

# AIR-CONCEPTS

*air distribution products*



# FloXact™ Stick

#### Application

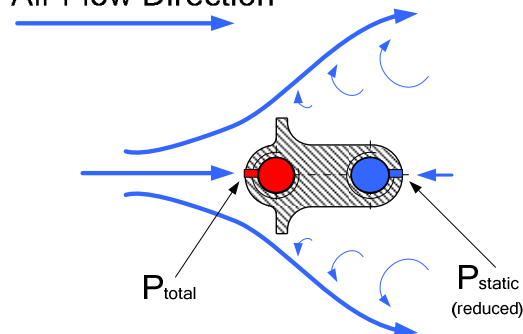
The FloXact™ Stick is used to measure air velocity / air volume in HVAC systems. The design allows for easy installation in existing air duct or terminals.

The FloXact™ Stick operates on the pitot tube principle and measures the total and static pressure components of airflow.

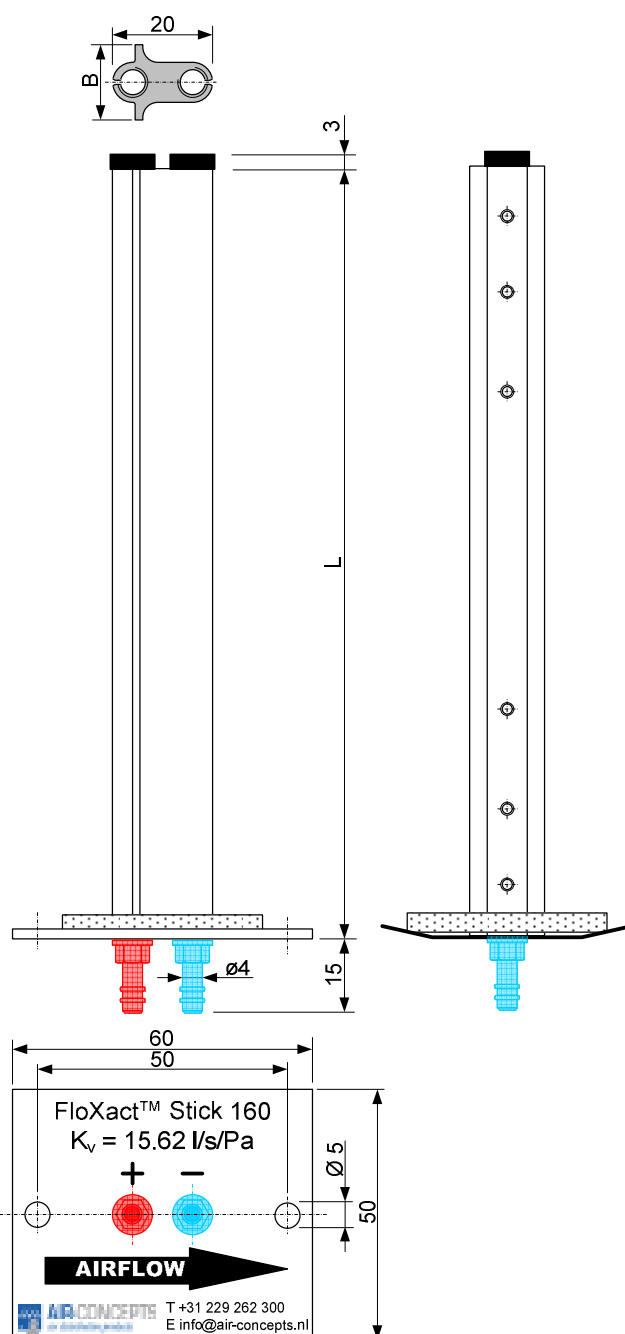
The sensor determines the average air velocity, measured over 6, 8 or 10 measuring points, depending on the size.

The unique shape of the measuring profile creates a linear amplification of at least  $2.5 \times P_{dyn}$  making accurate measurements from 1,0 m/s possible.

