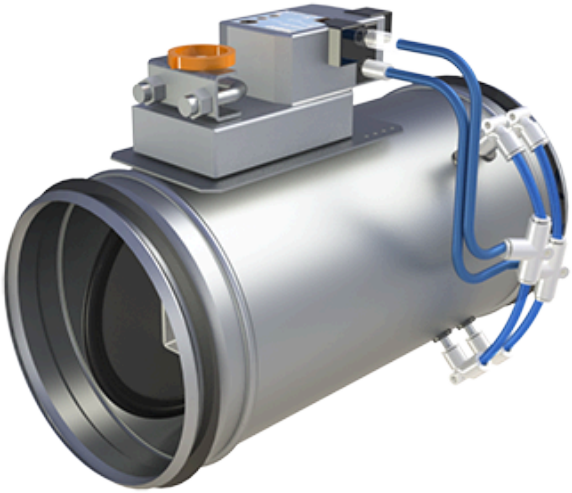
Halton Max MOC – Airflow management damper (VAV)



Overview

Circular airflow management damper for a wide variety of standard VAV applications. Quick and easy commissioning with factory-set airflow rate limits according to customer-specific needs.

- Averaging cross measurement tubes, basic actuators, 1-10 m/s airflow velocity
- Suitable for both supply and exhaust installations
- Available also for Halton Vita OR operating room and Halton Workplace applications

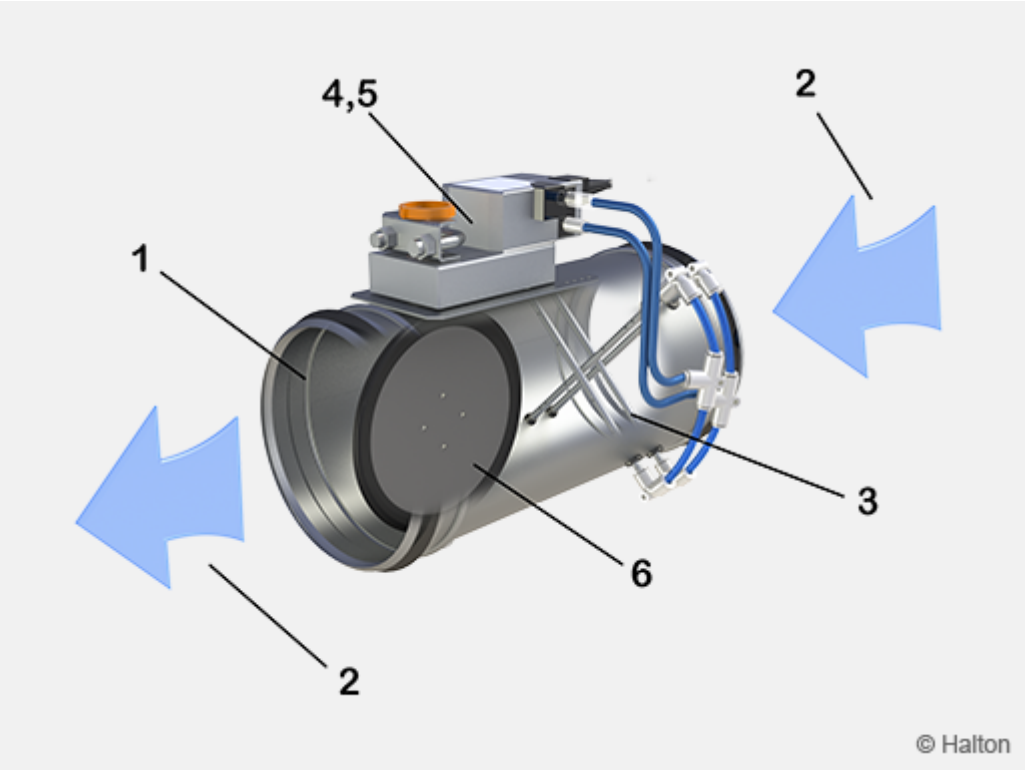
Product models and options

- Models with blade gasket (EN 1751, class 4 tightness) and/or external insulation available
- Casing tightness fulfills EN 1751, class C requirements
- Several connection sizes between 100-630 mm
- Galvanised steel and stainless steel (EN 1.4404, AISI 316L) as material options
- Several actuator options
- Sound attenuators and reheat coils available as accessory

Other product characteristics

- Maximum differential pressure: 1000 Pa over the damper
- Operating range: ambient temperature of 0-50 °C
- Ambient relative humidity: < 95%, non-condensing

Operating principle



Key

1. Damper
2. Airflow direction
3. Measurement probe
4. VAV airflow controller
5. Actuator
6. Blade

The damper contains a cross-type airflow measurement probe, a VAV airflow controller, an actuator and a blade (with or without gasket). Depending on the actuator model, the VAV controller is a separate unit or integrated into the actuator.

The damper 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 VAV controller. The VAV 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. The VAV controller can also send actual value data back to the room interface controller. The communication protocol used for the signal between the room control interface and the VAV controller depends on the actuator model.

For more information about the available actuator models, see section Actuators.

Key technical data

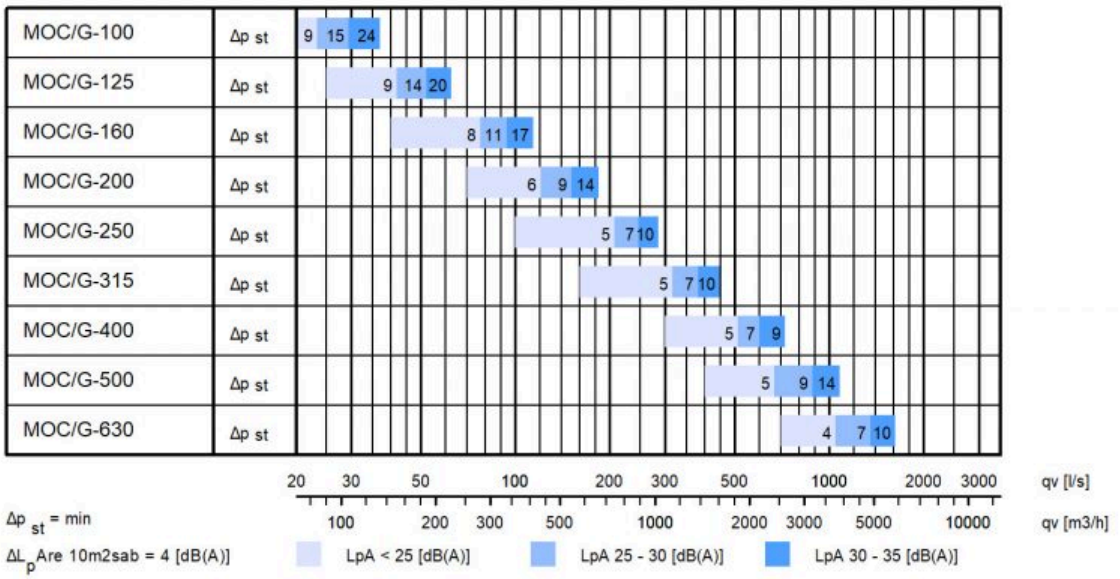
The Halton Max MOC airflow management dampers are available in four product models: G and I:

- Product models G and I include a blade gasket for airtight shut-off operation.
- Product model I include a 50 mm insulation for air radiated sound.

