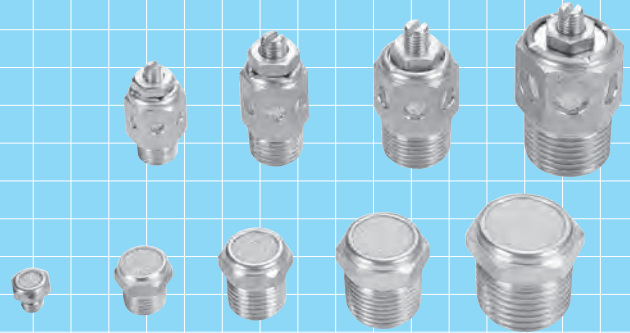


# SILENCERS

Silencers are designed to attenuate the exhaust noise caused by control of pneumatic lines. In general, silencers are mounted on the exhaust ports of solenoid valves, directional control valves and the like, to reduce exhaust noise when direction is changed. This contributes to overall noise reduction in plants.

<b>ES3</b>	Standard resin-made type	$R\frac{1}{8} \sim R1$
<b>ES4</b>	Standard metal-made type	$R\frac{3}{4} \sim R2\frac{1}{2}$
<b>ES4S</b>	Standard stainless-steel type	$M5 \sim R\frac{1}{2}$
<b>ES5</b>	Flat metal-made type	$M5 \sim R\frac{1}{2}$
<b>ES5S</b>	Flat stainless-steel type	$R\frac{1}{8} \sim R\frac{1}{2}$
<b>EVS5</b>	With throttle valve (resin-made)	$R\frac{1}{8} \sim R\frac{1}{4}$
<b>EVS4-M5/EVS6</b>	With throttle valve (metal-made)	$M5 \cdot R\frac{1}{8} \sim R\frac{1}{2}$



## Specifications

Port size		M5	6A	8A	10A	15A	20A	25A	32A	40A	50A	65A		
			R1/8	R1/4	R3/8	R1/2	R3/4	R1	R1 1/4	R1 1/2	R2	R2 1/2		
Model code	Standard type	resin	ES3							-				
		metal	-				ES4							
		Stainless-steel	ES4S							-				
	Flat type	metal	ES5							-				
		Stainless-steel	ES5S							-				
	With throttle valve	resin	-	EVS5				-						
metal		EVS4	EVS6				-							
Effective sectional area (mm <sup>2</sup> )	ES3	-	15	30	60	90	160	230	-					
	ES4	-				160	270	459	660	910	1390			
	ES5	3.5	10	25	30	34	-							
	ES4S	4.0	13	20	25	56	-							
	ES5S	-	3.5	4.0	6.5	12	-							
	EVS5	Refer to the flow characteristic graphs.												
	EVS4	Refer to the flow characteristic graphs.												
EVS6	Refer to the flow characteristic graphs.													
Operating pressure		0 ~ 1.0MPa												
Ambient temperature range (For use below 5°C, be careful about freezing.)	ES3	- 20 ~ 60°C												
	ES4	- 20 ~ 60°C												
	ES5	- 20 ~ 60°C												
	EVS5	Fluid : 5 ~ 60°C					Ambient temperature : - 10 ~ 60°C							
	EVS4	- 20 ~ 60°C												
	EVS6	- 5 ~ 60°C												
	ES4S	5 ~ 150°C												
Attenuation	ES3	-	17dB (A)			20dB (A)			-					
	ES4	-				20dB (A)			15dB (A)					
	ES5	15dB (A)				-								
	ES4S	20dB (A)				-								
	ES5S	-	20dB (A)				-							
	EVS5	-	15dB (A)		-									
	EVS4	7dB (A)	-											
	EVS6	-	15dB (A)				-							
Mass		Refer to the Outside Dimensions chart.												



# Silencers

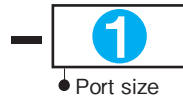
## Model Code

When ordering, specify the model as follows:

### Standard resin-made type

R 1/8 ~ 1

**ES3**



### Standard metal-made type

R 3/4 ~ 2\_1/2

**ES4**



### Standard stainless-steel type

M5 ~ R 1/2

**ES4S**



### Flat metal-made type

M5 ~ R 1/2

**ES5**



### Flat stainless-steel type

R 1/8 ~ 1/2

**ES5S**



### With throttle valve (resin-made)

R 1/8 ~ 1/4

**EVS5**



### With throttle valve (metal-made)

M5

**EVS4 - M5**

R 1/8 ~ 1/2

**EVS6**



## JIS Symbol

Standard type	With throttle valve
ES3, ES4, ES4S, ES5, ES5S	EVS4, EVS6

### 1 Port size

R 1/8	6A
R 1/4	8A
R 3/8	10A
R 1/2	15A
R 3/4	20A
R 1	25A

### 2 Port size

R 3/4	20A
R 1	25A
R 1 1/4	32A
R 1 1/2	40A
R 2	50A
R 2 1/2	65A

### 3 Port size

M5 thread	M5
R 1/8	6A
R 1/4	8A
R 3/8	10A
R 1/2	15A

### 4 Port size

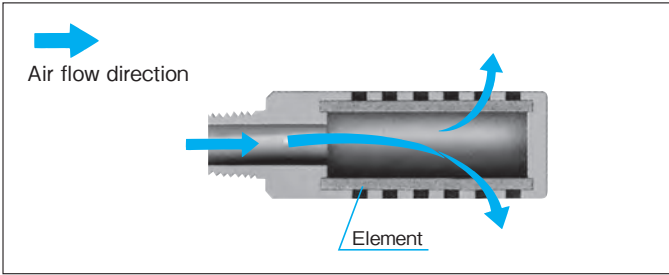
R 1/8	6A
R 1/4	8A
R 3/8	10A
R 1/2	15A

### 5 Port size

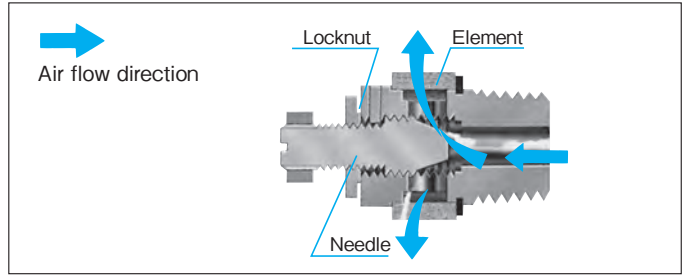
R 1/8	6A
R 1/4	8A

Construction/Operation

Standard metal-made type ES3-6A ~ 25A



With throttle valve EVS4-M5



ES3 Standard resin-made type



EVS5 With throttle valve (resin-made)



ES4 Standard metal-made type



EVS4 With throttle valve (metal-made)



ES4S Standard stainless-steel type



EVS6 With throttle valve (metal-made)



ES5 Flat metal-made type



ES5S Flat stainless-steel type



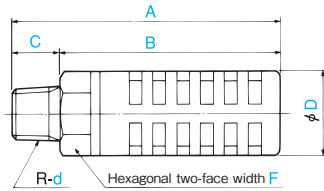


# Silencers

## Outside Dimensions

### Standard resin-made type

#### ES3-6A ~ 25A



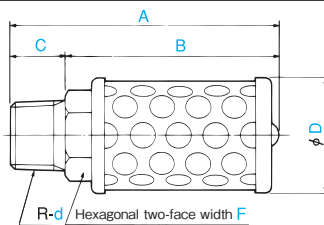
Dimensional Table

Units : mm

Model code	d	A	B	C	D	F	Mass (g)
ES3-6A	1/8	60	50	10	20	17	15
ES3-8A	1/4	60	50	10	20	17	15
ES3-10A	3/8	91	75	16	28	24	40
ES3-15A	1/2	91	75	16	28	24	40
ES3-20A	3/4	128	108	20	48	36	130
ES3-25A	1	128	108	20	48	36	130

### Standard metal-made type

#### ES4-20A ~ 65A



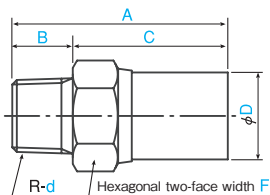
Dimensional Table

Units : mm

Model code	d	A	B	C	D	F	Mass (g)
ES4-20A	3/4	110	88	22	46	36	210
ES4-25A	1	156	130	26	46	36	270
ES4-32A	1 1/4	199	172	27	72	50	750
ES4-40A	1 1/2	243	212	31	72	50	810
ES4-50A	2	247	215	32	98	70	1600
ES4-65A	2 1/2	367	333	34	98	80	2600

### Standard stainless-steel type

#### ES4S-M5 ~ 15A



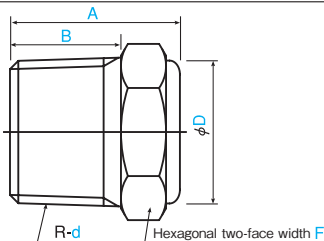
Dimensional Table

Units : mm

Model code	d	A	B	C	D	F	Mass (g)
ES4S-M5	M5	20	5	15	8	8	4
ES4S-6A	1/8	27.5	6.5	21	11.5	13	12
ES4S-8A	1/4	35	11	24	14	16	24
ES4S-10A	3/8	47.5	13.5	34	17.5	19	38
ES4S-15A	1/2	57	16	41	22	24	60

### Flat metal-made type

#### ES5-M5 ~ 15A



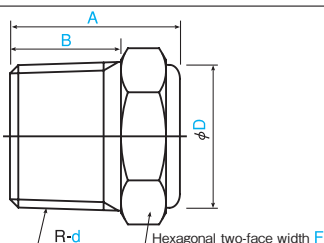
Dimensional Table

Units : mm

Model code	d	A	B	D	F	Mass (g)
ES5-M5	M5	8.8	5	7.5	8	1.5
ES5-6A	1/8	12.7	7	10.8	11	5.5
ES5-8A	1/4	17.8	11	13.3	14	10.5
ES5-10A	3/8	21.2	13.5	16.5	18	19.5
ES5-15A	1/2	24.5	16	20.6	22	33

### Flat stainless-steel type

#### ES5S-6A ~ 15A



Dimensional Table

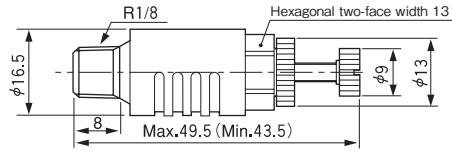
Units : mm

Model code	d	A	B	D	F	Mass (g)
ES5S-6A	1/8	14.5	6.5	12.5	13	5.5
ES5S-8A	1/4	19	11	15.2	16	10.5
ES5S-10A	3/8	22.5	13.5	18.6	19	19.5
ES5S-15A	1/2	22.5	16	23.1	24	33

