

Miniature Fittings

M Series

RoHS

Applicable Tubing: $\varnothing 2$ Connection Thread: M3, M5



Made to Order
(Refer to page 3 for details.)

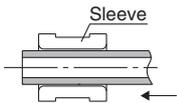
Applicable tubing O.D. x I.D.: $\varnothing 2 \times \varnothing 1.2$
 Connection thread: M3 x 0.5 / M5 x 0.8
 One-touch fitting size: $\varnothing 3.2 / \varnothing 4$



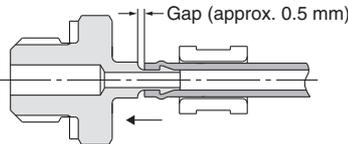
Tubing Connection and Removal

Connection of tubing

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

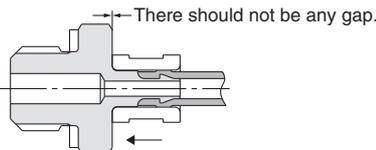


3. Insert the tubing slowly into the fittings. Make sure to secure a gap of approx. 0.5 mm between the tubing end and the barb end.



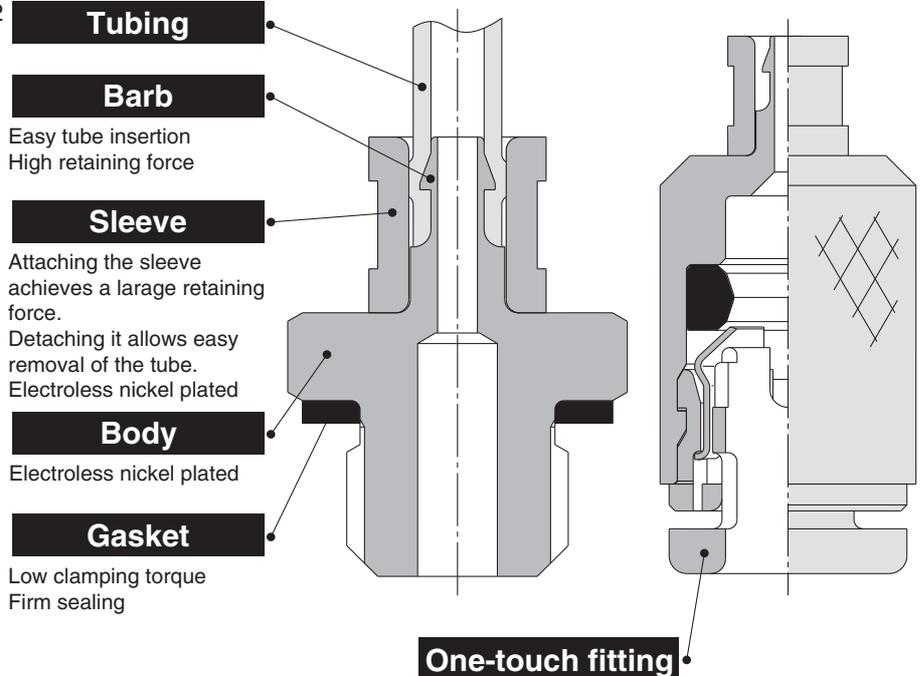
4. Insert the sleeve slowly. Make sure not to allow any gap between the sleeve end side and the body end side. (Please refer to the illustration below.) If you feel any strong resistance and cannot push the sleeve completely to the end side, this may be caused due to jamming. Remove and repeat again 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.



Tubing

Barb

Easy tube insertion
High retaining force

Sleeve

Attaching the sleeve achieves a large retaining force.
Detaching it allows easy removal of the tube.
Electroless nickel plated

