








F.R.L  
 F (Filtr)  
 R (Reg)  
 L (Lub)  
 PresSW  
 Shutoff  
 SlowStart  
 FlmResistFR  
 Oil-ProhR  
 MedPresFR  
 No Cu/  
 PTFE FRL  
 Outdrs FR  
 F.R.L  
 (Related)  
 CompFRL  
 LgFRL  
 PrecsR  
 VacFR  
 Clean FR  
 ElecPneuR  
 AirBoost  
 SpdContr  
 Silncr  
 CheckV/  
 other  
 Jnt/tube  
 AirUnt  
 PrecsCompn  
 Mech/  
 ElecPresSw  
 ContactSW  
 AirSens  
 PresSW  
 Cool  
 AirFloSens/  
 Contr  
 WaterRtSens  
 TotAirSys  
 (Total Air)  
 TotAirSys  
 (Gamma)  
 RefrDry  
 DesicDry  
 HiPolymDry  
 MainFiltr  
 Dischrg  
 etc  
 Ending

# UP.F.U.NU.KX.SR Tube

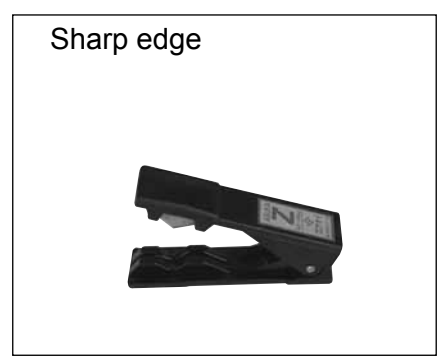
O.D. 1.8/3.2/4/6/8/10/12/15 mm

● Tubes can be selected according to applications  
 A great variety of tubes are available according to the purpose and applications. Furthermore, they are highly reliable, meeting needs of space saving and complex piping, etc.

Antistatic tube	Soft nylon tube	New urethane tube	Urethane tube	Coiling tube
 O.D. x I.D. (mm) 3.2 x 1.8 4 x 2.5 6 x 4 8 x 5 10 x 6.5 12 x 8 ·Refer to page: 815	Manufacturer of colors other than white: Aoi Co., Ltd.  O.D. x I.D. (mm) 3.2 x 2.0 3.2 x 2.4 4 x 2.5 6 x 4 8 x 6 10 x 7.5 12 x 9 15 x 11.5 16 x 12 ·Refer to page: 815	 O.D. x I.D. (mm) 4 x 2.5 6 x 4.5 8 x 6 10 x 7.5 12 x 9 ·Refer to page: 819	 Aoi Co., Ltd. O.D. x I.D. (mm) 3.2 x 1.8 4 x 2 6 x 4 8 x 5 10 x 6.5 12 x 8 ·Refer to page: 820	 Aoi Co., Ltd. O.D. x I.D. (mm) 6 x 4 8 x 6 10 x 7.5 12 x 9.2 ·Refer to page: 820
Flame-resistant tube	Tube cutter			
 Aoi Co., Ltd. O.D. x I.D. (mm) 4 x 2.3 6 x 3.8 8 x 5.5 10 x 7 12 x 8.5 ·Refer to page: 821	 Aoi Co., Ltd.			

**Tube cutter**  
 Aoi Co., Ltd.  
 AZ-1200

- Features**  
 (1) Sharp cutting edge for right-angle cut prevents air trouble.  
 (2) Extremely lightweight and compact.  
 (3) Easy blade replacement.
- Applicable material**  
 ● Nylon tube  
 ● Urethane tube  
 ● PTFE tube  
 ● Other plastic tubes





# Antistatic tube

- O.D.: 3.2 mm, 4 mm, 6 mm, 8 mm, 10 mm, 12 mm



## Features

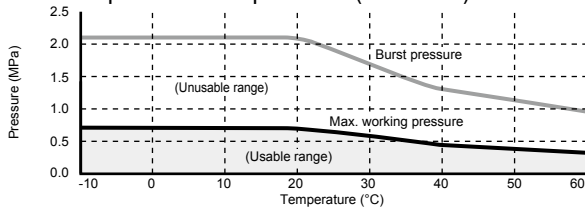
- Resistant to static electricity and dust build-up
- Variety of colors  
Tubing is available in black, white, transparent, transparent blue, or transparent green.  
Applications can be distinguished by color.
- Standard clean-room specifications (F2 Series)
- Wide variation  
· Six diameters are available:  $\phi 3.2$ ,  $\phi 4$ ,  $\phi 6$ ,  $\phi 8$ ,  $\phi 10$  and  $\phi 12$ .

