

# Miniature Fittings

## M Series

Applicable Tubing: ø2 Connection Thread: M3, M5



Made to Order

(Refer to page 193 for details.)

RoHS

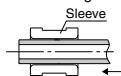
**Applicable tubing O.D. x I.D.:** ø2 x ø1.2  
**Connection thread:** M3 x 0.5 / M5 x 0.8  
**One-touch fitting size:** ø3.2 / ø4



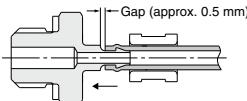
### Tubing Connection and Removal

#### Connection of tubing

1. Cut the tubing perpendicularly allowing additional length.
2. Insert the tubing into the sleeve.



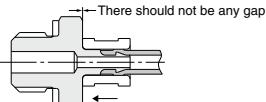
3. Insert the tubing slowly into the fittings. Make sure to secure a gap of approx. 0.5 mm between the tubing end and the barb end.



4. Insert the sleeve slowly. Make sure not to allow any gap between the sleeve end side and the body end side. (Please refer to the illustration below.)

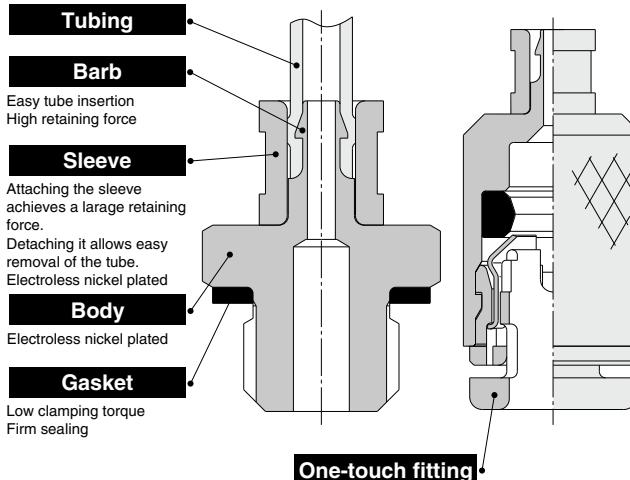
If you feel any strong resistance and cannot push the sleeve completely to the end side, this may be caused due to jamming. Remove and repeat again by starting from step 1 making sure to secure a gap in the step 3.

Note) When installing the tubing, the sleeve must be attached. Operation without attaching the sleeve may cause tubing disconnection.



#### Removal of tubing

1. Withdraw the sleeve straight along the tubing. Use a tool such as long-nose pliers if it is difficult to pull out by hand.
2. Withdraw the tubing straight.
3. When reusing the tubing, cut off the previously installed portion of the tubing to avoid possible leakage and/or disconnection of the tubing.



### Specifications

Applicable tubing material	Polyurethane
Applicable tubing (O.D. / I.D.)	ø2 / ø1.2
Fluid	Air, Water (1, 2)
Max. operating pressure	1 MPa (3)
Ambient and fluid temperature	-5 to 60°C, Water: 0 to 40 (No freezing)
Port size	M3, M5, ø3.2, ø4
Thread	JIS B0205 (Metric fine thread)

Note 1) The surge voltage pressure must be under the maximum operating pressure.

Note 2) Deionized water is not recommended for use as it may affect the material used in the fittings.

In addition, it is known to degrade the water quality.

Note 3) Apply the maximum operating pressure to the tube during the tube connection.

### How to Order

M -	5	AU -	2 -	
Miniature fitting				
Made to Order Refer to page 193 for details.				
Model				
AU	Barb fitting	M3, M5		
ALU	Barb elbow	M3		
ALHU		M5		
F	Barb One-touch	ø3.2, ø4		
R	Plug-in reducer			
Port size				
3	M3 x 0.5			
5	M5 x 0.8			
32	ø3.2			
04	ø4			
Applicable tubing (O.D. / I.D.)	2	ø2 / ø1.2		

For details on applicable tubing O.D. and port size combinations for each model, refer to the charts on the Dimensions page.

