Addressee : *For the attention of Mr Pierre Henry CHAILLOU*

UBBINK FRANCE
ZA MALABRY
13 RUE DE BRETAGNE
BP 4301
44243 LA CHAPELLE SUR ERDRE CEDEX
FRANCE

Villeurbanne, 08/11/2023

ACCREDITATION N°1-0021 PORTEE DISPONIBLE SUR WWW.COFRAC.FR

Person in charge : **Camille Lefebvre**
Function : Project Manager

Signature : Camille LEFEBVRE

Test Report N° 2332139
Version : 00

Aeraulics tests for the ventilation terminal HAELIX

EQUIPMENT ID : Ventilation terminal HAELIX Rondo
MANUFACTURER : UBBINK FRANCE
REFERENCE DOCUMENT(S) : EN 13141-2 : 2010
TESTS MADE BY : Jeremy Allimann
DATE OF TESTS : 2 au 7 November 2023

The signed final report cancels all the draft documents distributed before.

Each new version of the report cancels and replaces the previous one.

All canceled copies or duplicates of the report must be destroyed. We draw your attention on risks of mistakes encountered by using a canceled version.

Version	Date	Nature of change	Modified pages
00	08/11/2023	First edition	

Results of test reports are the exclusive property of the customer and CETIAT prohibits their distribution to third parties without prior written consent.

Any commercial use of the name CETIAT or of test results is subject to CETIAT's prior consent.

This report may be reproduced only in its entirety.

The test reports written by CETIAT are valid only for the equipment provided for the test in the specific conditions under which the test was run.

Information concerning the measurement equipment used for the tests is kept in CETIAT's archives.

The use of these results for designing equipments using this material must take into account manufacturing tolerances and real operating conditions. CETIAT cannot be held liable for such use of these results.

The formulas or codes used to predict either the operation of a device in conditions other than those used in the test or the characteristics of similar devices of different dimensions are based on the state of knowledge at the time the results were delivered and are subject to change. The results obtained through these formulas or codes are given as an indication only.

The report digitally signed is sent to the customer. A copy is kept at CETIAT.

CONTENTS

1. INTRODUCTION....4
2. SUMMARY OF RESULTS....4

APPENDIX 1 - PRODUCT TESTED....6
APPENDIX 2 - TEST METHODOLOGY....8
APPENDIX 3 - DETAILED RESULTS....11
APPENDIX 4 - INSTRUMENTATION....17

1. INTRODUCTION

The company UBBINK asked CETIAT to characterise the aeraulic curves for a ventilation air terminal named HAELIX Rondo.

The tests are done according to the standard EN 13141-2: 2010 *Ventilation for buildings - Performance testing pf components/products for residential ventilation - Part 2: Exhaust and supply air terminal devices.*

The summary of results is in Paragraph 2.

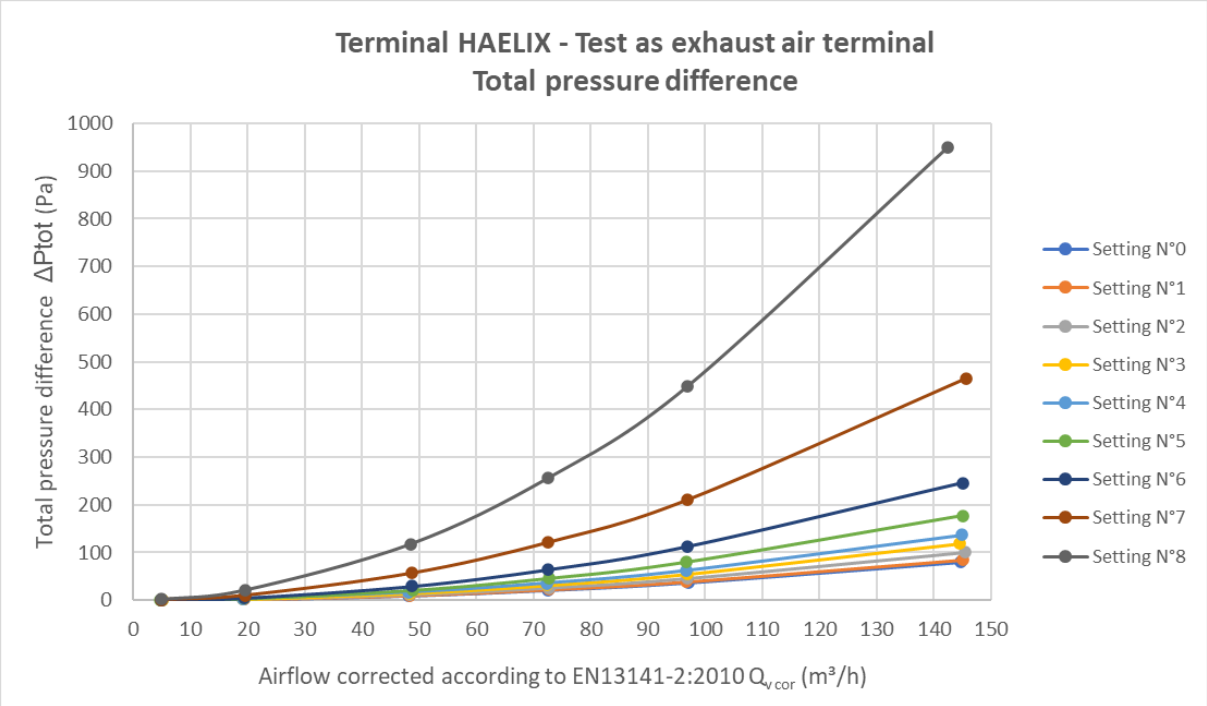
The product tested is described in APPENDIX 1.

