

Halton Max MOC, airflow management damper - Technical description

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1 Introduction

1.1 Copyright and disclaimers

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1.2 About this document

This technical description is intended for anyone needing detailed technical information about the product. It also provides general design-related information, such as design examples. More detailed designs can be carried out using the Halton eHIT selection tool, available at www.ehit.halton.com.

1.3 Summary of changes

Release	Date	Description
2.1	07.04.2026	Updated actuators T9 and T11 - removed text "without cable"
2.0	09.07.2025	Updates from WordPress moved to Heretto
1.0	17.03.2021	First published version

2 Product description

2.1 Overview



Halton Max MOC is a circular airflow management damper, is designed for versatility across a wide range of VAV applications. Quick, easy commissioning with factory-set airflow rate limits tailored 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

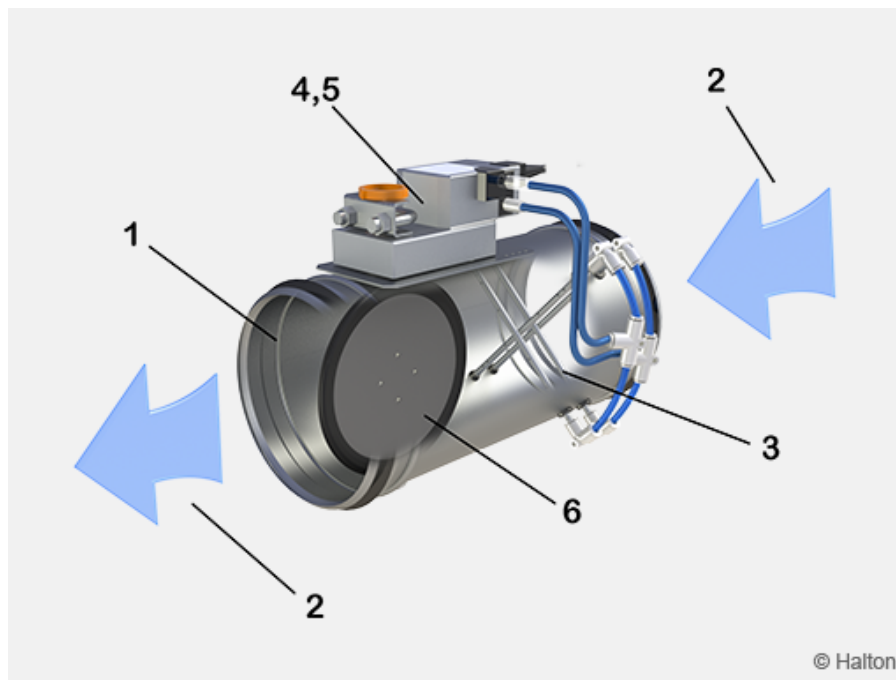
Product models and options

- Model with external insulation is available as an option
- Shut-off operation tightness fulfills (EN 1751), class 4 requirements
- 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

2.2 Operating principle



No.	Part
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 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.

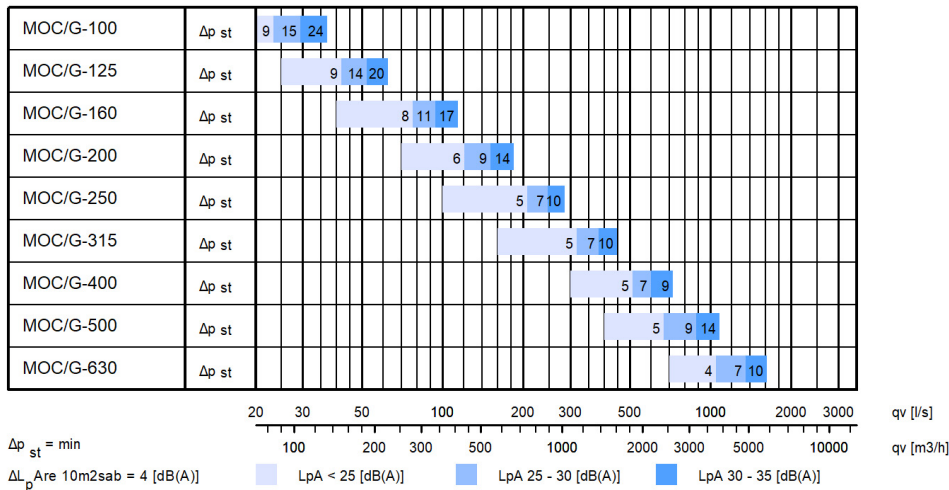
Changes in room conditions can be adjusted manually from an end-user interface or by different sensors such as occupancy or room pressure sensors, thermostats or timers. The conditions can also be managed remotely from a building management system (BMS). The control signal and the airflow measurement 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.

