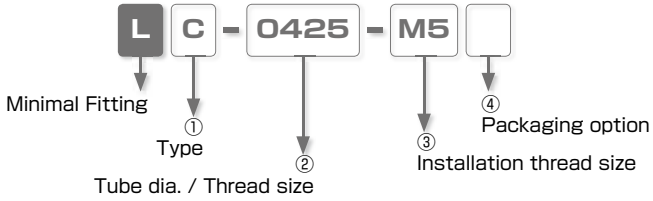
Ultra-Small Barb Fitting for Pneumatic Piping

Minimal Fitting Series

- *Suitable for Vacuum Piping by a Combination with Vacuum Tube*
- *Suitable for Small Application and Space-Saving.*
- *Newly Added Compression Type*
- *Fixing Tube by Hand Tightening for Compression Type.*
- *Optional Selection of Clean-Room Packaging.*

Products are packed in a clean room (equivalent to ISO class 6) after cleaned by clean air.

Model Designation (Example)



① Type

See dimensional drawing

② Tube dia. / Thread size

● Tube dia.

Code	0320	0425	0535	0640
Tube O.D. (mm)	ø3	ø4	ø5	ø6
Tube I.D. (mm)	ø2	ø2.5	ø3	ø4

● Thread size (For Male Screw Union "LN" only)

Code	M3	M5
Size (mm)	M3 × 0.5	M5 × 0.8

● Thread size (Female Screw)

Code	FM3	FM5
Size (mm)	M3 × 0.5	M5 × 0.8

③ Installation thread size

Thread size	Metric thread (mm)			Taper pipe thread
Code	M3	M5	M6	01
Size	M3 × 0.5	M5 × 0.8	M6 × 1	R1/8

④ Packaging option

No code : Standard spec.
C : Clean-room package

Specifications

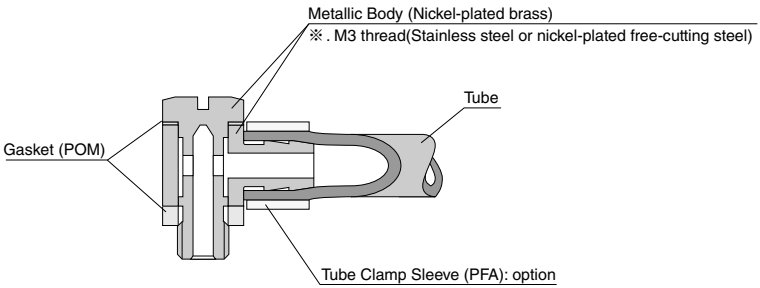
■ Barb type

Fluid medium	Air
Max. operating pressure	0.5MPa Used with Vacuum Tube "UD" : 0.4MPa
Max. vacuum	-100kPa
Operating temp. range	0～50℃ (No freezing)

■ Compression type / Female screw type

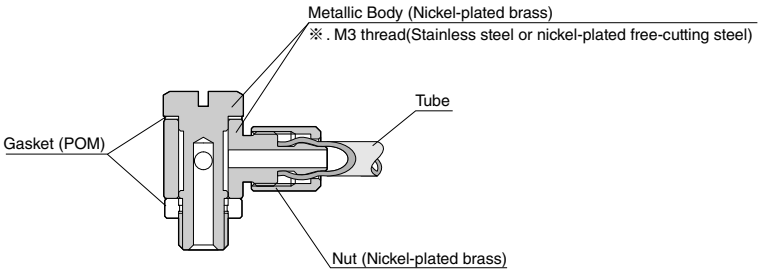
Fluid medium	Air
Max. operating pressure	1MPa Used with Vacuum Tube "UD" : 0.4MPa
Max. vacuum	-100kPa
Operating temp. range	0～50℃ (No freezing)

■ Construction (Barb Single Banjo: LH)



※. Gasket material for metric thread: SUS304+NBR or POM for standard specification : POM for Clean-room package

■ Construction (Compression Single Banjo: LHN)



※. Gasket material for metric thread: SUS304+NBR or POM for standard specification : POM for Clean-room package

⚠ Detailed Safety Instructions

Before using PISCO products, be sure to read “Safety Instructions” and “Safety Instruction Manual” on page 23 to 27 and “Common Safety Instructions for Fittings” on page 33 to 35.

Caution

1. Make sure to insert the barb into a tube up to the barb end. Inadequate insertion may result in the escape of the tube and a fluid leakage.
2. Be sure to place Tube Clamp Sleeve on the edge of outer tube when using Vacuum Tube “UD” with this product. There is a possibility to cause the escape of tube and a fluid leakage without Tube Clamp Sleeve.
3. Regarding the Tube insertion for the Compression type, pass the tube through the nut and insert the barb into the tube up to the barb end. Inadequate insertion may result in the escape of the tube and a fluid leakage.
4. Tighten the nut by hand until it touches the metallic body. Inadequate tightening may result in the escape of the tube and a fluid leakage.