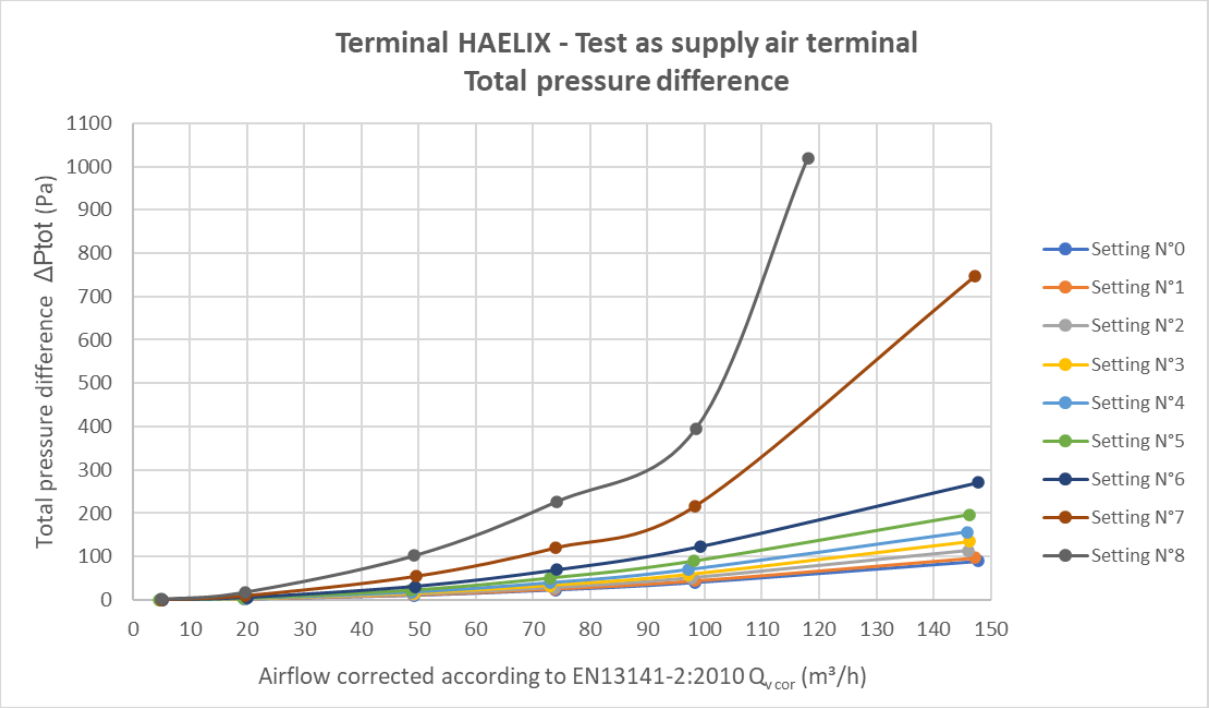
The test methodology is described in APPENDIX 2.

The detailed results are presented in APPENDIX 3.

The instrumentation used is listed in APPENDIX 4.

2. SUMMARY OF RESULTS




Terminal HAELIX - Test as supply air terminal
Total pressure difference
Total pressure difference ΔPtot (Pa)
1100
1000
900
800
700
600
500
400
300
200
100
0
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
Airflow corrected according to EN13141-2:2010 Qv cor (m³/h)
Setting N°0
Setting N°1
Setting N°2
Setting N°3
Setting N°4
Setting N°5
Setting N°6
Setting N°7
Setting N°8

APPENDIX 1 - PRODUCT TESTED

The product is a ventilation air terminal named HAELIX Rondo.

This terminal can be used as an exhaust air terminal and as a supply air terminal.

The connecting diameter is 125 mm.

The terminal has 9 opening positions. They are set manually.





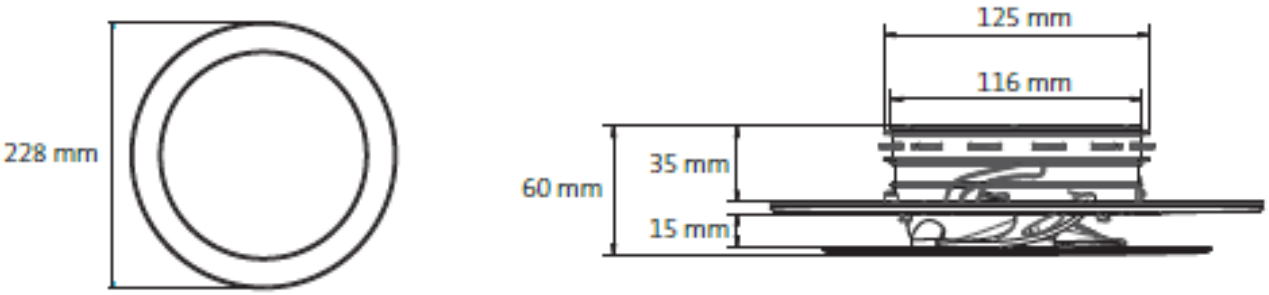
Front



Back



9 manual settings



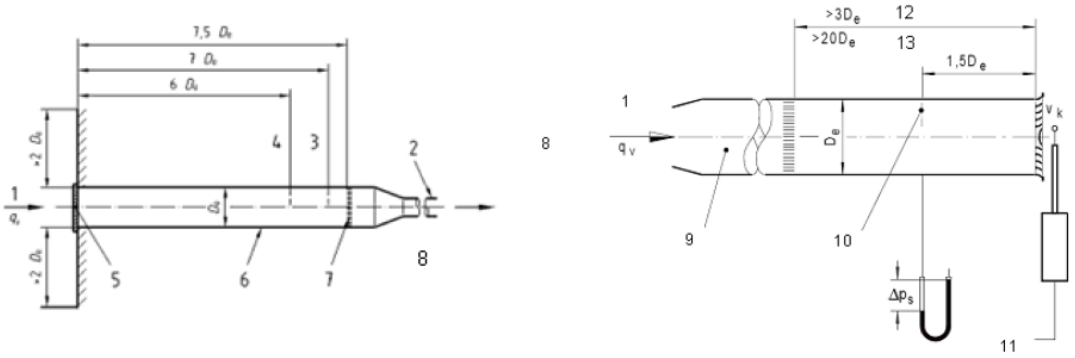
Dimensions

APPENDIX 2 - TEST METHODOLOGY

The tests are done according to the paragraph 4.1 of the standard EN 13141-2 : 2010 *Ventilation for buildings - Performance testing pf components/products for residential ventilation - Part 2: Exhaust and supply air terminal devices.*

The tests are made in supply configuration and in exhaust configuration.

