

Private: Halton VHD – VAV diffuser



Overview

Terminated as of 1st March 2023

-> no replacing product available

- Installation for suspended ceiling
- Stable throw length with variable supply airflow rates
- Wide supply air temperature range
- Suitable for systems with constant static pressure ductwork system
- Designed for use with Halton TRI/V plenum
- Maximum flow rate adjustment and measurement section available for supply (MSM)
- Minimum airflow between 10...15 l/s for sizes 160...250
- airflow control with actuator, 24 VAC, signal 0-10V

Accessories

- -Balancing plenum Halton TRI/V with connection cable

Quick selection

VHD-160	Δp_{tot} L 0.2	12 2.8	19 3.4	30 4.1				
VHD-200	Δp_{tot} L 0.2		8 3.6	11 4.1	15 4.6			
VHD-250	Δp_{tot} L 0.2			9 3.9	13 4.5	18 5.1		

$\Delta T = 0$ [°C]

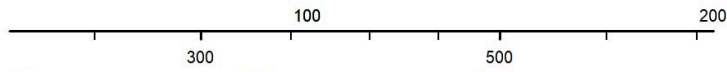
$\Delta p_{tot} = \min$

ΔL_p Are 10m2sab = 4 [dB(A)]

□ LpA < 25 [dB(A)]

■ LpA 25 - 30 [dB(A)]

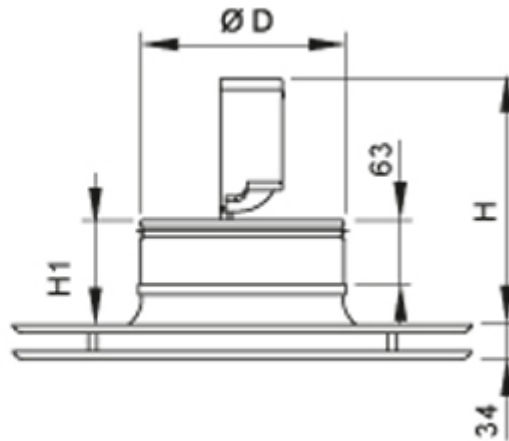
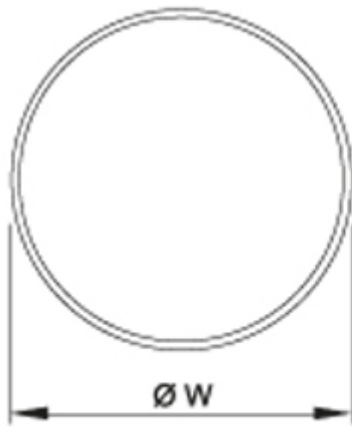
■ LpA 30 - 35 [dB(A)]



qv [l/s]

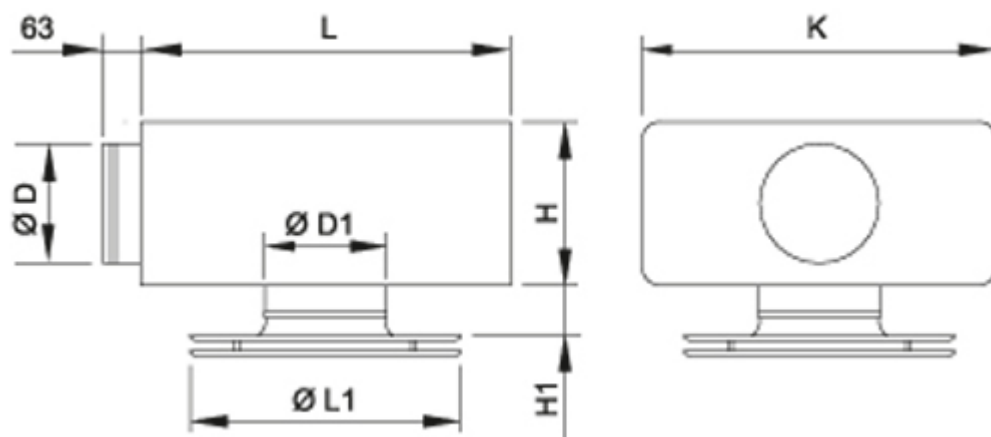
qv [m3/h]

Dimensions



NS	Ø W	H	H1	Ø D
160	299	234	98	159
200	449	267	104	199
250	449	275	116	249

Halton VHD with Halton TRI/V plenum



NS	TRI/V	L	L1	H	H1	K	ØD	ØD1
160	160...160	458	299	222	96...126	432	159	162
200	200...200	618	449	272	100...130	592	199	202
250	250...250	618	449	336	111...141	592	249	252

