Westenberg
Engineering
Engineering consultancy for fluid dynamics

Product Catalogue

Wind Tunnels Measurement Systems &

Equipment & Services

Westenberg
Wind Tunnels
& Measurement Systems

2015

1. Westenberg: Company´s Profile

Westenberg Engineering has two different divisions: an engineering office Westenberg Engineering and the manufacturing department Westenberg Wind Tunnels.Westenberg Engineering has been founded by John B. Westenberg(degreed engineer)in1992 . Westenberg Engineering is focused on engineering and developement of customized solutions around all kind of fluid dynmamical and fluid mechanical themes. The integrated DAkkS certified calibration for air velocity measurement is part of unit!

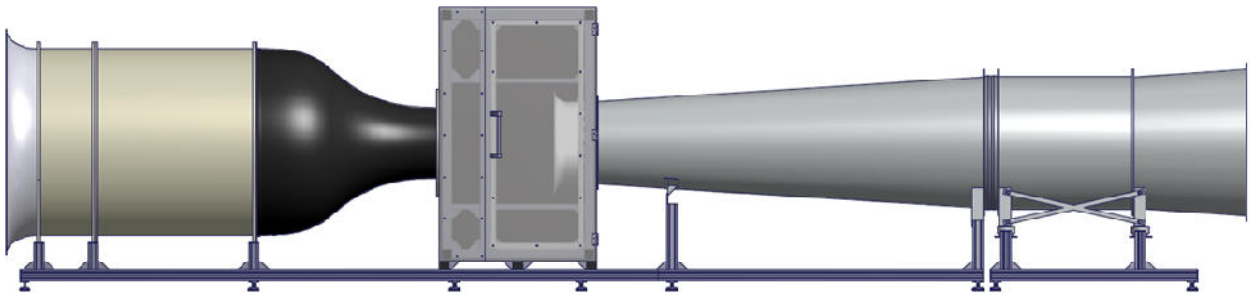
Based on a long lasting experience we develop and manufacture wind tunnels offering all kind of service features for fluid dynamical chalanges.

2. Eiffel Type Wind Tunnels

The Eiffel Type wind tunnel is an open tube without recirculation of the flow.
The fan is placed at the tunnels end inside of the outlet difuser.
The flow streams through a settling chamber (equipped with honey comb and screens) to the nozzle followed by the closed measurement chamber. Due to the negative pressure in the chamber this is indispensable.

The essential advantages of the Eiffel Type wind tunnel are as follows:

- No twist effects caused by the fan
- No turbulences caused by the aerodynamical corners
- The wind tunnel aspirates only calm ambient air (please consider the location)
- The temperature inside the measurement chamber mostly matches with the temperature of the ambience.



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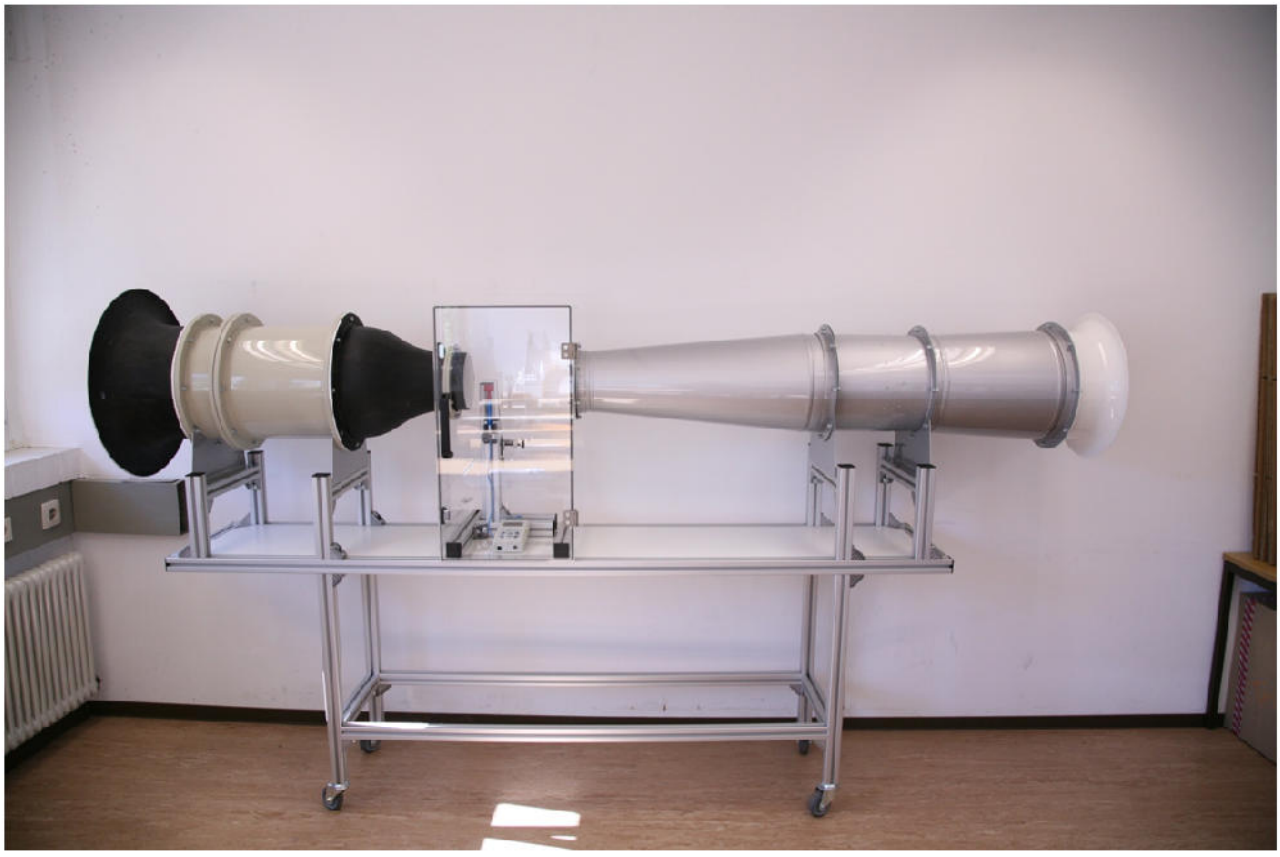
WK 818040-E