Body

Electroless nickel plated

Gasket

Low clamping torque
Firm sealing

One-touch fitting

Specifications

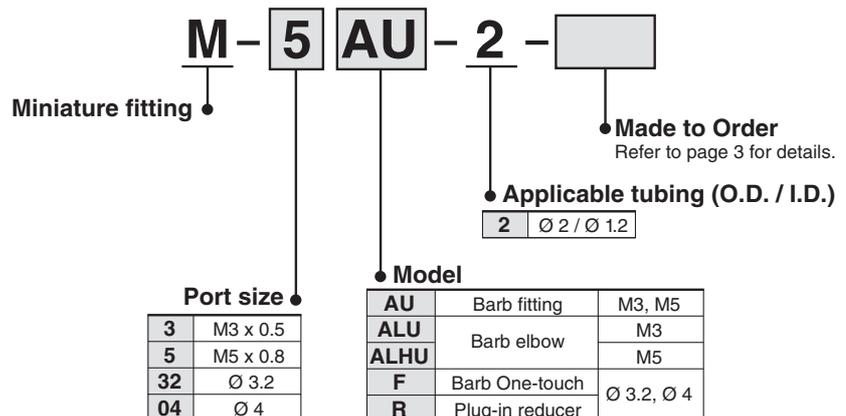
Applicable tubing material	Polyurethane
Applicable tubing (O.D. / I.D.)	$\varnothing 2 / \varnothing 1.2$
Fluid	Air, Water (1, 2)
Max. operating pressure	1 MPa (3)
Ambient and fluid temperature	-5 to 60 °C, Water: 0 to 40 (No freezing)
Port size	M3, M5, $\varnothing 3.2$, $\varnothing 4$
Thread	JIS B0205 (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



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

Dimensions

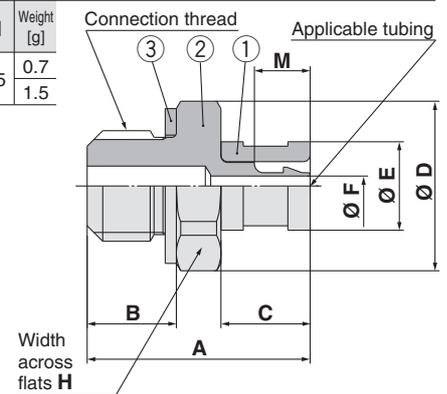
Barb Fitting: M-3AU-2, M-5AU-2



Applicable tubing O.D. / I.D. [mm]	Connection thread	Model	H	A	B	C	D	E	F	M	Weight [g]
Ø 2 / Ø 1.2	M3 x 0.5	M-3AU-2	4.5	9	3	4	5	4	0.9	2.5	0.7
	M5 x 0.8	M-5AU-2	7	10	4	7.7	1.5				

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	—



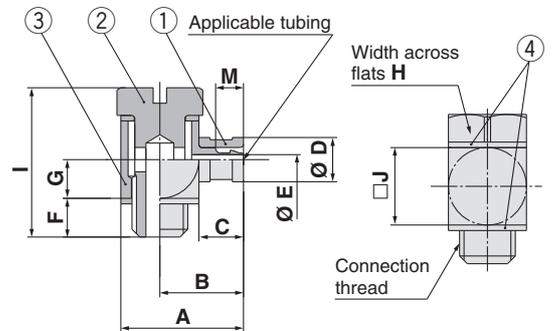
Barb Elbow: M-3ALU-2, M-5ALHU-2



Applicable tubing O.D. / I.D. [mm]	Connection thread	Model	H	A	B	C	D	E	F	G	I	J	M	Weight [g]
Ø 2 / Ø 1.2	M3 x 0.5	M-3ALU-2	5	9	6.5	4	4	0.9	2.5	2.5	9.4	5	2.5	1.6
	M5 x 0.8	M-5ALHU-2	7	11	7.5				3.5	3.5	13.5	7		3.5

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	—



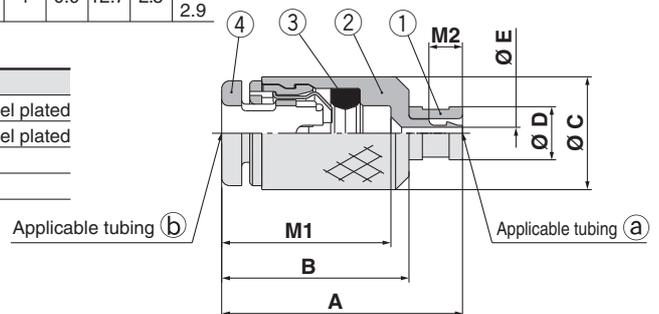
Barb One-touch: M-32F-2, M-04F-2



Applicable tubing O.D. / I.D. [mm]	Model	A	B	C	D	E	M1	M2	Weight [g]	
	Model	A	B	C	D	E	M1	M2	Weight [g]	
Ø 2 / Ø 1.2	Ø 3.2	M-32F-2	17.7	13.7	7.5	4	0.9	12.7	2.5	2.4
	Ø 4	M-04F-2	18	14	8.5					2.9