### UP-F2 Series ( $\phi 3.2$ to $\phi 6$ )

#### Specifications

Descriptions	UP-91** -F2-P80		
O.D. x I.D. mm × mm	$\phi 3.2 \times \phi 1.8$ (Note)	$\phi 4 \times \phi 2.5$	$\phi 6 \times \phi 4$
Working fluid	Compressed air		
Max. working pressure MPa	0.7 ( $\approx 100$ psi, 7 bar) (20°C (68°F))		
Ambient temperature °C	0 (32°F) to 60 (140°F) (no freezing)		
Durometer hardness (JIS K 7215)	HDA94 (reference)		
Min. bend rad (JIS B 8381) mm	4	6	12
Min. installation radius mm	8	11	18
Burst pressure MPa	2.1 ( $\approx 300$ psi, 21 bar) (20°C (68°F))		
Vol resist ratio (JIS K 6911) $\Omega \cdot \text{cm}$	Black: $10^4$ to $10^5$ , other colors: $10^{10}$ to $10^{11}$ (reference value)		
Material	Antistatic urethane		
Color	Black, white, clear, clear blue, clear green, clear red (Note)		

#### Ambient temperature and pressure (use/burst)

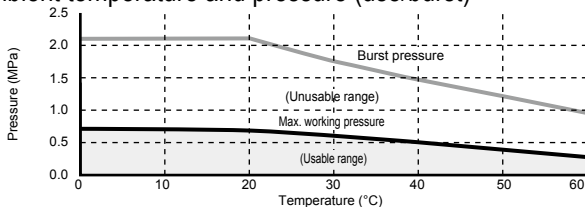


### UP-F1 Series ( $\phi 8$ to $\phi 12$ )

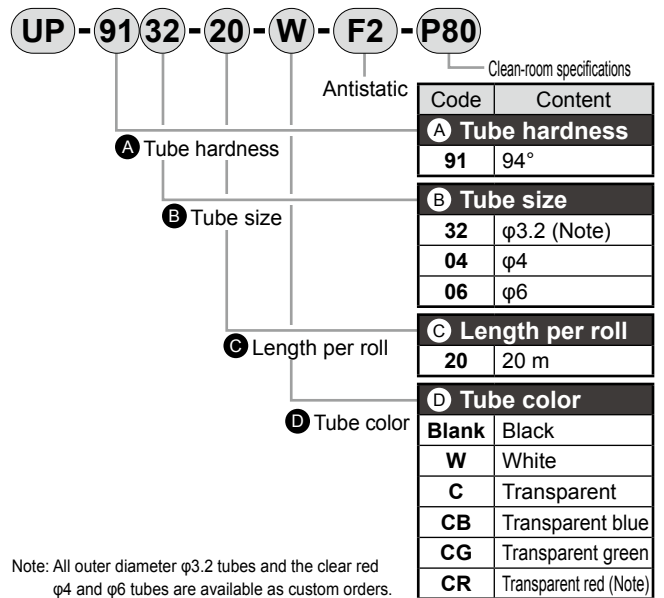
#### Specifications

Descriptions	UP-92** -F1		
O.D. x I.D. mm × mm	$\phi 8 \times \phi 5$	$\phi 10 \times \phi 6.5$	$\phi 12 \times \phi 8$
Working fluid	Compressed air		
Max. working pressure MPa	0.7 ( $\approx 100$ psi, 7 bar) (20°C (68°F))		
Ambient temperature °C	0 (32°F) to 60 (140°F) (no freezing)		
Durometer hardness (JIS K 7215)	HDA92 (reference)		
Min. bend rad (JIS B 8381) mm	10	13	16.5
Min. installation radius mm	25	30	36
Burst pressure MPa	2.1 ( $\approx 300$ psi, 21 bar) (20°C (68°F))		
Vol resist ratio (JIS K 6911) $\Omega \cdot \text{cm}$	Black: $10^4$ to $10^8$ , other colors: $10^8$ to $10^{12}$ (reference value)		
Material	Antistatic urethane		
Color	Black, white, transparent, transparent blue, transparent green		