Technical data:

Diameter of jet outlet:	180 mm
Actual length of working section:	215 mm
Contraction ratio:	4
Flow speed:	0.3 - 40 m/s
(50 m sea level)	
Turbulence ratio by 20 m/s:	< 0.5 - 0.8 %
Fan connection:	240 V / 50 Hz
Motor output:	1.1 kW
Dimensions (width, height, length):	617 x 1862 x 3085 mm
Weight:	approx. 105 kg

Technical data are subject to change



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WK 825535-E

Technical data:

Diameter of jet outlet:	180 mm
Actual length of working section:	200 mm
Contraction ratio:	4
Flow speed:	0.3 - 35 m/s
(50 m sea level)	
Turbulence ratio by 20 m/s:	0,5 - 0,8 %
Fan connection:	400 V / 50 Hz
Motor output:	4.5 kW
Dimensions (width, height, length):	900 x 1510 x 4450 mm
Weight:	approx. 200 kg

Technical data are subject to change

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WK 832060-E

Technical data:

Diameter of jet outlet:	320 mm
Actual length of working section:	500 mm
Contraction ratio:	8
Flow speed: (50 m sea level)	0.3 - 60 m/s
Turbulence ratio by 20 m/s:	< 0.5 - 0.8 %
Fan connection:	400 V / 50 Hz
Motor output:	9 kW
Dimensions (width, height, length):	1500 x 1500 x 7500 mm
Weight:	approx. 2.200 kg

Technical data are subject to change

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WK 860060-E

Technical data:

Diameter of jet outlet:	600 mm
Actual length of working section:	800 mm
Contraction ratio:	5,5
Flow speed:	0.3 - 60 m/s
(50 m sea level)	
Turbulence ratio by 20 m/s:	0.5 - 0.8 %
Fan connection:	400 V / 50 Hz
Motor output:	35 kW
Dimensions (width, height, length):	1500 x 2000 x 8000 mm
Weight:	approx. 3.100 kg

Technical data are subject to change

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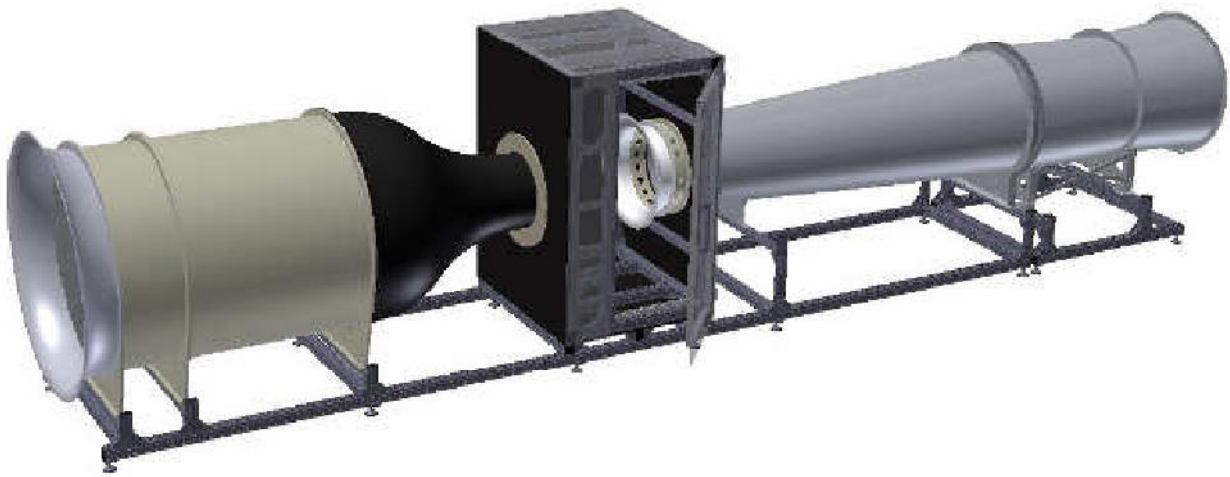
WK 860075-E

Technical data:

Diameter of jet outlet:	600 mm
Actual length of working section:	900 mm
Contraction ratio:	8
Flow speed:	0.5 - 75 m/s
(50 m sea level)	
Turbulence ratio by 20 m/s:	0.5 %
Fan connection:	3 x 220 V 300 A / 50 Hz
Motor output:	85 kW
Dimensions (width, height, length):	1970 x 2490 x 10900 mm

Technical data are subject to change



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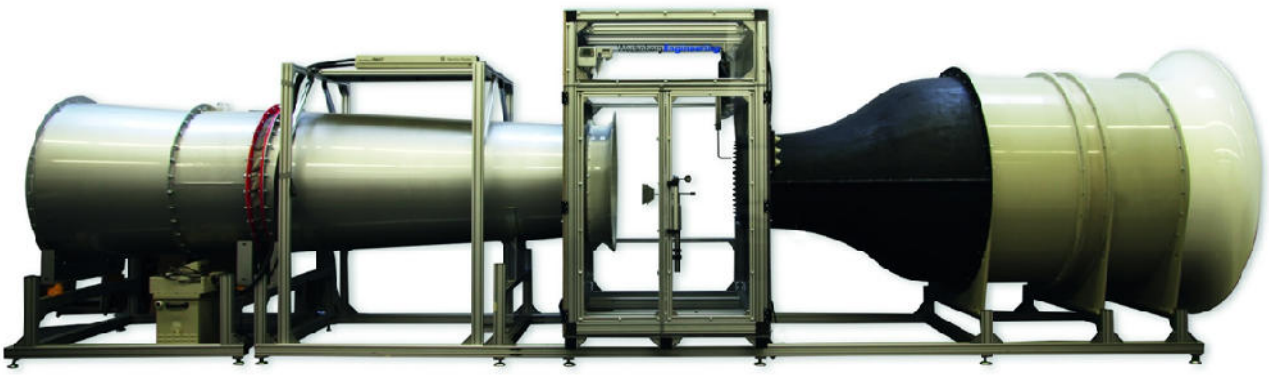
WK 880050-E

