

# Halton Max MDC – Zone control damper for Halton Workplace system



## Overview

The Halton Max MDC airflow management damper operates as a fundamental element of the supply and exhaust ductwork zones in the Halton Workplace systems.

This management damper can operate either in duct static pressure control mode or duct airflow control mode.

Typically at the Halton Workplace zonal level, supply air is kept at constant pressure with the Halton Max MDC. Exhaust air is operated with the airflow control mode.

For ductwork static pressure control, airflow management damper is used with static pressure measurement unit Halton MSS.

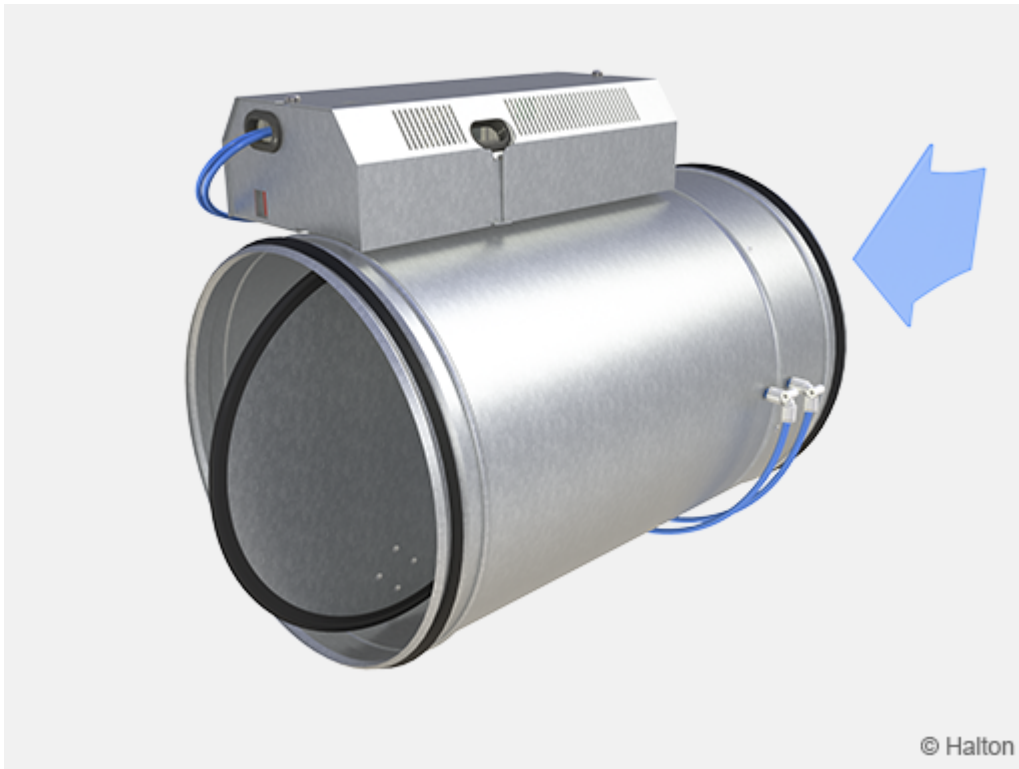
## Application

- Airflow is measured with calibrated orifice plate
- Airflow control damper for Halton Workplace zone control applications
- Circular pressure-independent variable airflow control damper
- Supply and exhaust installations

## Key features

- Pressure-independent operation
- Duct static pressure control and airflow rate control modes are available
- For duct static pressure control used with the Halton MSS
- Insensitive to dust collection in ductwork
- Enables flexibility in terms of space layout
- Project specific settings are preset at the factory
- Controller settings are easily adjustable on site with BACnet/IP connection or web browser
- Can be connected to Buildings Management System (BMS)
- Velocity range 0,5 — 6 m/s
- General measurement uncertainty: Accuracy  $\pm 10\%$

## Operating principle



The damper can operate either as a supply or an exhaust unit. It maintains the required airflow level or pressure level through static pressure measurement. For ductwork static pressure control, static pressure measurement unit (Halton MSS) with pressure transmitter is used for zone ductwork static pressure measurement.

The damper contains airflow measurement with orifice plate, controller, pressure measurement sensor and an actuator for controlling the damper blade.

