

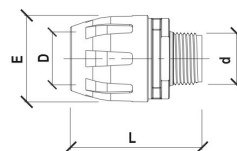
Compressed air piping system Series SPEEDLINE



Design type	Screw fitting with O-ring and retaining clip
Tube outside diameter	16...63mm
Properties	high flow rates leak-free compressed air network simple expansion option silicone-free shock-resistant ROHS-compliant
Materials	Body, Union nut and Compression ring PA6, Holding clamp Stainless steel 1.4310, O-ring NBR
recommended Tube materials	Aluminium tubes Series SPEEDLINE Plastic tubing Series SPEEDLINE
Medium	Compressed air, Vacuum (Liquids and other gases on request)
Medium temperature	-15...+65°C with aluminium tube -10...+35°C with plastic tube
Operating pressure	0...16bar with aluminium tube, Vacuum -0,99bar 0...13bar with plastic tube, Vacuum -0,99bar
Mounting instructions	Installation and System test: • All tubes and fittings should be clean and undamaged before use. • Pipelines must be installed with a slight downward slope so that condensate can collect. • All tubing and fitting installations should be pressure-tested after installation. • The system shall be tested at an operating pressure of 1.5 bar over a period of 5 minutes. • System pressure relief to 0bar. • Subsequently, the system shall be tested at an operating pressure of 1.2 to 1.5 times the maximum pressure over a period of 2 hours. • Within this period, no leaks may occur at the connecting parts. In this context, sealing plugs and end caps are useful for sealing the end openings and creating a leak-tight connection. Sealant: For threaded connections we recommend the use of liquid sealant or PTFE tape. Lubricant: We recommend using a silicone-free lubricant that does not chemically attack the materials used. e.g. Type LUB003

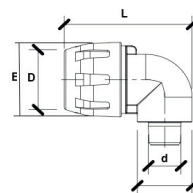


Straight male connector, Thread tapered



Thread d	Tube outside diameter D [mm]	E	L	Insertion depth [mm]	Weight [g]	Material	Type
R1/2"	16	37	64	38	30	PA6	SC12C-16-12-DD
R1/2"	20	45	68	48	60	PA6	SC12C-20-12-DD
R3/4"	20	45	68	48	60	PA6	SC12C-20-34-DD
R1/2"	25	51	71	52	80	PA6	SC12C-25-12-DD
R3/4"	25	51	73	52	80	PA6	SC12C-25-34-DD
R1"	25	51	76	52	80	PA6	SC12C-25-10-DD
R1"	32	61	85	62	120	PA6	SC12C-32-10-DD
R1 1/4"	32	61	87	62	130	PA6	SC12C-32-114-DD
R1"	40	75	96	70	200	PA6	SC12C-40-10-DD
R1 1/4"	40	75	97	70	200	PA6	SC12C-40-114-DD
R1 1/2"	40	75	98	70	200	PA6	SC12C-40-112-DD
R1 1/2"	50	87	108	79	300	PA6	SC12C-50-112-DD
R2"	50	87	111	79	290	PA6	SC12C-50-20-DD
R2"	63	108	115	80,5	350	PA6	SC12C-63-20-DD

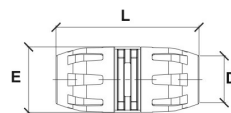
Male elbow screw-in fitting, Thread tapered



Thread d	Tube outside diameter D [mm]	E	L	Insertion depth [mm]	Weight [g]	Material	Type
R1/2"	20	45	78	48	68	PA6	SC16C-20-12-DD
R1/2"	25	51	87	52	95	PA6	SC16C-25-12-DD
R3/4"	25	51	87	52	95	PA6	SC16C-25-34-DD

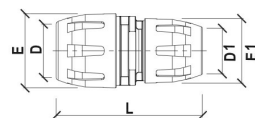


Straight connector, with tube stop



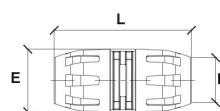
Tube outside diameter D [mm]	E	L	Insertion depth [mm]	Weight [g]	Material	Type
16	37	81	38	50	PA6	SC13-16-DD
20	45	98	48	90	PA6	SC13-20-DD
25	51	106	52	132	PA6	SC13-25-DD
32	61	124	62	212	PA6	SC13-32-DD
40	75	142	70	350	PA6	SC13-40-DD
50	87	161	79	505	PA6	SC13-50-DD
63	108	170	80,5	570	PA6	SC13-63-DD

Straight connector (Reducer), with tube stop



Tube outside diameter D [mm]	Tube outside diameter D1 [mm]	E	E1	L	Insertion depth [mm]	Insertion depth 1 [mm]	Weight [g]	Material	Type
20	25	45	51	81	48	52	120	PA6	SC13-20-25-DD
25	32	51	61	98	52	62	178	PA6	SC13-25-32-DD
25	40	51	75	106	52	70	230	PA6	SC13-25-40-DD
32	40	61	75	124	62	70	290	PA6	SC13-32-40-DD
40	50	75	87	142	70	79	450	PA6	SC13-40-50-DD

