Private: Halton Vita Lab VFP – Airflow damper

Overview

Halton Vita Lab

VFP – airflow management damper

Halton VFP is a plastic fume cupboard damper for Halton Vita Lab Solo systems:

- For general exhaust ventilation design applications
  (fume cupboard exhausts are connected to one common fan)
- For exhaust installations
- Delivered with an integrated control box containing a differential pressure sensor for airflow measurement, a Halton VLC fume cupboard controller and a fast actuator

Product characteristics

- Circular inlet, circular outlet
- Pressure independent operation
- Operating range with ambient temperature of 0-50 °C
- Ambient relative humidity <95%, non-condensing
- Maximum differential pressure over the damper of 500 Pa

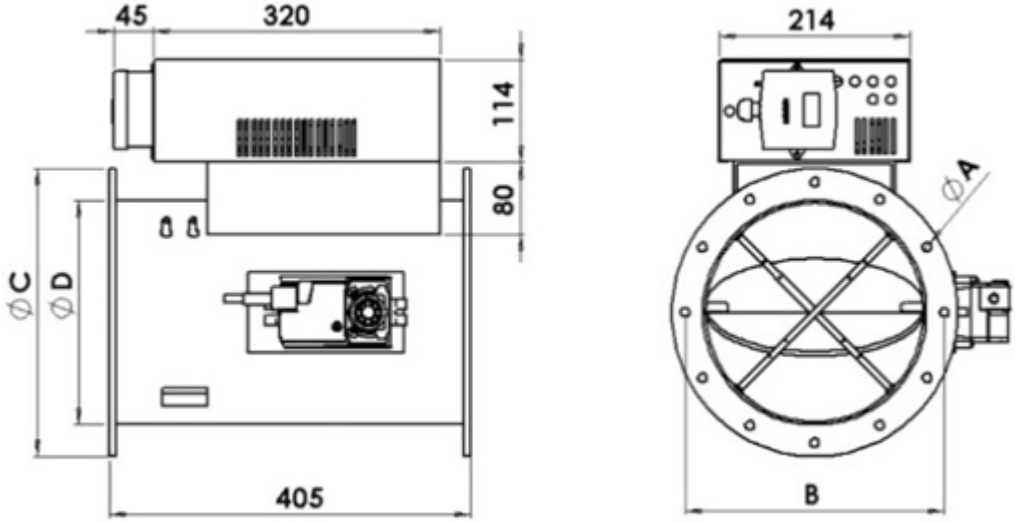
Product models and options

- Halton VFP-Y
    - Airflow measurement with measurement probe
    - Available with or without flanges for connection
    - Sizes: 125, 160, 200, 250, 315, 400, 500
    - Casing material choice PVC or PPS
- Halton VFP-V
    - Airflow measurement with venturi principle
    - Equipped with flange for connection
    - Sizes 160, 200, 250, 315 available in PVC or PPS
    - Sizes 125, 400 and 500 available in PPS only

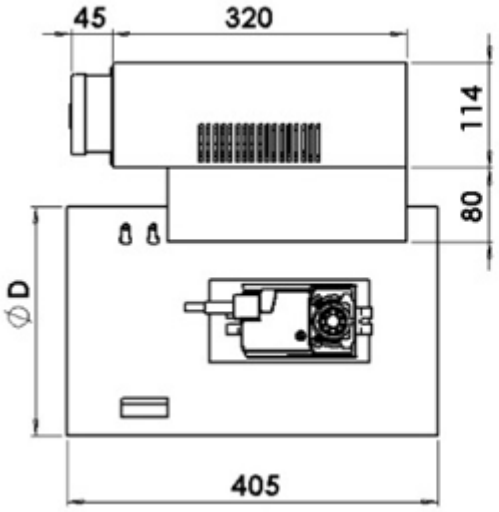
The Halton Vita Lab Solo Design Guide available from Halton Sales provides you with more information about selecting the right configuration and exhaust unit for your Halton Vita Lab solution. However, as all designs vary, close cooperation with Halton is recommended in order to ensure the best results.