2.3 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

2.4 Key technical data

The Halton Max airflow control dampers are available in two product models: G and I:

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

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	sizes 100-250
Minimum torque 10 Nm	sizes 315-630	sizes 315-630

2.5 Structure and materials



Fig. 1. Halton Max MOC, structure

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 (EN 1.4404/AISI 316L)
Blade gasket	EPDM Rubber	EPDM Rubber
Duct gaskets (vulcanised to the casing)	1C-polyurethane hybrid	1C-polyurethane hybrid

Part	Material option galvanised steel (order code MA=CS)	Material option stainless steel (order code MA=AS)
Measurement probe	Aluminium	Stainless steel (EN 1.4404/AISI 316L)
External insulation (I-model)	Mineral wool	Mineral wool
Measurement tubes	PU plastic	PU plastic

2.6 Dimensions and weight

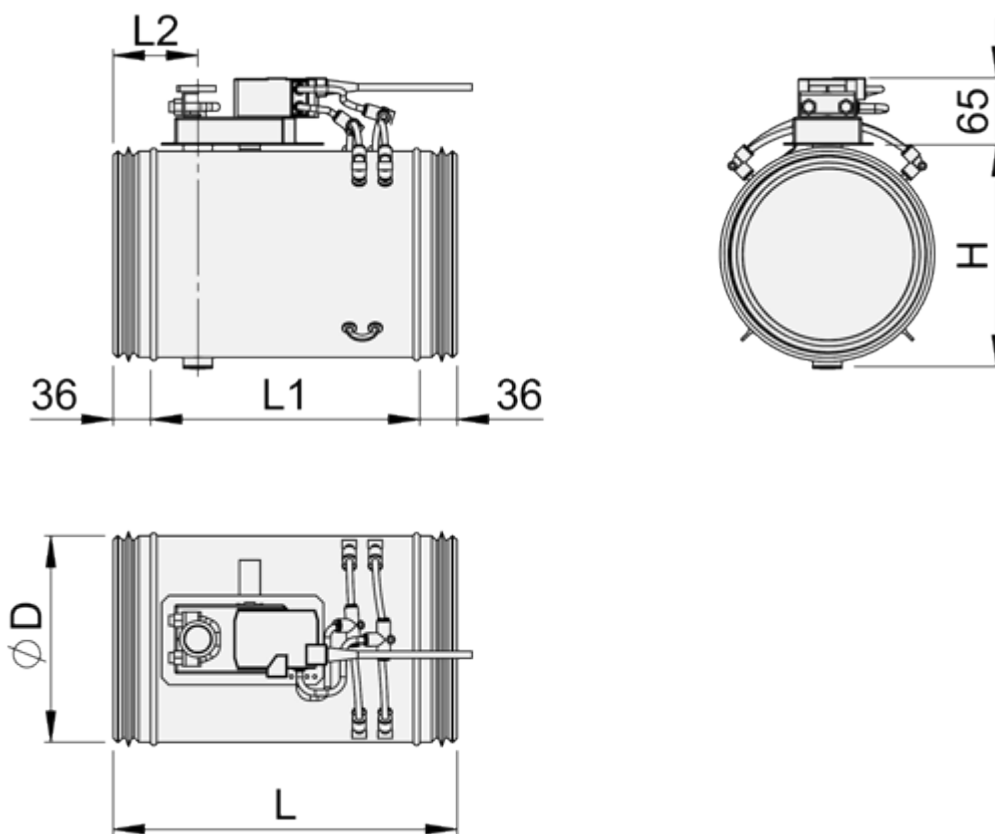


Fig. 2. Halton Max MOC, G-model (non-insulated frame)

NS	D	L	L1	L2	H	Weight [kg]**
100	99	331*	176	82	110	1.7
125	124	331*	176	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

NS	D	L	L1	L2	H	Weight [kg]**
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

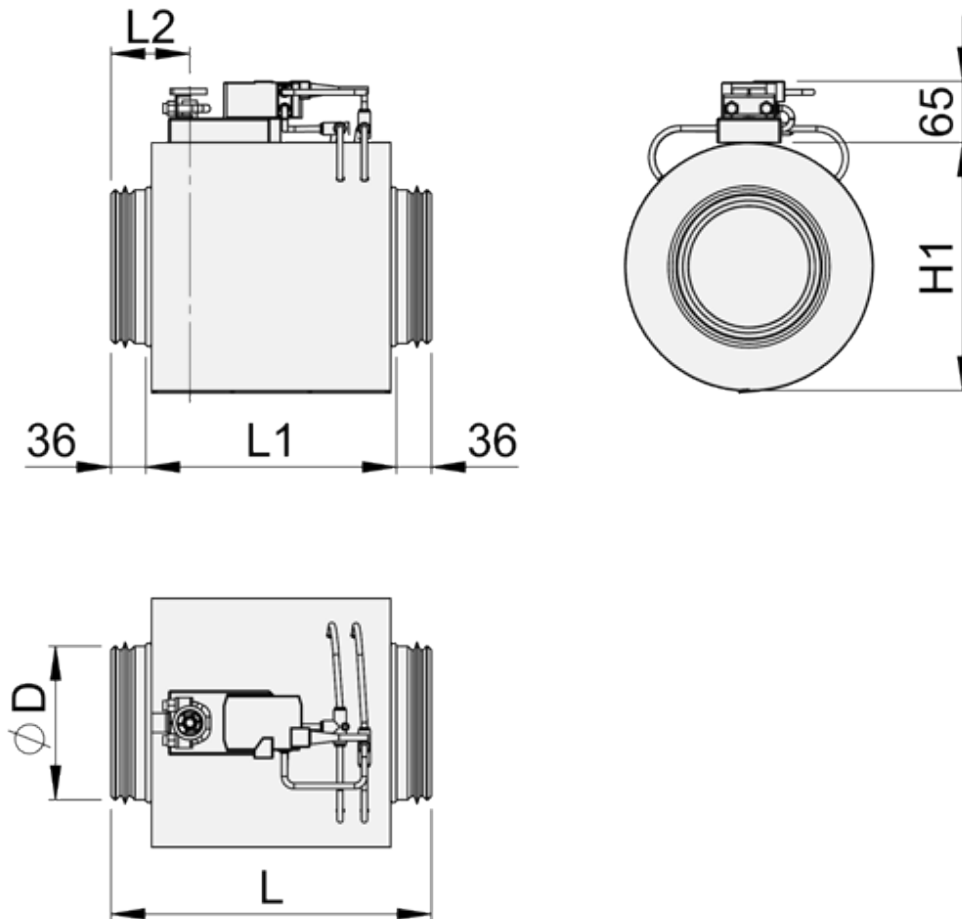


Fig. 3. Halton Max MOC, I-models (insulated frame)

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

NS	D	L	L1	L2	H1	Weight [kg]**
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

2.7 System package

2.7.1 Overview

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

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



Fig. 4. Halton Jaz JDA static diffuser and Halton Max MOC 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, CO₂, 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
- The Halton Workplace system includes the following:
 - 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

2.7.2 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.

