# Miniature Fittings



Applicable Tubing: Ø2 Connection Thread: M3, M5



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



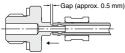
#### **Tubing Connection and Removal**

#### Connection of tubing

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



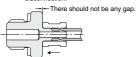
Insert the tubing slowly into the fittings. Make sure to secure a gap of approx. 0.5 mm between the tubing end and the barb end.



 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.)

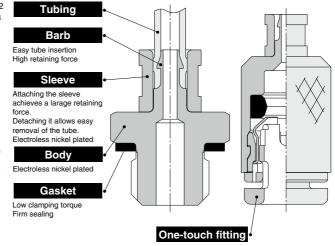
If you feel any strong resistance and cannot push the sleeve completely to the end side, this may be caused due to jamming. Remove and repeat again by starting from step 1 making sure to secure a gap in the step 3.

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



#### Removal of tubing

- 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.
- When reusing the tubing, cut off the previously installed portion of the tubing to avoid possible leakage and/or disconnection of the tubing.



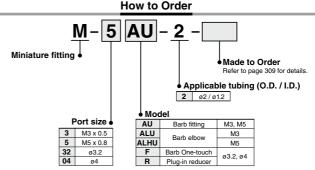
### **Specifications**

Applicable tubing material	Polyurethane
Applicable tubing (O.D. / I.D.)	ø2 / ø1.2
Fluid	Air, N <sub>2</sub> , Water (1, 2, 3)
Max. operating pressure	1 MPa (4)
Ambient and fluid temperature	-5 to 60°C, Water: 0 to 40°C (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) As the barb One-touch comes with grease, it cannot be used when N2 is used as clean, dry air. Note 4) Apply the maximum operating pressure to the tube during the tube connection.



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

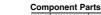


#### **Dimensions**

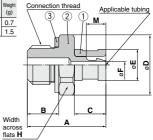
#### Barb Fitting: M-3AU-2, M-5AU-2



applicable tubing O.D. / I.D. (mm)	thread	Model	Н	Α	В	С	D	Е	F	М	Weight (g)
ø <b>2 /</b> ø <b>1.2</b>	M3 x 0.5	M-3AU-2	4.5	9	3		5		0	0.5	0.7
02/01.2	M5 x 0.8	M-5AU-2	7	10	4	4	7.7	4	0.9	2.5	(g) .5 0.7 1.5



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

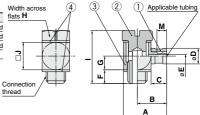


#### Barb Elbow: M-3ALU-2, M-5ALHU-2



Applicable tubing O.D. / I.D. (mm)	Connection thread	Model	н	A	В	С	D	E	F	G	_	J	М	Weight (g)
ø2 / ø1.2	M3 x 0.5	M-3ALU-2	5	9	6.5	4	4		2.5	2.5	9.4	5	2 -	1.6
02/01.2	M5 v 0 8	M-5ALHIL2	7	11	7.5	4	4	0.9	2.5	3.5	125	7	2.5	2.5

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



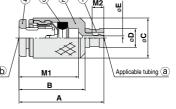
#### Barb One-touch: M-32F-2, M-04F-2



Applicable tubing (mm)			١.	В	С	_	_	М1		Weight	
@ (O.D. / I.D.)	(b) (O.D.)	Model	A	В	C	ט	_	IVI I	IVIZ	(g)	
ø2/ø1.2	ø3.2	3.2 M-32F-2 17.7 13.7 7.5 4 0.9 12.	10.7	, , , ,	2.4						
02/01.2	ø <b>4</b>	M-04F-2	18	14	8.5	"	0.9	12.7	2.5	2.9	,



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	_



Applicable tubing (b)

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

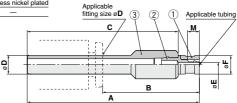
Applicable tubing O.D. / I.D. (mm)		Model	Α	B (1)	С	Е	F	М	Weight (g)
ø2 / ø1.2	ø3.2	M-32R-2	36	22.7	31.5	E F M (g)	0.7		
WZ 1 W 1.Z	a <b>4</b>	M-04R-2	36.5	23.2	32	0.9	4	2.5	0.8

Note 1) Dimensions when connected to KQ2 series.