The airflow controller can receive the airflow control signal via

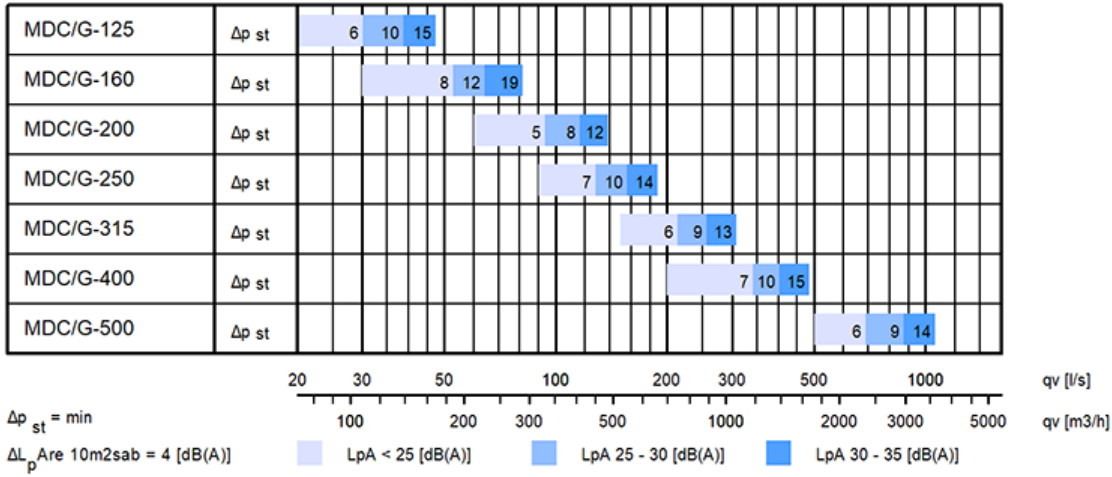
- BACnet/IP

# Key technical data

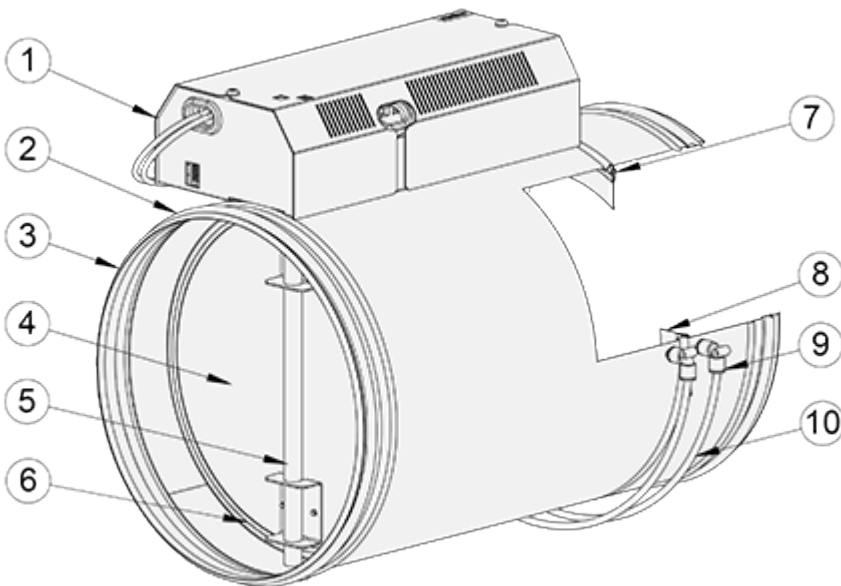
Feature	Value
Duct connection sizes	ø125-500 mm
Material	Galvanised steel
Air velocity range	<ul style="list-style-type: none"> <li>• 0.5 – 6 m/s for airflow control</li> <li>• 0.5 – 5 m/s for static pressure control (up to 4 m/s for most optimal operation)</li> </ul>
Operating range (ambient temperature)	0-50 °C
Ambient relative humidity (non-condensing)	< 95%
Communication interface	BACnet/IP
Operating modes <ul style="list-style-type: none"> <li>• Static pressure control</li> <li>• Airflow 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> <li>• Static pressure setpoint range 40 to 200 Pa in static pressure control mode</li> </ul>
Accessories	<ul style="list-style-type: none"> <li>• Sound attenuator</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 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 EN 1751 class C</li> <li>• shut-off operation tightness fulfils EN 1751 class 4</li> </ul>
Maintenance	Maintenance-free

# Quick selection

The operable airflow range for Halton Max MDC corresponds to duct air velocities 0.5-6 m/s. The below example shows the airflow ranges and noise levels with damper blade fully open.



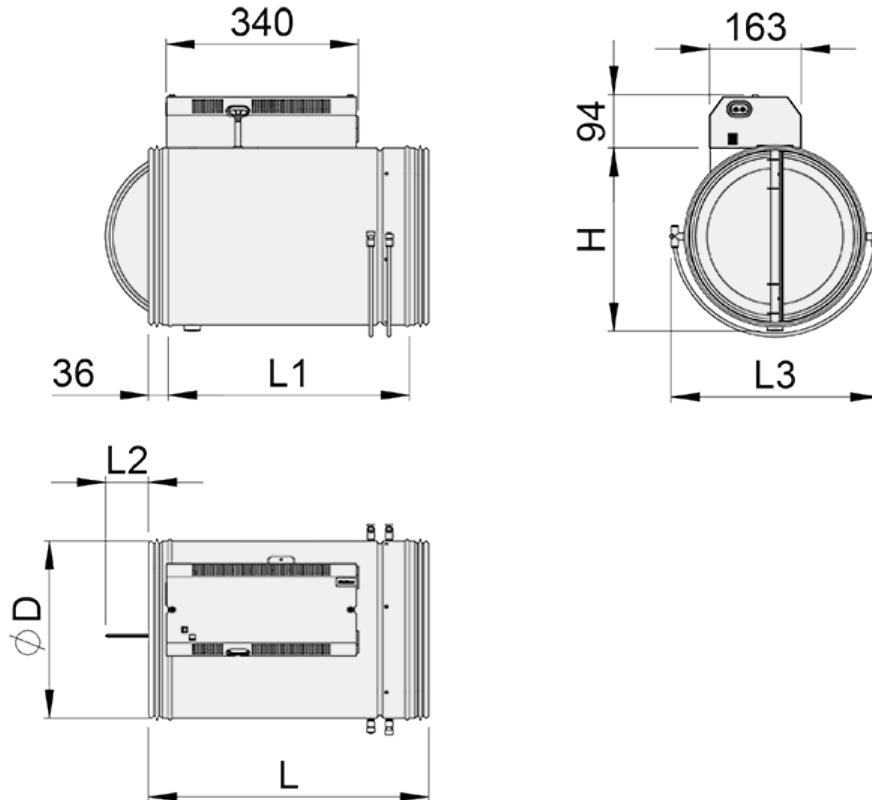
# Structure and materials



No.	Part	Material
1	Control box	Galvanised steel
2	Duct seal gasket	Rubber
3	Casing	Galvanised steel
4	Blade	Galvanised steel
5	Shaft	Galvanised steel
6	Blade gaskets	EPDM rubber
7	Orifice plate gasket	EPDM rubber
8	Orifice plate	Galvanised steel
9	Tube connectors	Polyacetal
10	Measurement tabs	Polyurethane

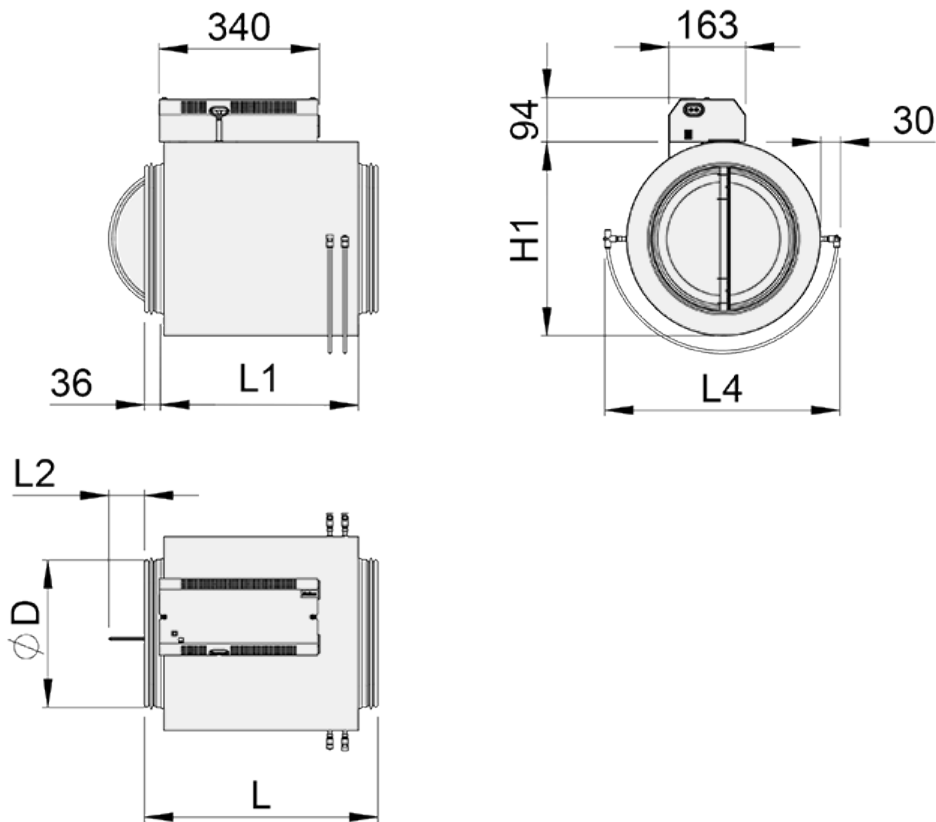
## Dimensions and weight

### Model without insulation



NS [mm]	øD [mm]	L [mm]	L1 [mm]	L2 [mm]	L3 [mm]	H [mm]	Weight [kg]
125	124	329	257	–	184	134	5.5
160	159	329	257	–	219	169	5.8
200	199	494	422	15	259	209	6.5
250	249	494	422	38	309	259	7.2
315	314	494	422	70	374	324	8.0
400	399	620	545	115	459	409	9.9
500	499	620	545	95	559	509	17.7

## Model with insulation (50 mm)



NS [mm]	øD [mm]	L [mm]	L1 [mm]	L2 [mm]	L4 [mm]	H [mm]	Weight [kg]
125	124	329	257	–	305	225	6.3
160	159	329	257	–	340	260	6.7
200	199	494	422	15	380	300	8.2
250	249	494	422	38	430	350	9.2
315	314	494	422	70	495	415	10.3
400	399	620	545	115	580	500	13.7
500	499	620	545	95	680	600	22.4

## Specification

The pressure-independent variable airflow management damper is made of galvanised steel, with an airflow measurement with orifice plate.