KQ2  
KQB2  
KS  
KM  
KF  
M  
H/DL  
L/LL  
KC  
KK  
KK130  
DM  
KDM  
KB  
KR  
KA  
KQG2  
KG  
KFG2  
MS  
KKA  
KP  
LQ  
MQR  
T  
IDK

## **M Series**

## Dimensions

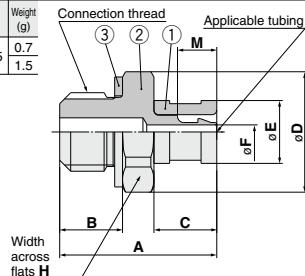
## **Barb Fitting: M-3AU-2, M-5AU-2**



Applicable tubing O.D. / I.D. (mm)	Connection thread	Model	H	A	B	C	D	E	F	M	Weight (g)
<b>ø2 / ø1.2</b>	<b>M 3 x 0.5</b>	<b>M-3AU-2</b>	4.5	9	3	4	5	7.7	4	0.9	2.5
	<b>M 5 x 0.8</b>	<b>M-5AU-2</b>	7	10	4						0.7

## Component Parts

No.	Description	Material	Note
1	Sleeve	C3604	Electroless nickel plated
2	Barb fitting	C3604	Electroless nickel plated
3	Gasket	NBR, Stainless steel 304	—



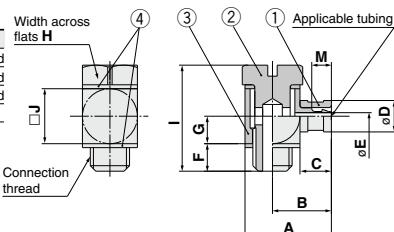
## **Barb Elbow: M-3ALU-2, M-5ALHU-2**



Applicable tubing O.D. / I.D. (mm)	Connection thread	Model	H	A	B	C	D	E	F	G	I
<b>ø2 / ø1.2</b>	<b>M3 x 0.5</b>	<b>M-3ALU-2</b>	5	9	6.5	4	4	0.9	2.5	2.5	9.4
	<b>M5 x 0.8</b>	<b>M-5ALHU-2</b>	7	11	7.5				3.5	3.5	13.9

## Component Parts

Component Parts			
No.	Description	Material	Note
1	Sleeve	C3604	Electroless nickel plated
2	Stud	C3604	Electroless nickel plated
3	Barb elbow	C3604	Electroless nickel plated
4	Gasket	NBR Stainless steel 304	—



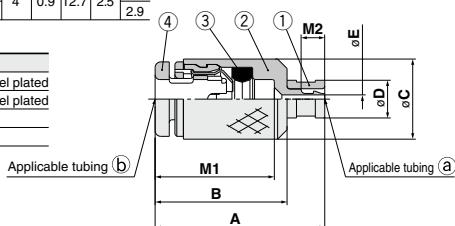
**Barb One-touch: M-32F-2, M-04F-2**



Applicable tubing (mm)		Model	A	B	C	D	E	M1	M2	Weight (g)
(a) (O.D. / I.D.)	(b) (O.D.)									
ø2 / ø1.2	ø3.2	<b>M-32F-2</b>	17.7	13.7	7.5		4	0.9	12.7	2.5
	ø4	<b>M-04E-2</b>	18	14	8.5					2.9

### **Component Parts**

Component Parts			
No.	Description	Material	Note
1	Sleeve	C3604	Electroless nickel plated
2	Body	C3604	Electroless nickel plated
3	Seal	NBR	—
4	Cassette	PCB, Stainless steel 304	—



## Plug-in Reducer: M-32R-2, M-04R-2



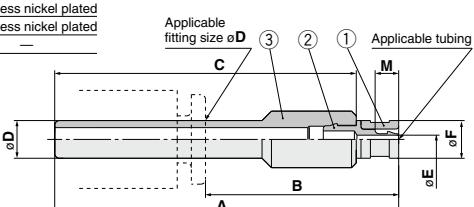
Applicable tubing O.D. / I.D. (mm)	Fitting size øD	Model	A	B <sup>(1)</sup>	B <sup>(2)</sup>	C	E	F	M	Weight (g)
ø2 / ø1.2	ø3.2	M-32R-2	36	23.3	20.5	31.5	0.9	4	2.5	0.7
	4	M-34R-2	26.5	22.2	20.5	32	1.2	5	3	1.1

Note 1) Dimensions when connected to the M5 and M6 connection threads for K1 series and K2 series.

