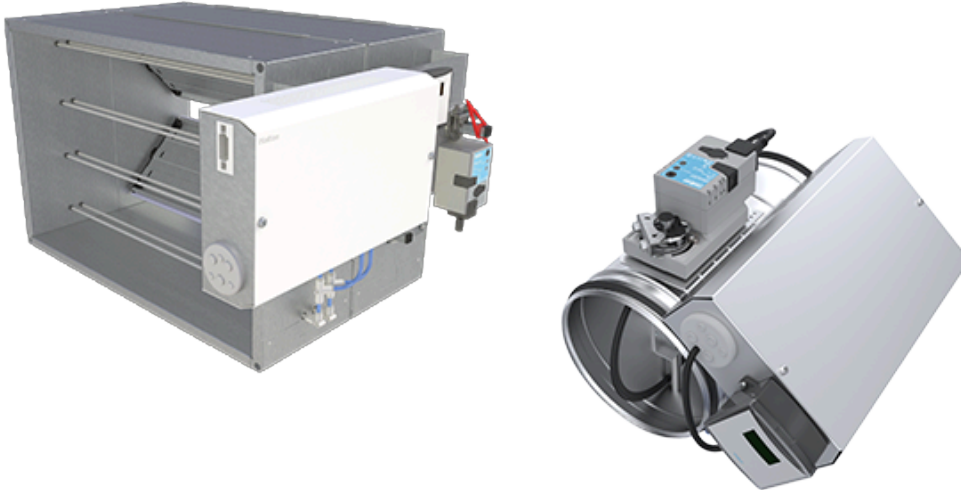


# Halton Vita VLR – Room airflow controller for Halton Vita Lab solutions



## Overview

The Halton Vita VLR controller operates as a fundamental element of the supply and exhaust ductwork in the Halton Vita Lab solution. This solution is an independent stand-alone system, which can be connected via bus communication to the BMS system.

Intended for all kind of environments, especially clean rooms or laboratory rooms. Airflow measuring is based on differential pressure between averaging cross measuring tubes.

The room controller (Halton Vita VLR), equipped with a fast actuator and pressure differential sensor, controls the room airflow or pressurisation so that the desired room balance or differential pressure between the room and the reference space is achieved.

## Application

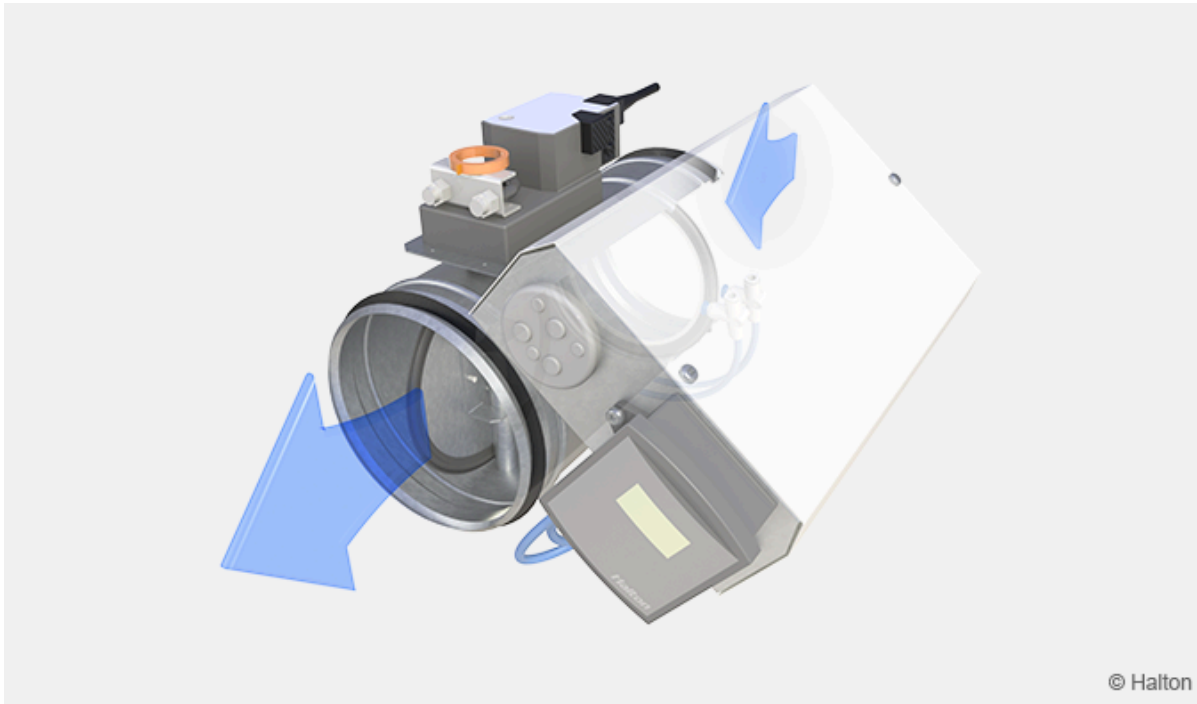
- Airflow is measured with cross measuring tubes or orifice plate
- Airflow control damper for Halton Vita Lab solution
- Circular and rectangular pressure-independent variable airflow controller
- Room supply and exhaust airflow installations