Feature	Product model: G	Product model: I
Blade gasket	x	x
50 mm external insulation	–	x
Tightness EN 1751, class C and class 4	x	x
Minimum torque 5 Nm	Sizes 100-250 mm	Sizes 100-250 mm
Minimum torque 10 Nm	Sizes 315-630 mm	Sizes 315-630 mm

Quick selection

Airflow ranges for Halton Max MOC with an air velocity of 1-10 m/s.
Applies to dampers with blade gasket (models G and I) and to all actuators except Halton ED.



NS [mm]	qv min – max [l/s]	qv min – max [m^3/h]
100	8 – 79	28 – 283
125	12 – 123	44 – 442
160	20 – 201	72 – 724
200	31 – 314	113 – 1131
250	49 – 491	177 – 1767
315	78 – 779	281 – 2806
400	126 – 1257	452 – 4524
500	296 – 1964	707 – 7069
630	312 – 3117	1122 – 11222

System package

Halton Workplace WRA room automation system package for Halton Max MOC airflow management damper

Halton Workplace WRA is part of the Halton Workplace solution offering.

Fig.1. *Halton Jaz JDA static diffuser and Halton Max MOC circular VAV damper combined with a Halton Workplace room automation controller.*

Halton Workplace WRA is a controller especially designed for controlling the automation system of office spaces and meeting rooms. It is used for controlling the ventilation airflow, room temperature, and indoor air quality.

The Halton Workplace WRA room automation package consists of a controller unit and optional components depending on customer needs: a wall panel and sensors for temperature, CO_2, occupancy, pressure, and condensation.

There are options available for the controller unit and wall panel, depending on the number of controls and sensors required. The Halton Workplace WRA room automation controller is always combined with other Halton products for adaptable and high-level indoor climate.

Application area

- Controlling the ventilation airflow, room temperature, and indoor air quality in office spaces and meeting rooms
- The Halton Workplace WRA room automation controller is an important part of the Halton Workplace system, controlling room units and airflow control dampers
- Overall Halton Workplace System includes:
    - Room air conditioning applications with Halton Workplace WRA room automation controller:
        - Active chilled beams
        - Exhaust units
        - VAV dampers
        - Active VAV diffuser
- Halton Max MDC, zone control dampers
- Halton Workplace WSO, system optimiser

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 office environments
- Highly energy-efficient and reliable system operation

Operating principle

The Halton Workplace WRA room automation controller operates with Variable Air Volume (VAV) dampers and active chilled beams of the Halton Workplace system. These are used for adjusting the ventilation airflow, room temperature, and indoor air quality in office spaces.

Each room unit in an office space can have its own dedicated Halton Workplace WRA room automation controller, or a single controller can control multiple room units. The Halton Workplace WRA room automation controller can automatically adjust the system according to the indoor environment level preferred by users. Each room unit having its own dedicated controller brings maximum flexibility.

Room automation: Halton Jaz JDA and Halton Max MOC VAV damper controlled with Halton Workplace WRA room automation controller

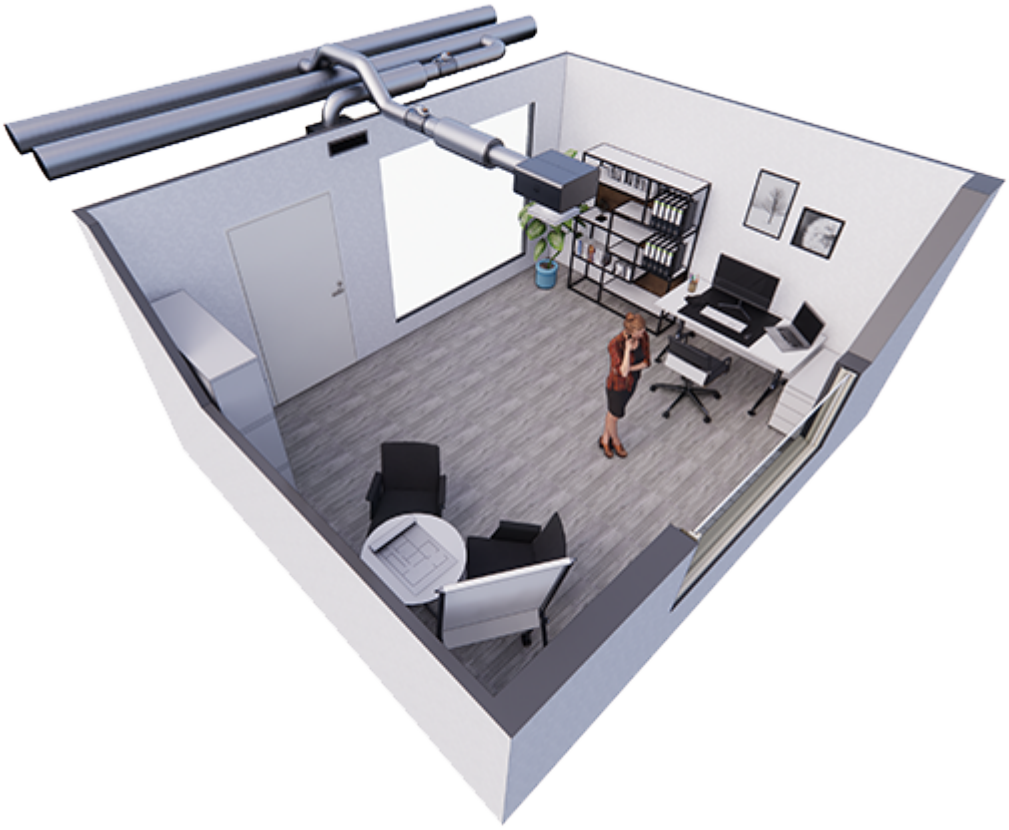


Fig.2. *Halton Jaz JDA diffuser and Halton Max MOC airflow management damper, controlled with Halton Workplace WRA room automation controller in a single office room*

Room automation description

In this configuration, the Halton Workplace WRA room automation controller (type DXR2.E12P-102A) controls a Halton Jaz JDA diffuser that is combined with a Halton Max MOC airflow management damper. External CO_2 and occupancy sensors are installed in the room. The temperature sensor is integrated into the wall panel (type QMX3.P34). The system also includes an exhaust VAV damper and radiator heating water valve control. One Halton Workplace WRA room automation controller can individually control up to four room units, and there can be several Halton Workplace WRA room automation controllers in the room.

Design criteria for room automation

- Supply airflow control
- Exhaust airflow control
- Window switch control
- External CO_2 and occupancy sensors
- Wall panel with temperature sensor and display

