# Halton Jaz JDS – Variable air volume diffuser unit (VAV)

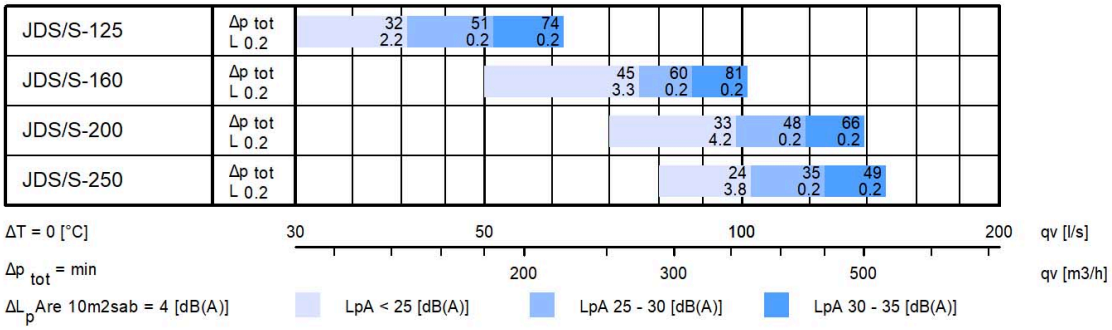

## Overview

- Stable throw length with variable air flow rates for enabling draught free air distribution
- Installation for suspended ceiling
- Designed for systems with constant static pressure ductwork system
- Integrated balancing plenum with measurement and adjustment functions
- Effective sound attenuation