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

#### **Spare Parts**

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

# 

- I Be sure to read this before handling the products.
- Refer to page 11 for safety instructions and pages 14 to 18 for fittings and tubing precautions.

#### **⚠** 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.

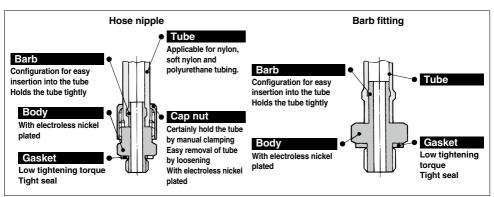
	Thread	Model	Number of tightening rotations
	140	M-3AU-2	Approx. 1/4 rotations
	M3	M-3ALU-2	Approx. 1/2 rotations
	M5	M-5AU-2	Approx. 1/6 to 1/4 rotations <sup>Note)</sup>
		M-5ALHU-2	Approx. 1/2 rotationsNote)

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

# 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.





#### Specifications

Applicable to	ubing material	Nylon Soft nylon		nvlon	Polyurethane	PFA (1)	FEP (2)	Modified PTFE (3)	Wear resistant polyurethane (4)	
Applicable tubing O.D. / I.D.	M3	_	95	ø4/ø2.5	ø3.18/ø2 ø4/ø2.5	_	_	_	_	
	M5, R 1/8	ø4/ø2.5 ø6/ø4			ø3.18/ø2 ø4/ø2.5 ø6/ø4	ø4/ø2.5 ø6/ø4	ø4/ø2.5 ø6/ø4	ø4/ø2.5 ø6/ø4	ø4/ø2.5 ø6/ø4	
Fluid		Air, N <sub>2</sub> , Water (5, 6, 7)								
Max. operating	pressure (at 20°C)	1.5 MPa	1 M	IPa	0.8 MPa	1 MPa	1.5 MPa	1.4 MPa	0.8 MPa	
Ambient and f	luid temperature	-5 to 60°C, Water: 0 to 40°C (No freezing)								
Connection size			M3, M5	5, R ½		M5. R 1/8				
Thread					0205, Clas B0203 (Ta					

Note 1), Note 2), Note 3), Note 4) Compatible only with hose nipple type.

Note 5) Barb fitting, barb elbow, barb elbow (H) are not compatible with water.

Note 6) 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 7) As the universal nipple comes with grease, it cannot be used when N<sub>2</sub> is used as clean, dry air.

#### **Principal Parts Material**

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

<sup>\*</sup> 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 mar	Fitting marking for applicable tubing material							
Connection	rubing	Barb fittings	Barb elbow	Barb elbow (H)						
М3	Soft nylon tubing Polyurethane tubing									
R 1/8,	Nylon tubing									
M5	Soft nylon tubing Polyurethane tubing	Marking	Marking	Marking						



