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QUICK FITTINGS ROTARY TYPE CONTENTS

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QUICK FITTINGS ROTARY TYPE



Caution

Before use, be sure to read the "Safety Precautions" on p. 49.

QUICK FITTINGS ROTARY TYPE

Standard Type High Rotary Type

- Optimum for swing and rotating portions, and built-in bearing for smooth operation.
- High rotary type (for high-speed rotation) uses dual bearings. Further reduces radial loads for smoother rotation.

Specifications

● Standard type

Model	TSR, TLR				
Applicable tube size	φ 4	φ 6	φ 8	φ 10	φ 12
Media	Air				
Maximum operating pressure	0.9MPa [131psi.]				
Operating vacuum pressure	-100kPa [-29.54in.Hg]				
Operating temperature range	0~60°C [32~140°F]				
Recommended tube	Nylon tube, urethane tube				
Allowable rotating speed r.p.m	500		400	300	250
Color of release ring	Black				
Sales unit	1 pc.				

Remark: Supplied with a gasket or sealant coated.

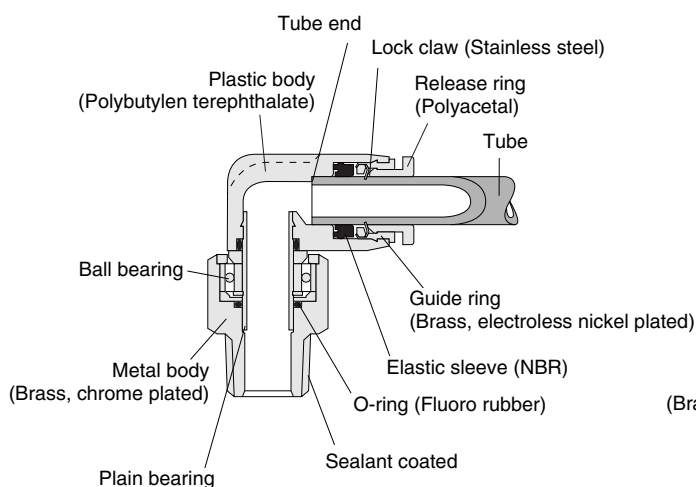
● High rotary type

Model	TSRH, TLRH					TARH		TBRH	
Applicable tube size	φ 4	φ 6	φ 8	φ 10	φ 12	R1/8, R1/4 Rc1/8, Rc1/4	R3/8, R1/2 Rc3/8, Rc1/2	R1/8, R1/4	R3/8, R1/2
Media	Air								
Maximum operating pressure	0.9MPa [131psi.]								
Operating vacuum pressure	-100kPa [-29.54in.Hg]								
Operating temperature range	0~60°C [32~140°F]								
Recommended tube	Nylon tube, urethane tube								
Allowable rotating speed r.p.m	1500	1200	1200	1000	1000	1200	900	1200	990
Color of release ring	Black								
Sales unit	1 pc.					1 pc.		1 pc.	

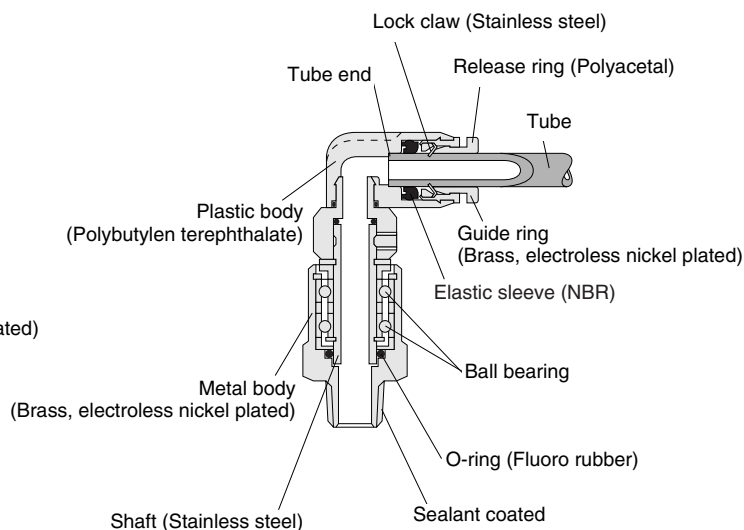
Remark: Supplied with a gasket or sealant coated.

