

Private: Halton Vita Lab VLX – airflow management damper

Halton Vita Lab

VLX – airflow management damper

Halton VLX is a galvanised steel damper for Halton Vita Lab Room and Halton Vita Lab Zone solutions with special requirements on noise reduction:

- Halton Vita Lab Room
 - For supply and exhaust installations, for controlling room supply or exhaust airflow
- Halton Vita Lab Zone
 - For exhaust installations, to control the zone exhaust pressure

- The addition of a static pressure measuring unit (MSS) is recommended for measuring the static pressure
- Delivered with an integrated control box containing a differential pressure sensor for airflow measurement, a Halton VLC controller and a fast actuator

Product characteristics

- Airflow management plenum with acoustic attenuation (high density mineral wool)
- Pressure independent operation
- Complete shut-off function
- Maximum differential pressure over the damper of 1000 Pa
- Operating range : ambient temperature of 0 to 50 °C
- Ambient relative humidity <95%, non-condensing

Product models and options

- Short (VLX/S) and long (VLX/L) versions
- Separate supply and exhaust models
- Available sizes : 100, 125, 160, 200, 250, 315, 400 and 500
- Two options for insulation thickness (25mm and 40mm)
- Electrical or hot water reheating unit available
- Circular inlet, rectangular outlet (standard model)
- Outlet plenum with one or more circular connections available

The Halton Vita Lab Solo and Halton Vita Lab Room Design Guides available from Halton Sales provide you with more information about selecting the right configuration and damper for your Halton Vita Lab solution.

However, as all designs vary, close cooperation with Halton is recommended in order to ensure the best results.

3



Long version

| | D | W2 | Y | W1 |
|-----------------------|----------|-----------|----------|-----------|
| 25 mm Insulation : I1 | 100 | 400 | 250 | 1000 |
| | 125 | 400 | 250 | 1000 |
| | 160 | 400 | 250 | 1000 |
| | 200 | 600 | 280 | 1200 |
| | 250 | 700 | 320 | 1400 |
| | 315 | 800 | 400 | 1600 |
| | 355 | 1000 | 450 | 1600 |
| | 400 | 1000 | 450 | 1600 |
| | 500 | 1300 | 550 | 1800 |
| 40 mm Insulation : I2 | 100 | 430 | 280 | 1000 |
| | 125 | 430 | 280 | 1000 |
| | 160 | 430 | 280 | 1000 |
| | 200 | 630 | 310 | 1200 |
| | 250 | 730 | 350 | 1400 |
| | 315 | 830 | 430 | 1600 |
| | 355 | 1030 | 480 | 1600 |
| | 400 | 1030 | 480 | 1600 |
| | 500 | 1330 | 580 | 1800 |

Short version

| | D | W2 | Y | W1 |
|-----------------------|-----|------|-----|------|
| 25 mm Insulation : I1 | 100 | 400 | 250 | 600 |
| | 125 | 400 | 250 | 600 |
| | 160 | 400 | 250 | 600 |
| | 200 | 600 | 280 | 600 |
| | 250 | 700 | 320 | 900 |
| | 315 | 800 | 400 | 900 |
| | 355 | 1000 | 450 | 900 |
| | 400 | 1000 | 450 | 900 |
| | 500 | 1300 | 550 | 1000 |
| 40 mm Insulation : I2 | 100 | 430 | 280 | 600 |
| | 125 | 430 | 280 | 600 |
| | 160 | 430 | 280 | 600 |
| | 200 | 630 | 310 | 600 |
| | 250 | 730 | 350 | 900 |
| | 315 | 830 | 430 | 900 |
| | 355 | 1030 | 480 | 900 |
| | 400 | 1030 | 480 | 900 |
| | 500 | 1330 | 580 | 1000 |

Airflow range per size

Minimum and maximum airflow ranges for the different sizes for Halton VLX 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 m ³ /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 | Galvanised steel |
| Damper blade | Galvanised steel |
| Perforated blade | Galvanised steel |
| Bearings | HDPE (Polyethylene Resin) |
| Blade gasket | EPDM Rubber |
| Measurement probe | Aluminium |
| Tube Connectors | Polyacetal |
| Flexible tubes | Silicone |
| Acoustic insulation | High density wool |
| Control Box | Galvanised steel (Control option : CB = CB1) |

Function

Depending on the application, the damper maintains the required airflow in the fume cupboard, the room and/or the duct. A stable airflow is achieved 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 maintain a constant face velocity. If the airflow does not reach the predefined setpoint, an audio-visual alarm is triggered.