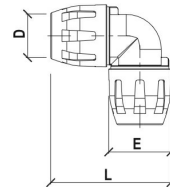
Straight slip-on connector, without tube stop, movable when loose



Tube outside diameter D [mm]	E	L	Insertion depth [mm]	Weight [g]	Material	Type
32	61	124	62	212	PA6	SC13-32-DD-B
40	75	142	70	350	PA6	SC13-40-DD-B
50	87	161	79	505	PA6	SC13-50-DD-B
63	108	170	80,5	570	PA6	SC13-63-DD-B

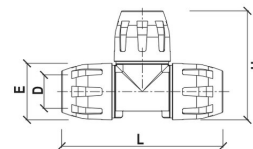


Elbow connector



Tube outside diameter D [mm]	E	L	Insertion depth [mm]	Weight [g]	Material	Type
16	37	72	38	70	PA6	SC17-16-DD
20	45	86	48	100	PA6	SC17-20-DD
25	51	95	52	140	PA6	SC17-25-DD
32	61	122	62	240	PA6	SC17-32-DD
40	75	130	70	390	PA6	SC17-40-DD
50	87	152	79	580	PA6	SC17-50-DD
63	108	165	80,5	800	PA6	SC17-63-DD

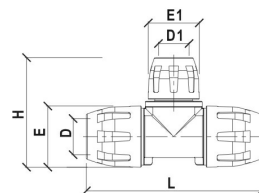
T-connector



Tube outside diameter D [mm]	E	L	Insertion depth [mm]	Weight [g]	Material	Type
16	37	109	38	90	PA6	SC29-16-DD
20	45	127	48	160	PA6	SC29-20-DD
25	51	140	52	210	PA6	SC29-25-DD
32	61	170	62	360	PA6	SC29-32-DD
40	75	185	70	565	PA6	SC29-40-DD
50	87	216	79	850	PA6	SC29-50-DD
63	108	235	80,5	1200	PA6	SC29-63-DD

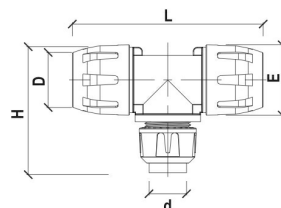


T reducing connector



Tube outside diameter D [mm]	Tube outside diameter D1 [mm]	E	E1	H	L	Insertion depth [mm]	Insertion depth 1 [mm]	Weight [g]	Material	Type
20	16	45	37	80	127	48	38	150	PA6	SC29-20-16-20-DD
25	16	51	37	88	140	52	38	200	PA6	SC29-25-16-25-DD
25	20	51	45	98	140	52	48	210	PA6	SC29-25-20-25-DD
32	20	61	45	111	170	62	48	340	PA6	SC29-32-20-32-DD
32	25	61	51	113	170	62	52	340	PA6	SC29-32-25-32-DD
40	25	75	51	128	185	70	52	510	PA6	SC29-40-25-40-DD
40	32	75	61	131	185	70	62	540	PA6	SC29-40-32-40-DD
50	32	87	61	147	216	79	62	760	PA6	SC29-50-32-50-DD
50	40	87	75	150	216	79	70	820	PA6	SC29-50-40-50-DD
63	40	108	75	160	235	80,5	70	820	PA6	SC29-63-40-63-DD
63	50	108	87	168	235	80,5	79	1120	PA6	SC29-63-50-63-DD

