.9	26.7	15	18.1	17	20	38
ZSF-D10-8-P4	ø10	R1/4	11	61.4	25.4	55.4	30	17.5	20.4	17	35	36.5
ZSF-D10-10-P4		R3/8	12	62.4	25.4	56.1	30.7	17.5	20.4	17	35	44
ZSF-D12-10-P4	ø12	R3/8	12	67.8	28.4	61.5	32.9	21	23.1	21	59	54.5
ZSF-D12-15-P4		R1/2	15	70.8	28.4	62.6	34	21	23.1	21	59	69

Note: The G1 and G2 dimensions of taper screw type are the reference dimension after screw tightening.

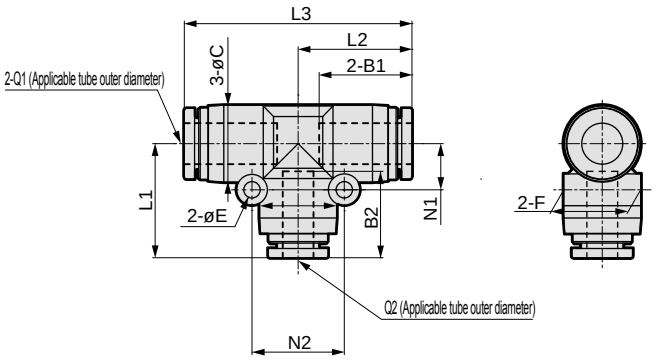
Dimensions

Branch union Y
● ZSF-Y□-P4



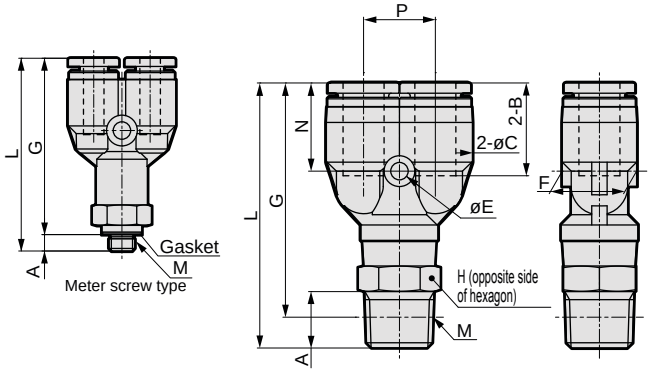
Model no.	Applicable tube O.D.	L	C1	C2	B	P	E	N	F	Effective sectional area mm²	Weight g
ZSF-Y4-P4	ø4	33	10	10	15	11	3.2	14.2	10.4	4.2	6.5
ZSF-Y6-P4	ø6	38	13	12.5	17.1	12	3.4	15.9	13.5	10	9
ZSF-Y8-P4	ø8	42.4	15	14.5	18.1	14	3.4	17.2	14.5	16.5	13
ZSF-Y10-P4	ø10	48.8	18	18	20.9	18	4.5	19.7	18	27	22
ZSF-Y12-P4	ø12	55.2	21.5	21	23.6	20	4.2	22.4	21	38	31

Different diameter union Tee
● ZSF-EG□-□-P4



Model no.	Applicable tube O.D.		L1	L2	L3	C	B1	B2	E	N1	N2	F	Effective sectional area mm²	Weight g
	Q1	Q2												
ZSF-EG6-4-P4	ø6	ø4	19.6	20.2	40.4	13	17.1	15	3.2	8	16	13.5	4.1	9
ZSF-EG8-6-P4	ø8	ø6	22.4	22.2	44.4	15	18.1	17	3.2	9	18	15.6	10.3	12
ZSF-EG10-8-P4	ø10	ø8	24.9	25.4	50.8	17.5	19.8	18.1	4.2	12	24	18.2	19.6	19.5
ZSF-EG12-10-P4	ø12	ø10	28.2	28.6	57.2	21	23.1	20.9	4.2	14	28	21.7	32.5	28

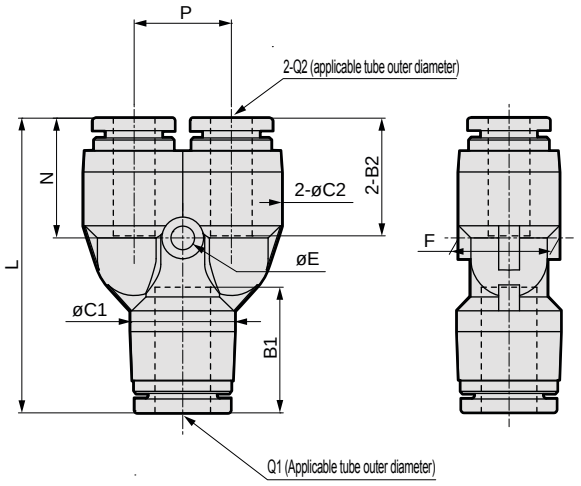
Branch Y
● ZSF-X□-□-P4



Model no.	Applicable tube O.D.	M	A	L	G	C	B	P	E	N	H	F	Effective sectional area mm²	Weight g
ZSF-X4-M5-P4	ø4	M5 × 0.8	3	37.7	34.7	10	15	11	3.2	14.2	10	10.4	1.5	9.5
ZSF-X4-6-P4		R1/8	8	40.7	36.7	10	15	11	3.2	14.2	10	10.4	4.2	12.5
ZSF-X4-8-P4		R1/4	11	43.7	37.7	10	15	11	3.2	14.2	14	10.4	4.2	20.5
ZSF-X6-M5-P4	ø6	M5 × 0.8	3	41.5	38.5	12.5	17.1	12	3.4	15.9	12	13.5	1.5	14
ZSF-X6-6-P4		R1/8	8	44.5	40.5	12.5	17.1	12	3.4	15.9	12	13.5	10	15.5
ZSF-X6-8-P4		R1/4	11	47.5	41.5	12.5	17.1	12	3.4	15.9	14	13.5	10	23
ZSF-X6-10-P4		R3/8	12	49.3	43	12.5	17.1	12	3.4	15.9	17	13.5	10	21
ZSF-X8-6-P4	ø8	R1/8	8	48.7	44.7	14.5	18.1	14	3.4	17.2	14	14.5	16.5	20.5
ZSF-X8-8-P4		R1/4	11	51.7	45.7	14.5	18.1	14	3.4	17.2	14	14.5	16.5	25.5
ZSF-X8-10-P4		R3/8	12	53.5	47.2	14.5	18.1	14	3.4	17.2	17	14.5	16.5	24.5
ZSF-X10-8-P4	ø10	R1/4	11	58.5	52.5	18	20.9	18	4.5	19.7	17	18	30	38
ZSF-X10-10-P4		R3/8	12	59.5	53.2	18	20.9	18	4.5	19.7	17	18	30	45.5
ZSF-X12-10-P4	ø12	R3/8	12	64.7	58.4	21	23.6	20	4.2	22.4	21	21	37	56.5
ZSF-X12-15-P4		R1/2	15	67.7	59.5	21	23.6	20	4.2	22.4	21	21	37	71

Note: The G dimension of taper screw type is the reference dimension after screw tightening.

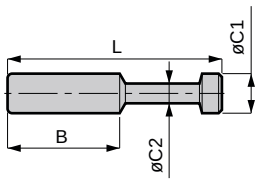
Different diameter union Y
● ZSF-W□-□-P4



Model no.	Applicable tube O.D.		L	C1	C2	B1	B2	P	E	N	F	Effective sectional area mm²	Weight g
	Q1	Q2											
ZSF-W6-4-P4	ø6	ø4	37.4	13	12.5	17.1	15	12	3.4	15.3	13.5	4.2	8.5
ZSF-W8-6-P4	ø8	ø6	42.6	15	14.5	18.1	17.1	14	3.4	17.4	14.5	10	11.5
ZSF-W10-8-P4	ø10	ø8	48.3	18	18	20.9	18.2	18	4.5	19.2	18	17	18.5
ZSF-W12-10-P4	ø12	ø10	55	21.5	21	23.6	20.4	20	4.2	22.2	21	27	28.5

Dimensions

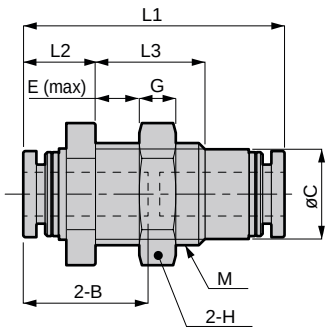
Plug
● ZSF-BP□-P4



Body material: Polypropylene resin

Model no.	Fitting port size	L	C1	C2	B	Weight g
ZSF-BP4-P4	ø4	27.5	5	3	15	0.5
ZSF-BP6-P4	ø6	32.5	7	3	17	0.5
ZSF-BP8-P4	ø8	36.5	9	4	18.1	1
ZSF-BP10-P4	ø10	42	11	5	20.2	2
ZSF-BP12-P4	ø12	44	13	6	23.4	2.5