## Key features

- Stand-alone system

- Pressure-independent operation
- Airflow rate and room pressure control modes are available
- Project specific settings are preset and tested at the factory
- Several connection sizes between 100-630 mm
- Velocity range 1 — 6.5 m/s
- Can be connected to Buildings Management System (BMS)

## Operating principle



**Fig.1.** Operating principle of Halton Vita VLR with VFH airflow damper

The airflow controller contains a cross-type airflow measurement probe, a VAV airflow controller, a fast actuator, differential pressure sensor and a blade (with or without gasket).

The airflow controller can function either as a supply or an exhaust unit. It maintains the required airflow through accurate measurement and airflow control, regardless of variations in the room conditions or duct pressure. The airflow measurement is based on a differential pressure generated by high-precision pickup tubes of the measurement probe. The tubes are engineered for sensitivity in low airflows and for low noise generation in high airflows.

Changes in room conditions can be adjusted manually from an end-user interface or by different sensors such as occupancy or room pressure sensors, thermostats or timers. The conditions can also be managed remotely from a building management system (BMS). The control signal and the airflow measurement data from the pickup tubes are processed in the Halton Vita VLR controller. The Halton Vita VLR controller gives the actuator a command to change the position of the damper blade, in order to keep the airflow at the predefined setpoint. The airflow setpoint can be modified between minimum and maximum settings from the room controller interface or a BMS.

# Key technical data

Feature	Value
Duct connection sizes	Circular: ø100-630 mm Rectangular: 200×150 – 800×400 mm
Material	Galvanised or stainless steel (EN 1.4404/AISI 316L)
Air velocity range	<ul style="list-style-type: none"> <li>1 – 6.5 m/s</li> </ul>
Operating range (ambient temperature)	0-50 °C
Ambient relative humidity (non-condensing)	< 95%
Communication interface	ModBUS RTU/IP, BACnet/IP
Operating modes <ul style="list-style-type: none"> <li>Airflow control</li> <li>Room pressure control</li> </ul>	<ul style="list-style-type: none"> <li>Complete shut off function</li> <li>Maximum differential pressure over the damper 500 Pa</li> </ul>
Accessories	<ul style="list-style-type: none"> <li>Sound attenuator (SA)</li> <li>Room pressure sensor (VPT)</li> <li>Room panel (HTP)</li> <li>Insulation 50 mm mineral wool for air radiated sound and condensation purposes</li> </ul>
Protection class	<ul style="list-style-type: none"> <li>Controller: IP20</li> </ul>
Power supply	<ul style="list-style-type: none"> <li>AC 230 or 24 V -15%/+20%</li> </ul>
Standards and certifications	<ul style="list-style-type: none"> <li>Controller CE marking, quality standard ISO9001 compliance</li> <li>Building material declaration, declaration of conformity</li> <li>Environmental standard ISO14001</li> <li>Casing tightness               <ul style="list-style-type: none"> <li>circular model: EN 1751 class C</li> <li>rectangular model: EN 1751 class B</li> </ul> </li> <li>Shut-off operation tightness               <ul style="list-style-type: none"> <li>circular model: fulfils EN 1751 class 4</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>◦ rectangular model: fulfils EN 1751 class 1</li> </ul>
Maintenance	According to the building maintenance program