Duct connection shall include integral airtight rubber gaskets.

The management damper section shall contain airflow measurement, flow controller and damper actuator.

The variable air volume control damper includes both constant pressure and airflow control applications, and, is available for BACnet/IP communication protocol.

## Construction

- Damper includes airflow measurement with orifice plate, controller, pressure measurement sensor 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 class C.
- Damper with optional external insulation include a 50 mm mineral wool insulation layer
- Closing blade with gasket ensure complete shut-off function

## Material

- Galvanised steel

## Electrical data

- Communication protocol BACnet/IP
- Power supply voltage 230 V AC

- Maximum load for transformer 20 VA

## Parameter settings

- Project specific parameters are preset at the factory
- Controller settings are adjustable on site with BACnet/IP connection or web browser

## Accessories

- Sound attenuator for noise reduction. An access panel can be added for easy maintenance.

# Installation

## Installation options

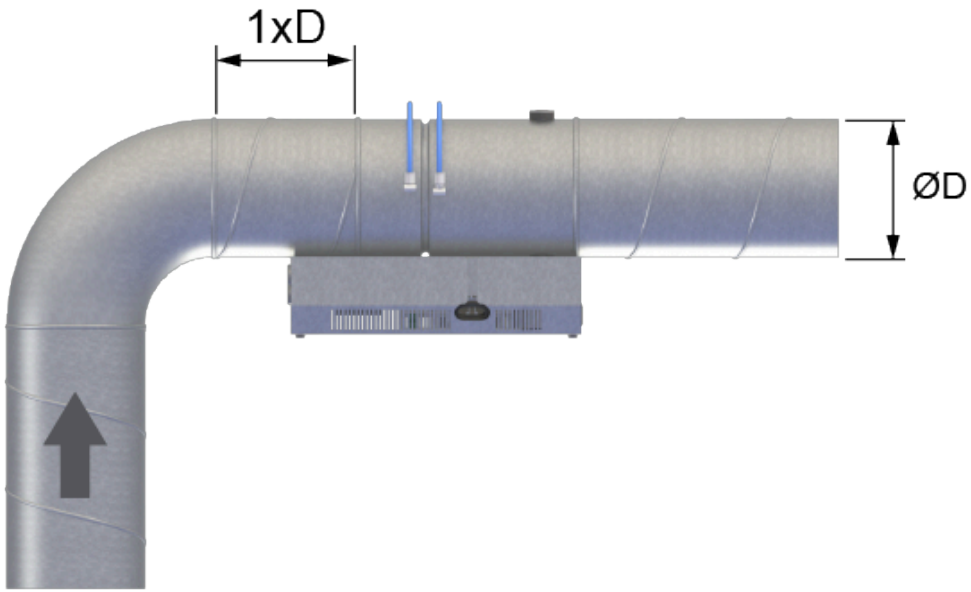
The Halton Max MDC airflow control damper is installed taking into account the required safety distances. Install the unit into ductwork in such a way that the airflow direction through the unit is as indicated with the arrow label in the unit casing.

## Space requirements

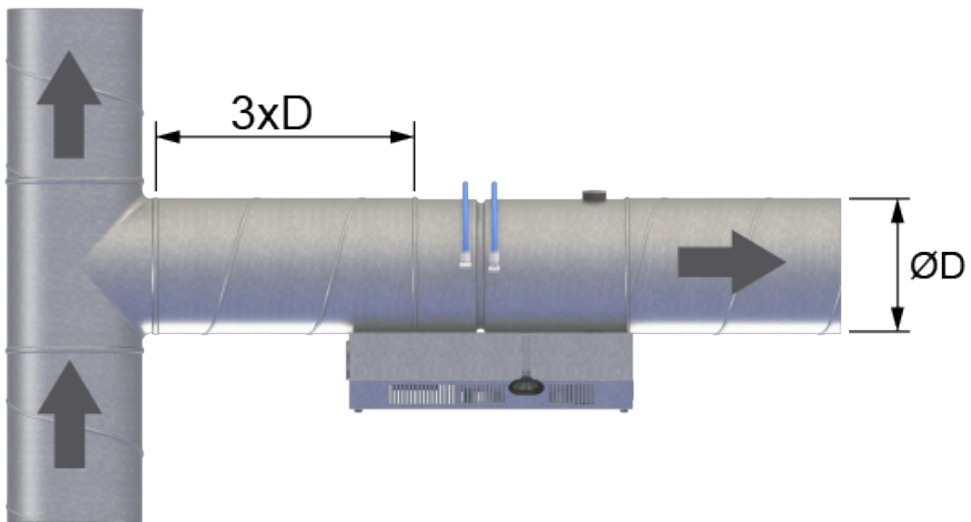
Disturbances in the ductwork such as duct bends, T-branches and sound attenuators cause turbulence and an uneven airflow. This can lead to fluctuation and inaccuracy in measurement values.

To ensure the accuracy of the airflow measurement, the minimum safety distances are defined for different installation options below. The safety distance is same for all damper sizes.