The tests benches are the following:



a) for exhaust air terminal device

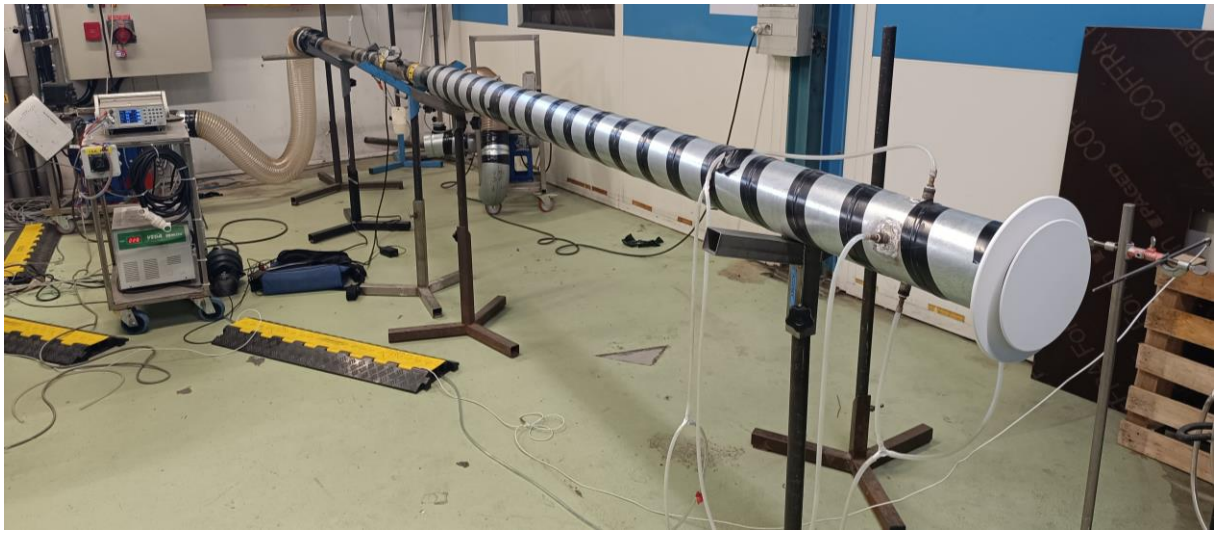
b) for supply air terminal device

Key

1 Airflow
2 Airflow meter
3 Plane of temperature measurement
4 Plane of pressure measurement
5 Air terminal device
6 Test duct, diameter *D*e
7 Flow straightener
8 Connection to fan, flowrate control and airflow meter
9 Transition to test duct size
10 Plane of measurement
11 Signal to display or computer
12 with flow straightener
13 without flow straightener



Test bench - exhaust configuration



Test bench - supply configuration

The tests are done for the 9 settings.
For each setting, the measurements are done for 6 levels of airflow between 5 and 150 m³/h.

The following measurements are done:

- Static pressure difference ΔP
- Volume airflow $q_{v,meas}$
- Air temperature θ_a
- Atmospheric pressure P_a
- Dew point temperature

The air temperature is between 15°C and 25°C during all the tests.

According to EN 13141-2:2010, the measured airflow is corrected according to EN 13142-1:2004 with the following formula:

$$q_{v,cor} = q_{v,meas} \times \frac{293}{273 + \theta_a} \times \frac{P_a}{101325}$$

With:

- $q_{v,cor}$ = volume airflow at the standard conditions (20 °C, 101325 Pa), m^3/h
- $q_{v,meas}$ = measured volume airflow, m^3/h
- θ_a = air temperature, °C
- P_a = atmospheric pressure, Pa

The total pressure difference (pressure drop) is calculated with the following formula:

$$\text{Exhaust configuration: } \Delta P_{tot} = \Delta P - Pdyn$$

$$\text{Supply configuration: } \Delta P_{tot} = \Delta P + Pdyn$$

$$P_{dyn} = \frac{1}{2} \times \rho_{ref} \times V^2$$

With:

- ΔP_{tot} = total pressure difference, Pa
- ΔP = static pressure difference measured, Pa
- $Pdyn$ = dynamic pressure, Pa
- ρ_{ref} = density at the standard conditions (20 °C, 101325 Pa) =1.2 kg/m^3
- V = air velocity calculated with the ratio of corrected volume airflow and duct section, m/s

For each setting, the following equations are indicated:

$$q_{v,cor} = K1 \times (\Delta P)^{n1}$$

$$q_{v,cor} = K2 \times (\Delta P_{tot})^{n2}$$

With:

- $q_{v,cor}$ = volume airflow at the standard conditions (20 °C, 101325 Pa), m^3/h
- ΔP = static pressure difference measured, Pa
- ΔP_{tot} = total pressure difference, Pa
- *K1 K2* = coefficient
- *n1 n2* = exposant

APPENDIX 3 - DETAILED RESULTS

1. Test as an exhaust air terminal

Setting N°0 **Qv cor = 14.1 x (DPstat)^0.52** **Qv cor = 14.6 x (DPtot)^0.53**

Airflow measured $Q_{v\ meas}$ (m³/h)	Static pressure difference measured ΔP (Pa)	Atmospheric pressure (Pa)	Dry temperature (°C)	Dew point temperature (°C)	Density (kg/m³)	Airflow corrected according to EN13141-2:2010 $Q_{v\ cor}$ (m³/h)	Dynamic pressure Pdyn (Pa)	Total pressure difference ΔPtot (Pa)
5.2	0.1	97 414	18.6	5.6	1.16	5.0	0.0	0.1
20.1	1.8	97 408	18.4	5.6	1.16	19.5	0.1	1.7
49.8	10.5	97 410	18.3	5.6	1.16	48.2	0.7	9.7
75.1	22.8	97 416	18.3	5.6	1.16	72.6	1.6	21.2
100.4	39.9	97 427	18.2	5.6	1.16	97.1	2.9	37.0
149.5	85.8	97 431	18.2	5.7	1.16	144.6	6.4	79.4

Setting N°1 **Qv cor = 14.4 x (DP)^0.51** **Qv cor = 14.9 x (DPtot)^0.51**

Airflow measured $Q_{v\ meas}$ (m³/h)	Static pressure difference measured ΔP (Pa)	Atmospheric pressure (Pa)	Dry temperature (°C)	Dew point temperature (°C)	Density (kg/m³)	Airflow corrected according to EN13141-2:2010 $Q_{v\ cor}$ (m³/h)	Dynamic pressure Pdyn (Pa)	Total pressure difference ΔPtot (Pa)
5.1	0.1	97 418	18.5	5.6	1.16	4.9	0.0	0.1
20.1	1.9	97 417	18.5	5.5	1.16	19.4	0.1	1.8
49.9	11.0	97 422	18.5	5.5	1.16	48.3	0.7	10.3
75.1	24.1	97 426	18.5	5.5	1.16	72.6	1.6	22.5
100.0	41.8	97 431	18.5	5.6	1.16	96.6	2.9	38.9
150.1	91.2	97 424	18.5	5.4	1.16	145.1	6.5	84.7