Component Parts

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

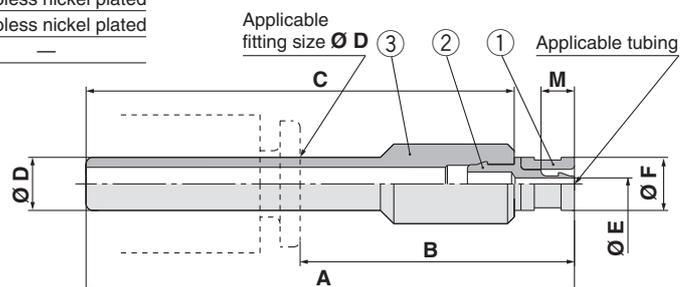


Plug-in Reducer: M-32R-2, M-04R-2

Applicable tubing O.D. / I.D. [mm]	Fitting size Ø D	Model	A	B ⁽¹⁾	B ⁽²⁾	C	E	F	M	Weight [g]
Ø 2 / Ø 1.2	Ø 3.2	M-32R-2	36	23.3	20.5	31.5	0.9	4	2.5	0.7
	Ø 4	M-04R-2	36.5	23.8	20.5	32				0.8

Component Parts

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





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

Spare Parts

Description	Part no.	Applicable thread	Material	Applicable model
Gasket	M-3G	M3	PVC	—
	M-3G3		Stainless steel 304, NBR	M-3AU-2, M-3ALU-2
	M-5G2	M5	Stainless steel 304, NBR	M-5AU-2, M-5ALHU-2
	M-5G3		Stainless steel 316, Special FKM	—
Sleeve	M-5-2-P02	—	C3604 (With electroless nickel plated)	M-□-2

⚠ Specific Product Precautions

Be sure to read this before handling the products.
Refer to back page for Safety Instructions.

⚠ Caution

1. Tightening of M3/M5 Threads

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-2	Approx. 1/4 rotations
	M-3ALU-2	Approx. 1/2 rotations
M5	M-5AU-2	Approx. 1/6 to 1/4 rotations ^{Note)}
	M-5ALHU-2	Approx. 1/2 rotations ^{Note)}

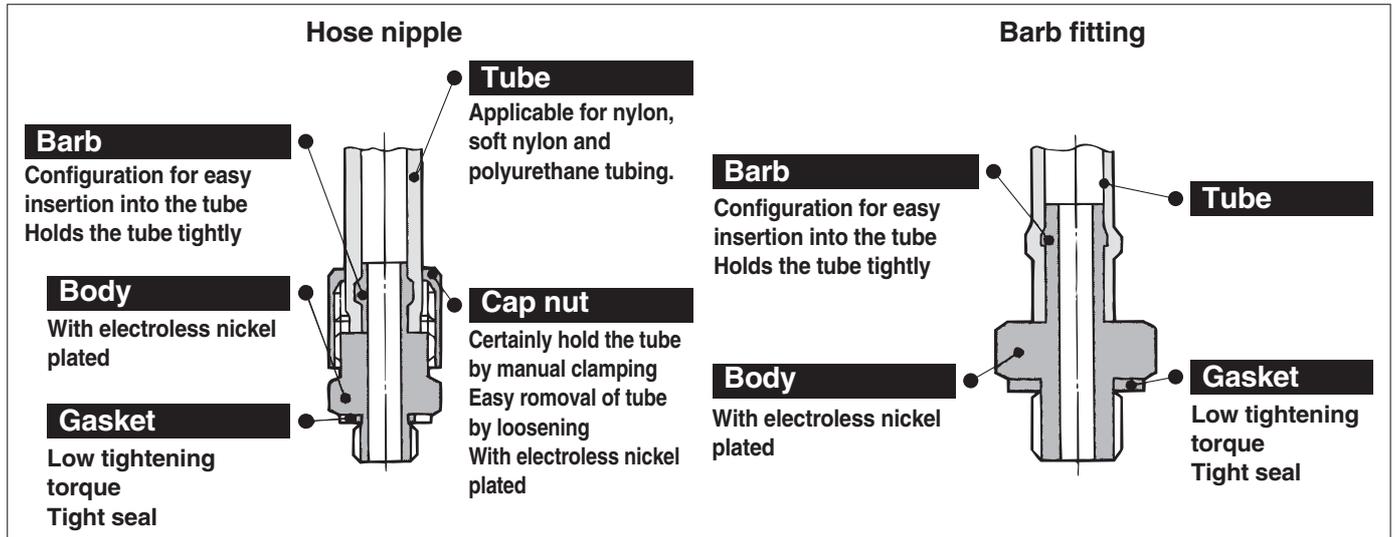
Note) As a guideline, the tightening torque should be 1 to 1.5 N·m.