- Radiator heating water valve control

Schematic drawing

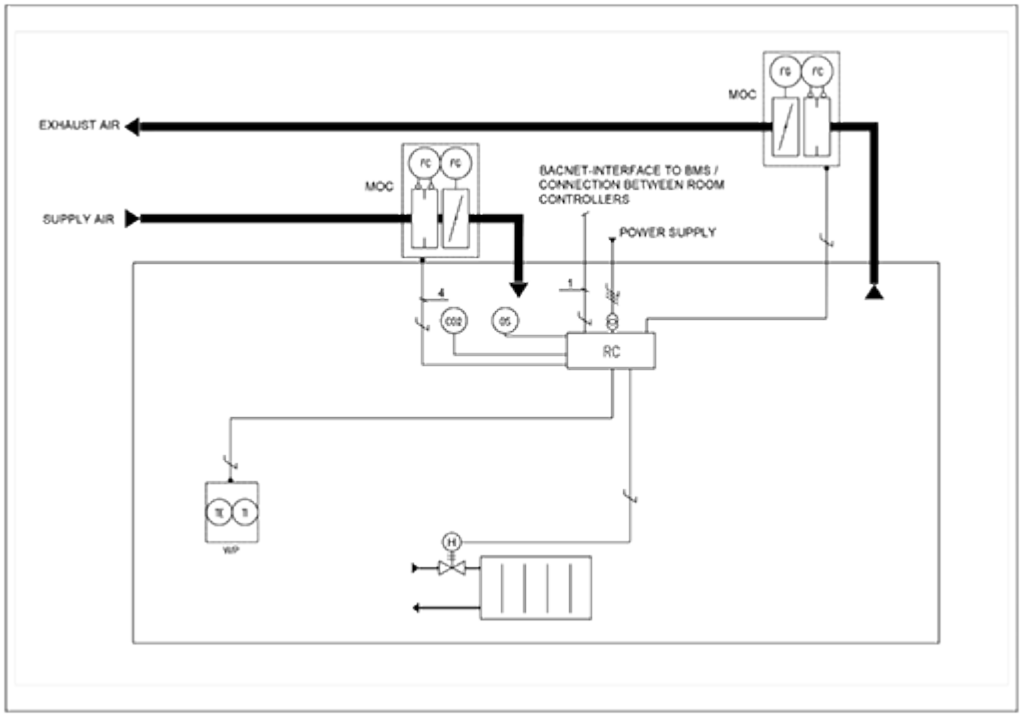


Fig.3. *Schematic drawing: Halton Jaz JDA diffuser and Halton Max MOC airflow management damper, controlled with Halton Workplace WRA room automation controller*

Equipment list

Code	Equipment
RC	Controller unit
FG	Airflow damper actuator
FC	Airflow measurement
H	Water valve actuator
OS	Occupancy sensor
CO2	CO_2 sensor
WP	Wall panel
TE	Temperature sensor
TI	Temperature display

Wiring diagram

For the wiring diagram of similar configuration, see the product pages of the Halton Workplace WRA room automation controller.

Components and order code examples for the system

- 1 x Passive diffuser: Halton Jaz JDA
  – JDA/S-125(R4) WS=NA, CO=W, ZT=N + TRI/S-125-125(N)
- 1 x VAV damper: Halton Max One Circular
  – MOC/G-125, MA=CS
- 1 x Exhaust unit: Halton AGC Exhaust grille + Halton PRL Plenum for grilles
  – AGC/N-400-100 FS=CL, ME=A, FI=PN, CO=W, ZT=N+PRL/F-400-100-160
- 1 x VAV damper: Halton Max MOC
  – MOC/G-160, MA=CS
- Automation package: 1 x Halton Workplace WRA room automation controller unit with related components
  – WRA/MOC-E21-EV-EX4, WP=34, LC=NA, SE=NA, SW=NA, ST=NA, SL=OE, PM=NA, TC=NA, CV=NA, RV=RA, ZT=N

Note: For more information, see the product pages of the Halton Workplace WRA room automation controller.

Structure and materials

Part	Material option: Galvanised steel (order code MA=CS)	Material option: Stainless steel (order code MA=AS)
Casing	Galvanised steel	Stainless steel (EN 1.4404/AISI 316L)
Damper blade	Galvanised steel	Stainless steel (EN 1.4404/AISI 316L)
Shaft	Galvanised steel	Stainless steel
Blade gasket	EPDM Rubber	EPDM Rubber
Duct gaskets (vulcanised to the casing)	1C-polyurethane hybrid	1C-polyurethane hybrid
Measurement probe	Aluminium	Stainless steel
External insulation (I-model)	Mineral wool	Mineral wool
Measurement tubes	PU plastic	PU plastic

Fig.4. *Halton Max MOC, stainless steel model (EN 1.4404/AISI 316L)*

Actuators

A range of actuators are available for various application needs.

All actuators include an integrated dynamic differential pressure sensor with a low bypass airflow rate through the sensor element. Therefore not to be used in highly contaminated environments. Airflow rate limits are set at the factory.

Controller	Notes	Torque [Nm]	Damper size [mm]	Commication interface	Order code
EM	Analogue controller Manufacturer: Belimo	5	100-250	DC0..10V/ 2..10V	**EM** = LMV-D3-MF-F.1 HI (DC 0/2...10 V), 5 Nm
EK	Analogue controller Manufacturer: Belimo	10	100-250	DC0..10V/ 2..10V	**EC** = LMV-D3-MP (MP bus), 5 Nm
EC	Controller with NFC connectivity for mobile onsite parameter adjustment (Belimo Assistant App). Analogue or MPbus. Manufacturer: Belimo	5	100-250	Belimo MP bus or 0..10V/ 2..10V	**EC** = LMV-D3-MP (MP bus), 5 Nm
EE	Controller with NFC connectivity for mobile onsite parameter adjustment (Belimo Assistant App). Analogue or MPbus. Manufacturer: Belimo	10	100-630	Belimo MP bus or 0..10V/ 2..10V	**EE** = NMV-D3-MP (MP bus), 10 Nm
ER	Controller with KNX Manufacturer: Belimo	5	100-250	KNX	**ER** = LMV-D3-KNX (KNX bus), 5 Nm
ES	Controller with KNX Manufacturer: Belimo	10	100-630	KNX	**ES** = NMV-D3-KNX (KNX bus), 10 Nm

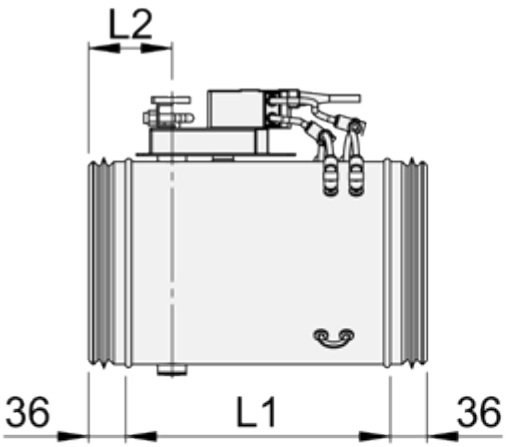
ET	Controller with Modbus Manufacturer: Belimo	5	100-250	Modbus	**ET** = LMV-D3-MOD (Modbus RTU), 5 Nm
EU	Controller with Modbus Manufacturer: Belimo	10	100-630	Modbus	**EU** = NMV-D3-MOD (Modbus RTU), 10 Nm
EH	Analogue controller Manufacturer: Siemens	5	100-250	DC0..10V/ 2..10V	**EU** = NMV-D3-MOD (Modbus RTU), 10 Nm
EG	Analogue controller Manufacturer: Siemens	10	100-630	DC0..10V/ 2..10V	**EG** = GLB181.1E/3 (DC 0/2...10V), 10 Nm
EV	Controller with KNX Manufacturer: Siemens	5	100-250	KNX	**EV** = GDB181.1E/KN (KNX bus), 5 Nm
EW	Actuator with KNX Manufacturer: Siemens	10	100-630	KNX	**EW** = GLB181.1E/KN (KNX bus), 10 Nm
EB	Actuator with Modbus RTU (RS-485) Manufacturer: Siemens	5	100-250	Modbus	**EB** = GDB181.1E/MO (Modbus RTU), 5 Nm
EF	Actuator with Modbus RTU (RS-485) Manufacturer: Siemens	10	100-630	Modbus	**EF** = GLB181.1E/MO (Modbus RTU), 10 Nm
V1*	Analogue controller Manufacturer: Belimo	5	100-250	DC0..10V/ 2..10V	**V1** = LM24A-VST, (DC 0/2...10 V), 5 Nm+VRU-D3-BAC
V2*	Analogue controller Manufacturer: Belimo	10	100-630	DC0..10V/ 2..10V	**V2** = NMQ24A-VST, (DC 0/2...10 V), 10 Nm + VRU-D3-BAC