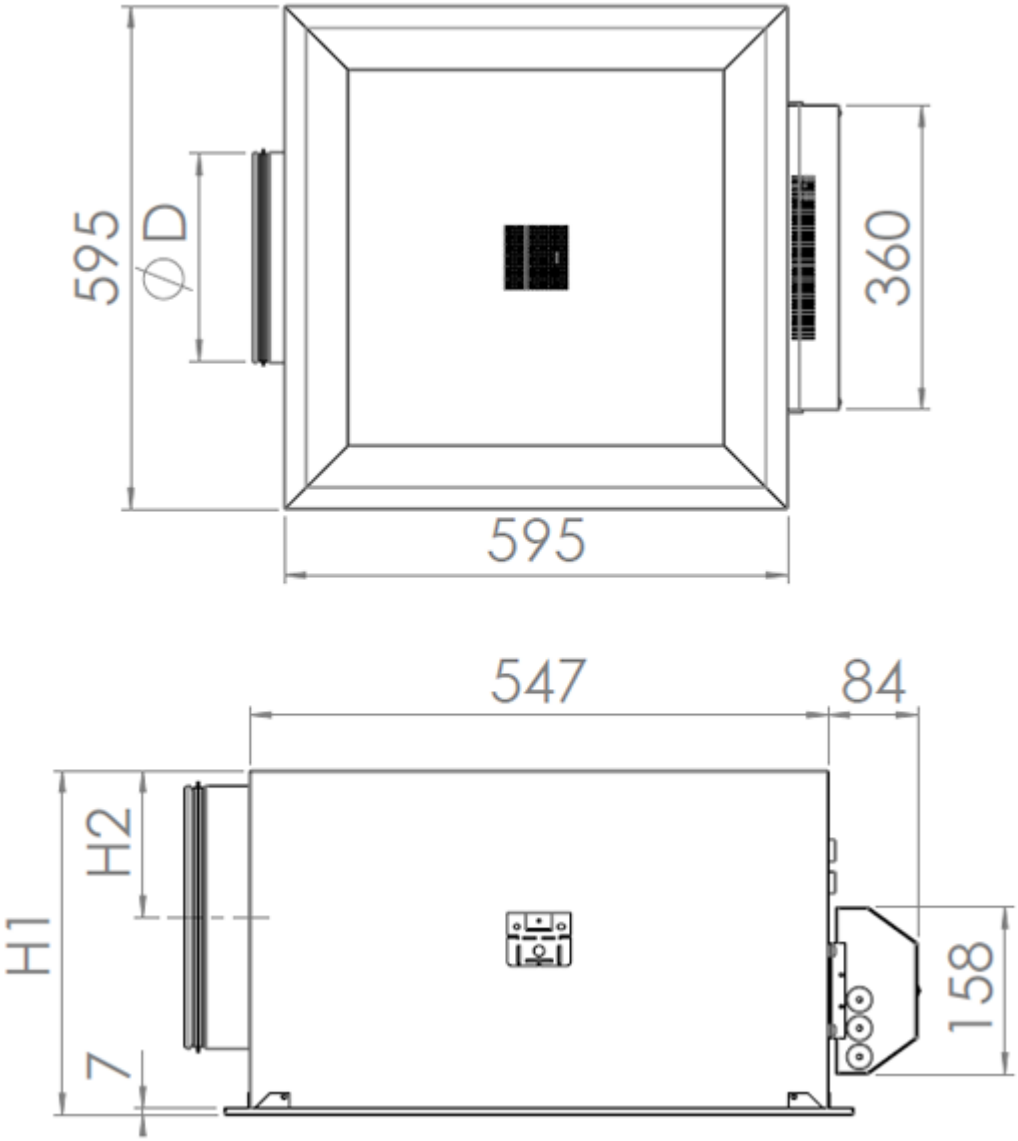
## Applications

- Available for Halton Workplace applications

# Quick selection




# Dimensions

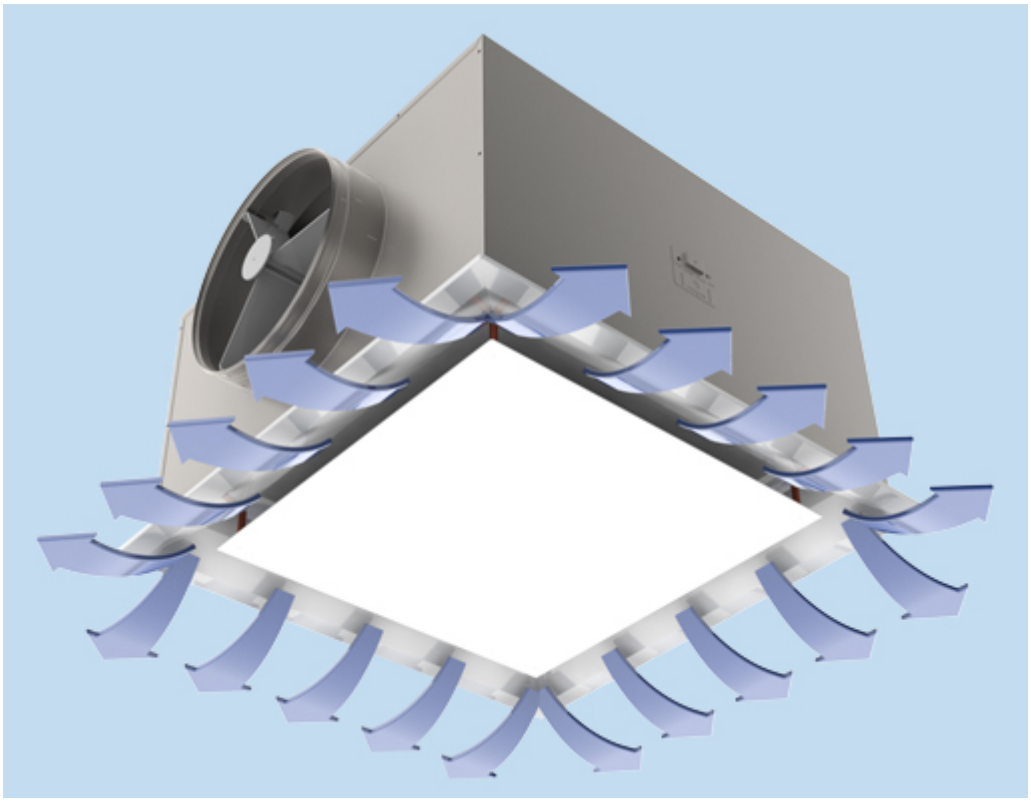


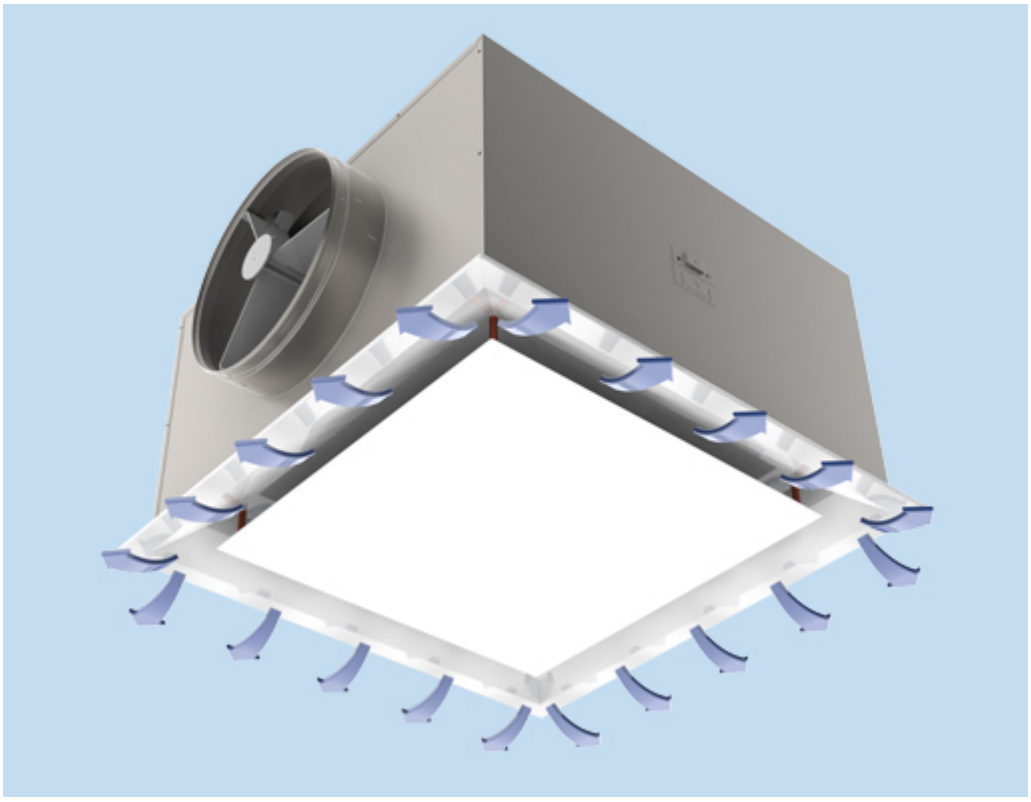
| NS | Ø D | H1 | H2 |
|---|---|---|---|
| 125 | 124 | 276 | 114 |
| 160 | 159 | 276 | 114 |
| 200 | 199 | 326 | 139 |
| 250 | 249 | 326 | 139 |