Bulk head union
● ZSF-MP□-P4

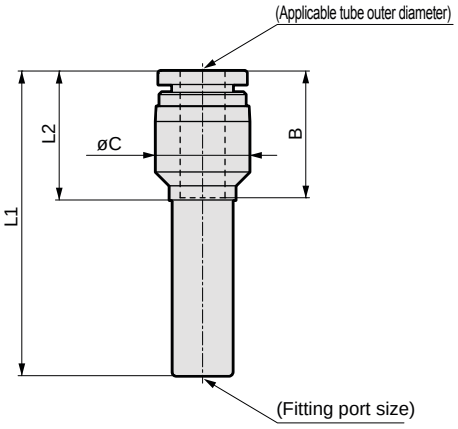


Body material: Polypropylene resin

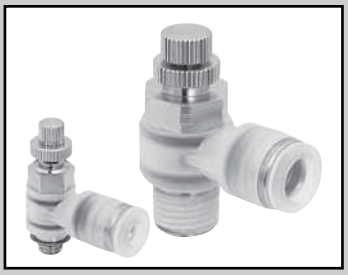
Model no.	Applicable tube O.D.	M	L1	L2	L3	C	B	H	G	E	Effective sectional area mm²	Weight g
ZSF-MP4-P4	ø4	M12×1.5	31.6	9.3	12	10	15	14	5	6	4.2	7.2
ZSF-MP6-P4	ø6	M14×1.5	35.8	9.9	15	12.3	17.1	17	5	9	10.7	10.2
ZSF-MP8-P4	ø8	M16×1.5	38.4	10.7	15.5	14.2	18.1	19	6	8.5	19.1	14.3
ZSF-MP10-P4	ø10	M20×2	43.4	13.2	18.5	17.5	20.9	24	6	11	39.6	24.4
ZSF-MP12-P4	ø12	M24×2	48.8	13.4	20.5	21	23.6	27	6	13	47.6	30.4

Note When fixing, tighten with the specified recommended tightening torque by using the bulk head section. (Refer to page 19 to find the recommended tightening torque and cautions for fixing.)

Reducer
● ZSF-J□-□-P4



Model no.	Applicable tube O.D.	Fitting port size	L1	L2	C	B	Effective sectional area mm²	Weight g
ZSF-J6-4-P4	ø4	ø6	37.8	15	10	15	5	2.4
ZSF-J8-4-P4	ø4	ø8	40.3	15	12.5	15	4.5	3
ZSF-J8-6-P4	ø6	ø8	40.9	17.1	12.5	17.1	11.5	3.2
ZSF-J10-6-P4	ø6	ø10	43.9	17.1	12.5	17.1	11.5	3.6
ZSF-J10-8-P4	ø8	ø10	43.7	18.1	14.5	18.1	22.5	4.7
ZSF-J12-8-P4	ø8	ø12	49.7	18.1	14.5	18.1	23	5.4
ZSF-J12-10-P4	ø10	ø12	50.2	20.4	17.5	20.4	31.5	7.9

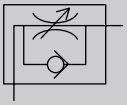


PP (polypropylene resin) type Speed control valve Elbow

SC3F-P4 Series

- For air-operated components
- Port size M3, M5, R1/8 to R1/2

JIS symbol



RoHS

Specifications

Model no.		SC3F-P4														
Descriptions		SC3F-M3	SC3F-M5		SC3F-6			SC3F-8			SC3F-10				SC3F-15	
Applicable tube outer diameter	mm	ø4	ø4	ø6	ø4	ø6	ø8	ø6	ø8	ø10	ø6	ø8	ø10	ø12	ø10	ø12
Working fluid		Air														
Max. working pressure	MPa	1.0 (Note 1)													0.9 (Note 1)	
Min. working pressure	MPa	0.1														
Proof pressure	MPa	1.5 (Note 2)													1.35 (Note 2)	
Ambient temperature/ fluid temperature	°C	0 to 60 (No freezing) (Note 3)														
Port size	Rc	M3	M5		R1/8			R1/4			R3/8				R1/2	
Product weight	g	7.8	7	8	18	19	22	38	41	44	67	69	71	74	106	109
Number of needle turn		7 and over			12 and over			13 and over								

Note 1: The value for the max. working pressure is when the temperature is at 20°C. When using the valve in different temperature regions, refer to page 9, "Relationship diagram between working temperature and the max. working pressure".
Note 2: The value of the withstanding pressure is when the temperature is at 20°C. Withstanding pressure becomes 1.5 times of the max. working pressure.
Note 3: Freezing could occur by adiabatic expansion depending on air character (dew point).

Flow and effective sectional area

Model no.			SC3F-P4														
Descriptions			SC3F-M3	SC3F-M5		SC3F-6			SC3F-8			SC3F-10				SC3F-15	
Applicable tube outer diameter		mm	ø4	ø4	ø6	ø4	ø6	ø8	ø6	ø8	ø10	ø6	ø8	ø10	ø12	ø10	ø12
Free flow	Flow	ℓ/min (ANR)	40	55		200		230	390	400		600	800		840	1380	
	Effective sectional area	mm²	0.6	0.8		3		3.4	5.8	5.9		8.8	12		12.4	20.5	
Controlled flow	Flow	ℓ/min (ANR)	65	70		150			270			550	850	920		1450	1600
	Effective sectional area	mm²	0.95	1		2.2			4			8	12.5	13.5		21.5	23.5

Note 1: The flow is the atmospheric pressure conversion value at pressure 0.5MPa.
Note 2: For the effective sectional area, corresponding value from the flow is written.

How to order

SC3F - 8 - 8 - I - P4

- Model no.
- Ⓐ Port size
- Ⓑ Applicable tube outer diameter
- Ⓒ Option

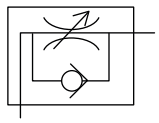
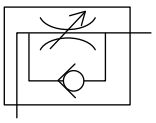
Symbol	Descriptions
Ⓐ Port size	
M3	M3 × 0.5
M5	M5 × 0.8
6	R1/8
8	R1/4
10	R3/8
15	R1/2

Ⓑ Applicable tube outer diameter		Port size					
		M3	M5	6	8	10	15
4	**ø4**	●	●	●			
6	**ø6**		●	●	●	●	
8	**ø8**			●	●	●	
10	**ø10**				●	●	●
12	**ø12**					●	●

Ⓒ Control method	
Blank	Meter-out
I	Meter-in (custom order)

are not available.

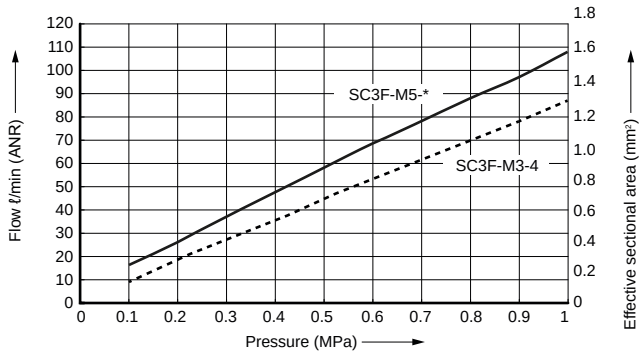
■ Control method

	Meter-out control	Meter-in control
JIS symbol	 Male thread side	 Male thread side

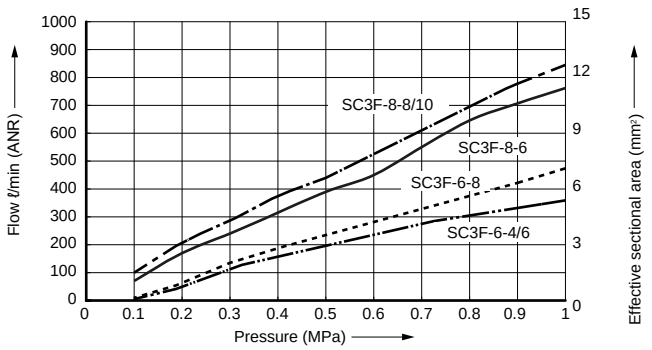
Flow characteristics

[Free flow]

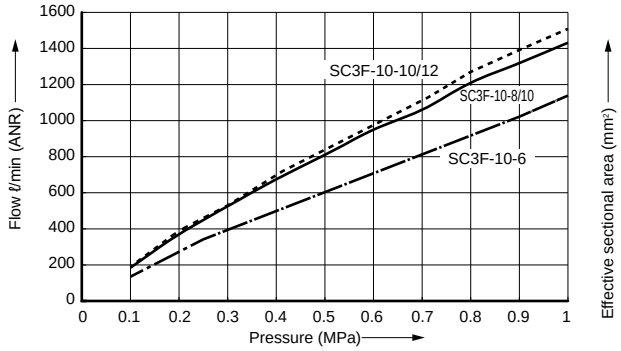
● SC3F-M3-4, SC3F-M5-*



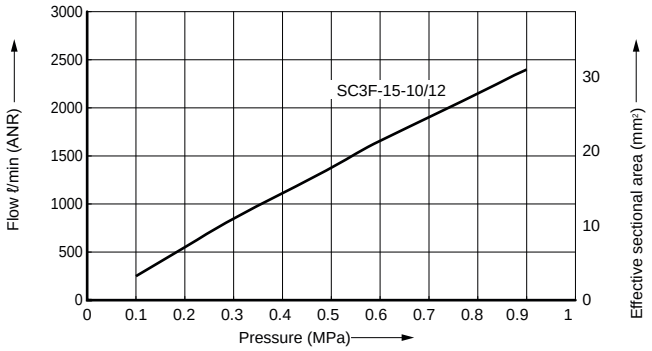
● SC3F-6-*, SC3F-8-*



● SC3F-10-*

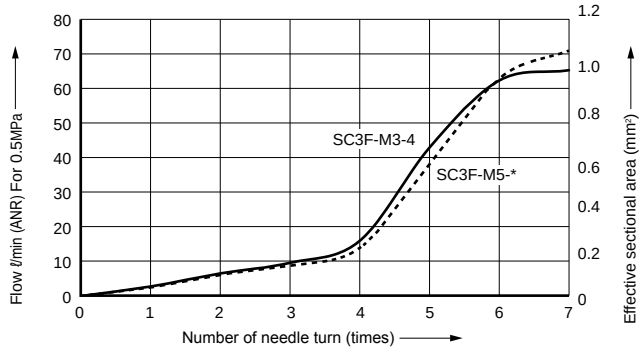


● SC3F-15-*

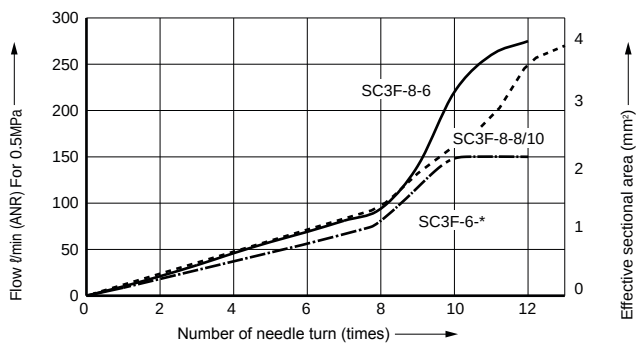


[Controlled flow]