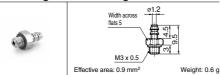
# M3, R 1/8 Series

#### M5 Series

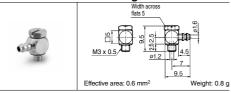
Series	Model	Description	Applic	cation	Note	Series Model	Description	Appli	cation	Note	Series Model	Description	Application	Note	
	M-3AU-3	Barb fitting for soft tube	For so tubing	ft nylon	ø3.18/2.18 x M3 ø3.18/2	M-5AN-4	Barb fitting for nylon tubing	For ny		ø4/2.5 x M5	M-5T	tee	Both sides allow 90°	M5 female x M5 female	
	M-3AU-4		thane	tubing ft nylon	x M3 ø4/2.5	M-5AN-6	P.313	tubing		ø6/4 x M5		P.314	connection	x M5 female	
		P.312 Barb elbow for	and po		x M3 ø3.18/2.18	M-5AU-3	Barb fitting for soft tubing	For so tubing		ø3.18/2.18 x M5 ø3.18/2	M-5UL	Universal	Body rotates at 360° around the	M5 female	
	M-3ALU-3	soft tubing	Body rotates	tubing For poly- urethane	x M3 ø3.18/2	M-5AU-4	The state of the s	thane For so	tubing ft nylon	x M5 ø4/2.5		P.314 Universal tee	stud axis		
	M-3ALU-4		at 360° around the stud axis	tubing For soft	x M3	M-5AU-6	P.313	and po thane	olyure-	x M5 ø6/4 x M5	M-5UT		Body rotates at 360° around the	M5 female x M5 female	
	M-3ALU-4	P.312		and poly- urethane tubing	ø4/2.5 x M3	M-5ALN-4	Barb elbow for nylon tubing	• For ny		ø4/2.5 x M5		P.314 Extention fitting	stud axis	x M5 male	
МЗ	M-3UL	Universal elbow	at 360		M3 female	M-5ALN-6	P.313		)° around ud axis	ø6/4 x M5	M-5J		Solid piece moves fitting up from	M5 male x M5 female	
MO	W-30L	P.312	around stud a		x M3 male	M-5ALU-3	Barb elbow for soft tubing	Body	For soft nylon tubing For poly-	ø3.18/2.18 x M5 ø3.18/2		P.314 Nipple	workpiece Fitting to		
	M-3UT	Universal tee	at 360		M3 female x M3 female	M-5ALU-4		rotates at 360° around the stud axis	urethane tubing For soft nylon	x M5 ø4/2.5 x M5	M-5N	•	workpiece and fitting to fitting	M5 male x M5 male	
		P.312	around stud a		x M3 male	M-5ALU-6	P.313		nylon and poly- urethane tubing	ø6/4 x M5	M5	P.314 Universal nipple	Body rotates	M5 male	
	M-3N	Nipple	workpiece and fitting		M3 male	M-5ALHN-4	Barb elbow (H) for nylon tubing	at 360°	For nylon tubing	ø4/2.5 x M5	M-5UN	P.314	at 360° around the stud axis	x M5 male PAT.	
		P.312 Plug	to fittir conne		X INO ITILIC	M5 M-5ALHN-6	P.313			ø6/4 x M5 ø3.18/2.18		Bulkhead union	Panel-mount	M5 female	
	M-3P	a lug	Use to			M-5ALHU-3	Barb elbow (H) for soft tubing	for soft tubing B	Body For pouretha	For soft nylon tubing For poly- urethane	x M5 ø3.18/2	M-5E	P.314	connection	x M5 female
		P.312	port			M-5ALHU-4		at 360° around the stud axis	For soft nylon and polyure-	x M5 ø4/2.5 x M5	M-5ER	Bulkhead reducer	Reduction from Rc 1/8 to M5 including panel or	Rc 1/8 x M5 female	
Series	Model	Description	Applio	cation	Note	M-5ALHU-6	P.313		thane tubing	ø6/4 x M5		P.315	bracket mounting	x ws iemaie	
	M-01AN-4	Barb fitting for nylon tubing	For ny		ø4/2.5 x R ½	M-5H-4	Hose nipple	For ny soft ny and		ø4/2.5 x M5	M-5M	Manifold	For reducing Rc 1/8 female be diverted to up to 9,	Rc 1/8 x M5 female	
	M-01AN-6	P.312	uonig		ø6/4 x R 1/8	M-5H-6	P.313		ethane	ø6/4 x M5	INI-SINI	P.315	M5 stations, including panel or bracket mounting	(9 stations)	
R 1/8	M-01AU-4	Barb fitting for soft tubing	For so	and	ø4/2.5 x R ½	M-5HL-4	Hose elbow		ylon and	ø4/2.5 x M5	M-5B	Bushing	For reducing R 1/8 female	R 1/8 x M5 female	
7/8	M-01AU-6	P.312	polyur thane	re- tubing	ø6/4 x R 1/8	M-5HL-6	P.314	• Body	rotates	ø6/4 x M5		P.315 Plug	to M5.	PIBITISI CIVI A	
	M-01H-4	Hose nipple	For ny soft ny and po	ylon	Ø4/2.5 x R 1/8	M-5HLH-4	Hose elbow (H)	at 36 arour stud a	nd the	ø4/2.5 x M5	M-5P	P.315	Use to plug unused M5 port.		
	M-01H-6	P.312	uretha tubing		ø6/4 x R ½	M-5HLH-6	P.314			ø6/4 x M5	_				
						M-5L	Elbow	One-s 90° ell		M5 female x M5 female					
							P.314								

