Determination of the aerodynamic performance of air intake vent Vilpe WIVE

Requested by

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Order ref.

Martin Granö, 17.6.2022, EF4APT220037-02

Contact person

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Assignment

Determination of the aerodynamic performance of the air intake vent Vilpe WIVE.

Sample details

The customer delivered the WIVE vent. Description of the sample is presented in Appendix 1.

The sample was received	12.7.2022
Measurements were carried out	25.-26.10.2022

Methods

Air flow rate through the valve was determined according to standard EN 13141-1:2019 /1/.

In the measurements, the air flow rate through the valve was determined as a function of the static pressure difference between the test chamber and the ambient air. During the measurements, the test chamber was in under pressure compared to the ambient air. Air flow rates were measured according to ISO 5167-1:2003 and ISO 5167-2:2003 /2/ using orifice plates with corner tappings.

FINAS Finnish Accreditation Service has accredited our laboratory (T001) to perform measurements according to ISO 5167-1:2003 and ISO 5167-2:2003. All other measurements mentioned in this test report are not contained in the field of the accreditation.

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Results

The measurement results are presented in Appendix 2.

The test results relate only to the sample tested.

Instruments used in the measurements as presented in appendix 3.

References

/1/ EN 13141-1:2019. Ventilation for buildings. Performance testing of components/products for residential ventilation. Part 1: Externally and internally mounted air transfer devices.

/2/ ISO 5167-1:2003. Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full. Part 1: General principles and requirements.

ISO 5167-2:2003. Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full. Part 2: Orifice plates.