Inner Construction, Major Parts and Materials

● Standard type

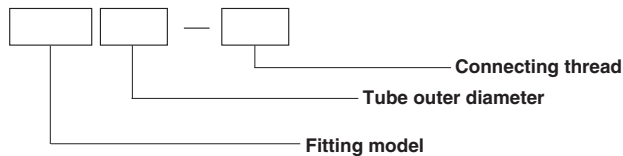


● High rotary type



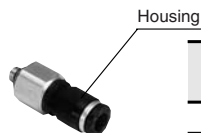
Order Codes

● Standard type



※For the fitting models, the tube size, and thread size combinations, see the table below.

● TSR Straight 355



Tube size	Thread size					
	M5×0.8	M6×1	R1/8	R1/4	R3/8	R1/2
4	M5	M6	01	—	—	—
6	—	M6	01	02	—	—
8	—	—	01	02	03	—
10	—	—	01	02	03	04
12	—	—	—	02	03	04

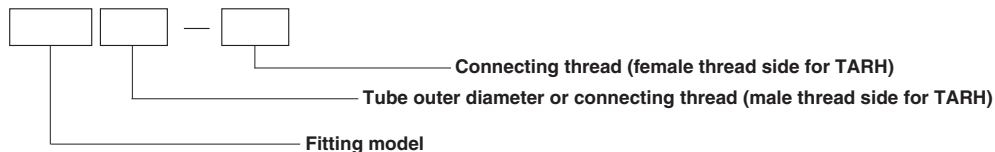
Parts	Tube size	Material
Housing	4, 6, 8	Polybutylene terephthalate
	10,12	Aluminum alloy (black anodized)

● TLR Elbow 356



Tube size	Thread size					
	M5×0.8	M6×1	R1/8	R1/4	R3/8	R1/2
4	M5	M6	01	—	—	—
6	—	M6	01	02	—	—
8	—	—	01	02	03	—
10	—	—	01	02	03	04
12	—	—	—	02	03	04

● High rotary type



※For the fitting models, the tube size and connecting thread size combinations, see the table below.

● TSRH Straight 357



Tube size	Thread size					
	M5×0.8	M6×1	R1/8	R1/4	R3/8	R1/2
4	M5	M6	01	—	—	—
6	—	—	01	02	—	—
8	—	—	01	02	—	—
10	—	—	—	—	03	04
12	—	—	—	—	03	04

● TLRH Elbow 357



Tube size	Thread size					
	M5×0.8	M6×1	R1/8	R1/4	R3/8	R1/2
4	M5	M6	01	—	—	—
6	—	—	01	02	—	—
8	—	—	01	02	—	—
10	—	—	—	—	03	04
12	—	—	—	—	03	04

● TARH Male thread — Female thread 358



Thread size R	Thread size Rc			
	1/8	1/4	3/8	1/2
1/8(01)	01	02	—	—
1/4(02)	01	02	—	—
3/8(03)	—	—	03	04
1/2(04)	—	—	03	04

● TBRH Male thread — Male thread 358

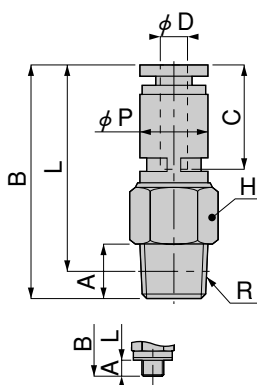


Thread size R	Thread size R			
	1/8	1/4	3/8	1/2
1/8(01)	01	02	—	—
1/4(02)	01	02	—	—
3/8(03)	—	—	03	04
1/2(04)	—	—	03	04

Dimensions (Standard type) (mm)