Setting N°2 **Qv cor = 12.3 x (DP)^0.53** **Qv cor = 12.6 x (DPtot)^0.53**

Airflow measured $Q_{v\ meas}$ (m³/h)	Static pressure difference measured ΔP (Pa)	Atmospheric pressure (Pa)	Dry temperature (°C)	Dew point temperature (°C)	Density (kg/m³)	Airflow corrected according to EN13141-2:2010 $Q_{v\ cor}$ (m³/h)	Dynamic pressure Pdyn (Pa)	Total pressure difference ΔPtot (Pa)
5.1	0.2	97 416	18.6	5.4	1.16	4.9	0.0	0.2
19.9	2.2	97 415	18.5	5.4	1.16	19.3	0.1	2.1
50.0	12.9	97 416	18.4	5.4	1.16	48.3	0.7	12.2
75.1	28.0	97 418	18.4	5.4	1.16	72.6	1.6	26.4
100.2	48.8	97 417	18.4	5.3	1.16	96.8	2.9	45.9
150.5	106.6	97 401	18.5	5.6	1.16	145.4	6.5	100.1

Setting N°3 **Qv cor = 11.5 x (DP)^0.53** **Qv cor = 11.8 x (DPtot)^0.53**

Airflow measured $Q_{v\ meas}$ (m³/h)	Static pressure difference measured ΔP (Pa)	Atmospheric pressure (Pa)	Dry temperature (°C)	Dew point temperature (°C)	Density (kg/m³)	Airflow corrected according to EN13141-2:2010 $Q_{v\ cor}$ (m³/h)	Dynamic pressure Pdyn (Pa)	Total pressure difference ΔPtot (Pa)
5.3	0.2	97 380	18.6	5.6	1.16	5.1	0.0	0.2
19.9	2.6	97 374	18.6	5.6	1.16	19.3	0.1	2.5
50.1	15.3	97 368	18.5	5.6	1.16	48.4	0.7	14.5
74.9	33.0	97 368	18.5	6.5	1.16	72.4	1.6	31.4
100.3	57.7	97 368	18.5	6.7	1.16	96.8	2.9	54.8
149.6	124.9	97 362	18.6	6.4	1.16	144.5	6.4	118.4

Setting N°4 **Qv cor = 10.8 x (DP)^0.53** **Qv cor = 11 x (DPtot)^0.53**

Airflow measured $Q_{v\ meas}$ (m³/h)	Static pressure difference measured ΔP (Pa)	Atmospheric pressure (Pa)	Dry temperature (°C)	Dew point temperature (°C)	Density (kg/m³)	Airflow corrected according to EN13141-2:2010 $Q_{v\ cor}$ (m³/h)	Dynamic pressure Pdyn (Pa)	Total pressure difference ΔPtot (Pa)
5.1	0.2	97 397	18.8	6.6	1.16	4.9	0.0	0.2
19.9	2.9	97 398	18.7	6.5	1.16	19.2	0.1	2.8
49.9	16.9	97 403	18.6	6.3	1.16	48.2	0.7	16.2
74.9	37.1	97 409	18.6	6.6	1.16	72.4	1.6	35.5
100.1	64.8	97 416	18.5	6.1	1.16	96.7	2.9	62.0
150.0	143.1	97 421	18.5	6.2	1.16	144.9	6.5	136.6

Setting N°5 | **Qv cor = 9.4 x (DP)^0.53** | **Qv cor = 9.6 x (DPtot)^0.53**

Airflow measured $Q_{v\ meas}$ (m³/h)	Static pressure difference measured ΔP (Pa)	Atmospheric pressure (Pa)	Dry temperature (°C)	Dew point temperature (°C)	Density (kg/m³)	Airflow corrected according to EN13141-2:2010 $Q_{v\ cor}$ (m³/h)	Dynamic pressure Pdyn (Pa)	Total pressure difference ΔPtot (Pa)
4.9	0.3	97 429	18.6	6.3	1.16	4.7	0.0	0.3
20.1	3.7	97 436	18.6	6.4	1.16	19.4	0.1	3.6
50.6	22.0	97 443	18.5	6.2	1.16	48.9	0.7	21.3
75.3	47.7	97 448	18.4	6.1	1.16	72.8	1.6	46.1
100.0	82.8	97 450	18.4	6.2	1.16	96.7	2.9	80.0
149.9	182.9	97 453	18.4	6.2	1.16	145.0	6.5	176.4