Technical data:

Diameter of jet outlet:	800 mm
Actual length of working section:	1000 mm
Contraction ratio:	4
Flow speed:	0.3 - 50 m/s
(50 m sea level)	
Turbulence ratio by 20 m/s:	0.5 - 0.8 %
Fan connection:	400 V / 50 Hz
Motor output:	34 kW
Dimensions (width, height, length):	2360 x 2600 x 11000 mm

Technical data are subject to change



3. Goettinger Type Wind Tunnel

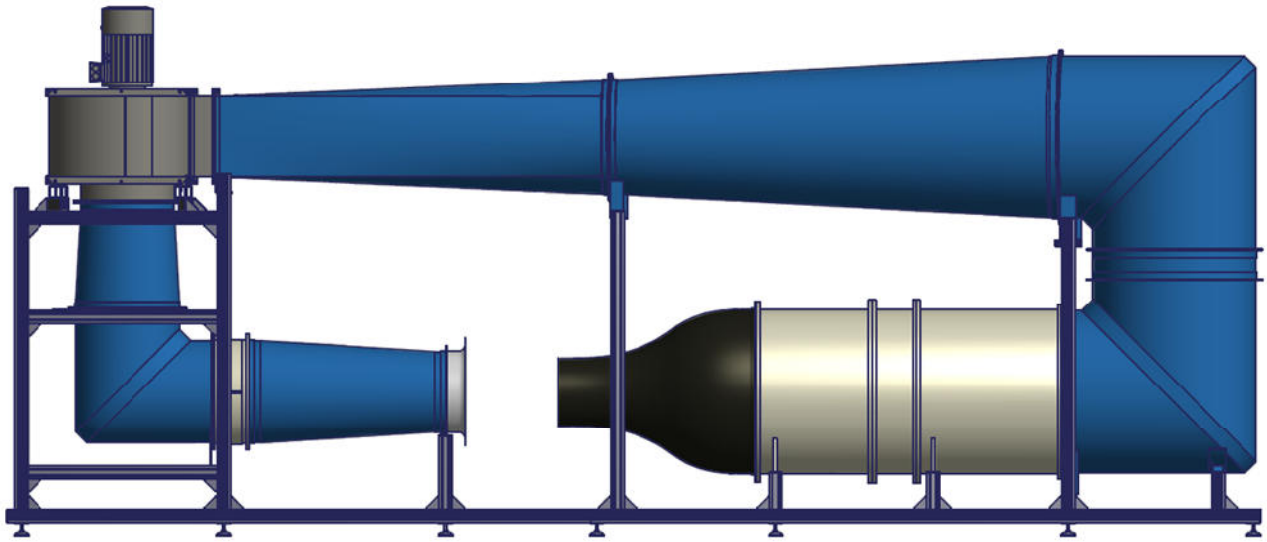
The Goettingen Type wind tunnel is a recirculating with a closed loop.

Wind tunnels of this type can be driven optional with a closed or an open test section.

The open test section allows much more comfort for the measurement procedure!

The Goettingen Type wind tunnel has a big distance between the fan and the measurement area so that there is less than a marinal influence of the fan´s twist effects to the measurement area.

One other big advantage is the lower energy consumption compared to a Eiffel Type tunnel.



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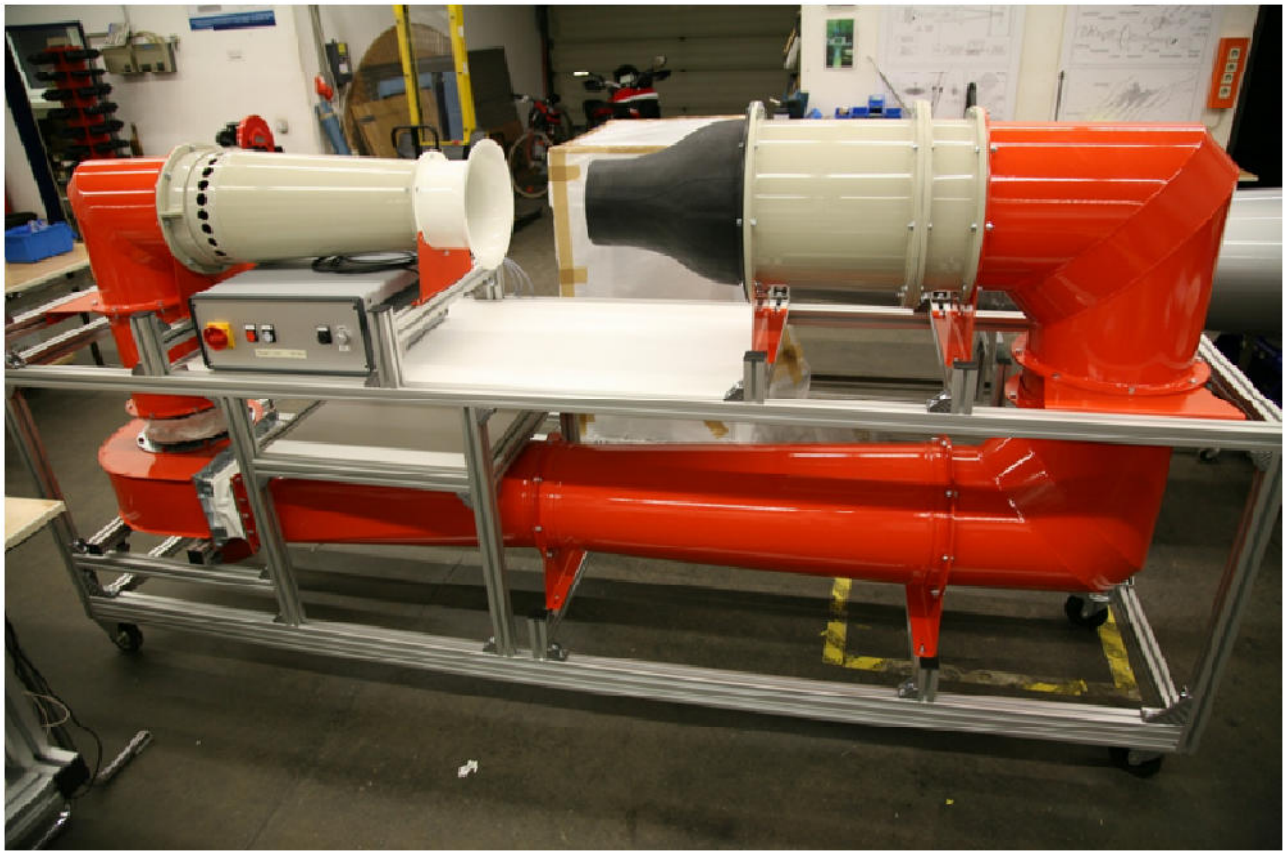
WK 818035-G