# Features and options

Category	Name	Description
Solution concept	Room airflow control	–
	Room pressure control	–
	Total exhaust measurement	–
Control concept	General supply, master	Room airflow compensation
	General exhaust, master	Room airflow compensation
	General supply, slave	–
	General exhaust, slave	–
	Room pressure control, supply	Under pressure application
	Room pressure control, exhaust	Overpressure application
Damper	VFH	Circular with gross tube, galvanised steel
	VFC	Circular with orifice plate, galvanised steel
	VFA	Circular with orifice plate, antibacterial painted galvanised steel
	VFN	Circular with orifice plate, stainless steel (AISI 316L)
	VFI	Circular with cross tube, stainless steel (AISI 316L)
	VKR	Rectangular with gross tube, galvanised steel
	VLX	Rectangular with gross tube, galvanised steel, long or short model

For more detailed information of the order code, see section Order code.

## Solution description

Halton Vita VLR is a part of the Halton Vita Lab solution offering.



**Fig.2.** Halton Vita VLR + VKR airflow damper combined with a Halton Vita Lab Room controller, Halton Vita VPT

Halton Vita VLR is a controller especially designed for controlling the automation system of laboratory and cleanroom environment. It is used for controlling the ventilation airflow, room temperature, and indoor air quality.

The Halton Vita VLR automation package consists of a controller unit and optional components depending on customer needs: a wall panel and sensors for temperature, CO<sub>2</sub>, occupancy and pressure.

In the laboratory room Halton fume cupboard ventilation controllers Halton Vita VLS are connected to the Halton Vita VLR via internal BUS. The holistic system includes all components for high required laboratory ventilation control.

## Application area

- Controlling the ventilation airflow, room pressure, room temperature, and indoor air quality in the laboratory and clean rooms
- The Halton Vita VLR controller is an important part of the Halton Vita Lab system, controlling room conditions when Halton Vita VLS controls fume cupboards
- Overall Halton Vita Lab system includes:
  - Halton Vita Lab Room air conditioning applications:
    - Supply airflow
    - General exhaust
    - Room pressure
    - Temperature and CO<sub>2</sub>
- Halton Vita Lab Solo fume cupboard control
- Halton Vita Lab Zone duct static pressure
- Local exhaust units and all ventilated components in the laboratory environment

## Key features

- Factory-tested controller and wiring, easy to install
- Pre-installed project-specific parameters, quick to commission
- Several operating modes based on occupancy, thermal comfort, and indoor air quality
- Enables fully flexible layout solutions for changing needs in laboratory environment
- Highly energy-efficient and reliable system operation

## Operating principle

Supply airflow control Halton Vita Lab Room is realized by

- racking the measured exhaust units; fume hoods and local exhausts
- setting the supply airflow setpoint to correspond the exhaust airflow rate
- applying a defined deviation between the exhaust and supply

Halton Vita Lab Room can also control

- the pressurization of the laboratory space based on the differential pressure measurement between the space and the ambient reference space

Halton Vita Lab Room –system can also maintain

- desired minimum air change in the room when exhaust airflow from exhaust units is insufficient
- room temperature either by general ventilation airflow rate control and/or by controlling the supply air temperature