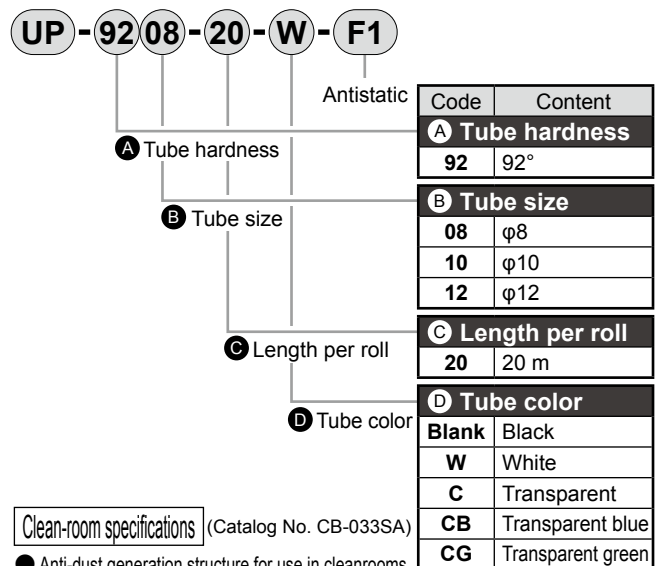
#### Ambient temperature and pressure (use/burst)



#### How to order



#### How to order



UP-92\*\* -F1 - P80

- F.R.L
- F (Filtr)
- R (Reg)
- L (Lub)
- PresSW
- Shutoff
- SlowStart
- FimResistFR
- Oil-ProhR
- MedPresFR
- No Cu/ PTFE FRL
- Outdrs FR
- F.R.L (Related)
- CompFRL
- LgFRL
- PrescR
- VacF/R
- Clean FR
- ElecPneur
- AirBoost
- SpdContr
- Silncr
- CheckV/ other
- Jnt/tube
- AirUnt
- PresCompn
- Mech/ ElecPresSw
- ContactSW
- AirSens
- PresSW Cool
- AirFloSens/ Contr
- WaterRISens
- TotAirSys (Total Air)
- TotAirSys (Gamma)
- RefrDry
- DesicDry
- HiPolymDry
- MainFiltr
- Dischrg etc
- Ending

# Antistatic tube

F.R.L. Dedicated fitting/speed controller (custom order product)

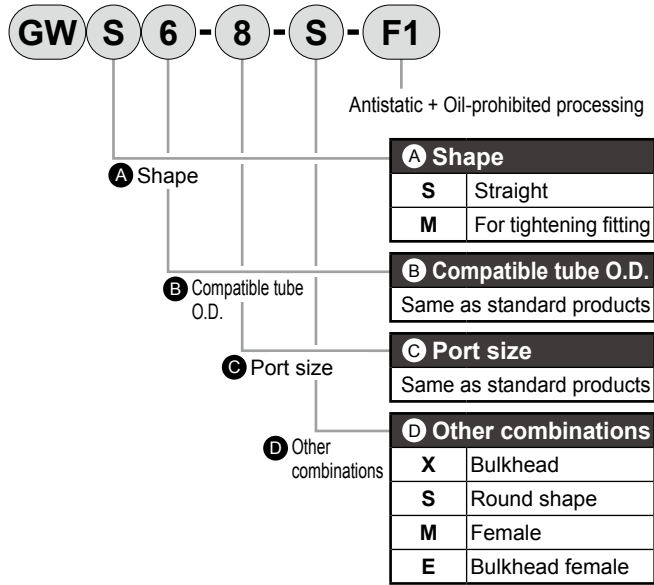
## Specifications

Descriptions	Contents
Volume resistance ratio $\Omega \cdot \text{cm}$	$10^4$ to $10^6$ or less (reference value)
Resin parts	Antistatic PBT (black)
Lubricant	Oil free

Note: Other specifications are the same as those of the standard products. Refer to the specifications of GW Series fitting or SC3W Series speed controller.

