

# Halton Pop PDI, plenum for diffusers – 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.halton.com](http://www.halton.com).

## 1.3 Summary of changes

Release	Date	Description
1.0	09-June-2023	First release.

## 2 Product description

### 2.1 Overview



Halton Pop PDI balancing plenum for diffusers is suitable for both supply and exhaust air. By connecting the diffusers to a balancing plenum in the distribution ductwork, their performance can be significantly improved. It also attenuates noise from the ductwork.

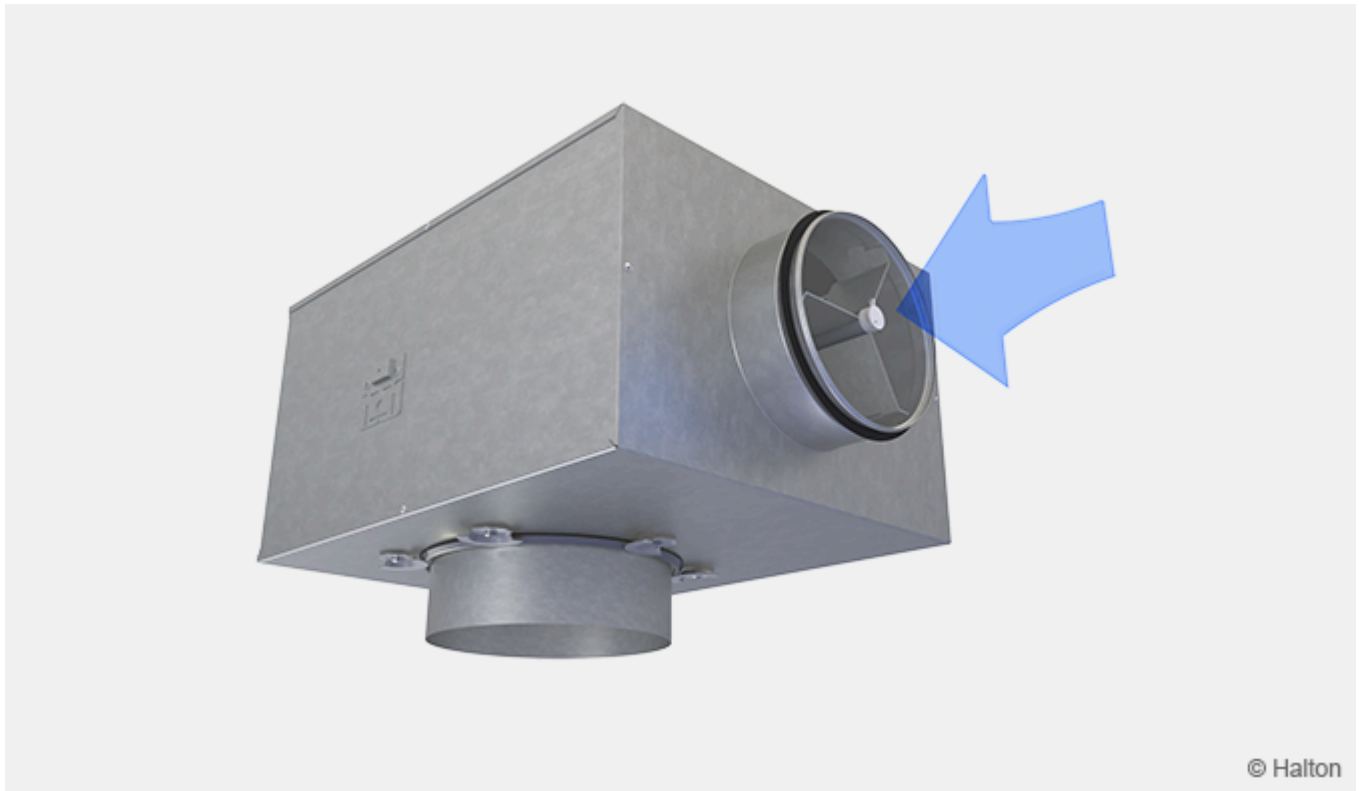
#### Application area

- To be used together with a ceiling diffuser, e.g. Halton Jaz JMC, Halton Jaz JSC, Halton Jaz JDA or Halton TRB