# Material

| Part | Material | Finishing | Note |
|---|---|---|---|
| Diffuser plate | Steel | Powder painted, white (RAL 9003) | Special colours available |
| Front panel | Steel | Powder painted, white (RAL 9003) | Special colours available |
| Control cone | Steel | Powder painted, black | – |
| Gasket | Rubber compound | – | – |
| Plenum casing | Galvanised steel | – | – |
| Control box | Galvanised steel | – | – |
| Attenuation material | Polyester fiber | – | – |
| Spigot with gasket | Galvanised steel | – | Gasket of rubber compound |
| Measurement and adjustment module (MSM) | **Body:** aluminium **Plate:** galvanised steel **Brackets:** galvanised steel **Plastic parts:** polypropylene (PP) **Spindle:** stainless steel | – | – |

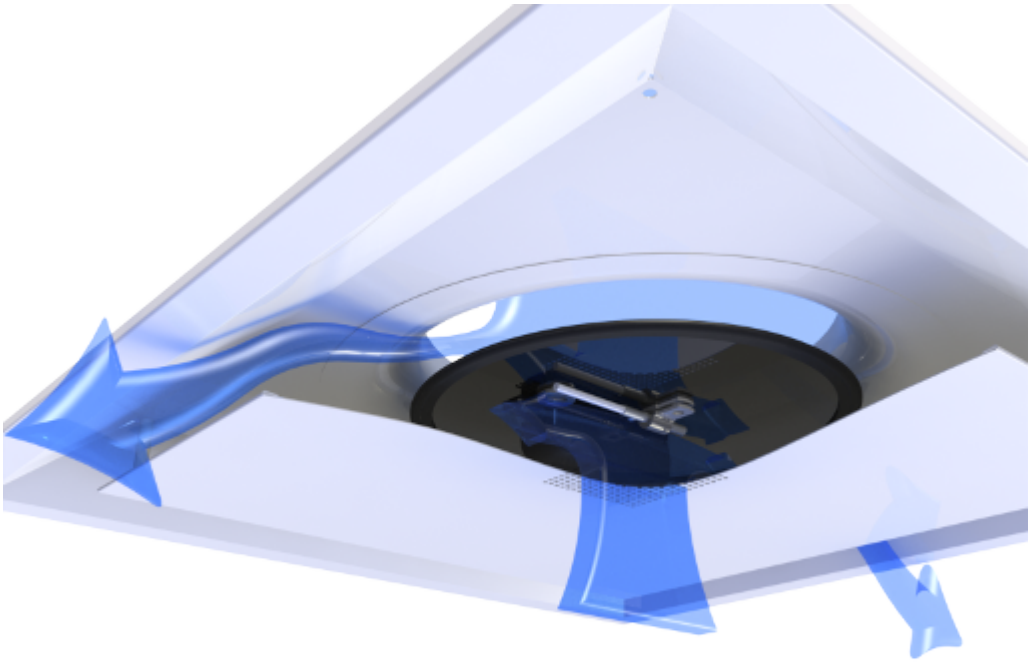
# Function





The Halton Jaz Conical VAV is an active ceiling diffuser for supply air in variable conditions.

Air is supplied horizontally to the room space mainly through the slots of the diffuser.



The room air will circulate through the perforation in the front panel to the sensors located inside the diffuser.

The unit maintains a nearly constant outlet air velocity between the minimum and maximum airflow rates, create comfortable conditions and low residual air velocities in the occupied zone. Room conditions can be guaranteed without a risk of draughts, at both the maximum and minimum airflow rate.

Recommended maximum air temperature difference between supply and room air is 12 ° C.

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

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

Exhaust diffuser do not include any airflow control function, will need a separate flow control damper (like Halton HFB).

# System package

## Halton Workplace WRA room automation system package for Halton Jaz Conical VAV (JDS) diffuser

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

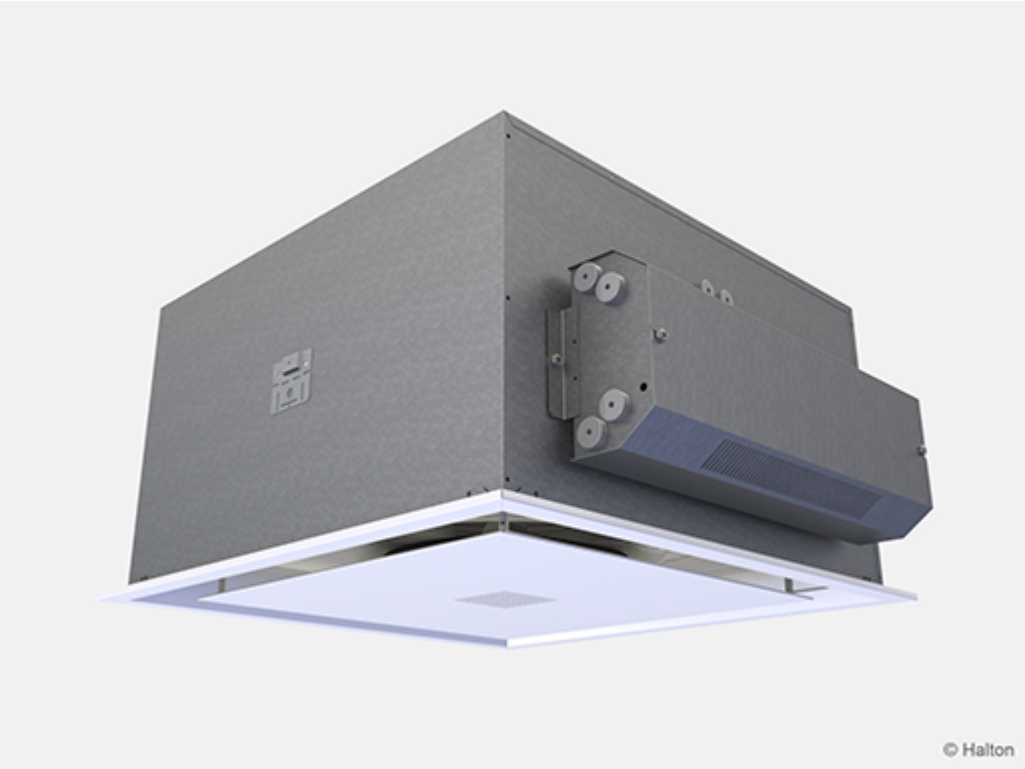



***Fig.1.*** *Halton Workplace WRA room automation controller integrated to Halton Jaz Conical VAV diffuser*

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 diffusers

- Halton Max MDC zone control damper
- 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 Conical VAV (JDS) active diffusers controlled with Halton Workplace WRA room automation controllers