Miniature Fittings

M Series

Applicable Tubing: Ø 3.2, Ø 4, Ø 6 Connection Thread: M3, M5, R 1/8

RoHS



Compact piping space

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

Line up various styles

For air connection in confined areas.

Accepts many styles of plastic tubing

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



Made to Order
(Refer to page 10 for details.)

Specifications

Applicable tubing material		Nylon	Soft nylon	Polyurethane	PFA ⁽¹⁾	FEP ⁽²⁾	Modified PTFE ⁽³⁾
Applicable tubing O.D. / I.D.	M3	—	Ø 3.18/Ø 2.18	Ø 4/Ø 2.5	Ø 3.18/Ø 2 Ø 4/Ø 2.5	—	—
	M5, R 1/8	Ø 4/Ø 2.5 Ø 6/Ø 4		Ø 4/Ø 2.5 Ø 6/Ø 4	Ø 3.18/Ø 2 Ø 4/Ø 2.5 Ø 6/Ø 4	Ø 4/Ø 2.5 Ø 6/Ø 4	Ø 4/Ø 2.5 Ø 6/Ø 4
Fluid		Air, Water ^(4,5)					
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

* Body of M-5E, M-5ER, M-5M is not surface-treated.
Electroless nickel plate treated is available as option -X2.

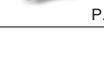
Fitting Markings for Applicable Tubing Material (Barb fitting, Barb elbow, Barb elbow (H))
Tubing material determines the compatible fittings. (Refer to the table below.)

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

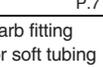
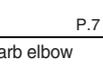
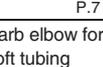
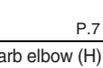
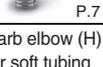
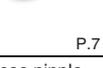
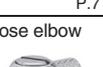
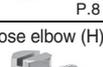
M Series

Series M3, R 1/8

Series	Model	Description	Application	Note
M3	M-3AU-3		For soft nylon tubing	Ø 3.18/2.18 x M3
			For polyurethane tubing	Ø 3.18/2 x M3
	M-3AU-4		For soft nylon and polyurethane tubing	Ø 4/2.5 x M3
	M-3ALU-3		For soft nylon tubing	Ø 3.18/2.18 x M3
			For polyurethane tubing	Ø 3.18/2 x M3
	M-3ALU-4		For soft nylon and polyurethane tubing	Ø 4/2.5 x M3
	M-3UL		Body rotates at 360° around the stud axis	M3 female x M3 male
	M-3UT		Body rotates at 360° around the stud axis	M3 female x M3 female x M3 male
	M-3N		Fitting to workpiece and fitting to fitting connection	M3 male x M3 male
	M-3P		Use to plug unused M3 port	

Series	Model	Description	Application	Note
R 1/8	M-01AN-4		For nylon tubing	Ø 4/2.5 x R 1/8
				Ø 6/4 x R 1/8
	M-01AU-4		For soft nylon and polyurethane tubing	Ø 4/2.5 x R 1/8
				Ø 6/4 x R 1/8
	M-01H-4		For nylon, soft nylon and polyurethane tubing	Ø 4/2.5 x R 1/8
	M-01H-6			Ø 6/4 x R 1/8