Material

Part	Material	Finishing
Upper plate	Steel	Powder painted, white (RAL 9003)
Front panel	Perforated steel	Powder painted, white (RAL 9003)
Control cone	Steel	Powder painted, black
Gasket	Rubber	–

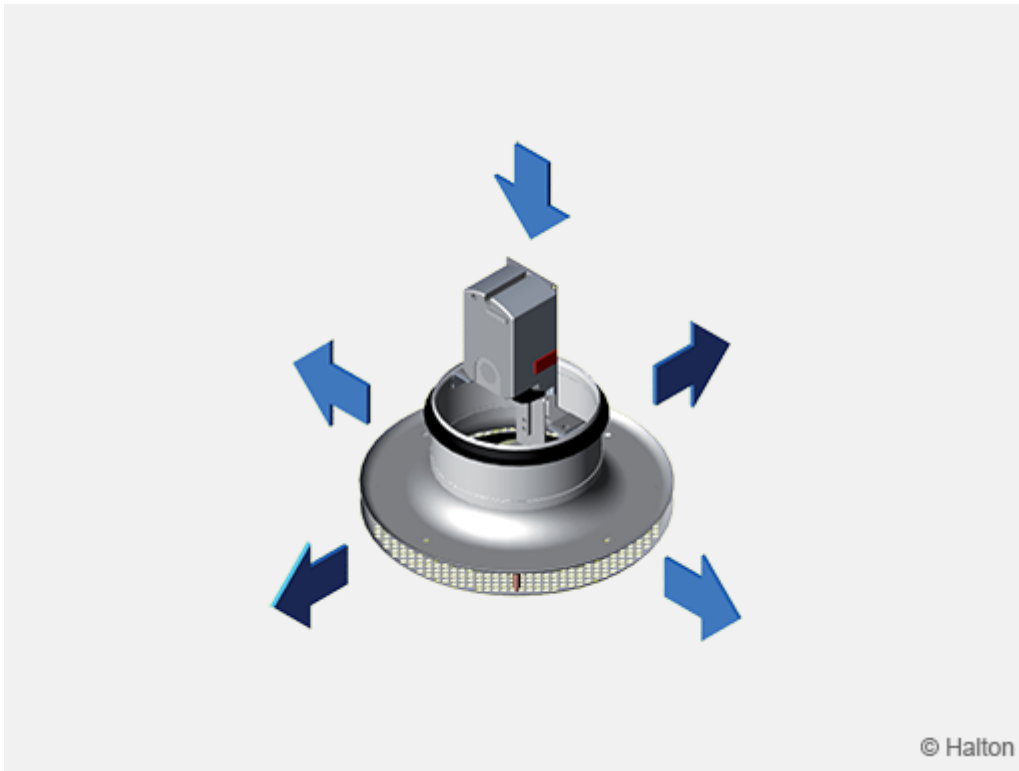
Accessories

Actuator

In the standard delivery the Halton VHD is always equipped with a Siemens GDB161.2E/HA damper actuator.

Actuator	Force	Control signal	Operating voltage	Power consumption
GDB161.2E/HA	125 Nm	0...10 VDC	24 VAC	3VA

Function



The Halton VHD is an active ceiling diffuser for supply air.

Air is supplied to the room space mainly through the side slots of the diffuser. The air jet supplied horizontally through the side slots induces room air.