#### M3 Series

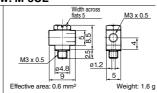
#### Barb Fitting for Soft Tubing: M-3AU-3



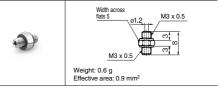
### Barb Elbow for Soft Tubing: M-3ALU-3



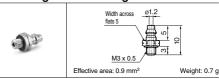
#### Universal Elbow: M-3UL



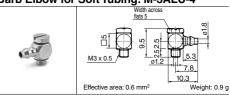
Nipple: M-3N



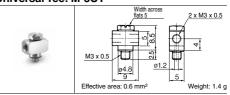
#### Barb Fitting for Soft Tubing: M-3AU-4



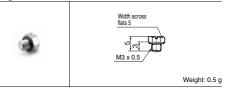
#### Barb Elbow for Soft Tubing: M-3ALU-4



#### Universal Tee: M-3UT



Plug: M-3P



#### R 1/8 Series

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



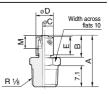
Applicable tubing	Model	A	В	øC	(mm²)	(g)
Nylon tubing	M-01AN-4	15.1	5	1.8	2.1	6.4
Nyion tubing	M-01AN-6	17.1	7	2.5	4.0	6.6
0-64-65	M-01AU-4	15.1	5	1.8	2.1	6.5
Soft tubing	M-01AU-6	17.1	7	2.5	4.0	6.7

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i.		ш
Width across flats 10		
R 1/8		7.

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



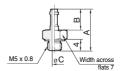
Model	A	В	øC	øD	E	М	Effective area (mm²)	Weight (g)	
M-01H-4	18.6	8.5	1.8	6.5	7	5	2.1	7.1	
M-01H-6	19.6	9.5	3	8.5	8	6	5.5	7.7	



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



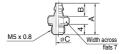
Model	A	B øC		Effective area (mm²)	Weight (g)
M-5AN-4	12	5	1.8	2.1	1.6
M-5AN-6	14	8	2.5	4.0	1.7



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



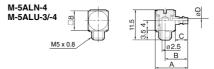
Model	A B øC		Effective area (mm²)	Weight (g)	
M-5AU-3	11.5	4.5	1.6	1.7	1.5
M-5AU-4	12	5	1.8	2.1	1.6
M-5AU-6	14	7	2.5	4.0	1.8



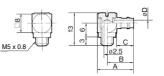
Barb Elbow for Nylon Tubing: M-5ALN-4/-6 Barb Elbow for Soft Tubing: M-5ALU-3/-4/-6



Model	Α	В	С	øD	(mm²)	(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



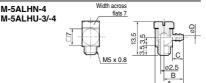




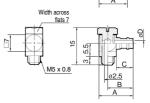
Barb Elbow for Nylon Tubing: M-5ALHN-4/-6 Barb Elbow for Soft Tubing: M-5ALHU-3/-4/-6



Model	Α	B C øD		øD 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



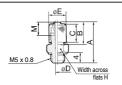
M-5ALHN-6 M-5ALHU-6



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



Model	A	В	С	øD	øE	н	М	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

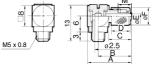


#### M5 Series

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



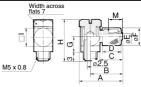
Model	A	В	С	D	øΕ	øF	М	Effective area (mm²)	Weight (g)
M-5HL-4	16.5	12.5	8.5	7	1.8	6.5	5	1.4	4.4
M-5HL-6	17.5	13.5	9.5	8	2.5	8.5	6	2.4	5.2