T-connector, Female thread

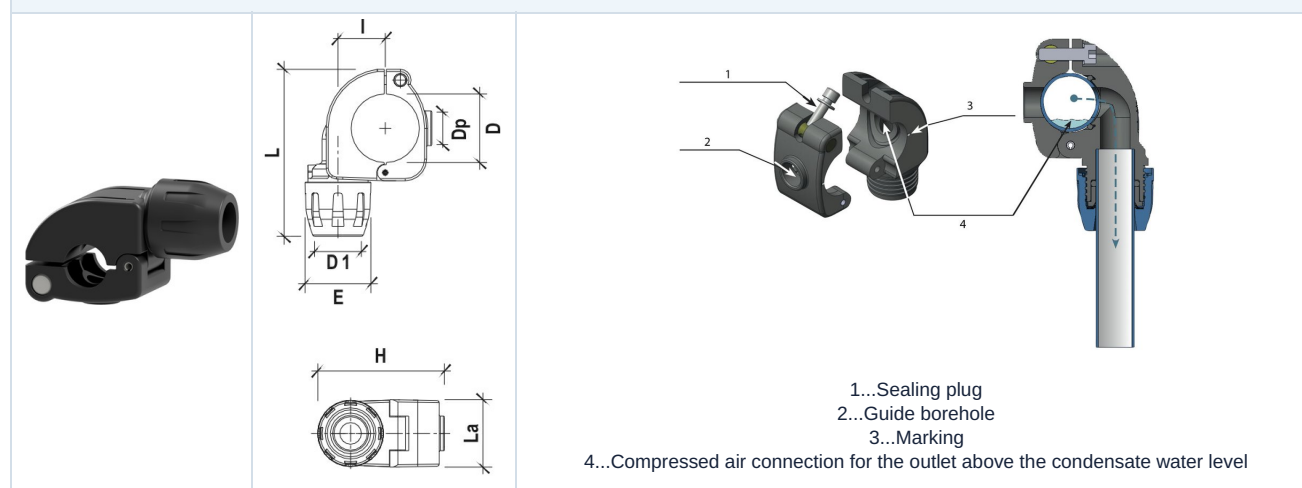


Thread d	Tube outside diameter D [mm]	E	H	L	Insertion depth [mm]	Weight [g]	Material	Type
RP1/2"	20	45	75	127	48	160	PA6	SC29-20-12-20-DD
RP1/2"	25	51	80	140	52	210	PA6	SC29-25-12-25-DD



Pipe branch connection with pipe connection

This branch connection enables a quick additional outlet to be created without dismantling the main line. The compressed air connection is located above the condensate level. The ingress of water into the branch line is prevented.

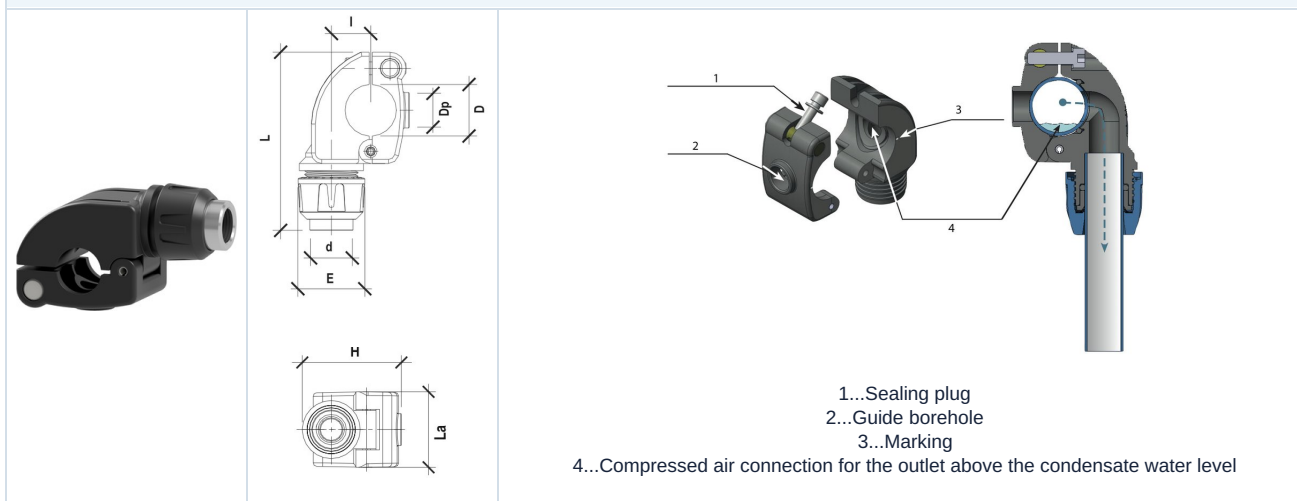


Tube outside diameter Main tube D [mm]	Tube outside diameter Branching D1 [mm]	Dp	E	H	I	L	La	Insertion depth [mm]	Weight [g]	Material	Type
25	16	19	37	69,5	24,5	113	52	38,8	220	PA6	SC29-25-16-DD
25	20	19	45	69,5	24,5	113	52	49,8	230	PA6	SC29-25-20-DD
32	16	19	37	71	24,5	113	52	38,8	220	PA6	SC29-32-16-DD
32	20	19	45	71	24,5	113	52	49,8	220	PA6	SC29-32-20-DD
40	16	24	37	84	29,6	125	52	38,8	250	PA6	SC29-40-16-DD
40	20	24	37	84	29,6	125	52	49,8	270	PA6	SC29-40-20-DD
40	25	24	51	84	29,6	125	52	54,8	280	PA6	SC29-40-25-DD
50	16	24	37	115	31	145	60	38,8	420	PA6	SC29-50-16-DD
50	20	24	45	115	31	145	60	49,8	420	PA6	SC29-50-20-DD
50	25	24	51	115	31	145	60	54,8	430	PA6	SC29-50-25-DD
63	20	24	45	115	43	145	60	49,8	370	PA6	SC29-63-20-DD
63	25	24	51	115	43	145	60	54,8	390	PA6	SC29-63-25-DD
63	32	24	61	115	43	148	60	61,9	390	PA6	SC29-63-32-DD