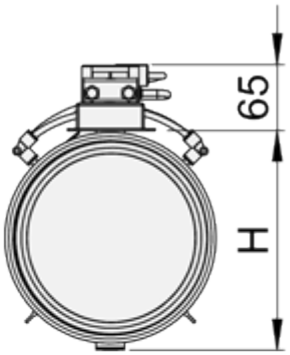
V3*	Analogue controller Manufacturer: Belimo	4	100-250	DC0..10V/ 2..10V	**V3** = LMQ24A-VST, 2.5 sec (DC 0/2...10 V), 4 Nm + VRU-D3-BAC
V4*	Analogue controller Manufacturer: Belimo	8	100-630	DC0..10V/ 2..10V	**V4** = NMQ24A-VST, 4 sec (DC 0/2...10 V), 8 Nm + VRU-D3-BAC
HM	Controller include actuator with LonWorks Manufacturer: Distech	5	100-250	LonWorks	**HM** = ECL-VAV-S, HAV (LonWorks), 5Nm
HK	Modulating actuator from Belimo: Controller LonWorks Manufacturer: Distech	10	10	LonWorks	**HK** = ECL-VAV-N, HAV + NM24A-SR (LonWorks), 10 Nm

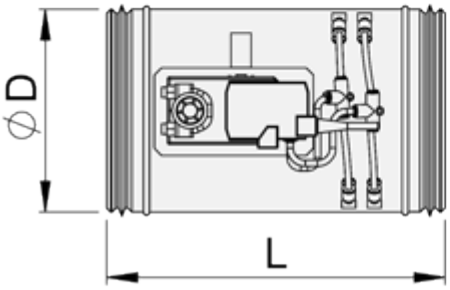
* Only for airflow measurements

Dimensions and weight

Halton Max MOC, G-model (non insulated)





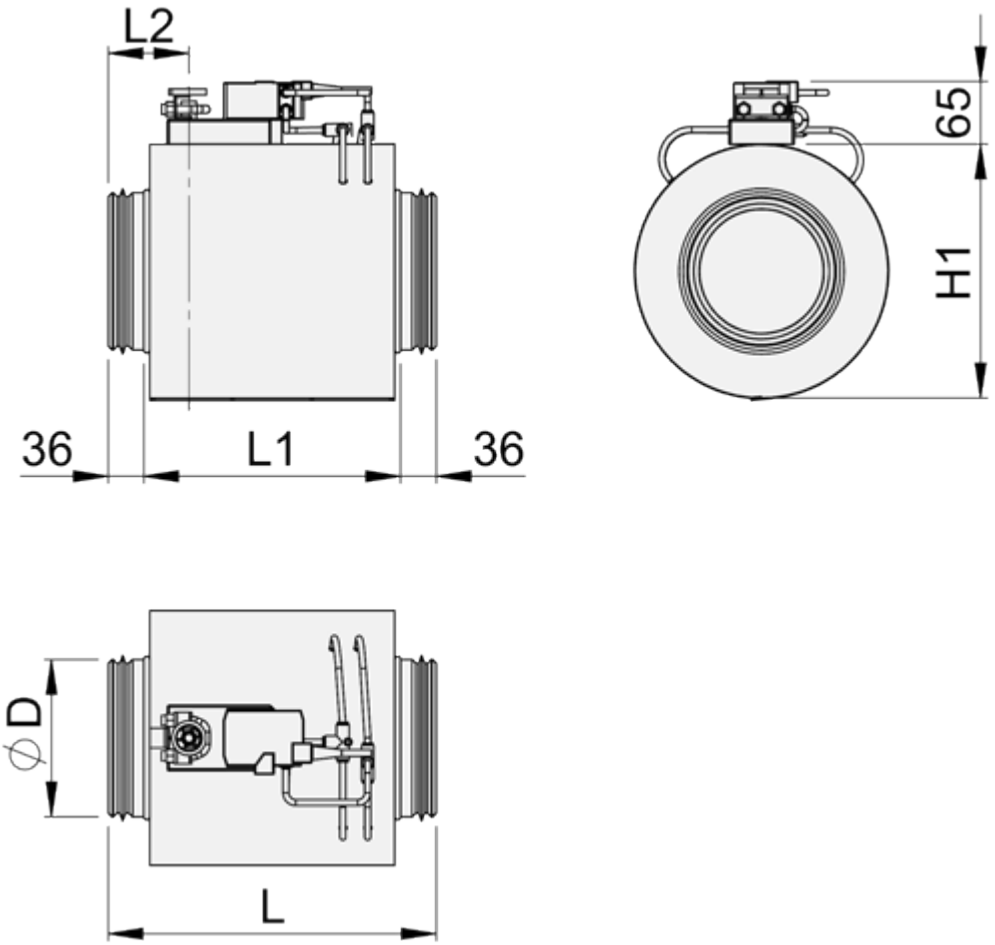


NS	D	L	L1	L2	H	Weight [kg]**
100	99	331*	259*	82	110	1.7
125	124	331*	259*	82	135	1.9
160	159	331	259	82	170	2.2
200	199	331	259	82	210	2.6
250	249	331	259	82	260	3.2
315	314	331	259	82	325	3.8
400	399	500	428	82	410	5.3
500	499	630	558	149	508	13.7
630	629	630	558	149	638	18.5

*) Body length changed as of 1st January 2021 (L=248 -> 331 mm, L1=176 -> 259 mm)

**) Control unit is included in weight

Halton Max MOC, I-model (insulated)



NS	D	L	L1	L2	H1	Weight [kg] **
100	99	331*	176	82	200	2.2
125	124	331*	176	82	225	2.7
160	159	331	259	82	260	3.6
200	199	331	259	82	300	4.4
250	249	331	259	82	350	5.3
315	314	331	259	82	415	6.8
400	399	500	428	82	500	10.2
500	499	630	558	149	600	23.6
630	629	630	558	149	730	30.8

*) Body length changed as of 1st January 2021 (248 -> 331 mm)

**) Control unit is included in weight

Specification

Pressure-independent variable airflow control damper for supply and exhaust installations.

Construction

- Damper includes an airflow measurement probe, airflow controller and damper actuator.
- Duct connection includes integral airtight rubber gaskets.
- Damper with blade gasket: the tightness of the control damper in closed position conforms to standard EN1751 class 4 and casing tightness to EN 1751/C.
- Damper without blade gasket: the tightness of the control damper in closed position conforms to standard EN1751/C.
- Damper with external insulation include a 50mm mineral wool insulation layer.

Material

- Galvanised steel, with an airflow measurement probe of aluminium
- Stainless steel, with measurement probe of stainless steel

Electrical data

- Digital bus and/or analogue connection available, depending on the actuator
- Analogue airflow controller control signal input range is 0...10 VDC or 2 ...10 VDC and output range 0...10 VDC for airflow feedback
- Supply voltage 24 VAC

Parameter settings

- Design airflow range limits are calibrated at the factory.

Accessories

- Sound attenuator for noise reduction. An access panel can be added for easy maintenance.
- Electric reheat coil with internal heating controller. Power supply 230 VAC, less than 16A. A safety overheat thermostat with both automatic and manual reset as well as an alarm relay with the possibility of remote alarm monitoring are incorporated in the heater. A room controller is required to control the duct heater with a 0...10 VDC control signal.
- Electric reheat coil without internal heating controller. Power supply 230 VAC (pulse width modulation). A safety overheat thermostat with both automatic and manual reset is incorporated in the heater. A room controller required to control the duct heater with a 0...10 VDC control signal.

