


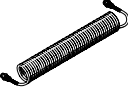


## Spiral plastic tubing

**FESTO**



## Product range overview

Design	Type	∅ [mm]	Colour			Operating medium		
			Blue	Black	Blue/black	Compressed air	Vacuum	Water
<b>Spiral tubing</b>		<b>Outside ∅</b>						
	<b>PUN-S</b> Polyurethane	4 6 8 10 12	■	■	–	■	■	–
	<b>PUN-S-DUO</b> Polyurethane Paired tubing	4 6 8 10 12	–	–	■	■	■	–
<b>Spiral tubing, pre-assembled</b>		<b>Inside ∅</b>						
	<b>PUN-SG</b> Polyurethane	6.4 7.9	■	–	–	■	■	■
	<b>PPS</b> Polyamide	4.75 6.35	■	–	–	■	■	■

**Note**

The term 'water' used here should be understood to mean liquid mains water that is free of ice. The suitability of the products for water modified in any way, such as demineralised water, salt water or water with additives, as well as water in the vapour phase, must be enquired about separately.

The suitability of the products for water should not be understood as approval for e.g. drinking water applications.

## Product range overview

Type	Halogen-free	PWIS-free to FN 942 010	Suitable for energy chains	Approved by the German Technical Control Board (TÜV)	Resistance					Shore hardness <sup>2)</sup>	→ Page/ Internet
					Chemicals	Microbes	UV radiation	Hydrolysis	Stress cracks		
<b>Spiral tubing</b>											
PUN-S	■	■	■	■	-	-	++ <sup>1)</sup>	+	++	D 52 ±3	6
PUN-S-DUO	■	■	■	■	-	-	+	+	+	D 52 ±3	8
<b>Spiral tubing, pre-assembled</b>											
PUN-SG	■	■	-	-	+	++	+	++	+	A 87 ±3	11
PPS	■	■	■	-	+	++	+	+	+	-	13

++ Very suitable

+ Limited suitability (on request)

- Not suitable

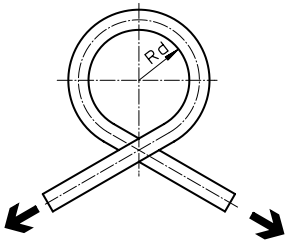
1) Applies to black colour

2) Values are determined using test boards. Derived values using tubing may vary.

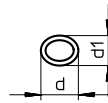
## Technical data

### Measurement method

#### Flow-relevant bending radius $R_d$



The tube is bent in the direction of its own curve until the tubing outer diameter is flattened by 5%.  $R_d$  is then calculated mathematically. The flow rate is not reduced until  $R_d$  is reached.

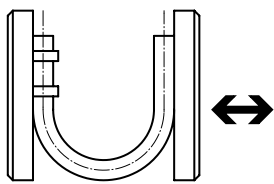


Cross section flattened by bending the tube.

$d$  = non-deformed tubing O.D.

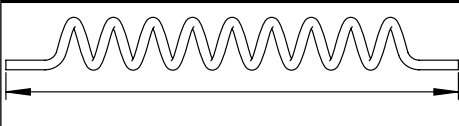
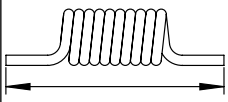
$d1$  = deformed tubing O.D.

#### Minimum bending radius $R_{min}$



The tube fixed to the base plate is bent until the deformation results in a kink. The measured value is the minimum bending radius  $R_{min}$ . This  $R_{min}$  results in significant reductions in flow rate.

### Length specifications

	Working length	With tensile load, 80% of the maximum section length
	Block length	Without tensile load

#### Note

The working length represents 80% of the maximum permissible expansion. This maximum expansion is the limit value before permanent deformation takes place.

## Type codes – PUN-S, PUN-S-DUO

001	Series
<b>PUN</b>	Plastic tubing, polyurethane

002	Tubing O.D. x wall thickness
<b>4x0,75</b>	4x0.75 mm
<b>6x1</b>	6x1 mm
<b>8x1,25</b>	8x1.25 mm
<b>10x1,5</b>	10x1.5 mm
<b>12x2</b>	12x2 mm