FITTING

Standard Size List

Connection: Thread ⇔ Tube

Type	Page	Thread size	Tube O.D. x I.D. (mm) 3×2	4×2.5	5×3	6×4
LC Barb Straight	P.271	M3×0.5	●	●		●
		M5×0.8	●	●	●	●
		M6×1		●		●
		R1/8	●	●		●

Type	Page	Thread size	Tube O.D. x I.D. (mm) 3×2	4×2.5	5×3	6×4
LH Barb Single Banjo	P.271	M3×0.5	●	●		
		M5×0.8	●	●		●
LB Barb Branch Tee	P.272	M3×0.5	●	●		
		M5×0.8	●	●		●

Connection: Thread ⇔ Tube (Compression type)

Type	Page	Thread size	Tube O.D. x I.D. (mm) 3×2	4×2.5	5×3	6×4
LCN Compression Straight	P.277	M3×0.5	●			
		M5×0.8	●	●		●
		R1/8	●	●		●

Type	Page	Thread size	Tube O.D. x I.D. (mm) 3×2	4×2.5	5×3	6×4
LHN Compression Single Banjo	P.277	M5×0.8	●	●		●

Connection: Thread ⇔ Thread

Type	Page	Thread size	Thread size (Female screw) M3×0.5	M5×0.8
LH Female Screw Banjo	P.273	M3×0.5	●	
		M5×0.8		●
LB Female Screw Banjo Tee	P.273	M3×0.5	●	
		M5×0.8		●
LD Female Screw Run Tee	P.275	M5×0.8		●
LZ Female Screw Cross	P.275	M5×0.8		●
LLC Extension Screw Adaptor	P.276	M3×0.5	●	
		M5×0.8		●

Type	Page	Thread size (Female screw)	Thread size (Female screw) M3×0.5	M5×0.8
LL Female Screw Elbow	P.274	M5×0.8		●
LE Female Screw Tee	P.274	M5×0.8		●
LU Female Screw Union	P.276	M3×0.5	●	
		M5×0.8		●
LM Bulkhead Female Screw Union	P.276	M5×0.8		●

Type	Page	Thread size	Thread size (Male screw) M3×0.5	M5×0.8
LN Male Screw Union	P.274	M3×0.5	●	
		M5×0.8		●

Connection: Tube ⇔ Tube

Type	Page	Tube O.D. x I.D. 1 (mm)	Tube O.D. x I.D. 2(mm) 3×2	4×2.5	6×4
LU Barb Union Straight	P.272	3×2	●		
		4×2.5		●	
		6×4			●

Type	Page	Tube O.D. x I.D. 1 (mm)	Tube O.D. x I.D. 2 (mm) 3×2	4×2.5
LG Unequal Barb Union Straight	P.272	4×2.5	●	
		6×4	●	●

Plug

Type	Page	Thread size M3×0.5	M5×0.8
LP Plug	P.275	●	●

Other

Type	Page	Tube O.D.(mm) 4	6
LS Tube Clamp Sleeve	P.273	●	●

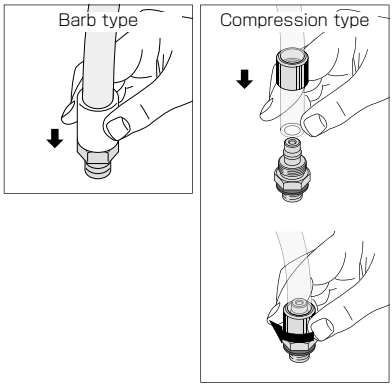
How to insert and disconnect

1. How to insert and disconnect tubes

① Tube insertion

As for barb type, insert the barb into a tube up to the barb end. The outer shape of barb seals inside of the tube. The stability of tube insertion may varies by materials and the hardness of tubes. If necessary, use Tube Clamp Sleeve to avoid the escape of tubes.

As for compression type, pass the tube through the nut and insert the barb into the tube up to the barb end. Tighten the nut by hand until it touches the metallic body.

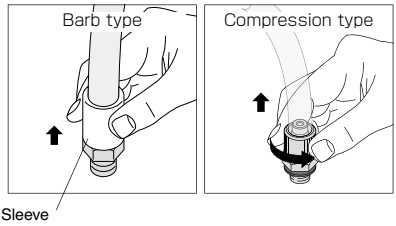


② Tube disconnection

As for barb type, remove Tube Clamp Sleeve first, and pull the tube out.

As for compression type, loosen the nut by hand, and pull the tube out.

Make sure to stop air supply before the tube disconnection for both types.

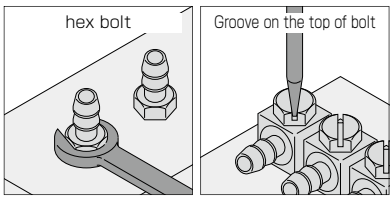


2. How to tighten thread

① Tightening thread

There are two ways to tighten thread. Use a spanner for a hexagonal-column and use a flathead screwdriver to tighten the groove on the top of bolt.

Refer to "Table 2: Recommended tightening torque / Sealock color / Gasket materials" under "4. Instructions for Installing a fitting" in "Common Safety Instructions for Fittings".



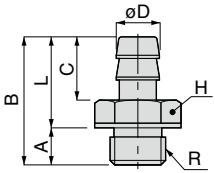
Applicable Tube and Related Products

Vacuum Tube·····P.612
Fluororesin Tube with Clean-room Package·····P.638
Polyurethane Tube with Clean-room Package·····P.642