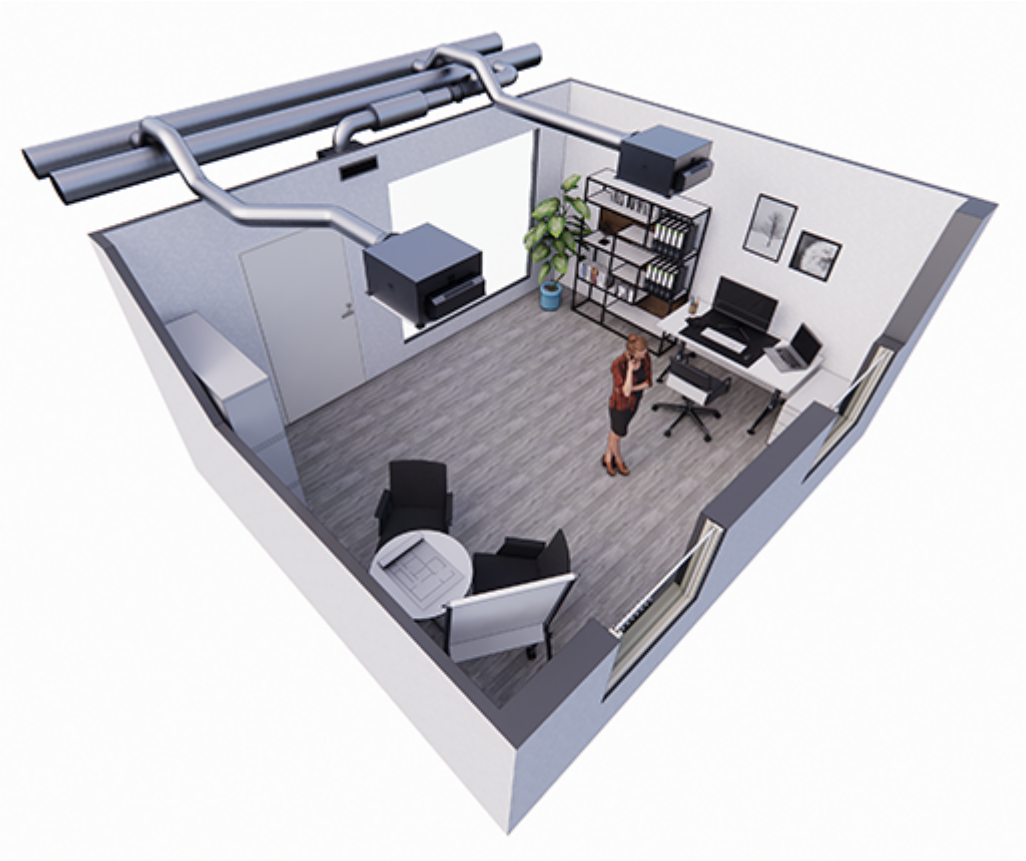


*Fig.15. Two Halton Jaz Conical VAV (JDS) active diffusers controlled with Halton Workplace WRA room automation controllers in a single office room*

## Room automation description

In this configuration, two Halton Workplace WRA room automation controllers (type DXR2.E12P-102A) control two Halton Jaz Conical VAV active diffusers. Each active diffuser has integrated temperature, $CO_2$, and occupancy sensors. The pressure sensor is integrated into the Halton Workplace WRA room automation controller. 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 terminal units, and there can be several Halton Workplace WRA room automation controllers in the room.

## Design criteria for room automation

- Active diffuser has integrated balancing plenum with measurement and adjustment functions
- Active diffuser has integrated $CO_2$, occupancy, and temperature sensors
- Pressure sensor integrated into Halton Workplace WRA room automation controller