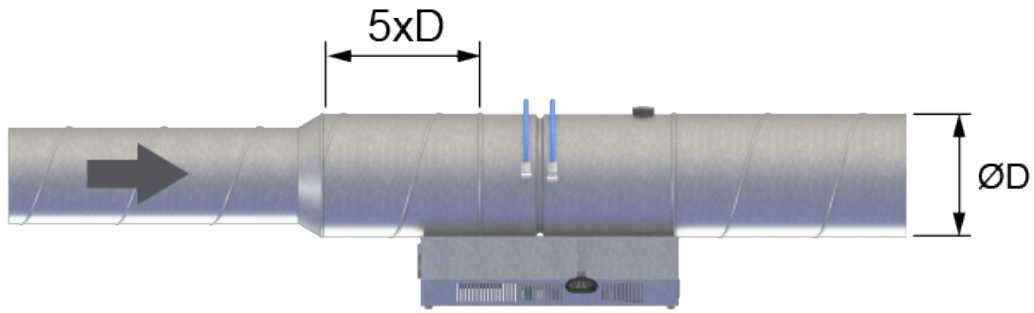




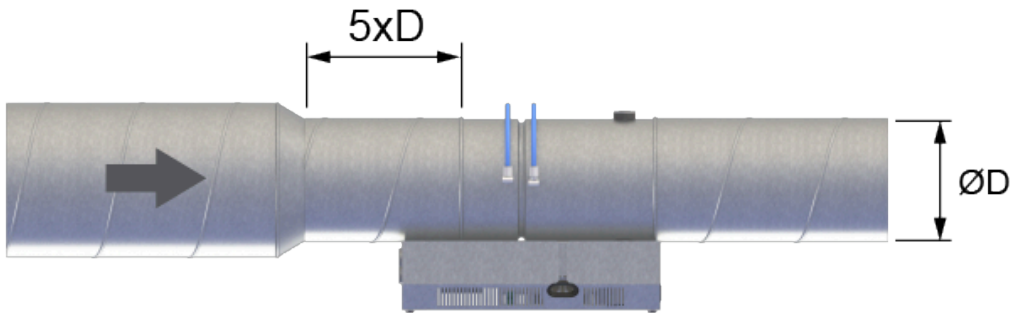
*Fig. 1. After 90° elbow*



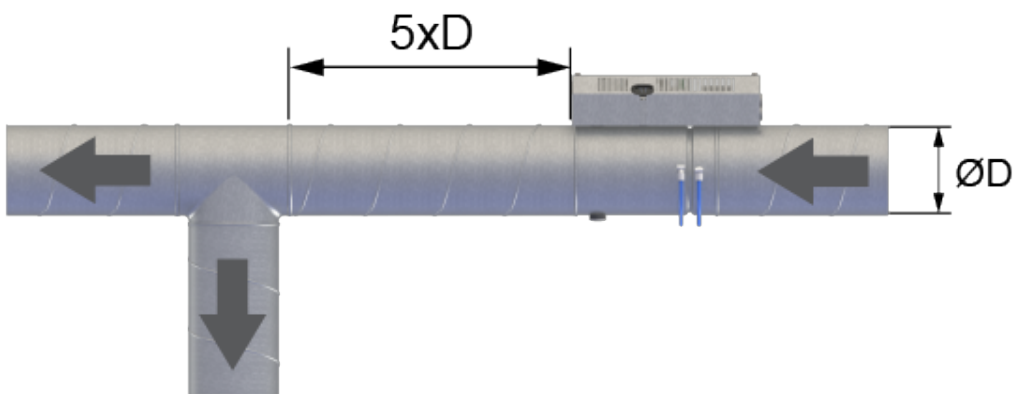
*Fig. 2. T-branch side flow*



*Fig. 3. After enlarger*



*Fig. 4. After reducer*

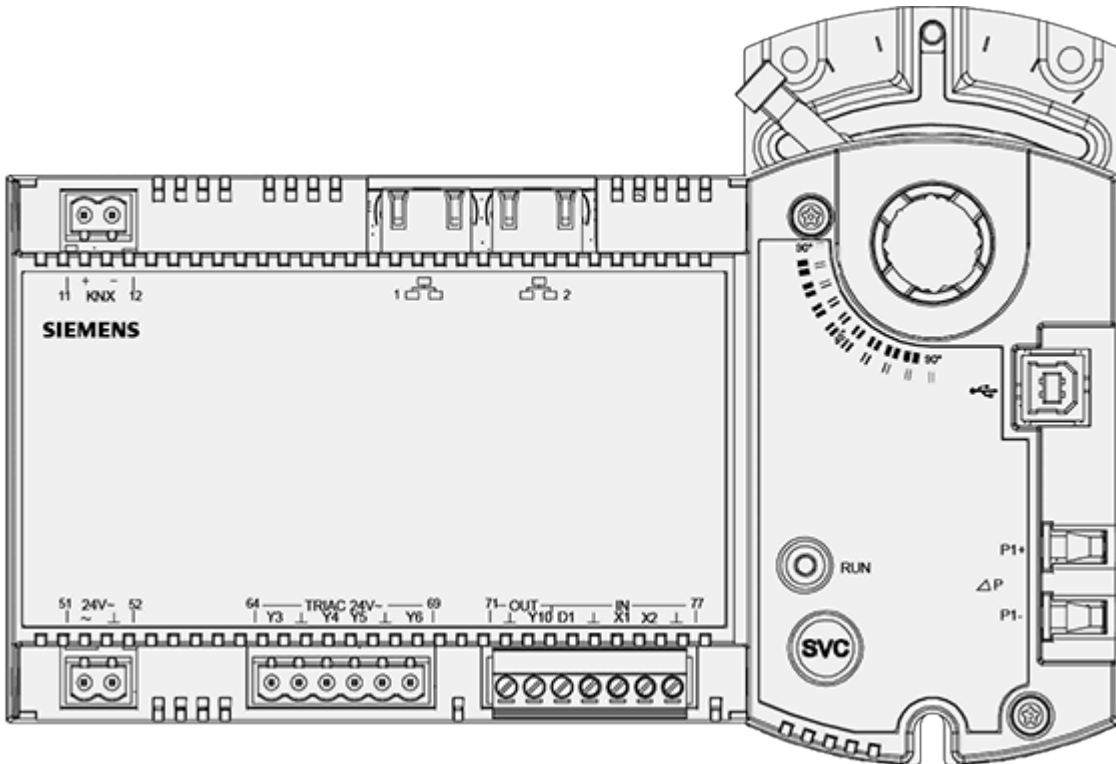


**Fig. 5. Before T-branch**

The recommended safety distance between Halton Max MDC control damper and Halton MSS measuring unit is min. 5xD.

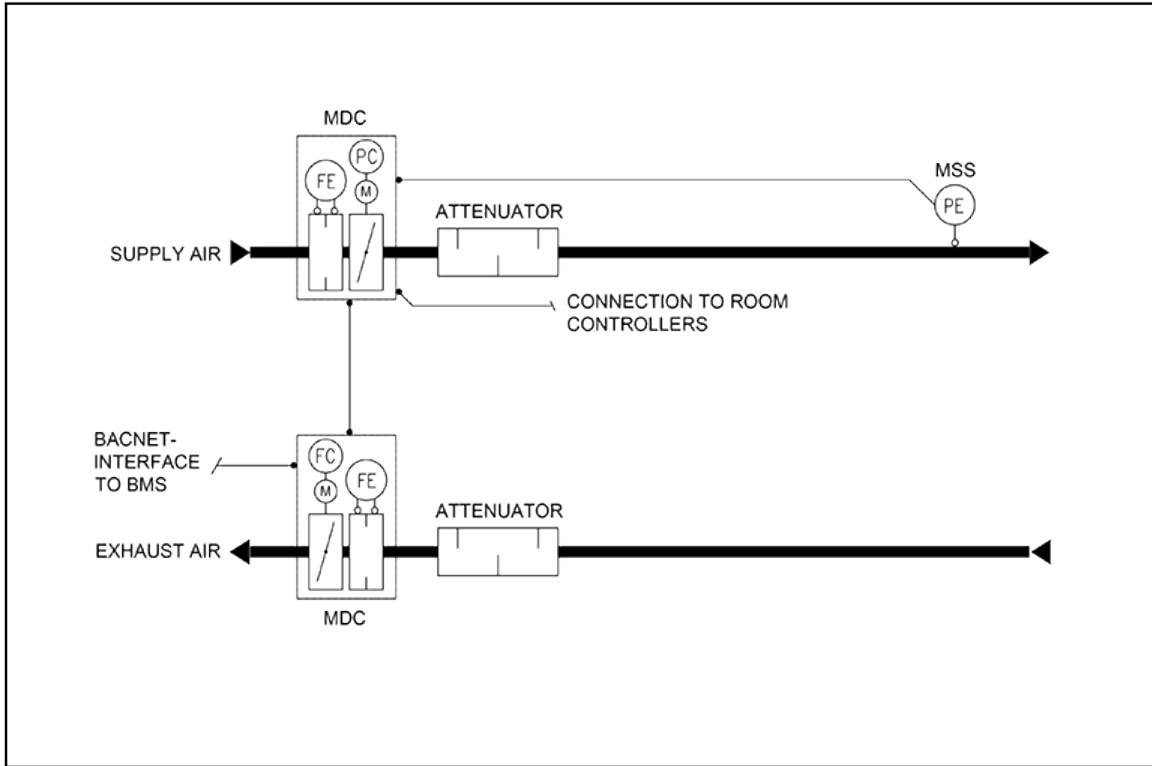
## Wiring

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.