#### Key features

- Ensures proper function of ceiling diffusers
- Allows adjusting the airflow for supply or exhaust air with an adjustment module (MSM or MEM)
- Makes it easier to connect the diffuser to a ductwork
- Attenuates sound effectively
- Access for ductwork cleaning

## 2.2 Operating principle

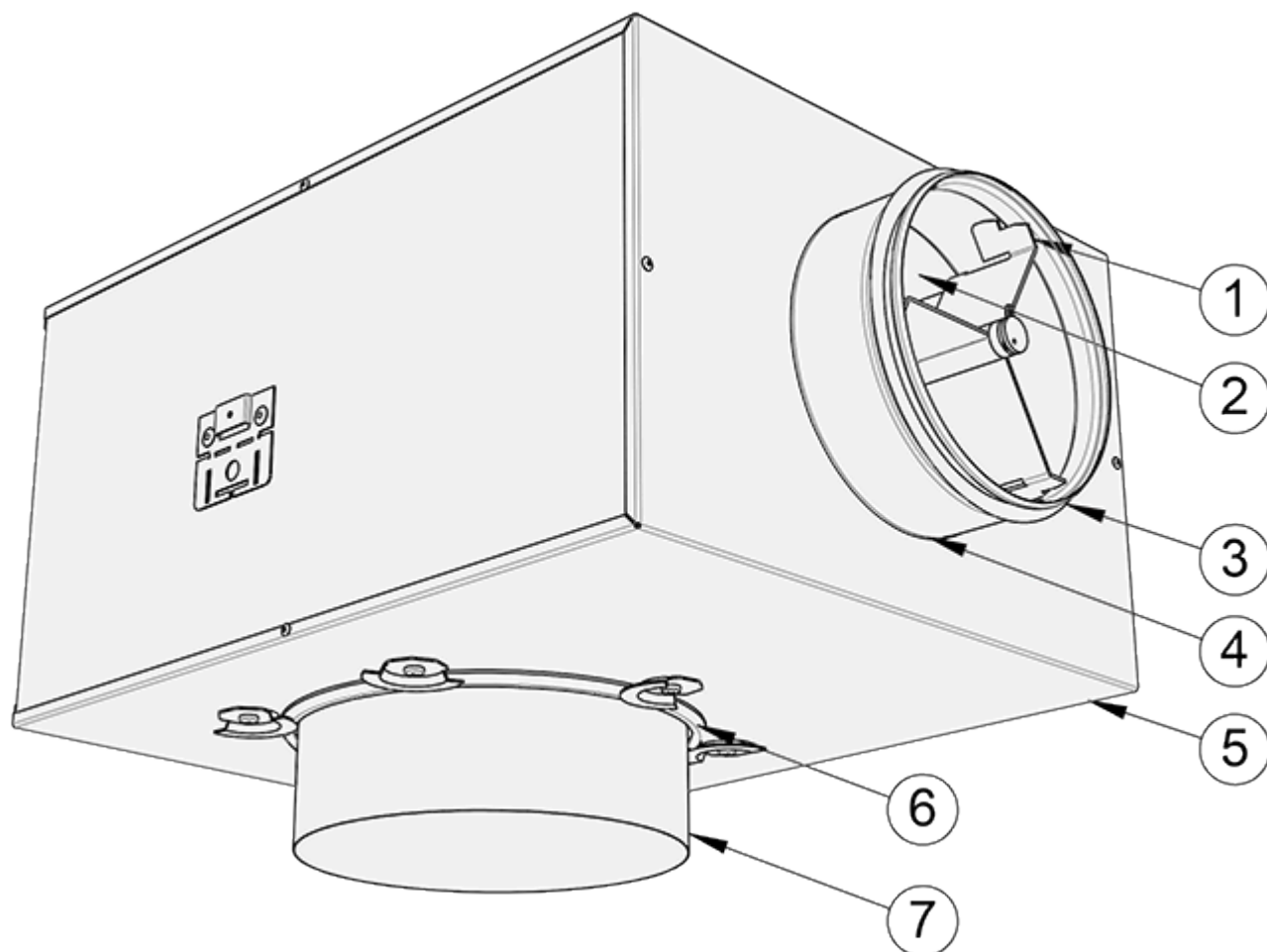


*Fig. 1. Operating principle of Halton Pop PDI.*

Halton Pop PDI balancing plenum can be used either as a supply or exhaust air unit. A range of diffusers can be connected to the distribution ductwork using the plenum, which improves their functional characteristics considerably.