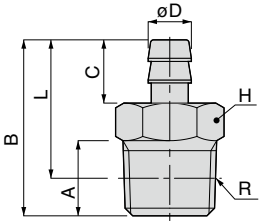
LC Barb Straight

CAD

RoHS compliant



Metric thread



Taper pipe thread

Unit : mm

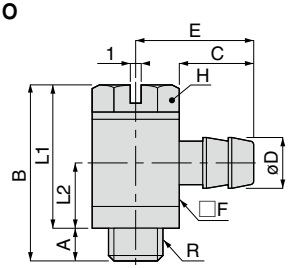
Model code	Tube I.D. øD	R	A	B	L	C	Hex. H	Weight (g)	Orifice dia.	Effective area (mm^2)	CAD file name (※4)
LC-0320-M3□	2	M3×0.5	2.5 [2.2]	11	8.5 [8.8]	6	5.5	0.7	1.2	0.9	TFMF-001
LC-0320-M5□		M5×0.8	3 [3.2]	11.5	8.5 [8.3]		7	1.5			
LC-0320-01□		R1/8	8	18	14		10	6.9			–
LC-0425-M3□	2.5	M3×0.5	2.5 [2.2]	12	9.5 [9.8]	7	5.5	0.8	1.2	0.9	TFMF-001
LC-0425-M5□		M5×0.8	3 [3.2]	13	10 [9.8]		7	1.5	1.6	1.7	
LC-0425-M6□		M6×1	4	14	10		8	2.5			
LC-0425-01□		R1/8	8	19	15		10	1.9			–
LC-0535-M5□	3	M5×0.8	3 [3.2]	13	10 [9.8]	7	7	1.5	1.8	2	TFMF-001
LC-0640-M3□	4	M3×0.5	2.5 [2.2]	12.5	10 [10.3]	7	5.5	1.3	1.2	0.9	
LC-0640-M5□		M5×0.8	3 [3.2]	13	10 [9.8]		7	1.5	2.4	3.8	
LC-0640-M6□		M6×1	4	14	10		8	2.5			
LC-0640-01□		R1/8	8	19	15		10	7.5			–

※1. □ in Model code / Replaced with "C" for Clean-room package
※2. "L" is a reference value for height dimension after tightening taper thread.
※3. Dimensions in [ ] are for clean-room package products.
※4. Visit PISCO website for CAD data of clean-room package products.
※5. Be sure to place Tube Clamp Sleeve on the edge of outer tube in order to avoid the escape of tubes.

LH Barb Single Banjo

CAD

RoHS compliant



Unit : mm

Model code	Tube I.D. øD	R	A	B	L1	L2	C	E	Hex. H	□F	Weight (g)	Orifice dia.	Effective area (mm^2)	CAD file name
LH-0320-M3□	2	M3×0.5	2.2	11.5	9.3	4.3	6	8.8	5.5	5.5	1.9	1.0	0.5	–
LH-0320-M5□		M5×0.8	3.2	16	12.8	6		10	7	8	5.5	1.2	0.8	TFMF-001
LH-0425-M3□	2.5	M3×0.5	2.2	11.5	9.3	4.3	7	9.8	5.5	5.5	1.9	1.0	0.5	–
LH-0425-M5□		M5×0.8	3.2	16	12.8	6		11	7	8	5.5	1.6	1.2	TFMF-001
LH-0640-M5□	4	M5×0.8	3.2	16	12.8	6	7	11	7	8	6	1.8	1.5	

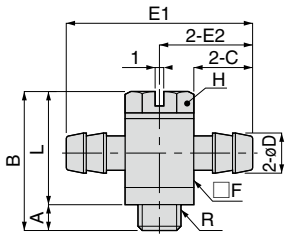
※1. □ in Model code / Replaced with "C" for Clean-room package
※2. Be sure to place Tube Clamp Sleeve on the edge of outer tube in order to avoid the escape of tubes.

CAD CAD data is available at PISCO website.

LB Barb Branch Tee

CAD

RoHS compliant



Unit：mm

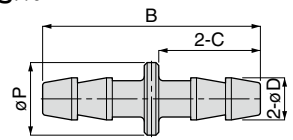
Model code	Tube I.D. øD	R	A	B	L	C	E1	E2	Hex. H	□F	Weight (g)	Orifice dia.	Effective area (mm^2)	CAD file name
LB-0320-M3□	2	M3×0.5	2.2	11.5	9.3	6	17.5	8.75	5.5	5.5	2	1.0	0.5	–
LB-0320-M5□		M5×0.8	3.2	16	12.8		20	10	7	8	5.3	1.2	0.8	
LB-0425-M3□	2.5	M3×0.5	2.2	11.5	9.3	7	19.5	9.75	5.5	5.5	2.1	1.0	0.5	
LB-0425-M5□		M5×0.8	3.2	16	12.8		22	11	7	8	5.4	1.6	1.2	
LB-0640-M5□	4	M5×0.8	3.2	16	12.8	7	22	11	7	8	6.5	1.8	1.5	TFMF-002

※ 1. □ in Model code / Replaced with "C" for Clean-room package

※ 2. Be sure to place Tube Clamp Sleeve on the edge of outer tube in order to avoid the escape of tubes.

LU Barb Union Straight

RoHS compliant



Unit：mm

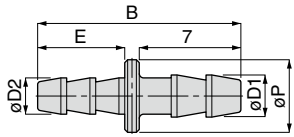
Model code	Tube I.D. øD	B	C	øP	Weight (g)	Orifice dia.	Effective area (mm^2)
LU-0320□	2	13	6	4	0.4	1.2	0.9
LU-0425□	2.5	15	7	5	0.6	1.6	1.7
LU-0640□	4	15.6	7	7.5	1.8	2.4	3.8

※ 1. □ in Model code / Replaced with "C" for Clean-room package

※ 2. Be sure to place Tube Clamp Sleeve on the edge of outer tube in order to avoid the escape of tubes.