003	Design
<b>S</b>	Spiral

004	Working length [m]
<b>0,5</b>	0.5
<b>1</b>	1
<b>1,5</b>	1.5
<b>2</b>	2
<b>6</b>	6

005	Number of tubes
	Single tubing
<b>DUO</b>	Paired tubing

006	Colour
<b>SW</b>	Black
<b>BL</b>	Blue
<b>BS</b>	Blue/black

# Spiral plastic tubing

## Data sheet – PUN-S

### Spiral plastic tubing PUN-S

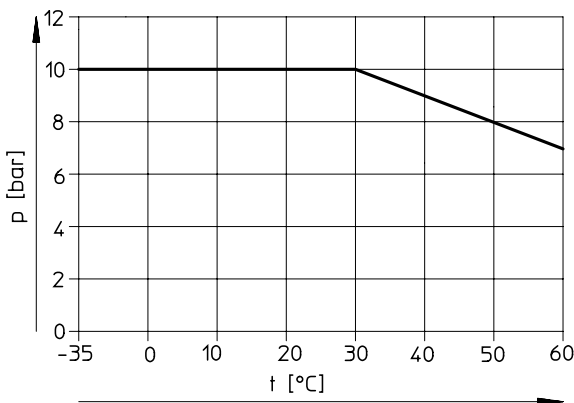
Highly flexible plastic tubing



General technical data					
Type	PUN-4x0.75-S	PUN-6x1-S	PUN-8x1.25-S	PUN-10x1.5-S	PUN-12x2-S
Pneumatic connection	For push-in connector O.D. 4 mm	For push-in connector O.D. 6 mm	For push-in connector O.D. 8 mm	For push-in connector O.D. 10 mm	For push-in connector O.D. 12 mm
	For barbed connector I.D. 3 mm with union nut	For barbed connector I.D. 4 mm with union nut	For barbed connector I.D. 6 mm with union nut	–	–
	For barbed connector I.D. 3 mm	For barbed connector I.D. 4 mm	For barbed connector I.D. 6 mm	–	–

Operating and environmental conditions	
Temperature-dependent operating pressure [bar]	–0.95 ... +10 → graph
Operating medium	Compressed air to ISO 8573-1:2010 [7:-:-]
PWIS conformity	VDMA24364-B2-L
Ambient temperature [°C]	–35 ... +60
Certification	German Technical Control Board (TÜV)
Certificate issuing authority	B 013277 0506 00

### Operating pressure p as a function of temperature t



1) Recommended fitting

### Possible fittings



Push-in fitting QS,  
Quick Star<sup>1)</sup>  
→ Internet: qs



Push-in fitting QS-B,  
Quick Star<sup>1)</sup>  
→ Internet: qs-b



Push-in fitting CRQS, Quick Star,  
stainless steel  
→ Internet: crqs



Push-in fitting NPQM  
→ Internet: npqm



Quick connector CK  
→ Internet: ck



Barbed fitting CN  
→ Internet: cn



#### Note

Greater force is required when assembling the fittings CK/CN. Expanding the tube ends using a tapered mandrel makes pushing them on easier.

## Data sheet – PUN-S

Materials	
Shore hardness	D 52 ±3
Tubing	TPE-U(PU)
Note on materials	RoHS-compliant
	Free of copper and PTFE

Dimensions and ordering data								
Outside ø [mm]	Inside ø [mm]	Winding ø [mm]	Number of windings	Working length [m]	Block length [m]	Weight [g]	Part no.	Type
<b>Colour: blue</b>								
4	2.6	25	20	0.5	0.184	13	197587	PUN-4x0.75-S-0.5-BL
			45	1	0.284	27	197588	PUN-4x0.75-S-1-BL
			70	1.5	0.384	42	197589	PUN-4x0.75-S-1.5-BL
6	4	46	23	1	0.344	51	197590	PUN-6x1-S-1-BL
			52	2	0.518	110	197591	PUN-6x1-S-2-BL
			168	6	1.214	350	197592	PUN-6x1-S-6-BL
8	5.7	60	12	1	0.304	65	197593	PUN-8x1.25-S-1-BL
			27	2	0.424	140	197594	PUN-8x1.25-S-2-BL
			87	6	0.904	440	197595	PUN-8x1.25-S-6-BL
10	7	80	9.5	1	0.305	110	197596	PUN-10x1.5-S-1-BL
			22	2	0.43	250	197597	PUN-10x1.5-S-2-BL
			70	6	0.91	760	197598	PUN-10x1.5-S-6-BL
12	8	95	9	1	0.32	200	197599	PUN-12x2-S-1-BL
			20	2	0.452	420	197600	PUN-12x2-S-2-BL
			64	6	0.98	1300	197601	PUN-12x2-S-6-BL
<b>Colour: black</b>								
4	2.6	25	20	0.5	0.184	13	197602	PUN-4x0.75-S-0.5-SW
			45	1	0.284	27	197603	PUN-4x0.75-S-1-SW
			70	1.5	0.384	42	197604	PUN-4x0.75-S-1.5-SW
6	4	46	23	1	0.344	51	197605	PUN-6x1-S-1-SW
			52	2	0.518	110	197606	PUN-6x1-S-2-SW
			168	6	1.214	350	197607	PUN-6x1-S-6-SW
8	5.7	60	12	1	0.304	65	197608	PUN-8x1.25-S-1-SW
			27	2	0.424	140	197609	PUN-8x1.25-S-2-SW
			87	6	0.904	440	197610	PUN-8x1.25-S-6-SW
10	7	80	9.5	1	0.305	110	197611	PUN-10x1.5-S-1-SW
			22	2	0.43	250	197612	PUN-10x1.5-S-2-SW
			70	6	0.91	760	197613	PUN-10x1.5-S-6-SW
12	8	95	9	1	0.32	200	197614	PUN-12x2-S-1-SW
			20	2	0.452	420	197615	PUN-12x2-S-2-SW
			64	6	0.98	1300	197616	PUN-12x2-S-6-SW

