Rotational flow tunnel for visualisation of rotation flow in pipes

Flow measurement / selection criteria

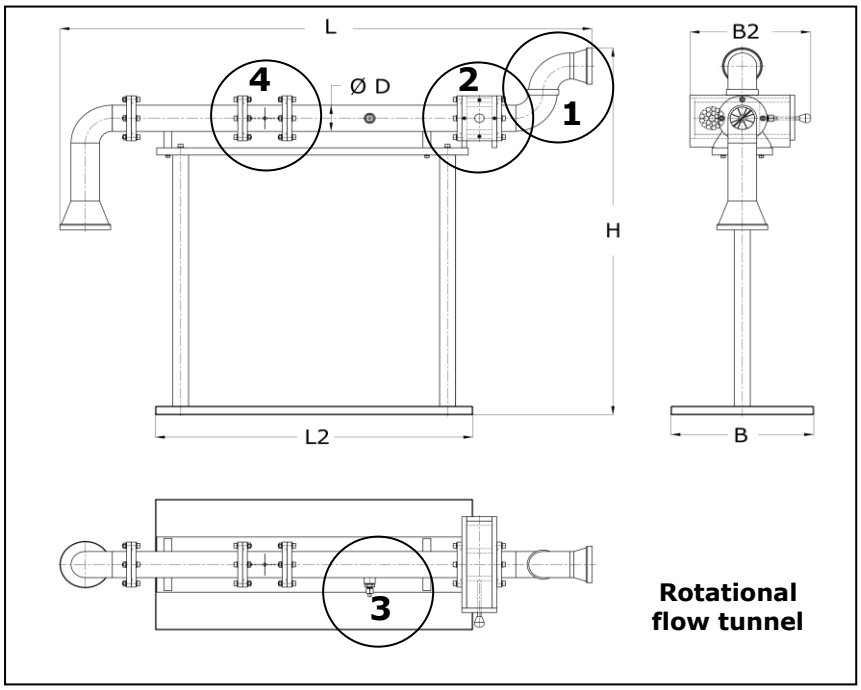
- A wide range of measurement technology is available for flow velocity and flow rate measurement. In order to select a suitable measuring principle and the appropriate sensor technology, the application must be considered more closely. Criteria for sensor selection are among others the medium to be measured, its operating parameters, pipe sizes, explosion protection requirements, SIL requirements, degree of pollution of the medium, flow velocities, etc..

Requirements on the flow / disturbances of the flow

- An important prerequisite for a well-functioning measurement is a well formed, centric and over time constant flow profile without rotational flow. It has to be considered that all fittings protruding into the pipeline and the pipeline routing itself have a disturbing influence on the flow profile.
  A rotational flow represents a particular challenge, as very long pipe sections are necessary to dissolve rotational flow. Different disturbances can overlap.

Rotational flow tunnel / visualisation / influence on the measurement results

- With our rotational flow tunnel the rotational flow caused by an upstream disturbance can be visualised. You can clearly explain, illustrate and find out for yourself, how rotational flow can be created, for example by pipe elbows. The effect on the measurement results can also be directly observed with an integrated flow sensor.
- The rotational flow is a rotationally symmetrical flow with circumferential flow components. The flow vectors not only have an axial but also a radial component. The flowing particles then move on helical paths. Flow measurement is impaired because the radial components are hardly detected and, in addition, flow velocity in the centre of the pipe decreases.
- The rotational flow tunnel also offers the possibilities to observe in a very direct way the function of flow rectifiers and their effects on the flow profile and the measured values.

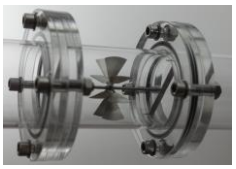


1 inlet design

2x 90° elbow; elbows are arranged in a plane

2x 90° elbow; elbows are arranged 3-dimensional in space and not in a plane

4 indicator rotational flow



indicator doesn`t rotate; no rotational flow

indicator rotates; rotational flow

3 sensor mounting

Threaded socket with internal thread for the installation of flow sensors.
Using the measurement results, the influence of rotational flow in pipes can be observed and examined.

2 flow rectifier

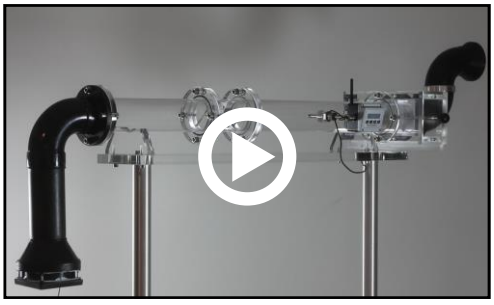
rectifier is not in use;
free passage of air flow;

rectifier is not in use;
air must flow through the rectifier;

Technical data

dimensions	length L length L2 width B width B2 height H	1675 mm 800 mm 450 mm 380/475 mm 1264 mm
weight	approx. 45 kg	
pipe diameter	80 mm	
pipeline material	acrylic glass	
rectifier	bundle rectifier	
indicator	special aluminium vane wheel	
fan	suction fan 230 VAC with safety plug	
sensor connection	1 ½" thread socket	

You can see the viedo of the rotational flow tunnel in operation by following this link
https://youtu.be/jW6cWvpRopU



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