Air Flow Direction



Operation of the FloXact™



#### Design features

- Easy installation in existing air ducts or terminals
- Multi point averaging according to the "Log-Tchebycheff" method
- 2% accuracy starting from 1,0 m/s air velocity
- The unique shape (patent pending) creates a linear amplification of at least  $2.5 \times P_{dyn}$ .
- Chamfered entrances to eliminate air direction effects make the FloXact™ Stick insensitive to approaching multi-directional, rotating airflow with yaw and pitch up to  $30^\circ$  from straight flow.
- 8 standard sizes  $\varnothing 100$ ,  $\varnothing 125$ ,  $\varnothing 160$ ,  $\varnothing 200$ ,  $\varnothing 250$ ,  $\varnothing 315$ ,  $\varnothing 355$  and  $\varnothing 400$ , other dimensions or sensors for rectangular duct are available upon request.
- Operating temperature  $+5$  to  $+95^\circ\text{C}$

#### Dimensions FloXact™-Rxxx

	100	125	160	200	250	315	355	400
L	95	120	156	196	146	311	351	396
B	15				25			

### 2.1 - FloXact™-Stick

#### Operation

The FloXact™-Stick operates on the pitot tube principle and measures the total and static pressure components of airflow. The pressure ports located on the leading surface are sensing the total pressure (Pt) and sensing ports positioned at the rear, sense the static pressure (Ps). The difference between the total pressure and the static pressure is the dynamic pressure (Pd) which relates to the squared air velocity as:

$$P_d = \frac{1}{2} \times \rho \times v^2$$

$P_d$  = dynamic pressure in Pa

$\rho$  = density of the gas (air) in kg/m<sup>3</sup>

$v$  = velocity in m/s

To simplify mathematics and include the amplification and duct area, the FloXact™-Sticks are provided with a  $K_v$  value.

The air volume can be determined with the following formula:

$$Q = K_v \times \sqrt{P_{fs}}$$

$Q$  = air volume in l/s

$K_v$  =  $K_v$  value in l/s/Pa

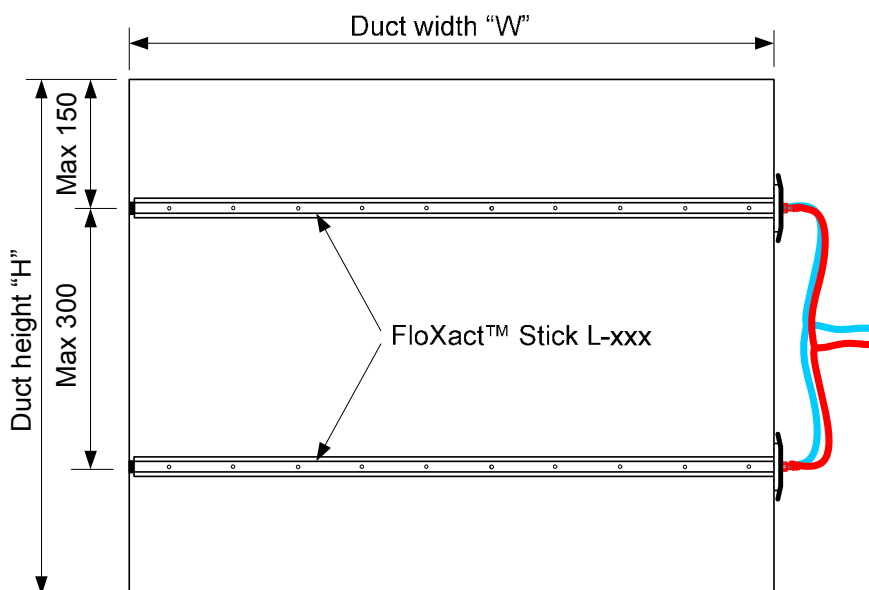
$P_{fs}$  = pressure difference measured by the FloXact™ Stick in Pa