Halton Pop PDI balancing plenum equalises the airflow by reducing the flow velocity and spreads the air evenly into the diffuser ensuring its proper function. The balancing plenum also attenuates the duct noise.

## 2.3 Structure and materials



No.	Part	Description
1	Measurement and adjustment module (MSM or MEM)	<ul style="list-style-type: none"> <li>▪ Body: Aluminium</li> <li>▪ Plate: Galvanised steel</li> <li>▪ Brackets: Galvanised steel</li> <li>▪ Plastic parts: Polypropylene (PP)</li> <li>▪ Spindle: Stainless steel</li> </ul>
2	Attenuation material	<ul style="list-style-type: none"> <li>▪ Polyester fibre</li> <li>▪ Mineral wool</li> </ul>
3	Duct seal gasket	Polymer
4	Duct connection spigot	Galvanised steel
5	Casing	Galvanised steel
6	Gasket	EPDM rubber
7	Diffuser connection spigot	Galvanised steel

2.4 Dimensions and weight

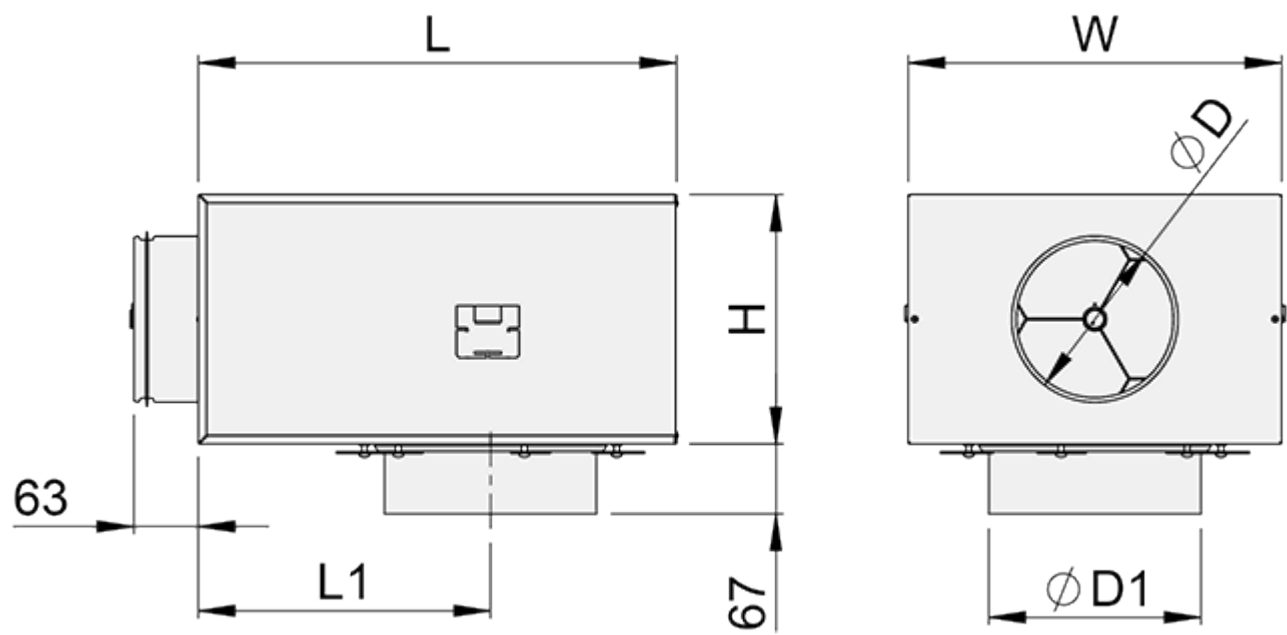


Fig. 2. Dimensions of Halton Pop PDI plenum.

