Private: Halton Vita Lab VFI – Airflow dampers (draft)

Halton Vita Lab

VFI – airflow management damper

Halton VFI is a stainless steel 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 controller and a fast actuator

Halton reserves the right to alter products without notice.

Product characteristics

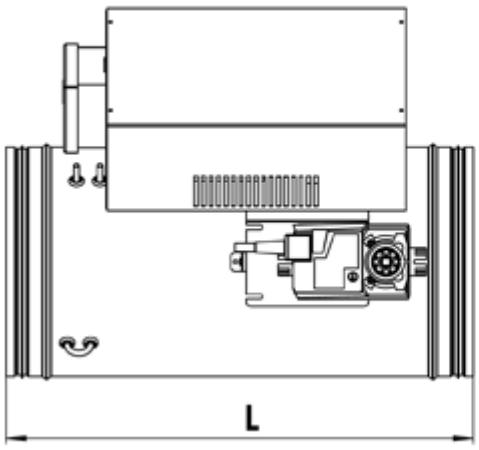
- Circular inlet, circular outlet
- Casing made of 316L corrosion-proof stainless steel
- Casing tightness complies with EN 1751, class C
- Complete shut-off function
- Pressure-independent operation
- Operating range with ambient temperature of 0-50 °C
- Ambient relative humidity <95%, non-condensing
- Maximum differential pressure over the damper of 1000 Pa

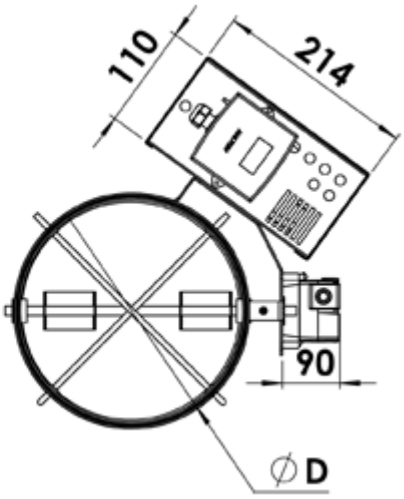
Product models and options

- Available sizes : 100, 125, 160, 200, 250, 315, 400 and 500

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





NS	D	L
100	98	500
125	123	500
160	158	500
200	198	500
250	248	500
315	313	500
400	398	500
500	498	500

Airflow ranges per size

Minimum and maximum airflow ranges for the different sizes for Halton VFI in l/s and m³/h (max is based on damper velocity of 8 m/s):

NS	Qmin	Q for 8m/s
100	8 l/s	64 l/s
	29 m^3/h	230 m^3/h
125	13 l/s	104 l/s
	47 m^3/h	374 m^3/h
160	20 l/s	160 l/s
	72 m^3/h	576 m^3/h
200	32 l/s	256 l/s
	115 m^3/h	922 m^3/h
250	49 l/s	392 l/s
	176 m3/h	1411 m^3/h
315	78 l/s	624 l/s
	281 m^3/h	2246 m^3/h
400	126 l/s	1008 l/s
	454 m^3/h	3629 m^3/h
500	197 l/s	1576 l/s
	709 m^3/h	5674 m^3/h

Material

Part	Material
Casing	Stainless steel (AISI 316)
Damper blade	Stainless steel (AISI 316)
Shaft	Stainless steel (AISI 316)
Bearings	HDPE (Polyethylene Resin)
Blade gasket	EPDM Rubber
Duct gaskets	1C-polyurethane hybrid
Measurement probe	Aluminium
Tube Connectors	Polyacetal
Flexible tubes	Silicone
Control Box	Galvanised steel (Control option : CB = CB1)

Function

The damper 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 and calculates the airflow rate.

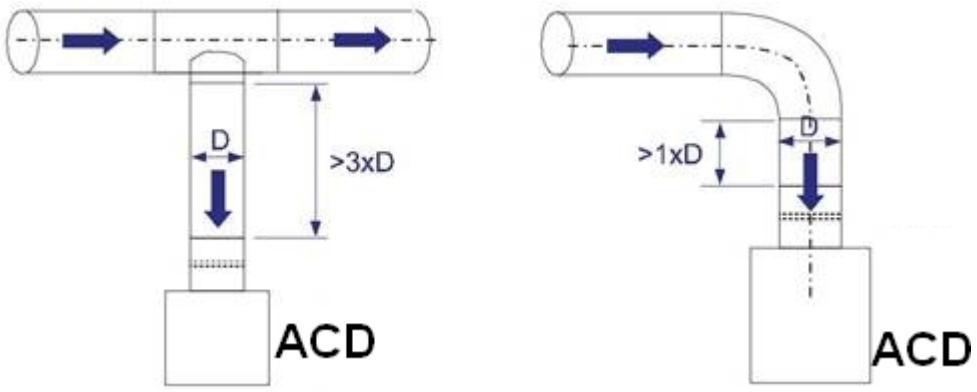
Based on the calculations, the VLC then adapts the damper position or frequency using a PID control in order to maintaina constant face velocity. If the airflow does not reach the predefined setpoint, an audio-visual alarm is triggered.

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

Installation

The exhaust 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]

NS	k (l/s)	k (m3/h)
100	6,5	23,5
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

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.

Damper made of 316L stainless steel with measurement probe pipes made of aluminium.

Pressure-independent damper equipped with

- integral airtight rubber gaskets for duct connection
- 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

Compliance with standards:

- Tightness of the control damper in closed position (EN1751 class 4)
- Casing tightness (EN 1751 class C).

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

VFI-D

D = Diameter of duct connection
100, 125, 160, 200, 250, 315, 400, 500

Other options and accessories

MA = Material
SS Stainless steel (AISI 316)

ZT = Tailored product
N No

Code example

VFI-100, MA=SS, ZT=N