Model	100	125	160	200	250	315	355	400
Kv	5,60	9,17	15,62	25,06	38,43	62,85	80,83	103,76
$P_{fs}$ in Pa	Air volume in l/s							
2	8	13	22	35	54	89	114	147
3	10	16	27	43	67	109	140	180
4	11	18	31	50	77	126	162	208
5	13	21	35	56	86	141	181	232
6	14	22	38	61	94	154	198	254
7	15	24	41	66	102	166	214	275
8	16	26	44	71	109	178	229	293
9	17	28	47	75	115	189	243	311
10	18	29	49	79	122	199	256	328
12	19	32	54	87	133	218	280	359
14	21	34	58	94	144	235	302	388
16	22	37	62	100	154	251	323	415
18	24	39	66	106	163	267	343	440
20	25	41	70	112	172	281	362	464
25	28	46	78	125	192	314	404	519
30	31	50	86	137	210	344	443	568
35	33	54	92	148	227	372	478	614
40	35	58	99	159	243	397	511	656
45	38	62	105	168	258	422	542	696
50	40	65	110	177	272	444	572	734
60	43	71	121	194	298	487	626	804
70	47	77	131	210	322	526	676	868
80	50	82	140	224	344	562	723	928
90	53	87	148	238	365	596	767	984
100	56	92	156	251	384	628	808	1.038
125	63	103	175	280	430	703	904	1.160
150	69	112	191	307	471	770	990	1.271
175	74	121	207	332	508	831	1.069	1.373
200	79	130	221	354	543	889	1.143	1.467
225	84	138	234	376	576	943	1.213	1.556
250	89	145	247	396	608	994	1.278	1.641
275	93	152	259	416	637	1.042	1.340	1.721
300	97	159	270	434	666	1.089	1.400	1.797

- Kv values are based on  $D_{nom} = D - 3$  mm.
- The table above is for air with 1.20 kg/m<sup>3</sup> density (20°C, 50% r.h. and 1013 mbar).

- The correction for different densities is determined with the following formula : **Corr** =  $\sqrt{(\rho/1.20)}$

#### Mounting instructions rectangular units



Duct "H"	N° off FloXact™	Duct or unit width "W"													
		200	250	300	350	400	450	500	600	700	800	900	1000	1100	1200
		<b>K<sub>v</sub> value in l/s/Pa</b>													
150	1	23,0	28,8	34,5	40,3	46,0	51,8	57,5	69,1	80,6	92,1	104	115	127	138
200		33,1	41,4	49,7	58,0	66,3	74,6	82,9	99,4	116	133	149	166	182	199
250		41,4	51,8	62,1	72,5	82,9	93,2	104	124	145	166	186	207	228	249
300		47,0	58,7	70,4	82,2	94	106	117	141	164	188	211	235	258	282
350	2	55,2	69,1	82,9	96,7	110	124	138	166	193	221	249	276	304	331
400		65,4	81,7	98,1	114	131	147	163	196	229	261	294	327	360	392
450		73,7	92,1	110	129	147	166	184	221	258	295	331	368	405	442
500		83,8	105	126	147	168	189	209	251	293	335	377	419	461	503
600		101	127	152	177	203	228	253	304	354	405	456	506	557	608
700	3	115	144	173	201	230	259	288	345	403	460	518	575	633	691
800		133	167	200	234	267	300	334	400	467	534	601	667	734	801
900		152	190	228	266	304	342	380	456	532	608	684	760	836	911
1000	4	166	207	249	290	331	373	414	497	580	663	746	829	911	994
1100		184	230	276	322	368	414	460	552	644	737	829	921	1013	1105
1200		203	253	304	354	405	456	506	608	709	810	911	1013	1114	1215

- The air volume can be determined with the following formula:
- The table above is for air with 1.20 kg/m<sup>3</sup> density (20°C, 50% r.h. and 1013 mbar). The correction for different densities is determined with the following

$$Q = K_v \times \sqrt{P_{fs}}$$

Q = air volume in l/s  
 K<sub>v</sub> = K<sub>v</sub> value in l/s/Pa  
 P<sub>fs</sub> = pressure difference measured by the FloXact™ Stick in Pa