Installation

Safety distances

Disturbances in the ductwork such as duct bends, T-branches and sound attenuators cause turbulence and an uneven airflow. This can lead to fluctuation and inaccuracy in measurement values.

In order to ensure the accuracy of the airflow measurement, the minimum safety distances between the measuring unit and airflow disturbances must be respected.

For airflow control applications, the minimum safety distance is 1xD after an elbow bend and 3xD for T-branches. The safety distance between the damper and a sound attenuator is 2xD.

Install the unit into the ductwork so that the safety distances and direction of the airflow are as indicated in the following figures. Please refer to project-specific job drawings for more details.

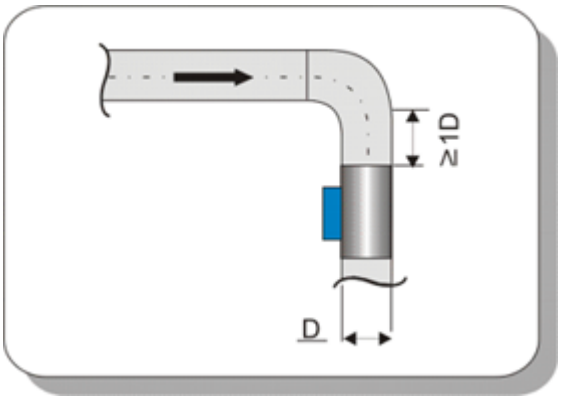


Fig.5. Bend (90° elbow)

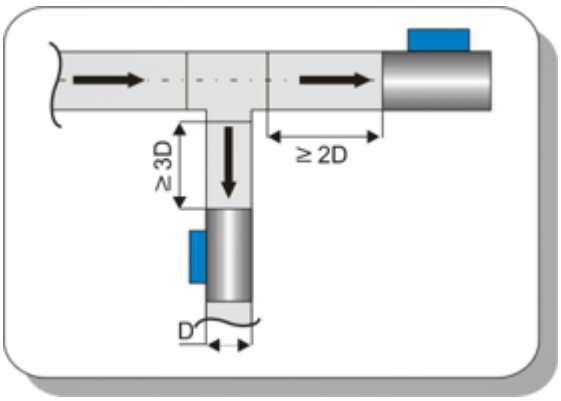


Fig.6. T-branch

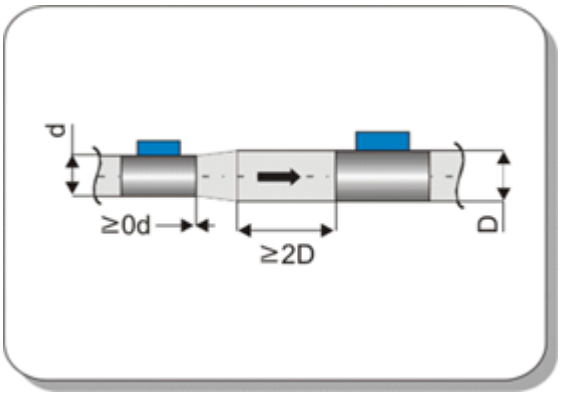


Fig.7. With sound attenuator

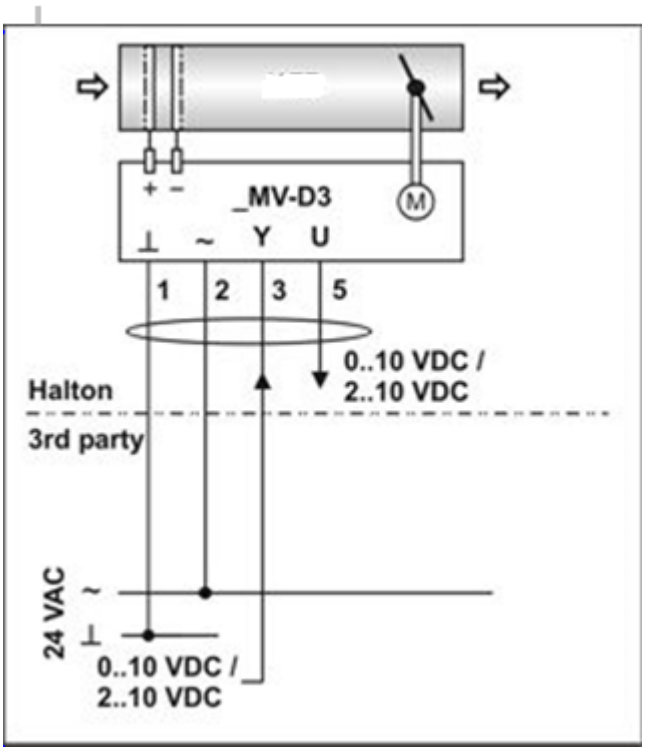
Space requirements

Sufficient space must be reserved to allow access to accessories during commissioning and maintenance.

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.

The responsibilities between Halton and 3rd party are specified in the following example wiring diagram for a typical variable airflow control application:



Key

1 (G0) 24 VAC system neutral
2 (~) 24 VAC live
3 (w) 2...10- or 0...10-VDC airflow setpoint signal input

5 (U5) 2...10- or 0...10-VDC airflow feedback signal output

Commissioning

Airflow control

The airflow rates for Halton Max MOC are preset at the factory. If the airflow rates are not specified by the customer, the default factory settings are 0 for the minimum airflow rate and the nominal value (Vnom) for the maximum rate.

The nominal airflow rates in the following table are given with a pressure level of 150 Pa. Applies to all Halton Max MOC actuator models.

NS	Vnom (l/s) @ 150 Pa	Vnom (m^3/h) @ 150 Pa
100	78	282
125	123	441
160	221	794
200	353	1270
250	574	2068
315	881	3170
400	1484	5344
500	2387	8593
630	3895	14021

The actual airflow rate is calculated as a function of differential pressure at the measurement probe and the measurement probe k factor.

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

where

- **q_v** Actual airflow rate [l/s]
- **k** k factor of the product
- **Δp_m** Differential pressure of measurement probe [Pa]

The actuators are equipped with a pressure sensor, and there is a very low airflow through the differential pressure sensor of the controller. Therefore, a manual differential measurement manometer can be connected in parallel to the airflow controller (for example with tube T-

branches) and both measurements can operate in parallel with continuous control.
The k factors for the different sizes are listed in the following table:

NS	k factor (l/s)
100	6.4
125	10.0
160	18.0
200	28.8
250	46.9
315	71.9
400	121.2
500	194.9
630	318.0