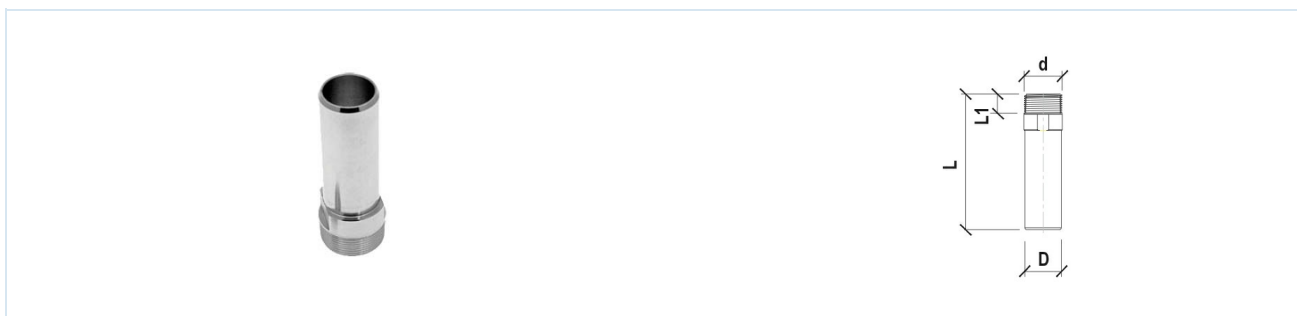
Pipe branch connection with female thread

This branch allows a quick additional outlet to be created without dismantling the main line. The compressed air connection is located above the condensate level. Prevents water from entering the branch lines.



Tube outside diameter Main tube D [mm]	Thread Branching d	Dp	E	H	I	L	La	Weight [g]	Material	Type
25	RP1/2"	19	45	71,5	24,5	113	52	240	PA6	SC29-25-12-DD
32	RP1/2"	19	45	71,5	24,5	113	52	220	PA6	SC29-32-12-DD
40	RP1/2"	24	45	83	29,6	125	52	280	PA6	SC29-40-12-DD
40	RP3/4"	24	51	83	29,6	125	52	300	PA6	SC29-40-34-DD
50	RP1/2"	24	45	115,5	31	145	60	400	PA6	SC29-50-12-DD
50	RP3/4"	24	51	115,5	31	145	60	500	PA6	SC29-50-34-DD
63	RP1/2"	24	45	115,5	43	145	60	380	Aluminium	SC29-63-12-DA
63	RP3/4"	24	51	115,5	43	145	60	400	Aluminium	SC29-63-34-DA
63	RP1"	24	61	115,5	43	148	60	620	Aluminium	SC29-63-10-DA

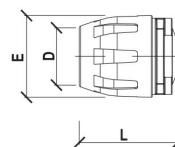
Threaded connector, Thread tapered



Thread d	Tube outside diameter D [mm]	L	L1	Weight [g]	Material	Type
R3/8"	16	76	10	25	Aluminium	SC38C-16-38-A
R1/2"	20	95	13	36	Aluminium	SC38C-20-12-A
R3/4"	20	96	13	43	Aluminium	SC38C-20-34-A
R1"	25	108	16	73	Aluminium	SC38C-25-10-A
R11/4"	32	119	18	95	Aluminium	SC38C-32-114-A
R11/2"	40	135	21	152	Aluminium	SC38C-40-112-A
R2"	50	157	23	517	Aluminium	SC38C-50-20-A
R2"	63	171	26	675	Aluminium	SC38C-63-20-A

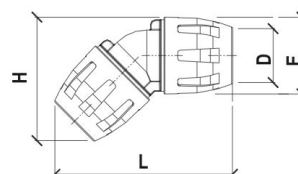


Sealing cap



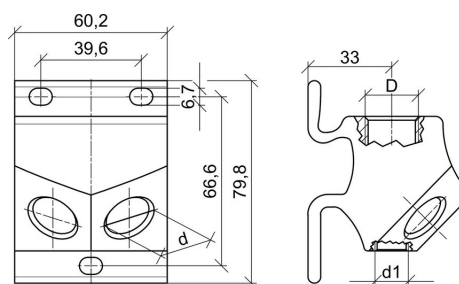
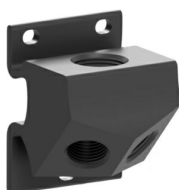
Tube outside diameter D [mm]	E	L	Insertion depth [mm]	Weight [g]	Material	Type
16	37	50	38	30	PA6	SC40-16-DD
20	45	54	48	58	PA6	SC40-20-DD
25	51	60	52	75	PA6	SC40-25-DD
32	61	71	62	126	PA6	SC40-32-DD
40	75	78	70	200	PA6	SC40-40-DD
50	87	85	79	298	PA6	SC40-50-DD
63	108	90	80,5	350	PA6	SC40-63-DD