formula : **Corr** =  $\sqrt{(\rho/1.20)}$

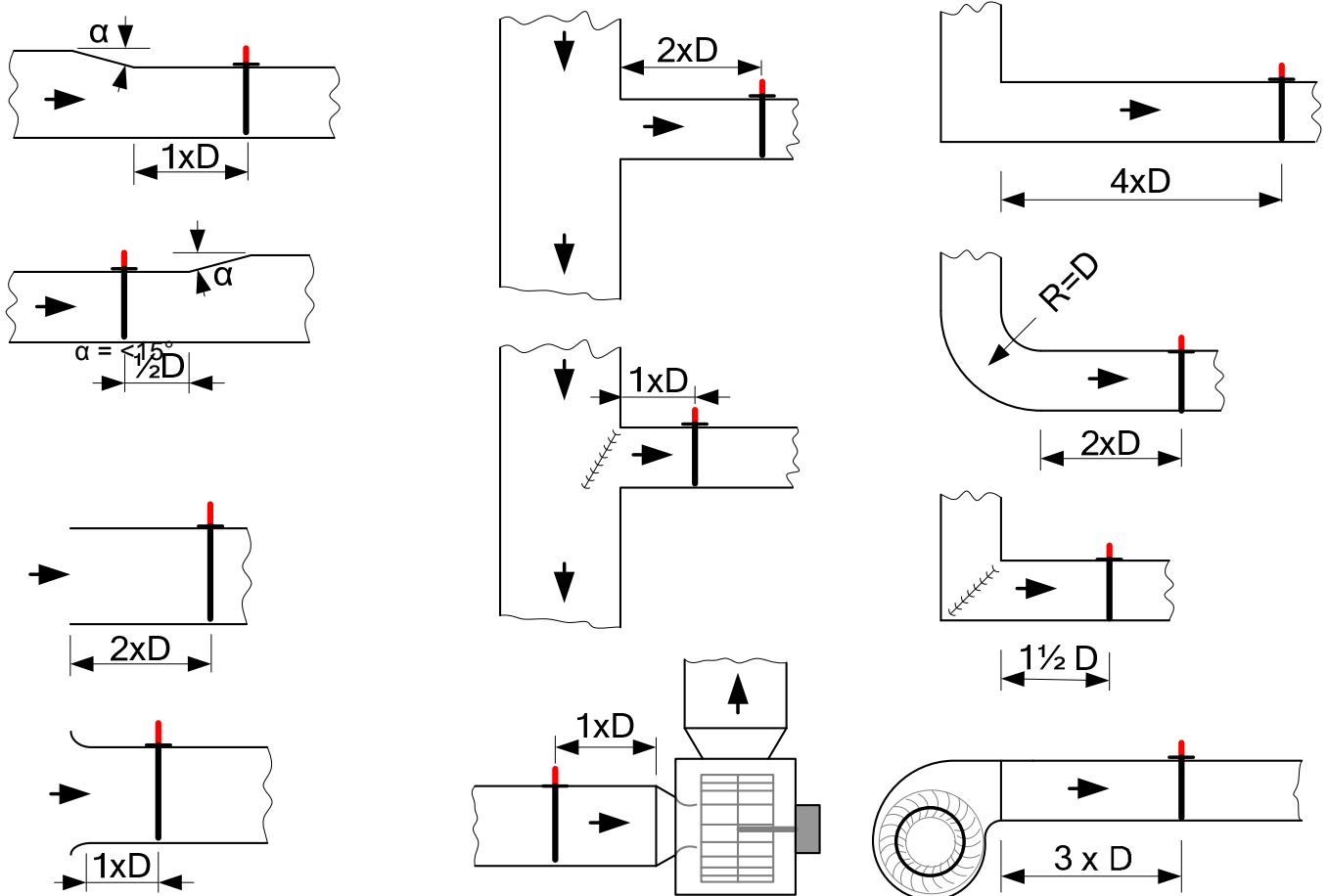
- For intermediate sizes, please contact our office

#### Mounting instructions

- Check that the FloXact™ Stick size corresponds with the duct or terminal were it is installed.
- The FloXact™ Stick is mounted in the duct by drilling a  $\varnothing 25\text{mm}$  hole.
- Check that the air flow direction in the duct corresponds with the arrow on the FloXact™ Stick.
- For round ducts, we recommend to install the FloXact™ Stick diagonally in the duct. This equalises both horizontal and vertical irregular air approach.
- For non standard applications, please contact our office



#### Minimum straight duct approach



Round ducts : **D = duct diameter**  
 Rectangular ducts : **D = 2 x (H x W) / (H + W)**  
 Example:  
 W = 600, H = 300  
 $D = 2 \times (600 \times 300) / (600 + 300) = 400 \text{ mm}$

#### UNIVERSAL AIR FLOW METER – DPT FLOW U

Measures air flow and velocity



#### Model summary and technical data

Each device is individually temperature compensated.