Note 1) Dimensions when connected to the M5 and  
Note 2) Dimensions when connected to KQ series

### **Component Parts**

Component Parts			
No.	Description	Material	Note
1	Sleeve	C3604	Electroless nickel plated
2	Studded body	C3604	Electroless nickel plated
3	Stem	PP	—



# Made to Order Specifications

Please contact SMC for detailed dimensions, specifications and lead times.



## 1 Gasket Material Modification

Symbol	Specifications	
X226	Gasket material: Stainless steel 304, FKM	
	Applicable thread	Gasket part no.
X112	M3	M3G-DPH00489
	Gasket material: Stainless steel 316, Special FKM	
	Applicable thread	Gasket part no.
	M5	M-5G3

KQ2

KQB2

KS

KX

KM

KF

M

H/DL

L/LL

KC

KK

KK130

DM

KDM

KB

KR

KA

KQG2

KG

KFG2

MS

KKA

KP

LQ

MQR

T

IDK

## Spare Parts

Description	Part no.	Applicable thread	Material
Gasket	IN-233-706	M3	Stainless steel 304, NBR
	M-5G2	M5	Stainless steel 304, NBR
	M-5G3		Stainless steel 316, Special FKM
Sleeve	M-5-2-P02	—	C3604 (With electroless nickel plated)

## ⚠ Specific Product Precautions

- Be sure to read this before handling the products.
- Refer to back page 50 for Safety Instructions and pages 13 to 17 for Fittings and Tubing Precautions.

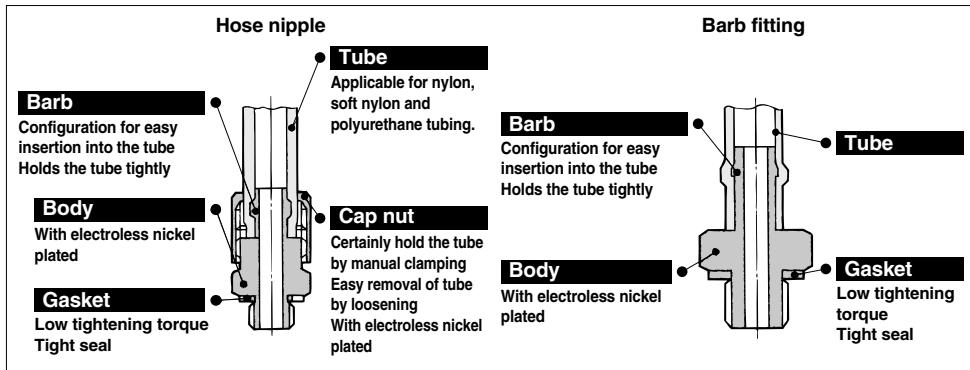
### ⚠ Caution

1. Tightening of M3/M5 Threads
  - 1) Tighten a barb fitting by hand, and give it an additional 1/6 turn with a wrench.
  - 2) Tighten a barb elbow by hand, and give it an additional 1/3 turn with a wrench.

# Miniature Fittings

## M Series

Applicable Tubing: ø3.2, ø4, ø6 Connection Thread: M3, M5, R 1/8



### Compact piping space

Hose nipple tubing connection/disconnection is simple while keeping a large retaining force.

### Line up various types

For air connection in confined areas.

### Accepts many types of plastic tubing

Hose nipple and hose elbow accepts nylon, soft nylon, and polyurethane tubing.