- Radiator heating water valve control
- Exhaust airflow control

## Schematic drawing

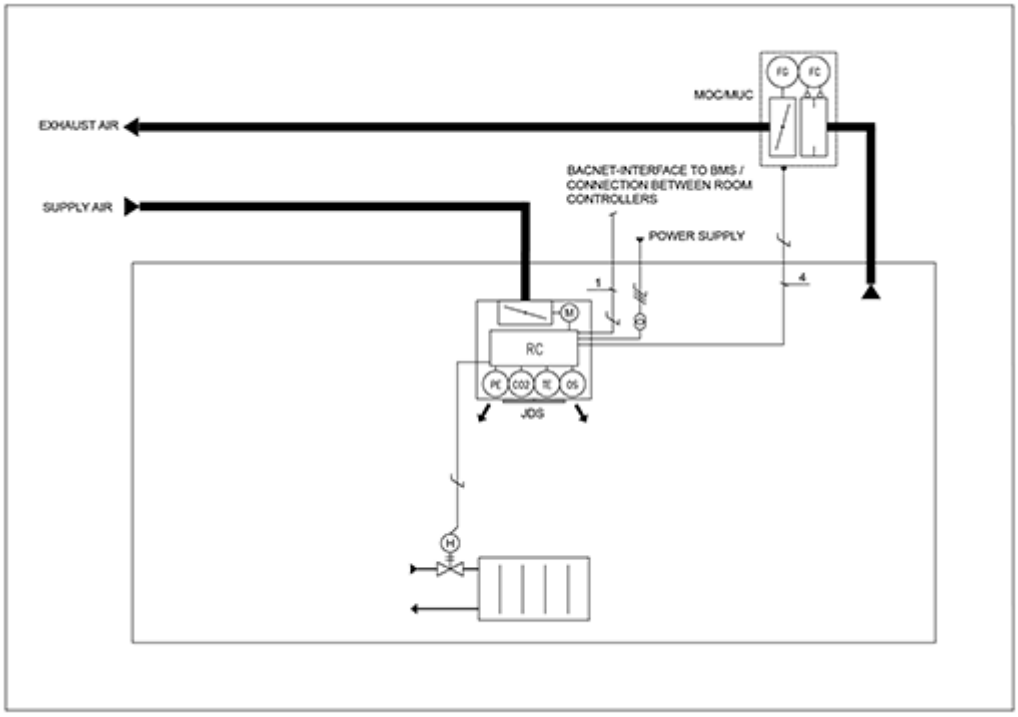



*Fig.16. Schematic drawing: Halton Jaz Conical VAV active diffuser controlled with Halton Workplace WRA room automation controller*

**Equipment list**

| Code | Equipment |
|---|---|
| RC | Controller unit |
| FG | Airflow damper actuator |
| FC | Airflow measurement |
| H | Water valve actuator |
| OS | Occupancy sensor |
| PE | Pressure sensor |
| CO2 | $CO_2$ sensor |
| TE | Temperature sensor |

### Wiring diagram

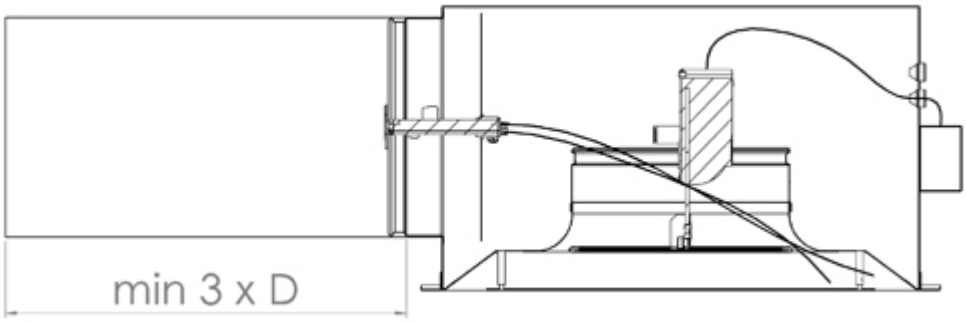
For the wiring diagram of similar configuration, see the product pages of the Halton Workplace WRA room automation controller.

### Components and order code examples for the system

- 2 x Active diffuser: Halton Jaz Conical VAV
  – JDS/S-125 CO=SW, IO=NA, RC=NA, SE=SA2, ED=N, CP=NA, ZT=N
- 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 Ultra Circular or Halton Max One Circular
  – MUC/G-160, MA=CS
- Automation package: 2 x Halton Workplace WRA room automation controller unit with related components
  – WRA/JDS-E21-JD-EX4, WP=NA, LC=NA, SE=NA, SW=NA, ST=IA, SL=OI, PM=P2, TC=NA, CV=NA, RV=RA, ZT=N