LG Unequal Barb Union Straight

RoHS compliant



Unit：mm

Model code	Tube I.D. øD1	Tube I.D. øD2	B	E	øP	Weight (g)	Orifice dia.	Effective area (mm^2)
LG-0425-0320□	2.5	2	14	6	5	0.6	1.2	0.9
LG-0640-0320□	4	2	14.6	6	7.5	1.5	1.2	0.9
LG-0640-0425□		2.5	15.6	7		1.6	1.6	1.7

※ 1. □ in Model code / Replaced with "C" for Clean-room package

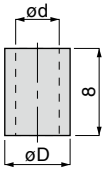
※ 2. Be sure to place Tube Clamp Sleeve on the edge of outer tube in order to avoid the escape of tubes.

CAD CAD data is available at PISCO website.

LS Tube Clamp Sleeve

CAD

RoHS compliant



Unit：mm

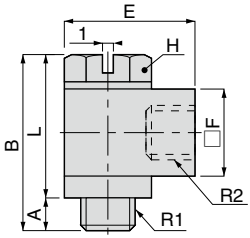
Model code	Tube O.D.	øD	ød	Weight (g)	CAD file name
LS-0425□	4	6	4	0.3	TFMF-002
LS-0640□	6	8	6	0.4	

※. □ in Model code / Replaced with "C" for Clean-room package

LH Female Screw Banjo

CAD

RoHS compliant



Unit：mm

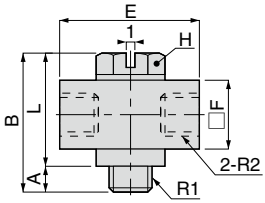
Model code	R1	R2	A	B	L	E	Hex. H	□F	Weight (g)	Orifice dia.	Effective area (mm^2)	CAD file name
LH-FM3-M3□	M3×0.5	M3×0.5	2.2	11.5	9.3	8.7	5.5	5.5	2.2	1.0	0.5	–
LH-FM5-M5□	M5×0.8	M5×0.8	3.2	16	12.8	12	7	8	6.5	1.8	1.5	TFMF-002

※. □ in Model code / Replaced with "C" for Clean-room package

LB Female Screw Banjo Tee

CAD

RoHS compliant



Unit：mm

Model code	R1	R2	A	B	L	E	Hex. H	□F	Weight (g)	Orifice dia.	Effective area (mm^2)	CAD file name
LB-FM3-M3□	M3×0.5	M3×0.5	2.2	11.5	9.3	11	5.5	5.5	2.7	1.0	0.5	–
LB-FM5-M5□	M5×0.8	M5×0.8	3.2	16	12.8	16	7	8	6.5	1.8	1.5	TFMF-002

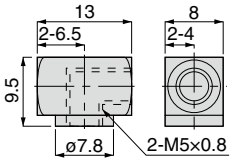
※. □ in Model code / Replaced with "C" for Clean-room package

CAD CAD data is available at PISCO website.

LL Female Screw Elbow

CAD

RoHS compliant



Unit：mm

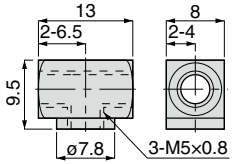
Model code	Weight (g)	CAD file name
LL-FM5□	5.5	TFMF-002

※. □ in Model code / Replaced with "C" for Clean-room package

LE Female Screw Tee

CAD

RoHS compliant



Unit：mm

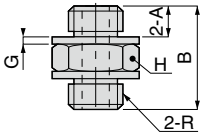
Model code	Weight (g)	CAD file name
LE-FM□	5.5	TFMF-002

※. □ in Model code / Replaced with "C" for Clean-room package

LN Male Screw Union

CAD

RoHS compliant



Unit：mm

Model code	R	A	B	G	Hex. H	Weight (g)	Orifice dia.	Effective area (mm^2)	CAD file name(※3)
LN-M3-M3□	M3 × 0.5	2.5 [2.2]	8	0.5 [0.8]	5.5	0.7	1.2	1.0	–
LN-M5-M5□	M5 × 0.8	3 [3.2]	9.5	0.5 [0.3]	7	1.5	2.5	2.1	TFMF-002

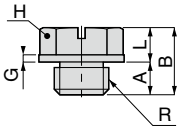
※1. □ in Model code / Replaced with "C" for Clean-room package
※2. Dimensions in [ ] are for clean-room package products.
※3. Visit PISCO website for CAD data of clean-room package products.

CAD CAD data is available at PISCO website.

LP Plug

CAD

RoHS compliant



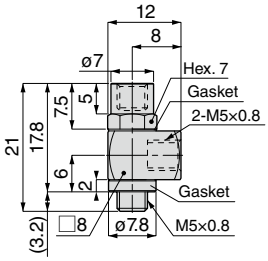
Unit : mm

Model code	R	A	B	L	G	Hex. H	Weight (g)	CAD file name(※3)
LP-M3	M3 × 0.5	2.5 [2.2]	5.5	3	0.5 [0.8]	5.5	0.6	–
LP-M5	M5 × 0.8	3 [3.2]	6	3	0.5 [0.3]	7	1.5	TFMF-002

※1. □ in Model code / Replaced with "C" for Clean-room package
※2. Dimensions in [ ] are for clean-room package products.
※3. Visit PISCO website for CAD data of clean-room package products.

LD Female Screw Run Tee

RoHS compliant



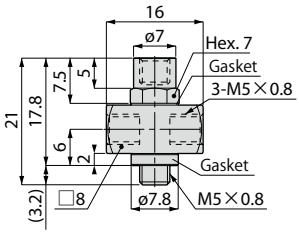
Unit : mm

Model code	Weight (g)	Effective area (mm^2)
LD-FM5-M5□	7.2	1.5

※. □ in Model code / Replaced with "C" for Clean-room package

LZ Female Screw Cross

RoHS compliant



Unit : mm

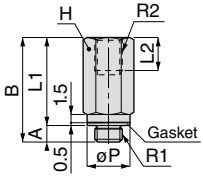
Model code	Weight (g)	Effective area (mm^2)
LZ-FM5-M5□	8.6	1.5

※. □ in Model code / Replaced with "C" for Clean-room package

CAD CAD data is available at PISCO website.