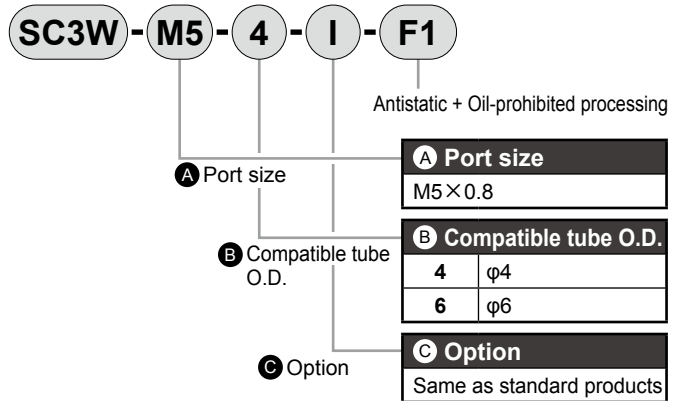
## How to order

### ● Dedicated fitting



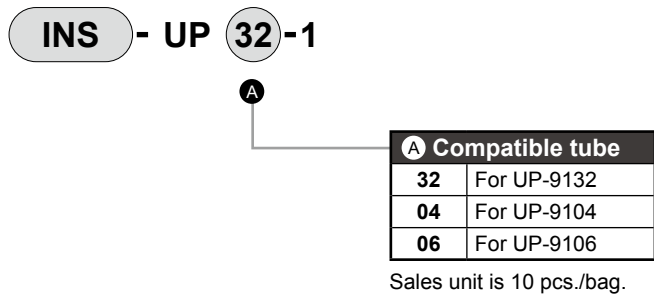
\* "-F1" is selected for the end of the new fitting GW Series model. Refer to How to order for fitting GW Series for model details.

### ● Speed controller



\* "-F1" is selected for the end of the speed controller SC3W Series model. Refer to How to order for speed controller SC3W Series for model details.

### ● Insert ring



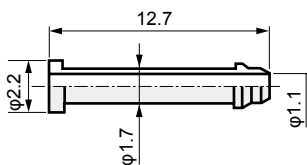
## Dimensions

### ● Dedicated fitting/speed controller

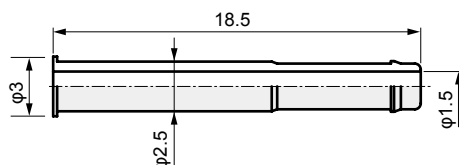
Refer to the dimensions of GW Series fitting (pages 736 to 749) and SC3W Series speed controller (page 636).

### ● Insert ring [custom order product]

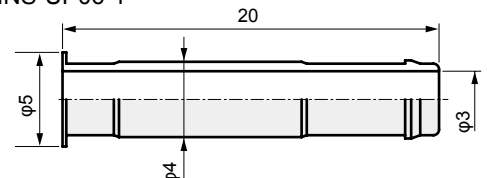
·INS-UP32-1



·INS-UP04-1



·INS-UP06-1



Material: Copper alloy + electroless nickeling

### Safety precautions

#### CAUTION

##### Design/selection

- Be sure to ground the member connected to the fitting. Electrostatic discharge could build up in tubing if the part is not grounded.
- When using tubing where antistatic performance is essential, select "black" tubing.
- Use the same size of urethane tube, push-in fitting and insert ring.
- When using with vacuum pressure with a push-in fitting, use the insert ring.
- Use CKD brand fittings and tubes.
- Do not apply a pull-out force exceeding the values given on the right onto the fitting or tube.

Tube O.D.	Pull-out force (N)
φ3.2	30
φ4	30
φ6	55
φ8	110
φ10	150
φ12	180

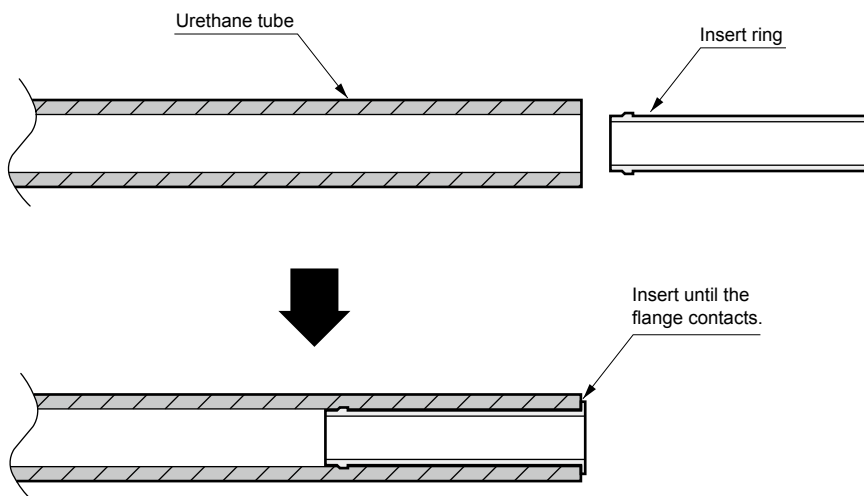
##### Mounting, installation and adjustment

- The insert ring can be pulled out of the urethane tube by hand when remodeling or restructuring the piping connections. Therefore the insert ring need not be discarded.