**Fig.3.** System components for Halton Vita Lab solutions.

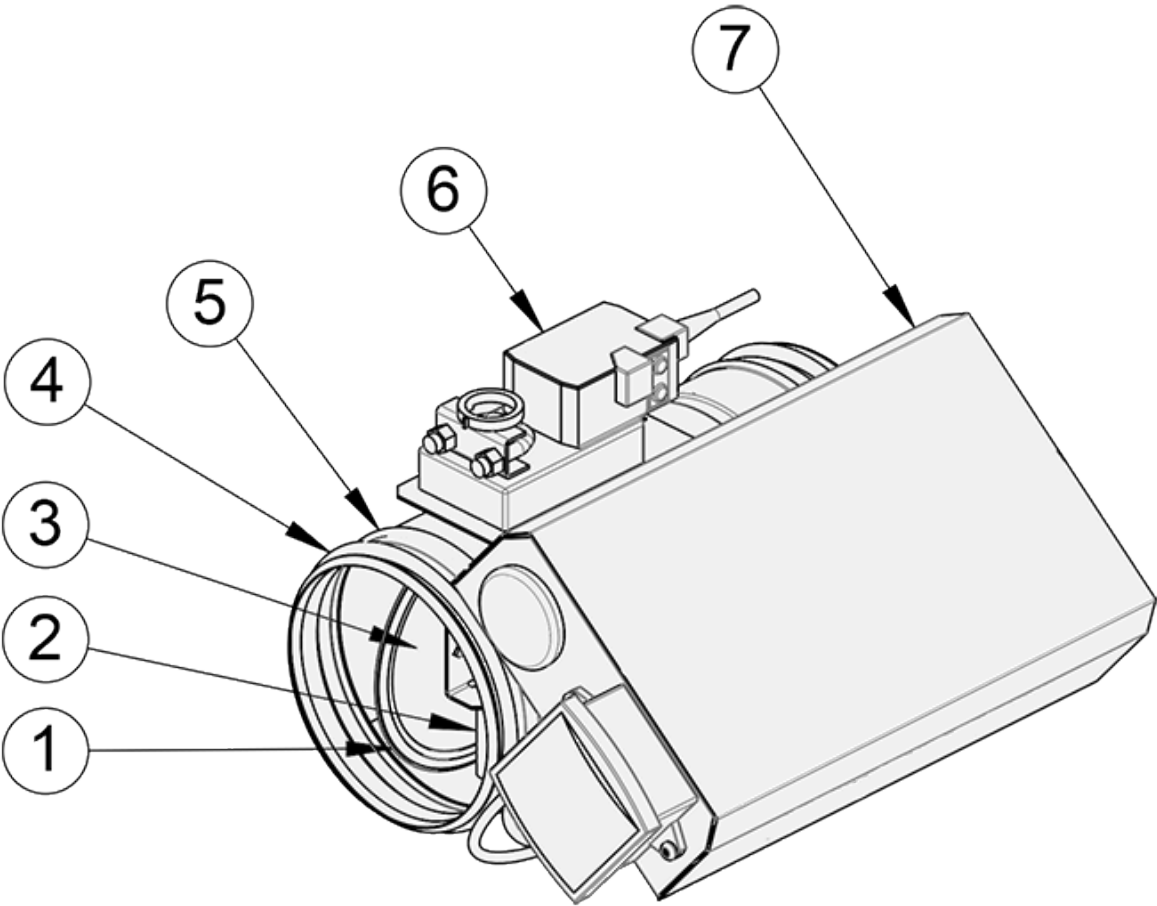


# Quick selection

## Halton Vita VLR with VFH damper

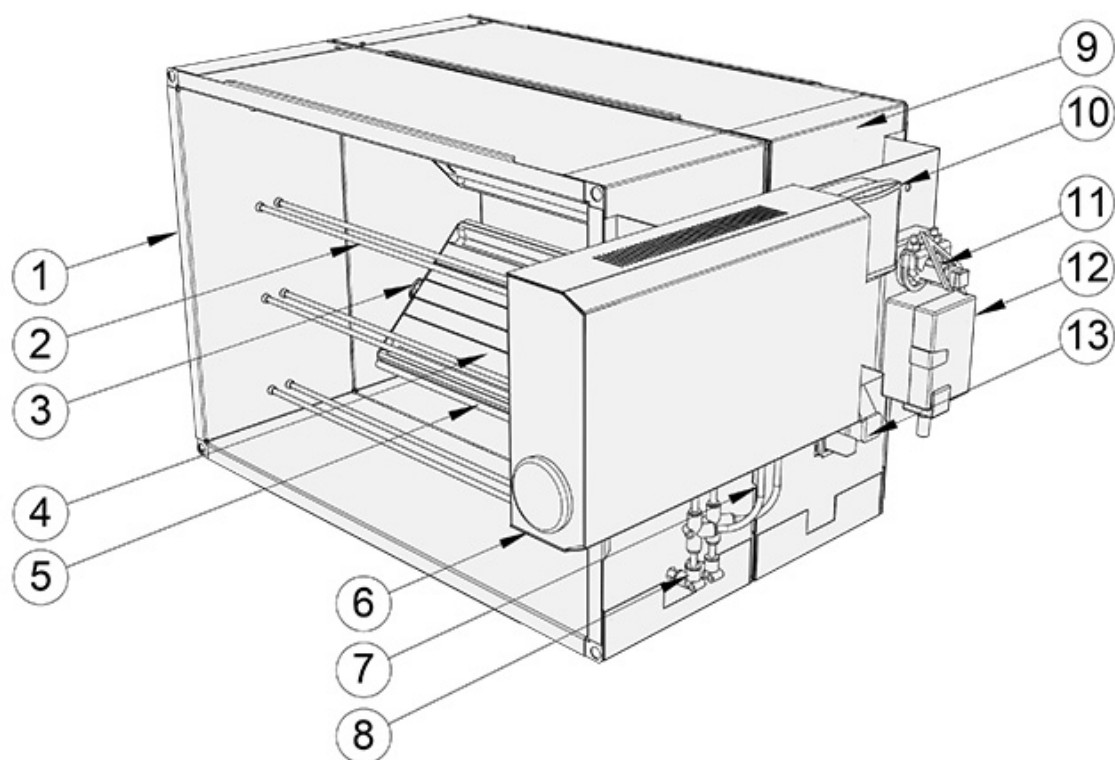
Size	qv	qv
	min – max [l/s]	min – max [m3/h]
125	12 – 80	44 – 288
160	20 – 131	72 – 472
200	31 – 204	113 – 734
250	49 – 319	177 – 1148
315	78 – 507	281 – 1825
400	126 – 817	452 – 2941
500	296 – 1276	707 – 4594

## Structure and materials



**Fig.3.** Halton Vita VLR with damper VFH

No.	Part	Material	Note
1	Blade gasket	EPDM rybber	–
2	Shaft	Galvanised steel	Stainless steel (EN 14404/ AISI316L) with damper option VFI
3	Blade	Galvanised steel	Stainless steel (EN 14404/ AISI316L) with damper option VFI
4	Duct seal gasket	1C-polyurethane hybrid	–
5	Casing	Galvanised steel	Stainless steel (EN 14404/ AISI316L) with damper option VFI
6	Actuator	Plastic, steel, PVC cable	–
7	Airflow controller box	–	–