## Spiral plastic tubing

### Data sheet – PUN-S-DUO

#### DUO spiral plastic tubing PUN-S-DUO

Highly flexible paired plastic tubing.  
Two lengths of tubing are fused together into a tubing pair.

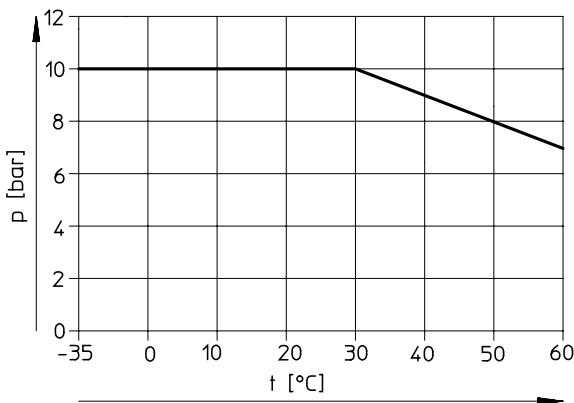
For fitting, the paired tubing is separated as required at both ends.



General technical data					
Type	PUN-4x0.75-S	PUN-6x1-S	PUN-8x1.25-S	PUN-10x1.5-S	PUN-12x2-S
Pneumatic connection	For push-in connector O.D. 4 mm	For push-in connector O.D. 6 mm	For push-in connector O.D. 8 mm	For push-in connector O.D. 10 mm	For push-in connector O.D. 12 mm
	For barbed connector I.D. 3 mm with union nut	For barbed connector I.D. 4 mm with union nut	For barbed connector I.D. 6 mm with union nut	–	–
	For barbed connector I.D. 3 mm	For barbed connector I.D. 4 mm	For barbed connector I.D. 6 mm	–	–

Operating and environmental conditions	
Temperature-dependent operating pressure [bar]	–0.95 ... +10 → graph
Operating medium	Compressed air to ISO 8573-1:2010 [7:-:-]
PWIS conformity	VDMA24364-B2-L
Ambient temperature [°C]	–35 ... +60
Certification	German Technical Control Board (TÜV)
Certificate issuing authority	B 013277 0506 00

#### Operating pressure p as a function of temperature t



1) Recommended fitting

#### Possible fittings



Push-in fitting QS,  
Quick Star<sup>1)</sup>  
→ Internet: qs



Push-in fitting QS-B,  
Quick Star<sup>1)</sup>  
→ Internet: qs-b



Push-in fitting CRQS, Quick Star,  
stainless steel  
→ Internet: crqs



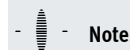
Push-in fitting NPQM  
→ Internet: npqm



Quick connector CK  
→ Internet: ck



Barbed fitting CN  
→ Internet: cn



#### Note

Greater force is required when assembling the fittings CK/CN. Expanding the tube ends using a tapered mandrel makes pushing them on easier.