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

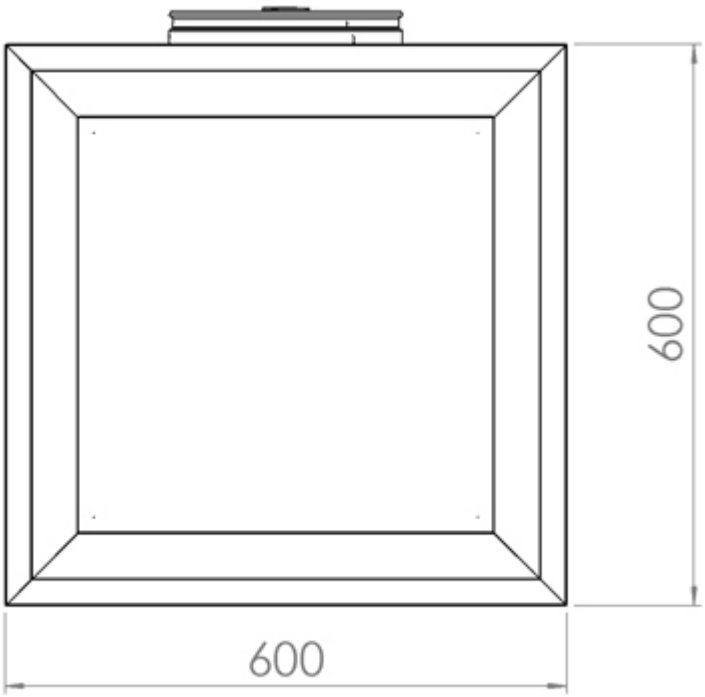
# Installation

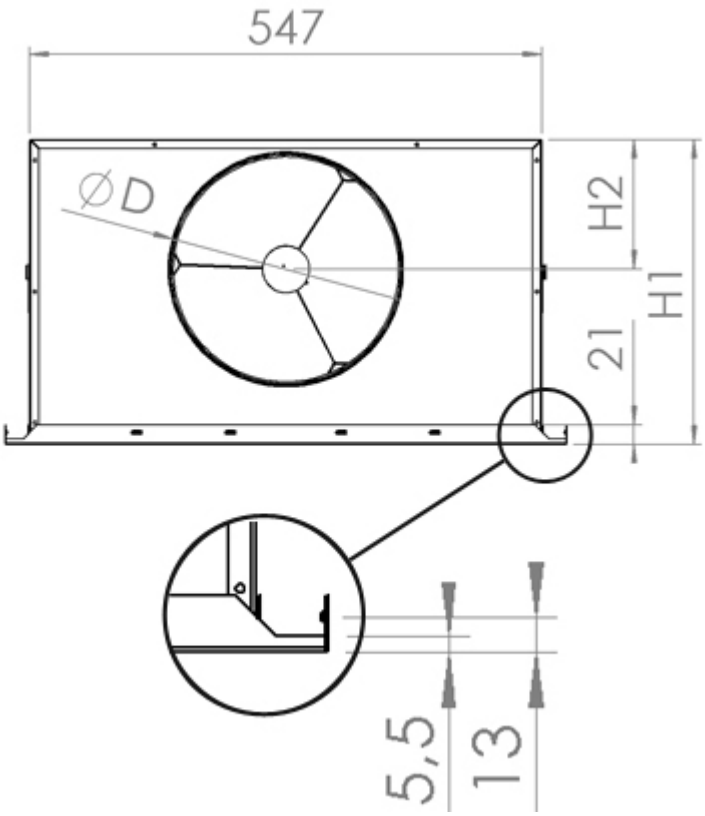


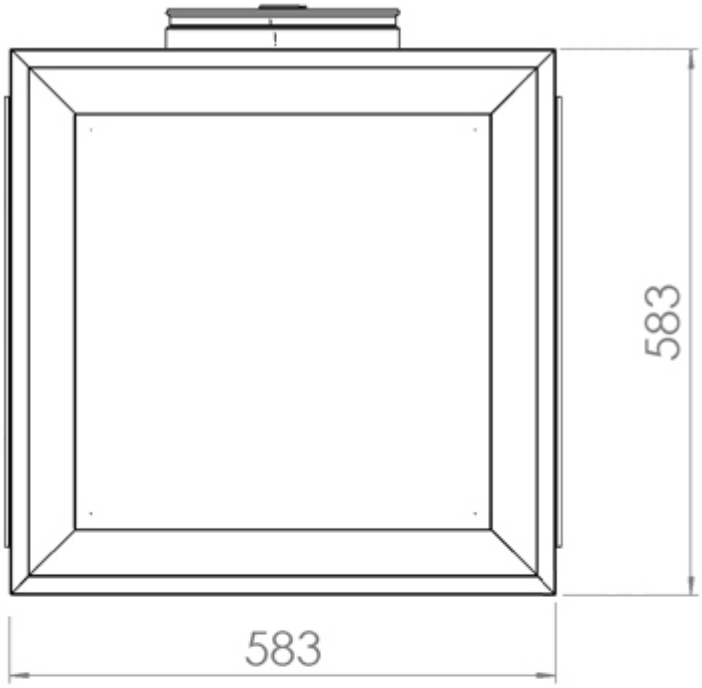

The Halton Jaz Conical VAV active diffuser shall have a minimum safety distance of 3 x duct dimension to ensure reliable measurement and accurate control of the airflow rate.

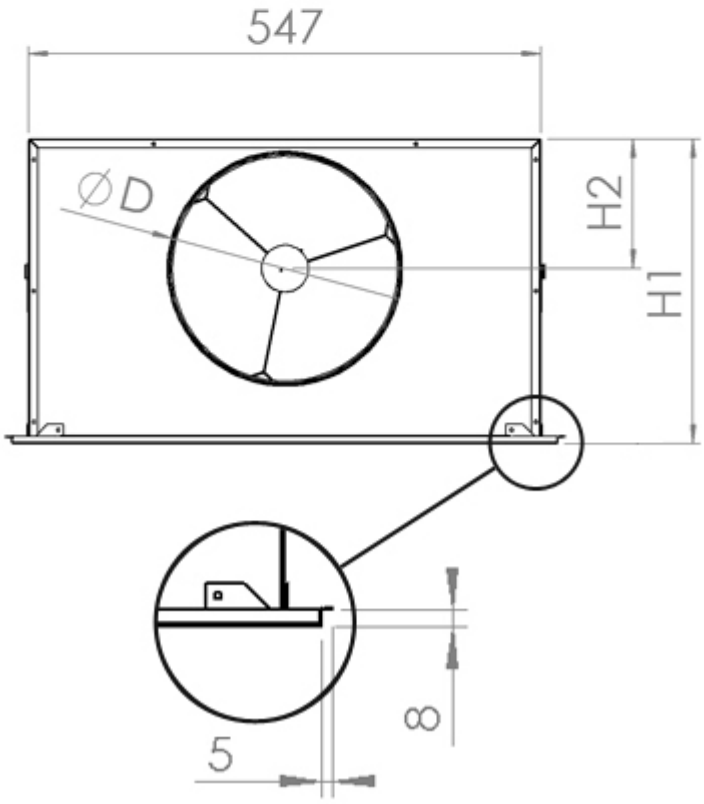
Hang the diffuser by using the brackets located on two sides of the plenum.