2.7.3 Room automation

Halton Jaz JDA diffuser and Halton Max MOC VAV damper, controlled with Halton Workplace WRA room automation controller

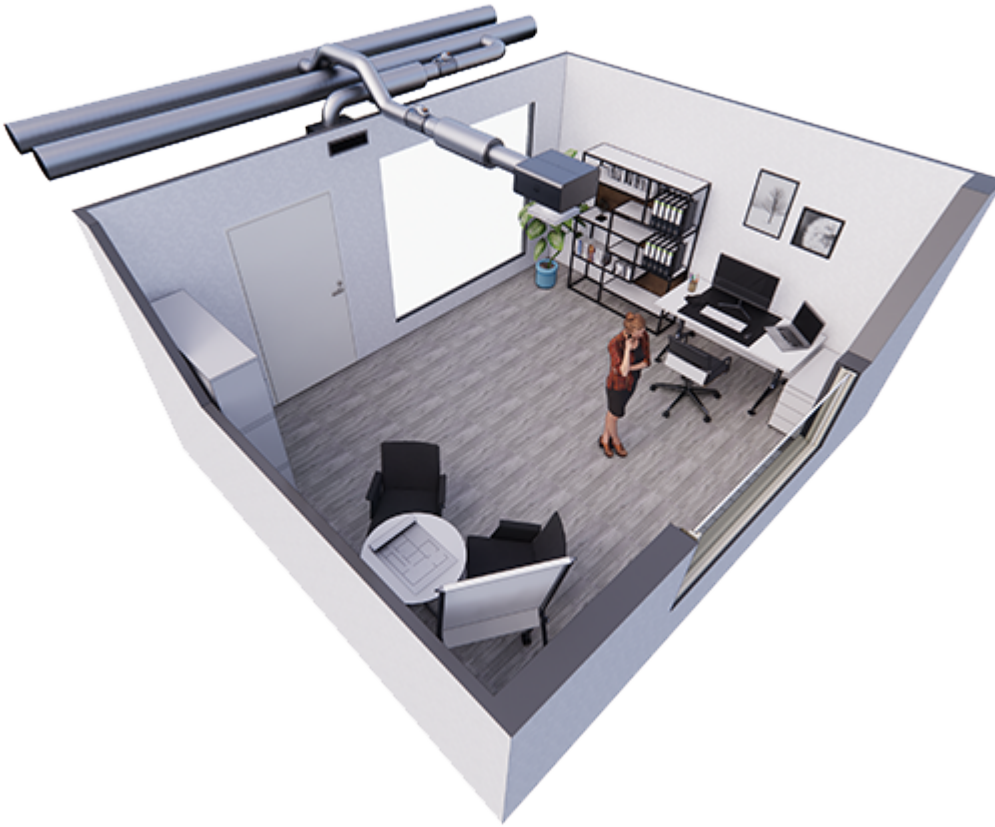


Fig. 5. Halton Jaz JDA diffuser and Halton Max Full MOC VAV damper, controlled with Halton Workplace WRA room automation controller in a single office room

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 Full MOC VAV damper. External CO₂ 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 CO₂ and occupancy sensors
- Wall panel with temperature sensor and display
- Radiator heating water valve control