## Data sheet – PUN-S-DUO

Materials	
Shore hardness	D 52 ±3
Tubing	TPE-U(PU)
Note on materials	RoHS-compliant
	Free of copper and PTFE

Dimensions and ordering data								
Outside ø [mm]	Inside ø [mm]	Winding ø [mm]	Number of windings	Working length [m]	Block length [m]	Weight [g]	Part no.	Type
<b>Colour: blue/black</b>								
4	2.6	25	20	0.5	0.268	25	197617	PUN-4x0.75-S-0.5-DUO-BS
			45	1	0.468	55	197618	PUN-4x0.75-S-1-DUO-BS
			70	1.5	0.668	84	197619	PUN-4x0.75-S-1.5-DUO-BS
6	4	46	23	1	0.488	102	197620	PUN-6x1-S-1-DUO-BS
			52	2	0.836	230	197621	PUN-6x1-S-2-DUO-BS
			168	6	2.228	700	197622	PUN-6x1-S-6-DUO-BS
8	5.7	60	12	1	0.408	130	197623	PUN-8x1.25-S-1-DUO-BS
			27	2	0.648	280	197624	PUN-8x1.25-S-2-DUO-BS
			87	6	1.608	870	197625	PUN-8x1.25-S-6-DUO-BS
10	7	80	9.5	1	0.41	220	197626	PUN-10x1.5-S-1-DUO-BS
			22	2	0.66	490	197627	PUN-10x1.5-S-2-DUO-BS
			70	6	1.62	1520	197628	PUN-10x1.5-S-6-DUO-BS
12	8	95	9	1	0.44	390	197629	PUN-12x2-S-1-DUO-BS
			20	2	0.704	830	197630	PUN-12x2-S-2-DUO-BS
			64	6	1.76	2600	197631	PUN-12x2-S-6-DUO-BS

## Spiral plastic tubing

### Type codes – PUN-SG, pre-assembled

001	Series
<b>PUN</b>	Plastic tubing, polyurethane

002	Tubing O.D. x wall thickness
<b>10x1,5</b>	10x1.5 mm
<b>12x2</b>	12x2 mm

003	Design
<b>SG</b>	Spiral with fabric

004	Working length [m]
<b>2,4</b>	2.4
<b>4,8</b>	4.8
<b>6</b>	6

005	Colour
<b>BL</b>	Blue

006	Pneumatic connection
<b>1/4</b>	Male thread G1/4
<b>3/8</b>	Male thread G3/8

## Data sheet – PUN-SG, pre-assembled

## Spiral plastic tubing PUN-SG

Highly flexible and hydrolysis-resistant pneumatic tubing with fibre reinforcement and captive rotatable fittings.



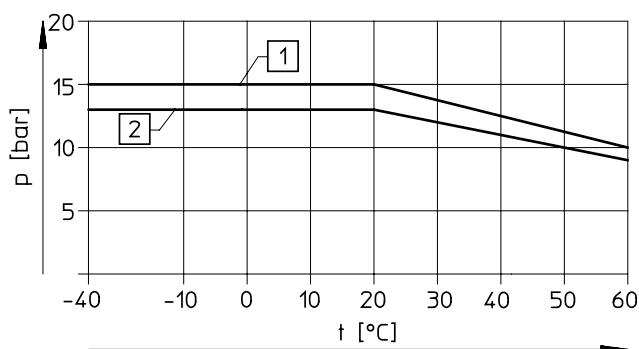
General technical data		PUN-10x1.5-SG	PUN-12x2-SG
Type		PUN-10x1.5-SG	PUN-12x2-SG
Pneumatic connection 1, 2		Male thread G1/4	Male thread G3/8
Nominal tightening torque	[Nm]	11 ±20%	12.5 ±20%

Operating and environmental conditions		PUN-10x1.5-SG	PUN-12x2-SG
Temperature-dependent operating pressure	[bar]	-0.95 ... +15 → graph	-0.95 ... +13 → graph
Operating medium		Compressed air to ISO 8573-1:2010 [7:-:-]	
Ambient temperature	[°C]	-40 ... +60	
Corrosion resistance class CRC <sup>1)</sup>		1	

1) Corrosion resistance class CRC 1 to Festo standard FN 940070

Low corrosion stress. Dry indoor application or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

## Operating pressure p as a function of temperature t



[1] PUN-10x1.5-SG

[2] PUN-12x2-SG

Materials	
Shore hardness	A 87 ±3
Tubing	TPE-U(PU)
Connecting thread	Nickel-plated brass
Protection against kinking	POM
Note on materials	RoHS-compliant Free of copper and PTFE