Technical data:

Diameter of jet outlet:	800 mm
Actual length of working section:	1000 mm
Contraction ratio:	4
Flow speed:	0.3 - 50 m/s
(50 m sea level)	
Turbulence ratio by 20 m/s:	0.5 - 0.8 %
Fan connection:	400 V / 50 Hz
Motor output:	34 kW
Dimensions (width, height, length):	2360 x 2600 x 11000 mm
Weight:	approx. 200 kg

Technical data are subject to change



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WK 818065-G / 825540-G

Technical data:

Diameter of jet outlet:	180 mm / 255 mm
Actual length of working section:	280 mm / 320 mm
Contraction ratio:	8 / 4
Flow speed: (50 m sea level)	0.1 - 65 m/s / 0.1 - 40 m/s
Turbulence ratio by 20 m/s:	0.3 - 0.5 %
Fan connection:	400 V / 50 Hz
Motor output:	4 kW
Dimensions (width, height, length):	2100 x 1400 x 4100 mm

Technical data are subject to change

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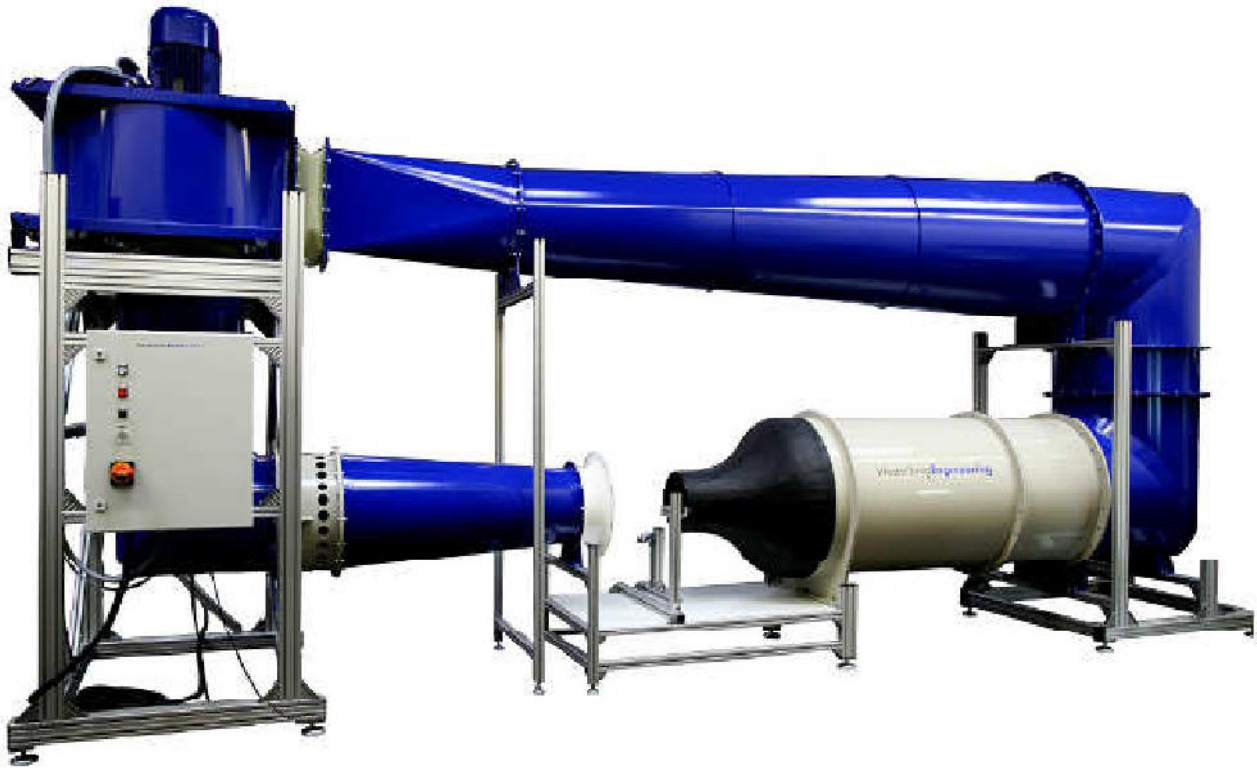
WK 832070-G

Technical data:

Diameter of jet outlet:	320 mm
Actual length of working section:	468 mm
Contraction ratio:	8
Flow speed: (50 m sea level)	0.1 - 70 m/s
Turbulence ratio by 20 m/s:	0.3 - 0.5 %
Fan connection:	400 V / 50 Hz
Motor output:	12 kW
Dimensions (width, height, length):	1600 x 2790 x 6995 mm