Schematic drawing

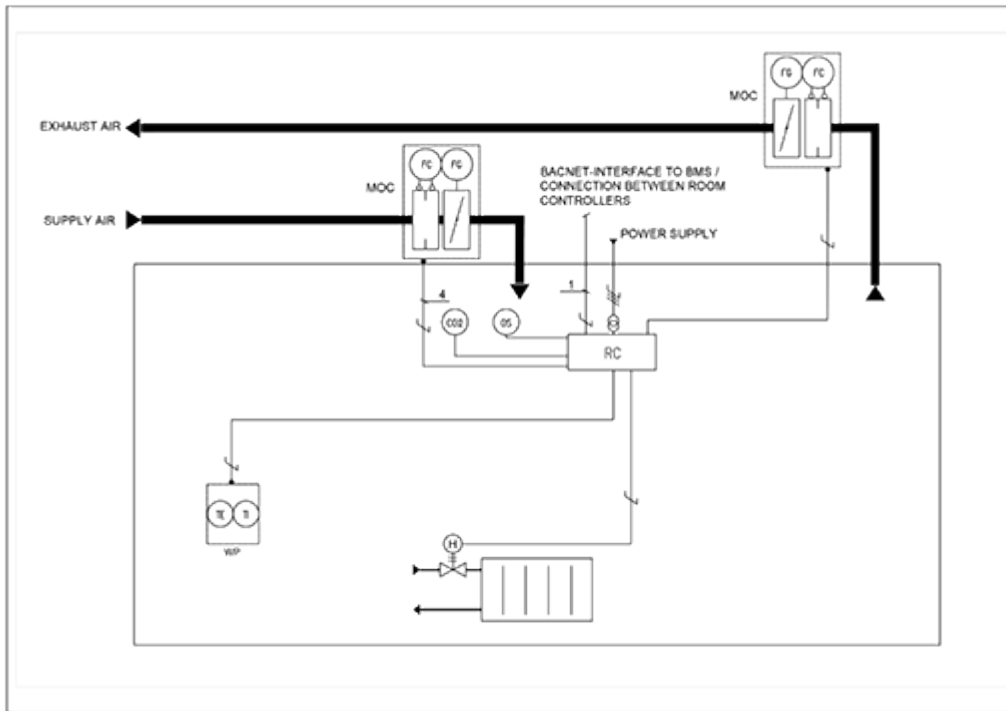


Fig. 6. Schematic drawing: Halton Jaz JDA diffuser and Halton Max Full MOC VAV damper, controlled with Halton Workplace WRA room automation controller

Equipment list

Code	Equipment
RC	Controller unit
FG	Airflow damper actuator
FC	Airflow measurement
H	Water valve actuator
OS	Occupancy sensor
CO ₂	CO ₂ sensor
WP	Wall panel
T	Temperature sensor
TI	Temperature display

Wiring diagram

For the wiring diagram of a similar configuration, see the product page of the Halton Workplace WRA room automation controller, section *Installation information*.

2.7.4 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 MOC
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 page of the Halton Workplace WRA room automation controller.

2.8 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 include blade gasket: the tightness of the control damper in closed position conforms to standard EN 1751 class 4 and casing tightness to EN 1751, class C.
- Damper with external frame 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.
- 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.

2.9 Order code

MOC-S-D; SP-MA-CU-SE-TF-FS-SA-RH-ZT

Main options	
S = Model	
G	With blade gasket
I	With blade gasket and insulation (50 mm)
D = Duct connection [mm]	100, 125, 160, 200, 250, 315, 400, 500, 630

Other options and accessories	
SP = System package	Halton Workplace WRA
N	No
Y	Yes
MA = Material	
GS	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)

Other options and accessories	
EF	GLB181.1E/MO (Modbus RTU), 10 Nm (sizes 100-630)
T9	NSVA-MOD-5H (DC 0-10 V and Modbus RTU), 5 Nm
T11	NSVA-MOD-10H (DC 0-10 V and Modbus RTU), 10 Nm
V1	LM24A-VST, (DC 0/2...10 V), 5 Nm+VRU-D3-BAC
V2	NM24A-VST, (DC 0/2...10 V), 10 Nm+VRU-D3-BAC
V3	LMQ24A-VST, 2.5 sec (DC 0/2...10 V), 4 Nm+VRU-D3-BAC
V4	NMQ24A-VST, 4 sec (DC 0/2...10 V), 8 Nm+VRU-D3-BAC
HM	ECL-VAV-S, HAV (LonWorks), 5Nm
HK	ECL-VAV-N, HAV + NM24A-SR (LonWorks), 10 Nm
SE = Sensors	
NA	Not assigned
DS1	Duct sensor (CO ₂ , Duct CO ₂)
P1	Differential pressure transmitter (HDP-PE)
TF = Transformer	
NA	Not assigned
TF1	230/24 transformer (35VA)
FS = Factory-set airflow limits	
DC	Customer specified settings
DS	Default factory settings (V _{nom})
SA = Sound attenuator	
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
H1 L	600 mm; Outlet = Inlet; Mineral wool
H8 L	1000/1250 mm; Outlet > Inlet; Polyester fibre
H11 L	600 mm; Outlet = Inlet; Mineral wool; Access panel

Other options and accessories	
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	
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)

Order code example

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

3 Design information

3.1 Design considerations

3.1.1 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.

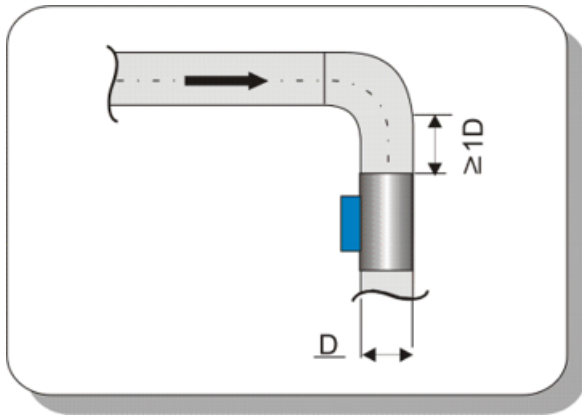


Fig. 7. Bend (90° elbow)