Setting N°6 | **Qv cor = 8.6 x (DP)^0.51** | **Qv cor = 8.7 x (DPtot)^0.51**

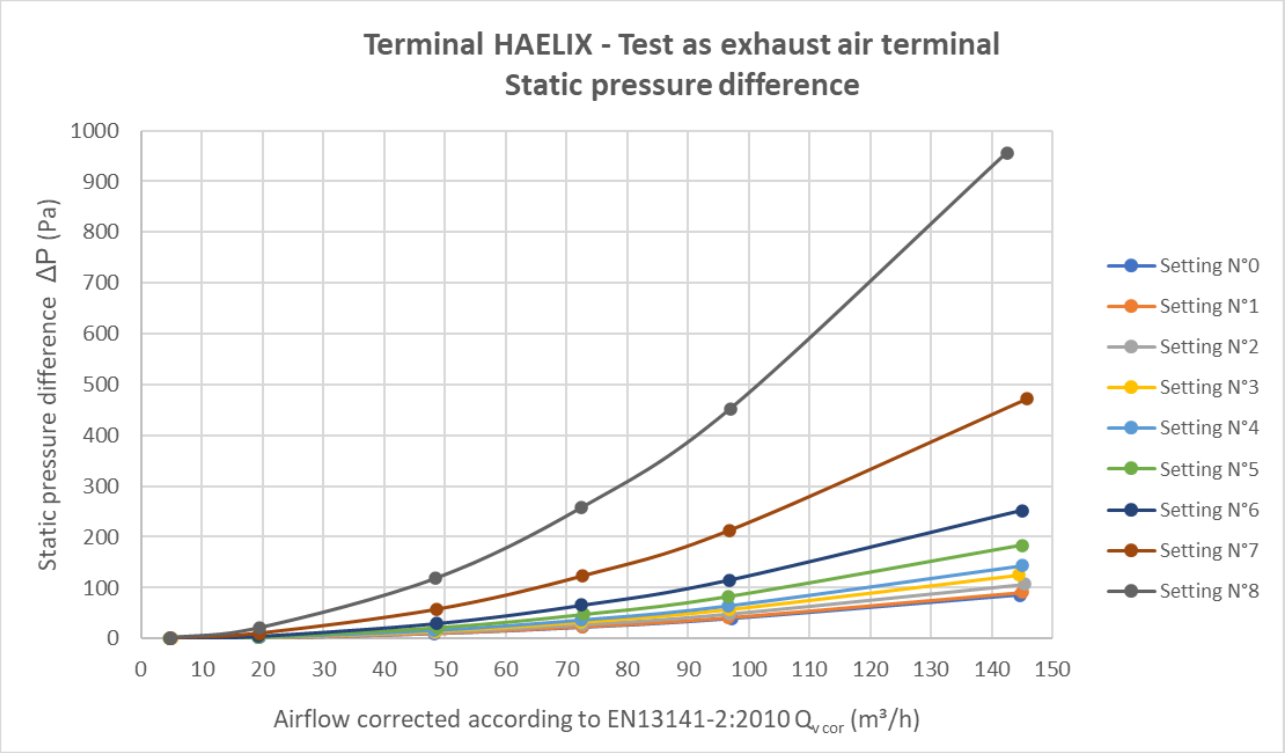
Airflow measured $Q_{v\ meas}$ (m³/h)	Static pressure difference measured ΔP (Pa)	Atmospheric pressure (Pa)	Dry temperature (°C)	Dew point temperature (°C)	Density (kg/m³)	Airflow corrected according to EN13141-2:2010 $Q_{v\ cor}$ (m³/h)	Dynamic pressure Pdyn (Pa)	Total pressure difference ΔPtot (Pa)
5.0	0.3	97 453	18.5	6.3	1.16	4.8	0.0	0.3
20.0	5.1	97 454	18.4	6.3	1.16	19.3	0.1	4.9
50.3	30.0	97 452	18.4	6.4	1.16	48.6	0.7	29.2
75.0	65.7	97 458	18.5	6.5	1.16	72.5	1.6	64.0
100.1	115.2	97 455	18.5	6.5	1.16	96.8	2.9	112.3
150.0	251.6	97 459	18.6	6.6	1.16	145.0	6.5	245.2

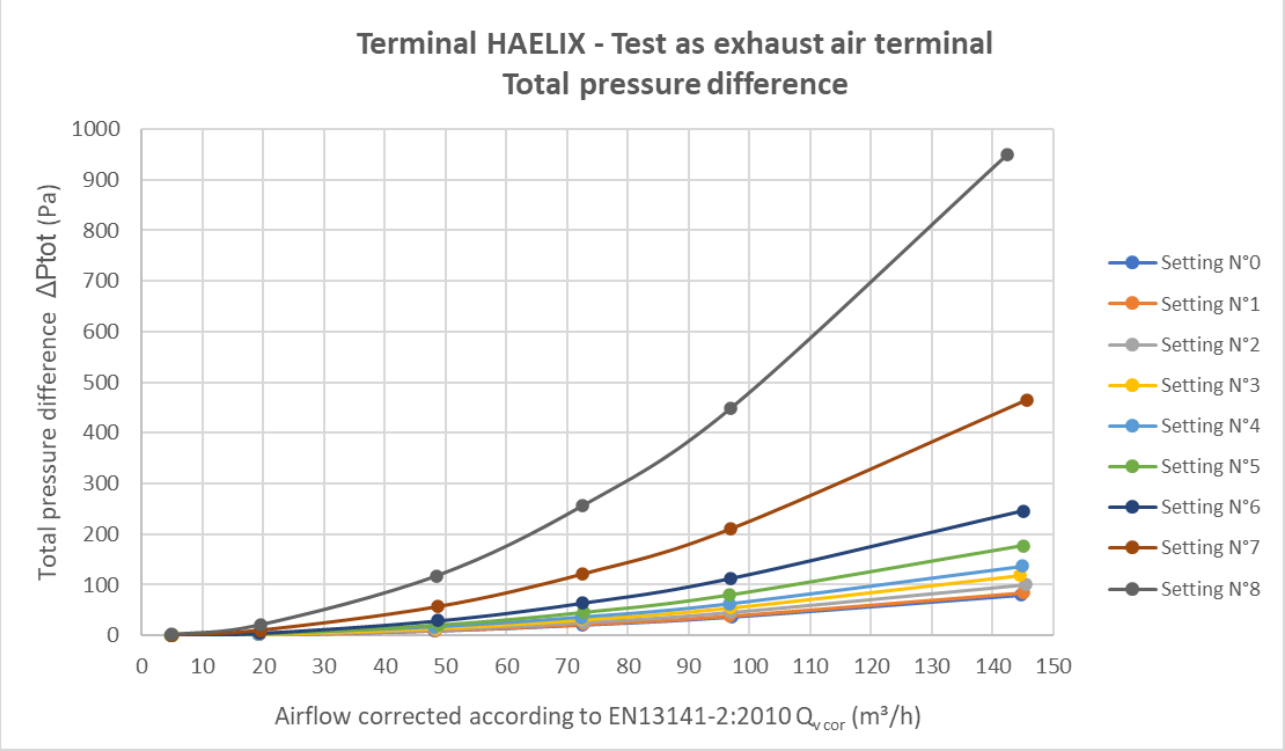
Setting N°7 | **Qv cor = 6.2 x (DP)^0.51** | **Qv cor = 6.3 x (DPtot)^0.51**

Airflow measured $Q_{v\ meas}$ (m³/h)	Static pressure difference measured ΔP (Pa)	Atmospheric pressure (Pa)	Dry temperature (°C)	Dew point temperature (°C)	Density (kg/m³)	Airflow corrected according to EN13141-2:2010 $Q_{v\ cor}$ (m³/h)	Dynamic pressure Pdyn (Pa)	Total pressure difference ΔPtot (Pa)
5.1	0.6	97 460	18.8	6.7	1.16	4.9	0.0	0.6
20.2	10.0	97 462	18.7	6.8	1.16	19.5	0.1	9.9
50.3	57.0	97 464	18.6	6.9	1.16	48.6	0.7	56.3
75.1	122.7	97 465	18.4	6.8	1.16	72.6	1.6	121.1
100.0	212.9	97 471	18.0	7.5	1.16	96.9	2.9	210.0
150.5	471.4	97 474	18.2	7.6	1.16	145.7	6.5	464.8