Espoo, 28.10.2022

Pekka Kettunen

Pekka Kettunen
Expert

Mika Hurme
Expert

Appendices 3
Distribution Customer, electronically approved

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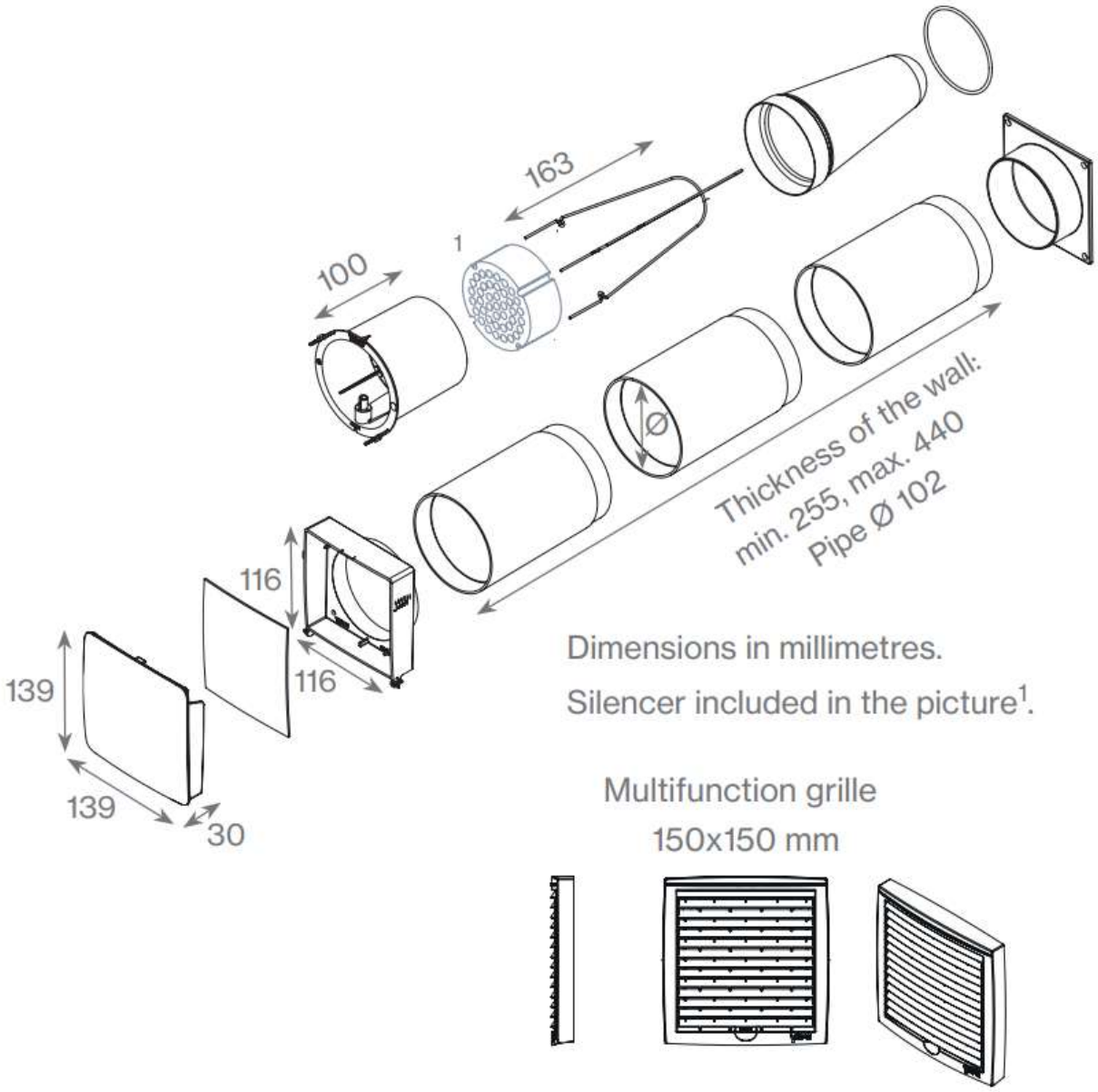
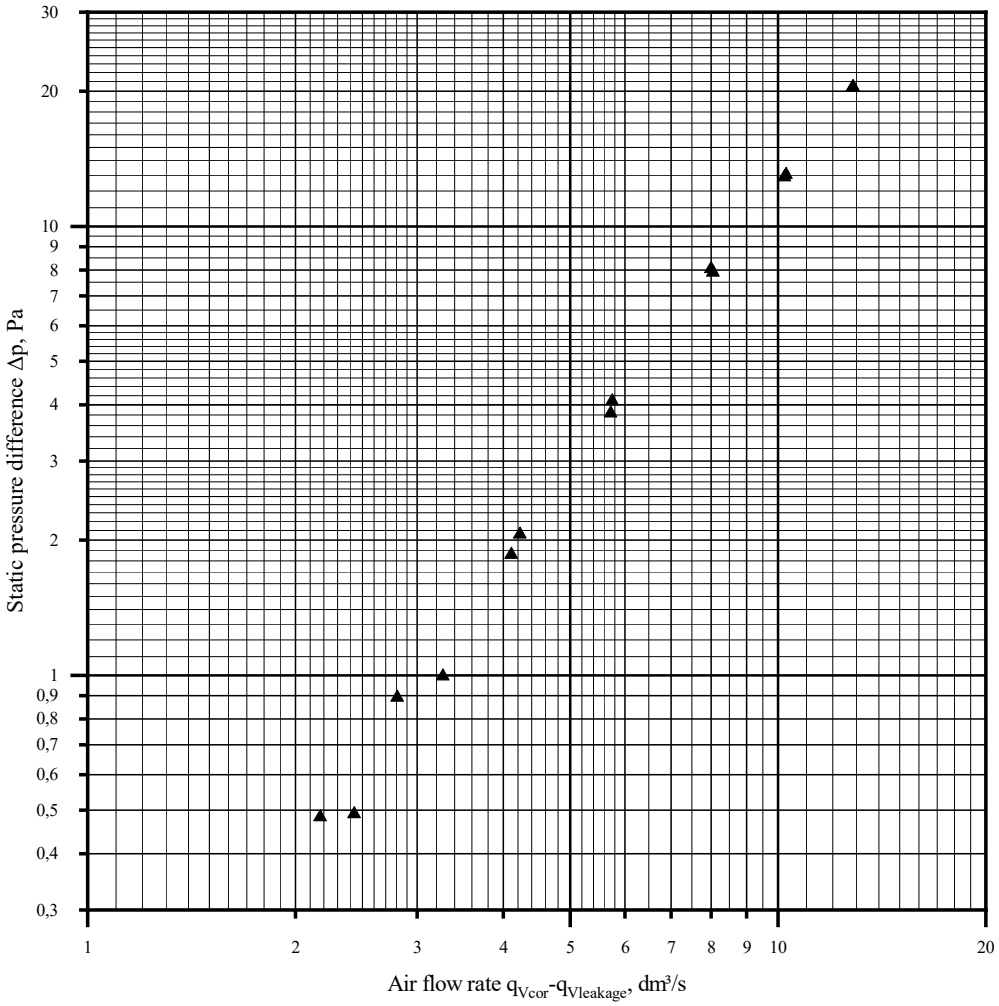
Description of the sample (according to information from the manufacturer)



Valve: Vilpe WIVE
Configuration: WIVE valve, 3 blocks of tubes and grille
Setting: Fully open