**Made to Order**  
(Refer to page 200 for details.)

### Specifications

Applicable tubing material	Nylon	Soft nylon	Polyurethane	Super PFA <sup>(1)</sup>	FEP <sup>(2)</sup>	Modified PTFE <sup>(3)</sup>
Applicable tubing O.D. / I.D.	M3	—	ø4/ø2.5 ø3.18/ø2.18	ø3.18/ø2 ø4/ø2.5	—	—
	M5, R 1/8	ø4/ø2.5 ø6/ø4	ø4/ø2.5 ø6/ø4	ø3.18/ø2 ø4/ø2.5 ø6/ø4	ø6/ø4	ø4/ø2.5 ø6/ø4
Fluid				Air, Water <sup>(4, 5)</sup>		
Max. operating pressure (at 20°C)	1.5 MPa	1 MPa	0.8 MPa	1 MPa	1.5 MPa	1.4 MPa
Ambient and fluid temperature			–5 to 60°C, Water: 0 to 40°C (No freezing)			
Connection size		M3, M5, R 1/8			M5, R 1/8	
Thread			JIS B0205, Class 2 (Metric fine thread)		JIS B0203 (Taper thread for piping)	

Note 1), Note 2), Note 3) Compatible only with hose nipple type.

Note 4) Barb fitting, barb elbow, barb elbow (H) are not compatible with water.

Note 5) Deionized water is not recommended for use as it may affect the material used in the fittings.

In addition, it is known to degrade the water quality.

### Principal Parts Material

Material	Body	C3604 (Electroless nickel plate) (Nipple M-3N, M-5N: Stainless steel 303)
	Gasket	Nylon 66: GF30%, Stainless steel 304: NBR (PVC for M3)

\* Body of M-5E, M-5ER, M-5M is not surface-treated.

Electroless nickel plate treated is available as option -X2.

### Fitting Markings for Applicable Tubing Material (Barb fitting, Barb elbow, Barb elbow (H))

Tubing material determines the compatible fittings. (Refer to the table below.)

Connection	Tubing	Fitting marking for applicable tubing material		
		Barb fittings	Barb elbow	Barb elbow (H)
M3	Soft nylon tubing Polyurethane tubing		—	
R 1/8, M5	Nylon tubing			
	Soft nylon tubing Polyurethane tubing			

## **M3, R 1/8 Series**

Series	Model	Description	Application	Note
M3	M-3AU-3	Barb fitting for soft tube	For soft nylon tubing	ø3.18/2.18 x M3
	M-3AU-4		For polyurethane tubing	ø3.18/2 x M3
M-3ALU-3		Barb elbow for soft tubing	For soft nylon tubing	ø3.18/2.18 x M3
	M-3ALU-4		For polyurethane tubing	ø3.18/2 x M3
M-3UL		Universal elbow	Body rotates at 360° around the stud axis	ø4/2.5 x M3
	M-3UT		Body rotates at 360° around the stud axis	M3 female x M3 male
M-3N		Nipple	Fitting to workpiece and fitting to fitting connection	M3 male x M3 male
	M-3P	Plug	Use to plug unused M3 port	P.196

## **M5 Series**

Series	Model	Description	Application	Note
M5	M-5AN-4	Barb fitting for nylon tubing	For nylon tubing	ø4/2.5 x M5
	M-5AN-6			ø6/4 x M5
M-5ALU-3		Barb fitting for soft tubing	For soft nylon tubing	ø3.18/2.18 x M5
	M-5AU-4		For polyurethane tubing	ø3.18/2 x M5
M-5ALU-6		Barb elbow for soft tubing	For soft nylon and polyurethane tubing	ø4/2.5 x M5
	M-5ALN-4	Barb elbow for nylon tubing	• For nylon • Body rotates at 360° around the stud axis	ø4/2.5 x M5
M5	M-5ALN-6		For soft nylon tubing	ø6/4 x M5
	M-5ALU-3	Barb elbow for soft tubing	For soft nylon tubing Body rotates at 360° around the stud axis	ø3.18/2.18 x M5
M-5ALU-4			For polyurethane tubing	ø3.18/2 x M5
	M-5ALU-6		For soft nylon and polyurethane tubing	ø4/2.5 x M5
M5	M-5ALHN-4	Barb elbow (H) for nylon tubing	Body rotates at 360° around the stud axis	ø4/2.5 x M5
	M-5ALHN-6		For nylon tubing	ø6/4 x M5
M-5ALHU-3		Barb elbow (H) for soft tubing	For soft nylon tubing Body rotates at 360° around the stud axis	ø3.18/2.18 x M5
	M-5ALHU-4		For polyurethane tubing	ø3.18/2 x M5
M-5ALHU-6			For soft nylon and polyurethane tubing	ø4/2.5 x M5
	M-5ALHU-6		Body rotates at 360° around the stud axis	ø6/4 x M5
M-5H-4		Hose nipple	For nylon, soft nylon and polyurethane tubing	ø4/2.5 x M5
	M-5H-6			ø6/4 x M5
M-5HL-4		Hose elbow	For nylon, soft nylon and polyurethane tubing	ø4/2.5 x M5
	M-5HL-6		• For nylon, soft nylon and polyurethane tubing • Body rotates at 360° around the stud axis	ø6/4 x M5
M-5HLH-4		Hose elbow (H)	ø4/2.5 x M5	
	M-5HLH-6		ø6/4 x M5	
M-5L		Elbow	One-sided 90° elbow	M5 female x M5 female