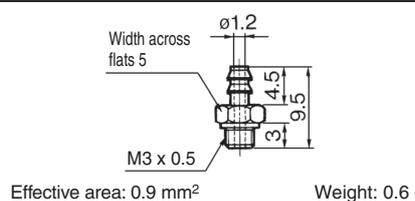
Series M5

Series	Model	Description	Application	Note
M5	M-5AN-4		For nylon tubing	Ø 4/2.5 x M5
	M-5AN-6			Ø 6/4 x M5
	M-5AU-3		For soft nylon tubing	Ø 3.18/2.18 x M5
			For polyurethane tubing	Ø 3.18/2 x M5
	M-5AU-4		For soft nylon and polyurethane tubing	Ø 4/2.5 x M5
	M-5AU-6			Ø 6/4 x M5
	M-5ALN-4		• For nylon • Body rotates at 360° around the stud axis	Ø 4/2.5 x M5
	M-5ALN-6			Ø 6/4 x M5
	M-5ALU-3		For soft nylon tubing	Ø 3.18/2.18 x M5
			For polyurethane tubing	Ø 3.18/2 x M5
M-5ALU-4		For soft nylon and polyurethane tubing	Ø 4/2.5 x M5	
M-5ALU-6			Ø 6/4 x M5	
M-5ALHN-4		Body rotates at 360° around the stud axis	Ø 4/2.5 x M5	
M-5ALHN-6			Ø 6/4 x M5	
M-5ALHU-3		For soft nylon tubing	Ø 3.18/2.18 x M5	
		For polyurethane tubing	Ø 3.18/2 x M5	
M-5ALHU-4		For soft nylon and polyurethane tubing	Ø 4/2.5 x M5	
M-5ALHU-6			Ø 6/4 x M5	
M-5H-4		For nylon, soft nylon and polyurethane tubing	Ø 4/2.5 x M5	
M-5H-6			Ø 6/4 x M5	
M-5HL-4		• For nylon, soft nylon and polyurethane tubing • Body rotates at 360° around the stud axis	Ø 4/2.5 x M5	
M-5HL-6			Ø 6/4 x M5	
M-5HLH-4		Body rotates at 360° around the stud axis	Ø 4/2.5 x M5	
M-5HLH-6			Ø 6/4 x M5	
M-5L		One-sided 90° elbow	M5 female x M5 female	

Series	Model	Description	Application	Note
M5	M-5T		Both sides allow 90° connection	M5 female x M5 female x M5 female
	M-5UL		Body rotates at 360° around the stud axis	M5 female x M5 male
	M-5UT		Body rotates at 360° around the stud axis	M5 female x M5 female x M5 male
	M-5J		Solid piece moves fitting up from workpiece	M5 male x M5 female
	M-5N		Fitting to workpiece and fitting to fitting connection	M5 male x M5 male
	M-5UN		Body rotates at 360° around the stud axis	M5 male x M5 male PAT.
	M-5E		Panel-mount connection	M5 female x M5 female
M-5ER		Reduction from Rc 1/8 to M5 including panel or bracket mounting	Rc 1/8 x M5 female	
M-5M		For reducing Rc 1/8 female be diverted to up to 9, M5 stations, including panel or bracket mounting	Rc 1/8 x M5 female (9 stations)	
M-5B		For reducing R 1/8 female to M5.	R 1/8 x M5 female	
M-5P		Use to plug unused M5 port.		