The calculation based on Universal formula:  $V = k * \sqrt{\Delta P(Pa)}$ , the unit is given in menu

DPT Flow - D for display -AZ for autozero	P range	Scalable Air flow range or Air velocity range	Accuracy for pressure **) over operation temp. -5...+50°C	Long term stability typical 1 year without – AZ -AZ	
				≤ ± 1 Pa	≤ ± 24 Pa *)
DPT Flow-U-7000 (-D, -AZ)	0...7000 Pa	0-1...50 m3/s 0-4000 ... 200000 m3/h	± 7Pa + ± 1,5% from reading	≤ ± 1 Pa	≤ ± 24 Pa *)
DPT Flow-U-5000 (-D, -AZ)	0...5000 Pa	0-2000 ... 100000 cfm 0-1000 ... 50000 l/s	± 7Pa + ± 1,5% from reading	≤ ± 1 Pa	≤ ± 24 Pa *)
DPT Flow-U-2000 (-D, -AZ)	0...2000 Pa	0-10...100 m/s 0-2000...20000 f/min	± 5Pa + ± 1,5% from reading	≤ ± 1 Pa	≤ ± 8 Pa *)
DPT Flow-U-1000 (-D, -AZ)	0...1000 Pa		± 5Pa + ± 1,5% from reading	≤ ± 1 Pa	≤ ± 8 Pa *)

\*\*) including: general accuracy, temperature drift, linearity, hysteresis and repetition error

\*) - AZ model recommended

#### Display

Alphanumeric display with MENU user interface  
 The display can be ordered separately for installation purposes.

Bursting pressure	30 kPa
Suitable media	Air and non-aggressive gases
Measuring element	Piezoresistive

#### MENU selections and initialization instructions for installation

If buttons are not pressed within 20 seconds the device returns to the normal measuring mode.

Press select >2 seconds



1. Press Select > 2 seconds to start the menu.

2. Select K-value range, either

0.001...1.00 or  
1.00...2000

3. Set the right k-value for the formula

$$V = k * \sqrt{\Delta P(Pa)}$$

for examples:

Air Velocity: k-value depends on pitot tube coefficient , general K=1.29.

Air Flow : k-value depends on pitot tube coefficient and duct size or the Fan type if measured over fan.

4. Set the unit for the formula  $V = k * \sqrt{\Delta P(Pa)}$

Flow volume: m3/s, m3/h, cfm, l/s

Velocity: m/s or f/min

5. Set Display and V output unit

Flow volume: m3/s, m3/h, cfm, l/s

Velocity: m/s, feet/min

(Pa value is always shown on display first row)

6. Output scale, scalable

m3/s → 10V = 0,025 ... 50 m3/s

m3/h → 10V = 100 ... 200 000 m3/h

cfm → 10V = 50 ... 100000 cfm

l/s → 10V = 25 ... 50000 l/s

m/s → 10V = 10 ... 100 m/s

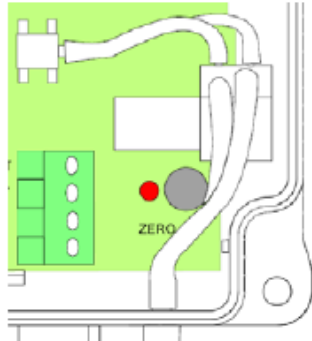
f/min → 10V = 2000 ... 20000 f/min

7. Stepless response time selection.

1s...20s.

8. Press end and the device returns to the normal measuring mode

#### Auto zero element



Auto zero element makes the DPT FLOW meter maintenance free. Element automatically adjusts the transmitters zero point from time to time, this eliminates the zero point long term drift of the piezoresistive sensing element.

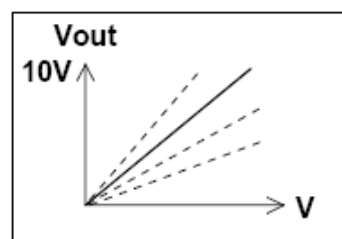
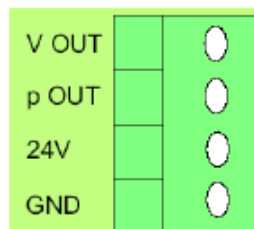
During zero point adjustment the output and display values will freeze to the latest measured value. The automatic zero point adjustment takes 4 seconds. Zero point adjustment is carried out every 10 minutes normally and during warm up the time is shorter a few times.