Technical data are subject to change



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WK 845050-G

Technical data:

Diameter of jet outlet:	450 mm
Actual length of working section:	630 mm
Contraction ratio:	6
Flow speed:	0.3 - 50 m/s
(50 m sea level)	
Turbulence ratio by 20 m/s:	0.3 - 0.5 %
Fan connection:	400 V / 50 Hz
Motor output:	22 kW
Dimensions (width, height, length):	1600 x 2790 x 6995 mm

Technical data are subject to change

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WK 860060-G

Technical data:

Diameter of jet outlet:	600 mm
Actual length of working section:	1000 mm
Contraction ratio:	5,44
Flow speed:	0.1 - 60 m/s
(50 m sea level)	
Turbulence ratio by 20 m/s:	0.3 - 0.5 %
Fan connection:	400 V / 50 Hz
Motor output:	44 kW
Dimensions (width, height, length):	5000 x 2700 x 12900 mm

Technical data are subject to change

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WK 8250x25040-G

Technical data:

Diameter of jet outlet:	250 x 250 mm
Actual length of working section:	600 mm
Contraction ratio:	8
Flow speed: (50 m sea level)	0.2 - 40 m/s
Turbulence ratio by 20 m/s:	0.8 %
Fan connection:	400 V / 50 Hz
Motor output:	5 kW
Dimensions (width, height, length):	1400 x 2000 x 4700 mm

Technical data are subject to change

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WK 8300x30040-G

Technical data:

Diameter of jet outlet:	300 x 300 mm
Actual length of working section:	600 mm
Contraction ratio:	1:4
Flow speed:	0.3 - 40 m/s
(50 m sea level)	
Turbulence ratio by 20 m/s:	0,8 %
Fan connection:	3 x 400 V 32 A 50 Hz
Motor output:	5.5 kW
Dimensions (width, height, length):	1290 x 2055 x 5828 mm

Technical data are subject to change

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WK 81300x80025-G

Technical data:

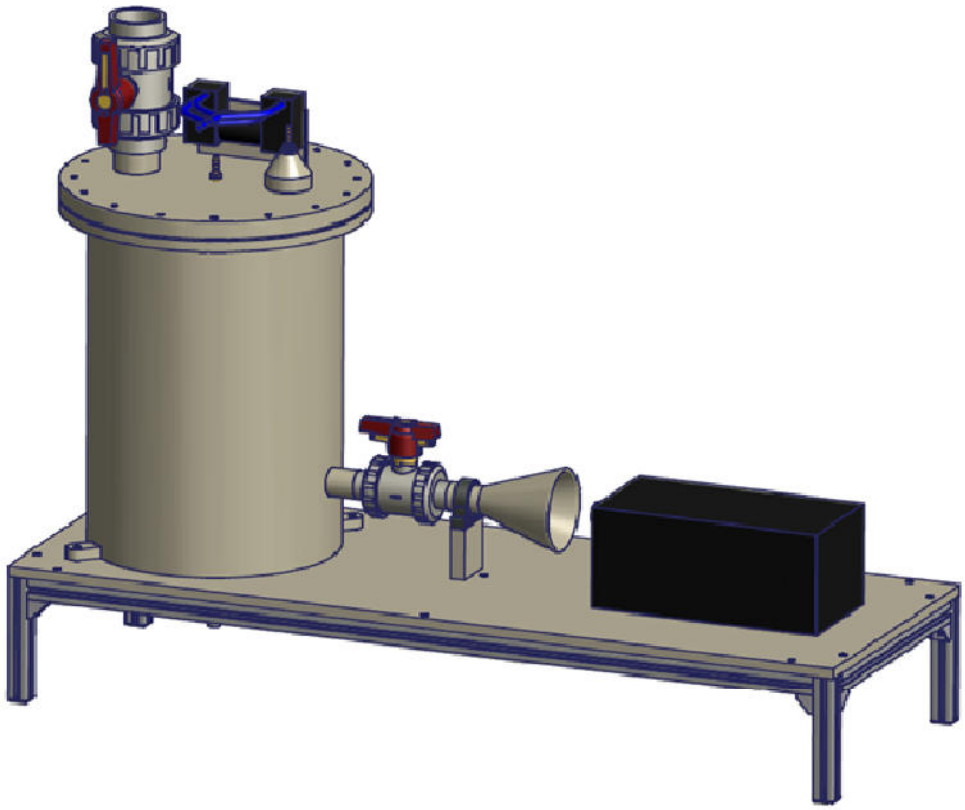
Diameter of jet outlet:	1300 x 800 mm
Actual length of working section:	2500 mm
Contraction ratio:	3,5
Flow speed:	0.2 - 25 m/s
(50 m sea level)	
Turbulence ratio by 20 m/s:	< 1 %
Fan connection:	3 x 400 V 125 A 50 Hz
Motor output:	31.5 kW
Dimensions (width, height, length):	4200 x 2300 x 14800 mm

Technical data are subject to change

4. Wind Tunnel Accessories

Flow Calculation System (Westi-Box)

Steamgenerator



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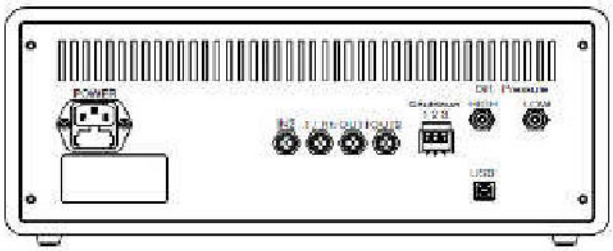
Flow Calculation System

Westi-Box

Measurement system for flow velocity (on demand as well for volume flow or mass flow) The Westi Box measures based priciple of differential pressure at a Prandtl-Tube. The System consits on 4 (or more) Differencial pressure sensors measuring the pressure differece at the Prandtl-Tube oder. To determin the air density an absolute pressure sensor as well as a temperature and humidity sensor is integrated! - The Westi Box is simultaneously the control of the wind tunnels or test benches via 0 – 10 V outlet.