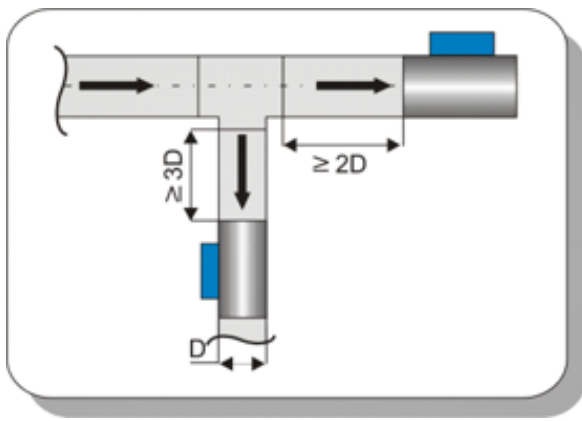


Fig. 8. T-branch

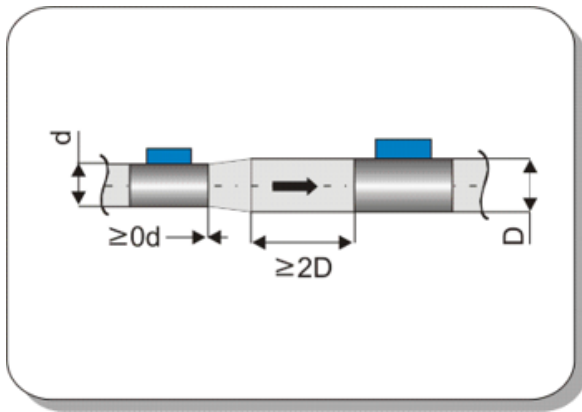


Fig. 9. With sound attenuator

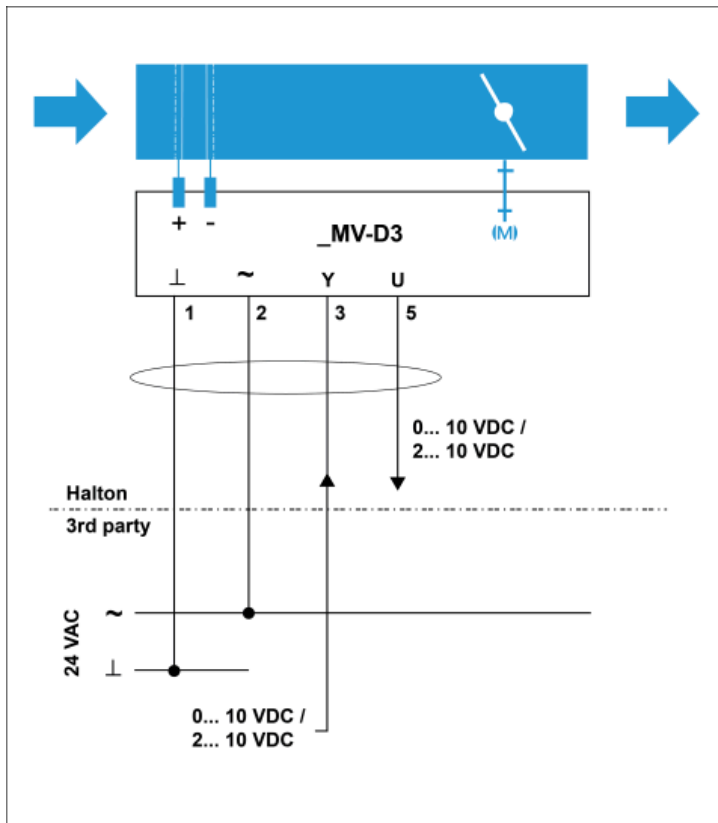
Space requirements

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

Wiring

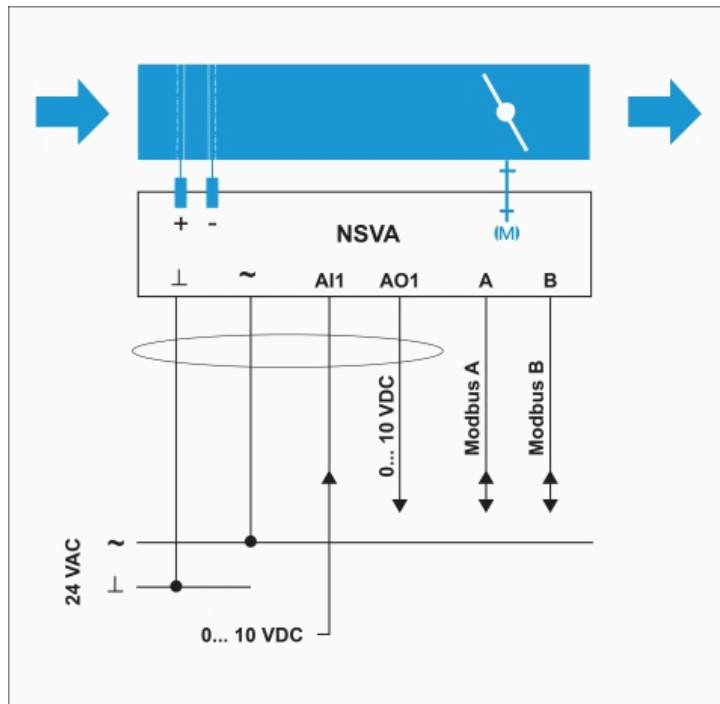
The wiring must be carried out by professional technicians in accordance with local regulations. For the power supply, a safety-isolating transformer must be used.

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



No.	Key	Description
1	⊥	24 VAC system neutral
2	~	24 VAC live
3	Y	2...10- or 0...10-VDC airflow setpoint signal input
5	U5	2...10- or 0...10-VDC airflow feedback signal output

The following picture shows a typical variable airflow control application without cables.



Wire colour	Key	Description
Black	⊥	24 VAC system neutral
Red	~	24 VAC live
Gray	AI1	Analog input
Purple	AO1	Output for airflow feedback signal
Yellow	A	Data receive/send line A
Green	B	Data receive/send line B

3.1.2 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 (V_{nom}) 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 One Circular actuator models

NS	V_{nom} [l/s] @ 150 Pa	V_{nom} [m ³ /h] @ 150 Pa
100	78	282
125	123	441
160	221	794
200	353	1270

NS	Vnom [l/s] @ 150 Pa	Vnom [m ³ /h] @ 150 Pa
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.