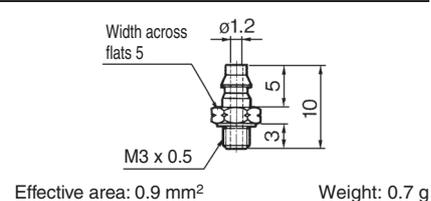
Series M3

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

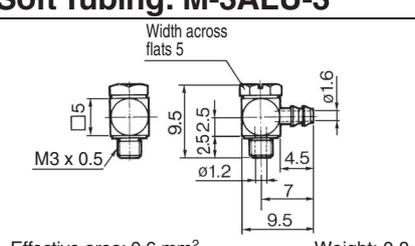
Effective area: 0.9 mm² Weight: 0.6 g

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

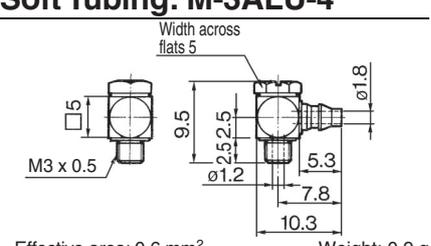
Effective area: 0.9 mm² Weight: 0.7 g

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

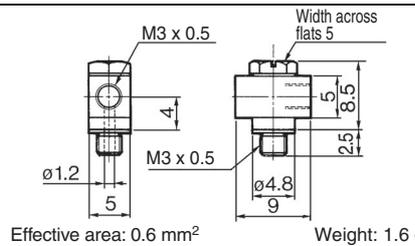
Effective area: 0.6 mm² Weight: 0.8 g

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

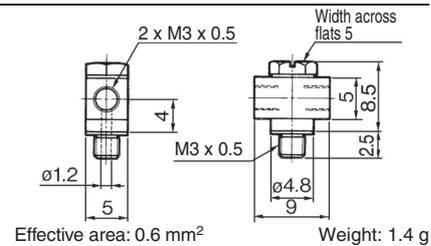
Effective area: 0.6 mm² Weight: 0.9 g

Universal Elbow: M-3UL

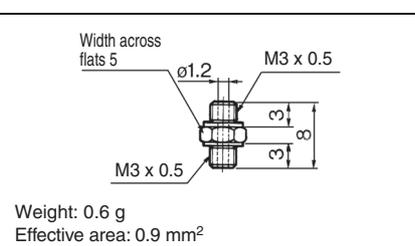
Effective area: 0.6 mm² Weight: 1.6 g

Universal Tee: M-3UT

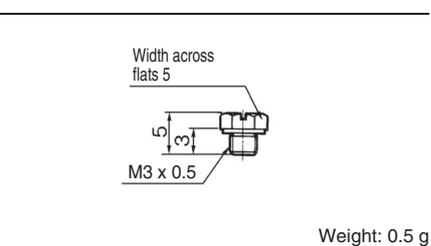
Effective area: 0.6 mm² Weight: 1.4 g

Nipple: M-3N

Weight: 0.6 g
Effective area: 0.9 mm²

Plug: M-3P

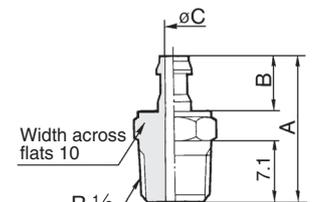
Weight: 0.5 g

Series R 1/8

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



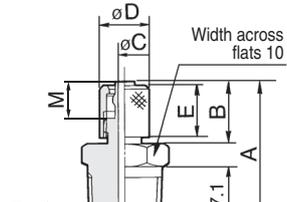
Applicable tubing	Model	A	B	Ø C	Effective area (mm ²)	Weight [g]
Nylon tubing	M-01AN-4	15.1	5	1.8	2.1	6.4
	M-01AN-6	17.1	7	2.5	4.0	6.6
Soft tubing	M-01AU-4	15.1	5	1.8	2.1	6.5
	M-01AU-6	17.1	7	2.5	4.0	6.7



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



Model	A	B	Ø C	Ø D	E	M	Effective area (mm ²)	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



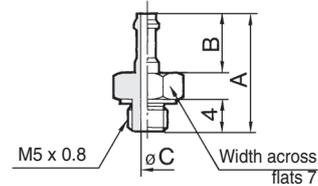
M Series

Series M5

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



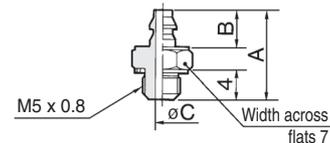
Model	A	B	Ø C	Effective area (mm ²)	Weight [g]
M-5AN-4	12	5	1.8	2.1	1.6
M-5AN-6	14	8	2.5	4.0	1.7



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



Model	A	B	Ø C	Effective area (mm ²)	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

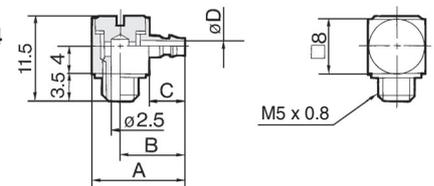


Barb Elbow for Nylon Tubing: M-5ALN-4/-6 Barb Elbow for Soft Tubing: M-5ALU-3/-4/-6

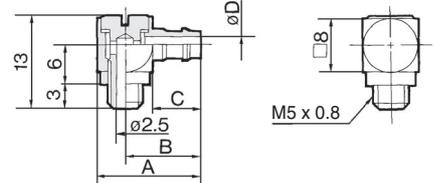


Model	A	B	C	Ø D	Effective area (mm ²)	Weight [g]
M-5ALN-4	13	9	5	1.8	1.4	4.0
M-5ALN-6	15	11	7	2.5	2.4	4.4
M-5ALU-3	13	9	4.5	1.6	1.1	4.0
M-5ALU-4	13.5	9.5	5	1.8	1.4	4.1
M-5ALU-6	15.5	11.5	7	2.5	2.4	4.5