## Outside Dimensions

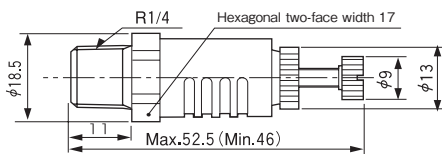
### With throttle valve (resin-made)

#### EVS5-6A resin-made



Mass (g)
30

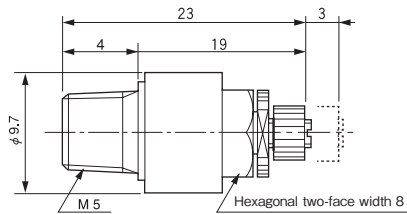
#### EVS5-8A resin-made



Mass (g)
35

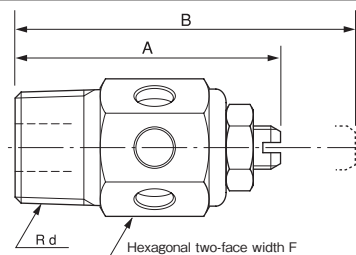
### With throttle valve (metal-made)

#### EVS4-M5 metal-made



Mass (g)
5

#### EVS6 metal-made



Model code	d	A	B	F	Mass (g)
EVS6 - 6A	1/8	29	39	12.7	18
EVS6 - 8A	1/4	36.5	47	14	32
EVS6 - 10A	3/8	39.8	50	17.5	49
EVS6 - 15A	1/2	45.6	59	22	84



## Performance Tables

### Flow characteristics graphs (Exhaust air)

#### ES3 • ES4 • ES5

Calculate the flow (Q) of standard type silencers using the formula shown on the right.

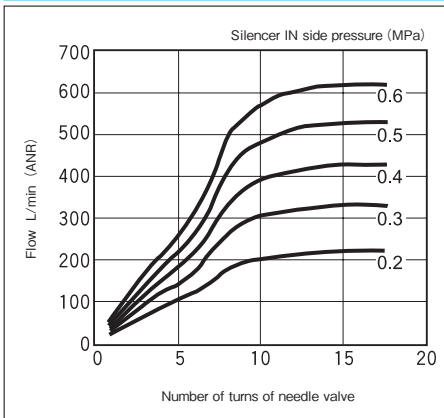
**Q** : Flow (L/min)    **S** : Effective sectional area (mm<sup>2</sup>)

**PH**=Silencer IN side absolute pressure (MPa,abc.) = (Gauge pressure : PH+0.1033MPa)

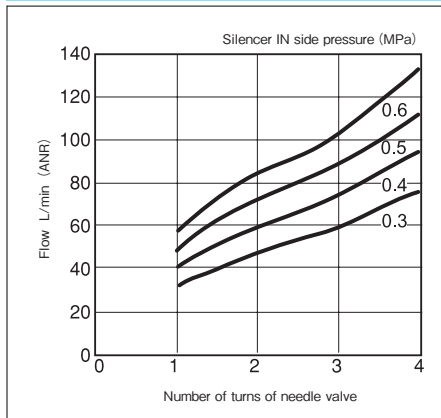
**T**=Silencer IN side temperature (K)

$$Q = 113SP_H \sqrt{\frac{273}{T}}$$

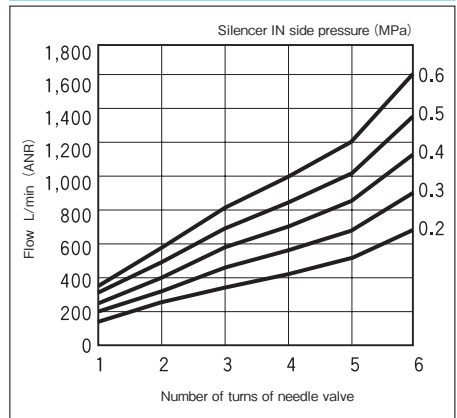
#### EVS5-6A



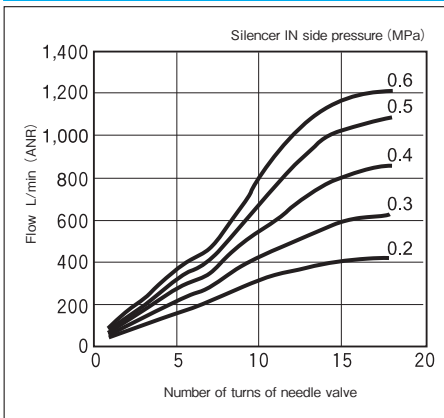
#### EVS4-M5



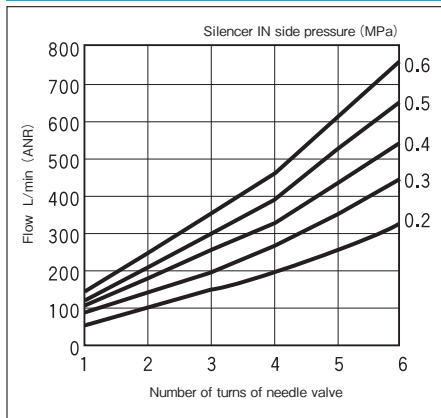
#### EVS6-10A



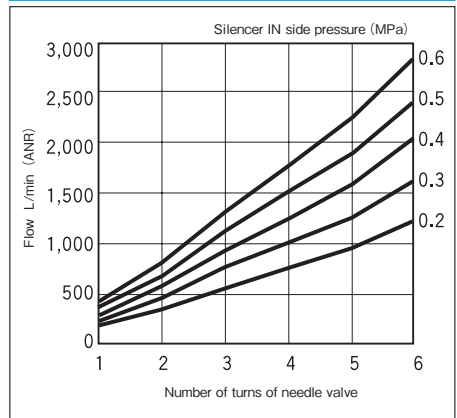
#### EVS5-8A



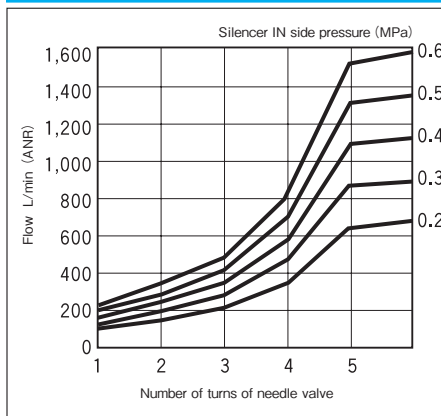
#### EVS6-6A



#### EVS6-15A



#### EVS6-8A



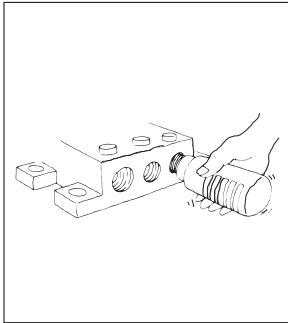
## Operating Instructions

### 1 Installation

- **Resin-made**

For silencers of sizes up to 8A, screw the silencer in lightly as far as it will go by hand.

For sizes 10A to 25A, repeat as for size 8A, and then screw in tighter with a hex driver inserted into the hexagonal part of the silencer.

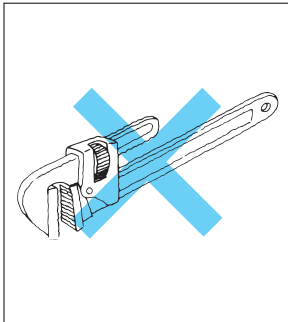


- **Metal-made**

For all sizes, first screw in lightly as far as possible by hand, and then tighten with a hex driver inserted in the hexagonal part of the silencer.

- **With throttle valve**

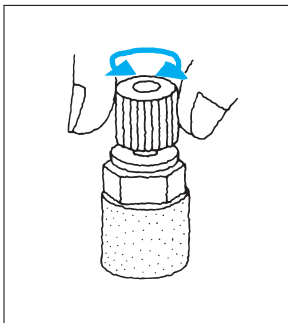
For all sizes, first screw in lightly by hand as far as it will go, and then tighten with a hex driver which can be inserted in the hexagonal part of the silencer.



- Never attempt to apply a pipe wrench, etc., to the cap (body) of the silencer, regardless of the material—resin or metal, of which it is made.

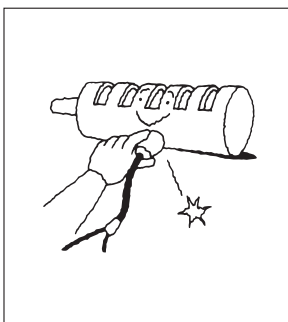
### 2 Use of the silencer with a throttle valve

- When adjusting exhaust air flow, rotate the needle clockwise to reduce the flow, and counterclockwise to increase the flow.
- After exhaust air flow adjustment, tighten the lock nut.
- When controlling the cylinder speed, mount a directional control valve onto the exhaust port. Take care not to squeeze the air supply port of the directional control valve, as well as the piping between the air cylinder and the directional control valve.



### 3 During use

- If the actuator, air cylinder, etc., becomes extremely sluggish, the silencer may be clogged. In such case, flush or wash out the exterior of the silencer. If clogging persists, the silencer must be replaced.

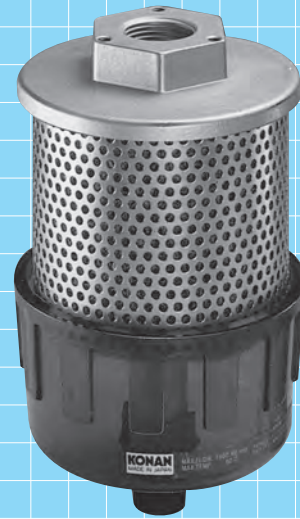
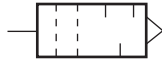


# EXHAUST FILTERS

**KMFC2** <sup>Rc</sup> 3/8 · 3/4 · 1 · 1 1/2 · 2

KMFC2 series exhaust filter collects oil mist in compressed air with excellent efficiency up to 99.9% . At the same time cuts off the noise from a centralized exhaust system. This dual function of oil elimination and noise reduction ensures comfortable work environment.

JIS Symbol



## Model Code

When ordering,specify the model as follows:

**KMFC2** – **1** – **2**  
 ● Port size                      ● Bracket

### 1 Port size

Rc 3/8	10
Rc 3/4	20
Rc 1	25
Rc 1_1/2	40
Rc 2	50

### 2 Bracket

Without	No entry
With	BR

● Bracket is not mounted but appended with regulators.