Pin	Description	Terminal	Module	Channel
1, 2 Ethernet	2x RJ45 interface for 2-port ethernet switch	–	–	–
11, 12 KNX	KNX connection	+, –	–	–
USB	USB interface	–	–	–
51...52 power 24 V AC	Power supply SELV / PELV AC 24 V	V~	–	–
	System neutral	?	–	–
64...69 Triac outputs	Switching output AC 24V	Y3...Y6	11	3...6
71 Digital output	Positioning output DC 0...10 V	Y10	21	1, 2
	System neutral	?	–	–
73...77	Digital input	D1	1	1
	Universal inputs	X1, X2	1	5, 6
	System neutral	?	–	–
ΔP Differential pressure detector	Connected to the higher pressure	P1+	31	1
	Connected to the lower pressure	P1-	31	1
Motor Control Outputs	Shaft turns clockwise (CW)	–	11	2
	Shaft turns counter clockwise (CCW)	–	11	1
Service	Service button	SVC	–	–
Display	Operation LED	RUN	–	–

# Wiring examples



*Fig.6. Halton Max MDC with static pressure control*

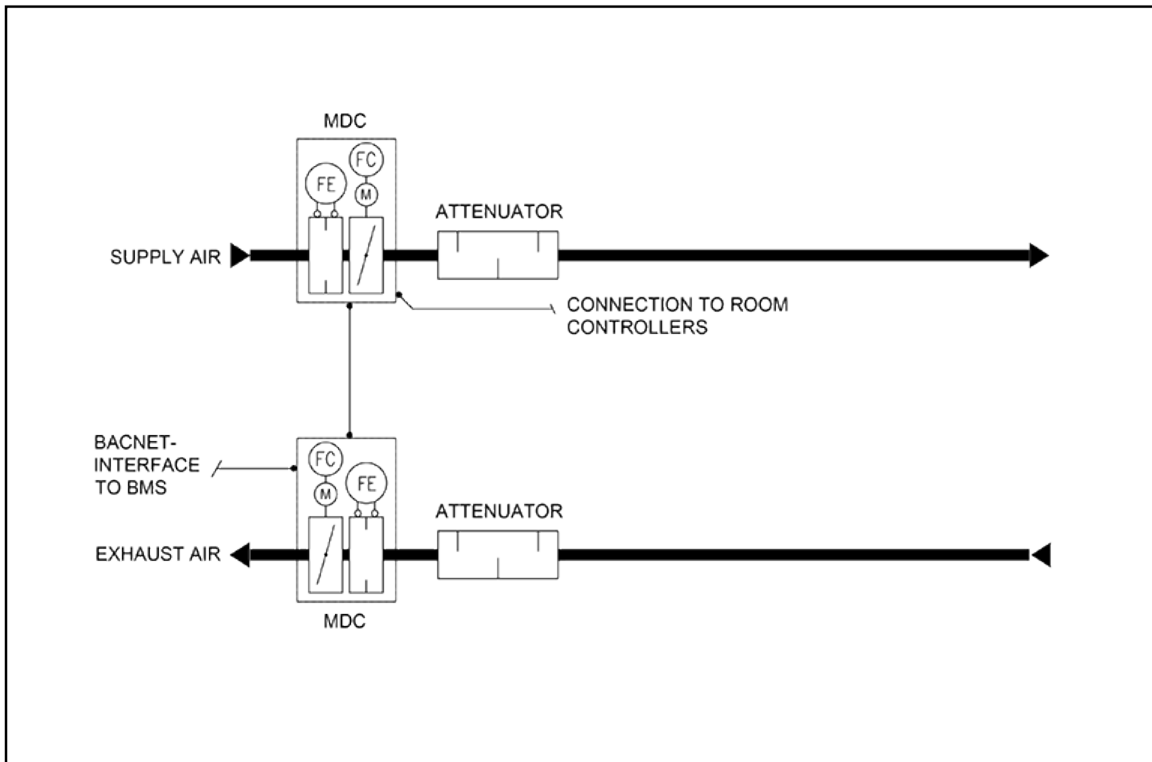


Fig.7. Halton Max MDC with airflow control

# Commissioning

## Airflow control

Airflow rate ranges of the Halton Max MDC are presented in the table below. The airflow rate range is valid both for pressure and airflow control applications.

On typical Halton Workplace zone control application, the supply airflow is based on constant pressure control and exhaust airflow is based on airflow control. In this application the actual supply airflow is measured and sent as a setpoint to exhaust airflow controller. Therefore, airflow rate ranges are essential factors both for supply and exhaust air applications.

NS	k factor [l/s]	k factor [m <sup>3</sup> /h]
125	7.5	27.0
160	11.3	40.6
200	21.7	78.0
250	27.7	99.7
315	44.1	158.8
400	67.3	242.3
500	101.8	366.5

NS	l/s min @ 0.5 m/s	l/s max @ 6 m/s	m <sup>3</sup> /h min @ 0.5 m/s	m <sup>3</sup> /h max @ 6 m/s
125	6,9	74.0	24.8	266.0
160	10.0	121.0	36.0	434.0
200	15.9	188.4	56.5	678.0
250	25.0	294.4	90.0	1060.0
315	40.0	467.0	144.0	1682.0
400	63.5	753.6	229.0	2713.0
500	99.5	1177.0	358.0	4237.0

The actual airflow rate can be calculated as a function of differential pressure at the Halton Max MDC measurement probe and the measurement probe k factor. The proper k factor can be found in an attachment for the product.

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

- q<sub>v</sub>** Actual airflow rate [l/s]
- k** k factor of the product
- Δp<sub>m</sub>** Differential pressure of measurement probe [Pa]

The Halton Max MDC airflow management damper is 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.

## Duct pressure control

Zone pressure setpoint is set as a network variable. The static pressure setpoint range on Halton Workplace application is 40 to 200 Pa.

The actual measured static pressure can be read from the LED display of the Halton MSS static pressure measurement unit with pressure transmitter. Pressure values can be read as network variables.