# Alternatively ceiling integrations






**Clip-in ceilings**

**Fineline-15 ceilings**

| NS | ØD | H1 | H2 |
|---|---|---|---|
| 125 | 124 | 276 | 114 |
| 160 | 159 | 276 | 114 |
| 200 | 199 | 326 | 139 |
| 250 | 249 | 326 | 139 |

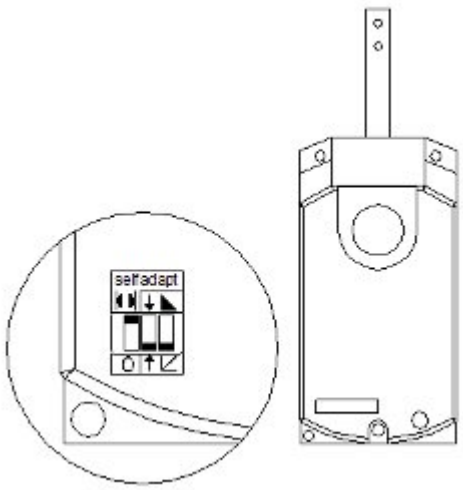
# Controls

The Halton Workplace WRA controller is a room controller dedicated to complete room applications providing the demand-controlled ventilation.

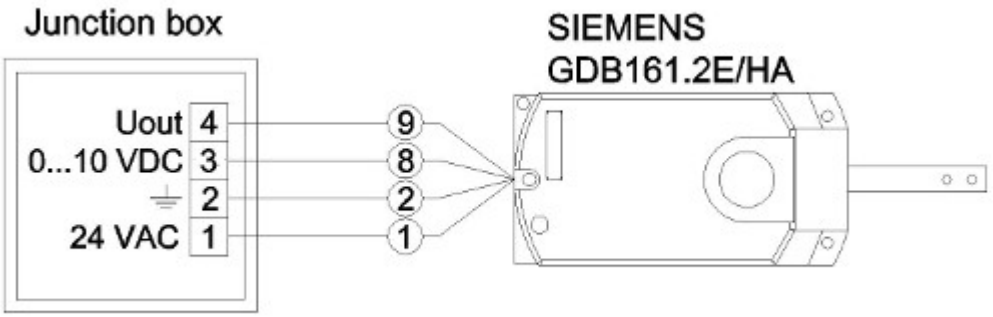
- Halton Jaz Conical VAV diffuser integrated with room controller
- Room air temperature measurement to control space temperature
- Occupancy sensor for demand based operation located outside of the diffuser (separate ceiling installation)
- Air quality control with carbon dioxide sensor ($CO_{2)}$

The Halton Workplace WRA room controller provides a wide variety of connections for sensors and actuators and the possibility to connect a wall mounted panel with or without a display for local set points adjustment e.g. temperature, and a wireless remote control.

# Wiring

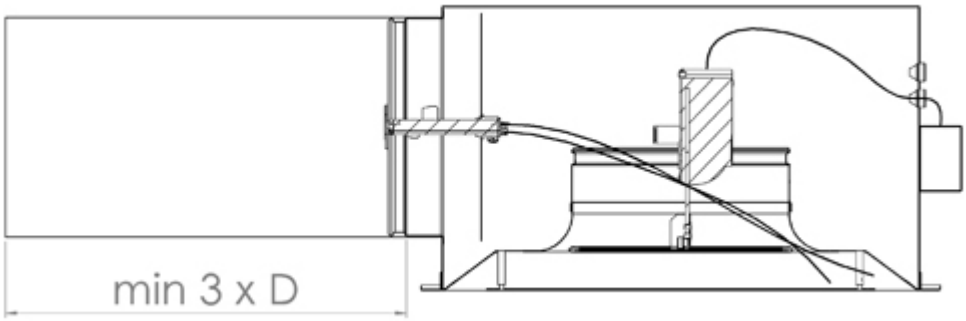



Control that the actuator settings are in line with the factory pre-setted DIL switches.




**Control signals in junction box:**
Terminal 1 Power supply 24 VAV
Terminal 2 Ground
Terminal 3 0 VDC = minimum position airflow
10 VDC = maximum position/airflow
Terminal 4 Not connected (feedback form actuator)

# Commissioning




Make sure that the control plate of diffuser is fully open (at the lowest position). This can be done either mechanically or electrically:

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

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

If the duct zone pressure is too low and the zone pressure control damper is fully open, you should either adjust the supply fan pressure set point to be higher or adjust the MSM adjustment unit.

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

# Adjustment

The maximum airflow rate of the active diffuser is measured and adjusted using the MSM module.

Airflow rate is calculated using the pressure difference reading and the k factor.