KQ2

KQB2

KS X

KM

KF

H/DL L/L

KC

KK

KK130

DM

KDM

KB

KR

KA

KQG2

KG

KFG2

MS

KKA

KP

LQ

MQR

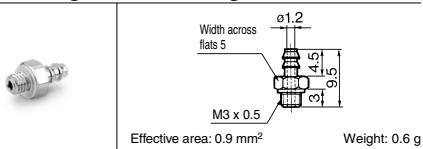
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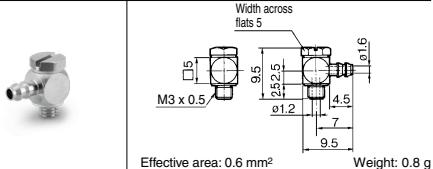
# M Series

## M3 Series

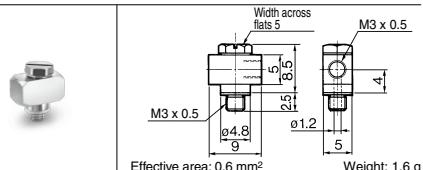
### Barb Fitting for Soft Tubing: M-3AU-3



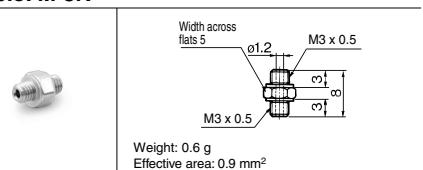
### Barb Elbow for Soft Tubing: M-3ALU-3



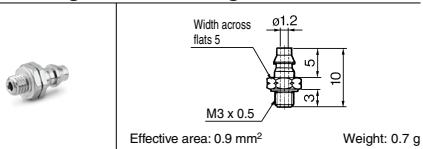
### Universal Elbow: M-3UL



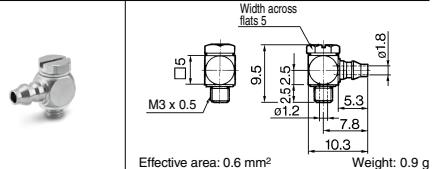
### Nipple: M-3N



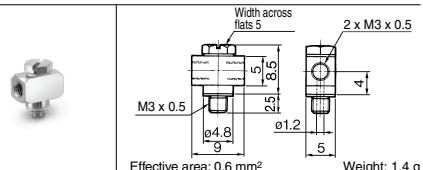
### Barb Fitting for Soft Tubing: M-3AU-4



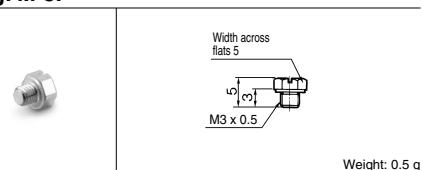
### Barb Elbow for Soft Tubing: M-3ALU-4



### Universal Tee: M-3UT



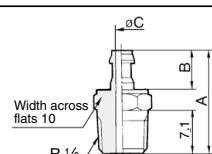
### Plug: M-3P



## R 1/8 Series

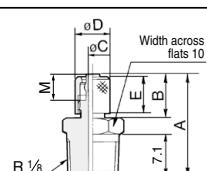
### Barb Fitting for Nylon Tubing, Soft Tubing: M-01A□-4/-6