Aerodynamic performance
EN 13141-1:2019
The ambient air temperature: 19.4 °C

Air density 1,20 kg/m³



Valve: Vilpe WIVE
Configuration: WIVE valve, 3 blocks of tubes and grille
Setting: Fully open

Aerodynamic performance
EN 13141-1:2019
The ambient air temperature: 19.4 °C

Increasing Δp			Decreasing Δp		
Δp	$q_{V\,cor}$	$q_{V\,cor}$ - $q_{V\,leakage}$	Δp	$q_{V\,cor}$	$q_{V\,cor}$ - $q_{V\,leakage}$
Pa	dm³/s	dm³/s	Pa	dm³/s	dm³/s
-0.49	2.44	2.43	-0.48	2.17	2.17
-0.99	3.27	3.27	-0.89	2.81	2.81
-2.06	4.23	4.23	-1.85	4.11	4.11
-3.83	5.72	5.72	-4.08	5.76	5.76
-7.89	8.06	8.06	-8.03	8.01	8.01
-12.9	10.2	10.2	-13.0	10.3	10.3
-20.4	12.8	12.8	-20.4	12.8	12.8

Δp	Static pressure difference between test chamber and ambient air, Pa (Test chamber pressure is negative compared to ambient air)
$q_{V\,cor}$	Air flow rate at air density 1,20 kg/m^3, dm^3/s
$q_{V\,cor}$ - $q_{V\,leakage}$	Air flow rate at air density 1,20 kg/m³ minus testing chamber leakage, dm^3/s

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Valve: Vilpe WIVE
Configuration: WIVE valve, 3 blocks of tubes and grille
Setting: Fully open

Flow technical performance calculated using measuring points fitting
EN 13141-1:2019
The ambient air temperature: 19.4 °C

Increasing Δp			Decreasing Δp		
Δp	$q_{V\,cor}$	$q_{V\,cor}$ - $q_{V\,leakage}$	Δp	$q_{V\,cor}$	$q_{V\,cor}$ - $q_{V\,vuoto}$
Pa	dm³/s	dm³/s	Pa	dm³/s	dm³/s
-5.0		6.5	-5.0		6.4
-10.0		9.1	-10.0		9.1
-15.0		10.8	-15.0		10.8
-20.0		12.7	-20.0		12.7

Δp	Statical pressure difference between testing chamber and ambient air, Pa (Testing chamber is negetive pressured relative to surrounding air)
$q_{V\,cor}$	Air flow rate at air density 1,20 kg/m^3, dm^3/s
$q_{V\,cor}$ - $q_{V\,leakage}$	Air flow rate at air density 1,20 kg/m3 minus testing chamber leakage, dm^3/s

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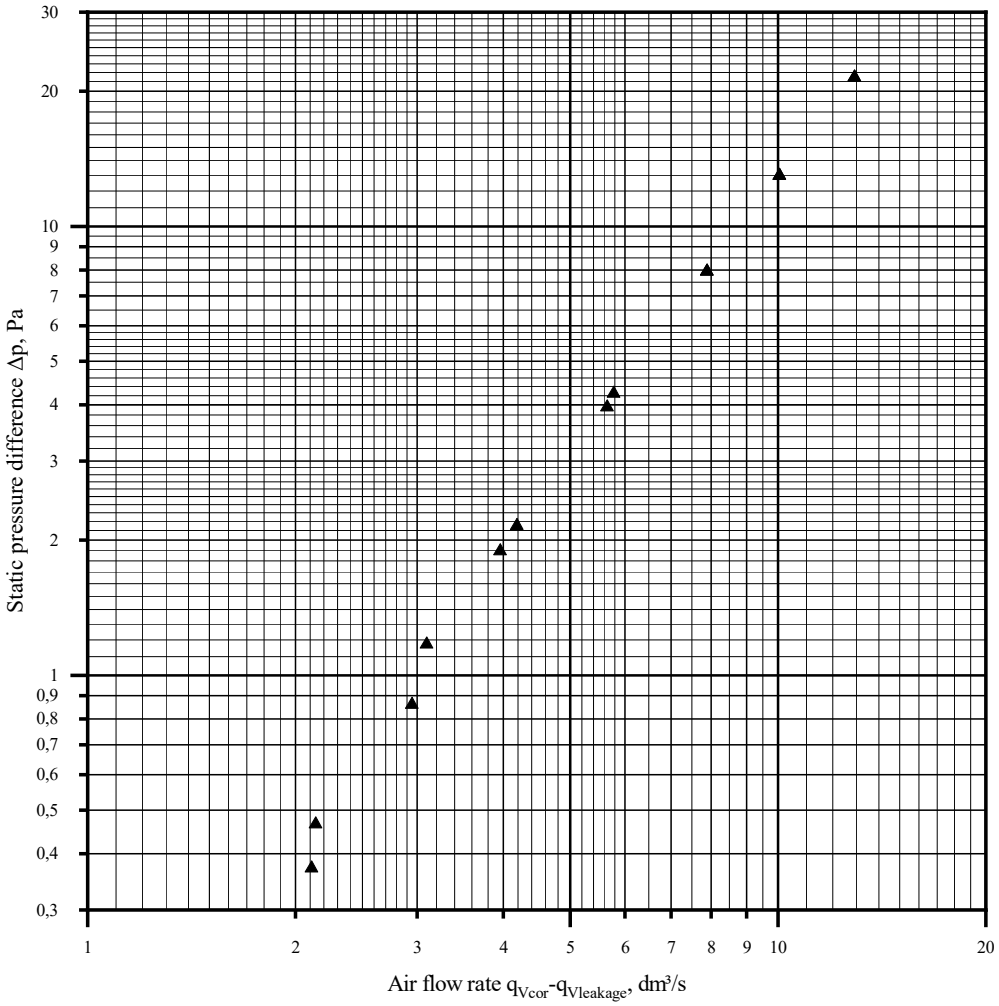
Valve: Vilpe WIVE
Configuration: WIVE valve with thermostat, 3 blocks of tubes and grille
Setting: Fully open (thermostat blocked)