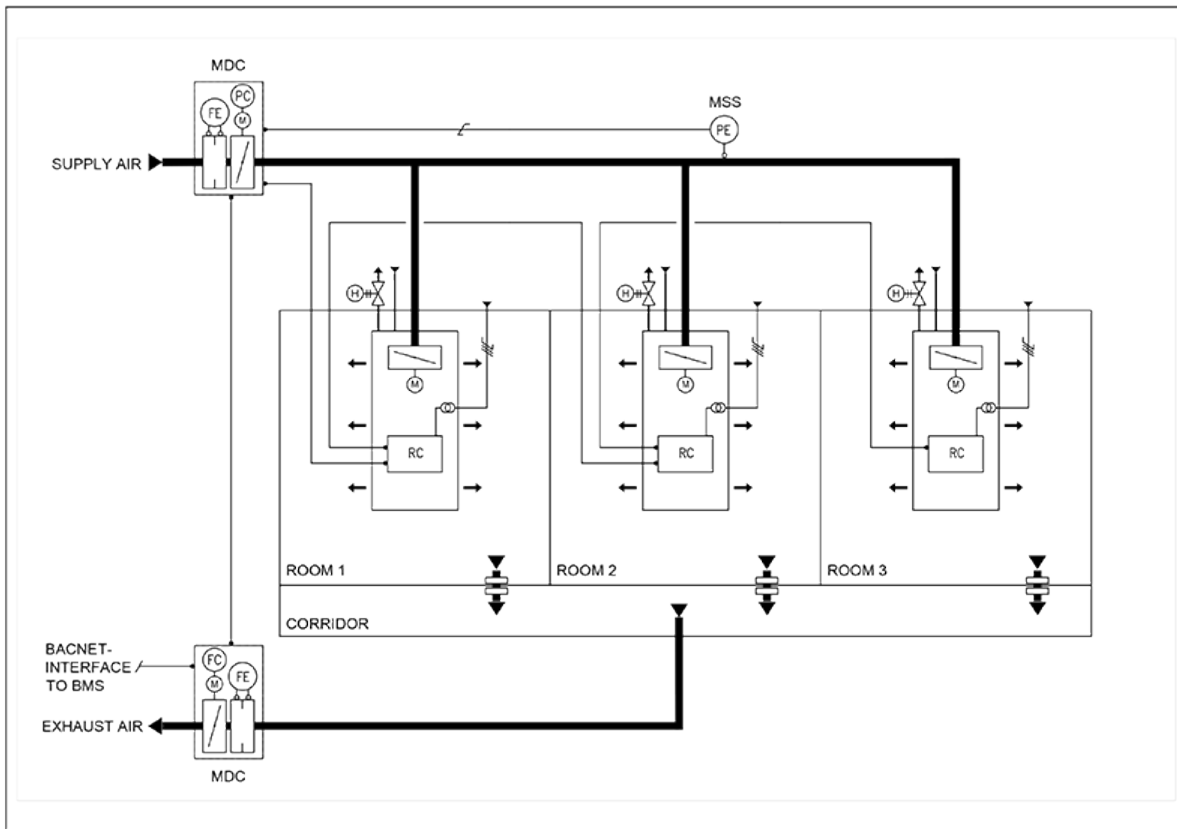
## Product selection examples

### Zone exhaust concepts

The room system options are operated by the zone VAV control damper (MDC) with constant pressure ductwork (pressure dependent) for supply air and constant velocity ductwork for exhaust air (pressure independent).

### Centralised exhaust concept

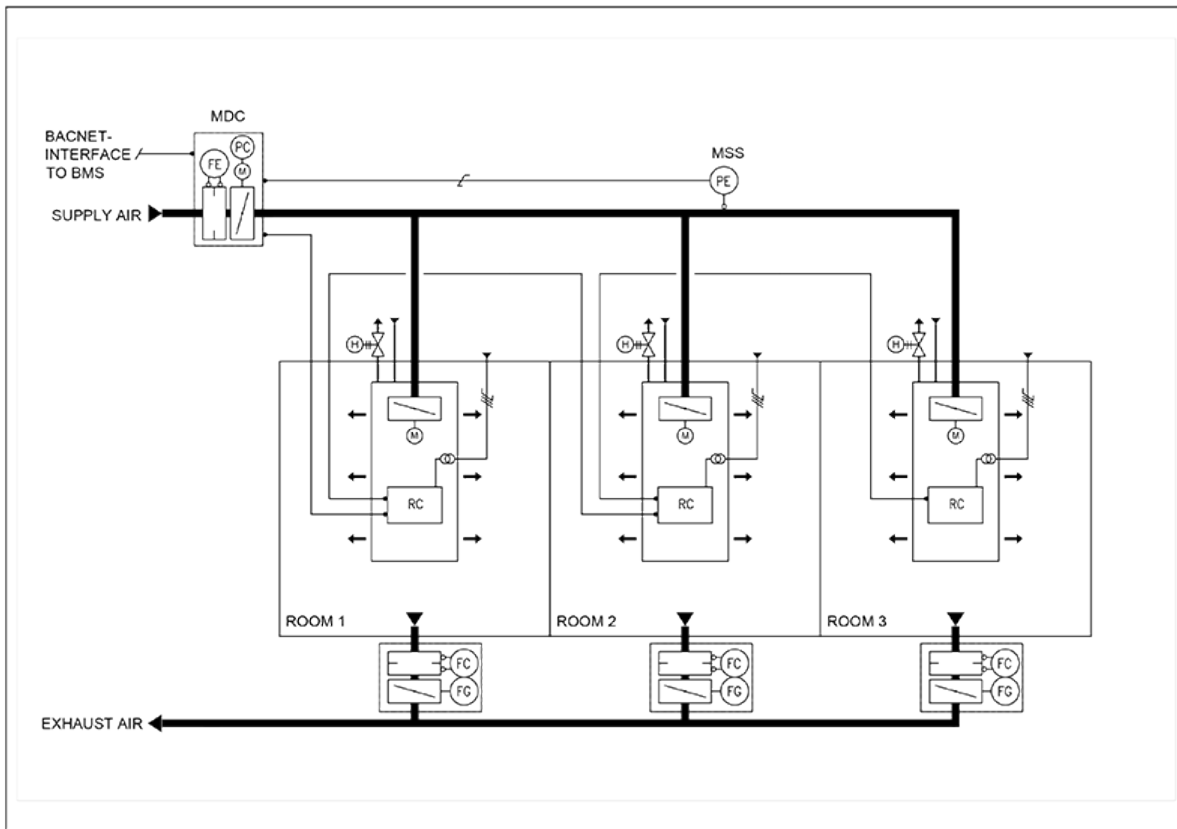
Exhaust airflows are transferred through ceiling or wall grilles towards the common exhaust unit.