Applicable tubing	Model	A	B	øC	Effective area (mm <sup>2</sup> )	Weight (g)
Nylon tubing	M-01AN-4	15.1	5	1.8	2.1	6.4
	M-01AN-6	17.1	7	2.5	4.0	6.6
Soft tubing	M-01AU-4	15.1	5	1.8	2.1	6.5
	M-01AU-6	17.1	7	2.5	4.0	6.7



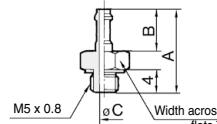
### Hose Nipple: M-01H-4/-6

Model	A	B	øC	øD	E	M	Effective area (mm <sup>2</sup> )	Weight (g)
M-01H-4	18.6	8.5	1.8	6.5	7	5	2.1	7.1
M-01H-6	19.6	9.5	3	8.5	8	6	5.5	7.7

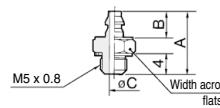


**M5 Series****Barb Fitting for Nylon Tubing: M-5AN-4/-6**

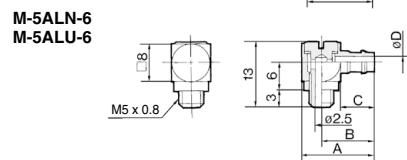
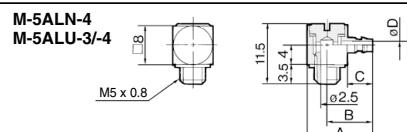
Model	A	B	$\phi C$	Effective area (mm²)	Weight (g)
M-5AN-4	12	5	1.8	2.1	1.6
M-5AN-6	14	8	2.5	4.0	1.7

**Barb Fitting for Soft Tubing: M-5AU-3/-4/-6**

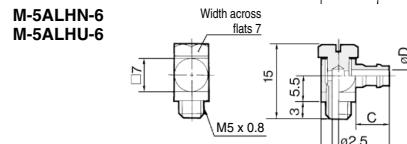
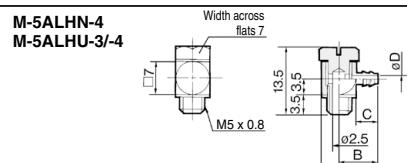
Model	A	B	$\phi C$	Effective area (mm²)	Weight (g)
M-5AU-3	11.5	4.5	1.6	1.7	1.5
M-5AU-4	12	5	1.8	2.1	1.6
M-5AU-6	14	7	2.5	4.0	1.8

**Barb Elbow for Nylon Tubing: M-5ALN-4/-6****Barb Elbow for Soft Tubing: M-5ALU-3/-4/-6**

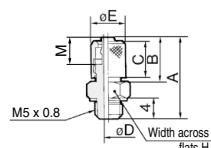
Model	A	B	C	$\phi D$	Effective area (mm²)	Weight (g)
M-5ALN-4	13	9	5	1.8	1.4	4.0
M-5ALN-6	15	11	7	2.5	2.4	4.4
M-5ALU-3	13	9	4.5	1.6	1.1	4.0
M-5ALU-4	13.5	9.5	5	1.8	1.4	4.1
M-5ALU-6	15.5	11.5	7	2.5	2.4	4.5

**Barb Elbow for Nylon Tubing: M-5ALHN-4/-6****Barb Elbow for Soft Tubing: M-5ALHU-3/-4/-6**

Model	A	B	C	$\phi D$	Effective area (mm²)	Weight (g)
M-5ALHN-4	12	8.5	5	1.8	1.4	3.2
M-5ALHN-6	14	10.5	7	2.5	2.4	3.7
M-5ALHU-3	12	8.5	4.5	1.6	1.1	3.2
M-5ALHU-4	12.5	9	5	1.8	1.4	3.3
M-5ALHU-6	14.5	11	7	2.5	2.4	3.9

**Hose Nipple: M-5H-4/-6**

Model	A	B	C	$\phi D$	$\phi E$	H	M	Effective area (mm²)	Weight (g)
M-5H-4	15.5	8.5	7	1.8	6.5	7	5	2.1	2.7
M-5H-6	16.5	9.5	8	2.5	8.5	8	6	4.0	3.9