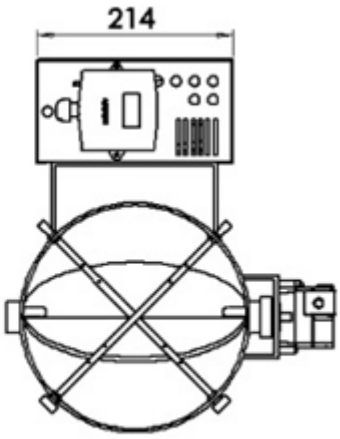
Dimensions

Halton VFP/Y with flange



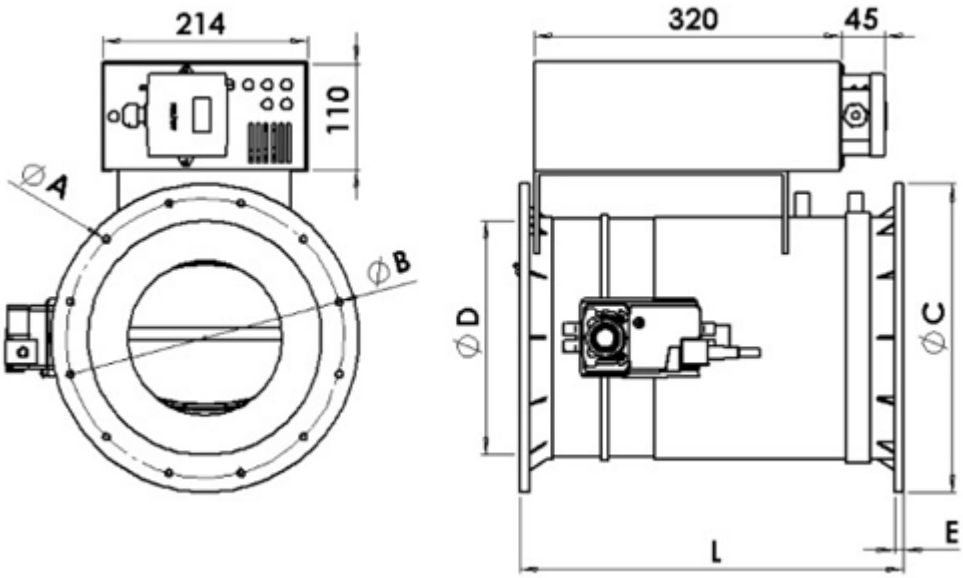
Halton VFP/Y without flange





NS	D	C	B	A
125	125	185	165	10
160	160	230	200	10
200	200	270	240	10
250	250	320	290	10
315	315	395	350	10
400	400	475	445	10
500	500	670	620	14

Halton VFP/V



NS	D	L	C	B	A	E
125	125	400	170	150	7	4
160	160	310	230	200	7	8
200	200	350	270	240	7	8
250	250	400	320	290	7	10
315	315	490	395	350	9	10
400	400	1100	480	495	9	16
500	500	1400	580	545	9	20

Airflow ranges per size

Halton VFP/Y

NS	Qmin	Q for 8m/s
125	12 l/s	98 l/s
	44 m^3/h	353 m^3/h
160	20 l/s	161 l/s
	72 m^3/h	579 m^3/h
200	31 l/s	251 l/s
	113 m^3/h	905 m^3/h
250	49 l/s	393 l/s
	177 m^3/h	1 414 m^3/h
315	78 l/s	623 l/s
	281 m^3/h	2 244 m^3/h
400	126 l/s	1 005 l/s
	452 m^3/h	3 619 m^3/h
500	196 l/s	1 571 l/s
	707 m^3/h	5 655 m^3/h

Halton VFP/V

NS	Qmin	Q for 8m/s
125	11 l/s	83 l/s
	37 m3/h	300 m3/h
160	18 l/s	142 l/s
	65 m^3/h	510 m^3/h
200	28 l/s	225 l/s
	102 m^3/h	810 m^3/h
250	44 l/s	353 l/s
	160 m^3/h	1 270 m^3/h
315	70 l/s	561 l/s
	252 m^3/h	2 018 m^3/h
400	116 l/s	931 l/s
	420 m3/h	3352 m^3/h
500	180 l/s	1447 l/s
	651 m^3/h	5211 m^3/h

Material

Part	Material
Casing	PVC or PPS
Damper blade	PVC or PPS
Measurement probes	PVC
Tube Connectors	Polyacetal
Flexible tubes	Silicone
Control Box	Galvanized steel (Control option : CB = CB1)

Function

Halton VFP maintains the required airflow in the fume cupboard through accurate measurement and airflow control, regardless of the variation in the conditions.