Elbow connector 45°



Tube outside diameter D [mm]	E	H	L	Insertion depth [mm]	Weight [g]	Material	Type
20	45	72	104	48	100	PA6	SC80-20-DD
25	51	81	115	52	145	PA6	SC80-25-DD
32	61	97	137	62	235	PA6	SC80-32-DD
40	75	115	160	70	375	PA6	SC80-40-DD
50	87	134	185	79	540	PA6	SC80-50-DD
63	108	140	210	80,5	770	PA6	SC80-63-DD

T-connector 45°, with wall mounting bracket, Female thread



Thread d	Thread d1	Thread D	Weight [g]	Material	Type
RP1/2"	RP1/4"	RP1/2"	330	Aluminium	SC81-12-A
RP1/2"	RP1/4"	RP3/4"	350	Aluminium	SC81-34-12-A

d1...This thread is normally closed. After drilling out, a condensate drain can be screwed in here.

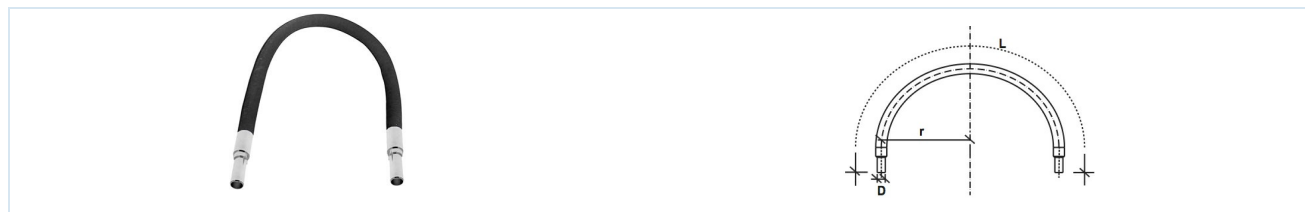


Aluminium tube, S-shaped bent, Length 0,5m, for distance compensation



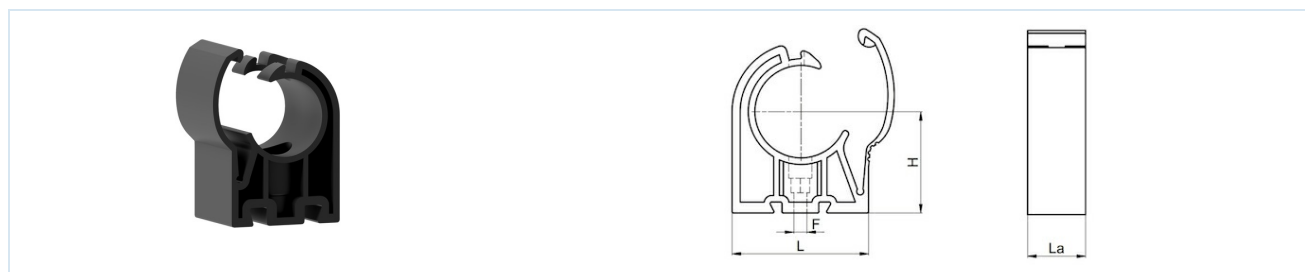
Tube outside diameter D [mm]	Weight [g]	Material	Type
16	70	Aluminium	AL-16/14-BU-0000,5-R-01
20	100	Aluminium	AL-20/17,4-BU-0000,5-R-01
25	130	Aluminium	AL-25/22,2-BU-0000,5-R-01

Flexible hose, Pipe nipple



Tube outside diameter D [mm]	L	r	Weight [g]	Material	Type
20	800	120	810	Aluminium	H0-20
25	820	150	925	Aluminium	H0-25
32	960	190	1200	Aluminium	H0-32
40	1200	230	1580	Aluminium	H0-40
50	1430	300	3400	Aluminium	H0-50
63	1650	390	4800	Aluminium	H0-63