## Specifications

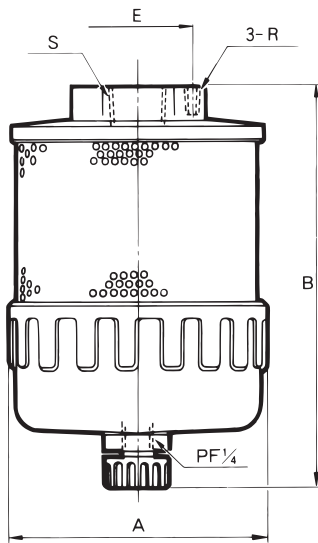
	KMFC2-10	KMFC2-20	KMFC2-25	KMFC2-40	KMFC2-50
Port size	Rc3/8	Rc3/4	Rc1	Rc1 1/2	Rc2
Effective sectional area	35mm <sup>2</sup>	105mm <sup>2</sup>	160mm <sup>2</sup>	350mm <sup>2</sup>	585mm <sup>2</sup>
Max.flow rate	450L/min	1,600L/min	3,000L/min	6,400L/min	10,500L/min
Noise reduction	32dB	28dB	32dB	23dB	22dB
Operating temperature	5 ~ 60°C				
Mass	0.28kg	0.56kg	0.75kg	1.3kg	1.8kg
Oil mist collection	99.9%				

● Noise reduction is defined as the difference between the noise that occurs at the orifice when fluid with max. flow rate is applied at 0.5MPa and that occurs when exhaust filter is mounted to the orifice (noise measured at 1m away from noise source).

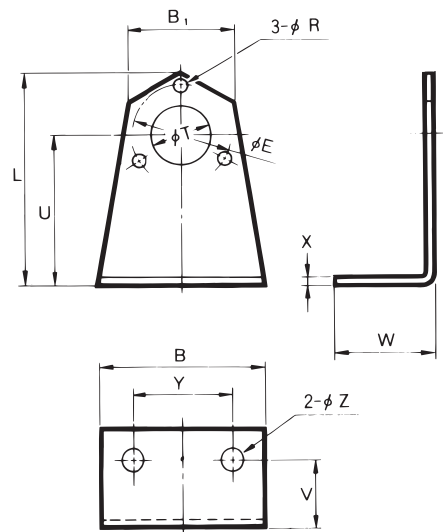


## Outside Dimensions

● KMFC2



● Bracket



■ Dimensions

Units : mm

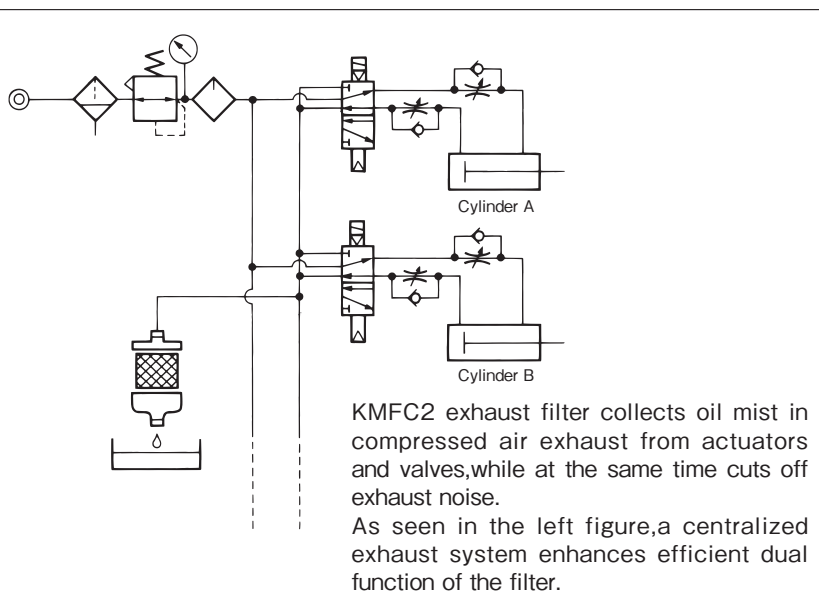
Model code	A	B	E	R	S
KMFC2-10	77	119	φ30	M4 × 0.7 depth 8	Rc3/8
KMFC2-20	102	169	φ44	M5 × 0.8 depth 10	Rc3/4
KMFC2-25	117	198	φ48	M5 × 0.8 depth 10	Rc1
KMFC2-40	137	258	φ66	M6 × 1 depth 10	Rc1 1/2
KMFC2-50	152	315	φ76	M6 × 1 depth 10	Rc2

■ Bracket Dimensions

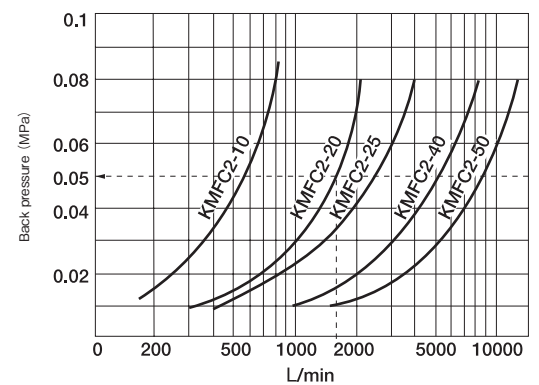
Units : mm

Model code	B	B1	L	R	T	U	V	W	X	Y	Z	E
KMFC2-10	50	32	64	4.5	18	44	20	30	2.3	30	7	30
KMFC2-20	70	46	82	5.5	29	54	20	30	3.2	40	7	44
KMFC2-25	70	50	92	5.5	37	62	20	30	3.2	40	7	48
KMFC2-40	100	70	115	7	50	74	25	35	4	70	9	66
KMFC2-50	100	80	127	7	62	80	25	35	4	70	9	76

## Application Example



## Flow characteristics graphs

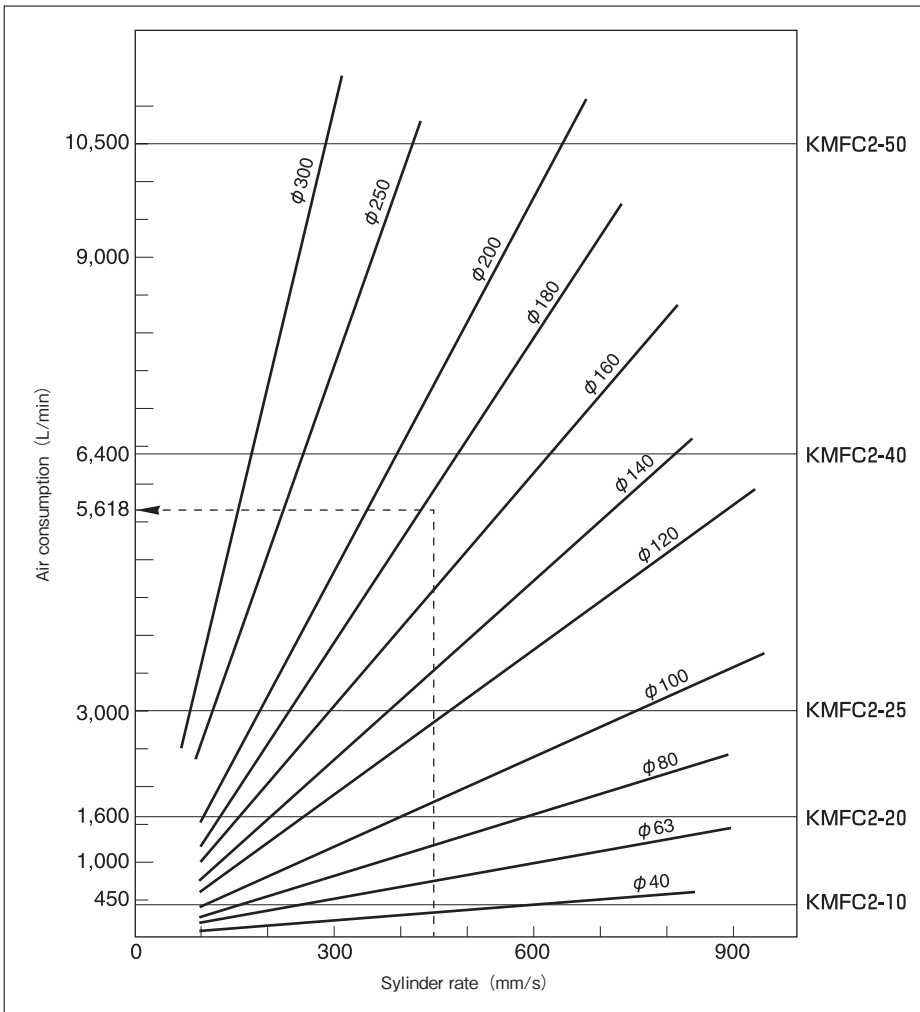


- When KMFC2-20A is used at 1600 L/min, back pressure is 0.05MPa.



# Exhaust Filters

## Model Selection Chart



### Guidance for selection

Type of exhaust filter is determined based on air consumption of the applicable circuit.

- ① Calculate air consumption of an actuator that works with the filter.  
If port volume between switch valve and actuator is large, add the volume to the calculated value.
- ② Multiply the calculated value 1.4-fold, and select an exhaust filter that functions with higher flow rate than the multiplied value. Refer to the 1.4-fold air consumption values of an Pneumatic cylinder left for selection of the exhaust filter. Please use for model selection.

### Example of calculation

#### Conditions

- Working pressure : 0.5MPa (gage pressure)
- Bore size of cylinder : φ180
- Piston speed : 450mm /s

#### Air consumption of cylinder

$$\frac{\pi}{4} \times 18^2 \times 45 \times 60 \times 0.6013 \times \frac{1.4}{0.1013} \times \frac{1}{1000} = 5618 \text{ L/min}$$

$\frac{\pi}{4} \times 18^2$	$\times 45$	$\times 60$	$\times 0.6013$	$\times \frac{1.4}{0.1013}$	$\times \frac{1}{1000}$	=5618
Cylinder piston area (cm <sup>2</sup> )	Rate (cm/min)	Absolute pressure (MPa)				L/min

● As result, KMFC2-40A (Nax flow 6400L/min) is selected.

## Operating Instructions

### 1 Installation

- Install the air filter so that the drain port is located at the bottom.