PDI	ØD [mm]	ØD1 [mm]	L [mm]	W [mm]	H [mm]	L1 [mm]	Weight [kg]
100-100	99	102	308	282	172	168	2.7
100-125	99	127	308	282	172	168	2.7
125-125	124	127	308	282	172	168	2.8
125-160	124	162	308	282	172	168	2.7
160-160	159	162	459	358	239	280	5.0
160-200	159	202	459	358	239	280	4.9
200-200	199	202	459	358	239	280	5.2
200-250	199	252	459	358	239	280	4.9
250-250	249	252	520	480	359	280	8.2
250-315	249	317	520	480	359	280	8.0
315-315	314	317	520	480	359	280	8.2
315-400	314	402	520	480	359	280	8.0

## 2.5 Specification

Balancing plenum for ceiling diffusers, fulfilling the following requirements:

### Structure

- Plenum has a removable adjustment module MSM for supply or MEM for exhaust.
- In the supply application, it is possible to measure and adjust the airflow with an MSM module.
- Diffuser connection spigot can be set to an outside or inside position to help the installation work.
- Inlet duct diameter 100, 125, 160, 200, 250 or 315 mm.
- Diffuser connection diameter 100, 125, 160, 200, 250, 315 or 400 mm.

### Materials

- Plenum manufactured from galvanised steel.
- Connection spigot manufactured from galvanised steel.
- Connection spigot equipped with fixed gasket.
- Attenuation material made of polyester fibre or mineral wool.
- No harmful materials are released from the attenuation material.

### Packaging

- The product is packed on a wooden pallet.



## 2.6 Order code

PDI/M-D-E; AC-ZT

Main options	
M = Model	
S	Supply (MSM adjuster)
E	Exhaust (MEM adjuster)
N	No adjustment module
D = Plenum duct connection size (mm)	100, 125, 160, 200, 250, 315
E = Diffuser connection size (mm)	100, 125, 160, 200, 250, 315, 400

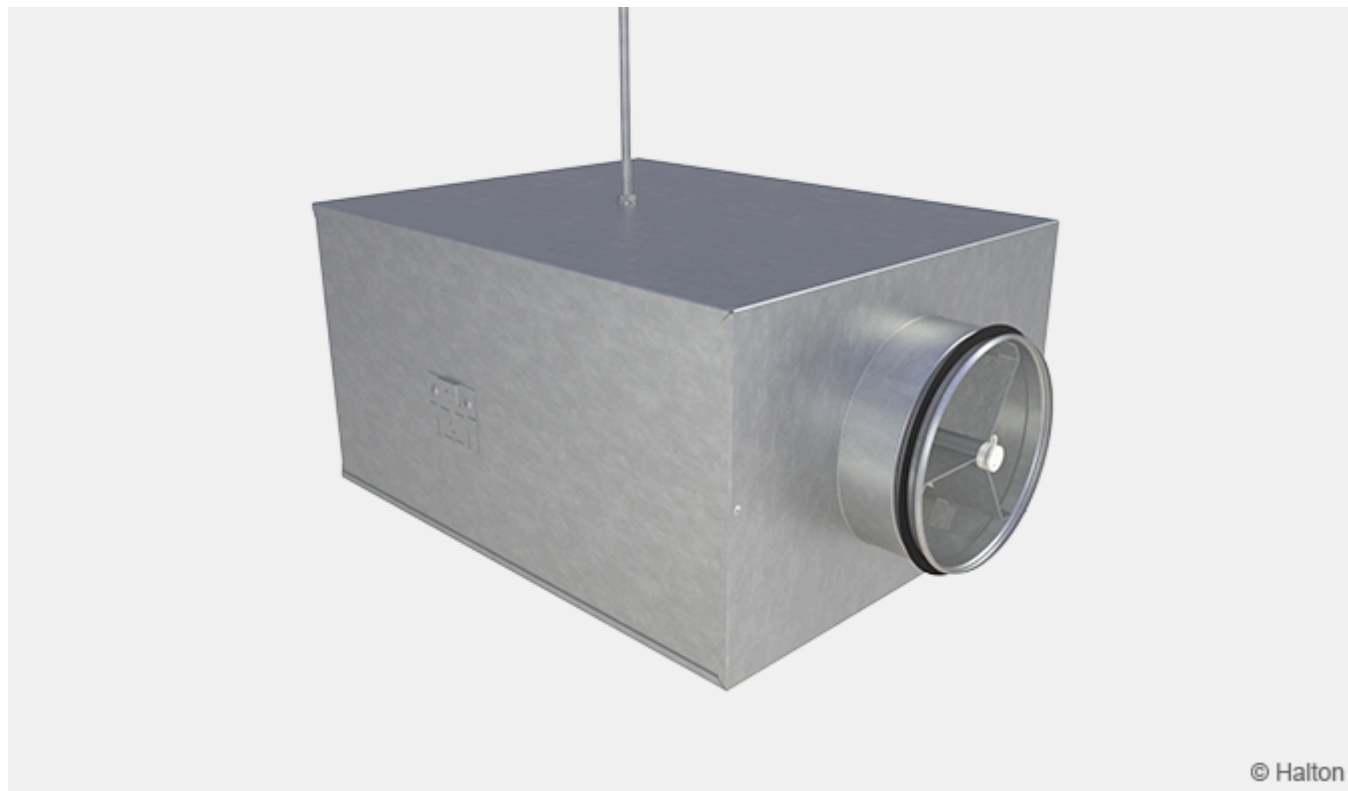
Other options and accessories	
AT = Sound attenuation material	
P	Polyester fibre
W	Mineral wool
NA	Not assigned
ZT = Tailored product	
N	No
Y	Yes (ETO)