Setting N°8 | **Qv cor = 4.1 x (DP)^0.52** | **Qv cor = 4.1 x (DPtot)^0.52**

Airflow measured $Q_{v\ meas}$ (m³/h)	Static pressure difference measured ΔP (Pa)	Atmospheric pressure (Pa)	Dry temperature (°C)	Dew point temperature (°C)	Density (kg/m³)	Airflow corrected according to EN13141-2:2010 $Q_{v\ cor}$ (m³/h)	Dynamic pressure Pdyn (Pa)	Total pressure difference ΔPtot (Pa)
5.0	1.3	97 471	18.4	7.3	1.16	4.8	0.0	1.3
20.2	21.3	97 465	18.6	6.8	1.16	19.6	0.1	21.2
50.1	118.1	97 466	18.6	6.8	1.16	48.4	0.7	117.4
75.1	258.0	97 469	18.6	6.8	1.16	72.5	1.6	256.3
100.3	451.9	97 467	18.6	6.8	1.16	96.9	2.9	449.1
147.4	956.2	97 465	18.7	6.9	1.16	142.4	6.2	949.9


Terminal HAELIX - Test as exhaust air terminal
Static pressure difference
Static pressure difference ΔP (Pa)
1000
900
800
700
600
500
400
300
200
100
0
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
Airflow corrected according to EN13141-2:2010 Qv cor (m³/h)
Setting N°0
Setting N°1
Setting N°2
Setting N°3
Setting N°4
Setting N°5
Setting N°6
Setting N°7
Setting N°8


Terminal HAELIX - Test as exhaust air terminal
Total pressure difference
Total pressure difference ΔPtot (Pa)
1000
900
800
700
600
500
400
300
200
100
0
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
Airflow corrected according to EN13141-2:2010 Qv cor (m³/h)
Setting N°0
Setting N°1
Setting N°2
Setting N°3
Setting N°4
Setting N°5
Setting N°6
Setting N°7
Setting N°8

2. Test as a supply air terminal

Setting N°0 **Qv cor = 15.1 x (DP)^0.52** **Qv cor = 14.6 x (DPtot)^0.52**

Airflow measured $Q_{v\ meas}$ (m^3/h)	Static pressure difference measured ΔP (Pa)	Atmospheric pressure (Pa)	Dry temperature (°C)	Dew point temperature (°C)	Density (kg/m^3)	Airflow corrected according to EN13141-2:2010 $Q_{v\ cor}$ (m^3/h)	Dynamic pressure Pdyn (Pa)	Total pressure difference ΔPtot (Pa)
5.1	0.1	99 124	18.8	7.8	1.18	5.0	0.0	0.1
19.8	1.6	99 129	18.8	7.9	1.18	19.5	0.1	1.7
50.0	9.5	99 135	18.8	8.0	1.18	49.1	0.7	10.2
75.2	21.1	99 141	18.9	8.1	1.18	73.9	1.7	22.8
99.9	37.0	99 143	18.5	8.0	1.18	98.2	3.0	40.0
150.3	83.0	99 143	18.3	8.0	1.18	147.9	6.7	89.7

Setting N°1 **Qv cor = 12.9 x (DP)^0.55** **Qv cor = 12.5 x (DPtot)^0.55**

Airflow measured $Q_{v\ meas}$ (m^3/h)	Static pressure difference measured ΔP (Pa)	Atmospheric pressure (Pa)	Dry temperature (°C)	Dew point temperature (°C)	Density (kg/m^3)	Airflow corrected according to EN13141-2:2010 $Q_{v\ cor}$ (m^3/h)	Dynamic pressure Pdyn (Pa)	Total pressure difference ΔPtot (Pa)
5.1	0.2	99 143	18.4	8.0	1.18	5.1	0.0	0.2
20.0	1.8	99 146	18.8	8.1	1.18	19.6	0.1	1.9
49.9	10.4	99 150	19.0	8.4	1.18	49.0	0.7	11.1
75.1	23.1	99 149	19.1	8.1	1.18	73.8	1.7	24.8
100.1	40.8	99 152	19.1	8.0	1.18	98.3	3.0	43.7
150.1	90.6	99 161	19.4	8.0	1.18	147.2	6.7	97.2

Setting N°2 **Qv cor = 12.9 x (DP)^0.53** **Qv cor = 12.5 x (DPtot)^0.53**

Airflow measured $Q_{v\ meas}$ (m^3/h)	Static pressure difference measured ΔP (Pa)	Atmospheric pressure (Pa)	Dry temperature (°C)	Dew point temperature (°C)	Density (kg/m^3)	Airflow corrected according to EN13141-2:2010 $Q_{v\ cor}$ (m^3/h)	Dynamic pressure Pdyn (Pa)	Total pressure difference ΔPtot (Pa)
4.9	0.2	99 926	21.0	5.9	1.18	4.8	0.0	0.2
20.0	2.1	99 927	21.0	5.9	1.18	19.6	0.1	2.2
50.0	12.1	99 927	20.8	5.9	1.18	49.2	0.7	12.9
74.9	26.6	99 935	20.7	6.0	1.18	73.7	1.7	28.2
100.1	47.6	99 156	21.0	8.1	1.17	97.7	2.9	50.5
149.9	106.8	99 155	21.3	8.2	1.17	146.0	6.6	113.4

Setting N°3 **Qv cor = 12.7 x (DP)^0.5** **Qv cor = 12.4 x (DPtot)^0.5**

Airflow measured $Q_{v\ meas}$ (m^3/h)	Static pressure difference measured ΔP (Pa)	Atmospheric pressure (Pa)	Dry temperature (°C)	Dew point temperature (°C)	Density (kg/m^3)	Airflow corrected according to EN13141-2:2010 $Q_{v\ cor}$ (m^3/h)	Dynamic pressure Pdyn (Pa)	Total pressure difference ΔPtot (Pa)
5.0	0.1	99 154	21.5	8.2	1.17	4.9	0.0	0.2
20.2	2.4	99 150	21.4	8.2	1.17	19.7	0.1	2.6
50.4	14.6	99 146	21.4	8.2	1.17	49.1	0.7	15.3
74.9	31.6	99 153	21.4	8.2	1.17	72.9	1.6	33.2
99.8	55.7	99 155	21.5	8.2	1.17	97.2	2.9	58.6
150.3	127.8	99 158	21.9	8.0	1.17	146.2	6.6	134.3