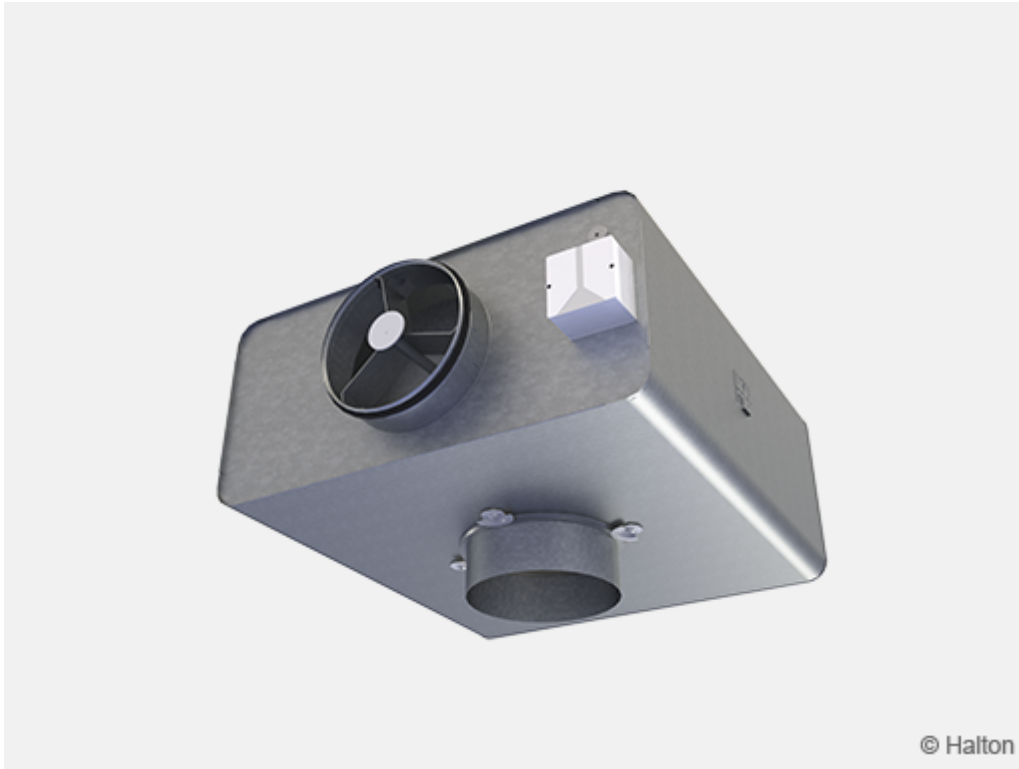
The unit maintains a high outlet air velocity between the minimum and maximum airflow rates, creating comfortable conditions and low residual air velocities in the occupied zone.

In the demand-based ventilation (DBV) and variable air volume (VAV) systems, room conditions can be guaranteed to be without a risk of draughts, at both the maximum and minimum airflow rate.

The pressure dependent function of the Halton VHD operates in combination with a constant pressure duct zone.

An external room controller varies the room airflow rate by running the Halton VHD diffuser actuator with a standard 0...10 VDC control signal.

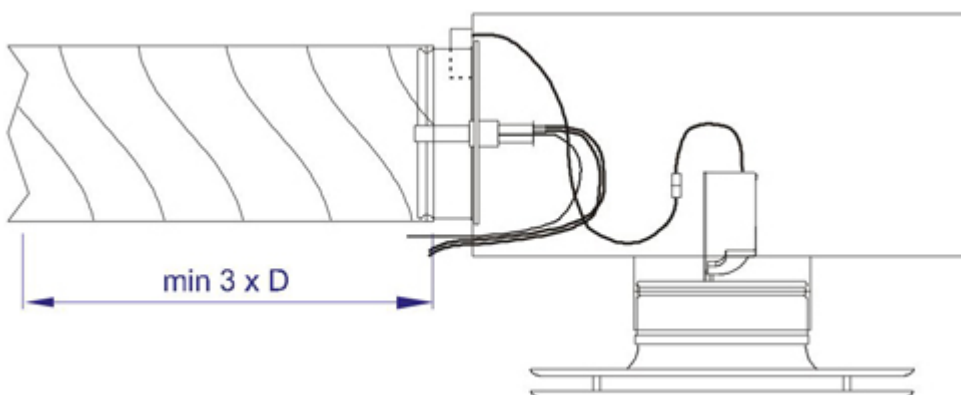
Related products



Use of the Halton VHD is most beneficial with a Halton TRI/V plenum. This plenum includes:

- A measurement and adjustment module MSM
- An electric junction box for power and control signal supply as well as a cable for easy connection of the variable air diffuser Halton VHD
- Installation safety and hanging wire for air diffuser