The evaluation is effected by a special LabView programm. As shown in the sreen shot the environmental conditions (absolute pressure, temperature, humidity & the resultant air pressure) are idicated. It reports as well the actual differential pressure and the calculated velocity.

Likewise the desired value and the mean value can be calculated, adjusted and stored with the Westi Box software.



The System comes with diverse connections, to dispose several kind of sensors Switches or other additional components.

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Flow Calculation System

Westi-Box

Technical data:

Measuring range:	0.5 m/s - 50 m/s (higher on request)
Accuracy:	1.2 % measured value
Measuring principle:	differential pressure method (4 dp probes) (Thermo-electrical-anemometer on request)
Measuring ranges dp probes:	25 Pa, 100 Pa, 400 Pa, 1600 Pa (higher on request)
Accuracy dp probes:	0.25 % full scale
Barometrical pressure probe:	800 mbar - 1100 mbar
Accuracy:	0.5 % full scale
Rel. humidity probe:	0 % - 100 %
Accuracy:	± 2.5 %
Temperature probe:	-30 °C - 70 °C, PT 100, class A
Accuracy:	± 0.2 °C
Power supply:	230 V / 50 Hz
Dimensions (width, height, length):	364 mm x 150 mm x 391 mm

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Steamgenerator

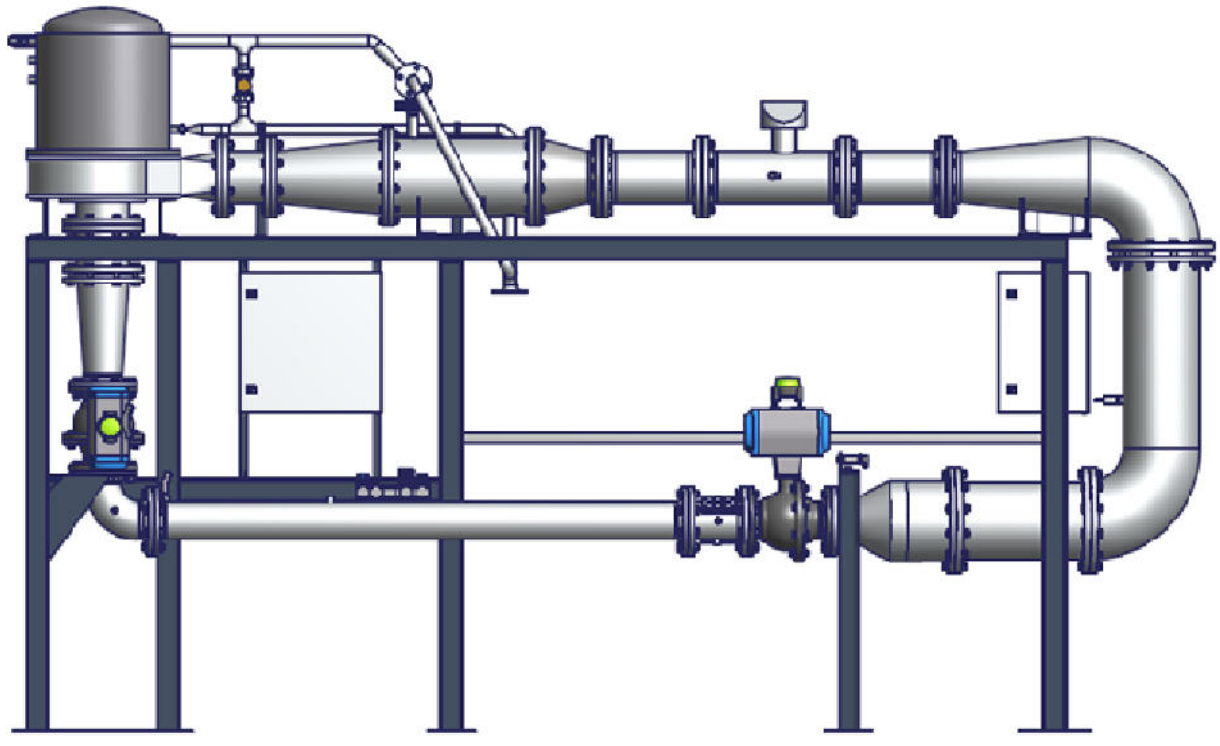
Technical data:

Diameter of steam outlet:	4 x Ø 4 mm
Steam hose (Diameter and Length):	Ø 8 mm x 3000 mm
Steam tank capacity:	50 l
Power supply:	240 V 50 Hz
Dimensions (width, height, length):	450 x 950 x 1250 mm

Technical data are subject to change

5. Special Wind Tunnels

Beside the standard wind tunnel types like the „Goettinger“ or the „Eiffler“ we manufacture as well pressure wind tunnels with a closed measurement area.
These kind of wind tunnels are regulated using a existing compresses air main machine to a static pressure between 4-10 Bar. The fan is an one level high performance radial fan! Caused by the friction of the compressed air with the wind tunnel´s inner walls the air has to be cooled. The cooling is generated by an aerodanamic heat exhcnace device. The cooling takes place automatically. The temperatur is controlled on 20 °C.
(either by a single cooling system or by a connection to an existing cooling circuit)
The measurement area can be isolated by two ball valves to change the device under test without loosing the pressure level inside the entire tunnel.
Refference system is a high accuracy turbine-flow meter.