Straight TSR

CAD QF-TSR



Metric thread type

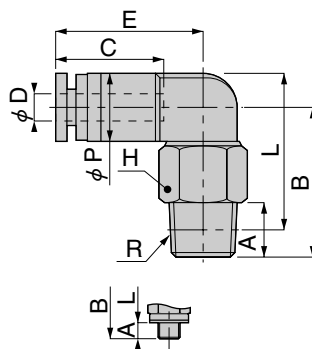
Model	Tube outer diameter ϕD	R	A	B	L ^{Note}	ϕP	C	Width across flats H	Allowable rotating speed (r.p.m)	Slip torque (g·cm) [in.·lbf]	Effective area (mm ²)	Mass (g) [oz.]
TSR4-M5	4	M5×0.8	3	32.6	29.6	10	16.1	12	500	60 [0.052]	1.9	13 [0.46]
TSR4-M6		M6×1	4	33.6							4.2	
TSR4-01		R1/8	8	34.1							3.6	
TSR6-M6	6	M6×1	4	37.2	33.2	12.5	17.2	14	500	120 [0.104]	4.5	19 [0.67]
TSR6-01		R1/8	8	36.9							9	18 [0.63]
TSR6-02		R1/4	11	38.9								23 [0.81]
TSR8-01	8	R1/8	8	45.3	41.3	14.5	18.9	17	400	150 [0.130]	20	34 [1.20]
TSR8-02		R1/4	11	44.3	38.3							32 [1.13]
TSR8-03		R3/8	12		38							39 [1.38]
TSR10-01	10	R1/8	8	55.8	51.8	17.8	20.2	22	300	200 [0.173]	35	68 [2.40]
TSR10-02		R1/4	11	58.8	52.8							74 [2.61]
TSR10-03		R3/8	12	56.8	50.5							70 [2.47]
TSR10-04		R1/2	15	59.3	51.1							86 [3.03]
TSR12-02	12	R1/4	11	61.9	55.9	20.8	23.4	24	250	250 [0.217]	50	94 [3.32]
TSR12-03		R3/8	12	62.4	56.1							95 [3.35]
TSR12-04		R1/2	15		54.2							102 [3.60]

Note: The L dimensions for the tapered thread type are the reference dimensions after the fittings are assembled.

Dimensions (Standard Type) (mm)

Elbow TLR

CAD QF-TLR



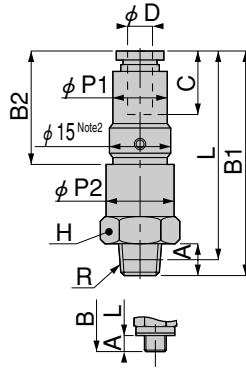
Metric thread type

Model	Tube outer diameter ϕ D	R	A	B	L ^{Note}	ϕ P	C	E	Width across flats H	Allowable rotating speed (r.p.m)	Slip torque (g·cm) [in.·lbft]	Effective area (mm ²)	Mass (g) [oz.]
TLR4-M5	4	M5×0.8	3	20.5	22.5	10	14.9	19.7	12	500	60 [0.052]	1.5	13 [0.46]
TLR4-M6		M6×1	4	21.5								4	14 [0.49]
TLR4-01		R1/8	8	22								2.9	15 [0.53]
TLR6-M6	6	M6×1	4	24.3	26.5	12.5	17	22.8	14	500	120 [0.104]	6.1	20 [0.71]
TLR6-01		R1/8	8	24								7.5	19 [0.67]
TLR6-02		R1/4	11	26								24	24 [0.85]
TLR8-01	8	R1/8	8	31.5	34.7	14.5	18.2	25.7	17	400	150 [0.130]	16.5	35 [1.23]
TLR8-02		R1/4	11	30.5	31.7								33 [1.16]
TLR8-03		R3/8	12	31.4	31.4								41 [1.45]
TLR10-01	10	R1/8	8	35.3	40	17.5	20.7	29.5	22	300	200 [0.173]	22	61 [2.15]
TLR10-02		R1/4	11	38.3	41							21	67 [2.36]
TLR10-03		R3/8	12	36.3	38.7							30	63 [2.22]
TLR10-04		R1/2	15	38.8	39.3							24	79 [2.79]
TLR12-02	12	R1/4	11	41	45.5	21	23.4	32.7	24	250	250 [0.217]	42.5	84 [2.96]
TLR12-03		R3/8	12	41.5	45.7								85 [3.00]
TLR12-04		R1/2	15	43.8	43.8								91 [3.21]

Note: The L dimensions for the tapered thread type are the reference dimensions after the fittings are assembled.

Dimensions (High Rotary Type) (mm)