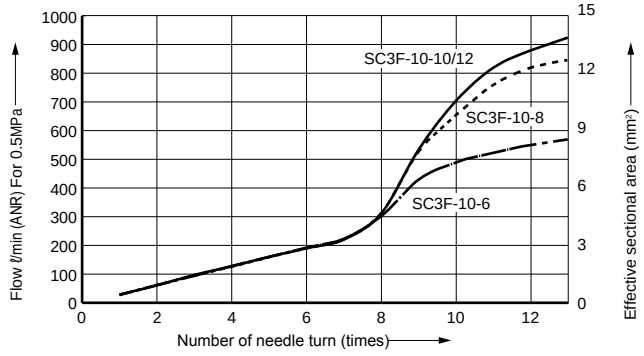
● SC3F-M3-4, SC3F-M5-*



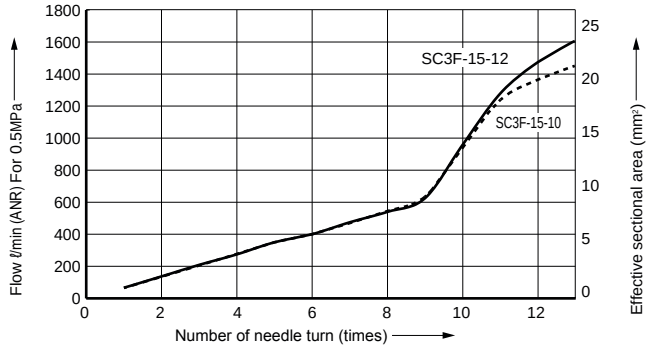
● SC3F-6-*, SC3F-8-*



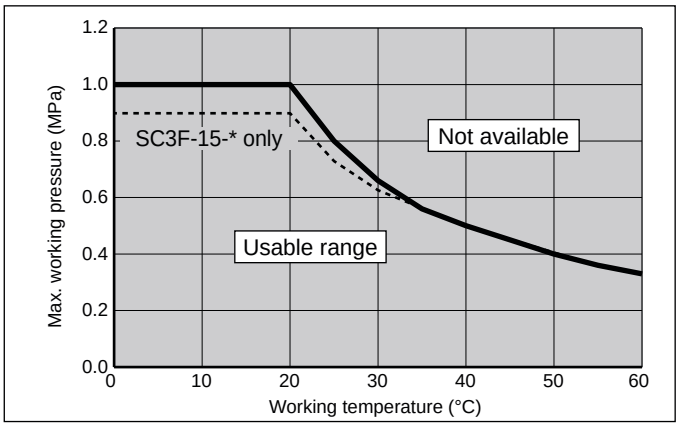
● SC3F-10-*



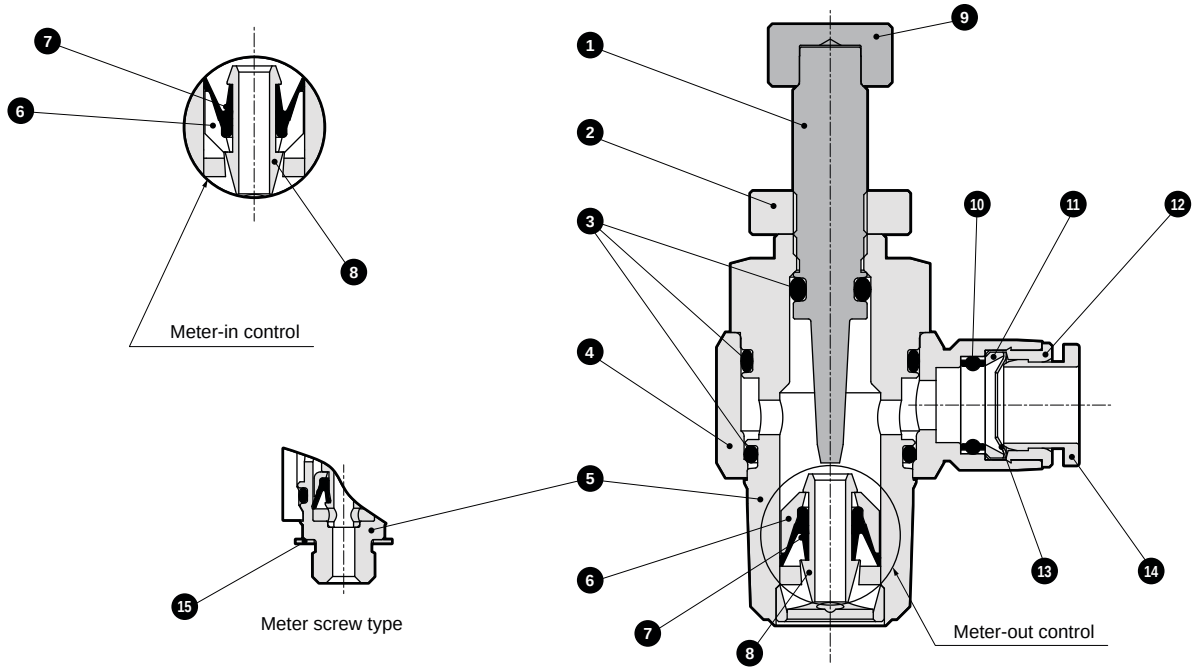
● SC3F-15-*



Relationship diagram between working temperature and max. working pressure



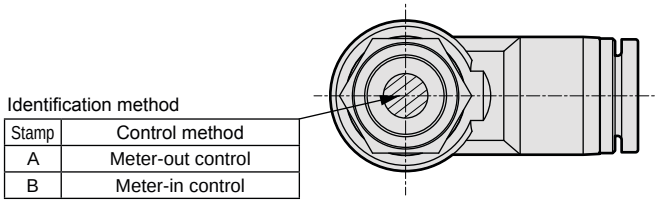
Internal structure and parts list

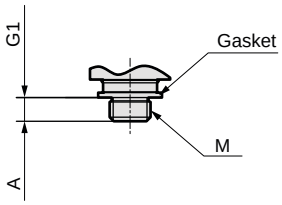


No.	Parts name	Material	No.	Parts name	Material
1	Needle	Stainless steel (SUS304)	9	Knob	Stainless steel (SUS304)
2	Lock nut	Stainless steel (SUS304)	10	Rubber sleeve	Hydrogenated nitrile rubber
3	O ring	Hydrogenated nitrile rubber	11	Lock ring	Stainless steel (SUS304)
4	Resin body	Polypropylene	12	Guide ring	Stainless steel (SUS304)
5	Metal body *1	Stainless steel (SUS304)	13	Lock jaw	Stainless steel (SUS301)
6	Basket	Polybutylene terephthalate	14	Release ring	Polypropylene
7	Check packing seal	Hydrogenated nitrile rubber	15	Gasket	Stainless steel (SUS304), Hydrogenated nitrile rubber
8	Inner ring	Stainless steel (SUS304)			

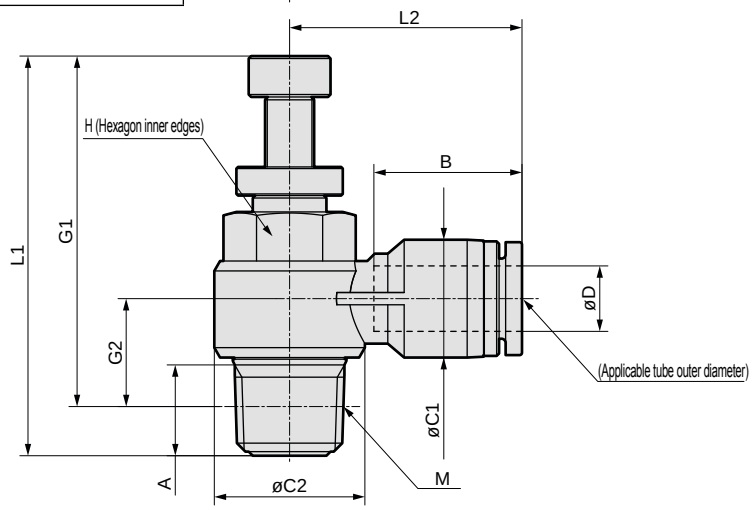
*1: R screw is a type with screw sealant.