The damper is also equipped with an actuator, made of two blades with a kinematic link. When the main blade moves, the second, perforated blade moves in a different direction. This reduces airborne noise when the air enters the unit. The main blade is equipped with a gasket to reduce the friction and the needed torque of the actuator. The electric power consumption of the control loop is also reduced.

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 and the Halton Vita Lab Room Design Guide available from Halton Sales

Product Models

See table for codes of the different product models and options:

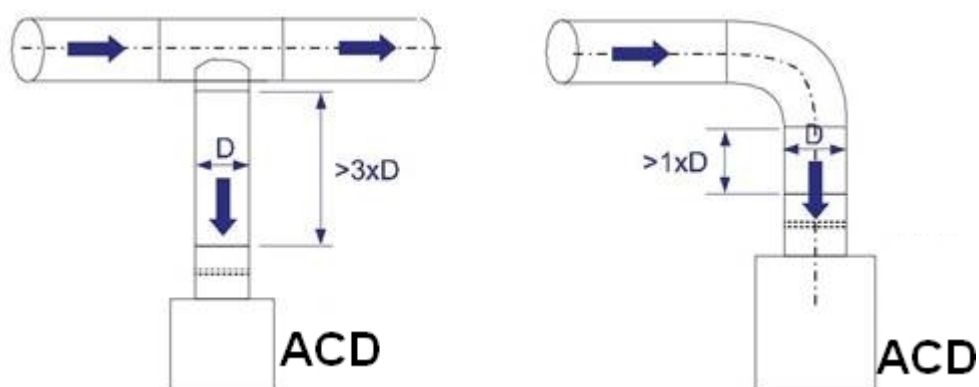
| Code | Application | Description |
|----------------|---------------------------|--------------------------------|
| VLX/S-S; IN=I1 | Supply, no noise limits | Short version, 25mm insulation |
| VLX/L-S; IN=I1 | Supply with noise limits | Long version, 25mm insulation |
| VLX/S-E; IN=I1 | Exhaust, no noise limits | Short version, 25mm insulation |
| VLX/L-E; IN=I1 | Exhaust with noise limits | Long version, 25mm insulation |
| VLX/S-S; IN=I2 | Supply, no noise limits | Short version, 40mm insulation |
| VLX/L-S; IN=I2 | Supply with noise limits | Long version, 40mm insulation |
| VLX/S-E; IN=I2 | Exhaust, no noise limits | Short version, 40mm insulation |
| VLX/L-E; IN=I2 | Exhaust with noise limits | Long version, 40mm insulation |

| Code | Accessory | Description |
|------|-------------------|---|
| WBO | Reheat coil | Module integrating a water coil that can be connected to VLX |
| PBO | Connection module | Module connecting the outlet of the unit to circular ductwork |

Installation

The damper must be installed horizontally and required safety distances must be taken into account when installing the damper.

Install the unit into the ductwork so the airflow direction through the unit is as indicated:



Static pressure measurement

When using the damper in Halton Vita Lab Zone applications, the addition of a static pressure measuring unit (Halton MSS) is recommended for increasing the accuracy of static pressure measurement.

In order to ensure the accuracy of the duct static pressure measurement, consider the safety distances between the measuring unit and airflow disturbances as follows:

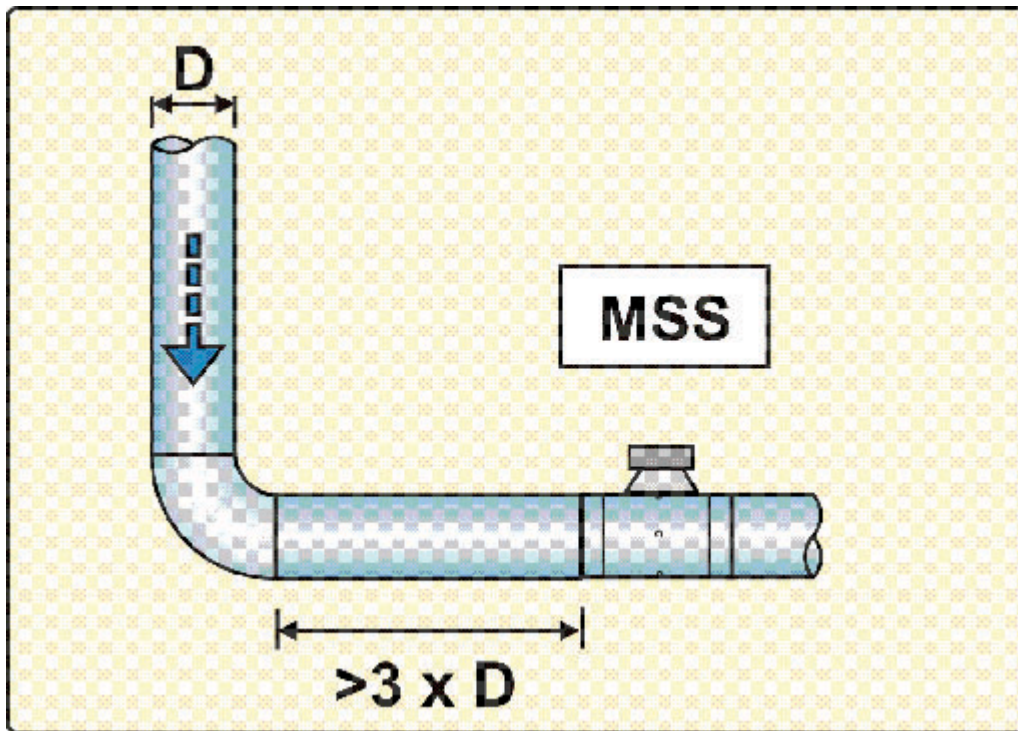


Fig.1. 90° elbow

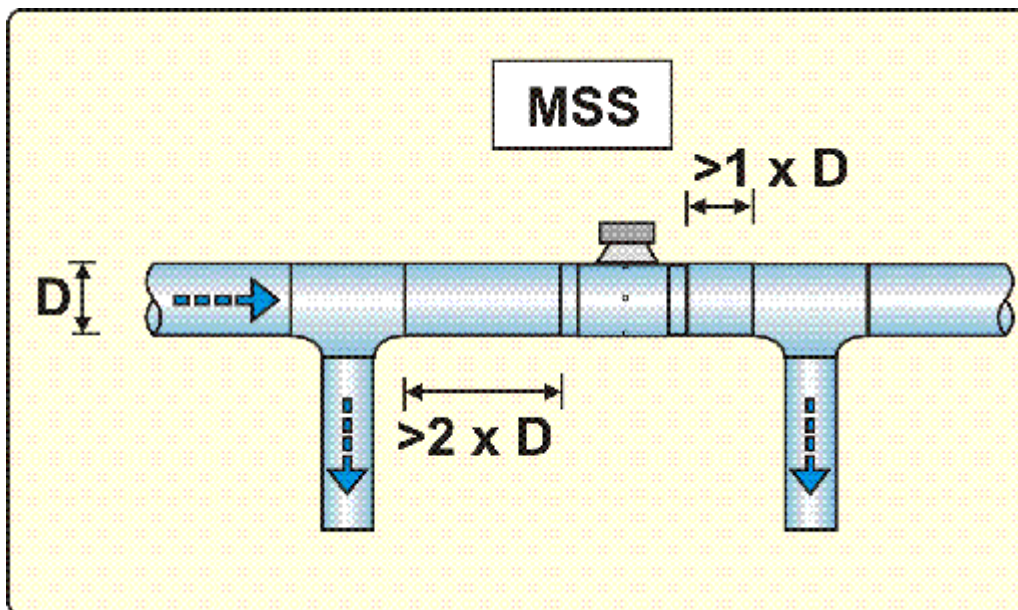


Fig.2. Branch on supply duct

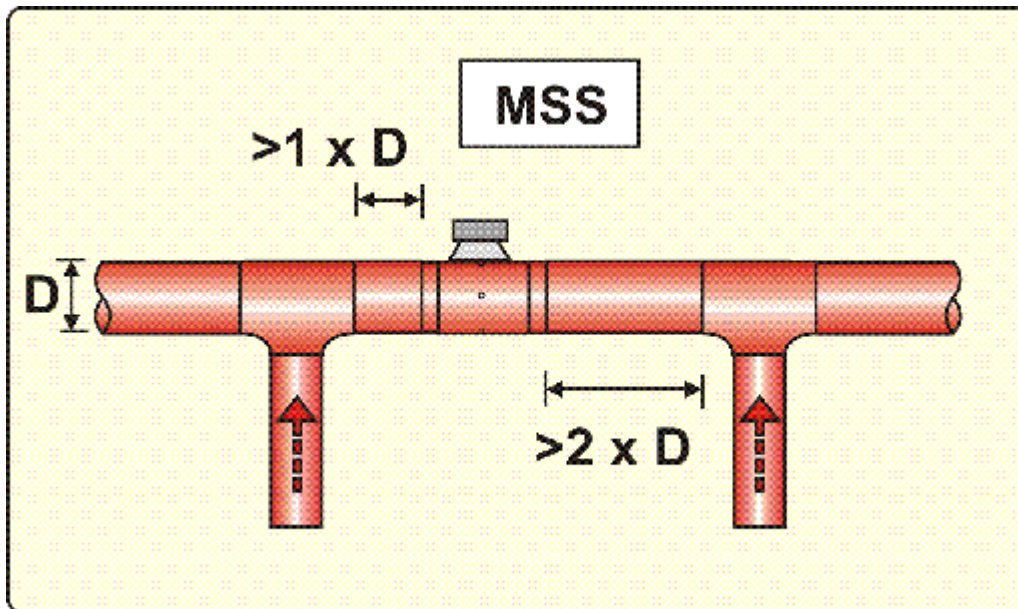


Fig.3. Branch on exhaust duct

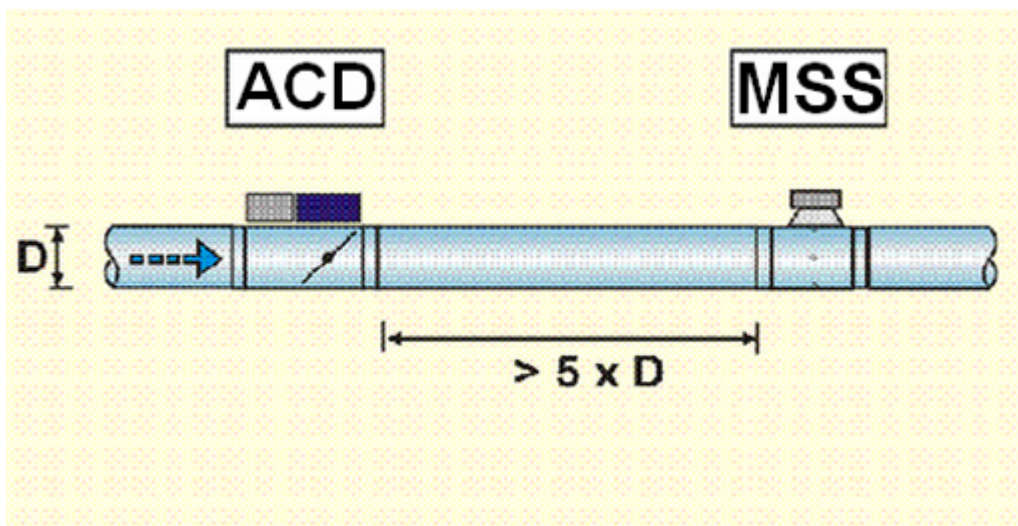


Fig.4. Safety distance between damper (ACD) and MSS, straight duct

Installation instructions and project-specific wiring diagrams are provided by Halton for all Halton Vita Lab system configurations. For more information, see the relevant Halton Vita Lab Solo and Halton Vita Lab Room Design Guides 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 (m ³ /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

Specification

Damper for Halton Vita Lab Room and Vita Lab Zone applications.

Variable airflow control damper used for measuring and controlling the airflow of the laboratory space in supply or exhaust applications, or for controlling zonal pressure.

Damper made of galvanised steel with measurement probe pipes made of aluminium. Casing made of galvanised steel.

Pressure-independent damper equipped with

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

Construction made with special attention to noise reduction.

- In the standard model, casing insulated with a 25 mm thick mineral wool. Mineral wool insulation has a high-density coating to avoid tearing, even at high velocities.
- An option for extra thick mineral wool insulation (40mm). This construction can replace the double skin construction.
- Damper actuator equipped with a kinematic link between blades for noise reduction. When the main blade moves, the second, perforated blade moves in a different direction. This reduces airborne noise when the air enters the unit. The main blade is equipped with a gasket to reduce the friction and the needed torque of the actuator. The electric power consumption of the control loop is also reduced.

- Acoustic part equipped with an asymmetrical silencer enabling additional acoustic attenuation, particularly in the low frequency-range.
- An option for a rectangular part, allowing air expansion

Compliance with standards: fire performance of the insulation Euro class A2, s1, d0

Suitable for laboratory environments: a smooth and washable surface to prevent microbial growth

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)

The calibration parameters and the location of the damper are clearly labelled at the factory prior to delivery.

Product Code

Product code

VLX/V-M-D

V = Version

L Long
S Short

M = Model

S Supply
E Exhaust

D = Diameter (connection size)

100, 125, 160, 200, 250, 315, 355, 400, 500

Other options and accessories

IN = Insulation

I1 25 mm
I2 40mm

AS = Accessory

N No
Y Yes

ZT = Tailored product

N No

Code example

VLX/L-S-250, IN=I1, AS=Y, ZT=N