Installation

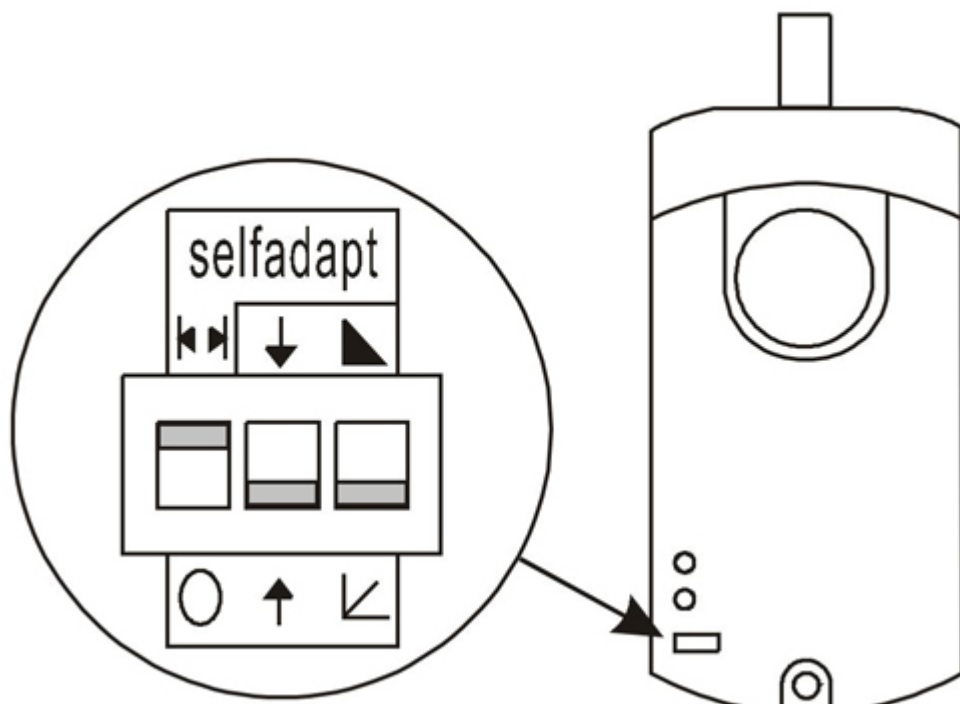


The active diffuser shall be installed in conjunction with the Halton TRI/V plenum box. The Halton TRI/V plenum shall have a safety distance of 3D minimum upstream, to ensure reliable measurement and accurate control of the airflow rate.

A hanging and safety wire for Halton VHD diffuser is delivered with the Halton TRI/V plenum. Hang the Halton VHD diffuser to the wire by means of a key ring.

Halton VHD is connected electrically to Halton TRI/V with ready assembled cable plug.

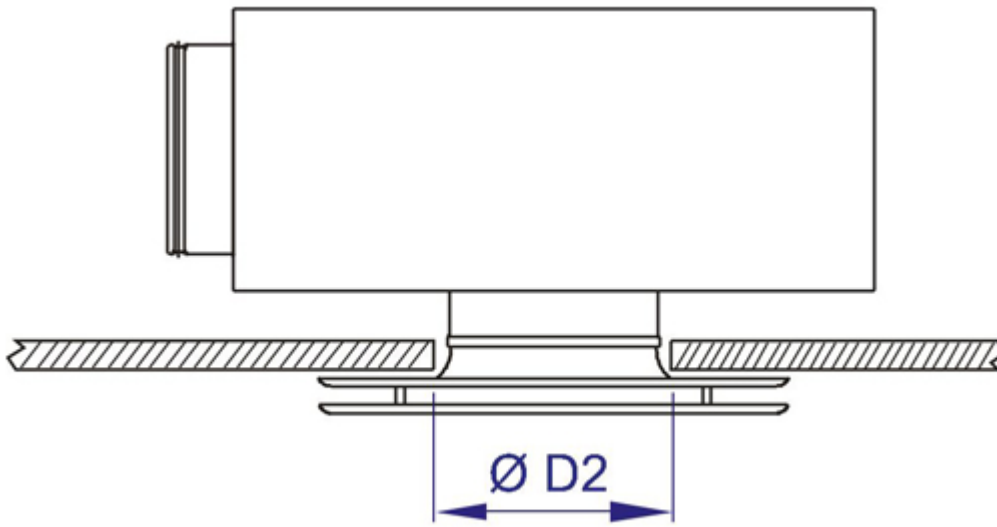
Control that the actuator settings are in line with the factory pre-setted DIL switches.



Release the actuator clutch and pull the control cone to the fully open position.
Mount the Halton VHD diffuser assembly to the Halton TRI/V plenum box.

Note:
The technical performance for the combination of supply air diffuser and plenum is presented separately for the two different installations.

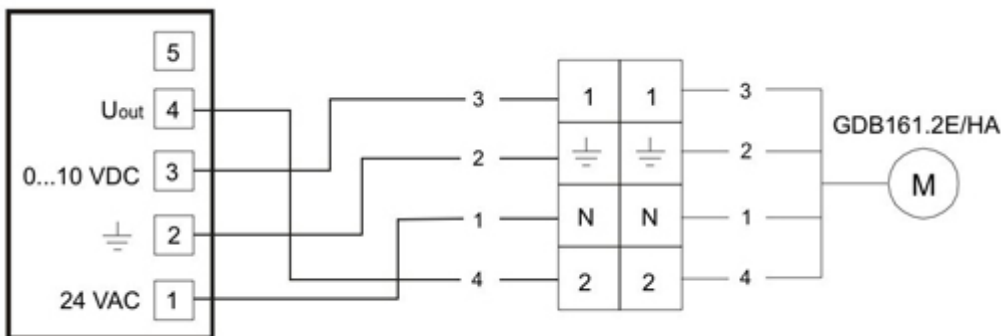
Dimensions of installation hole in suspended ceiling