Aerodynamic performance
EN 13141-1:2019
The ambient air temperature: 19.5 °C

Air density 1,20 kg/m³



Valve: Vilpe WIVE
Configuration: WIVE valve with thermostat, 3 blocks of tubes and grille
Setting: Fully open (thermostat blocked)

Aerodynamic performance
EN 13141-1:2019
The ambient air temperature: 19.5 °C

Increasing Δp			Decreasing Δp		
Δp	$q_{V\,cor}$	$q_{V\,cor}$ - $q_{V\,leakage}$	Δp	$q_{V\,cor}$	$q_{V\,cor}$ - $q_{V\,leakage}$
Pa	dm³/s	dm³/s	Pa	dm³/s	dm³/s
-0.37	2.11	2.11	-0.47	2.14	2.14
-0.86	2.95	2.95	-1.17	3.10	3.10
-1.89	3.96	3.96	-2.15	4.18	4.18
-4.23	5.78	5.78	-3.95	5.66	5.66
-7.93	7.90	7.90	-7.92	7.90	7.90
-13.0	10.1	10.1	-13.0	10.1	10.1
-21.5	12.9	12.9	-21.5	12.9	12.9

Δp	Static pressure difference between test chamber and ambient air, Pa (Test chamber pressure is negative compared to ambient air)
$q_{V\,cor}$	Air flow rate at air density 1,20 kg/m^3, dm^3/s
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Setting: Fully open (thermostat blocked)

Flow technical performance calculated using measuring points fitting
EN 13141-1:2019
The ambient air temperature: 19.5 °C

Nouseva Δp			Laskeva Δp		
Δp	$q_{V\,cor}$	$q_{V\,cor}$ - $q_{V\,leakage}$	Δp	$q_{V\,cor}$	$q_{V\,cor}$ - $q_{V\,vuoto}$
Pa	dm³/s	dm³/s	Pa	dm³/s	dm³/s
-5.0		6.3	-5.0		6.4
-10.0		8.9	-10.0		9.0
-15.0		10.6	-15.0		10.6
-20.0		12.3	-20.0		12.3