Dimensions





Meter screw type



Symbol / Model no.	Applicable tube O.D.	M	A	L1		G1		L2	G2	C1	C2	B	H
				MAX	MIN	MAX	MIN						
SC3F-M3-4-P4	ø4	M3 × 0.5	2.5	29.2	26.5	26.7	24	20	7.1	9.9	9.8	15	8
SC3F-M5-4-P4	ø4	M5 × 0.8	3	29.7	27	26.7	24	20	7.1	9.9	9.8	15	8
SC3F-M5-6-P4	ø6							24.1	8.3	12.4		17.1	
SC3F-6-4-P4	ø4	R1/8	8	40.5	34.4	36.5	30.4	21.5	10.7	10	14.4	15	12
SC3F-6-6-P4	ø6							23.6	10.9	12.4		17.1	
SC3F-6-8-P4	ø8							26.9	11.9	14.4		18.1	
SC3F-8-6-P4	ø6	R1/4	11.1	47.6	41.4	41.6	35.4	25.6	12.2	12.4	18.4	17.1	16
SC3F-8-8-P4	ø8							28.4	13.2	14.4		18.1	
SC3F-8-10-P4	ø10							31.1	14.8	17.6		20.4	
SC3F-10-6-P4	ø6	R3/8	13.2	53.5	46.5	47.1	40.1	29.1	15.4	14.4	22	17.1	21
SC3F-10-8-P4	ø8							28.9	15.4	14.4		18.1	
SC3F-10-10-P4	ø10							31.4	16.7	17.6		20.4	
SC3F-10-12-P4	ø12							37.1	18.4	21		23.6	
SC3F-15-10-P4	ø10	R1/2	16	59.1	52.3	50.9	44.1	33.8	18	17.6	28	20.4	27
SC3F-15-12-P4	ø12							36.6	19.7	21		23.6	

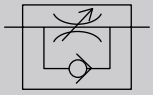
* The G1 and G2 dimensions of taper screw type are the reference dimensions after screw tightening.

PP (polypropylene resin) type Speed control valve Line type

SCLF-P4 Series

- For air-operated actuator
- Port size ø4, ø6, ø8, ø10, ø12

JIS symbol



RoHS

Specifications

Model no. / Discriptions		SCLF-H44S-P4	SCLF-H66S-P4	SCLF-H88S-P4	SCLF-H1010S-P4	SCLF-H1212S-P4
Applicable tube outer diameter	mm	ø4	ø6	ø8	ø10	ø12
Working fluid		Air				
Max. working pressure	MPa	0.9 (Note 1)				
Min. working pressure	MPa	0.05				
Proof pressure	MPa	1.35 (Note 2)				
Ambient temperature/ fluid temperature	°C	0 to 60 (No freezing) (Note 3)				
Product weight	g	10	15	26	44	62
Number of needle turn		10 and over	11 and over	8 and over		

Note 1: The value for the max. working pressure is when the temperature is at 20°C. When using in other temperature ranges, refer to the "Relationship diagram between working temperature and maximum working pressure" in below.
Note 2: The value of the withstanding pressure is when the temperature is at 20°C. Withstanding pressure becomes 1.5 times of the max. working pressure.
Note 3: Freezing could occur by adiabatic expansion depending on air character (dew point).

Flow and effective sectional area

Model no. / Descriptions			SCLF-P4				
			SCLF-H44S-P4	SCLF-H66S-P4	SCLF-H88S-P4	SCLF-H1010S-P4	SCLF-H1212S-P4
Applicable tube outer diameter		mm	ø4	ø6	ø8	ø10	ø12
Free flow	Flow	ℓ/min(ANR)	145	310	550	950	1380
	Effective sectional area	mm^2	2.1	4.6	8.2	14	20.5
Controlled flow	Flow	ℓ/min(ANR)	95	250	410	880	1300
	Effective sectional area	mm^2	1.4	3.7	6.0	13	19

Note 1: The flow is the atmospheric pressure conversion value at pressure 0.5MPa.
Note 2: For the effective sectional area, corresponding value from the flow is written.

How to order

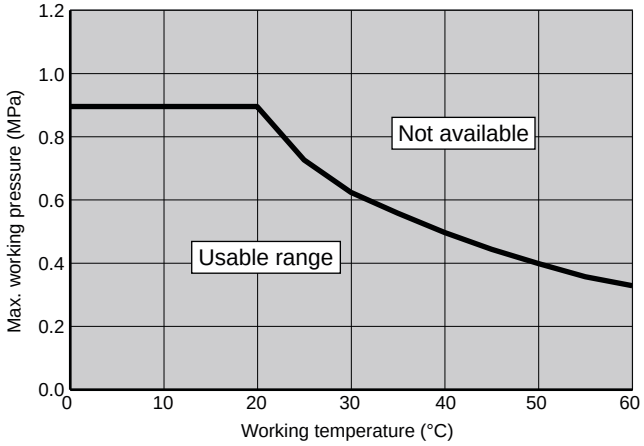
SCLF - H66 S- P4

PP union straight type speed control valve

Ⓐ Applicable tube outer diameter

Symbol	Description
Ⓐ Applicable tube outer diameter	
H44	ø4
H66	ø6
H88	ø8
H1010	ø10
H1212	ø12

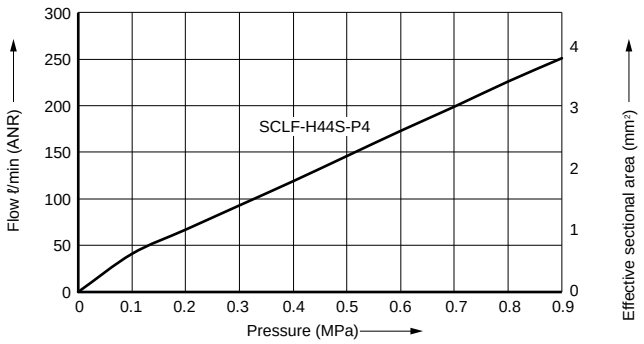
Relationship diagram between working temperature and maximum. working pressure



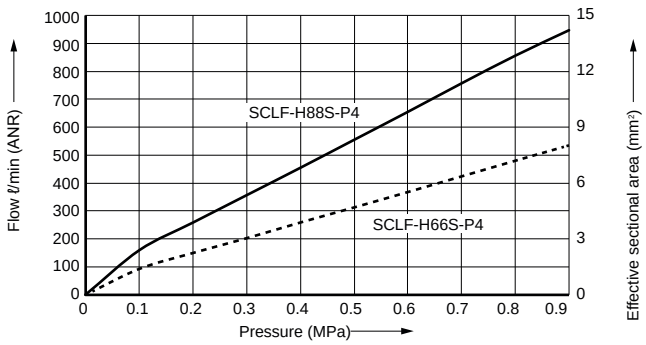
Flow characteristics

[Free flow]

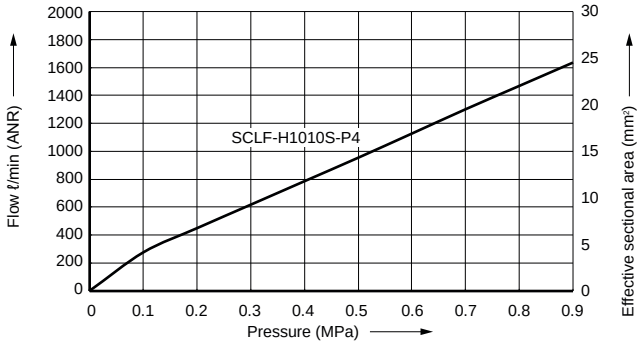
● SCLF-H44S-P4



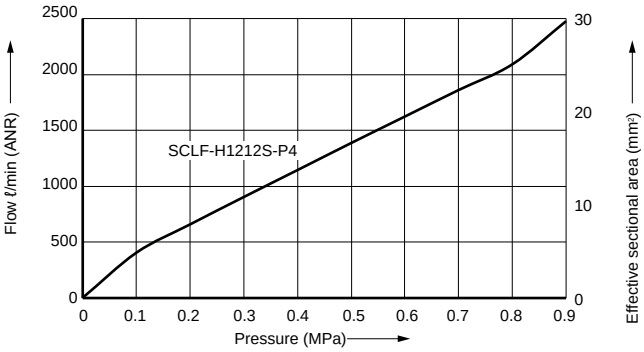
● SCLF-H66S-P4, SCLF-H88S-P4



● SCLF-H1010S-P4

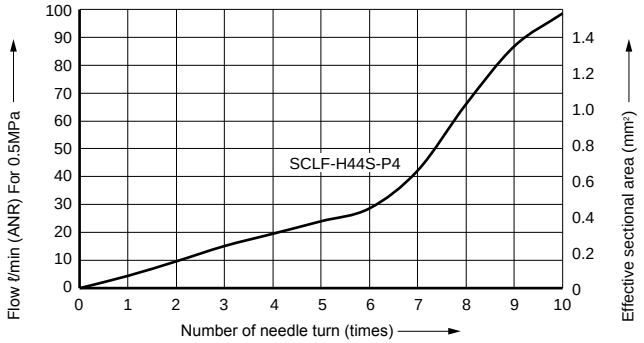


● SCLF-H1212S-P4

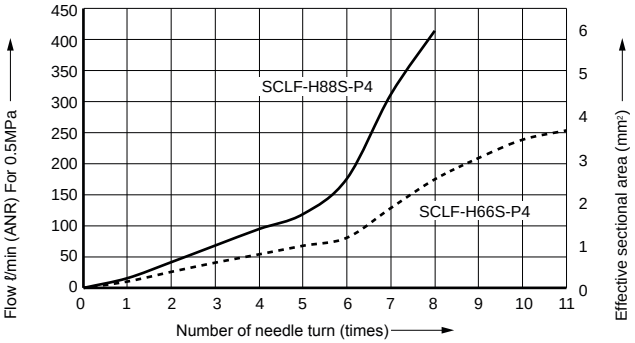


[Controlled flow]