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WK 815030-PN6

Technical data:

Diameter of jet outlet:	150 mm
Actual length of working section:	as needed
Contraction ratio:	4
Flow speed: (50 m sea level)	30 m/s by 6 bar
Turbulence ratio:	< 1 %
Working temperature:	20 °C (regulated)
Fan connection:	400 V / 50 Hz
Motor output:	12 kW
Dimensions (width, height, length):	950 x 2400 x 4900 mm
Weight:	approx. 12.300 kg

Technical data are subject to change

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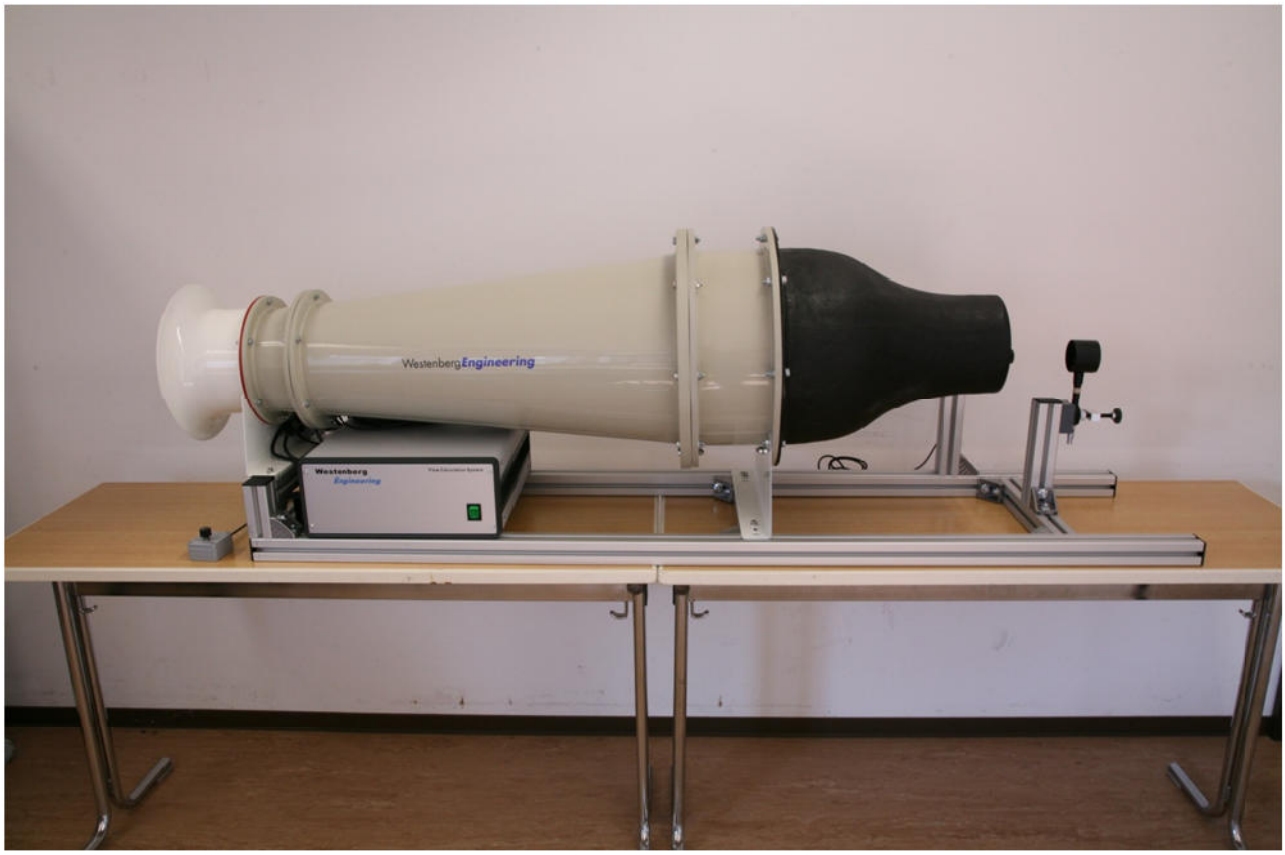
WK 818020-F

Technical data:

Diameter of jet outlet:	180 mm
Length of working section:	190 mm
Contraction ratio:	4
Flow speed:	1 - 20 m/s
(50 m sea level)	
Turbulence ratio by 20 m/s:	< 1 %
Fan connection:	240 V 50 Hz
Motor output:	500 W
Dimensions (width, height, length):	480 x 680 x 1550 mm
Weight:	approx. 40 kg

Technical data are subject to change



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Volume Flow Test Bench

Technical data:

Volume flow measurement:	20 - 4000 m³/h
max. pressure loss of the test bench:	about 1300 Pa
Reference nozzles:	3
Diameter of the nozzles:	40; 80; 180 mm
Volume flow measurement:	4 differential pressure sensors
Fan connection:	3 x 400 Volt 16 A 50 Hz
Motor output:	2 x 2.5 kW
Dimensions (width, height, length):	1350 x 1980 x 6833 mm

Technical data are subject to change

7. Mobile Flow Measurement System

Beschreibung:

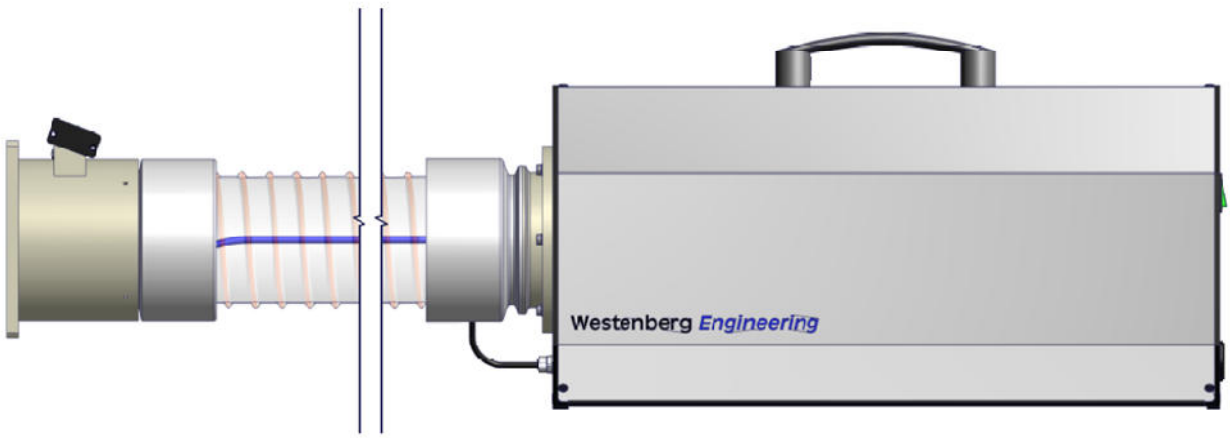
Mobile volume flow measurement system measuring volume flow and mass flow at blowing elements. The system is equipped with compensation of the flow-resitance equilizing the flow resistance of the test bench. For this the system uses an additional fan.