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

Δp_m	differential pressure of measurement probe [Pa]
k	The k-factor
q	Airflow rate [l/s]

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 damper 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

4 Technical reference data

4.1 Control units

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.

Actuator	Notes	Torque Nm	Damper size	Communication interface	Order code
EM	Analogue actuator 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 actuator Manufacturer: Belimo	10	100-630	DC0..10V/ 2..10V	EK = NMV-D3-MF-F.1 HI (DC 0/2...10 V), 10 Nm
EC	Actuator 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 = <u>LMV-D3-MP (MP bus), 5 Nm</u>
EE	Actuator 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 = <u>NMV-D3-MP (MP bus), 10 Nm</u>
ER	Actuator with KNX Manufacturer: Belimo	5	100-250	KNX	ER = <u>LMV-D3-KNX (KNX bus), 5 Nm</u>

Actuator	Notes	Torque Nm	Damper size	Communication interface	Order code
ES	Actuator with KNX Manufacturer: Belimo	10	100-630	KNX	ES = <u>NMV-D3-KNX (KNX bus), 10 Nm</u>
ET	Actuator with Modbus Manufacturer: Belimo	5	100-250	Modbus	ET = <u>LMV-D3-MOD (Modbus RTU), 5 Nm</u>
EU	Actuator with Modbus Manufacturer: Belimo	10	100-630	Modbus	EU = <u>NMV-D3-MOD (Modbus RTU), 10 Nm</u>
EH	Analogue actuator Manufacturer: Siemens	5	100-250	DC0..10V/ 2..10V	EH = <u>GDB181.1E/3 (DC 0/2...10 V), 5 Nm</u>
EG	Analogue actuator Manufacturer: Siemens	10	100-630	DC0..10V/ 2..10V	EG = <u>GLB181.1E/3 (DC 0/2...10V), 10 Nm</u>
EV	Actuator with KNX Manufacturer: Siemens	5	100-250	KNX communication	EV = <u>GDB181.1E/KN (KNX bus), 5 Nm</u>
EW	Actuator with KNX Manufacturer: Siemens	10	100-630	KNX communication	EW = <u>GLB181.1E/KN (KNX bus), 10 Nm</u>
EB	Actuator with Modbus RTU (RS-485) Manufacturer: Siemens	5	100-250	Modbus communication	EB = <u>GDB181.1E/MO (Modbus RTU), 5 Nm</u>
EF	Actuator with Modbus RTU (RS-485) Manufacturer: Siemens	10	100-630	Modbus communication	EF = <u>GLB181.1E/MO (Modbus RTU), 10 Nm</u>

Actuator	Notes	Torque Nm	Damper size	Communication interface	Order code
T9	Controller with Modbus Manufacturer: Halton	5	100-250	DC0-10V and Modbus	T9 = NSVA-MOD-5H (DC 0-10 V and Modbus RTU), 5 Nm
T11	Controller with Modbus Manufacturer: Halton	10	100-630	DC0-10V and Modbus	T11 = NSVA-MOD-10H (DC 0-10 V and Modbus RTU), 10 Nm
V1*	Analogue controller Manufacturer: Belimo	5	100-250	DC0..10V/2..10V	V1 = <u>LM24A-VST, (DC 0/2...10 V), 5 Nm + VRU-D3-BAC</u>
V2*	Analogue controller Manufacturer: Belimo	10	100-630	DC0..10V/2..10V	V2 = <u>NM24A-VST, (DC 0/2...10 V), 10 Nm + VRU-D3-BAC</u>
V3*	Analogue controller Manufacturer: Belimo	4	100-250	DC0..10V/2..10V	V3 = <u>LMQ24A-VST, 2.5 sec (DC 0/2...10 V), 4 Nm + VRU-D3-BAC</u>
V4*	Analogue controller Manufacturer: Belimo	8	100-630	DC0..10V/2..10V	V4 = <u>NMQ24A-VST, 4 sec (DC 0/2...10 V), 8 Nm + VRU-D3-BAC</u>
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	100-630	LonWorks communication	HK = ECL-VAV-N, HAV + NM24A-SR (LonWorks), 10 Nm

Table 1. Actuators for Halton Max One Circular (MOC)