Order code example for PDI	
	PDI/S-125-160; AT=P, ZT=N

## 3 Design information

### 3.1 Design considerations

#### 3.1.1 Installation



*Fig. 3. Installation of Halton Pop PDI from the top.*



*Fig. 4. Installation of Halton Pop PDI from the sides.*

Halton Pop PDI plenum can be installed using two strips or with M8 drop rods (not included into delivery). There are three possible fixing points in the plenum, shown in *Fig. 3* and *Fig. 4*.

The plenum is connected to the distribution ductwork with a spigot equipped with an integrated gasket.

The diffuser connection spigot is turnable, which allows to connect the diffuser in two different ways:

- Connection spigot positioned outwards (as in *Fig. 4*.)
- Connection spigot positioned inwards, which reduces the height of the diffuser-plenum combination.

The connection spigot is detached by loosening the bracket screws, after which it can be turned to another position.

### 3.1.2 Commissioning



Fig. 5. Adjustment of airflow.

#### Airflow control

The supply airflow rate is determined by using the measurement and adjustment module MSM. In case of exhaust air, the use of the adjustment module MEM is recommended. It is not possible to measure the exhaust airflow rate with the adjustment module MEM.

Pass the tubes and control spindle through the diffuser and close the front panel (if applicable). Measure the differential pressure with a manometer. The flow rate is calculated using the formula below:

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

where

- $q_v$  = Airflow rate [l/s] or [m<sup>3</sup>/h]
- $\Delta p_m$  = Measured pressure [Pa]
- $k$  = k factor given as a function of mounting and diameter (see the table below)

Adjust the airflow rate by rotating the control spindle until the desired airflow rate (pressure difference) is achieved.

Set the tubes and spindle back into the plenum. The damper position can be locked with a knurled head screw of the adjuster.

Duct connection (PDI)	k factor of MSM adjuster, opening > 0, [l/s]	
	> 8D	Min. 3D
100	5.7	7.5
125	9.6	12.6
160	16.4	21.9
200	26.3	31.0
250	47.1	51.5
315	78.8	-

Duct connection (PDI)	k factor of MSM adjuster, opening > 0, [m <sup>3</sup> /h]	
	>8D	Min. 3D
100	20.6	27.0
125	34.4	45.4
160	59.0	78.8
200	94.8	111.6
250	169.5	185.4
315	283.6	-

### 3.1.3 Maintenance

Open or detach the diffuser. Detach the measurement and adjustment module by pulling gently from the casing (not from the control spindle or measurement tubes).

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

The measurement and adjustment module is remounted by pushing the body until it meets the stopper.

The sound attenuation material within the plenum can also be removed to enable cleaning of the inner side of the plenum. Close or replace the diffuser after cleaning.