Application range:

Measurement of air outlets at car dashboards

Miscellaneous down blowing elements

Calibration of measurement sections



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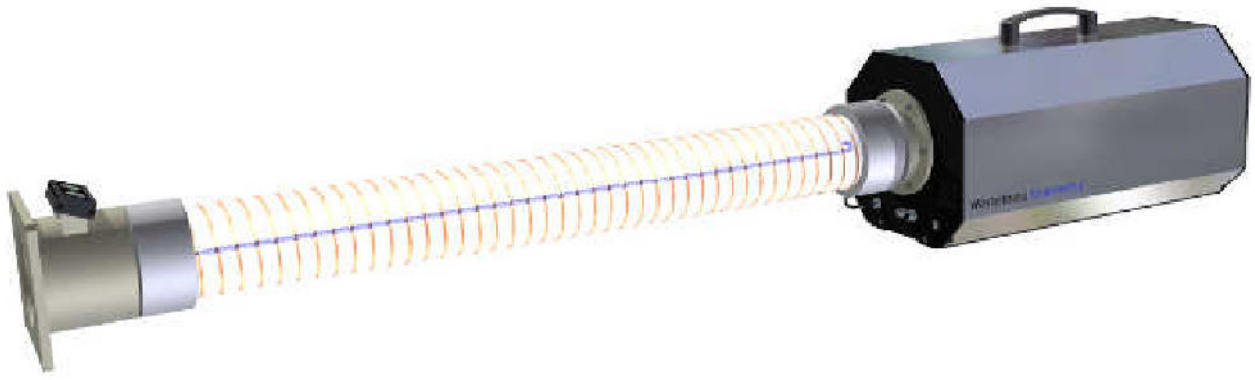
FMS 50

Technical data:

Diameter of the tube:	100 mm
Tube length:	3000 mm
Vol. flow measurement range:	2 - 50 l/s
Volume flow measurement:	Venturi nozzle 4 differntial pressure sensors
Fan connection:	230 V 50 Hz
Motor output:	91.2 W
Dimensions (width, height, length):	570 x 280 x 260 mm
Weight:	approx. 12 kg

Technical data are subject to change



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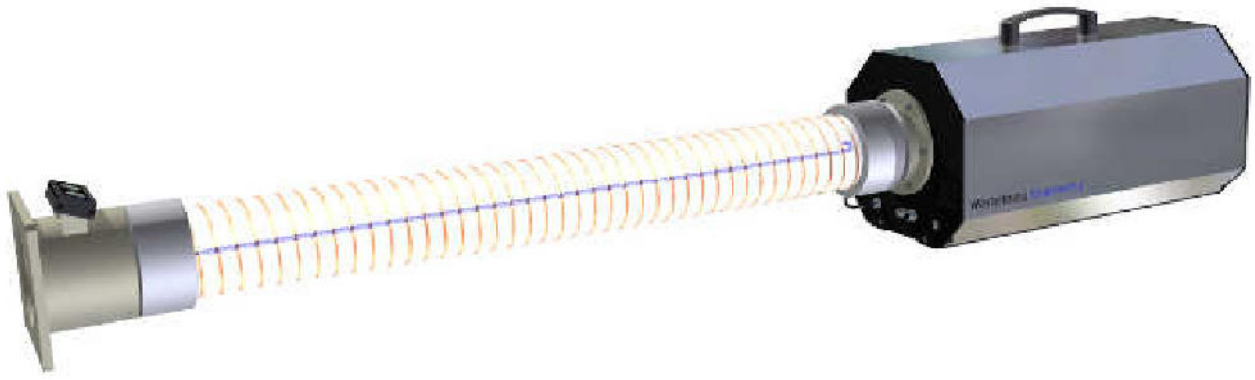
FMS 100

Technical data:

Diameter of the tuber:	125 mm
Tube length:	3000 mm
Vol. flow measurement range:	10 - 100 l/s
Volume flow measurement:	Venturi nozzle 4 differntial pressure sensors
Fan connection:	230 V 50 Hz
Motor output:	163 W
Dimensions (width, height, length):	570 x 280 x 260 mm
Weight:	approx. 12 kg

Technical data are subject to change



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FMS 250

Technical data:

Diameter of the tube:	150 mm
Tube length:	3000 mm
Vol. flow measurement range:	20 - 250 l/s
Volume flow measurement:	Venturi nozzle 4 differntial pressure sensors
Fan connection:	230 V 50 Hz
Motor output:	320 W
Dimensions (width, height, length):	720 x 300 x 320 mm
Weight:	approx. 20 kg

Technical data are subject to change

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FMS 490

Technical data:

Diameter of the tube:	200 mm
Tube length:	5000 mm
Vol. flow measurement range:	40 - 490 l/s
Volume flow measurement:	Venturi nozzle 4 differntial pressure sensors
Fan connection:	230 V 50 Hz
Motor output:	750 W
Dimensions (width, height, length):	930 x 1500 x 1000 mm
Weight:	approx. 100 kg

Technical data are subject to change