Setting N°4 **Qv cor = 11.9 x (DP)^0.5** **Qv cor = 11.7 x (DPtot)^0.5**

Airflow measured $Q_{v\ meas}$ (m^3/h)	Static pressure difference measured ΔP (Pa)	Atmospheric pressure (Pa)	Dry temperature (°C)	Dew point temperature (°C)	Density (kg/m^3)	Airflow corrected according to EN13141-2:2010 $Q_{v\ cor}$ (m^3/h)	Dynamic pressure Pdyn (Pa)	Total pressure difference ΔPtot (Pa)
5.3	0.2	99 153	21.9	8.1	1.17	5.2	0.0	0.2
20.1	2.9	99 159	21.8	8.1	1.17	19.6	0.1	3.0
50.2	16.9	99 160	21.7	7.6	1.17	48.8	0.7	17.7
74.9	37.5	99 163	21.7	7.6	1.17	72.9	1.6	39.1
99.7	66.6	99 173	21.6	7.5	1.17	97.1	2.9	69.5
149.9	149.9	99 177	21.8	7.7	1.17	145.8	6.5	156.5

Setting N°5 **Qv cor = 11.6 x (DP)^0.47** **Qv cor = 11.4 x (DPtot)^0.48**

Airflow measured $Q_{v\ meas}$ (m³/h)	Static pressure difference measured ΔP (Pa)	Atmospheric pressure (Pa)	Dry temperature (°C)	Dew point temperature (°C)	Density (kg/m³)	Airflow corrected according to EN13141-2:2010 $Q_{v\ cor}$ (m³/h)	Dynamic pressure Pdyn (Pa)	Total pressure difference ΔPtot (Pa)
4.8	0.1	99 202	21.6	7.5	1.17	4.7	0.0	0.1
19.8	3.6	99 200	21.5	7.5	1.17	19.3	0.1	3.7
49.9	21.1	99 190	21.3	7.6	1.17	48.6	0.7	21.8
74.9	48.3	99 194	21.2	7.7	1.17	73.0	1.6	50.0
100.5	86.3	99 201	21.0	7.7	1.17	98.0	3.0	89.3
150.1	190.2	99 210	21.2	7.8	1.17	146.3	6.6	196.8

Setting N°6 **Qv cor = 8.5 x (DP)^0.51** **Qv cor = 8.4 x (DPtot)^0.51**

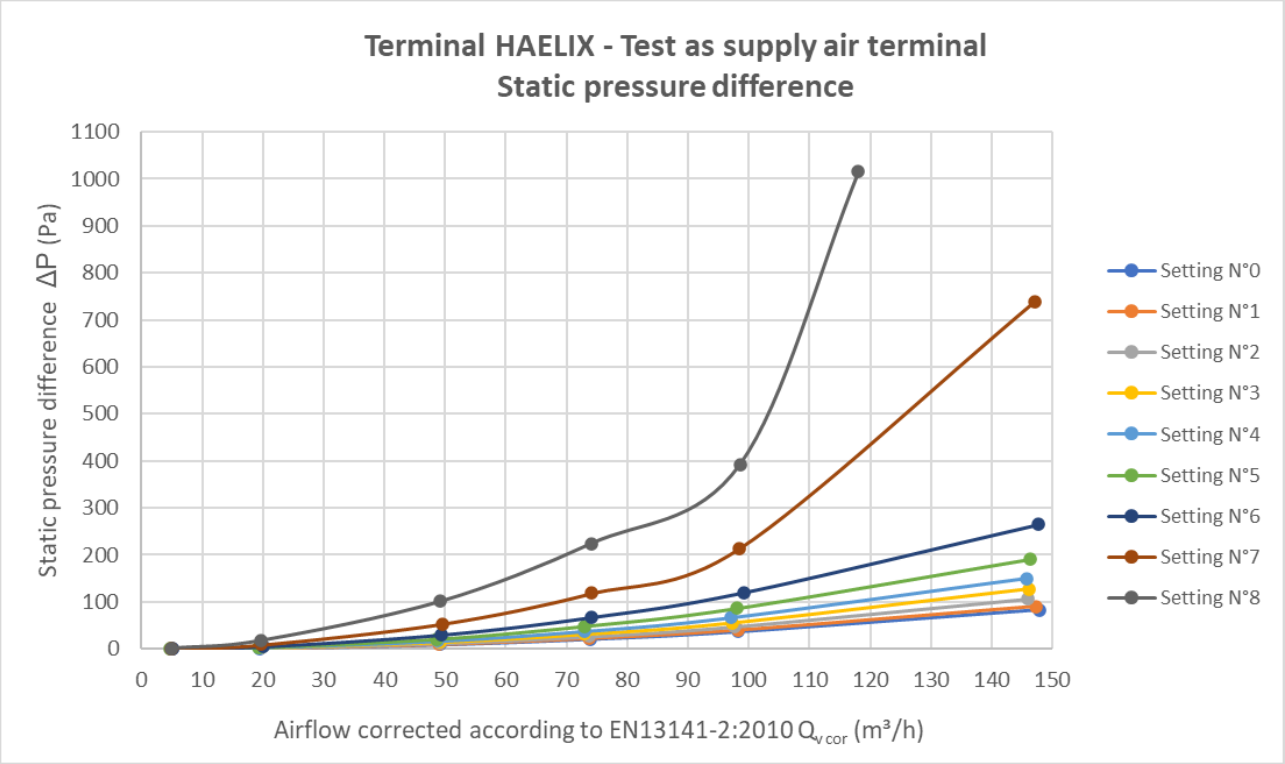
Airflow measured $Q_{v\ meas}$ (m³/h)	Static pressure difference measured ΔP (Pa)	Atmospheric pressure (Pa)	Dry temperature (°C)	Dew point temperature (°C)	Density (kg/m³)	Airflow corrected according to EN13141-2:2010 $Q_{v\ cor}$ (m³/h)	Dynamic pressure Pdyn (Pa)	Total pressure difference ΔPtot (Pa)
5.2	0.4	99 861	19.0	5.3	1.19	5.1	0.0	0.4
20.2	5.3	99 868	19.4	5.3	1.19	20.0	0.1	5.4
50.0	30.1	99 878	19.7	5.2	1.18	49.3	0.7	30.8
75.1	67.4	99 880	19.8	5.4	1.18	74.1	1.7	69.1
100.6	120.0	99 888	19.9	5.4	1.18	99.2	3.0	123.0
150.0	264.2	99 899	20.3	5.3	1.18	147.8	6.7	270.9