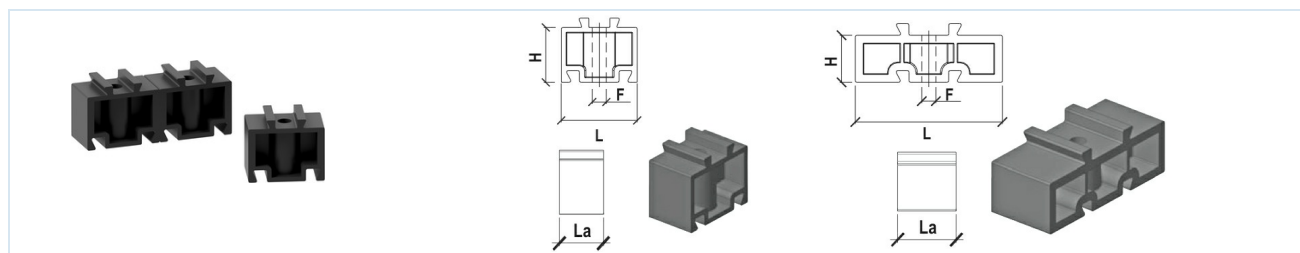
Tube clamp, Polypropylene, Threaded bushing M8



Tube outside diameter D [mm]	F	H	L	La	Weight [g]	Type
16	9	35	31	30	9	PB-16-E
20	9	35	31	30	20	PB-20-E
25	9	35	38	30	30	PB-25-E
32	9	35	49	30	70	PB-32-E
40	9	70	60	40	80	PB-40-E
50	9	70	75	40	85	PB-50-E
63	9	70	94	40	110	PB-63-E



Distance for pipe clamp holder, Polypropylene



Tube outside diameter D [mm]	F	H	L	La	Weight [g]	Type
16-32	9	35	49	30	19	SP-16-32-E
40-63	9	30	94	40	55	SP-40-63-E

Tube deburrer



Tube outside diameter D [mm]	Weight [g]	Type
16...50	440	T00L001
63...110	1760	T00L002

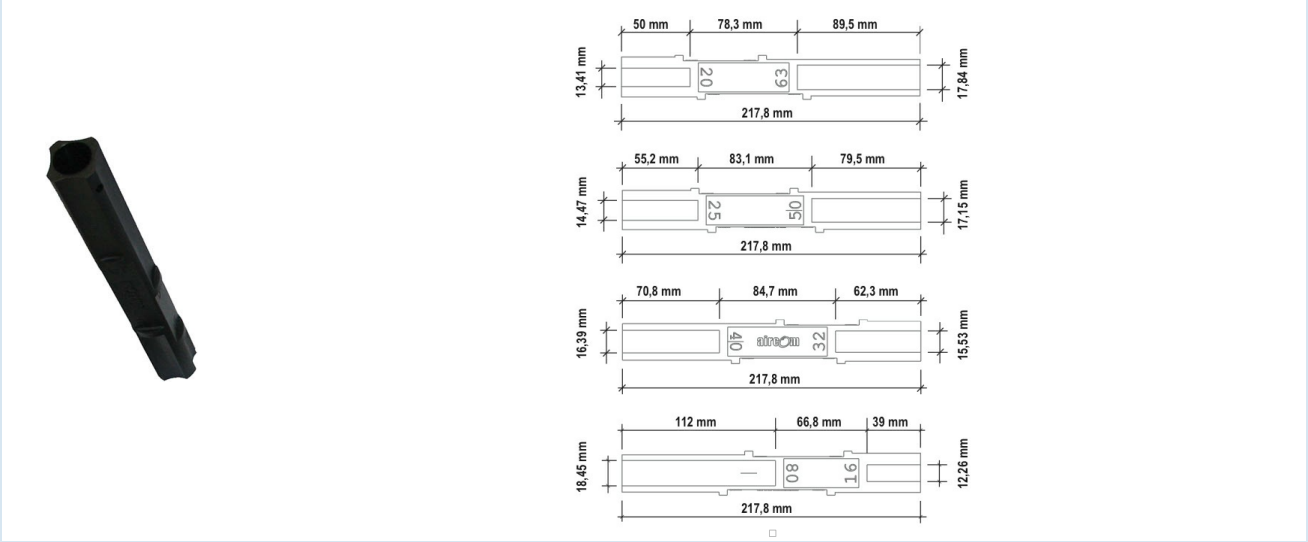
Wrench



Tube outside diameter D [mm]	Weight [g]	Type
20	68	T00L042
25	83	T00L043
32	90	T00L044
40	88	T00L045
50	114	T00L046
63	110	T00L047



Depth gauge



Tube outside diameter D [mm]	Type
16-63	T00L007

Annular cutter



Diameter [mm]	Type
15	T00L008
19	T00L009
24	T00L037

Universal deburring tool



Type
T00L010

Pipe cutter



Tube outside diameter D [mm]	Type
16-63	T00L011

Lubricant



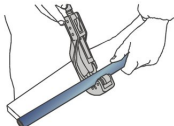
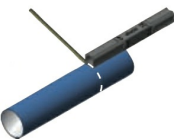
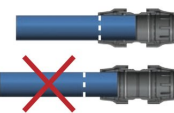
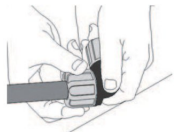
	Type
	LUB003lub