Accessories

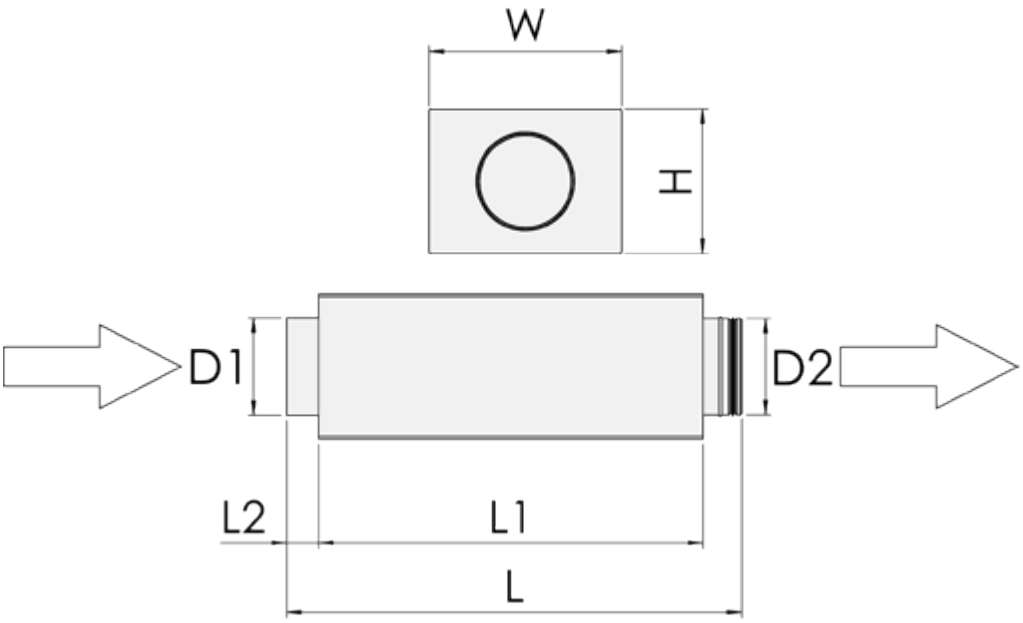
Sound attenuators

Description

Halton offers high-quality rectangular sound attenuators with round duct connection for reducing noise levels in the duct. Sound attenuators are available as accessory and the following options are available:

- Three lengths: 600, 1000 and 1250 mm
- Connection types
    - D2=D1
      The duct (D2) and damper (D1) connections are the same size
    - D2>D1
      The duct connection (D2) is one size larger than the damper (D1) connection
- Insulation material options:
    - Polyester fibre (PEF), tested according to ISO 7235, class C tightness level
    - Mineral wool (MW), class C tightness level
- Available with or without access panel for maintanance purposes

Technical data



D1 is connected directly to the damper with female-type connection. D2 is attached to the duct with male-type connection. The above picture depicts supply air installations. In exhaust installations, the airflow direction is from D2 to D1. The damper is always connected to D1.

Dimensions (mm) and weights

D1	D2	W	H	L	L1	L2	kg
H1 (MW)							
100	100	252	154	626	600	22	6,2
125	125	263	177	626	600	22	6,7
160	160	280	212	626	600	22	7,5
200	200	361	253	626	600	22	9,5
250	250	431	303	626	600	32	11,9
315	315	458	368	626	600	32	14,6
400	400	518	453	626	600	57	18,3
500	500	702	555	626	600	57	26,0
H3 (PEF)							
100	100	252	154	626	600	22	5,7
125	125	263	177	626	600	22	6,1
160	160	280	212	626	600	22	6,7
200	200	361	253	626	600	22	8,6
250	250	431	303	626	600	32	10,7
315	315	458	368	626	600	32	13,1
400	400	518	453	626	600	57	18,3
500	500	702	555	626	600	57	26,0
H5 (MW)							
100	125	263	177	626	600	22	6,7
125	160	280	212	626	600	22	7,5
160	200	361	253	626	600	22	9,5
200	250	431	303	626	600	32	11,9
250	315	458	368	626	600	32	14,6
315	400	518	453	626	600	57	18,3
400	500	702	555	626	600	57	26,0
500	630	851	684	626	600	67	33,7
H7 (PEF)							
100	125	263	177	626	600	22	6,1
125	160	280	212	626	600	22	6,7
160	200	361	253	626	600	22	8,6
200	250	431	303	626	600	32	10,7
250	315	458	368	626	600	32	13,1
315	400	518	453	626	600	57	18,3
400	500	702	555	626	600	57	26,00
500	630	851	684	626	600	67	33,7
H11 (MW)							
100	100	252	154	626	600	22	6,2
125	125	263	177	626	600	22	6,7
160	160	280	212	626	600	22	7,5
200	200	361	253	626	600	22	9,5
250	250	431	303	626	600	32	11,9
315	315	458	368	626	600	32	14,6
400	400	518	453	626	600	57	18,3
500	500	702	555	626	600	57	26,0
H13 (PEF)							
100	100	252	154	626	600	22	5,7
125	125	263	177	626	600	22	6,1
160	160	280	212	626	600	22	6,7
200	200	361	253	626	600	22	8,6
250	250	431	303	626	600	32	10,7
315	315	458	368	626	600	32	13,1
400	400	518	453	626	600	57	18,3
500	500	702	555	626	600	57	26,0
H15 (MW)							
100	125	263	177	626	600	22	6,7
125	160	280	212	626	600	22	7,5
160	200	361	253	626	600	22	9,5
200	250	431	303	626	600	32	11,9
250	315	458	368	626	600	32	14,6
315	400	518	453	626	600	57	18,3
400	500	702	555	626	600	57	26,0
500	630	851	684	626	600	67	33,7
H17 (PEF)							
100	125	263	177	626	600	22	6,1
125	160	280	212	626	600	22	6,7

D1	D2	W	H	L	L1	L2	kg
H2 (MW)							
100	100	252	154	1036	1000	22	9,7
125	125	263	177	1036	1000	22	10,5
160	160	280	212	1036	1000	22	11,4
200	200	361	253	1036	1000	22	13,9
250	250	431	303	1036	1000	32	16,6
315	315	458	368	1036	1000	32	20,5
400	400	518	453	1036	1000	57	26,4
500	500	702	555	1286	1250	57	37,4
H4 (PEF)							
100	100	252	154	1036	1000	22	8,9
125	125	263	177	1036	1000	22	9,5
160	160	280	212	1036	1000	22	10,1
200	200	361	253	1036	1000	22	12,3
250	250	431	303	1036	1000	32	14,6
315	315	458	368	1036	1000	32	18,0
400	400	518	453	1036	1000	57	26,4
500	500	702	555	1286	1250	57	37,4
H6 (MW)							
100	125	263	177	1036	1000	22	10,5
125	160	280	212	1036	1000	22	11,4
160	200	361	253	1036	1000	22	13,9
200	250	431	303	1036	1000	32	16,6
250	315	458	368	1036	1000	32	20,5
315	400	518	453	1036	1000	57	26,4
400	500	702	555	1286	1250	57	37,4
500	630	851	684	1286	1250	67	48,1
H8 (PEF)							
100	125	263	177	1036	1000	22	9,5
125	160	280	212	1036	1000	22	10,1
160	200	361	253	1036	1000	22	12,3
200	250	431	303	1036	1000	32	14,6
250	315	458	368	1036	1000	32	18,00
315	400	518	453	1036	1000	57	26,4
400	500	702	555	1286	1250	57	37,4
500	630	851	684	1286	1250	67	48,1
H12 (MW)							
100	100	252	154	1036	1000	22	9,7
125	125	263	177	1036	1000	22	10,5
160	160	280	212	1036	1000	22	11,4
200	200	361	253	1036	1000	22	13,9
250	250	431	303	1036	1000	32	16,6
315	315	458	368	1036	1000	32	20,5
400	400	518	453	1036	1000	57	26,4
500	500	702	555	1286	1250	57	37,4
H14 (PEF)							
100	100	252	154	1036	1000	22	8,9
125	125	263	177	1036	1000	22	9,5
160	160	280	212	1036	1000	22	10,1
200	200	361	253	1036	1000	22	12,3
250	250	431	303	1036	1000	32	14,6
315	315	458	368	1036	1000	32	18,0
400	400	518	453	1036	1000	57	26,4
500	500	702	555	1286	1250	57	37,4
H16 (MW)							
100	125	263	177	1036	1000	22	10,5
125	160	280	212	1036	1000	22	11,4
160	200	361	253	1036	1000	22	13,9
200	250	431	303	1036	1000	32	16,6
250	315	458	368	1036	1000	32	20,5
315	400	518	453	1036	1000	57	26,4
400	500	702	555	1286	1250	57	37,4
500	630	851	684	1286	1250	67	48,1
H18 (PEF)							
100	125	263	177	1036	1000	22	9,5
125	160	280	212	1036	1000	22	10,1