Δp	Statical pressure difference between testing chamber and ambient air, Pa (Testing chamber is negetive pressured relative to surrounding air)
$q_{V\,cor}$	Air flow rate at air density 1,20 kg/m^3, dm^3/s
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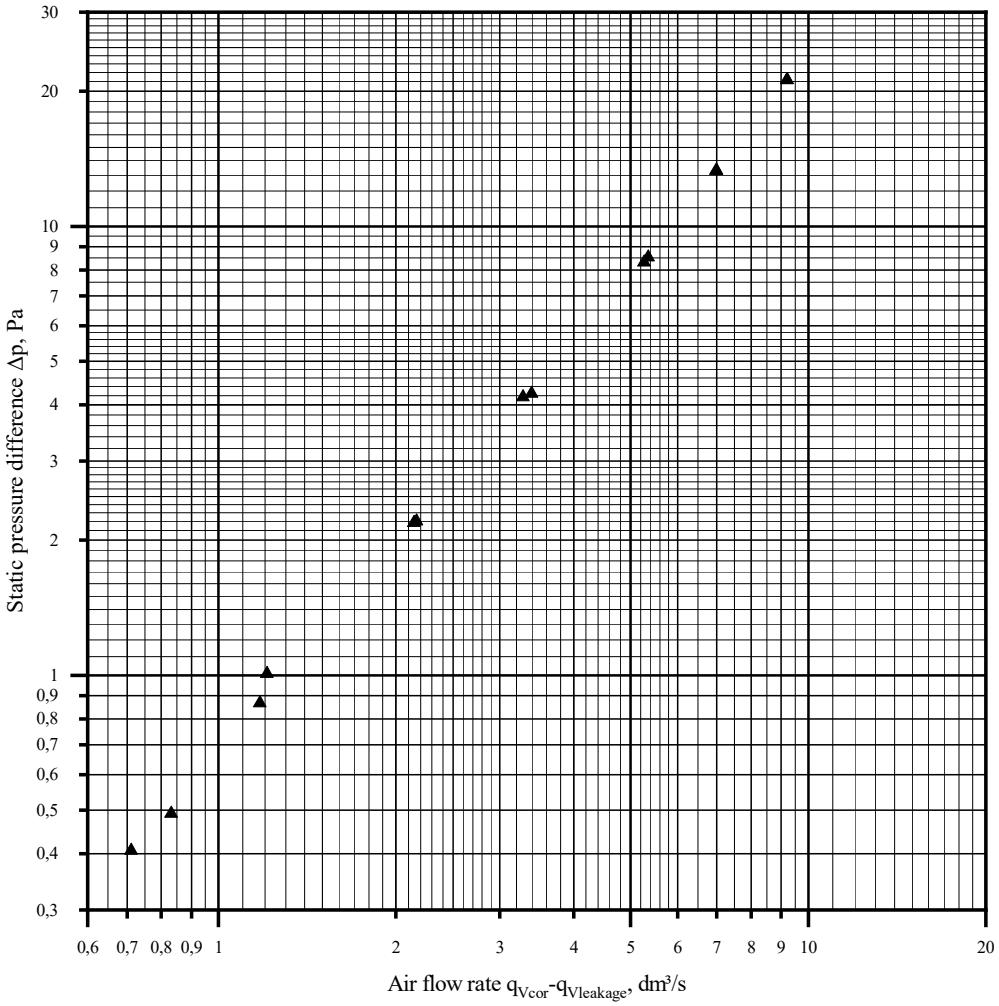
Valve: Vilpe WIVE
Configuration: WIVE valve with thermostat, 3 blocks of tubes, filter and grille
Setting: Fully open (thermostat blocked)

Aerodynamic performance
EN 13141-1:2019
The ambient air temperature: 19.4 °C

Air density 1,20 kg/m³



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Pa	dm³/s	dm³/s	Pa	dm³/s	dm³/s
-0.41	0.71	0.71	-0.49	0.83	0.83
-1.01	1.21	1.21	-0.87	1.18	1.18
-2.18	2.15	2.15	-2.20	2.17	2.17
-4.16	3.28	3.28	-4.24	3.40	3.40
-8.54	5.35	5.35	-8.32	5.27	5.27
-13.3	6.99	6.99	-13.3	6.98	6.98
-21.2	9.21	9.21	-21.2	9.21	9.21

Δp	Static pressure difference between test chamber and ambient air, Pa (Test chamber pressure is negative compared to ambient air)
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Nouseva Δp			Laskeva Δp		
Δp	$q_{V\,cor}$	$q_{V\,cor}$ - $q_{V\,leakage}$	Δp	$q_{V\,cor}$	$q_{V\,cor}$ - $q_{V\,vuoto}$
Pa	dm³/s	dm³/s	Pa	dm³/s	dm³/s
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-10.0		5.9	-10.0		5.9
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Instruments used

Instrument	Type code	Serial number	Calibration date
Micromanometer	Furness FCO12 Furness FCO12 Furness FCO12	0611108 0611107 0611106	15.7.2022 15.7.2022 15.7.2022
Barometer	Vaisala PTU303	M4440048	15.7.2022
Hygrometer	Vaisala PTU303	M4440048	21.11.2021
Thermometer	Agilent 34970A	MY44066372	12.7.2022
Orifice plate	Φ 50 / Φ 12.55 Φ 50 / Φ 23.05	- -	

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