Replacement bushing with O-ring



Tube outside diameter D [mm]	Type
16	BU0R-16
20	BU0R-20
25	BU0R-25
32	BU0R-32
40	BU0R-40
50	BU0R-50
63	BU0R-63

Mounting instructions Fittings

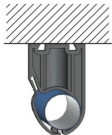
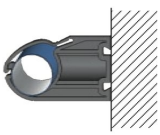
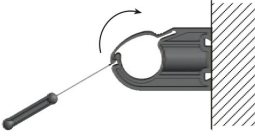
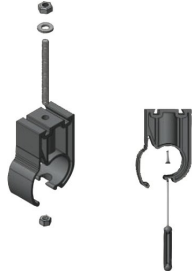
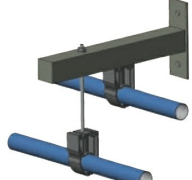
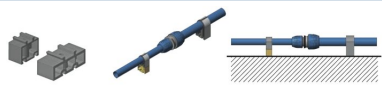
	Cut the tube square and free of burrs. Ensure that the tube has no sharp edges, longitudinal grooves or other damage.
	Chamfer the tube and, if necessary, remove any burrs or cutting residues from the inner edge and from the inside of the tube.
	Tighten the union nut hand-tight only. Then loosen the union nut again by half a turn.
	Mark the insertion depth on the tube.
	For easier handling, the end section of the tube and the O-ring should be lubricated with a suitable lubricant.. Insert the tube into the fitting and push it in as far as it will go.. The marking on the tube can be used to check whether the tube has been inserted far enough.
	Tighten the union nut hand-tight. Normally this is sufficient for diameter sizes 16-25 mm.
	For the larger sizes, the union nut must additionally be tightened by half a turn using a wrench..

Mounting instructions flexible hose

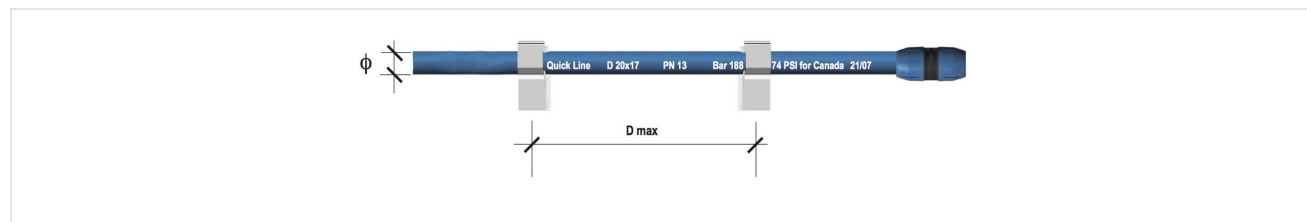
	Thanks to the aluminium adapters fitted at both ends, the hose can be connected directly to the fittings. For this, the same installation instructions must be followed as for the fittings.
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Mounting instructions Tube clamp

		The pipe fastening must be carried out exclusively using these pipe clamps. These pipe clamps allow the pipeline to slide during expansions or contractions due to temperature changes.. The pipe clamps can be used in both horizontal and vertical positions.
		Open the pipe clamp using a screwdriver. To do this lift the retaining tab out of the closure using a screwdriver.
		The pipe clamps can be fixed to the wall using screws and wall plugs. Another option is by means of threaded rod M8. The M8 nut must be inserted into the tube holder for this purpose. The M8 nut is included in the scope of delivery.
		Using the same M8 threaded rod, the pipe clamp can be mounted on other mounting systems.
		If required, spacers are available. These are intended for height compensation.

Maximum distance between the pipe clamps



Tube outside diameter D [mm]	Dmax [m]		
	20°C	30°C	40°C
16	2	2	1,5
20	2,5	2	1,5
25	3	2,5	2
32	3,5	3	2,5
40	4	3,5	3
50	4	3,5	3
63	4	3,5	3

For piping between the floor and a height of 2.5 m, we recommend reducing the spacing by half..

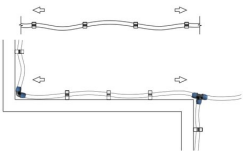
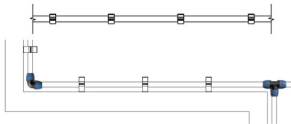
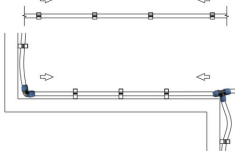


Mounting instructions Pipe branch connection

	Mount pipe branch onto the pipeline.
	Mark the position of the drilled hole and the pipe holder.
	Turn the pipe branch by 180° so that the marking is visible.
	Drill the main pipe with a suitable hole saw through the pilot hole.
	Remove the pipe branch connection. Deburr the drilled hole and remove the chips. Remove internal chips using hand or small vacuum cleaner.
	Place the pipe branch on the pipeline at the marking and tighten.