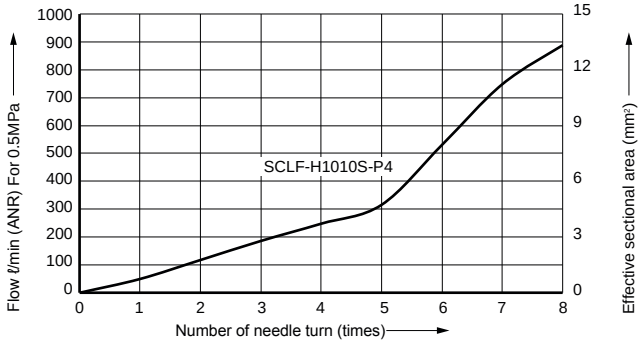
● SCLF-H44S-P4



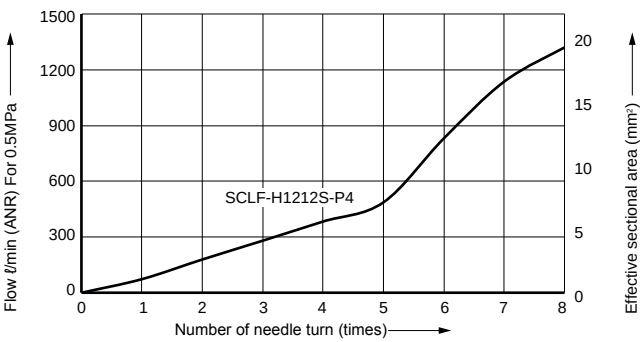
● SCLF-H66S-P4, SCLF-H88S-P4



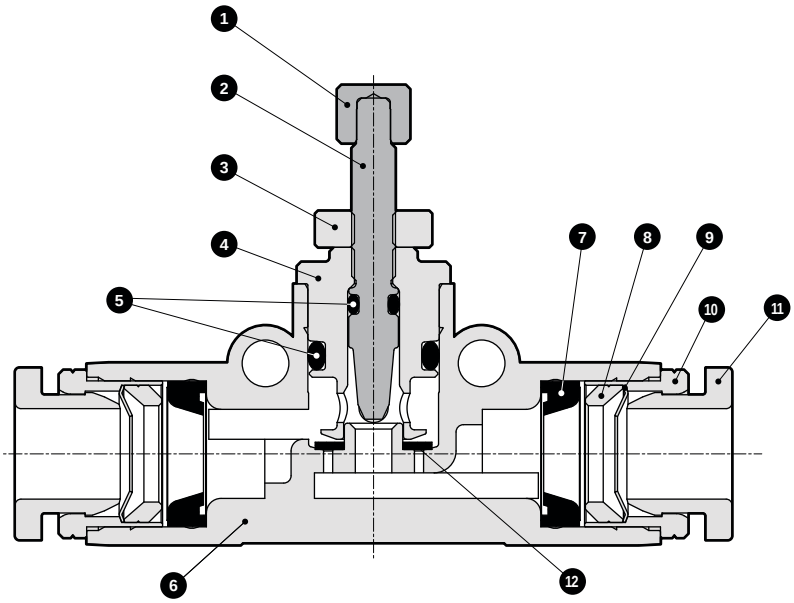
● SCLF-H1010S-P4



● SCLF-H1212S-P4

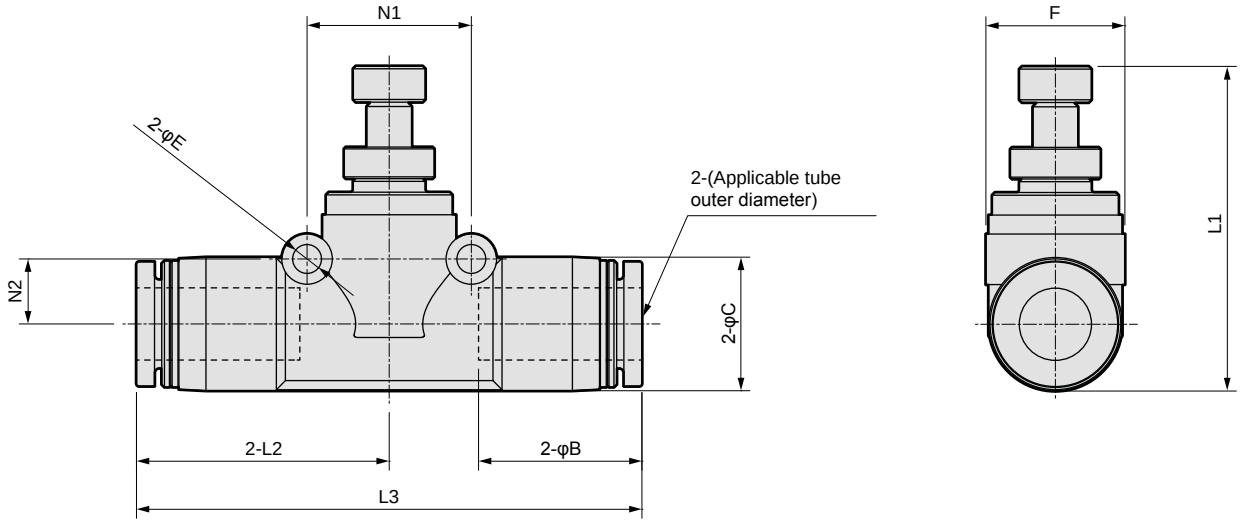


Internal structure and parts list

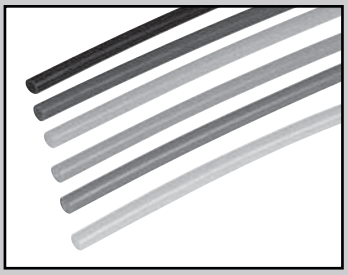


No.	Parts name	Material	No.	Parts name	Material
1	Knob	Stainless steel (SUS304)	7	Rubber sleeve	Hydrogenated nitrile rubber
2	Needle	Stainless steel (SUS304)	8	Lock ring	Stainless steel (SUS304)
3	Lock nut	Stainless steel (SUS304)	9	Lock jaw	Stainless steel (SUS301)
4	Metal body	Stainless steel (SUS304)	10	Guide ring	Stainless steel (SUS304)
5	O ring	Hydrogenated nitrile rubber	11	Release ring	Polypropylene resin
6	Resin body	Polypropylene resin	12	Diaphragm	Hydrogenated nitrile rubber

Dimensions



Symbol / Description	Applicable tube O.D.	L1		L2	L3	C	F	B	E	N1	N2
		MAX	MIN								
SCLF-H44S-P4	ø4	26	23.6	21.1	42.2	10	10.5	15	3.2	12.7	4.8
SCLF-H66S-P4	ø6	31.5	27.8	24.6	49.2	12.5	13.1	17.1	3.2	14.8	6.2
SCLF-H88S-P4	ø8	36	32.3	28	56	14.8	15.4	18.1	3.2	18.2	7.2
SCLF-H1010S-P4	ø10	41.8	38	32	64	18.2	19.7	20.4	4.2	22.2	8.7
SCLF-H1212S-P4	ø12	45.8	42.1	37.1	74.2	21.2	22.7	23.6	4.2	25.7	10.2



Polyolefin tube

● Outer diameter: 4 mm, 6 mm, 8 mm, 10 mm, 12 mm

RoHS

Main features

- Polyolefin resin is used to suit clean environments
- Two hardness types (standard type and soft type) are available.
- Outer diameter: ø4, ø6, ø8, ø10, ø12
- Six tube colors are provided as standard.

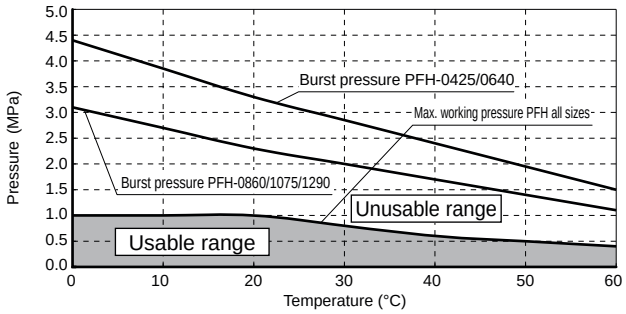
Specifications

Descriptions		PFH-0425	PFH-0640	PFH-0860	PFH-1075	PFH-1290	PFS-0425	PFS-0640	PFS-0850	PFS-1065	PFS-1280
O.D. × I.D.	mm × mm	4 × 2.5	6 × 4	8 × 6	10 × 7.5	12 × 9	4 × 2.5	6 × 4	8 × 5	10 × 6.5	12 × 8
Working fluid		Air (Note 1)									
Max. working pressure (Note 2)	MPa	1.0					0.8				
Burst pressure (Note 2)	MPa	3.3		2.3			2.1				
Working vacuum	kPa	-100									
Ambient temperature range	°C	0 to 60 (No freezing)									
Min. bending radius (JIS B 8381)	mm	7	12	23	27	33	7	12	12	18	20
Min. mounting radius	mm	15	25	37	46	54	15	25	25	29	41
Material		Polyolefin resin									
Applicable tube fitting		Fitting ZSP, ZSF Series									

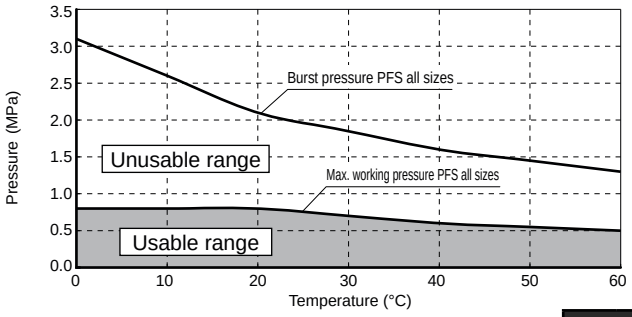
Note 1: Polyolefin resin is not suitable for piping within the general pneumatic circuit due to lack of resistance to mineral oil.
Note 2: The value for the max. working pressure and burst pressure are when the temperature is at 20°C. When using the product in other temperature ranges, refer to the graph of "Relation of usable temperature and pressure (normal breaking)".