LLC Extension Screw Adaptor

RoHS compliant



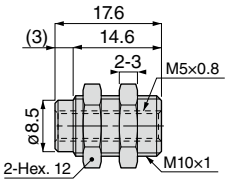
Unit：mm

Model code	R1	R2	A	B	L1	L2	Hex. H	Weight (g)	Effective area (mm^2)
LLC-FM3-M3□	M3 × 0.5	M3 × 0.5	2.5 [2.2]	12.5	10 [10.3]	5	5.5	1.6	1.0
LLC-FM5-M5□	M5 × 0.8	M5 × 0.8	3 [3.2]	19	16 [15.8]	6	8	6.2	3.8

※ 1. □ in Model code / Replaced with "C" for Clean-room package
※ 2. Dimensions in [ ] are for clean-room package products.

LM Bulkhead Female Screw Union

RoHS compliant



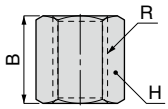
Unit：mm

Model code	Weight (g)	Effective area (mm^2)
LM-FM5□	9.7	5.5

※ . □ in Model code / Replaced with "C" for Clean-room package

LU Female Screw Union

RoHS compliant



Unit：mm

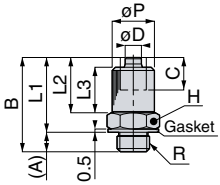
Model code	R	B	Hex. H	Weight (g)	Effective area (mm^2)
LU-FM3□	M3 × 0.5	6	5.5	1	3.9
LU-FM5□	M5 × 0.8	8	7	1.7	5.5

※ . □ in Model code / Replaced with "C" for Clean-room package

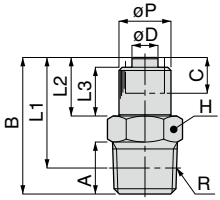
CAD CAD data is available at PISCO website.

LCN Compression Straight

RoHS compliant



Metric thread



Taper pipe thread

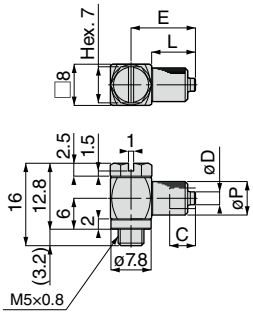
Unit：mm

Model code Model	Tube O.D. x I.D. øD	R	A	G	C	B	L1	L2	L3	øP	Hex. H	Weight (g)	Effective area (mm^2)
LCN-0320-M3□	3×2	M3×0.5	2.5 [2.2]	0.5 [0.8]	4	12	9.5 [9.8]	7	6	5	5.5	1.2	0.9
LCN-0320-M5□		M5×0.8	3 [3.2]	0.5 [0.3]		12.5	9.5 [9.3]				7	1.9	
LCN-0320-01□		R1/8	8	–		19	15				10	7.5	
LCN-0425-M5□	4×2.5	M5×0.8	3 [3.2]	0.5 [0.3]	5	14.5	11.5 [11.3]	8.5	7	6.5	7	2.5	2.0
LCN-0425-01□		R1/8	8	–		20.5	16.5				10	7.9	
LCN-0640-M5□	6×4	M5×0.8	3 [3.2]	0.5 [0.3]	5.5	15	12 [11.8]	9	7.5	8	8	3.4	3.8
LCN-0640-01□		R1/8	8	–		21	17				10	8.9	

※ 1. □ in Model code / Replaced with "C" for Clean-room package
※ 2. "L1" is a reference value for height dimension after tightening taper thread.
※ 3. Dimensions in [ ] are for clean-room package products.

LHN Compression Single Banjo

RoHS compliant



Unit：mm

Model code	Tube O.D. x I.D. øD	C	E	L	øP	Weight (g)	Effective area (mm^2)
LHN-0320-M5□	3×2	4	11	7	5	5.7	0.8
LHN-0425-M5□	4×2.5	5	12.5	8.5	6.5	6.2	1.5
LHN-0640-M5□	6×4	5.5	13	9	8	7	1.5

※ . □ in Model code / Replaced with "C" for Clean-room package

⚠ SAFETY Instructions

This safety instructions aim to prevent personal injury and damage to properties by requiring proper use of PISCO products.

Be certain to follow ISO 4414 and JIS B 8370

ISO 4414 : Pneumatic fluid power…Recomendations for the application of equipment to transmission and control systems.

JIS B 8370 : General rules and safety requirements for systems and their components.

This safety instructions is classified into “Danger”, “Warning” and “Caution” depending on the degree of danger or damages caused by improper use of PISCO products.

⚠ Danger	Hazardous conditions. It can cause death or serious personal injury.
⚠ Warning	Hazardous conditions depending on usages. Improper use of PISCO products can cause death or serious personal injury.
⚠ Caution	Hazardous conditions depending on usages. Improper use of PISCO products can cause personal injury or damages to properties.

⚠ Warning

1. Selection of pneumatic products
   ① A user who is a pneumatic system designer or has sufficient experience and technical expertise should select PISCO products.
   ② Due to wide variety of operating conditions and applications for PISCO products, carry out the analysis and evaluation on PISCO products. The pneumatic system designer is solely responsible for assuring that the user's requirements are met and that the application presents no health or safety hazards. All designers are required to fully understand the specifications of PISCO products and constitute all systems based on the latest catalog or information, considering any malfunctions.