Straight TSRH



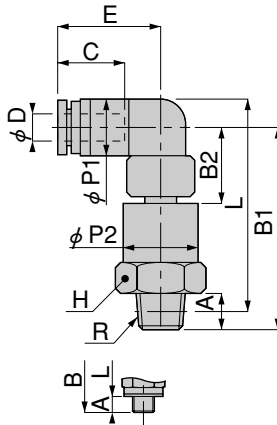
Metric thread type

Model	Tube outer diameter ϕ D	R	A	B1	B2	L ^{Note1}	ϕ P1	ϕ P2	C	Width across flats H	Allowable rotating speed (r.p.m)	Slip torque (g·cm) [in.·lbf]	Effective area (mm²)	Mass (g) [oz.]
TSRH4-M5	4	M5×0.8	3	43.2	22.7	40.2	11	11.6	14.9	12	1500	150	2.2	24 [0.85]
TSRH4-M6		M6×1	4	44.2		43.7						[0.130]	3	
TSRH4-01		R1/8	8	47.7								3.4	28 [0.99]	
TSRH6-01	6	R1/8	8	54.8	26.8	50.8	13	16.6	17	17	1200	150	12.8	51 [1.80]
TSRH6-02		R1/4	11	57.8		51.7						[0.130]	12.2	56 [1.98]
TSRH8-01	8	R1/8	8	58.1	30.1	54.1	15	16.6	18.2	17	1200	150	10.7	57 [2.01]
TSRH8-02		R1/4	11	61.1		55.1						[0.130]	11.5	63 [2.22]
TSRH10-03	10	R3/8	12	67.9	32.4	61.6	20	23.6	20.7	24	900	250	41.5	121 [4.27]
TSRH10-04		R1/2	15	70.9		62.7						[0.217]	42.9	138 [4.87]
TSRH12-03	12	R3/8	12	70.5	35	64.2	21	23.6	23.3	24	900	250	51.2	127 [4.48]
TSRH12-04		R1/2	15	73.5		65.3						[0.217]	49.6	144 [5.08]

Notes: 1. The L dimensions for the tapered thread type are the reference dimensions after the fittings are assembled.

2. The ϕ 15mm dimension shown in the above drawing is for TSRH6-□□ only.

Elbow TLRH



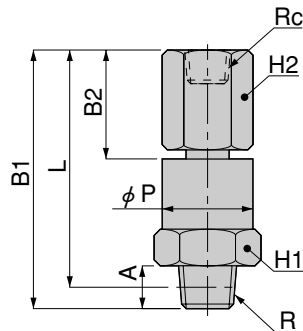
Metric thread type

Model	Tube outer diameter ϕ D	R	A	B1	B2	^{Note} L	ϕ P1	ϕ P2	C	E	Width across flats H	Allowable rotating speed (r.p.m)	Slip torque (g·cm) [in.·lbf]	Effective area (mm²)	Mass (g) [oz.]
TLRH4-M5	4	M5×0.8	3	33.7	13.2	35.7	10	11.6	14.9	19.7	12	1500	150 [0.130]	2.2	21 [0.74]
TLRH4-M6		M6×1	4	34.7		4.5								22 [0.78]	
TLRH4-01		R1/8	8	38.2		39.2								4.1	26 [0.92]
TLRH6-01	6	R1/8	8	44.5	16.5	46.7	12.5	16.6	17	22.8	17	1200	150 [0.130]	10	47 [1.66]
TLRH6-02		R1/4	11	47.5		47.7								10.5	53 [1.87]
TLRH8-01	8	R1/8	8	45.5	17.5	48.7	14.5	16.6	18.2	25.7	17	1200	150 [0.130]	11.5	50 [1.76]
TLRH8-02		R1/4	11	48.5		49.7								13	56 [1.98]
TLRH10-03	10	R3/8	12	56.9	21.4	59.3	17.5	23.6	20.7	29.5	24	900	250 [0.217]	27.2	109 [3.84]
TLRH10-04		R1/2	15	59.9		60.4								27	126 [4.44]
TLRH12-03	12	R3/8	12	58.6	23.1	62.8	21	23.6	23.4	32.7	24	900	250 [0.217]	42.5	115 [4.06]
TLRH12-04		R1/2	15	61.6		63.9								41.6	132 [4.66]

Note: The L dimensions for the tapered thread type are the reference dimensions after the fittings are assembled.

Dimensions (High Rotary Type) (mm)