Relation of usable temperature and pressure (normal breaking)

● PFH: Polyolefin tube standard type



● PFS: Polyolefin tube soft type

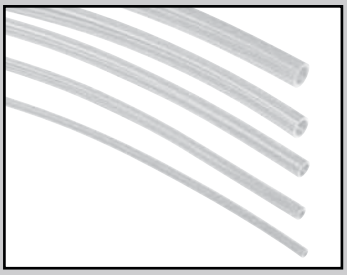


How to order

PF H - 0425 - 100 - CW - P4

- PF H: Ⓐ Type
- 0425: Ⓑ Tube size (O.D. × I.D.)
- 100: Length per roll: 100m
- CW: Ⓒ Color
- P4

Symbol	Descriptions	Model no. PFH	Model no. PFS
Ⓐ Type			
H	Standard type	●	
S	Soft type		●
Ⓑ Tube size (O.D. × I.D.)			
0425	ø4 × ø2.5	●	●
0640	ø6 × ø4	●	●
0850	ø8 × ø5		●
0860	ø8 × ø6	●	
1065	ø10 × ø6.5		●
1075	ø10 × ø7.5	●	
1280	ø12 × ø8		●
1290	ø12 × ø9	●	
Ⓒ Color			
B	Black	●	●
CW	Transparent white	●	●
CR	Transparent red	●	●
CB	Transparent blue	●	●
CG	Transparent green	●	●
CY	Transparent yellow	●	●



Fluorine resin tube

● Outer diameter: 4 mm, 6 mm, 8 mm, 10 mm, 12 mm

RoHS

Main features

- Fluorine resin (FEP) tube of high cost performance
- Eight sizes are provided (outer diameter: ø4 to ø12)

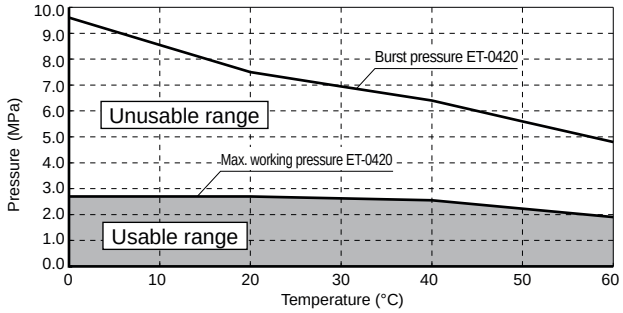
Specifications

Descriptions		ET-0420	ET-0425	ET-0640	ET-0860	ET-1075	ET-1080	ET-1290	ET-1210
O.D. × I.D.	mm × mm	4 × 2	4 × 2.5	6 × 4	8 × 6	10 × 7.5	10 × 8	12 × 9	12 × 10
Working fluid		Air							
Max. working pressure (Note 1)	MPa	2.7	1.6	1.6	1	1	0.7	1	0.7
Burst pressure (Note 1)	MPa	7.5	4.6	4.6	3.3	3.3	2.1	3.3	2.1
Working vacuum	kPa	-100							
Ambient temperature range	°C	-20 to 80 (No freezing)							
Min. bending radius (JIS B 8381)	mm	7	14	14	27	40	50	47	67
Min. mounting radius	mm	10	20	30	55	60	100	80	150
Material		Fluorine resin (FEP)							
Applicable tube fitting		Fitting ZSP, ZSF Series							

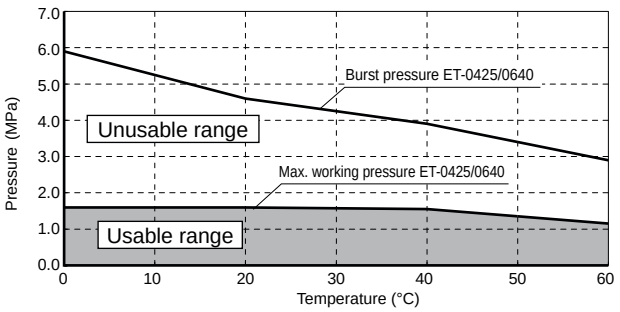
Note 1: The value for the max. working pressure and burst pressure are when the temperature is at 20°C. When using the product in different temperature regions, refer to the graph of "Relation of usable temperature and pressure (normal breaking)".

Relation of usable temperature and pressure (normal breaking)

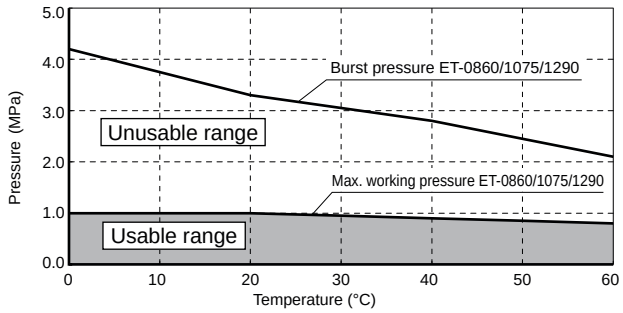
● ET-0420-*



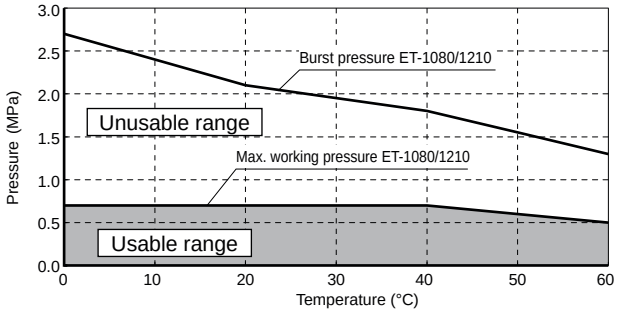
● ET-0425/0640-*



● ET-0860/1075/1290-*



● ET-1080/1210-*



How to order

ET - 0425 - 20 - C

- C: Color: transparent
- 20: Length per roll: 20m
- 0425: Ⓐ Tube size (O.D. × I.D.)

Symbol	Description
Ⓐ Tube size (O.D. × I.D.)	
0420	ø4 × ø2
0425	ø4 × ø2.5
0640	ø6 × ø4
0860	ø8 × ø6
1075	ø10 × ø7.5
1080	ø10 × ø8
1290	ø12 × ø9
1210	ø12 × ø10

Safety information

Always read this section before starting use.

When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices are secured.
It is important to select, use, handle, and maintain the product appropriately to ensure that the CKD product is used safely.
Be sure to observe the description given under DANGER, WARNING and CAUTION to assure safety of the equipment.
Check that device safety is ensured, and manufacture a safe device.

WARNING

1 This product is designed and manufactured as a general-purpose industrial device or part.
It must be handled by an operator having sufficient knowledge and experience in handling.

2 Use this product in accordance of specifications.

This product must be used within its stated specifications. Do not attempt to modify or additionally machine the product.
This product's applied scope is for use as equipment and parts for general industrial machinery. Therefore, outdoor (except for outdoor specifications) use as well as the following conditions and environments shall be considered outside of the applied scope.
(Note that this product can be used when CKD is consulted prior to use and the customer consents to CKD product specifications. The customer must provide safety measures to avoid risks in the event of problems.)

❶Use for special applications requiring safety including nuclear energy, railroad, aviation, ship, vehicle, medical equipment, equipment or applications coming into contact with beverage or food, amusement equipment, emergency shutoff circuits, press machine, brake circuits, or for safeguard.
❷Use for applications where life or assets could be adversely affected, and special safety measures are required.

3 Observe corporate standards and regulations, etc., related to the safety of device design and control, etc.

ISO 4414, JIS B 8370 (pneumatic system rules)
JFPS2008 (Principles for pneumatic cylinder selection and use)
Including High Pressure Gas Maintenance Law, Occupational Safety and Sanitation Laws, other safety rules, body standards and regulations, etc.

4 Do not handle, pipe, or remove devices before confirming safety.

❶Inspect and service the machine and devices after confirming safety of the entire system related to this product.
❷Note that there may be hot or charged sections even after operation is stopped.
❸When inspecting or servicing the device, turn off the energy source (air supply or water supply), and turn off power to the facility. Discharge any compressed air from the system, and pay attention to possible water leakage and leakage of electricity.
❹When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.

5 Observe warnings and cautions on the pages below to prevent accidents.

■ The safety cautions are ranked as"DANGER," "WARNING," and "CAUTION"in this section.

DANGER:	When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency to a warning.
WARNING:	When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.
CAUTION:	When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as “CAUTION” may lead to serious results depending on the situation.
In any case, important information that must be observed is explained.