2. Handle the pneumatic equipment with enough knowledge and experience
   ① Improper use of compressed air is dangerous. Assembly, operation and maintenance of machines using pneumatic equipment should be conducted by a person with enough knowledge and experience.

3. Do not operate machine / equipment or remove pneumatic equipment until safety is confirmed.
   ① Make sure that preventive measures against falling work-pieces or sudden movements of machine are completed before inspection or maintenance of these machine.
   ② Make sure the above preventive measures are completed. A compressed air supply and the power supply to the machine must be off, and also the compressed air in the systems must be exhausted.
   ③ Restart the machines with care after ensuring to take all preventive measures against sudden movements.

※. This safety instructions are subject to change without notice.

Disclaimer

1. PISCO does not take any responsibility for any incidental or indirect loss, such as production line stop, interruption of business, loss of benefits, personal injury, etc., caused by any failure on use or application of PISCO products.

2. PISCO does not take any responsibility for any loss caused by natural disasters, fires not related to PISCO products, acts by third parties, and intentional or accidental damages of PISCO products due to incorrect usage.

3. PISCO does not take any responsibility for any loss caused by improper usage of PISCO products such as exceeding the specification limit or not following the usage the published instructions and catalog allow.

4. PISCO does not take any responsibility for any loss caused by remodeling of PISCO products, or by combinational use with non-PISCO products and other software systems.

5. The damages caused by the defect of Pisco products shall be covered but limited to the full amount of the PISCO products paid by the customer.

⚠ SAFETY INSTRUCTION MANUAL

PISCO products are designed and manufactured for use in general industrial machines. Be sure to read and follow the instructions below.

⚠ Danger

1. Do not use PISCO products for the following applications.
   ① Equipment used for maintaining / handling human life and body.
   ② Equipment used for moving / transporting human.
   ③ Equipment specifically used for safety purposes.

⚠ Warning

1. Do not use PISCO products under the following conditions.
   ① Beyond the specifications or conditions stated in the catalog, or the instructions.
   ② Under the direct sunlight or outdoors.
   ③ Excessive vibrations and impacts.
   ④ Exposure / adhere to corrosive gas, inflammable gas, chemicals, seawater, water and vapor. *
   * Some products can be used under the condition above(④), refer to the details of specification and condition of each product.
2. Do not disassemble or modify PISCO products, which affect the performance, function, and basic structure of the product.
3. Turn off the power supply, stop the air supply to PISCO products, and make sure there is no residual air pressure in the pipes before maintenance and inspection.
4. Do not touch the release-ring of push-in fitting when there is a working pressure. The lock may be released by the physical contact, and tube may fly out or slip out.
5. Frequent switchover of compressed air may generate heat, and there is a risk of causing burn injury.
6. Avoid any load on PISCO products, such as a tensile strength, twisting and bending. Otherwise, there is a risk of causing damage to the products.
7. As for applications where threads or tubes swing / rotate, use Rotary Joints, High Rotary Joints or Multi-Circuit Rotary Block only. The other PISCO products can be damaged in these applications.
8. Use only Die Temperature Control Fitting Series, Tube Fitting Stainless SUS316 Series, Tube Fitting Stainless SUS316 Compression Fitting Series or Tube Fitting Brass Series under the condition of over 60℃ (140° F) water or thermal oil. Other PISCO products can be damaged by heat and hydrolysis under the condition above.
9. As for the condition required to dissipate static electricity or provide an antistatic performance, use EG series fitting and antistatic products only, and do not use other PISCO products. There is a risk that static electricity can cause system defects or failures.
10. Use only Fittings with a characteristic of spatter-proof such as Anti-spatter or Brass series in a place where flame and weld spatter is produced. There is a risk of causing fire by sparks.
11. Turn off the power supply to PISCO products, and make sure there is no residual air pressure in the pipes and equipment before maintenance. Follow the instructions below in order to ensure safety.
    ① Make sure the safety of all systems related to PISCO products before maintenance.
    ② Restart of operation after maintenance shall be proceeded with care after ensuring safety of the system by preventive measures against unexpected movements of machines and devices where pneumatic equipment is used.
    ③ Keep enough space for maintenance when designing a circuit.
12. Take safety measures such as providing a protection cover if there is a risk of causing damages or fires on machine / facilities by a fluid leakage.

⚠ Caution

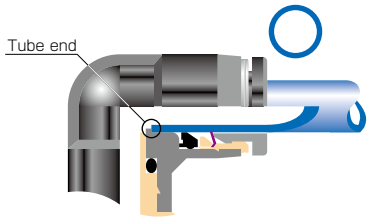
1. Remove dusts or drain before piping. They may get into the peripheral machine / facilities and cause malfunction.
2. When inserting an ultra-soft tube into push-in fitting, make sure to place an Insert Ring into the tube edge. There is a risk of causing the escape of tube and a fluid leakage without using an Insert Ring.
3. The product incorporating NBR as seal rubber material has a risk of malfunction caused by ozone crack. Ozone exists in high concentrations in static elimination air, clean-room, and near the high-voltage motors, etc. As a countermeasure, material change from NBR to HNBR or FKM is necessary. Consult with PISCO for more information.
4. Special option "Oil-free" products may cause a very small amount of a fluid leakage. When a fluid medium is liquid or the products are required to be used in harsh environments, contact us for further information.
5. In case of using non-PISCO brand tubes, make sure the tolerance of the outer tube diameter is within the limits of Table 1.