4.2 Accessories

4.2.1 Sound attenuators

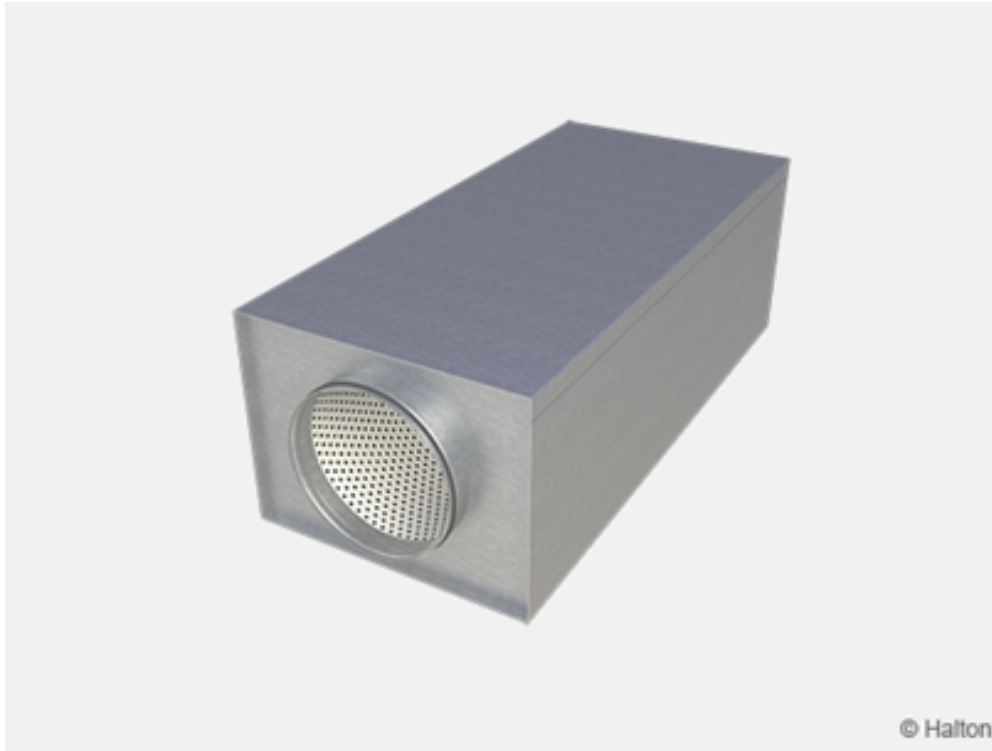


Fig. 10. Sound attenuator

Description

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

- 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 connection (D1).
- Insulation material options:
 - Polyester fibre (PEF), tested according to ISO 7235, EN 1751 tightness class C
 - Mineral wool (MW), EN 1751 tightness class C
- Available with or without access panel for maintenance purposes

Technical data

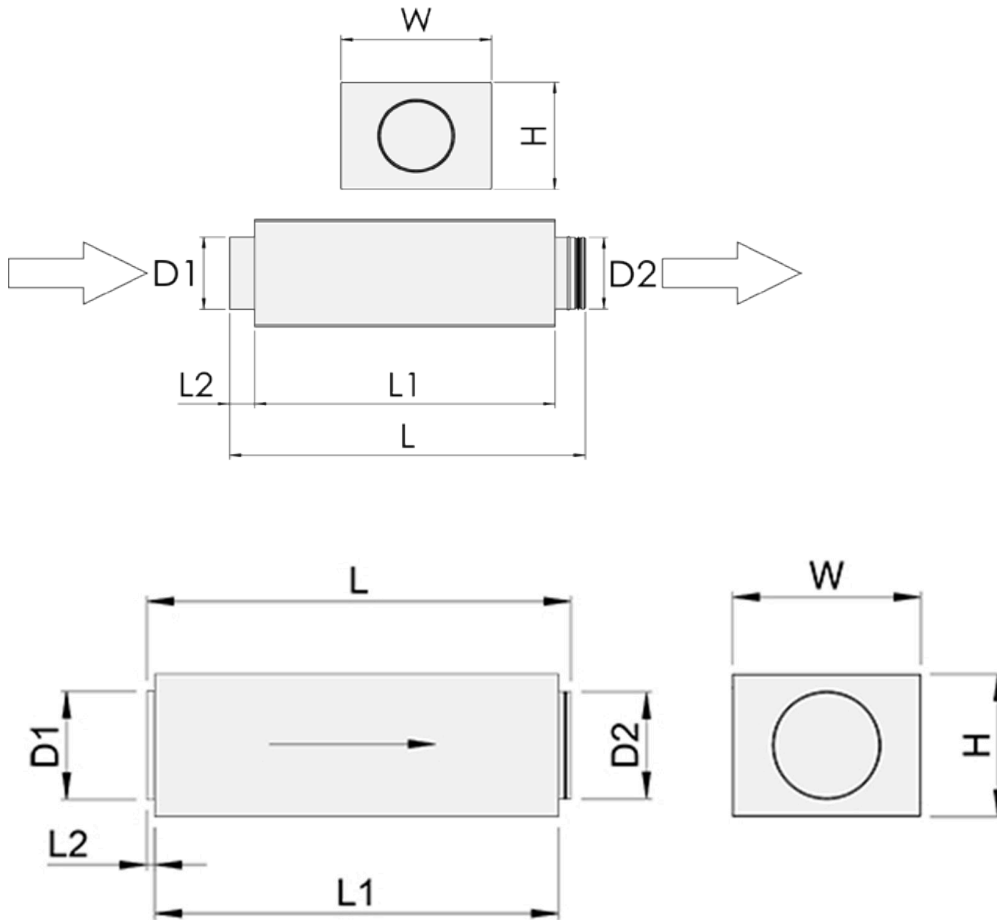


Fig. 11. Sound attenuator dimensions

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.

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
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	26,0
500	630	851	684	626	600	67	33,7
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
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	18,0
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