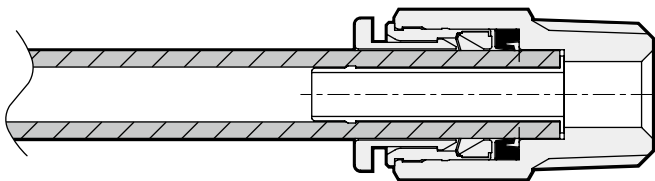
##### Use/maintenance

- Insert the insert ring by hand. If inserted with a tool, it could deform or break and cause vacuum leakage.
- Mounting method

1. Insert the insert ring into the urethane tube with a finger.



2. Insert into the push-in fitting (GW Series).



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- R (Reg)
- L (Lub)
- PresSW
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- SlowStart
- FimResistFR
- Oil-ProhR
- MedPresFR
- No Cu/PTFE FRL
- Outdrs FR
- F.R.L (Related)
- CompFRL
- LgFRL
- PrescR
- VacF/R
- Clean FR
- ElecPneuR
- AirBoost
- SpdContr
- Silncr
- CheckV/other
- Jnt/tube
- AirUnt
- PresCompn
- Mech/ElecPresSw
- ContactSW
- AirSens
- PresSW Cool
- AirFloSens/Contr
- WaterRtSens
- TotAirSys (Total Air)
- TotAirSys (Gamma)
- RefrDry
- DesicDry
- HiPolymDry
- MainFiltr
- Dischrg etc
- Ending



Tube

# F.U.NU.KX.SR Series

Wide bore size available according to purposes and applications.  
Highly reliable piping tubes.

- Outer diameter: 3.2/4/6/8/10/12/15/16 mm

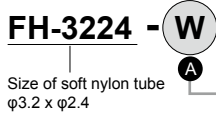
F.R.L  
F (Filtr)  
R (Reg)  
L (Lub)  
PresSW  
Shutoff  
SlowStart  
FimResistFR  
Oil-ProHR  
MedPresFR  
No Cu/  
PTFE FRL  
Outdrs FR  
F.R.L  
(Related)  
CompFRL  
LgFRL  
PrecsR  
VacFR  
Clean FR  
ElecPneuR  
AirBoost  
SpdContr  
Silncr  
CheckV/  
other  
Jnt/tube  
AirUnt  
PresCompn  
Mech/  
ElecPresSw  
ContactSW  
AirSens  
PresSW  
Cool  
AirFloSens/  
Contr  
WaterRtSens  
TotAirSys  
(Total Air)  
TotAirSys  
(Gamma)  
RefrDry  
DesicDry  
HiPolymDry  
MainFiltr  
Dischrg  
etc  
Ending

## Soft nylon tube

Manufacturer of colors other than white: Aoi Co., Ltd.

The soft nylon tube is very flexible compared to the conventional nylon tubes and optimal for piping in small or complicated spaces. The tube also has sufficient characteristics such as cold resistance, weather resistance, oil resistance and chemical resistance, etc.

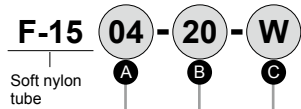
### How to order



Size of soft nylon tube  
φ3.2 x φ2.4

A Tube color	
Blank	Black
W	White

For miniature fitting (F)  
(page 728)



Soft nylon tube

A	Tube size (O.D.)		B Length/roll		C Tube color		
32	φ3.2	10	φ10	20	20 m	Blank	Black (standard)
04	φ4	12	φ12	100	100 m	W	White (standard)
06	φ6	15	φ15			R	Red
08	φ8	16	φ16			BU	Blue
						Y	Yellow
						G	Green
						O	Orange

Note: If tube color is white "W", length per roll 100 m is not available.

Note: Use the FH-3224 for miniature fitting. F-1532 cannot be used.

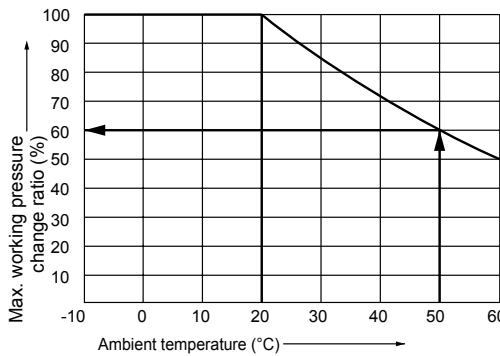
### Specifications

This table indicates the value at 20°C.