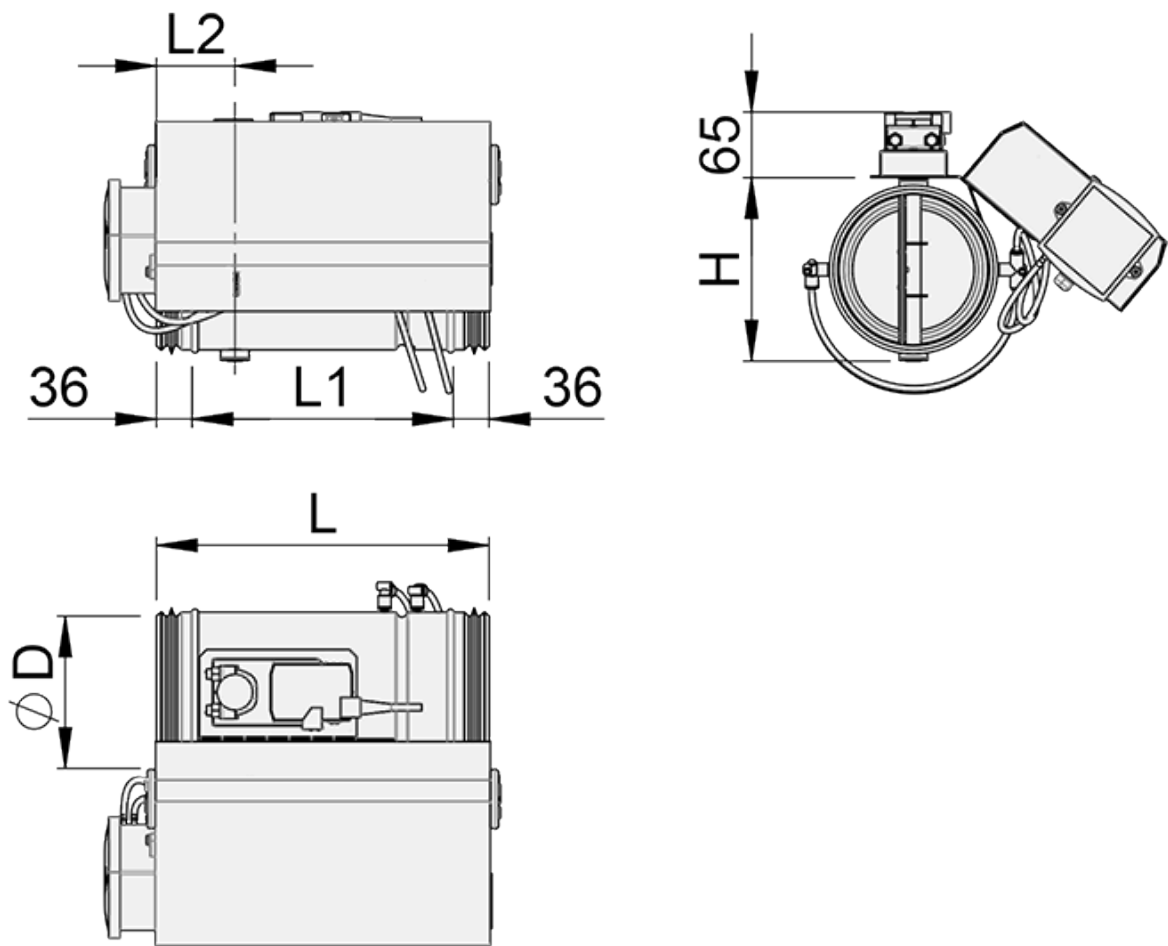


**Fig. 4.** Halton Vita VLR with damper VKR, insulated model

No.	Part	Material
1	Casing	Galvanised steel
2	Measurement probe pipes	Aluminium
3	Blade bearing	Alloy of polyamide and molybdenum sulphide (plastic)
4	Blandes	Galvanised steel. Sandwich design, inside polyurethane insulation (CFC free)
5	Blade gasket	Galvanised steel
6	Blade gaskets	Silicone
7	Measurement tubes	Polyurethane
8	Tube connection	Polyaceatal
9	External insulation	Galvanised steel casing. Insulation mineral wool
10	Transmitter enclosure	Polycarbonate (IP54)
11	Rectangular drive shaft	Galvanised steel (15×15 mm)
12	Operating model	Plastic, steel, PVC cable
13	Lever mechanism	Galvanised steel