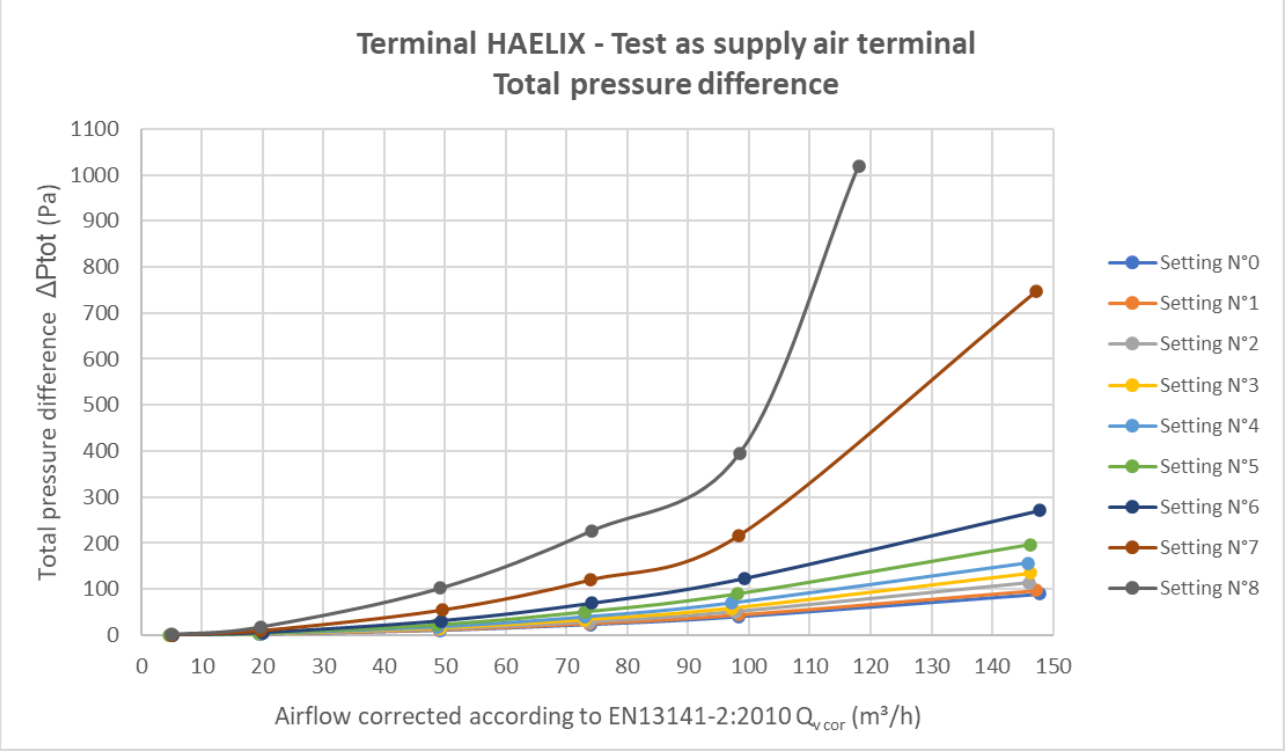
Setting N°7 **Qv cor = 6.7 x (DP)^0.49** **Qv cor = 6.6 x (DPtot)^0.49**

Airflow measured $Q_{v\ meas}$ (m³/h)	Static pressure difference measured ΔP (Pa)	Atmospheric pressure (Pa)	Dry temperature (°C)	Dew point temperature (°C)	Density (kg/m³)	Airflow corrected according to EN13141-2:2010 $Q_{v\ cor}$ (m³/h)	Dynamic pressure Pdyn (Pa)	Total pressure difference ΔPtot (Pa)
5.0	0.6	99 903	20.4	5.1	1.18	4.9	0.0	0.6
20.0	9.2	99 908	20.4	5.2	1.18	19.7	0.1	9.4
50.3	53.6	99 916	20.4	5.3	1.18	49.5	0.8	54.3
75.2	118.2	99 922	20.5	5.9	1.18	74.0	1.7	119.9
99.9	213.3	99 920	20.5	5.5	1.18	98.4	3.0	216.3
149.6	739.4	99 933	20.8	5.6	1.18	147.2	6.7	746.1

Setting N°8 **Qv cor = 4.8 x (DP)^0.49** **Qv cor = 4.8 x (DPtot)^0.49**

Airflow measured $Q_{v\ meas}$ (m³/h)	Static pressure difference measured ΔP (Pa)	Atmospheric pressure (Pa)	Dry temperature (°C)	Dew point temperature (°C)	Density (kg/m³)	Airflow corrected according to EN13141-2:2010 $Q_{v\ cor}$ (m³/h)	Dynamic pressure Pdyn (Pa)	Total pressure difference ΔPtot (Pa)
5.1	1.2	99 931	20.9	5.7	1.18	5.0	0.0	1.2
20.0	17.9	99 933	20.7	5.8	1.18	19.7	0.1	18.0
50.0	101.0	99 936	20.7	5.9	1.18	49.2	0.7	101.7
75.3	224.5	99 934	20.6	5.9	1.18	74.1	1.7	226.2
100.1	392.7	99 931	20.7	5.9	1.18	98.5	3.0	395.7
120.1	1015.3	99 932	21.0	5.9	1.18	118.1	4.3	1019.6


Terminal HAELIX - Test as supply air terminal
Static pressure difference
Static pressure difference ΔP (Pa)
1100
1000
900
800
700
600
500
400
300
200
100
0
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
Airflow corrected according to EN13141-2:2010 Qv cor (m³/h)
Setting N°0
Setting N°1
Setting N°2
Setting N°3
Setting N°4
Setting N°5
Setting N°6
Setting N°7
Setting N°8


Terminal HAELIX - Test as supply air terminal
Total pressure difference
Total pressure difference ΔPtot (Pa)
1100
1000
900
800
700
600
500
400
300
200
100
0
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
Airflow corrected according to EN13141-2:2010 Qv cor (m³/h)
Setting N°0
Setting N°1
Setting N°2
Setting N°3
Setting N°4
Setting N°5
Setting N°6
Setting N°7
Setting N°8

APPENDIX 4 - INSTRUMENTATION

	Number	Range	Calibration certificat
Airflowmeter	11869	5.754/396 m³/h	G221165AU
Manometer	14980	0/20 Pa	P2314928L
	14977	0/200 Pa	P2314948L
	5857	0/2000 Pa	P2312768N
Thermometer	15590	0/40°C	T23129691C
Atmospheric pressure	13320	90033/109938 Pa	P2209604N
Dew point	13320	-9/21°C	H2225431M