Disclaimer

1 Term of warranty

"Warranty Period" is one (1) year from the first delivery to the customer.

2 Scope of warranty

In case any defect attributable to CKD is found during the Warranty Period, CKD shall, at its own discretion, repair the defect or replace the relevant product in whole or in part, according to its own judgment.
Note that the following faults are excluded from the warranty term:
(1) Product abuse/misuse contrary to conditions/environment recommended in its catalogs/specifications
(2) Failure caused by other than the delivered product
(3) Use other than original design purposes.
(4) Third-party repair/modification
(5) Failure caused by reason that is unforeseeable with technology put into practical use at the time of delivery
(6) Failure attributable to force majeure.
In no event shall CKD be liable for business interruptions, loss of profits, personal injury, costs of delay or for any other special, indirect, incidental or consequential losses, costs or damages.

3 Compatibility confirmation

In no event shall CKD be liable for merchantability or fitness for a particular purpose, notwithstanding any disclosure to CKD of the use to which the product is to be put.

Safety precautions

Always read before starting use.
Refer to "Pneumatic, vacuum and auxiliary components CB-24SA".

Design & Selection

1. Common

⚠WARNING

■Use within the product's specific specification range.

■This product is for industrial use only. Must not be used in components or circuits for medical equipment or components that involve human lives.

■The maximum working pressure for this product differs depending on the ambient temperature range. Refer to the "relationship diagram of working temperature range and maximum working pressure and use the product within the specified range.

■Resin could deteriorate if exposed to direct sunlight or ultraviolet rays.

■Do not continue holding down and burden the release ring of the push-in fitting.

- The tube may become unable to be grasped.
- Do not have a posture to keep holding down the release ring while transporting the product for assembly.

■The product can be used for the liquid injection process of LiB production line, but is not verified for all types of electrolytic water. Therefore, careful compatibility verification is required before selecting a product and using it.

⚠CAUTION

■Do not use this valve in circuits where ozone is generated intentionally.
Ozone resistance is sufficient for naturally generated ambient ozone. Packing deteriorates if ozone levels are high.

■This product is used with compressed air. Do not use this unit for fluids.

■Rubber parts deteriorate and life is shortened if ultra dry air is used.

■Corrosion of product differ depending on the working environment. Prior to use, perform evaluation of introduction according to the working conditions. Damage of main body, coming out of tube, leakage could occur depending on the working condition.

■Do not use the product in the environment where it is exposed to drugs or other solvents. Damage of main body, parts dropping, tube coming off, leakage could occur.

■Confirm that PTFE can be used.
The sealant contains PTFE (polytetrafluoroethylene resin) powder. Check that this poses no problem during use.

- Contact CKD for using the product in the special environment.

■Use within the product's specific specification range.
Contact CKD when using the product outside specifications or for special applications.

- Use exceeding the specifications range may result in nsufficient performance, and safety cannot be secured.
- This product may not be used in special applications and environment.
For example, use for special applications including nuclear energy, railway, aircraft, marine vessel, vehicle, medical equipment, equipment, or applications coming into contact with beverage or food, amusement equipment, emergency shutoff circuits, press machine, brake circuits, or for safeguard.

2. Fitting

⚠CAUTION

■EPDM (packing seal material) is not suitable for piping within the general pneumatic circuit due to lack of resistance to mineral oil.

3. Speed control valve

⚠CAUTION

■This valve cannot be used as a stop valve, which should not have leakage. If tightened like stop valve, flow characteristics will be changed because of resin fitting deformation, as resin is used for material of needle fittings for SCLF Series.

■This valve cannot be used for negative pressure

■For SCLF Series, pressure to actuate check valve may be higher depends on impressed pressure toward controlled flow rate, impressed time, and environment temperature.

4. Tube

⚠WARNING

■The burst pressure of a tube drops when the temperature decreases. Understand the description of working pressures well and set a sufficient safety factor.

■Abnormal temperature rises due to adiabatic compression may damage the tube.

⚠CAUTION

■Use any tube with a bend radius and a mounting radius no less than the minimum values.

■In tube piping, set a sufficient safety factor considering that the length may change over time.

■Polyolefin tube

Polyolefin resin is not suitable for piping within the general pneumatic circuit due to lack of resistance to mineral oil.

Installation & Adjustment

1. Common

⚠WARNING

■Avoid using this product in hot or, humid places, outdoors, or where it is exposed to direct sunlight.

⚠CAUTION

■Avoid installing where vibration or impact occurs.

■Securing maintenance space

- Secure sufficient space for maintenance and inspection.

■Use within the recommended tightening torque range.

[Recommended tightening torque]

Port thread	Tightening torque N·m
M3	0.7
M5	1.0 to 1.5
R1/8	7 to 9
R1/4	12 to 14
R3/8	22 to 24
R1/2	28 to 30

■Select correct piping tube.

- When using the tube of the other company's brand , make sure that the tolerance of outer diameter meets the specification as descried in the table 1.

Tolerance of tube outer diameter

Type of tube	Tolerance of dimensions
Urethane tube	Nominal diameter ±0.15
Nylon tube	Nominal diameter ±0.1

- Use an insert ring for the tube internal diameter of the mounting side when a soft tube is used. If not, the tube could come off or leakage could occur.
- Securely insert the tube to the tube end, and make sure that the tube cannot be pulled off.
- Cut the tube at a right angle using the dedicated cutter and make sure that there is no scratch on the outer diameter of the tube and the tube is not shaped like an ellipse.
- Remove all swarf and foreign materials generated during piping and tube insertion before starting use.
- Provide sufficient allowance in the tube so that it does not bent suddenly.
- Do not reuse a tube that could be deteriorated and deformed.

■Flush and wash pipes to be used.

- Dirt or foreign materials in piping will lower product performance.

■When supplying compressed air after piping is completed, make sure that there is no leakage on the all pipe connections.

Apply a leakage detection agent on pipe connections with a brush, and check for air leaks.

■Pipe so that piping connections do not become dislocated due to device movement, vibration, or tension.

■Securely insert the tube until it contacts the joint's tube end, and check that it does not come off the joint.

■Do not tighten while pressure is applied.

■Avoid use in applications involving continuous turning or swaying.

- Otherwise the joint could be damaged.

■Cut the tube when the tube is repeatedly mounted, removed, and used. The surface of the tube tends to scar easily due to the difference in surface hardness, which could cause leakage.

■Do not repeatedly mount and remove the resin plug. The surface tends to scar easily and could cause leakage. Do not use a metal plug, which causes trouble.

■When setting a tube to a push-in fitting, confirm that the tube has been cut in the right angle, the tube exterior does not have a blemish, and the tube is not shaped like ellipse.

2. Fitting

⚠CAUTION

■Mounting and removal of the tube becomes tighter than the standard type due to the grease free specification. Make sure that the tube is inserted all the way to the end of the tube before use. Applying liquid which does not cause problems with use improve the installation effectiveness.

■Tighten the mounting nut of the bulkhead union with the following recommended tightening torque. When used for a long time or in the high temperature environment, the screw could get loosen due to change in creep shape. Regularly inspect and retighten with the recommended tightening torque. If retightening did not improve the looseness, replace it with a new one.

[Recommended tightening torque]

Port thread	Tightening torque N·m
M12	0.5 to 0.7
M14	0.7 to 0.9
M16	0.8 to 1.0
M20	1.5 to 1.9
M24	2.2 to 2.8

3. Speed control valve

⚠CAUTION

■Check that lock nuts are not loose.

■Check the number of turns for the needle valve used.

- The needle valve has dislocation prevention that could bite or break if the needle is turned too far. Check the number of rotation for the product used.

■Fully close the needle, and open to adjust speed.
- The needle opens when turned to the right and closes when turned to the left.

■Install an air filter in front of the circuit.
The flow varies depending on clogging or foreign matters adhered in the orifice.

■Check the flow direction and connect correctly.
- Do not tighten while pressure is applied.
- Although installation by rotating arbitrary direction is enabled, do not use for the purpose of constant rotation and vibration.

■If the product has a lock nut, securely tighten the nut by hand instead of using a tool. The lock nut or main unit could be damaged if the lock nut is tightened with a tool. If the lock nut is not accurately tightened, it could loosen and cause initial settings to deviate.

4. Tube

⚠WARNING

■Make sure that the tube does not have stresses such as tension, twist, and extreme bending. A tube could be crushed, ruptured, or dislocated.

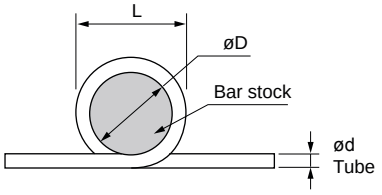
■Make sure that the tube is not blemished due to friction or tangling. The tube could rupture.

⚠CAUTION

■The minimum bending radius and the minimum mounting radius of a tube are reference values in an environment of 20°C and 65%RH. They are not guaranteed values. Use the minimum bending radius when using the tube winding it around a mandrel (bar stock). Use the minimum mounting radius in other cases. The values change depending on the working environment and the tube length. The person in charge of selecting tubes should carefully verify the applicability to the machine.