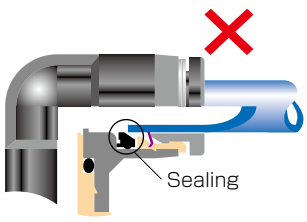
● Table 1. Tube O.D. Tolerance

mm size	Nylon tube	Polyurethane tube
ø1.8mm	—	±0.05mm
ø3mm	—	±0.15mm
ø4mm	±0.1mm	±0.15mm
ø6mm	±0.1mm	±0.15mm
ø8mm	±0.1mm	±0.15mm
ø10mm	±0.1mm	±0.15mm
ø12mm	±0.1mm	±0.15mm
ø16mm	±0.1mm	±0.15mm

inch size	Nylon tube	Polyurethane tube
ø1/8	±0.1mm	±0.15mm
ø5/32	±0.1mm	±0.15mm
ø3/16	±0.1mm	±0.15mm
ø1/4	±0.1mm	±0.15mm
ø5/16	±0.1mm	±0.15mm
ø3/8	±0.1mm	±0.15mm
ø1/2	±0.1mm	±0.15mm
ø5/8	±0.1mm	±0.15mm

6. Instructions for Tube Insertion
   ① Make sure that the cut end surface of the tube is at right angle without a scratch on the surface and deformations.
   ② When inserting a tube, the tube needs to be inserted fully into the push-in fitting until the tubing edge touches the tube end of the fitting as shown in the figure below. Otherwise, there is a risk of leakage.





Tube is not fully inserted up to tube end.

   ③ After inserting the tube, make sure it is inserted properly and not to be disconnected by pulling it moderately.

※. When inserting tubes, Lock-claws may be hardly visible in the hole, observed from the front face of the release-ring. But it does not mean the tube will surely escape. Major causes of the tube escape are the followings;
①Shear drop of the lock-claws edge
②The problem of tube diameter (usually small)
Therefore, follow the above instructions from ① to ③, even lock-claws is hardly visible.

7. Instructions for Tube Disconnection
   ① Make sure there is no air pressure inside of the tube, before disconnecting it.
   ② Push the release-ring of the push-in fitting evenly and deeply enough to pull out the tube toward oneself. By insufficient pushing of the release-ring, the tube may not be pulled out or damaged by scratch, and tube shavings may remain inside of the fitting, which may cause the leakage later.
8. Instructions for Installing a fitting
   ① When installing a fitting, use proper tools to tighten a hexagonal-column or an inner hexagonal socket. When inserting a hex key into the inner hexagonal socket of the fitting, be careful so that the tool does not touch lock-claws. The deformation of lock-claws may result in a poor performance of systems or an escape of the tube.
   ② Refer to Table 2 which shows the recommended tightening torque. Do not exceed these limits to tighten a thread. Excessive tightening may break the thread part or deform the gasket and cause a fluid leakage. Tightening thread with tightening torque lower than these limits may cause a loosened thread or a fluid leakage.
   ③ Adjust the tube direction while tightening thread within these limits, since some PISCO products are not rotatable after the installation.

● Table 2: Recommended tightening torque / Sealock color / Gasket materials

Thread type	Thread size	Tightening torque	Sealock color	Gasket materials
Metric thread	M3 × 0.5	0.7N·m	—	SUS304 NBR
	M5 × 0.8	1.0 ~ 1.5N·m		
	M6 × 1	2 ~ 2.7N·m		
	M3 × 0.5	0.5 ~ 0.6N·m		POM
	M5 × 0.8	1 ~ 1.5N·m		
	M6 × 0.75	0.8 ~ 1N·m		
	M8 × 0.75	1 ~ 2N·m		
Taper pipe thread	R1/8	7 ~ 9N·m	White	—
	R1/4	12 ~ 14N·m		
	R3/8	22 ~ 24N·m		
	R1/2	28 ~ 30N·m		
Unified thread	No.10-32UNF	1.0 ~ 1.5N·m	—	SUS304、NBR
National pipe thread taper	1/16-27NPT	7 ~ 9N·m	White	—
	1/8-27NPT	7 ~ 9N·m		
	1/4-18NPT	12 ~ 14N·m		
	3/8-18NPT	22 ~ 24N·m		
	1/2-14NPT	28 ~ 30N·m		

※ These values may differ for some products. Refer to each specification as well.

9. Instructions for removing a fitting
   ① When removing a fitting, use proper tools to loosen a hexagonal-column or an inner hex bolt.
   ② Remove the sealant stuck on the mating equipment. The remained sealant may get into the peripheral equipment and cause malfunctions.
10. Arrange piping avoiding any load on fittings and tubes such as twist, tensile, moment load, shaking and physical impact. These may cause damages to fittings, tube deformations, bursting and the escape of tubes.

⚠ Common Safety Instructions for Fittings

Before selecting or using PISCO products, read the following instructions. Read the detailed instructions for individual series as well as the instructions below.

⚠ Warning

1. Do not use fittings with fluid medium other than air or water. (Water can be used with some series.) Contact us for using other kind of fluid medium except air and water.

2. Do not use fittings except Anti-spatter, Brass and Brass Compression Fitting series in a place where the flame and weld spatter is produced. There is a risk of causing fire by sparks.

3. As for applications where threads or tubes swing / rotate, use Rotary Joints, High Rotary Joints or Multi-Circuit Rotary Block only. The other PISCO products can be damaged in these applications.