Dimensions and ordering data									
Outside ø	Inside ø	Flow-relevant bending radius	Winding ø	Number of windings	Working length	Block length	Weight	Part no.	Type
[mm]	[mm]	[mm]	[mm]		[m]	[m]	[g]		
<b>Colour: blue</b>									
9.5	6.4	50	42	21	2.4	0.889	180	533463	PUN-10x1.5-SG-2.4-BL-1/4
				50	4.8	1.165	340	533464	PUN-10x1.5-SG-4.8-BL-1/4
				66	6	1.317	430	533465	PUN-10x1.5-SG-6-BL-1/4
11.7	7.9	65	51	41	4.8	1.172	480	533466	PUN-12x2-SG-4.8-BL-3/8
				53	6	1.312	560	533467	PUN-12x2-SG-6-BL-3/8

## Spiral plastic tubing

### Type codes – PPS, pre-assembled

001	Series
PPS	Spiral plastic tubing, polyamide

002	Pipe/tubing I.D. [mm]
4	4.7
6	6.2

003	Working length [m]
7,5	7.5
15	15

004	Pneumatic connection
1/4	Male thread G1/4

005	Colour
BL	Blue

## Data sheet – PPS, pre-assembled

## Spiral plastic tubing PPS

This hydrolysis-resistant plastic tubing has high thermal and mechanical load capacities. Each tubing length is delivered ready for installation with 2 rotatable connectors and

captive sealing rings OL. Kinks at the tubing ends are prevented by the anti-kinking springs.



## General technical data

Pneumatic connection 1, 2	Male thread G1/4
Nominal tightening torque [Nm]	11 ±20%

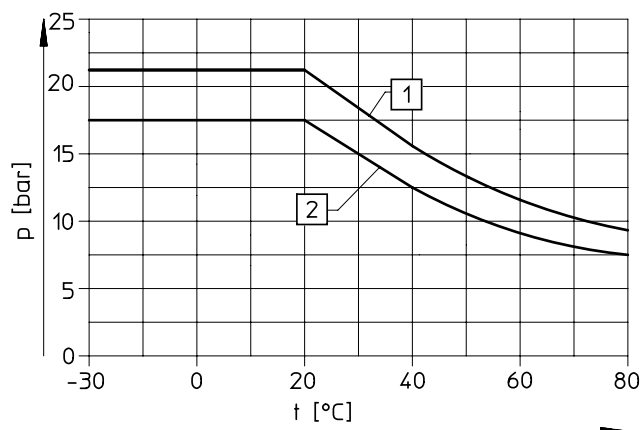
## Operating and environmental conditions

Type	PPS-4	PPS-6
Temperature-dependent operating pressure [bar]	-0.95 ... +21.2 → graph	-0.95 ... +17.2 → graph
Operating medium	Compressed air to ISO 8573-1:2010 [7:-:-]	
Ambient temperature [°C]	-30 ... +80	
Corrosion resistance class CRC <sup>1)</sup>	1	

1) Corrosion resistance class CRC 1 to Festo standard FN 940070

Low corrosion stress. Dry indoor application or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

## Operating pressure p as a function of temperature t



[1] PPS-4

[2] PPS-6

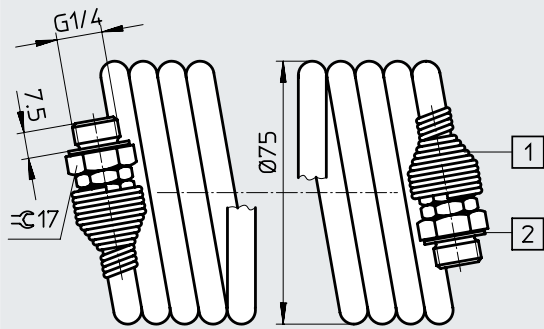
## Materials

Tubing	PA12-P
Connecting thread	Brass
Protection against kinking	Galvanised steel
Note on materials	RoHS-compliant

Data sheet – PPS, pre-assembled

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)



[1] Anti-kinking spring

[2] Captive seal

Ordering data

Outside ø [mm]	Inside ø [mm]	Winding ø [mm]	Number of windings	Working length [m]	Block length [m]	Weight [g]	Part no.	Type
<b>Colour: blue</b>								
6.3	4.7	75	44	7.5	0.34	249	19798	PPS-4-7.5-1/4-BL
			90	15	0.67	367	19799	PPS-4-15-1/4-BL
7.8	6.2	75	43	7.5	0.43	298	19796	PPS-6-7.5-1/4-BL
			86	15	0.80	500	19797	PPS-6-15-1/4-BL