■Measurement procedure

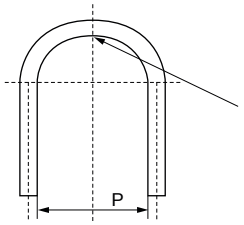
(1) Min. bending radius (JIS B 8381)
Values are the measurement results based on JIS B 8381.
If tubing is tightly wound around a round rod, indicate the rod radius when variation η reaches 25%.



$$\eta = \left(1 - \frac{L-D}{2d}\right) \times 100$$

η: Deforming ratio (%)
d: Tube outer diameter (mm)
L: Measurement (mm)
D: Diameter of the bar stock (mm)
(Twice the minimum bending radius)

(2) Min. mounting radius
Measurement is made by just bending the tube until the tube bore deformation becomes 25% and by finding the radius at that time.



Shall be the minimum mounting pitch when the deformation rate is 25% Min. mounting radius = P/2

■Make sure that the tube is not worn or damaged.
- The tube could be crushed, ruptured, or dislocated.

■Do not bend the tube. The bent section may break at a pressure lower than the max. working pressure.

During Use & Maintenance

1. Common

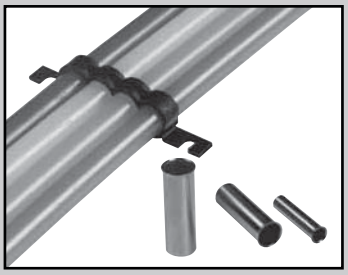
⚠WARNING

■Use within the maximum service pressure and maximum working pressure difference range.

⚠CAUTION

■During maintenance, stop supplying flow and check that no residual pressure remains.

■Storage
- Do not leave the product in a hot or highly humid atmosphere or outside of the specified range for a long time. This causes deterioration of resin and rubber.
- Contact CKD when storing this unit outside specifications.



Enclosed related parts

RoHS Custom order

● Tube binding band

Main features

Multiple tubes can be bound just by fitting them to the band.
Tubes can be fixed to the wall by screws.
Tube size: ø4 to ø12, Number of tubes bound: 2 to 4
PP (Polypropylene resin) is used as the material.

How to order

ZSF - TB 6 - 4

Ⓐ Applicable tube size (outer diameter)

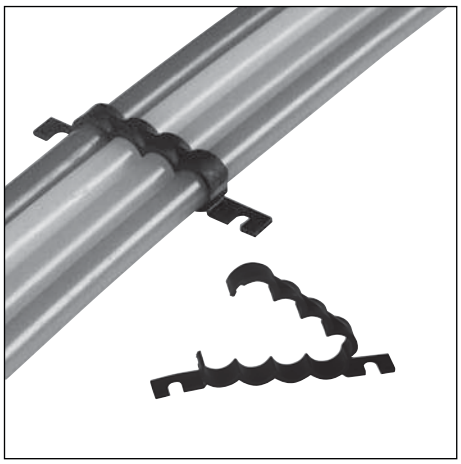
Ⓑ Number of tubes bound

Symbol	Descriptions
Ⓐ Applicable tube size (outer diameter) Note 1	
4	ø4
6	ø6
8	ø8
10	ø10
12	ø12

Ⓑ Number of tubes bound Note 1	
2	2 tubes
3	3 tubes
4	4 tubes

Note 1: If Ⓐ is "10" or "12", Ⓑ "3" cannot be selected.

* Sales unit is 10 sets (10 pieces / set).



● Insert ring

Main features

Prevents tube contraction from inside.
Stainless steel (SUS304) is used as the material.
Thickness: 0.2 mm

How to order

ZSF - WR 0425

Ⓐ Applicable tube

Symbol	Description
Ⓐ Applicable tube	
0320	ET-0420
0425	PF□-0425, ET-0425
0640	PF□-0640, ET-0640
0850	PFS-0850
0860	PFH-0860, ET-0860
1065	PFS-1065
1075	PFH-1075, ET-1075
1080	ET-1080
1280	PFS-1280
1290	PFH-1290, ET-1290
1210	ET-1210

* Sales unit is 5 sets (10 pieces / set).

- Applicable tube fitting: fitting
  ZSP, ZSF Series

⚠ Precautions

● These parts may drop depending on the tube type. If flowing of these parts in pipes could cause a problem, take preventive measures.

Related products

Components for secondary battery production P4* series

■ A wide range of variations are available for production safety of LiB manufacturing process from F.R.L. to pneumatic actuator.

Catalog No.CC-947A

Fitting stainless type ZW-P4 series

■ Introduced push-in fitting SUS303 equivalent product with use of stainless steel in the metal body section for secondary battery manufacturing equipment with limitation of copper material use, semiconductor, which dislikes particle occurrence due to corrosion, and FPD manufacturing equipment

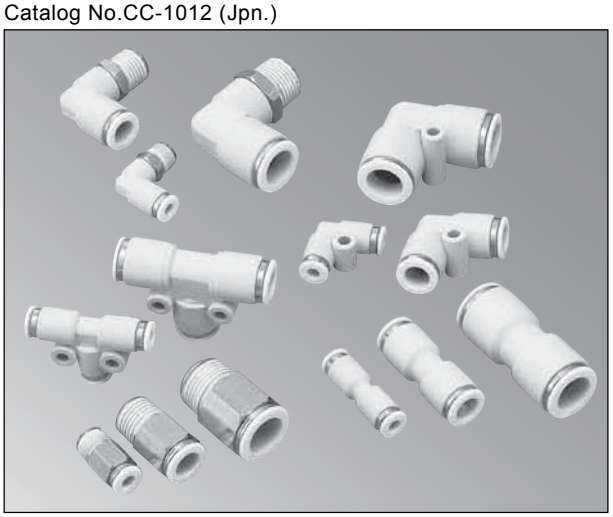
■ A wide variety of models

Wide variation available for each type of pneumatic pressure piping

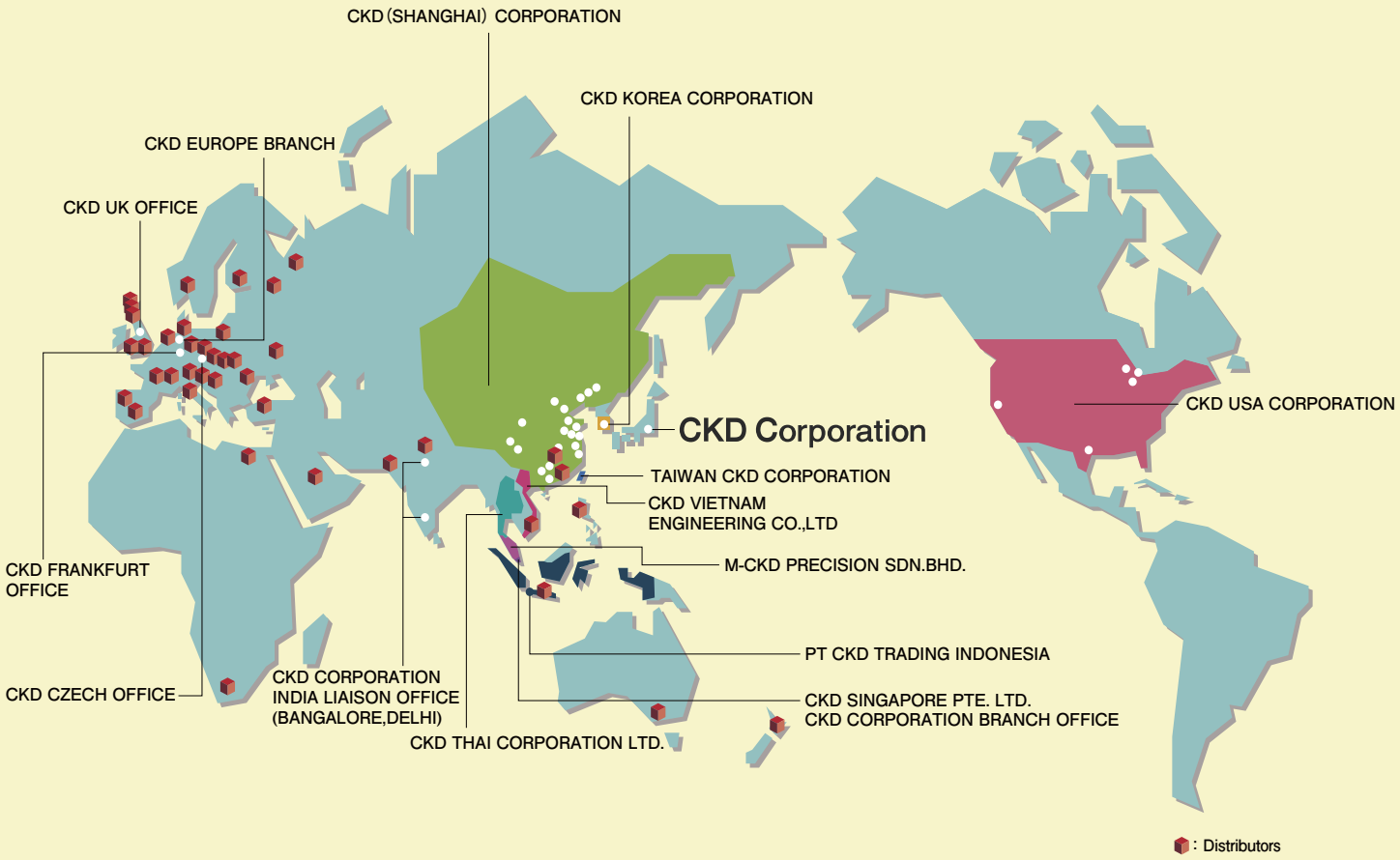
■ Ecological products

All substances that can adversely affect the environment have been eliminated from the materials RoHS directive compliant product

Catalog No.CC-1012 (Jpn.)



WORLD-NETWORK



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