4. Use only Die Temperature Control Fitting Series, Tube Fitting Stainless SUS316 Series, Tube Fitting Stainless SUS316 Compression Fitting Series or Tube Fitting Brass Series under the condition of over 60℃ (140° F) water or thermal oil. Other PISCO products can be damaged by heat and hydrolysis under the condition above.

5. As for the condition required to dissipate static electricity or provide an antistatic performance, use EG Series fitting and antistatic products only, and do not use other PISCO products. There is a risk that static electricity can cause system defects or failures.

6. Avoid any load on PISCO products, such as a tensile strength, twisting and bending. Otherwise, there is a risk of causing damage to the products.

⚠ Caution

1.In case of using non-PISCO brand tubes, make sure the tolerance of the outer tube diameter is within the following limits of Table 1.

●Table 1. Tube O.D. Tolerance

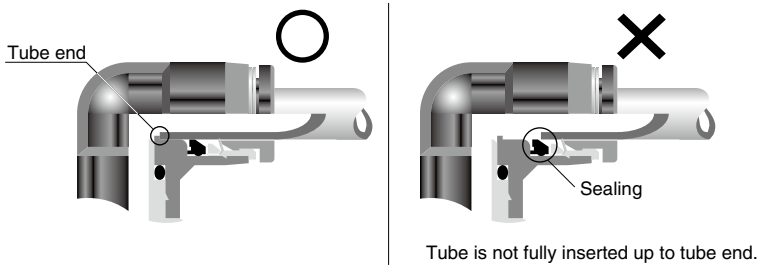
mm size	Nylon tube	Urethane tube
ø1.8mm	—	±0.05mm
ø3mm	—	±0.15mm
ø4mm	±0.1mm	±0.15mm
ø6mm	±0.1mm	±0.15mm
ø8mm	±0.1mm	±0.15mm
ø10mm	±0.1mm	±0.15mm
ø12mm	±0.1mm	±0.15mm
ø16mm	±0.1mm	±0.15mm

inch size	Nylon tube	Urethane tube
ø1/8	±0.1mm	±0.15mm
ø5/32	±0.1mm	±0.15mm
ø3/16	±0.1mm	±0.15mm
ø1/4	±0.1mm	±0.15mm
ø5/16	±0.1mm	±0.15mm
ø3/8	±0.1mm	±0.15mm
ø1/2	±0.1mm	±0.15mm
ø5/8	±0.1mm	±0.15mm

2. Instructions for Tube Insertion

① Make sure that the cut end surface of the tube is at right angle without a scratch on the tube surface and deformations.

② When inserting a tube, the tube needs to be inserted fully into the push-in fitting until the tubing edge touches the tube end of the fitting as shown in the figure below. Otherwise, there is a risk of leakage.



③ After inserting the tube, make sure it is inserted properly and not to be disconnected by pulling it moderately.

3. Instructions for Tube Disconnection

① Make sure there is no air pressure inside of the tube, before disconnecting it.

② Push the release-ring of the push-in fitting evenly and deeply enough to pull out the tube toward oneself. By insufficient pushing of the release-ring, the tube may not be pulled out or damaged by scratch, and tube shavings may remain inside of the fitting, which may cause the leakage later.

4. Instructions for Installing a fitting

① When installing a fitting, use proper tools to tighten a hexagonal-column or an inner hexagonal socket. When inserting a hex key into the inner hexagonal socket of the fitting, be careful so that the tool does not touch lock-claws. The deformation of lock-claws may result in a poor performance of systems or an escape of the tube.

② Refer to Table 2 which shows the recommended tightening torque. Do not exceed these limits to tighten a thread. Excessive tightening may break the thread part or deform the gasket and cause a fluid leakage. Tightening thread with tightening torque lower than these limits may cause a loosened thread or a fluid leakage.

③ Adjust the tube direction while tightening thread within these limits, since some PISCO products are not rotatable the installation.

● Table 2: Recommended tightening torque / Sealock color / Gasket materials

Thread type	Thread size	Tightening torque	Sealock color	Gasket materials
Metric thread	M3 × 0.5	0.7N·m	—	SUS304 NBR
	M5 × 0.8	1.0 ~ 1.5N·m		
	M6 × 1	2 ~ 2.7N·m		
	M3 × 0.5	0.5 ~0.6N·m		POM
	M5 × 0.8	1 ~1.5N·m		
	M6 × 0.75	0.8 ~ 1N·m		
	M8 × 0.75	1 ~ 2N·m		
Taper pipe thread	R1/8	7 ~ 9N·m	White	—
	R1/4	12 ~ 14N·m		
	R3/8	22 ~ 24N·m		
	R1/2	28 ~ 30N·m		
Unified thread	No.10-32UNF	1.0 ~ 1.5N·m	—	SUS304、NBR
National pipe thread taper	1/16-28NPT	7 ~ 9N·m	White	—
	1/8-27NPT	7 ~ 9N·m		
	1/4-18NPT	12 ~ 14N·m		
	3/8-18NPT	22 ~ 24N·m		
	1/2-14NPT	28 ~ 30N·m		

※.These values may differ for some products. Refer to each specification as well

5.Instructions for removng a fitting

① When removing a fitting, use proper tools to loosen a hexagonal-column or an inner hexagonal socket.

② Remove the sealant stuck on the mating equipment. The remained sealant may get into the peripheral equipment and cause malfunctions.

6.Arrange piping avoiding any load on fittings and tubes such as twist, tensile, moment load, shaking and physical impact. These may cause damages to fittings, tube deformations, bursting and the escape of tubes.