Expansions and contractions

		
Expansion	neutral state	Abbreviations
• Every material undergoes changes in dimensions due to temperature fluctuations. Starting from the installation temperature, expansions occur as the temperature increases and contractions occur as the temperature decreases. • Therefore, before installing the compressed air piping system, a correct thermal expansion calculation must be carried out beforehand.. • To prevent this effect from causing severe damage, the pipeline between two fixed points must be able to slide freely. • If this is not possible, it is necessary to install an expansion compensator between the two fixed points. • We recommend using expansion loops here (see below).		
		

The following factors for the longitudinal expansion of pipes must be taken into account:

Specific coefficient of linear expansion for aluminium = $23 \times 10^{-6} \text{m/m } ^\circ\text{C}$

Specific linear expansion coefficient for PVC = $75 \times 10^{-6} \text{m/m } ^\circ\text{C}$

For calculating the linear expansion, the following formula must be used:

$$\text{spec. Coefficient of linear expansion} \times \text{Cable length (L)} \times \text{Temperature } (\Delta T) = \Delta L$$

Example calculation:

A compressed air line (aluminium) with a length of 150 m, installed in a hall with an ambient temperature between +15 and +40 °C (ΔT thus 25 °C), expands by:

$$\begin{aligned} \Delta L &= 23 \times 10^{-6} \times 150 \text{m} \times 25^\circ\text{C} \\ \Delta L &= 0,086 \text{m} \end{aligned}$$



Example for pipeline calculation, Inlet pressure 8bar, Pressure drop max. 5%
Aluminium tubes Series SPEEDLINE

Compressed air distribution with ring main

For sizing the ring main, half the nominal length of the entire pipeline and the total compressed air demand must be taken into account.

e.g.: Compressed air consumption 2500NI/min. Operating overpressure 8bar, total pipeline length would be 300m, as a ring main 150m is to be assumed.

A = Line length of the ring main in m

B = Compressor flow rate in NI/min

B	A [m]								
[NI/min]	25	50	100	150	200	300	400	500	1000
600	16	16	20	20	25	25	25	25	32
900	16	20	20	25	25	25	32	32	40
1200	20	25	25	25	32	32	32	32	40
1750	25	25	32	32	32	40	40	40	50
2500	25	32	32	32	40	40	40	50	50
3500	32	32	40	40	40	50	50	50	63
4500	32	32	40	40	50	50	50	50	63
6000	40	40	40	50	50	50	63	63	63
8500	40	40	50	50	50	63	63	63	80
12000	50	50	50	63	63	63	80	80	80
18000	50	63	63	63	80	80	80	80	
21000	63	63	63	80	80	80	80		
31000	63	80	80	80	80				
45000	80	80	80						

Compressed air distribution with branch line

For sizing the branch line, the total pipeline length and the total compressed air demand must be taken into account.

e.g.: Compressed air consumption 2500NI/min. Operating overpressure 8bar, total pipeline length 150m:

A = length of the branch line in m

B = Compressor flow rate in NI/min

B	A [m]								
[NI/min]	25	50	100	150	200	300	400	500	1000
600	16	16	20	20	25	25	25	25	32
900	16	20	20	25	25	25	32	32	40
1200	20	25	25	25	32	32	32	32	40
1750	25	25	32	32	32	40	40	40	50
2500	25	32	32	32	40	40	40	50	50
3500	32	32	40	40	40	50	50	50	63
4500	32	32	40	40	50	50	50	50	63
6000	40	40	40	50	50	50	63	63	63
8500	40	40	50	50	50	63	63	63	80
12000	50	50	50	63	63	63	80	80	80
18000	50	63	63	63	80	80	80	80	
21000	63	63	63	80	80	80	80		
31000	63	80	80	80	80				
45000	80	80	80						

To determine the required line lengths for main, supply and branch lines, it is recommended to design the supply line as a ring main..



Spare tube length of fittings per piece in m							
Ø outside in mm							
16	0,1	0,7		0,1	0,1		0,8
20	0,2	1,2	1,0	0,2	0,2		1,2
25	0,2	1,5	1,2	0,3	0,2	1,8	1,5
32	0,3	2,0	1,3	0,3	0,3	2,4	
40	0,3	2,4	1,6	0,4	0,3	3,0	
50	0,4	3,0	2,0	0,4	0,4	4,0	
63	0,5	3,5	2,5	0,5	0,4	5,5	
80	0,7	4,8		0,7	0,4	6,5	

These values must be added to the actual pipe length in order to obtain the flow-equivalent pipeline length L.

Illustrations non-binding

Design, dimensional and material changes reserved

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