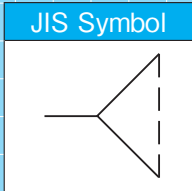
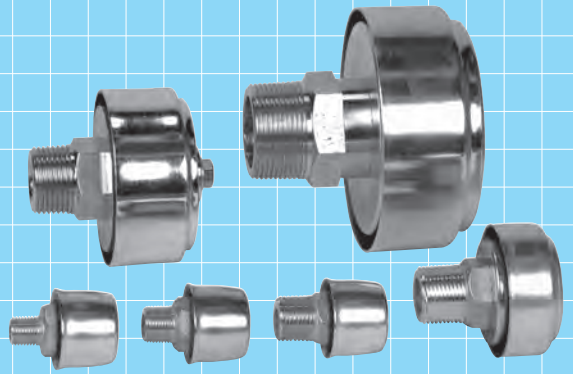
### 2 Discharging drain fluid

- Exhaust the collected drain from a drain cock before they enter into the filter element.

# MANIFOLD FILTERS

**MF2** Standard type <sup>R</sup> 1/4 ~ 1 1/2

Some pneumatic devices have a port open to the atmosphere. Examples are single-acting cylinders and vacuum devices. The manifold filter is installed on the open port of such devices to prevent foreign particles such as dirt, dust and scale, contained in external air from entering the devices.



**Model Code** When ordering, specify the model as follows:

## Standard type

**MF2-** 1  
 • Port size

1 Port size	
R 1/4	8A
R 3/8	10A
R 1/2	15A
R 3/4	20A
R 1	25A
R 1 1/2	40A

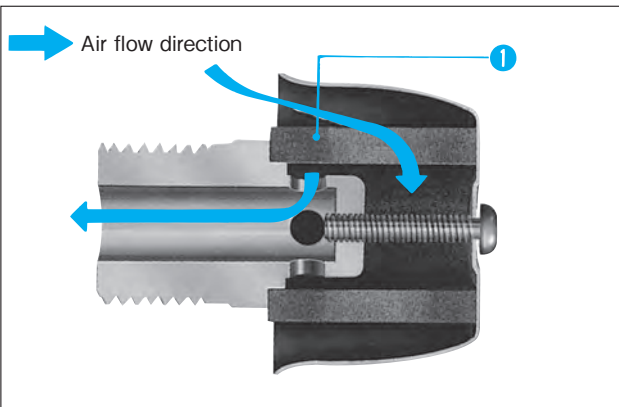
## Specifications

Model code	MF2					
Port size	8A	10A	15A	20A	25A	40A
	R 1/4	R 3/8	R 1/2	R 3/4	R 1	R 1 1/2
Operating pressure	Max. 1.0MPa					
Operating temperature	- 20 ~ 60°C (For use below 5°C ,provide adequate measures against freezing.)					
Mass	0.05kg		0.1kg		0.25kg	0.9kg

• For specifications other than those listed above, please contact us.

## Operation

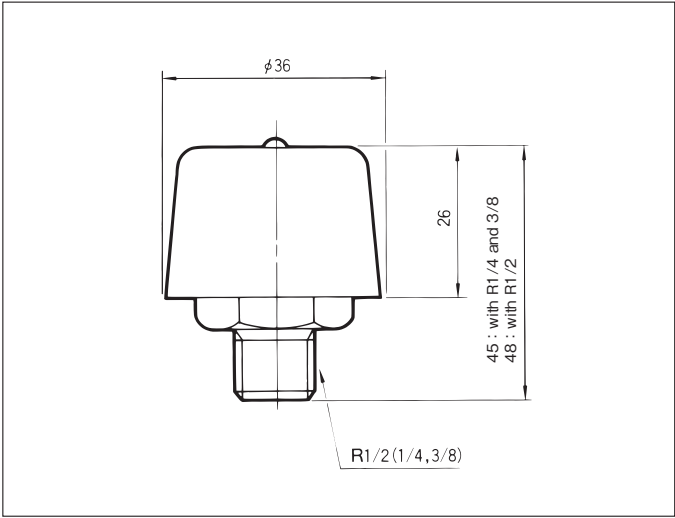
### Standard type MF2 – 15A



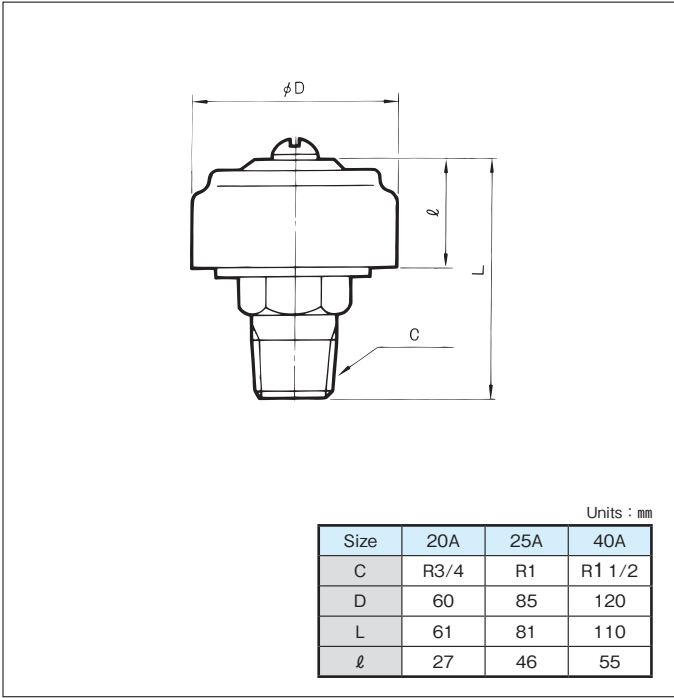
- 1 Element**
- Shuts out minute particles, scale, etc. contained in external air.

## Outside Dimensions

### MF2-8A · 10A · 15A



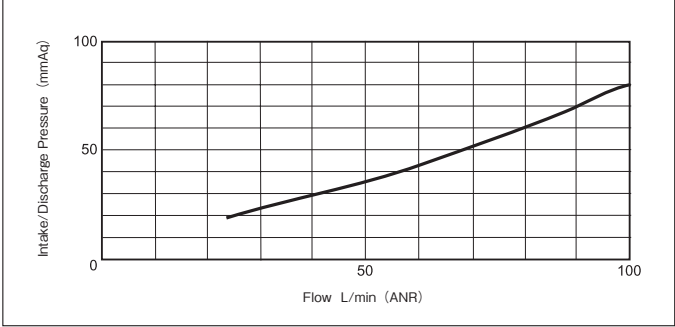
### MF2-20A · 25A · 40A



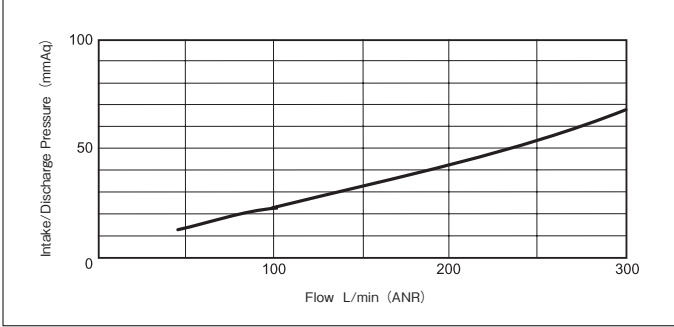
## Performance Tables

## Flow characteristics graphs

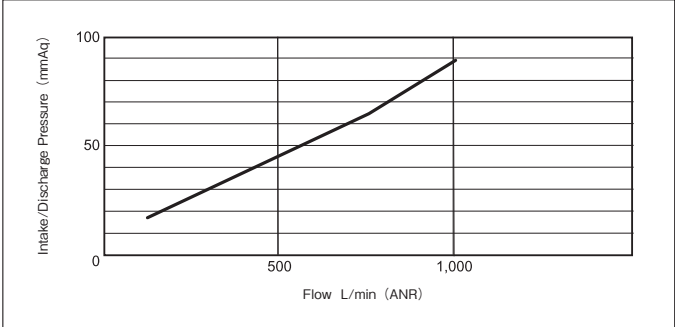
### MF2-8A · 10A · 15A



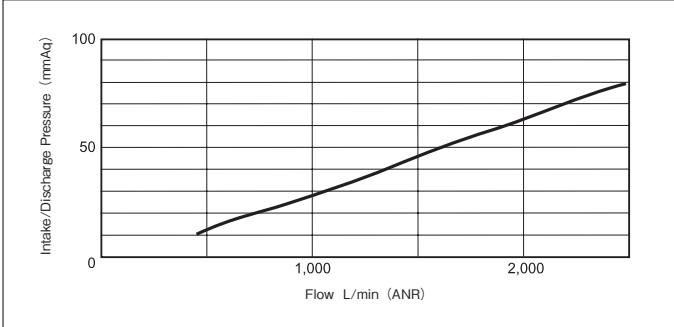
### MF2-20A



### MF2-25A



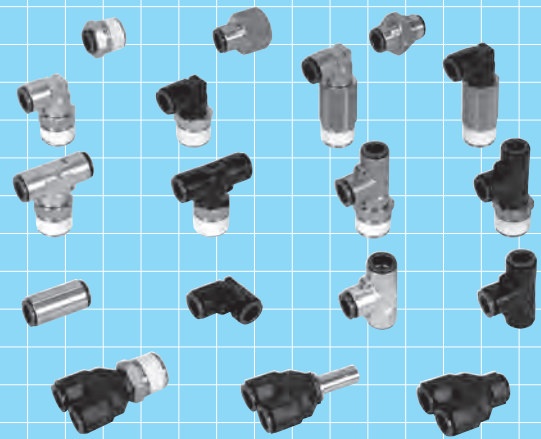
### MF2-40A



# One-Touch Couplers, TOUCH CONNECTORS

サイズ M5 × 0.8<sup>R or Rc</sup> 1/8 · 1/4 · 3/8 · 1/2

Touch connectors are one-touch couplers designed with operational ease as the priority, and adaptable for resin-made tubes for connecting pneumatic and vacuum circuits



## Features

### A wide range of tubing materials

- A wide choice of tubing materials is available including polyurethane, polyamide, polyethylene and polytetrafluoroethylene, depending on the application

### Optional color indicator rings and plates

- The indicator rings and plates permit visual distinction between lines in a complicated piping system for easy assembly and maintenance.

### One-touch connection

- One-touch connection and disconnection eliminates the need for tools.