Halton

Key

- MW Mineral wool
- PEF Polyester fibre

Examples of attenuation data:

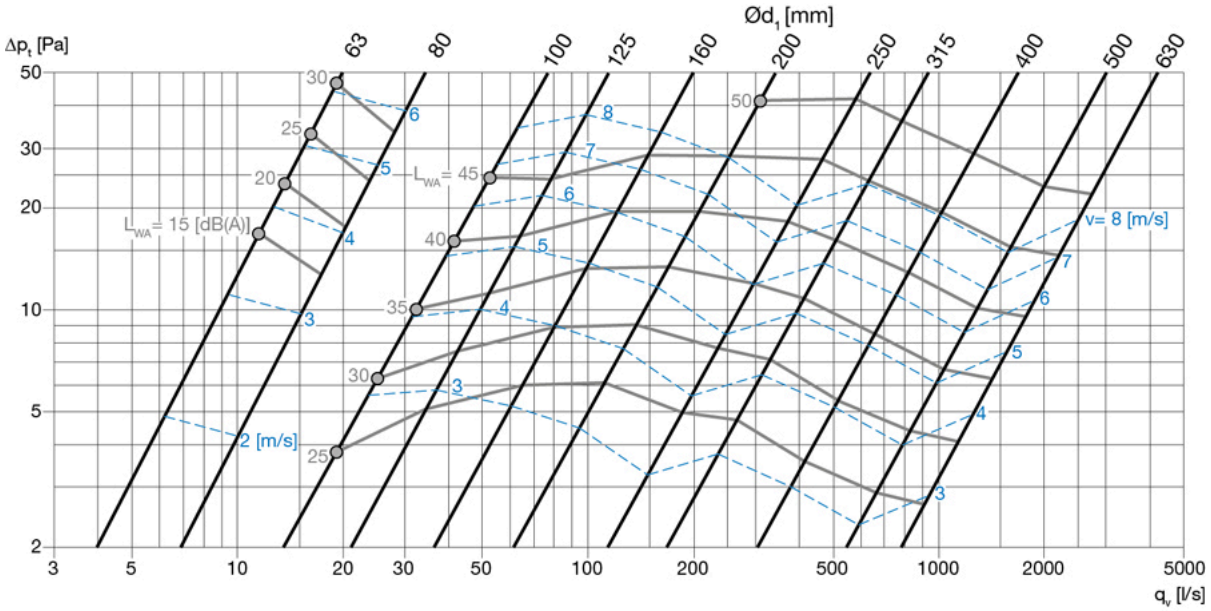


Fig.8. *Attenuation data, L = 600 mm, material = PEF*

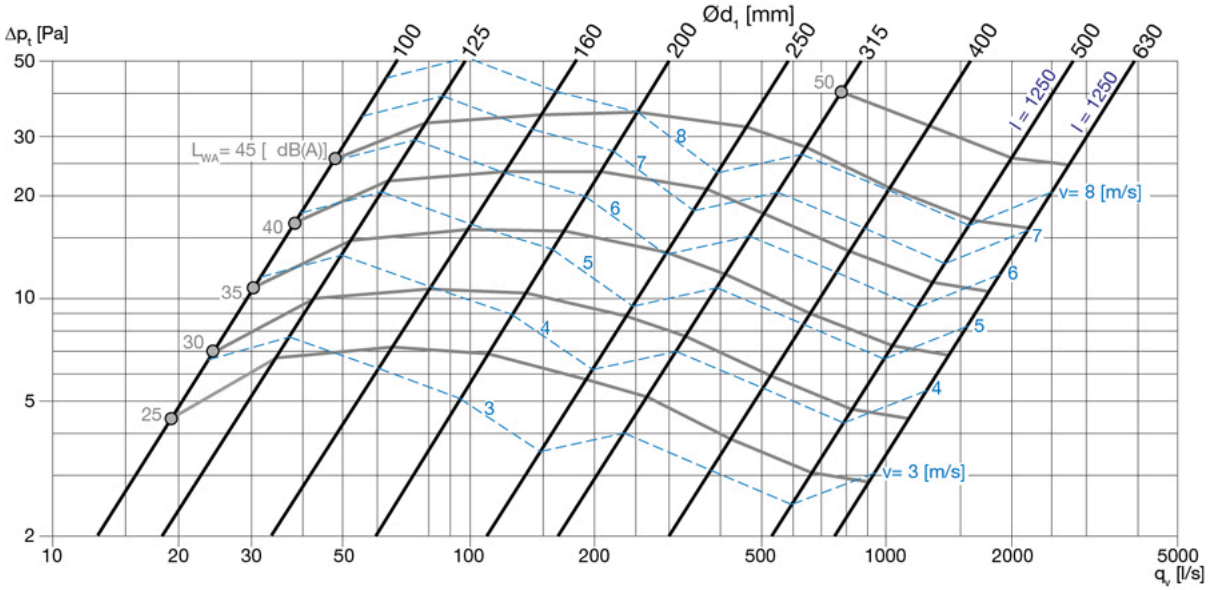


Fig.9. *Attenuation data, L = 1000 mm, material = PEF*

For further information, contact Halton sales.

Order code

SA = choose model code from column Code, H1 – H18.

Code	Length (mm)	Connection type	Insulation material	Access panel
H1	600	D2=D1	MW	No
H2	1000/1250*	D2=D1	MW	No
H3	600	D2=D1	PEF	No
H4	1000/1250*	D2=D1	PEF	No
H5	600	D2>D1	MW	No
H6	1000/1250*	D2>D1	MW	No
H7	600	D2>D1	PEF	No
H8	1000/1250*	D2>D1	PEF	No
H11	600	D2=D1	MW	Yes
H12	1000/1250*	D2=D1	MW	Yes
H13	600	D2=D1	PEF	Yes
H14	1000/1250*	D2=D1	PEF	Yes
H15	600	D2>D1	MW	Yes
H16	1000/1250*	D2>D1	MW	Yes
H17	600	D2>D1	PEF	Yes
H18	1000/1250*	D2>D1	PEF	Yes

Key

- D1 Damper connection
- D2 Duct connection
- MW Mineral wool
- PEF Polyester fibre
- * For sizes ⌀D 400 or 500. See Dimensions and Weight table.