M-5ALN-4
M-5ALU-3/-4



M-5ALN-6
M-5ALU-6

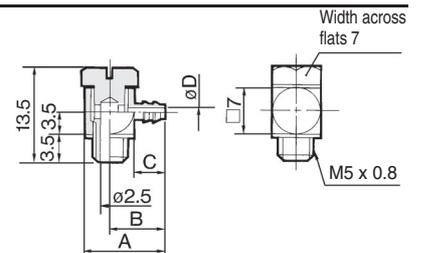


Barb Elbow for Nylon Tubing: M-5ALHN-4/-6 Barb Elbow for Soft Tubing: M-5ALHU-3/-4/-6

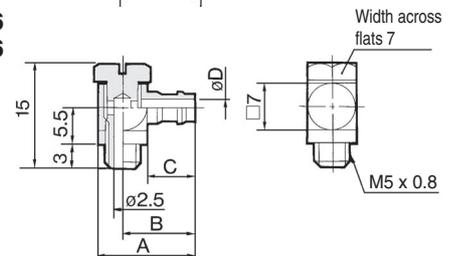


Model	A	B	C	Ø D	Effective area (mm ²)	Weight [g]
M-5ALHN-4	12	8.5	5	1.8	1.4	3.2
M-5ALHN-6	14	10.5	7	2.5	2.4	3.7
M-5ALHU-3	12	8.5	4.5	1.6	1.1	3.2
M-5ALHU-4	12.5	9	5	1.8	1.4	3.3
M-5ALHU-6	14.5	11	7	2.5	2.4	3.9

M-5ALHN-4
M-5ALHU-3/-4



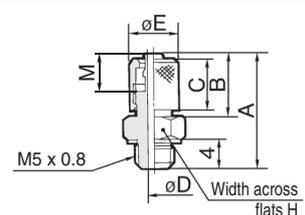
M-5ALHN-6
M-5ALHU-6



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



Model	A	B	C	Ø D	Ø E	H	M	Effective area (mm ²)	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

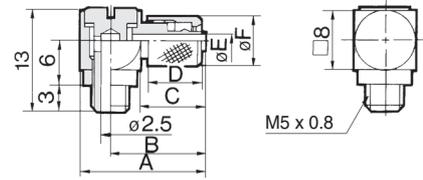


M5 Series

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



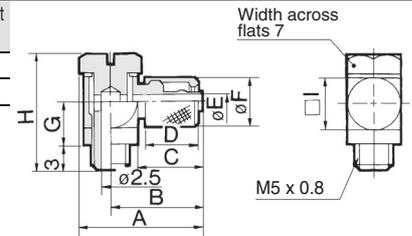
Model	A	B	C	D	Ø E	Ø F	Effective area (mm ²)	Weight [g]
M-5HL-4	16.5	12.5	8.5	7	1.8	6.5	1.4	4.4
M-5HL-6	17.5	13.5	9.5	8	2.5	8.5	2.4	5.2



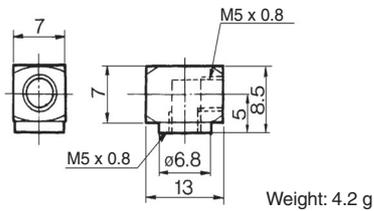
Hose Elbow: M-5HLH-4/-6



Model	A	B	C	D	Ø E	Ø F	G	H	□ I	M	Effective area (mm ²)	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