Fig. 12. Table. Dimensions (mm) and weight

Key	Description
MW	Mineral wool
PEF	Polyester fibre

Examples of attenuation data

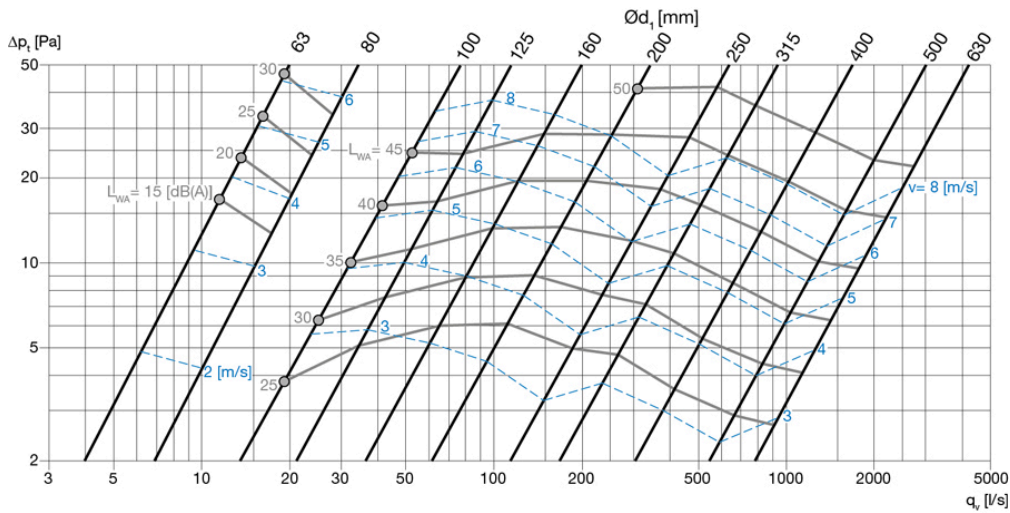


Fig. 13. Attenuation data, L=600 mm, material=PEF

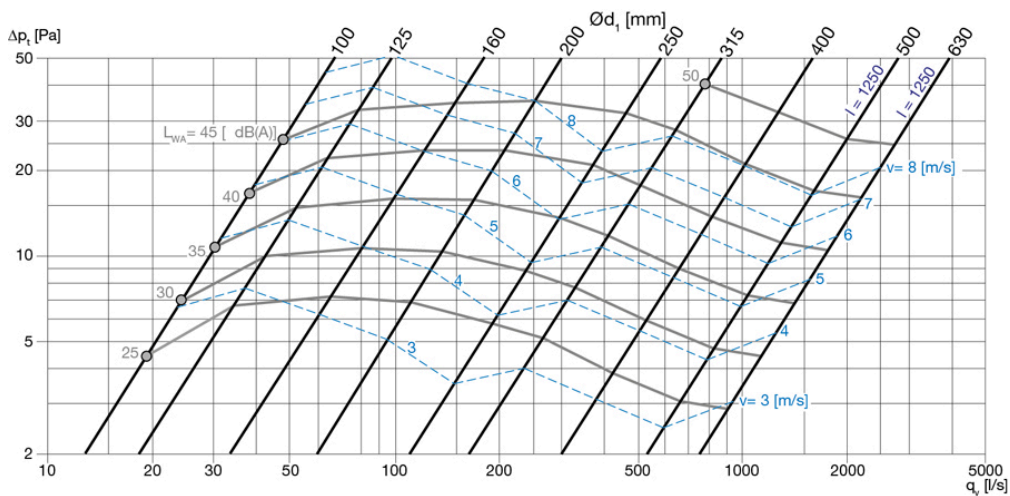


Fig. 14. Attenuation data, L=1000 mm, material=PEF

For further information, contact Halton Sales.

Order code

SA=model code, according to the following codes 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

Code	Length [mm]	Connection type	Insulation material	Access panel
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

Code	Description
D1	Damper connection
D2	Duct connection
MW	Mineral wool
PEF	Polyester fibre
*	For sizes øD 400 or 500. See Dimensions table above.

4.2.2 Reheat coils



Fig. 15. Reheat coil

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.
- Single-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, tightness class C
- Available for duct sizes 100-400 mm
- Power 600-3000 W

Note: Reheat coil is not available for sizes over 400 mm.

Technical data

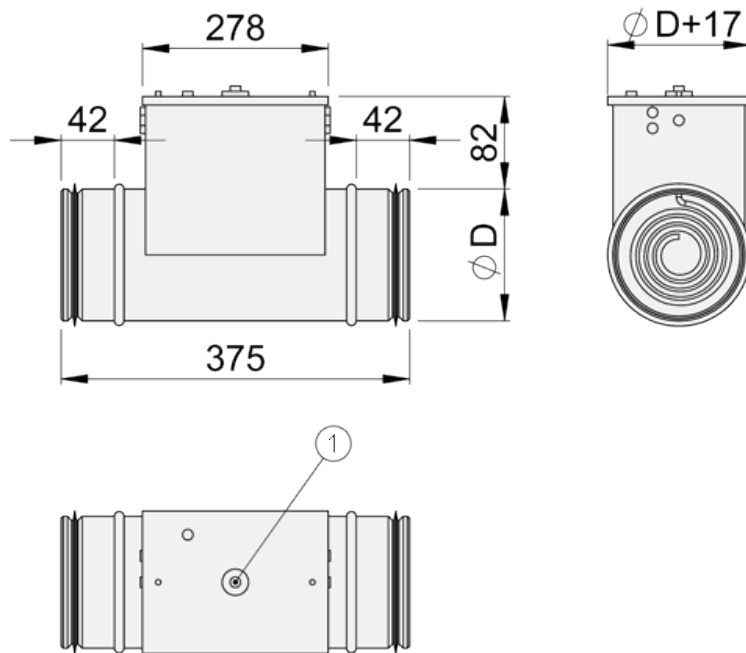


Fig. 16. Reheat coil dimensions

Key	Description
øD [mm]	100, 125, 160, 200, 250, 315, 400
1	Resetting of manual overheating protection

The heater can be installed in vertical or horizontal ducts. The safety distance is $2 \times D$.

The heater must always be interlocked towards the fan blowing air into the duct 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 an air velocity of 2.0 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

NS	Power [W]	qv l/s	qv m ³ /h	dT(max) K
315	3000	156	561	16
400	3000	251	905	10

Heating capacity with an air velocity of 6.0 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