Descriptions	FH-3224	F-1532	F-1504	F-1506	F-1508	F-1510	F-1512	F-1515	F-1516
Working fluid	Compressed air								
O.D. x I.D. mm×mm	3.2×2.4	3.2×2.0	4×2.5	6×4	8×6	10×7.5	12×9	15×11.5	16×12
Ambient temperature °C	-10 (14°F) to 60 (140°F) (no freezing)								
Burst pressure MPa	5.39 (≈780 psi, 53.9 bar)		4.9	3.9	3.43 (≈500 psi)		2.94	3.3	
Max. working pressure MPa	1.76 (≈260 psi, 17.6 bar)		1.67	1.27	1.18 (≈170 psi)		1	1.1	
Durometer hardness	HDD 63			HDD 52					
Min. bend rad (JIS B 8381) mm	13	4.5	5	8	15	20	26	43	46
Min. installation radius mm	21	7	10	20	30	40	55	80	90
Tube color	White/black		White (only 20 m)/black/red/blue/yellow/green/orange			White/black		Black	
Standard length per roll m	20		20/100			20/100 (only black)		20/100	

\* Outer diameter dimension tolerance may vary within ±0.1 mm.

### Relation of ambient temperature and max. working pressure



(Example) Tube F-1504 (φ4 x φ2.5)  
If ambient temperature is 50°C, max. working pressure is 60% of max. working pressure of 20°C.

$$1.76 \times \frac{60}{100} \approx 1.06(\text{MPa})$$



### New urethane tube

Due to the adoption of a new manufacturing process, larger inner diameter and increased strength are realized simultaneously with the same outer diameter. This piping tube is also used for larger flow rate. Also economical.

Common specifications 1 MPa = 10 bar

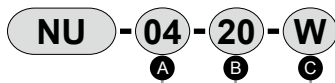
Descriptions	Content
Working fluid	Air
Ambient temperature °C	0 (32°F) to 60 (140°F)
Burst pressure MPa	4 (≈580 psi) (at 20°C (68°F))
Max. working pressure MPa	1.0 (≈150 psi) (at 20°C (68°F))
Operating vacuum pressure kPa	-100 (≈-15 psi, -1 bar)

### Specifications

Descriptions	NU-04	NU-06	NU-08	NU-10	NU-12
O.D. x I.D. mm×mm	4×2.5	6×4.5	8×6	10×7.5	12×9
Burst pressure MPa	4 (≈580 psi, 40 bar) to 2.4 (≈348 psi, 24 bar)				
Ambient temperature °C	0 (32°F) to 60 (140°F) (no freezing)				
Durometer hardness (JIS K7215)	HDD 64				
Min. bend rad (JIS B 8381) mm	8	16	24	30	36
Min. installation radius mm	12	26	36	42	52
Diametral accuracy mm	+0.1 -0.1			+0.1 -0.15	
Weight g/m	10	15	28	42	62
Tube color	Black/white				
Length per roll m	20/100 (only black)				

Note: Refer to Intro Page 59 for relation of the tube length to the effective cross-sectional area.

### How to order



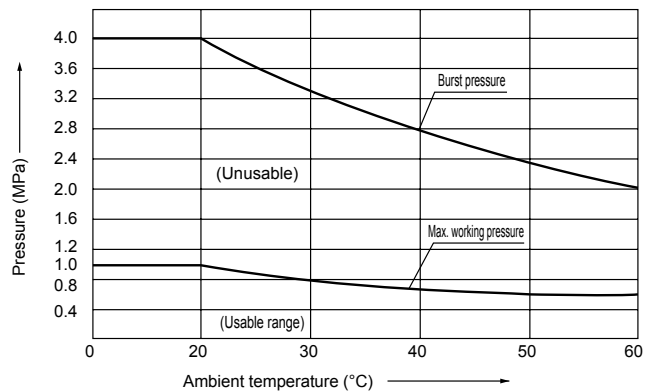
A	Tube size (O.D.)	B	Length/roll	C	Tube color
04	φ4	20	20 m	Blank	Black (standard)
06	φ6	100	100 m	w	White (standard)
08	φ8	Note: If color is white "W", length per roll 100 m is not available.			
10	φ10				
12	φ12				

Clean-room specifications (Catalog No. CB-033SA)

● Anti-dust generation structure for use in cleanrooms

NU ..... - P80

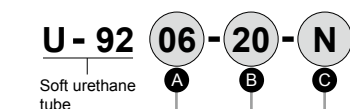
### Relation of ambient temperature and pressure (use/burst)



### Soft urethane tube

Aoi Co., Ltd.