KQ2

KQB2

KS

KX

KM

M

H/DL

L/L

KC

KK

KK130

DM

KDM

KB

KR

KA

KQG2

KG

KFG2

MS

KKA

KP

LQ

MQR

T

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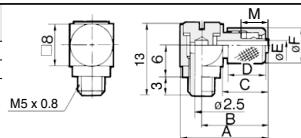
# M Series

## M5 Series

### Hose Elbow: M-5HL-4/-6



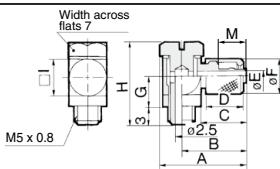
Model	A	B	C	D	$\phi E$	$\phi F$	M	Effective area (mm²)	Weight (g)
M-5HL-4	16.5	12.5	8.5	7	1.8	6.5	5	1.4	4.4
M-5HL-6	17.5	13.5	9.5	8	2.5	8.5	6	2.4	5.2



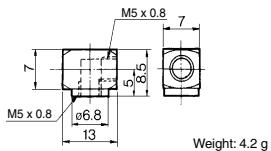
### Hose Elbow: M-5HLH-4/-6



Model	A	B	C	D	$\phi E$	$\phi F$	G	H	$\square I$	M	Effective area (mm²)	Weight (g)
M-5HLH-4	15.5	12	8.5	7	1.8	6.5	5.5	15	7	5	1.4	4.5
M-5HLH-6	17.5	13.5	9.5	8	2.5	8.5	6	16	8	6	2.4	6.6

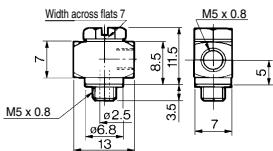


### Elbow: M-5L



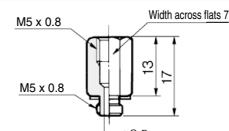
Weight: 4.2 g

### Universal Elbow: M-5UL



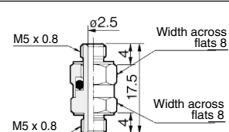
Effective area: 2.4 mm² Weight: 5.3 g

### Extension Fitting: M-5J



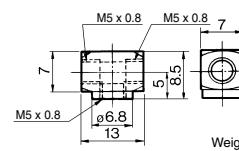
Effective area: 4.0 mm² Weight: 3.6 g

### Universal Nipple: M-5UN



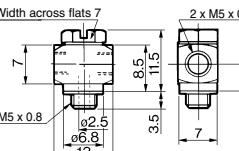
Effective area: 4.0 mm² Weight: 3.9 g

### Tee: M-5T



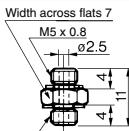
Weight: 3.5 g

### Universal Tee: M-5UT



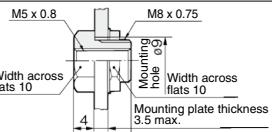
Effective area: 2.4 mm² Weight: 4.8 g

### Nipple: M-5N

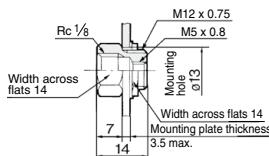


Effective area: 4.0 mm² Weight: 1.5 g

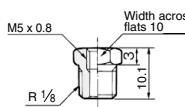
### Bulkhead Union: M-5E



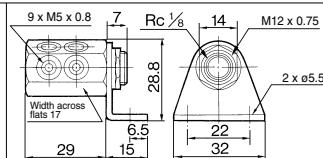
For the plate thickness 3.5 to 6 mm, give the plate tapping M8 x 0.75, and then screw-in. Weight: 4.6 g

**M5 Series****Bulkhead Reducer: M-5ER**

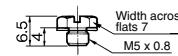
For the plate thickness 3.5 to 6 mm, give the plate tapping M12 x 0.75, and then screw-in.  
Weight: 12 g

**Bushing: M-5B**

Weight: 5.8 g

**Manifold: M-5M**

Panel mounting plate thickness max. 3.5 mm  
For the plate thickness 3.5 to 6 mm, give the plate tapping M12 x 0.75, and then screw-in.  
Weight: 59 g

**Plug: M-5P**

Weight: 1.3 g

## **Precautions**

Be sure to read this before handling the products.