## Individual room or zone exhaust concept

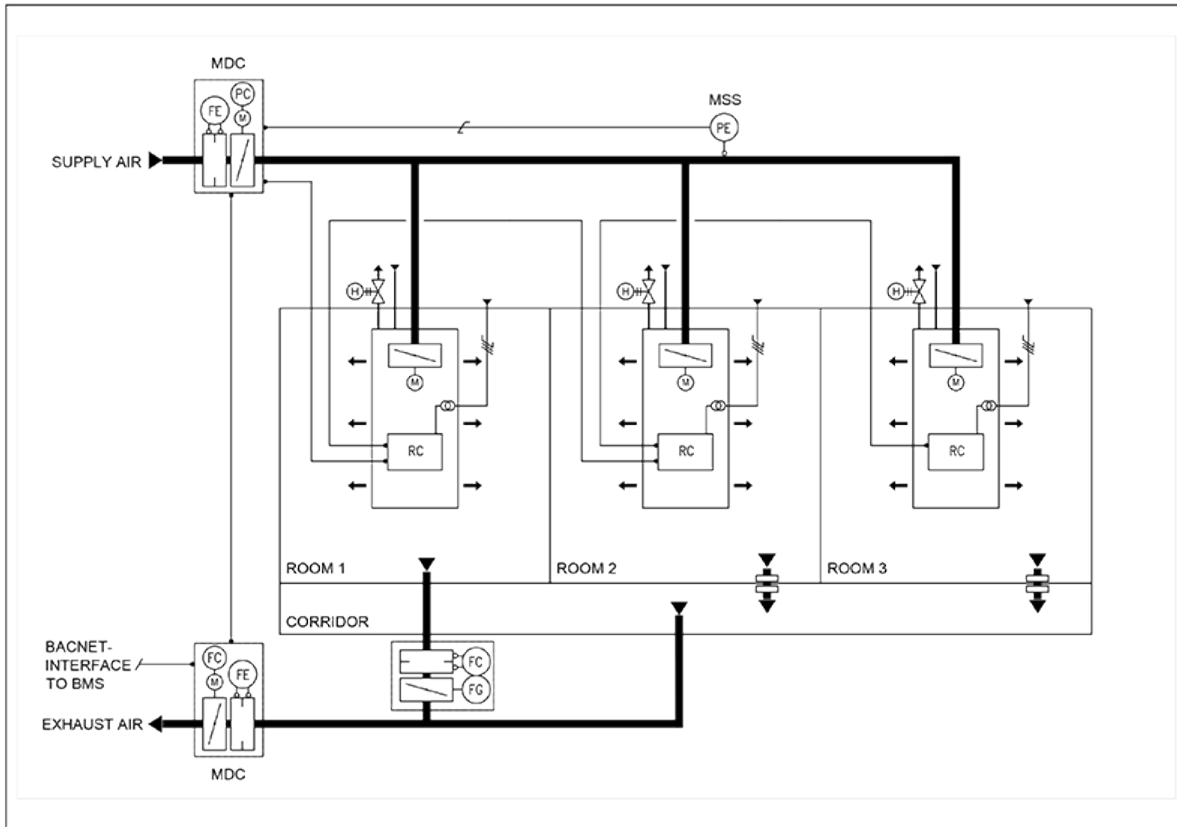
Exhaust airflows are transferred through ceiling or wall grilles directly to room branch ducts and via the main branch to the main riser duct.



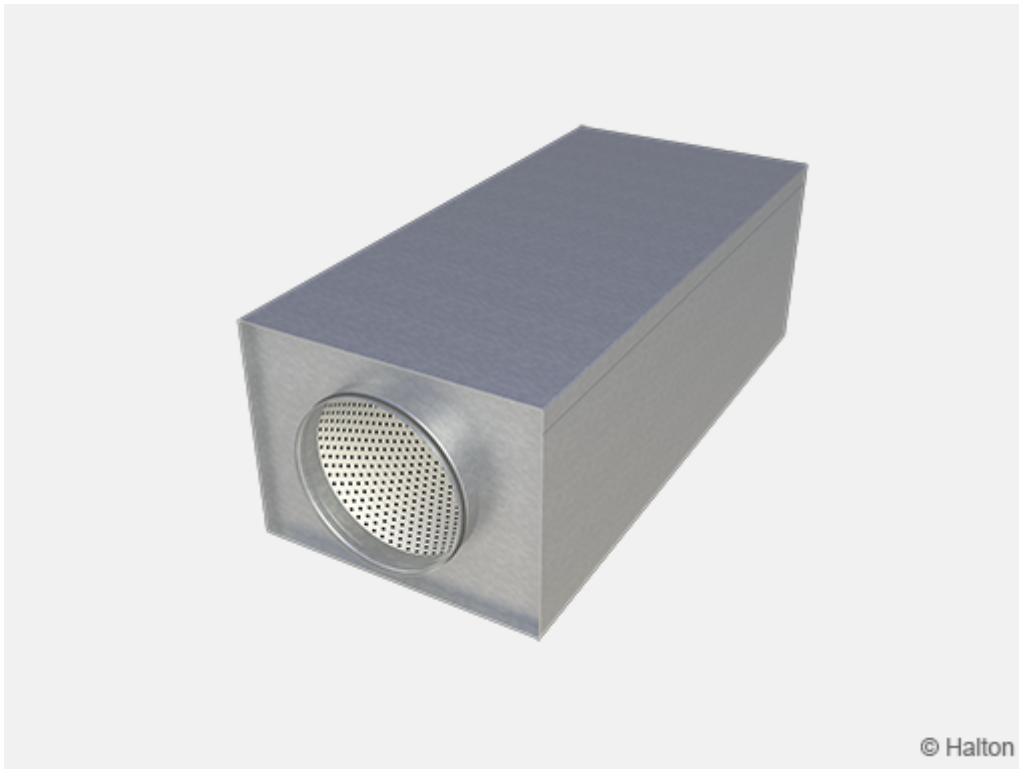


## Hybrid (mixed) exhaust concept

Some spaces are equipped with exhaust grilles or diffusers (usually meeting rooms and other separate spaces) and other spaces are transferring the air towards the common exhaust (usually open spaces and other common areas without walls)



# Sound attenuators

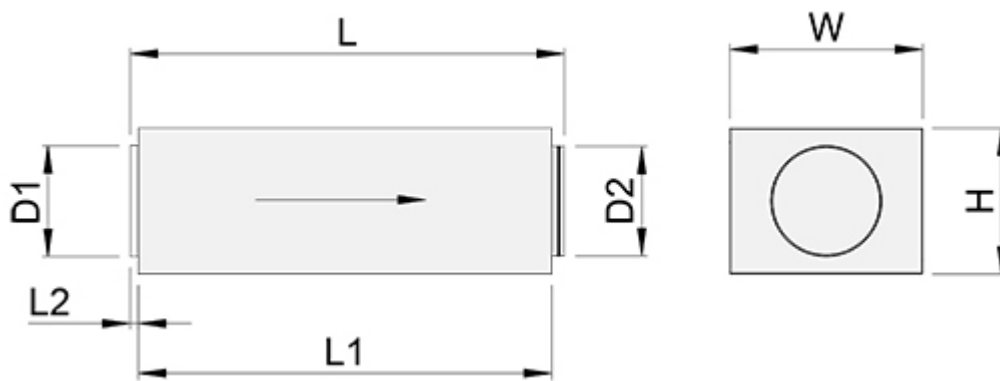


## Description

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 1250mm
- 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, class C tightness level
  - Mineral wool (MW), class C tightness level
- Available with or without access panel for maintenance 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.