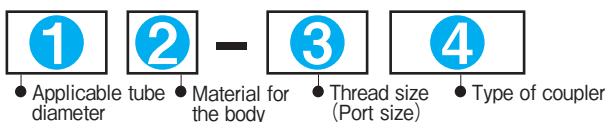
Large flow, yet compact design

Ideal for vacuum equipment piping

Connector mountable in any direction

## Model Code

When ordering, specify the model as follows. Please order it by ten units.



1 Applicable tube diameter	
4mm	4
6mm	6
8mm	8
10mm	10
12mm	12

2 Material for the body	
Metal	No entry
Resin	R

3 Thread size (Port size)	
M5 × 0.8	M5
R or Rc 1/8	01
R or Rc 1/4	02
R or Rc 3/8	03
R or Rc 1/2	04
Union	00

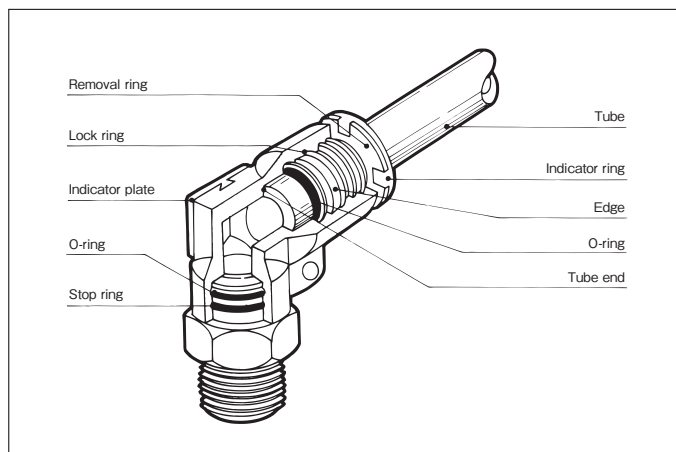
- Kind of threads for both male and female thread please refer each dimension table.

4 Type of coupler	
Male connector	M
Female connector	F
Male elbow	ML
Long male elbow	M2L
Male branch tee	MT
Male run tee	RT
Union	U
Union elbow	UL
Union tee	UT
Bulk head union	BU
Y connector	Y
Branch Y	BY
Union Y	UY

## Specifications

Model code	Same format for all		
Applicable fluid	Compressed air, vacuum, etc		
Operating pressure	Max.0.99MPa		
Material for main part	Body	Metal, Polyacetal	
	Seal	NBR	
Applicable tube material	Polyurethane, polyamide (nylon) , polyethylene, polytetrafluoroethylene (PTFE)		

## Construction

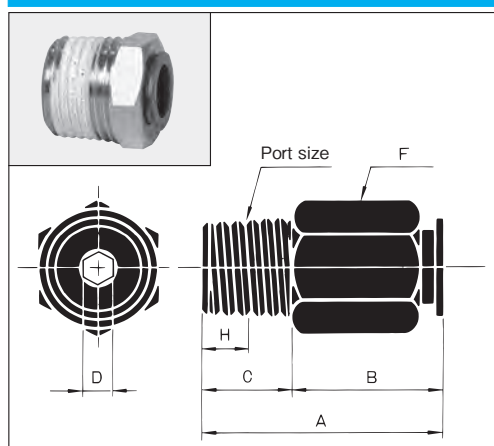


- The edge always cuts into the exterior surface of the tube due to its spring force. When force is applied for removing the tube, the edge will cut more deeply into the tube with the lock ring. To remove the tube, pull it out while pressing the ring.

## Outside Dimensions

### Male connector

M

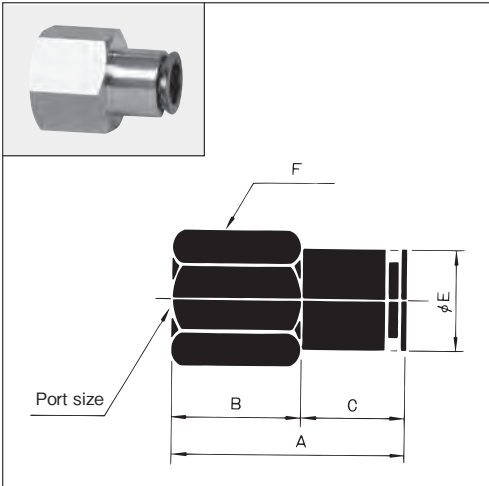


Model code	Port size	Dimensions (mm)						Material for the body
		A	B	C	D	F	H	
4-M5M	M5 × 0.8	20.5	16.5	4	—	10	—	Metal
4-01M	R1/8	17.6	9.6	8	3	10	4	
4-02M	R1/4	19.1	8.1	11	3	14	6	
6-M5M	M5 × 0.8	21.8	17.8	4	—	12	—	
6-01M	R1/8	21.7	13.7	8	4	12	4	
6-02M	R1/4	20.2	9.2	11	4	14	6	
6-03M	R3/8	21.2	9.2	12	4	17	6.4	
8-01M	R1/8	27.6	19.6	8	5	14	4	
8-02M	R1/4	26.1	15.1	11	6	14	6	
8-03M	R3/8	21.6	9.6	12	6	17	6.4	
10-01M	R1/8	28.3	20.3	8	5	17	4	
10-02M	R1/4	29.6	18.6	11	6	17	6	
10-03M	R3/8	27.6	15.6	12	8	17	6.4	
10-04M	R1/2	24.6	9.6	15	8	21	8	
12-02M	R1/4	32.6	21.6	11	7	19	6	
12-03M	R3/8	28.6	16.6	12	9	19	6.4	
12-04M	R1/2	26.6	11.6	15	9	21	8	

- Dimension "F" shows the subtense of a hexagon.

Female connector

F

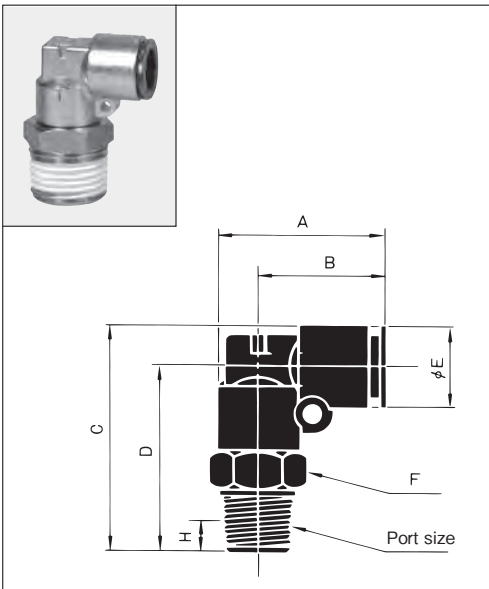


Model code	Port size	Dimensions (mm)					Material for the body
		A	B	C	E	F	
4-01F	Rc1/8	25	13	12	11	12	Metal
4-02F	Rc1/4	28	15	13	11	17	
6-01F	Rc1/8	26.3	14	12.3	13	14	
6-02F	Rc1/4	29.3	16	13.3	13	17	
6-03F	Rc3/8	30.3	16	14.3	13	21	
8-01F	Rc1/8	27.4	14	13.4	15	17	
8-02F	Rc1/4	30.4	16	14.4	15	17	
8-03F	Rc3/8	31.4	17	14.4	15	21	
10-02F	Rc1/4	30.8	16	14.8	17	17	
10-03F	Rc3/8	31.8	17	14.8	17	21	
10-04F	Rc1/2	34.8	19	15.8	17	24	
12-02F	Rc1/4	32.4	17	15.4	19	19	
12-03F	Rc3/8	33.4	18	15.4	19	21	
12-04F	Rc1/2	36.4	19.5	16.9	19	24	

• Dimension "F" shows the subtense of a hexagon.

Male elbow

ML

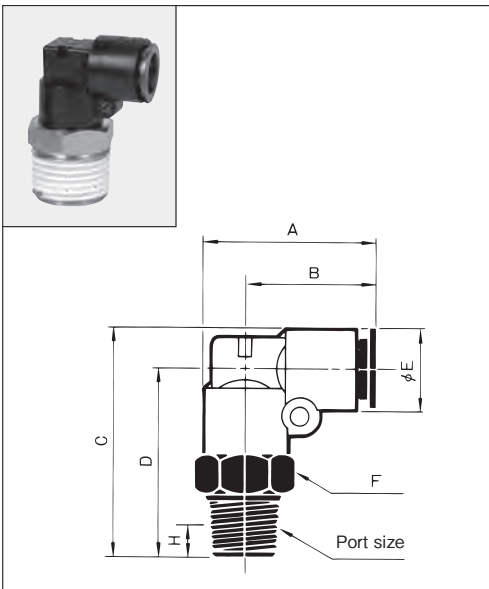


Model code	Port size	Dimensions (mm)							Material for the body
		A	B	C	D	E	F	H	
4-M5ML	M5 × 0.8	23.7	18.2	26.5	21	11	12	—	Metal
4-01ML	R1/8	23.7	18.2	30.5	25	11	12	4	
4-02ML	R1/4	23.7	18.2	33.5	28	11	14	6	
6-M5ML	M5 × 0.8	26.5	20	28.5	22	13	14	—	
6-01ML	R1/8	26.5	20	32.5	26	13	14	4	
6-02ML	R1/4	26.5	20	35.5	29	13	14	6	
6-03ML	R3/8	26.5	20	36.5	30	13	17	6.4	
8-01ML	R1/8	29.6	22.1	34.5	27	15	17	4	
8-02ML	R1/4	29.6	22.1	37.5	30	15	17	6	
8-03ML	R3/8	29.6	22.1	38.5	31	15	17	6.4	
10-01ML	R1/8	32	23.5	36.5	28	17	17	4	
10-02ML	R1/4	32	23.5	39.5	31	17	17	6	
10-03ML	R3/8	32	23.5	40.5	32	17	17	6.4	
10-04ML	R1/2	32	23.5	44.5	36	17	21	8	
12-02ML	R1/4	35.6	26.1	44	34.5	19	19	6	
12-03ML	R3/8	35.6	26.1	45	35.5	19	19	6.4	
12-04ML	R1/2	35.6	26.1	48	38.5	19	21	8	

• Dimension "F" shows the subtense of a hexagon. • The threaded portion of the male elbow can be turned as desired.