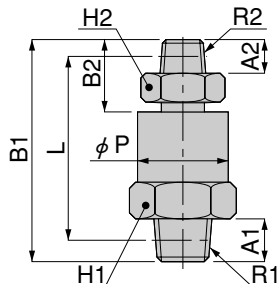
Male thread — Female thread TARH



Model	R	Rc	A1	A2	B1	B2	L ^{Note}	ϕ P	Width across flats H1	Width across flats H2	Allowable rotating speed (r.p.m)	Slip torque (g·cm) [in.·lbf]	Effective area (mm ²)	Mass (g) [oz.]
TARH01-01	R1/8	Rc1/8	8	9.5	47.2	19.2	43.2	16.6	17	14	1200	150 [0.130]	13.9	50 [1.76]
TARH01-02		Rc1/4		13.5	51.2	23.2	47.2			17			11	62 [2.19]
TARH02-01	R1/4	Rc1/8	11	9.5	50.2	19.2	44.2	16.6	17	14	1200	150 [0.130]	14.8	56 [1.98]
TARH02-02		Rc1/4		13.5	54.2	23.2	48.2			17			11.2	68 [2.40]
TARH03-03	R3/8	Rc3/8	12	14.5	62.1	26.6	55.8	23.6	24	22	900	250 [0.217]	47.2	133 [4.69]
TARH03-04		Rc1/2		16.5	64.1	28.6	57.8			24			53.1	140 [4.94]
TARH04-03	R1/2	Rc3/8	15	14.5	65.1	26.6	56.9	23.6	24	22	900	250 [0.217]	47.5	150 [5.29]
TARH04-04		Rc1/2		16.5	67.1	28.6	58.9			24			50.2	157 [5.54]

Note: The L dimensions are the reference dimensions after the fittings are assembled.

Male thread — Male thread TBRH



Model	R1	R2	A1	A2	B1	B2	L ^{Note}	ϕ P	Width across flats H1	Width across flats H2	Allowable rotating speed (r.p.m)	Slip torque (g·cm) [in.·lbf]	Effective area (mm ²)	Mass (g) [oz.]
TBRH01-01	R1/8	R1/8	8	8	43.2	15.2	35.3	16.6	17	14	1200	150 [0.130]	12.8	41 [1.45]
TBRH01-02		R1/4		11	46.2	18.2	36.2			14			12.2	47 [1.66]
TBRH02-01	R1/4	R1/8	11	8	46.2	15.2	36.2	16.6	17	14	1200	150 [0.130]	11.1	47 [1.66]
TBRH02-02		R1/4		11	49.2	18.2	37.2			14			11.4	53 [1.87]
TBRH03-03	R3/8	R3/8	12	12	57.1	21.6	44.4	23.6	24	22	900	250 [0.217]	48.8	111 [3.92]
TBRH03-04		R1/2		15	60.1	24.6	45.6			22			47.9	128 [4.51]
TBRH4-03	R1/2	R3/8	15	12	60.1	21.6	45.6	23.6	24	22	900	250 [0.217]	50.5	128 [4.51]
TBRH4-04		R1/2		15	63.1	24.6	46.8			22			47	145 [5.11]

Note: The L dimensions are the reference dimensions after the fittings are assembled.

Handling Instructions and Precautions

● Mounting

Precautions for mounting the body

1. To mount the body, use a suitable tool to tighten it to the outer or inner hexagonal section of the fitting.
2. When tightening screws, tighten to the recommended tightening torque shown in the table below. Tightening to more than the recommended torque could result in broken threads or air leaks due to deformed gaskets. Tightening to less than the recommended torque could lead to loose screws or air leaks.
3. For fittings with fixed piping direction, tighten to the desired piping direction, and then adjust so that it falls within the range of the body tightening torque.

Recommended tightening torque, sealant color, and gasket material

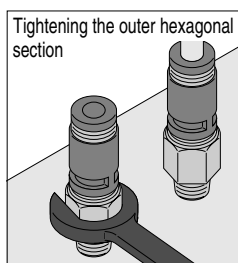
Thread type	Thread size	Tightening torque	Sealant color	Gasket material
Metric thread	M5×0.8	1.0~1.5N·m [8.9~13.3in·lbf]	—	SUS304 NBR
	M6×1	1.8~2.3N·m [15.9~20.4in·lbf]		
Taper pipe thread	R1/8	7~9N·m [62~80in·lbf]	White	—
	R1/4	12~14N·m [106~124in·lbf]		
	R3/8	22~24N·m [195~212in·lbf]		
	R1/2	28~30N·m [248~266in·lbf]		

Precautions for disconnecting the body

1. To disconnect the body, use a suitable tool to loosen it from the outer or inner hexagonal section of the body.
2. Clean off the sealant coating on the thread of the removed mating part. The coated sealant could enter other relating parts, and cause breakdowns.