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

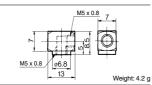


	Model	A	В	С	D	øΕ	øF	G	н	□□	M	Effective area (mm²)	Weight (g)	
	M-5HLH-4	15.5	12	8.5	7	1.8	6.5	5.5	15	7	5	1.4	4.5	
M-5HLH-6   17.5   13.5   9.5   8   2.5   8.5   6   16   8   6   2.4   6.6	M-5HLH-6	17.5	13.5	9.5	8	2.5	8.5	6	16	8	6	2.4	6.6	



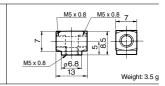
Elbow: M-5L





Tee: M-5T





#### **Universal Elbow: M-5UL**



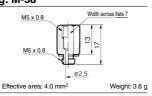


**Universal Tee: M-5UT** 

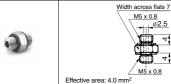


## **Extension Fitting: M-5J**



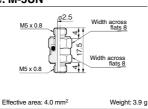


Nipple: M-5N



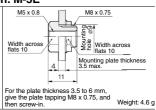
#### **Universal Nipple: M-5UN**





#### Bulkhead Union: M-5E





Weight: 1.5 g

#### **Bulkhead Reducer: M-5ER**



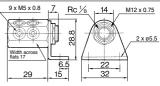


For the plate thinkness 3.5 to 6 mm, give the plate tapping M12 x 0.75, and then screw-in.

Weight: 12 g

### Manifold: M-5M



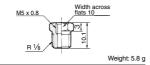


Panel mounting plate thickness max. 3.5 mm
For the plate thinkness 3.5 to 6 mm, give the plate tapping M12 x 0.75, and then screw-in.

Weight: 59 g

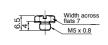
#### **Bushing: M-5B**





#### Plug: M-5P





Weight: 1.3 g

### 

Be sure to read this before handling the products.

Refer to page 11 for safety instructions and pages 14 to 18 for fittings and tubing precautions.

#### 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			
mead	M-3AU-□	realistic or agriculty rotations			
	M-3N	Approx. 1/4 rotations			
	M-3P				
M3	M-3ALU-□	Approx. 1/2 rotations			
	M-3UL				
	M-3UT				
M5	M-5AN-□				
	M-5AU-□				
	M-5H-□				
	M-5J	Approx. 1/6 to 1/4			
	M-5N	rotations <sup>Note)</sup>			
	M-5UN				
	M-5P				
	M-5ALN-□				
	M-5ALU-□				
	M-5ALHN-□				
	M-5ALHU-□	Approx. 1/2 rotations Note)			
	M-5HL-□	Approx. 1/2 Totations			
	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

#### 

- 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.
- Push the tube until it comes to the end of the barb portion, or it may cause air leakage or hose releasing.
- Tighten the cap nut firmly by hand on the fitting.

# Use of Tube with Barb Fitting ∧ Caution

- 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.

# Made to Order Specifications Please contact SMC for detailed dimensions, specifications and lead times.



# 1 Gasket Material Modification

Symbol	Specifications					
	Gasket material: Stainless steel 304, NBR					
X83	Applicable thread	Gasket part no.				
A63	M3	M-3G2				
	M5 Note)	M-5G2				
	Gasket material: Stainless steel 304, FKM					
X226	Applicable thread	Gasket part no.				
	M3	M3G-DPH00489				
	Gasket material: Sta	ainless steel 316, Special FKM				
X112	Applicable thread	Gasket part no.				
	M5	M-5G3				

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

#### **Spare Parts**

Description	Description Part no.		Material	Applicable model	
Gasket	M-3G	M3	PVC	_	
	M-3G3	IVIS	Stainless steel 304, NBR	M Series, For M3 thread	
	M-5G1		PVC	_	
	M-5G2		Stainless steel 304, NBR	M Series, For M5 thread	
	M-5G3	M5	Stainless steel 316, Special FKM	_	
	M-5GH		Nylon 66, GF30%	M-5AL□-6, M-5ALH□-6 M-5HL-4, 6, M-5HLH4, 6	
	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	