### How to order



A	Tube O.D. size	B	Length/roll	C	Tube color
04	φ4	20	20 m	Blank	Black
06	φ6	100	100 m	N	Transparent
08	φ8	Note: If color is white "W", length per roll 100 m is not available.		PW	Pure white
10	φ10			R	Red
12	φ12			BU	Blue
				Y	Yellow
				G	Green
				O	Orange

Clean-room specifications

(Catalog No. CB-033SA)

U-92 ..... - P80

### Specifications

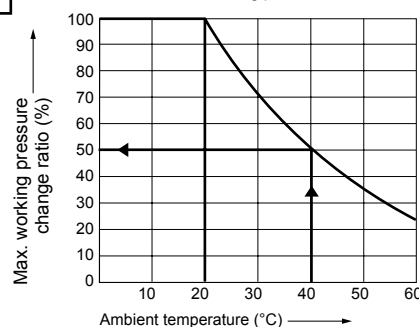
1 MPa = 10 bar

This table indicates the value at 20°C.

Descriptions	U-9204	U-9206	U-9208	U-9210	U-9212
Working fluid	Compressed air				
O.D. x I.D. mm×mm	4×2	6×3.7	8×5	10×6.5	12×8
Burst pressure MPa	4.1 (≈600 psi)	2.9 (≈420 psi)	2.8 (≈410 psi)	2.6 (≈380 psi)	2.6 (≈380 psi)
Max. working pressure MPa	1.3 (≈190 psi)	0.9 (≈130 psi)	0.9 (≈130 psi)	0.8 (≈120 psi)	0.8 (≈120 psi)
Durometer hardness JIS K7215	HDA 92				
Min. bending radius mm	4	10	11	13	16.5
Min. installation radius mm	8	17	25	30	36
Tube color	Black/transparent/red/blue/yellow/green/orange/pure white				
Standard length per roll m	20/100				

### Relation of ambient temperature and max. working pressure

The max. working pressure at 20°C is 100%.



When the temperature rises, the constant pressure gradually drops. Special care must be taken for temperature in use.

(Example) In U-9208, the max. working pressure at the ambient temperature of 40°C is 50% of that at 20°C.

$$0.9 \times \frac{50}{100} \approx 0.45(\text{MPa})$$

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- No Cu/ PTFE FRL
- Outdrs FR
- F.R.L (Related)
- CompFRL
- LgFRL
- PrecsR
- VacF/R
- Clean FR
- ElecPneuR
- AirBoost
- SpdContr
- Silncr
- CheckV/ other
- Jnt/tube
- AirUnt
- PrecsCompn
- Mech/ ElecPresSw
- ContactSW
- AirSens
- PresSW Cool
- AirFloSens/ Contr
- WaterRISens
- TotAirSys (Total Air)
- TotAirSys (Gamma)
- RefrDry
- DesicDry
- HiPolymDry
- MainFiltr
- Dischrg etc
- Ending

## Urethane tube

Since urethane tube has high mechanical strength, the tube strongly endures external force and also has flexibility. This is widely used in general pneumatic lines, etc.

### How to order

**U-95** **04** - **N**

Urethane tube

A Tube O.D. size		B Tube color	
32	φ3.2	Blank	Black
04	φ4	N	Clear
06	φ6		
08	φ8		
10	φ10		
12	φ12		

Note: Indicate tube color in the remarks on the order slip.

Clean-room specifications (Catalog No. CB-033SA)

**U-95** ..... - **P80**

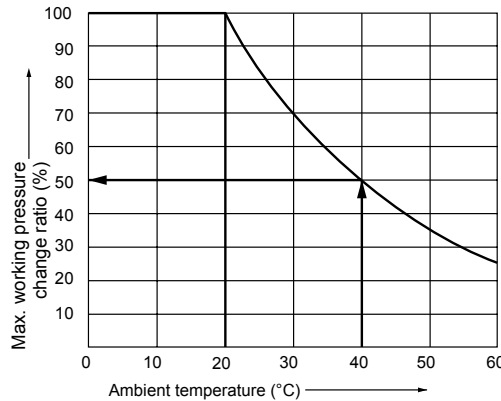
### Specifications

1 MPa = 10 bar  
This table indicates the value at 20°C.

Descriptions	U-9532	U-9504	U-9506	U-9508	U-9510	U-9512
Working fluid	Compressed air					
O.D. x I.D. mm×mm	3.2×1.8	4×2	6×4	8×5	10×6.5	12×8
Ambient temperature °C	0 (32°F) to 60 (140°F) (no freezing)					
Burst pressure MPa	6.1 (≈880 psi)	5.2 (≈750 psi)	3.2 (≈460 psi)	3.6 (≈520 psi)	3.4 (≈490 psi)	3.2 (≈460 psi)
Max. working pressure MPa	1.5 (≈220 psi)	1.7 (≈250 psi)	1.0 (≈150 psi)	1.2 (≈170 psi)	1.1 (≈160 psi)	1.0 (≈150 psi)
Durometer hardness JIS K 7215	HDA 97					
Min. bend rad (JIS B 8381) mm	4	5	13	14	16	20
Min. installation radius mm	7	10	20	30	40	50
Tube color	Transparent/black					
Standard length per roll m	20	20/100			20	

\* The O.D. tolerance of U-9506 and smaller model No. is  $+0.1$ <sub>-0.15</sub> mm, and that of U-9508 and larger model No. is  $+0.1$ <sub>-0.2</sub> mm.