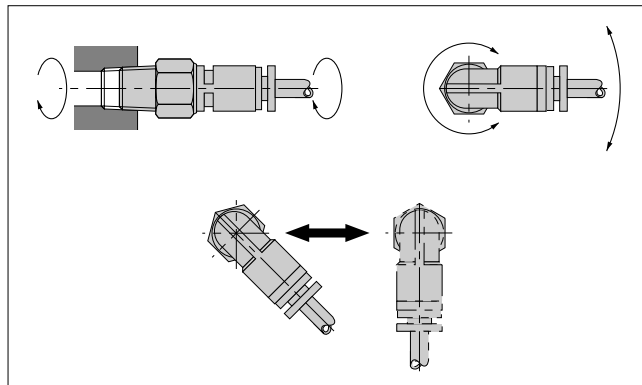
Method for tightening screws

For tightening screws, use a wrench on outer hexagonal section.

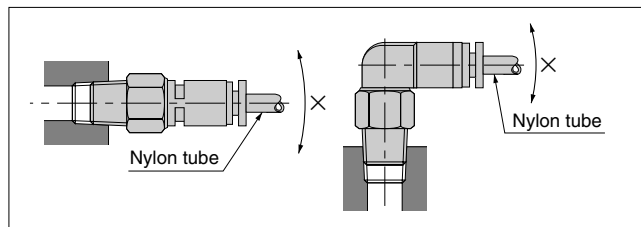


Cautions: 1. While Quick Fittings Rotary Type's sealant can be reused a number of times, the thread on the mating part may also be adhered with sealant. Always clean out the inside of the equipment's thread.

2. Since the bearing section for Quick Fittings Rotary Type is composed of a thin ball bearing and a plain bearing, and is designed to be compact and lightweight, keep the radial load to a minimum for use. For particularly severe motion, use of a urethane tube is recommended.



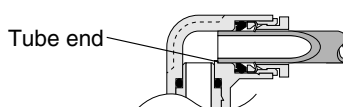
3. For tube motion like that shown in the figure below, use a urethane tube or high rotary type.



● Tube connection and disconnection

Precautions for connecting the tube

1. Check that the cut section of the tube has been cut at straight angle, that the outer surface of the tube is not scratched, and that the tube has not become oval shaped.
2. When connecting a tube, failure to insert the tube all the way to the end could result in air leaks.



3. After connection, pull the tube to check that it will not disconnect.

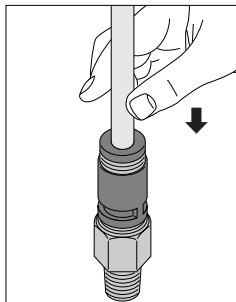
Precautions for disconnecting the tube

1. Before disconnecting a tube, check that the pressure inside the tube is down to zero.
2. Push the release ring evenly all the way to the end, and then pull the tube out. An insufficient push could make it impossible to pull the tube out, or could scratch the tube, leaving scratched tube material inside the fitting.

Tube connection and disconnection method

1. Tube connection

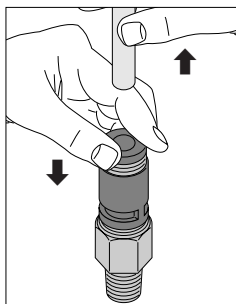
The Quick Fitting Rotary Type is equipped with a lock claw that holds the tube in place when it has been pushed all the way to the end, and with an elastic sleeve for sealing the tube periphery.



2. Tube disconnection

To disconnect the tube, first push on the release ring, releasing the lock claw, and then pull the tube out.

Always stop the air supply before removing the tube.



● Usable tubes

Either nylon or urethane tubes can be used. The tube outer diameter accuracy should be, for nylon tubes, within $\pm 0.1\text{mm}$ [$\pm 0.004\text{in.}$] of the nominal dimensions, and for urethane tubes, within $\pm 0.15\text{mm}$ [$\pm 0.006\text{in.}$] of the nominal dimensions, while the ovalness (difference between long diameter and short diameter) should be within 0.2mm [0.008in.].

Cautions: 1. Use tubes with no visible scratches on the outer surface.

If a scratch is made during repeated use, cut off the scratched portion.

2. Do not bend or twist the tube too much near the connection to the fitting. It could result in air leaks. The minimum bending radius for nylon tubes is as shown in the table below.

mm [in.]

Tube size	Minimum bending radius
$\phi 4$ [0.157]	20 [0.8]
$\phi 6$ [0.236]	30 [1.2]
$\phi 8$ [0.315]	50 [2.0]
$\phi 10$ [0.394]	80 [3.2]
$\phi 12$ [0.472]	150 [5.9]

● Others

Quick Fittings Rotary Type are greased more in the ball bearing and plain bearing portions than other fittings.