The damper is controlled by the Halton VLC controller (premounted on the unit in the control box). The VLC retrieves the measured sensor values of the Halton Vita Lab system and compares them with the assigned setpoint. The differential pressure sensor integrated in the damper measures the pressure with a measurement probe/venturi principle, and then calculates the airflow rate.

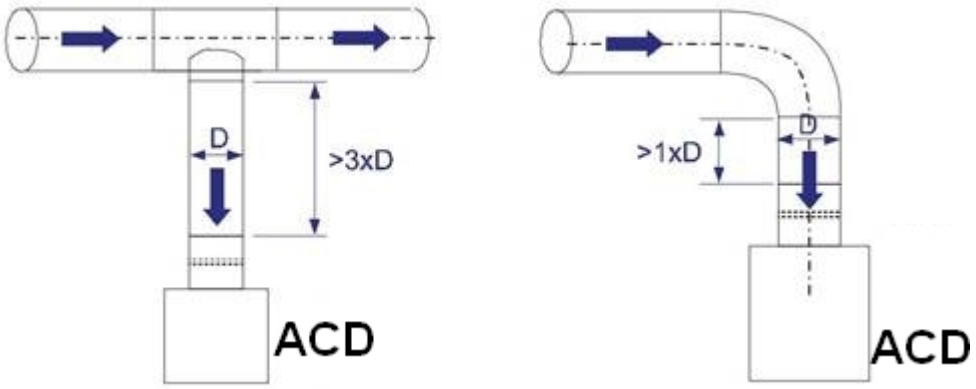
Based on the calculations, the VLC then adapts the damper position or frequency using a PID control in order to maintaina constant face velocity. If the airflow does not reach the predefined setpoint, an audio-visual alarm is triggered.

For more information about the operation of the damper as part of the Halton Vita Lab systems, see the Halton Vita Lab Solo Design Guide available from Halton Sales

Installation

The measurement unit can be installed horizontally, vertically or in any other position without impact on the measurement performance.

The required safety distances must be taken into account when installing the exhaust unit. Install the unit into the ductwork so the airflow direction through the unit is as indicated:



Installation instructions and project-specific wiring diagrams are provided by Halton for all Halton Vita Lab Solo system configurations. For more information, see the Halton Vita Lab Solo Design Guide available from Halton Sales.

Commissioning

The actual airflow can be calculated as a function of the differential pressure at the measurement probe and the measurement probe k factor as follows:

$$q_v = k * \sqrt{\Delta p_m}$$

q_v Actual airflow rate
k k-value for the product (see table below)
Δp_m Differential pressure of the measurement probe [Pa]

The k-factors in l/s and m³/h for the different sizes of Halton VFP-Y and VFP-V respectively:

Halton VFP/Y

NS	k (l/s)	k (m3/h)
125	10,6	38,2
160	18,3	65,8
200	27,4	98,8
250	44	158,4
315	71,4	256,9
400	117	421,2
500	185,1	666,4

Halton VFP/V

NS	k (l/s)	k (m3/h)
160	11,1	39,8
200	17	61,3
250	24,9	89,8
315	44,6	160,6

Specification

Exhaust unit for Halton Vita Lab Solo applications:

Variable airflow control damper used for measuring and controlling the exhaust airflow of fume cupboards connected to a common exhaust fan.

Made of PVC or PPS.

Pressure-independent damper equipped with

- a differential pressure sensor with auto-zero calibration and a digital display for airflow measurement
- an airflow controller
- a damper actuator using the LMS technology (Load Moment Stop) for extending product lifetime

Available with or without flanges for connection.

Short damper construction (<500mm).

Installation possible in any position without impact on the measurement performance.

Integration to fast systems possible due to:

- the differential pressure sensor's standard time constant of 0.5s
- the actuator's reaction time of 1.5s (damper sizes of up to 250mm)

Product Code

VFP/M-D

M = Measuremten type
Y Measurement probe
V Venturi

D = Diameter of duct connection
125, 160, 200, 250, 315, 400, 500

Other options and accessories

MA = Material
PV PVC
PP PPS

FL = Flanges
N No
Y Yes

ZT = Tailored product
N No

Code example

VFP/Y-125, MA=PV, FL=Y, ZT=N