NS	ØD2
160	211
200	265
250	333

Wiring

Wiring diagram



Junction box

Cable connection plug

Control signals on junction box

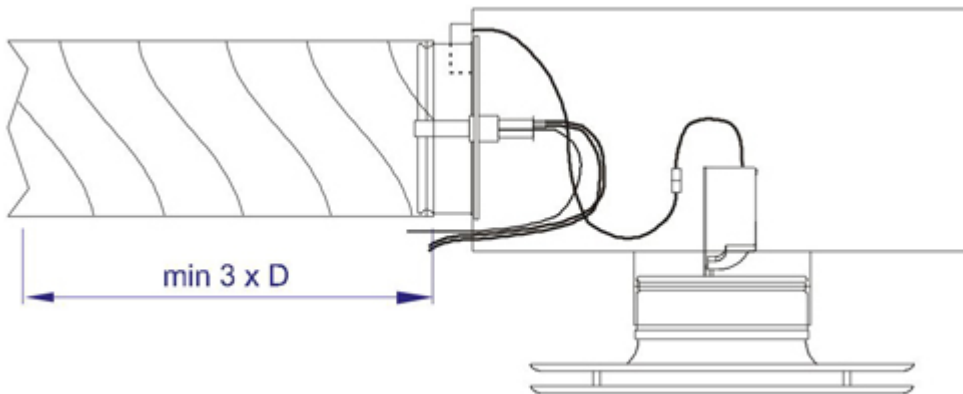
Terminal 3

- 0 VDC = minimum position / airflow
- 10 VDC = maximum position / airflow

Terminal 4 (feedback from actuator)

- Not connected

Commissioning



Make sure that the control cone of each active Halton VHD (and Halton VHB) damper is fully open (at the lowest position). This can be done either mechanically or electrically:

- If the power is not connected to active diffuser, release the actuator clutch and pull the control cone to the fully open position.
- If a 24 VAC power supply is connected to diffusers, please make sure that the control signal is constantly at 10 VDC.

Check that the duct zone constant pressure is at the intended level (for example, between 30 and 50 Pa).

If the duct zone pressure is too low and the zone pressure control damper is fully open, you should either adjust the supply fan pressure setpoint to be higher or adjust the MSM adjustment unit in the Halton TRI/V plenum.

The zone pressure control damper shall have a sufficient operative differential pressure over the damper (for example, 30 Pa or more).

Adjustment

The airflow rate of the active diffuser is measured and adjusted using the MSM module inside Halton TRI/V plenum.

Attach the measurement instrument to the measuring tubes on Halton TRI/V plenum and the airflow rate is calculated using the pressure difference reading and the k factor.

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

qv Calculated airflow rate [l/s]
k k factor from the table
Δp_m Measured pressure [Pa]

NS	k factor
160	15.9
200	26.2
250	44.5

If the airflow rate of the active diffuser is too high, adjust the position of the MSM adjustment unit in the Halton TRI/V plenum to closer position. If maximum airflow can't be reached, open MSM module first full open and if this is not enough, increase the duct zone pressure.

The minimum airflow is factory pre-adjusted.

Servicing

Open the diffuser part and detach the perforated plate of the coupling sleeve. Remove the control cone part completely.

Loosen two screws which are holding the motor assembly on Halton VHD body and let it hang on the wire.

The MSM is removed through Halton TRI/V outlet by pulling from it's body – not the measurement tubes or control spindle.

Clean the parts with a damp cloth, instead of immersing in water.

Replace all parts in opposite order.

Specification

The active diffuser is made of painted steel with a white (RAL 9003) standard colour. Air is introduced into the space through the side slots and perforated front panel, ensuring a high mixing rate. The diffuser maintains appropriate discharge velocity throughout the total airflow range.

The diffuser is connected to a balancing plenum designed for the active diffuser installation and equipped with a measurement and adjustment module.

The diffuser has a rubber gasket to ensure tight connection to the plenum.

Order Code

VHD-D, CO-ZT

D = Connection size
160, 200, 250

Other options and accessories

CO = Colour

SW White (RAL 9003)
X Special colour (RAL xxxx)

ZT= Tailored product

N No
Y Yes (ETO)

Sub products

TRI/V Plenum

Code example

VHD-160, CO=SW, ZT=N