Male elbow

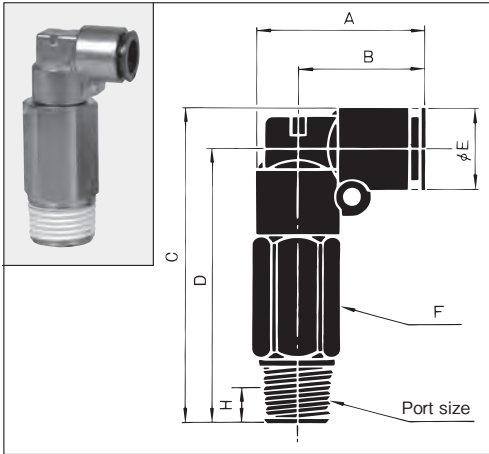
ML



Model code	Port size	Dimensions (mm)							Material for the body
		A	B	C	D	E	F	H	
4R-M5ML	M5 × 0.8	23.7	18.2	26.5	21	11	12	—	Polyacetal · Metal
4R-01ML	R1/8	23.7	18.2	30.5	25	11	12	4	
4R-02ML	R1/4	23.7	18.2	33.5	28	11	14	6	
6R-M5ML	M5 × 0.8	26.5	20	28.5	22	13	14	—	
6R-01ML	R1/8	26.5	20	32.5	26	13	14	4	
6R-02ML	R1/4	26.5	20	35.5	29	13	14	6	
6R-03ML	R3/8	26.5	20	36.5	30	13	17	6.4	
8R-01ML	R1/8	30.1	22.6	34.5	27	15	17	4	
8R-02ML	R1/4	30.1	22.6	37.5	30	15	17	6	
8R-03ML	R3/8	30.1	22.6	38.5	31	15	17	6.4	
10R-01ML	R1/8	32.5	24	36.5	28	17	17	4	
10R-02ML	R1/4	32.5	24	39.5	31	17	17	6	
10R-03ML	R3/8	32.5	24	40.5	32	17	17	6.4	
10R-04ML	R1/2	32.5	24	44.5	36	17	21	8	
12R-02ML	R1/4	36.1	26.1	44.5	34.5	20	19	6	
12R-03ML	R3/8	36.1	26.1	45.5	35.5	20	19	6.4	
12R-04ML	R1/2	36.1	26.1	48.5	38.5	20	21	8	

• Dimension "F" shows the subtense of a hexagon. • The threaded portion of the male elbow can be turned as desired.

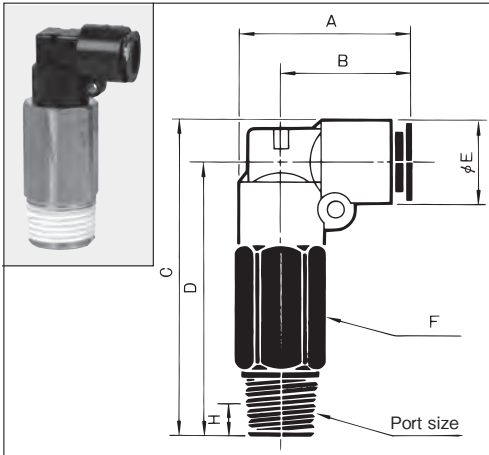
Long male elbow **M2L**



Model code	Port size	Dimensions (mm)							Material for the body
		A	B	C	D	E	F	H	
4-01M2L	R1/8	23.7	18.2	47.5	42	11	12	4	Metal
4-02M2L	R1/4	23.7	18.2	50.5	45	11	14	6	
6-01M2L	R1/8	26.5	20	51.5	45	13	12	4	
6-02M2L	R1/4	26.5	20	54.5	48	13	14	6	
8-01M2L	R1/8	29.6	22.1	55.5	48	15	14	4	
8-02M2L	R1/4	29.6	22.1	58.5	51	15	14	6	
8-03M2L	R3/8	29.6	22.1	59.5	52	15	17	6.4	
10-02M2L	R1/4	32	23.5	62.5	54	17	17	6	
10-03M2L	R3/8	32	23.5	63.5	55	17	17	6.4	
10-04M2L	R1/2	32	23.5	67.5	59	17	21	8	
12-02M2L	R1/4	35.6	26.1	68	58.5	19	19	6	
12-03M2L	R3/8	35.6	26.1	69	59.5	19	19	6.4	
12-04M2L	R1/2	35.6	26.1	74	64.5	19	21	8	

● Dimension "F" shows the subsize of a hexagon. ● The threaded portion of the male elbow can be turned as desired.

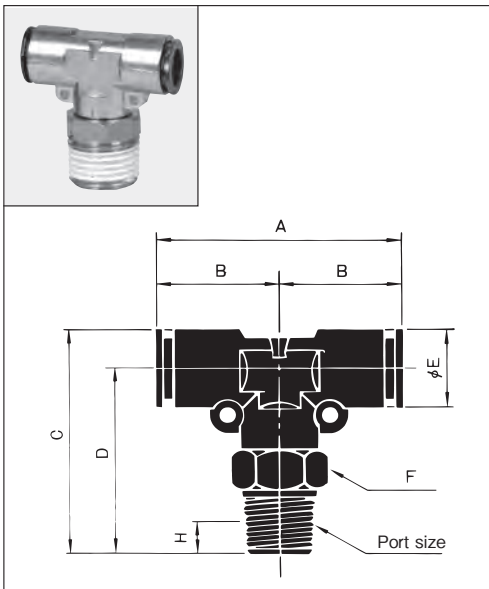
Long male elbow **M2L**



Model code	Port size	Dimensions (mm)							Material for the body
		A	B	C	D	E	F	H	
4R-01M2L	R1/8	23.7	18.2	47.5	42	11	12	4	Polyacetal · Metal
4R-02M2L	R1/4	23.7	18.2	50.5	45	11	14	6	
6R-01M2L	R1/8	26.5	20	51.5	45	13	12	4	
6R-02M2L	R1/4	26.5	20	54.5	48	13	14	6	
8R-01M2L	R1/8	30.1	22.6	55.5	48	15	14	4	
8R-02M2L	R1/4	30.1	22.6	58.5	51	15	14	6	
8R-03M2L	R3/8	30.1	22.6	59.5	52	15	17	6.4	
10R-02M2L	R1/4	32.5	24	62.5	54	17	17	6	
10R-03M2L	R3/8	32.5	24	63.5	55	17	17	6.4	
10R-04M2L	R1/2	32.5	24	67.5	59	17	21	8	
12R-02M2L	R1/4	36.1	26.1	68.5	58.5	20	19	6	
12R-03M2L	R3/8	36.1	26.1	60	59.5	20	19	6.4	
12R-04M2L	R1/2	36.1	26.1	65	64.5	20	21	8	

● Dimension "F" shows the subsize of a hexagon. ● The threaded portion of the male elbow can be turned as desired.

Male branch tee **MT**



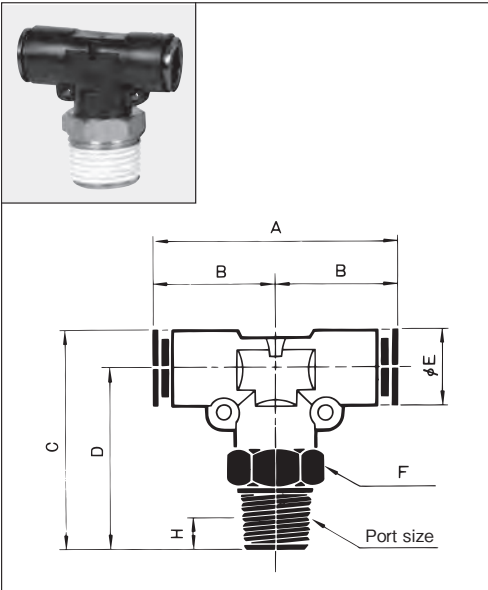
Model code	Port size	Dimensions (mm)							Material for the body
		A	B	C	D	E	F	H	
4-M5MT	M5 × 0.8	36.4	18.2	26.5	21	11	12	—	Metal
4-01MT	R1/8	36.4	18.2	30.5	25	11	12	4	
4-02MT	R1/4	36.4	18.2	33.5	28	11	14	6	
6-M5MT	M5 × 0.8	40	20	28.5	22	13	14	—	
6-01MT	R1/8	40	20	32.5	26	13	14	4	
6-02MT	R1/4	40	20	35.5	29	13	14	6	
6-03MT	R3/8	40	20	36.5	30	13	17	6.4	
8-01MT	R1/8	44.2	22.1	34.5	27	15	17	4	
8-02MT	R1/4	44.2	22.1	37.5	30	15	17	6	
8-03MT	R3/8	44.2	22.1	38.5	31	15	17	6.4	
10-01MT	R1/8	47	23.5	36.5	28	17	17	4	
10-02MT	R1/4	47	23.5	39.5	31	17	17	6	
10-03MT	R3/8	47	23.5	40.5	32	17	17	6.4	
10-04MT	R1/2	47	23.5	44.5	36	17	21	8	
12-02MT	R1/4	52.2	26.1	44	34.5	19	19	6	
12-03MT	R3/8	52.2	26.1	45	35.5	19	19	6.4	
12-04MT	R1/2	52.2	26.1	48	38.5	19	21	8	

● Dimension "F" shows the subsize of a hexagon. ● The threaded portion of the male elbow can be turned as desired.



Male branch tee

MT

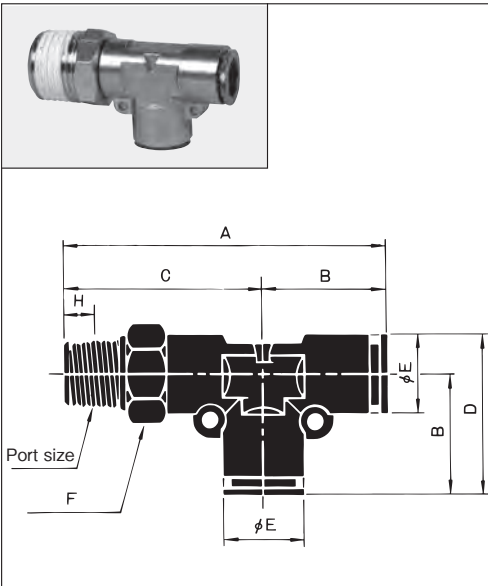


Model code	Port size	Dimensions (mm)							Material for the body
		A	B	C	D	E	F	H	
4R-M5MT	M5 × 0.8	36.4	18.2	26.5	21	11	12	—	Polyacetal · Metal
4R-01MT	R1/8	36.4	18.2	30.5	25	11	12	4	
4R-02MT	R1/4	36.4	18.2	33.5	28	11	14	6	
6R-M5MT	M5 × 0.8	40	20	28.5	22	13	14	—	
6R-01MT	R1/8	40	20	32.5	26	13	14	4	
6R-02MT	R1/4	40	20	35.5	29	13	14	6	
6R-03MT	R3/8	40	20	36.5	30	13	17	6.4	
8R-01MT	R1/8	45.2	22.6	34.5	27	15	17	4	
8R-02MT	R1/4	45.2	22.6	37.5	30	15	17	6	
8R-03MT	R3/8	45.2	22.6	38.5	31	15	17	6.4	
10R-01MT	R1/8	48	24	36.5	28	17	17	4	
10R-02MT	R1/4	48	24	39.5	31	17	17	6	
10R-03MT	R3/8	48	24	40.5	32	17	17	6.4	
10R-04MT	R1/2	48	24	44.5	36	17	21	8	
12R-02MT	R1/4	52.2	26.1	44.5	34.5	20	19	6	
12R-03MT	R3/8	52.2	26.1	45.5	35.5	20	19	6.4	
12R-04MT	R1/2	52.2	26.1	48.5	38.5	20	21	8	

● Dimension "F" shows the subtense of a hexagon. ● The threaded portion of the male elbow can be turned as desired.