# Dimensions and weight

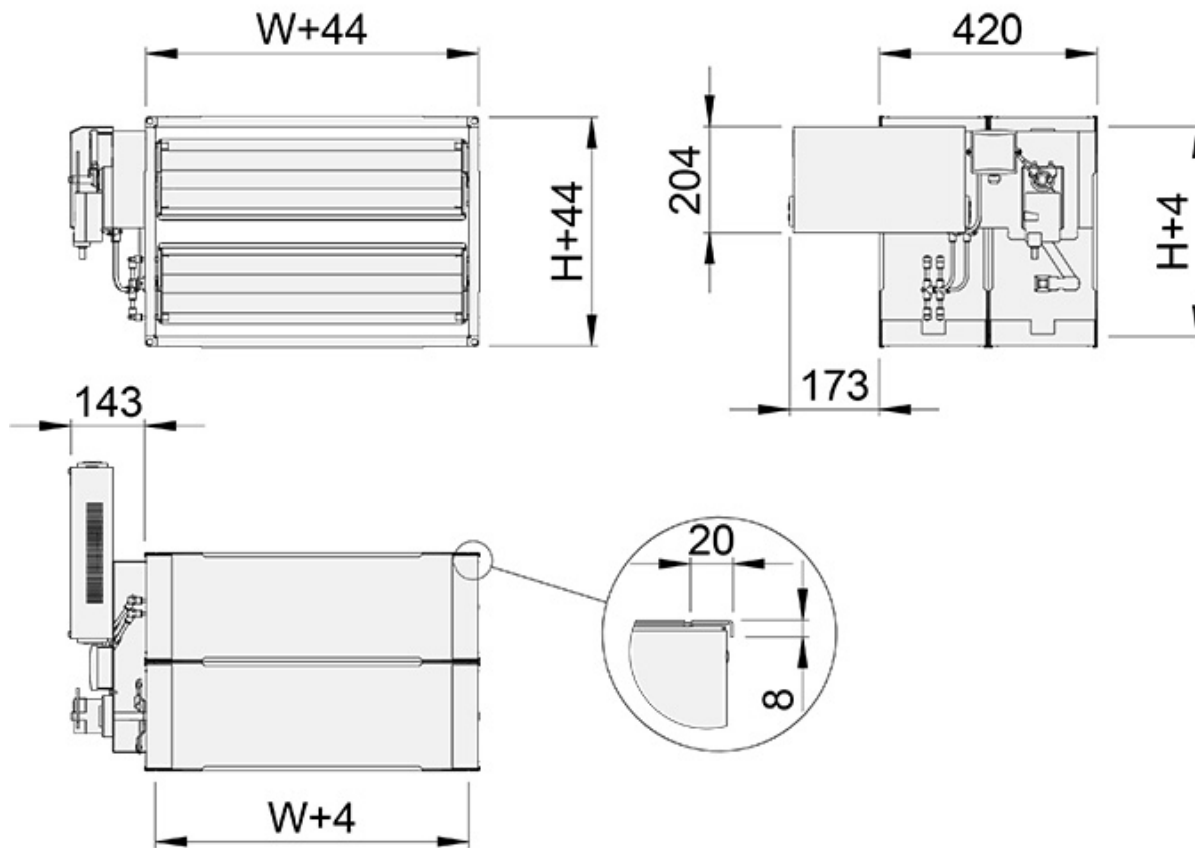
## Halton Vita VLR with damper VFH, without insulation



NS [mm]	øD [mm]	L [mm]	L1 [mm]	L2 [mm]	H [mm]	Weight [kg] *)
125	124	328	256	77	135	1.9
160	159	328	256	77	170	2.2
200	199	328	256	77	210	2.6
250	249	328	256	77	260	3.2
315	314	495	423	77	325	3.8
400	399	495	423	80	410	5.3
500	499	620	548	149	508	13.7

\*) Without airflow controller box

## Halton Vita VLR with damper VKR, without insulation



**W = Width of duct connection [mm]**

200, 300, 400, 500, 600, 700, 800

**H = Height of duct connection [mm]**

150, 200, 250, 300, 350, 400

## Specification

### Halton Vita VLR+VFH/VFI

Pressure-independent variable airflow control damper for supply and exhaust installations, fulfilling the following requirements:

#### Construction

- Airflow is adjusted by the position of the blade and measuring is based on differential pressure over the orifice plate
- Damper includes components
  - Fast actuator, 2.5/4.0 s running time
  - Controller box ("Master") or junction box ("Slave")