Reheat coils

Description

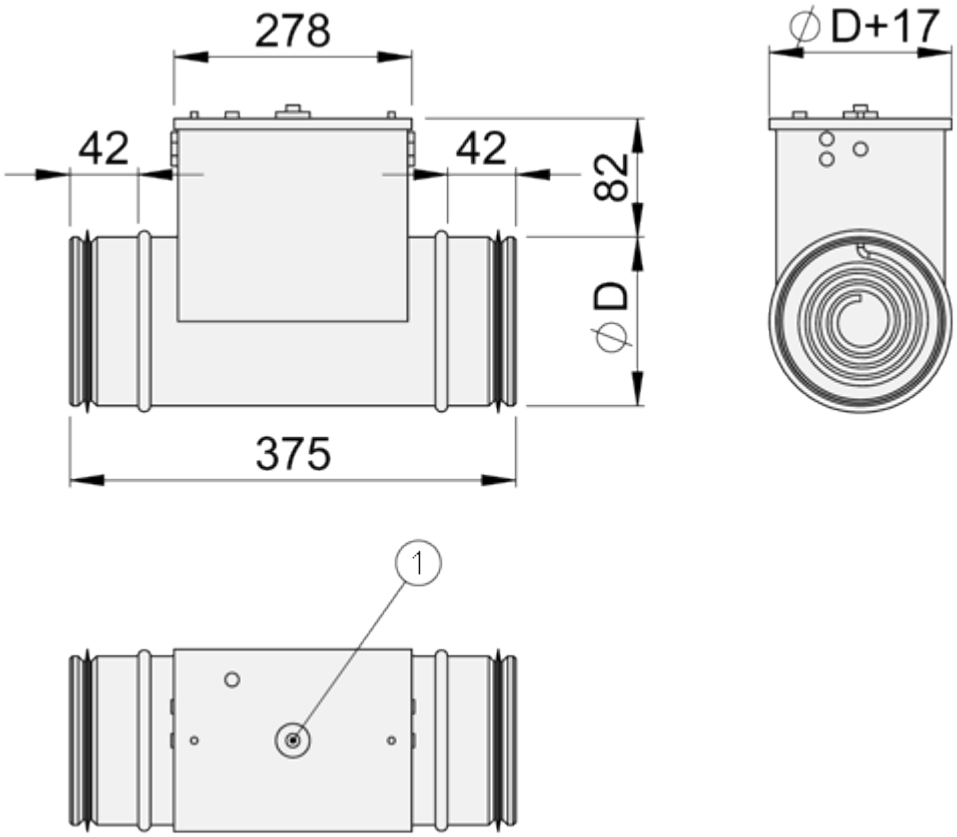
Reheat coils are available as accessory. Main features:

- Product models:
  - Model RM
    Without internal heating controller, PWM control signal input
  - Model RC
    With internal heating controller, 0...10-VAC control signal input. Built-in alarm relay with potential-free changeover contact for remote alarm monitoring. The alarm is

triggered by manual overheating protection or heater power loss.

- Sinlge-phase heater with 230 VAC, less than 16 A
- Increased heater safety with two internal overheating protection devices (automatic and manual), connected in series.
- EN 15727 class C tightness level
- Available for duct sizes 100 – 400 mm
- Power 600 – 3000 W

Technical data



Key

D 100, 125, 160, 200, 250, 315, 400 mm

1 Resetting of manual overheating protection

The heater can be installed in vertical or horizontal ducts. The safety distance is 2xD.

The heater must always be interlocked towards the fan or towards the airflow going through the heater. The interlocking function is connected to the duct heater power supply or, if the heater has an internal heating controller (model RC), it can also be connected directly to the controller.

The power supply to the duct heater must be switched off when the fan is switched off or when the airflow rate is too low.

When selecting the airflow control damper and reheat coil, ensure that the airflow velocity is above 2 m/s in order to guarantee a proper control function.

Heating capacity with low air velocity of 2 m/s

NS	Power (W)	qv l/s	qv m^3/h	dT(max) K
100	600	16	57	32
125	900	25	88	31
160	1500	40	145	31
200	2100	63	226	28
250	3000	98	353	25
315	3000	156	561	16
400	3000	251	905	10

Heating capacity with an air velocity of 6 m/s

NS	Power (W)	qv l/s	m^3/h	dT(max) K
100	600	47	170	11
125	900	74	265	10
160	1500	121	434	10
200	2100	188	679	9
250	3000	295	1060	8
315	3000	468	1683	5
400	3000	754	2714	3

For further information, contact Halton Sales.

Order code

RH=RM or RH=RC

Order code

MOC-S-D, MA-CU-FS-SA-RH-ZT

S = Model
G With blade gasket
I With blade gasket and insulation (50 mm)

D = Size of duct connection (mm)
100, 125, 160, 200, 250, 315, 400, 500, 630

Other options and accessories

MA = Material
CS Galvanised steel
AS Stainless steel (EN 1,4404/AISI 316L)

CU = Control unit
EM LMV-D3-MF-F.1 HI (DC 0/2...10 V), 5 Nm (sizes 100-250)
EK NMV-D3-MF-F.1 HI (DC 0/2...10 V), 10 Nm (sizes 100-630)
EC LMV-D3-MP (MP bus), 5 Nm (sizes 100-250)
EE NMV-D3-MP (MP bus), 10 Nm (sizes 100-630)
ER LMV-D3-KNX (KNX bus), 5 Nm (sizes 100-250)
ES NMV-D3-KNX (KNX bus), 10 Nm (sizes 100-630)
ET LMV-D3-MOD (Modbus RTU), 5 Nm (sizes 100-250)
EU NMV-D3-MOD (Modbus RTU), 10 Nm (sizes 100-630)
EH GDB181.1E/3 (DC 0/2...10 V), 5 Nm (sizes 100-250)
EG GLB181.1E/3 (DC 0/2...10V), 10 Nm (sizes 100-630)
EV GDB181.1E/KN (KNX bus), 5 Nm (sizes 100-250)
EW GLB181.1E/KN (KNX bus), 10 Nm (sizes 100-630)
EB GDB181.1E/MO (Modbus RTU), 5 Nm (sizes 100-250)
EF GLB181.1E/MO (Modbus RTU), 10 Nm (sizes 100-630)
LK LMV-D3-LON (LonWorks), 5 Nm (sizes 100-250)
LM NMV-D3-LON (LonWorks), 10 Nm (sizes 100-630)
HM ECL-VAV-S, HAV (LonWorks), 5Nm (sizes 100-250)
HK ECL-VAV-N, HAV + NM24A-SR (LonWorks), 10 Nm (sizes 100-630)

FS = Factory-set airflow limits
DC Customer specified settings
DS Default factory settings (Vnom)

SA = Sound attenuator (accessory
NA Not assigned
H1 L = 600 mm; Outlet = Inlet; Mineral wool
H2 L = 1000/1250 mm; Outlet = Inlet; Mineral wool
H3 L = 600 mm; Outlet = Inlet; Polyester fibre
H4 L = 1000/1250 mm; Outlet = Inlet; Polyester fibre
H5 L = 600 mm; Outlet > Inlet; Mineral wool
H6 L = 1000/1250 mm; Outlet > Inlet; Mineral wool
H7 L = 600 mm; Outlet > Inlet; Polyester fibre
H8 L = 1000/1250 mm; Outlet > Inlet; Polyester fibre
H11 L = 600 mm; Outlet = Inlet; Mineral wool; Access panel
H12 L = 1000/1250 mm; Outlet = Inlet; Mineral wool; Access panel
H13 L = 600 mm; Outlet = Inlet; Polyester fibre; Access panel
H14 L = 1000/1250 mm; Outlet = Inlet; Polyester fibre; Access panel
H15 L = 600 mm; Outlet > Inlet; Mineral wool; Access panel
H16 L = 1000/1250 mm; Outlet > Inlet; Mineral wool; Access panel

H17 L = 600 mm; Outlet > Inlet; Polyester fibre; Access panel
H18 L = 1000/1250 mm; Outlet > Inlet; Polyester fibre; Access panel

RH = Electric reheat coil (accessory)
NA Not assigned
RM No internal heating controller,
PWM Control signal input (230 VAC, pulse width modulation)
RC With internal heating controller (0...10-VAC control signal input)

ZT = Tailored product
N No
Y Yes (ETO)

Code example

MOC-G-100, MA=CS, CU=EM, FS=DC, SA=NA, RH=NA, ZT=N