Male branch tee

RT

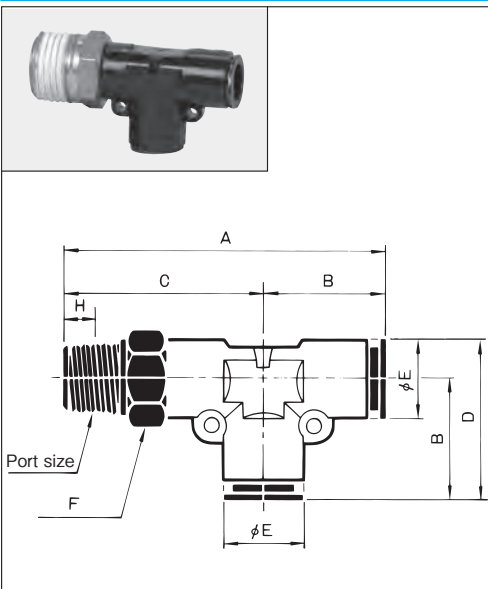


Model code	Port size	Dimensions (mm)							Material for the body
		A	B	C	D	E	F	H	
4-M5RT	M5 × 0.8	39.4	18.2	21.2	23.7	11	12	—	Metal
4-01RT	R1/8	43.4	18.2	25.2	23.7	11	12	4	
4-02RT	R1/4	46.4	18.2	28.2	23.7	11	14	6	
6-M5RT	M5 × 0.8	42	20	22	26.5	13	14	—	
6-01RT	R1/8	46	20	26	26.5	13	14	4	
6-02RT	R1/4	49	20	29	26.5	13	14	6	
6-03RT	R3/8	50	20	30	26.5	13	17	6.4	
8-01RT	R1/8	49.1	22.1	27	29.6	15	17	4	
8-02RT	R1/4	52.1	22.1	30	29.6	15	17	6	
8-03RT	R3/8	53.1	22.1	31	29.6	15	17	6.4	
10-01RT	R1/8	51.5	23.5	28	32	17	17	4	
10-02RT	R1/4	54.5	23.5	31	32	17	17	6	
10-03RT	R3/8	55.5	23.5	32	32	17	17	6.4	
10-04RT	R1/2	59.5	23.5	36	32	17	21	8	
12-02RT	R1/4	60.6	26.1	34.5	35.6	19	19	6	
12-03RT	R3/8	61.6	26.1	35.5	35.6	19	19	6.4	
12-04RT	R1/2	64.6	26.1	38.5	35.6	19	21	8	

● Dimension "F" shows the subtense of a hexagon. ● The threaded portion of the male elbow can be turned as desired.

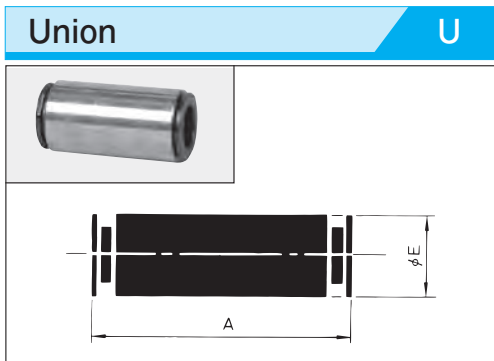
Male branch tee

RT

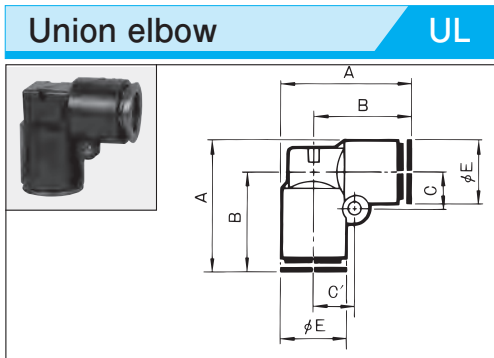


Model code	Port size	Dimensions (mm)							Material for the body
		A	B	C	D	E	F	H	
4R-M5RT	M5 × 0.8	39.4	18.2	21.2	23.7	11	12	—	Polyacetal · Metal
4R-01RT	R1/8	43.4	18.2	25.2	23.7	11	12	4	
4R-02RT	R1/4	46.4	18.2	28.2	23.7	11	14	6	
6R-M5RT	M5 × 0.8	42	20	22	26.5	13	14	—	
6R-01RT	R1/8	46	20	26	26.5	13	14	4	
6R-02RT	R1/4	49	20	29	26.5	13	14	6	
6R-03RT	R3/8	50	20	30	26.5	13	17	6.4	
8R-01RT	R1/8	49.6	22.6	27	30.1	15	17	4	
8R-02RT	R1/4	52.6	22.6	30	30.1	15	17	6	
8R-03RT	R3/8	53.6	22.6	31	30.1	15	17	6.4	
10R-01RT	R1/8	52	24	28	32.5	17	17	4	
10R-02RT	R1/4	55	24	31	32.5	17	17	6	
10R-03RT	R3/8	56	24	32	32.5	17	17	6.4	
10R-04RT	R1/2	60	24	36	32.5	17	21	8	
12R-02RT	R1/4	60.6	26.1	34.5	36.1	20	19	6	
12R-03RT	R3/8	61.6	26.1	35.5	36.1	20	19	6.4	
12R-04RT	R1/2	64.6	26.1	38.5	36.1	20	21	8	

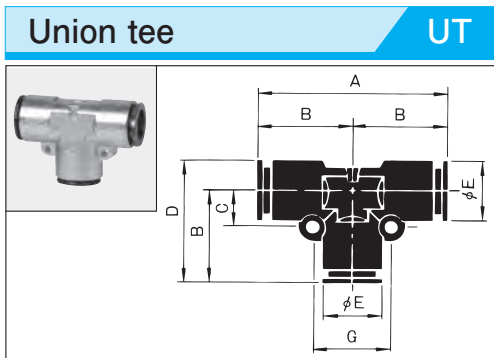
● Dimension "F" shows the subtense of a hexagon. ● The threaded portion of the male elbow can be turned as desired.



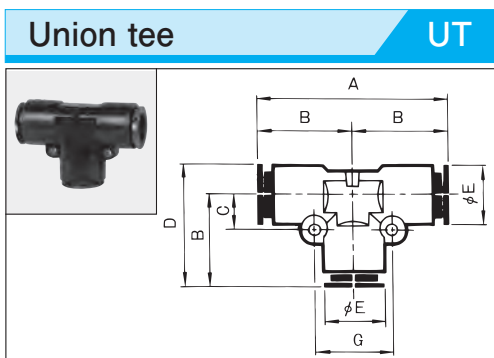
Model code	Dimensions (mm)		Material for the body
	A	E	
4-00U	32	11	Metal
6-00U	34.6	13	
8-00U	36.8	15	
10-00U	37.6	17	
12-00U	40.8	19	



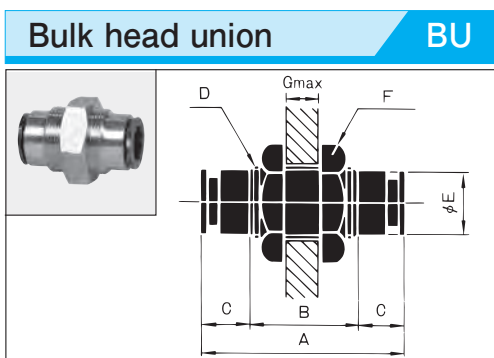
Model code	Dimensions (mm)					Material for the body
	A	B	C	C'	E	
4R-00UL	23.7	18.2	6.5	7.1	11	Polyacetal
6R-00UL	26.5	20	7.5	8.3	13	
8R-00UL	30.1	22.6	9	9.5	15	
10R-00UL	32.5	24	10	10.5	17	
12R-00UL	36.1	26.1	11.5	12	20	



Model code	Dimensions (mm)						Material for the body
	A	B	C	D	E	G	
4-00UT	36.4	18.2	6.5	23.7	11	14.2	Metal
6-00UT	40	20	7.5	26.5	13	16.6	
8-00UT	44.2	22.1	9	29.6	15	19	
10-00UT	47	23.5	10	32	17	21	
12-00UT	52.2	26.1	11	35.6	19	23	



Model code	Dimensions (mm)						Material for the body
	A	B	C	D	E	G	
4R-00UT	36.4	18.2	6.5	23.7	11	14.2	Polyacetal
6R-00UT	40	20	7.5	26.5	13	16.6	
8R-00UT	45.2	22.6	9	30.1	15	19	
10R-00UT	48	24	10	32.5	17	21	
12R-00UT	52.2	26.1	11.5	36.1	20	24	

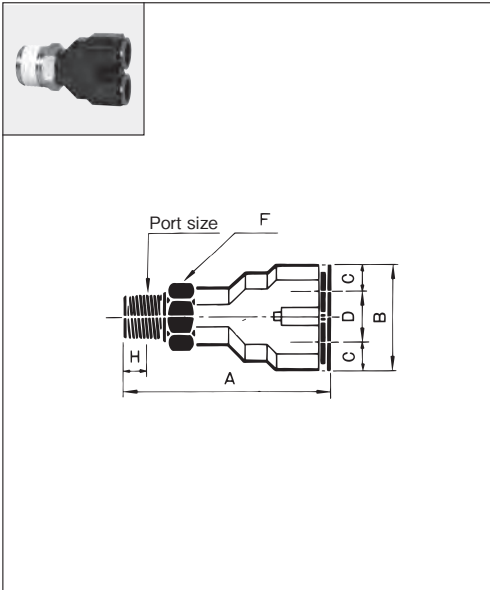


Model code	Dimensions (mm)							Material for the body
	A	B	C	D	E	F	Gmax.	
4-00BU	32	18	7	M12 × 1	11	14	10	Metal
6-00BU	34.6	18	8.3	M14 × 1	13	17	10	
8-00BU	36.8	18	9.4	M16 × 1	15	19	10	
10-00BU	37.6	18	9.8	M20 × 1	17	24	10	
12-00BU	40.8	20	10.4	M22 × 1	19	24	10	

• Dimension "F" shows the subtense of a hexagon.