- Pressure transmitter
- Airflow measuring tubing
- Duct connection with integral airtight rubber gaskets
- Complete shut-off function (blade gasket), complies with EN 1751 class 4
- Casing tightness complies with EN 1751 class C
- Damper with external insulation include a 50mm mineral wool

## Material

- VFH: Galvanised steel
- VFI: Stainless steel (AISI 316L)

## Electrical data

### Master

- Supply voltage: 230 VAC (230 VAC / 24 VAC -transformer included)
- Actuators / sensors supply voltage: 24 VAC
- Analog control: 2...10 VDC
- Analog measuring: 0...10 VDC (0-200 Pa)
- Modbus RTU, Modbus TCP, Bacnet IP -communication available via controller

### Slave:

- Supply voltage 24 VAC
- Actuators / sensors supply voltage: 24 VAC
- Analog control: 2...10 VDC
- Analog measuring: 0...10 VDC (0-200 Pa)
- No bus communication

## Parameter settings

### Master

- Design parameters are calibrated at the factory. Halton service will verify all parameters during commissioning phase.
- Dampers are tested at the factory.
- Controller settings are adjustable with a PC- or a handheld tool

# Installation

## Wiring

The wiring must be carried out by professional technicians in accordance with local regulations. For the power supply, a safety-isolating transformer must be used.

Installation instructions and project-specific wiring diagrams are provided by Halton for all Halton Vita Lab Room system configurations.

For more information, see the Halton Vita Lab Room Design Guide available from Halton Sales.

## Order code

### VLR/S-C-T-D; L-H-M-IN-MA-FC-TF-CB-ZT

Main options	
<b>S = Solution concept</b>	
A	Room airflow control
B	Room pressure control
C	Total exhaust measurement
<b>C = Control concept</b>	
1S	General supply (slave)
1E	General exhaust (slave)
4S	General supply (master, Room airflow compensation)
4E	General exhaust ( master, Room airflow compensation)
5S	Room pressure control (supply, under pressure application)
5E	Room pressure control (exhaust, overpressure application)
<b>T = Damper/measurement unit type</b>	
A	VFH (galvanised steel, cross tube)
B	VFC (galvanised steel, orifice)
C	VFA (galvanised steel, orifice, antibacterial)
D	VFN (stainless steel, orifice)
E	VFI (stainless steel, cross tube)
K	VKR (rectangular, galvanised steel, cross tube)
L	VLX/L (galvanised steel, cross tube, long version)
M	VLX/S (galvanised steel, cross tube, short version)
<b>D = Diameter of duct connection [mm]</b>	100, 125, 160, 200, 250, 315, 400, 500

Other options and accessories	
<b>L = Length [mm], when damper type VKR</b>	200, 300, 400, 500, 600, 700, 800
<b>H =Height [mm], when damper type VKR</b>	150, 200, 250, 300, 350, 400
<b>M = Model</b>	
S	Supply
E	Exhaust
<b>IN = Insulation</b>	
NA	Not assigned
I1	Insulated, 25 mm
I2	Insulated, 40 mm
I3	Insulated, 50 mm
<b>MA = Material</b>	
CS	Hot-galvanised steel
AS	Stainless steel (AISI 316)
<b>FC = Controller</b>	
A1	VLC-A1 (Modbus, 2 port, 15 I/O)
A2	VLC-A2 (Modbus, 3 port, 28 I/O)
<b>TF = Transformer</b>	
N	No
TF1	230/24 transformer (35VA)
TF2	230/24 transformer (60VA)
<b>CB = Control box</b>	
CB1	Galvanised box, delivered attached to damper/measurement unit
CB2	Galvanised box, delivered separately from damper/measurement unit
<b>ZT = Tailored product</b>	
N	No
Y	Yes (ETO)



## Order code example

VLR/A-B-200; L=NA, H=NA, M=S, FC=A1, TF=TF1, CB=CB1, ZT=N