### Relation of ambient temperature and max. working pressure



When the temperature rises, the constant pressure gradually drops. Special consideration must be given for the ambient temperature. (Example) In U-9506, the max. working pressure at an ambient temperature of 40°C is 50% of that at 20°C.

$$1.0 \times \frac{50}{100} \approx 0.5(\text{MPa})$$

## Coiling tube

A coiling tube is a coil-like manufactured extensible tube. Unlike conventional products, fittings are easily installed and the coil contracts and expands very smoothly due to the straight section provided with the specified length in the direction of expansion and contraction. Durability of coil end is also excellent.

### Specifications

Descriptions	KX-1206	KX-1208	KX-1210	KX-1212
O.D. x I.D. mm×mm	6×4	8×6	10×7.5	12×9.2
Ambient temperature °C	-10 (14°F) to 60 (140°F) (no freezing)			
Working extension m	2.5			
D mm	50	70		90
L mm	250	240	290	275
ℓ	100			
Tube color	Orange			

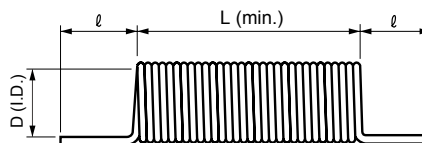
\* The O.D. tolerance is  $+0.07$ <sub>-0.1</sub> mm.  
\* Tube is made of hard nylon.

### How to order

**KX-12** **06**

Coiling tube

A O.D. size	
06	φ6
08	φ8
10	φ10
12	φ12

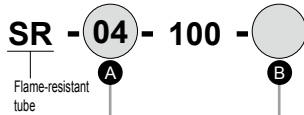


1 MPa = 10 bar

### Flame-resistant tube

Revolutionary tube made using flame-resistant materials. Even if welding sparks, etc., come into contact, the tube will not continue to burn. (UL standard 94V-0 or equivalent: self-extinguishing property)

### How to order



A Tube O.D. size		B Tube color	
04	φ4	Blank	Black
06	φ6	R	Red
08	φ8	BU	Blue
10	φ10	G	Green
12	φ12		

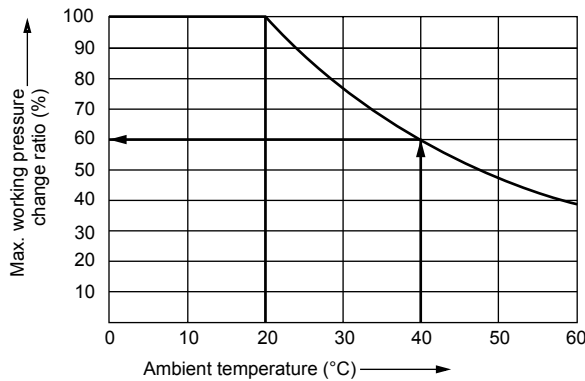
Note: Indicate tube color in the remarks on the order slip.

### Specifications

Descriptions	SR-04	SR-06	SR-08	SR-10	SR-12
O.D. x I.D. mm×mm	4×2	6×3.8	8×5.5	10×7	12×8.5
Ambient temperature °C	0 (32°F) to 60 (140°F) (no freezing)				
Burst pressure MPa	4.8 (≈700 psi)	4.3 (≈620 psi)	3.4 (≈490 psi)	3.3 (≈480 psi)	3.3 (≈480 psi)
Max. working pressure MPa	1.6 (≈230 psi)	1.4 (≈200 psi)	1.1 (≈160 psi)	1.1 (≈160 psi)	1.1 (≈160 psi)
Min. bending radius mm	15	22	30	40	50
Tube color	Black/red/blue/green				
Standard length per roll m	100				

This table indicates the value at 20°C.

### Relation of ambient temperature and max. working pressure



When the temperature rises, the constant pressure gradually drops. Special consideration must be given for the ambient temperature.  
(Example) In SR-06, the max. working pressure at the ambient temperature of 40°C is 60% of that at 20°C.

$$1.4 \times \frac{60}{100} \approx 0.84(\text{MPa})$$