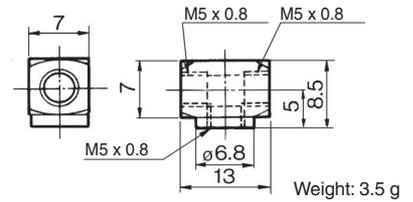


Elbow: M-5L



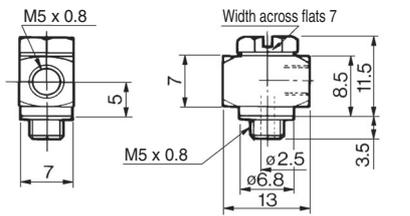
Weight: 4.2 g

Tee: M-5T



Weight: 3.5 g

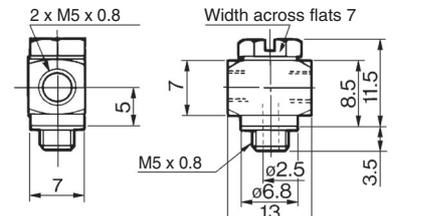
Universal Elbow: M-5UL



Effective area: 2.4 mm²

Weight: 5.3 g

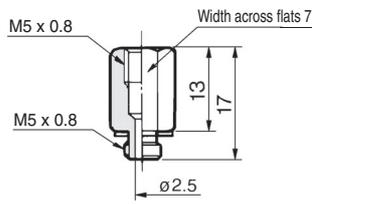
Universal Tee: M-5UT



Effective area: 2.4 mm²

Weight: 4.8 g

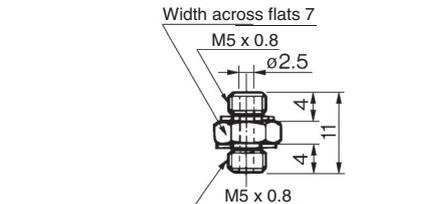
Extension Fitting: M-5J



Effective area: 4.0 mm²

Weight: 3.6 g

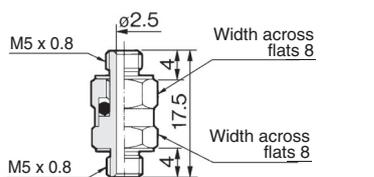
Nipple: M-5N



Effective area: 4.0 mm²

Weight: 1.5 g

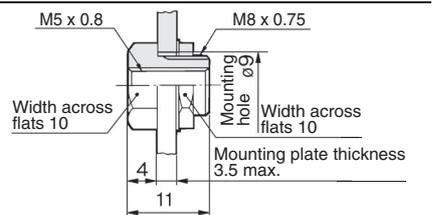
Universal Nipple: M-5UN



Effective area: 4.0 mm²

Weight: 3.9 g

Bulkhead Union: M-5E



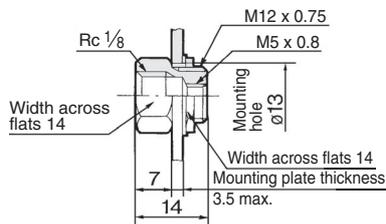
For the plate thickness 3.5 to 6 mm, give the plate tapping M8 x 0.75, and then screw-in.

Weight: 4.6 g

M Series

Series M5

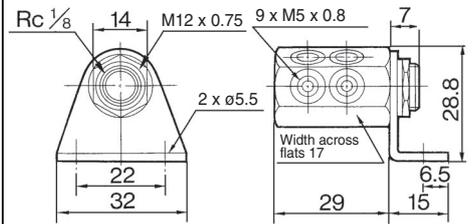
Bulkhead Reducer: M-5ER



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

Weight: 12 g

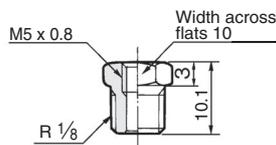
Manifold: M-5M



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

Bushing: M-5B



Weight: 5.8 g

Plug: M-5P



Weight: 1.3 g

⚠ 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		
	M-3ALU-□	Approx. 1/2 rotations	
	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-□		Approx. 1/2 rotations <small>Note)</small>
	M-5ALU-□		
	M-5ALHN-□		
	M-5ALHU-□		
	M-5HL-□		
	M-5HLH-□		
	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", "TK-3", "TK-5" or "TK-6".)
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", "TK-3", "TK-5" or "TK-6".)
2. Push the tube until it comes to the end of the barb portion, or it may cause air leakage or release hose.



Please contact SMC for detailed dimensions, specifications, and delivery.

1 Gasket Material Modification

Symbol	Specifications	
X83	Gasket material: Stainless steel 304, NBR	
	Applicable thread	Gasket part no.
	M3	IN-233-706
	M5 ^{Note)}	M-5G2
X226	Gasket material: Stainless steel 304, FKM	
	Applicable thread	Gasket part no.
	M3	M3G-DPH00489
X112	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-3G3		Stainless steel 304, NBR	M Series, For M3 thread
	M-5G1	M5	PVC	—
	M-5G2		Stainless steel 304, NBR	M Series, For M5 thread
	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
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

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)¹⁾, and other safety regulations.

 Caution:	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
 Warning:	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
 Danger:	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

- 1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots - Safety.
etc.

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogue.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary. If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”. Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.²⁾ Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.
- 2) Vacuum pads are excluded from this 1 year warranty.
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

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