Refer to back page 50 for Safety Instructions and pages 13 to 17 for Fittings and Tubing

Precautions.

**Tightening of M3/M5 Threads****Caution**

1. Tighten by hand, and give it an additional turn with a wrench.

Please check the number of tightening revolutions using the table below.

If tightened excessively, thread portion may be damaged and gasket may be deformed. This will cause air leakage. On the contrary, if tightened insufficiently, thread may loosen causing air leakage.

Thread	Model	Number of tightening rotations
M3	M-3AU-□	Approx. 1/4 rotations
	M-3N	
	M-3P	Approx. 1/2 rotations
	M-3ALU-□	
	M-3UL	
	M-3UT	
M5	M-5AN-□	Approx. 1/6 to 1/4 rotations <small>(Note)</small>
	M-5AU-□	
	M-5H-□	
	M-5J	
	M-5N	
	M-5UN	
	M-5P	
	M-5ALN-6	Approx. 1/2 rotations <small>(Note)</small>
	M-5ALU-6	
	M-5ALHN-6	
	M-5ALHU-6	
	M-5HL-□	
	M-5HLH-□	
	M-5ALN-4	
	M-5ALU-3,4	
	M-5ALHN-4	
	M-5ALHU-3,4	
	M-5UL	
	M-5UT	

(Note) As a guideline, the tightening torque should be 1 to 1.5 N·m.

**Use of Tube with Hose Nipple****Caution**

1. Cut the tube perpendicularly to the tube axis to a little longer than required length. (Use tube cutter "TK-1", "TK-2" or "TK-3".)

2. Pass the tube through the cap nut.

3. Push the tube until it comes to the end of the barb portion, or it may cause air leakage or hose releasing.

4. Tighten the cap nut firmly by hand on the fitting.

**Use of Tube with Barb Fitting****Caution**

1. Cut the tube perpendicularly to the tube axis to a little longer than required length. (Use tube cutter "TK-1", "TK-2" or "TK-3".)

2. Push the tube until it comes to the end of the barb portion, or it may cause air leakage or release hose.

- KQ2
- KQB2
- KS
- KX
- KM
- KF
- M
- H/DL
- L/LL
- KC
- KK
- KK130
- DM
- KDM
- KB
- KR
- KA
- KQG2
- KG
- KFG2
- MS
- KKA
- KP
- LQ
- MQR
- T
- IDK

# Made to Order Specifications

Please contact SMC for detailed dimensions, specifications and lead times.



## 1 Gasket Material Modification

Symbol	Specifications	
X83	Gasket material: Stainless steel 304, NBR	
	Applicable thread	Gasket part no.
	M3	M-3G2
X226	M5 Note)	M-5G2
	Gasket material: Stainless steel 304, FKM	
	Applicable thread	Gasket part no.
X112	M3	M3G-DPH00489
	Gasket material: Stainless steel 316, Special FKM	
	Applicable thread	Gasket part no.
	M5	M-5G3

Note) Compatible with only models using M-5GH.

## Spare Parts

Description	Part no.	Applicable thread	Material	Applicable model
Gasket	M-3G	M3	PVC	—
	M-3G2		Stainless steel 304, NBR	—
	M-5G1	M5	PVC	—
	M-5G2		Stainless steel 304, NBR	—
	M-5G3		Stainless steel 316, Special FKM	—
	M-5GH		Nylon 66, GF30%	M-5AL□-6, M-5ALH□-6 M-5HL-4, 6, M-5HLH4, 6
	M-6G	M6	Stainless steel 304, NBR	For KQ2 M6 thread
	M-10/32G			KQ2 Series, 10-32 UNF
Cap nut	M-5-4-P01	—	C3604 (With electroless nickel plated)	M-01H-4, M-5H-4 M-5HL-4, M-5HLH-4
	M-5-6-P01	—	C3604 (With electroless nickel plated)	M-01H-6, M-5H-6 M-5HL-6, M-5HLH-6