Branch Y

BY

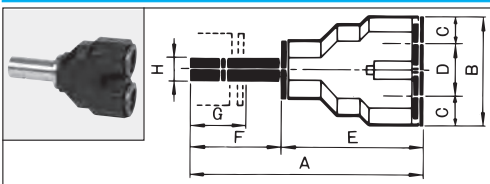


Model code	Port size	Dimensions (mm)						Material for the body
		A	B	C	D	F	H	
4R-M5BY	M5 × 0.8	37	22	5.5	11	12	—	Polyacetal · Metal
4R-01BY	R1/8	41	22	5.5	11	12	4	
4R-02BY	R1/4	44	22	5.5	11	14	6	
6R-M5BY	M5 × 0.8	—	—	—	—	—	—	
6R-01BY	R1/8	43.3	26	6.5	13	14	4	
6R-02BY	R1/4	46.3	26	6.5	13	14	6	
6R-03BY	R3/8	47.3	26	6.5	13	17	6.4	
8R-01BY	R1/8	47.4	30	7.5	15	17	4	
8R-02BY	R1/4	50.4	30	7.5	15	17	6	
8R-03BY	R3/8	51.4	30	7.5	15	17	6.4	
10R-01BY	R1/8	47.8	35	8.5	18	17	4	
10R-02BY	R1/4	50.8	35	8.5	18	17	6	
10R-03BY	R3/8	51.8	35	8.5	18	17	6.4	
10R-04BY	R1/2	55.8	35	8.5	18	21	8	
12R-02BY	R1/4	55.9	40	10	20	19	6	
12R-03BY	R3/8	56.9	40	10	20	19	6.4	
12R-04BY	R1/2	59.9	40	10	20	21	8	

● Dimension "F" shows the subtense of a hexagon. ● The threaded portion of the male elbow can be turned as desired.

Y connector

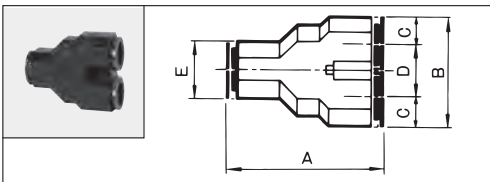
Y



Model code	Applicable tube diameter	Dimensions (mm)								Material for the body
		A	B	C	D	E	F	G	H	
4R-00Y	φ 4	49.5	22	5.5	11	29.5	20	15.5	φ 4	Polyacetal
6R-00Y	φ 6	52.8	26	6.5	13	31.8	21	16.8	φ 6	
8R-00Y	φ 8	58.4	30	7.5	15	36.4	22	17.9	φ 8	
10R-00Y	φ 10	59.3	35	8.5	18	36.8	22.5	18.3	φ 10	
12R-00Y	φ 12	63.9	40	10	20	39.9	24	19.9	φ 12	

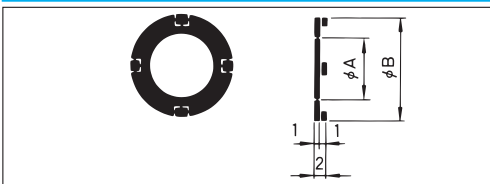
Union Y

UY



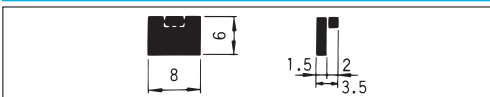
Model code	Applicable tube diameter	Dimensions (mm)					Material for the body
		A	B	C	D	E	
4R-00UY	φ 4	34	22	5.5	11	11	Polyacetal
6R-00UY	φ 6	37.6	26	6.5	13	13	
8R-00UY	φ 8	43.3	30	7.5	15	15	
10R-00UY	φ 10	44.1	35	8.5	18	17	
12R-00UY	φ 12	47.8	40	10	20	20	

Indicator ring



Model code	Applicable tube diameter	Dimensions (mm)		Color code
		A	B	
4CR	φ 4	4	10	W (white) R (red) LB (blue) Y (yellow) B (black) G (green)
6CR	φ 6	6	12	
8CR	φ 8	8	14	
10CR	φ 10	10	17	
12CR	φ 12	12	19	

Indicator plate



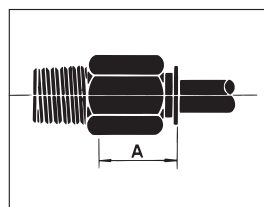
Model code	Color code
FCP	W (white) R (red) LB (blue) Y (yellow) B (black) G (green)

● The indicator plate is used in common for all sizes of elbows, tee and Y series.

Operating Instructions

1 During connection

● Completely insert the tube. Because the O-ring is used, the tube may feel to stop when it makes contact with the O-ring. However, it should be pushed past this, right up the tube end.



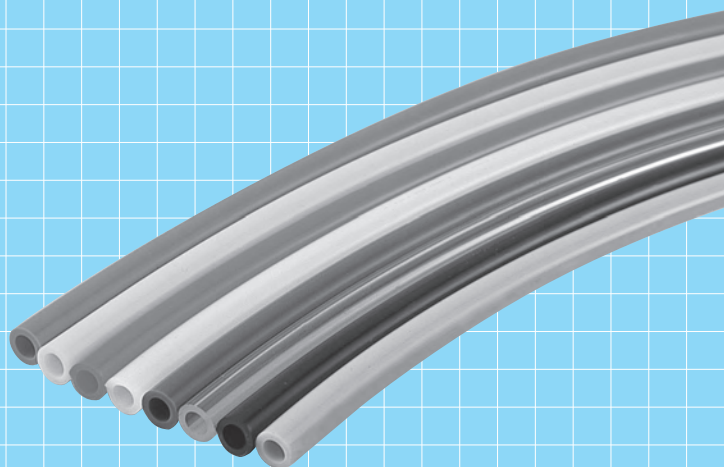
Unit : mm

Dimensions A	Tube size
15.5	φ 4
16.8	φ 6
17.9	φ 8
18.3	φ 10
19.9	φ 12

# TOUCH TUBES

**Size**     $\phi$  4 · 6 · 8 · 10 · 12

These resin-made tubes are perfect for pneumatic piping.



## Features

### Flexibility

- Touch tubes are more flexible than nylon tubes, and feature rubber-like elasticity, a minimal radius of curvature plus superior fatigue strength.

### Oil resistance

- High oil resistance makes the touch tubes applicable with spindle oil, machine oil or other oils.

### Abrasion resistance

- Superior mechanical strength and excellent abrasive resistance. It is most suitable for the facilities plumbing and the robot plumbing.

### Lightweight design

- Tough and lightweight materials enable compact equipment design.

### A wide range of colors available

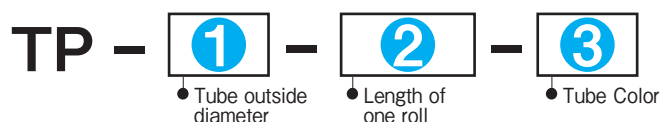
- Touch tubes are available in an extended range of colors, including black, white, yellow, red, green, blue, light green and transparent.

### Accurate outside diameter

- The highly accurate outside diameter makes touch tubes ideally suited as exterior seal connectors.

## Model Code

When ordering, specify the model as follows:



### 1 Tube outside diameter

4mm	4
6mm	6
8mm	8
10mm	10
12mm	12

### 2 Length of one roll

20m (Standard)	20M
100m (Standard)	100M

### 3 Tube Color

Black (Standard)	BK
White	W
Yellow	Y
Red	R
Green	G
Blue	LB
Transparent	C
Light green	LG

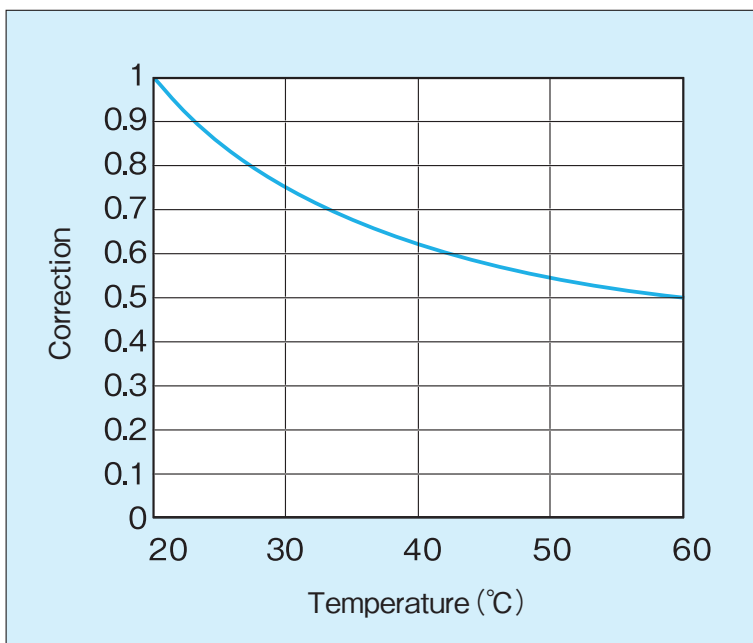
## Specifications

Mode code	OD × ID (mm × mm)	Ambient temp. Fluid Working temp (°C)	Burst pressure (MPa)	Max. Working pressure (MPa)	Min.radius of curvature (mm)	Mass (kg/m)	OD accuracy (mm)	Color
TP-4	4 × 2	- 5 ~ 60	3.0	0.8	5	0.011	± 0.1	Standard : black, white, yellow, red, green, blue, transparent, light green
TP-6	6 × 4				12	0.019		
TP-8	8 × 5				15	0.037		
TP-10	10 × 6.5				25	0.055	+ 0.1 - 0.15	
TP-12	12 × 8				28	0.076		

Note. The value at a temperature of 20°C. Please refer to the graph of the next page for the coefficient by the temperature.

## Reference

## Graph of burst pressure correction coefficient by temperature



- Working Pressure  
=Burst Pressure × Correction factor × 1/4

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