D1	D2	W	H	L	L1	L2	kg
<b>H1 (MW)</b>							
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

D1	D2	W	H	L	L1	L2	kg
<b>H3 (PEF)</b>							
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

D1	D2	W	H	L	L1	L2	kg
<b>H5 (MW)</b>							
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

D1	D2	W	H	L	L1	L2	kg
<b>H7 (PEF)</b>							
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

D1	D2	W	H	L	L1	L2	kg
<b>H11 (MW)</b>							
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

D1	D2	W	H	L	L1	L2	kg
<b>H13 (PEF)</b>							
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

D1	D2	W	H	L	L1	L2	kg
<b>H15 (MW)</b>							
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

D1	D2	W	H	L	L1	L2	kg
<b>H17 (PEF)</b>							
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
<b>H2 (MW)</b>							
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

D1	D2	W	H	L	L1	L2	kg
<b>H4 (PEF)</b>							
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

D1	D2	W	H	L	L1	L2	kg
<b>H6 (MW)</b>							
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

D1	D2	W	H	L	L1	L2	kg
<b>H8 (PEF)</b>							
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

D1	D2	W	H	L	L1	L2	kg
<b>H12 (MW)</b>							
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

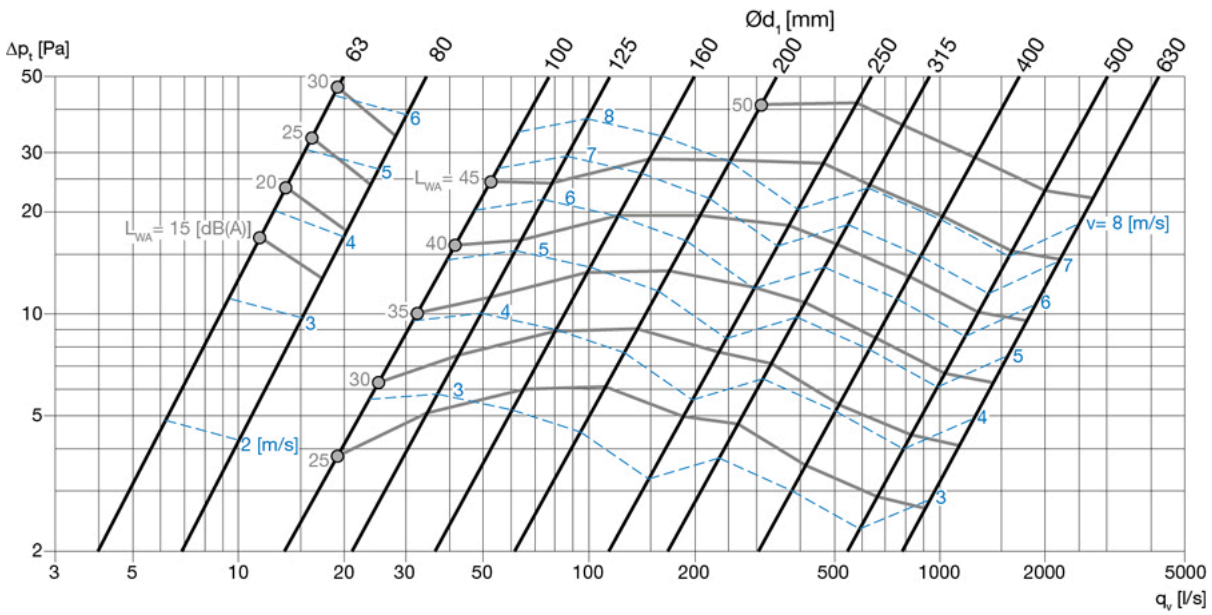
D1	D2	W	H	L	L1	L2	kg
<b>H14 (PEF)</b>							
100	100	252	154	1036	1000	22	8,9
125	125	263	177	1036	1000	22	9,5
160	160	280	212	1036	1000	22	10,1
200	200	361	253	1036	1000	22	12,3
250	250	431	303	1036	1000	32	14,6
315	315	458	368	1036	1000	32	18,0
400	400	518	453	1036	1000	57	26,4
500	500	702	555	1286	1250	57	37,4

D1	D2	W	H	L	L1	L2	kg
<b>H16 (MW)</b>							
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

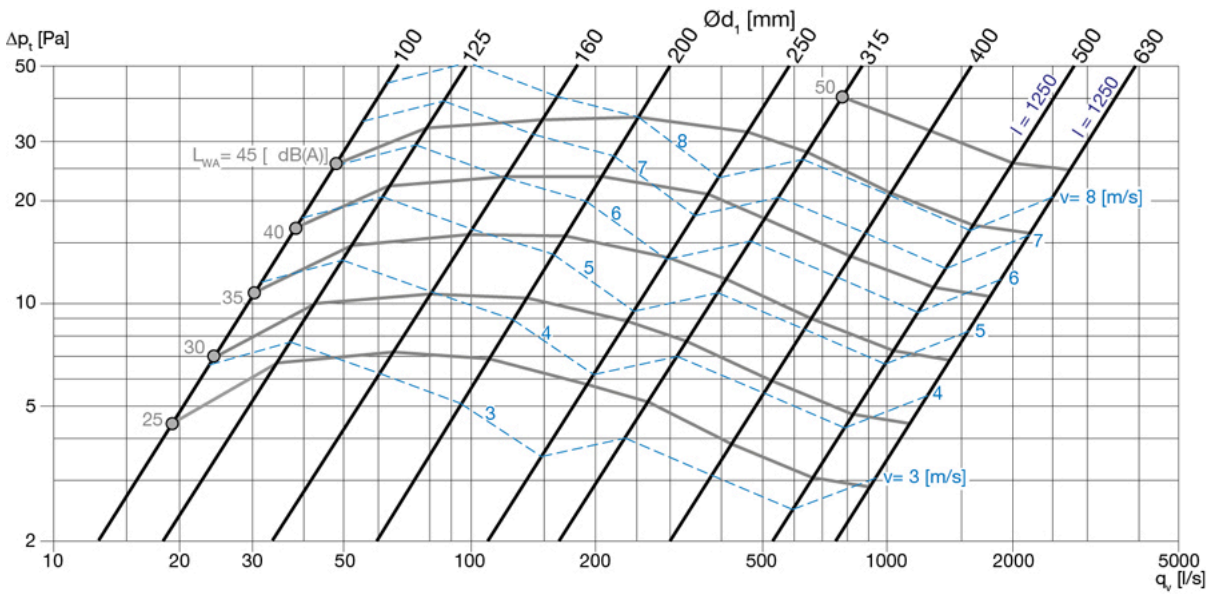
D1	D2	W	H	L	L1	L2	kg
<b>H18 (PEF)</b>							
100	125	263	177	1036	1000	22	9,5
125	160	280	212	1036	1000	22	10,1

**NOTE:** Sizes 100 and 630 are not available for Halton Max MDC.

### Examples of attenuation data



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



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

**NOTE:** For further information, contact Halton Sales.

# Order code

## MDC/S-D, MA-CU-CM-SA-ZT

### S = Model

- G Damper with blade gasket
- I Damper with blade gasket, insulation 50 mm

### D = Connection size [mm]

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

## Other options and accessories

### MA = Material

- GS Galvanised steel

### CU = Control unit

- S1 DXR2.E10PL-102B (BACnet/IP), 10 Nm

### CM = Control mode

- F1 Supply airflow control
- P1 Supply pressure control
- F2 Exhaust airflow control
- P2 Exhaust pressure control

### 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

### ZT = Tailored product

- N No
- Y Yes (ETO)

# Order code example

MDC/G-160, MA=GS, CU=S1, CM=F1, ZT=N