If the device is not equipped with autozero element, it is recommended to carry out the zero point adjustment every 12 months. Supply voltage must be connected one hour before the zero-point adjustment is carried out.

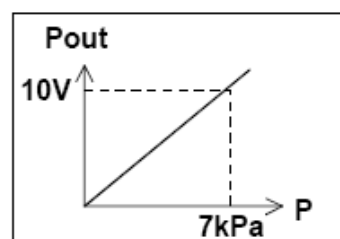
- 1) Loose both tubes from the pressure inlets + and -
- 2) Push zero button until the red led turns ON.
- 3) Wait until LED turns off and then install tubes again to the pressure inlets

#### Electrical interface

Supply voltage	24 VAC or VDC $\pm$ 10%
Power consumption	< 1.0 W
Output signal	Vout 0...10 VDC, Load R minimum 1k $\Omega$ Pout 0...10 VDC, Load R minimum 1k $\Omega$

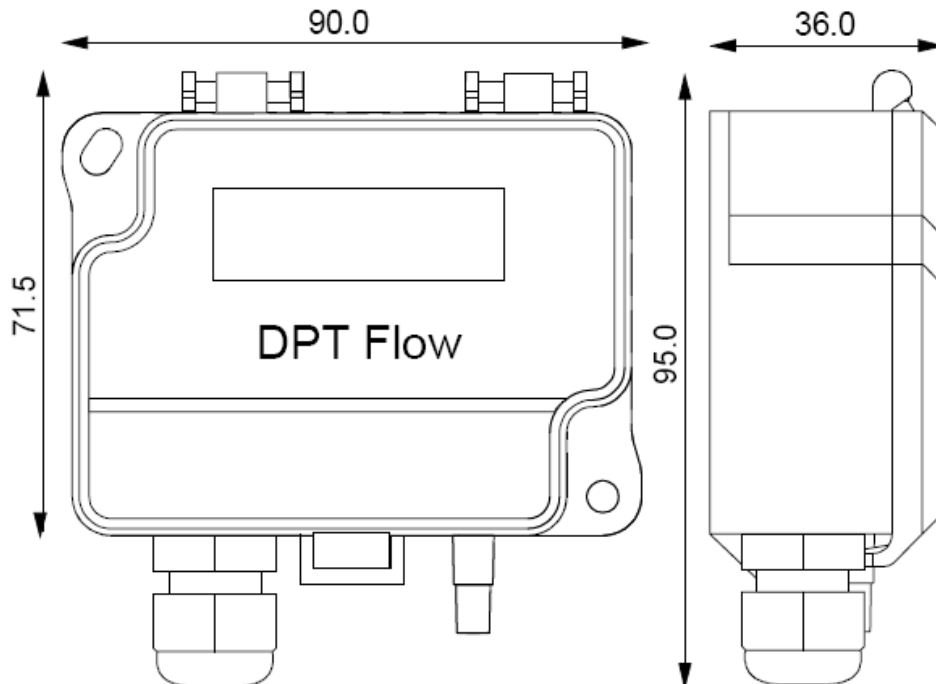


V out scale  
can be changed





<b>Materials</b>	Housing	ABS
	Cover	ABS
	Pressure connections	ABS
	Duct connectors	ABS
	Tubing	PVC, soft
<b>Connections</b>	Electrical connections	4 screw terminals, max 1.5 mm <sup>2</sup>
	Cable entry	M16
	Pressure connections	Male Ø 5,0 mm and 6,3 mm
<b>Weight</b>	150 grams	
<b>Dimensions</b>	90,0 x 71,5 x 36,0 mm	
<b>General ambient conditions</b>	Temperature range	
	Operation	-5...+50°C
	Storage	-20...+70°C
	Ambient humidity	0 to 95% RH
<b>Safety</b>	Protection standard	IP54
<b>Conformance</b>	Meets the requirements for CE marking:	
	EMC directive 2004/108/EEC	
	RoHS Directive 2002/95/EEC	



#### Type Designation

<b>FloXact™ Stick</b>	-	<b>R</b>	-	<b>200</b>
Type		model		size
Round ducts -		R		100
Rectangular ducts -		L		1200

#### Delivery

The FloXact™ Stick is supplied complete with:

- Gasket
- 50 cm red and blue PU-tubing  $\varnothing 4/\varnothing 6$