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

**qv** Calculated airflow rate (l/s)
**k** Factor from the table
**$\Delta p_m$** Measured pressure (Pa)

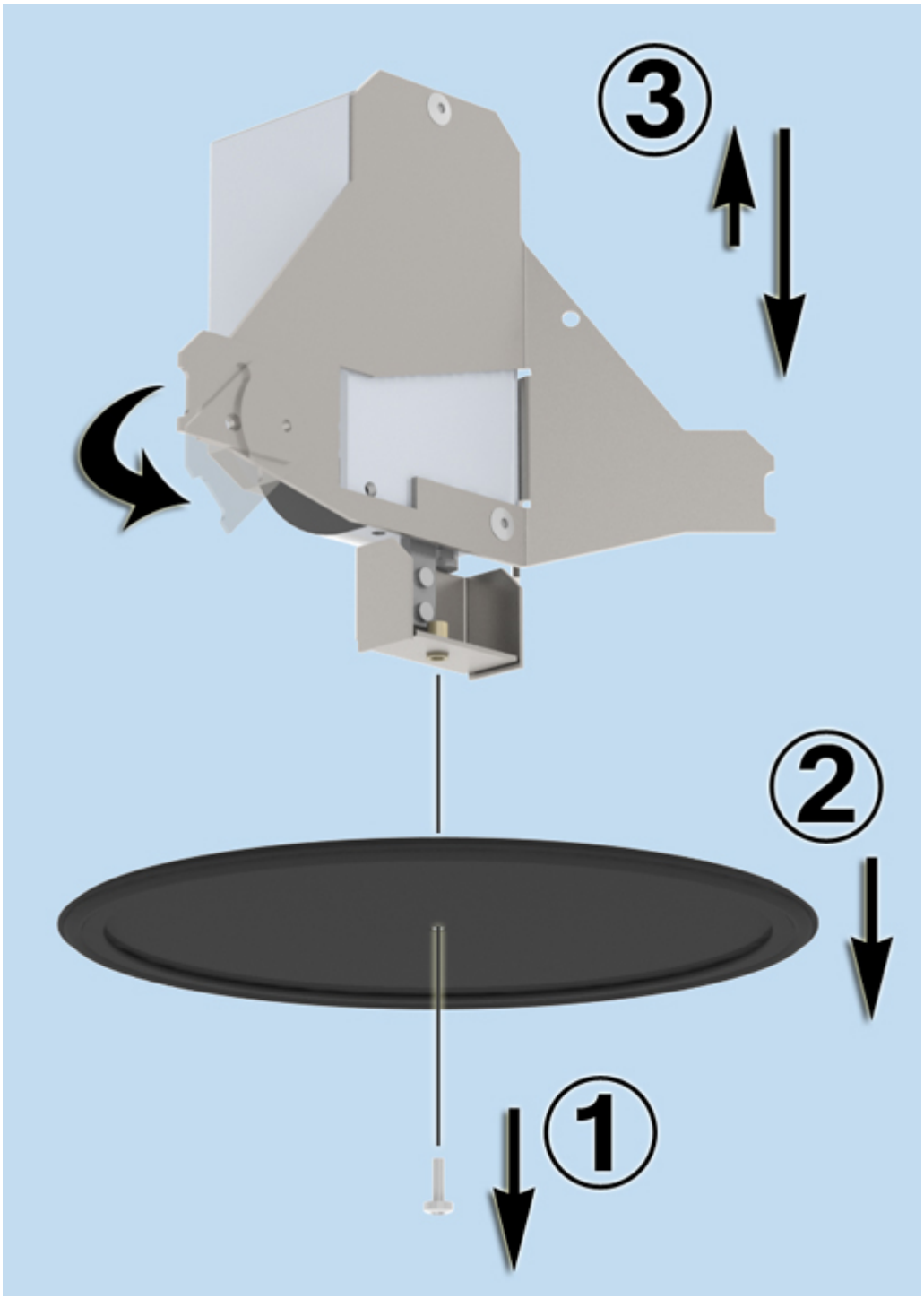
**The k-factors for installation with different safety distances**
(D = duct diameter).

| NS | > 8 * D | min 3 * D |
|---|---|---|
| 125 | 9,5 | 12,6 |
| 160 | 18,0 | 22,2 |
| 200 | 28,6 | 32,9 |
| 250 | 44,6 | 46,0 |

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

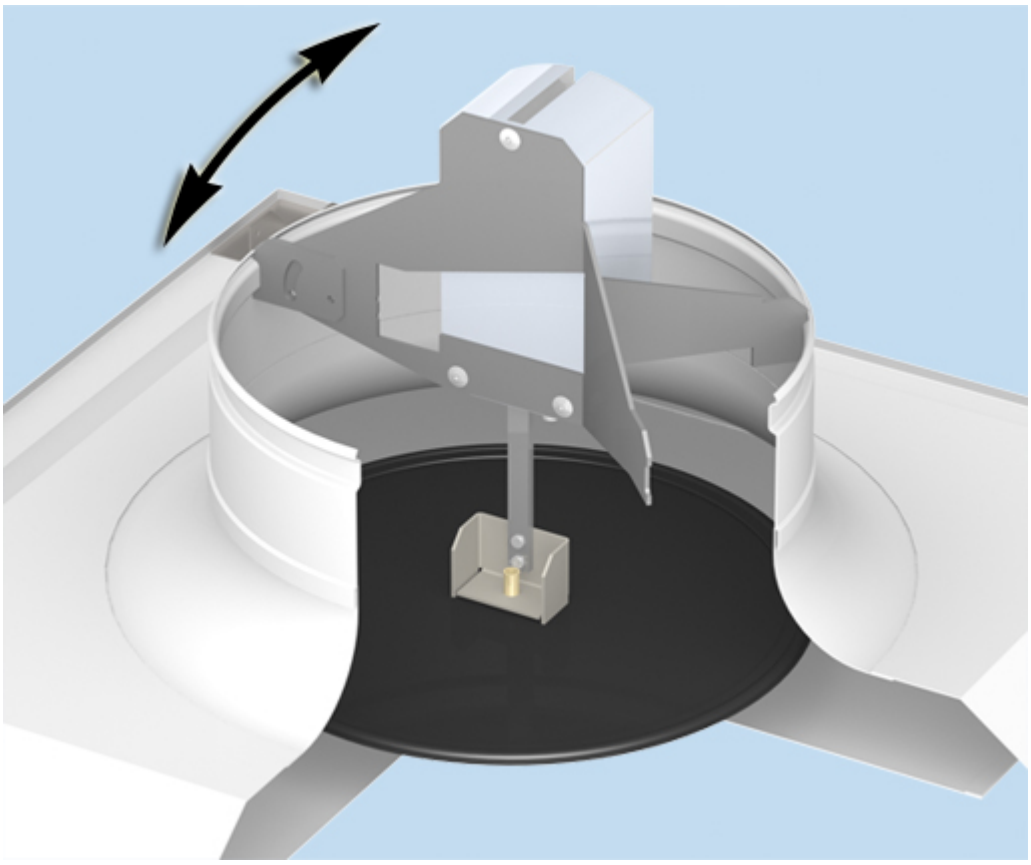
The minimum airflow for the diffuser is fixed by factory and cannot be adjusted.

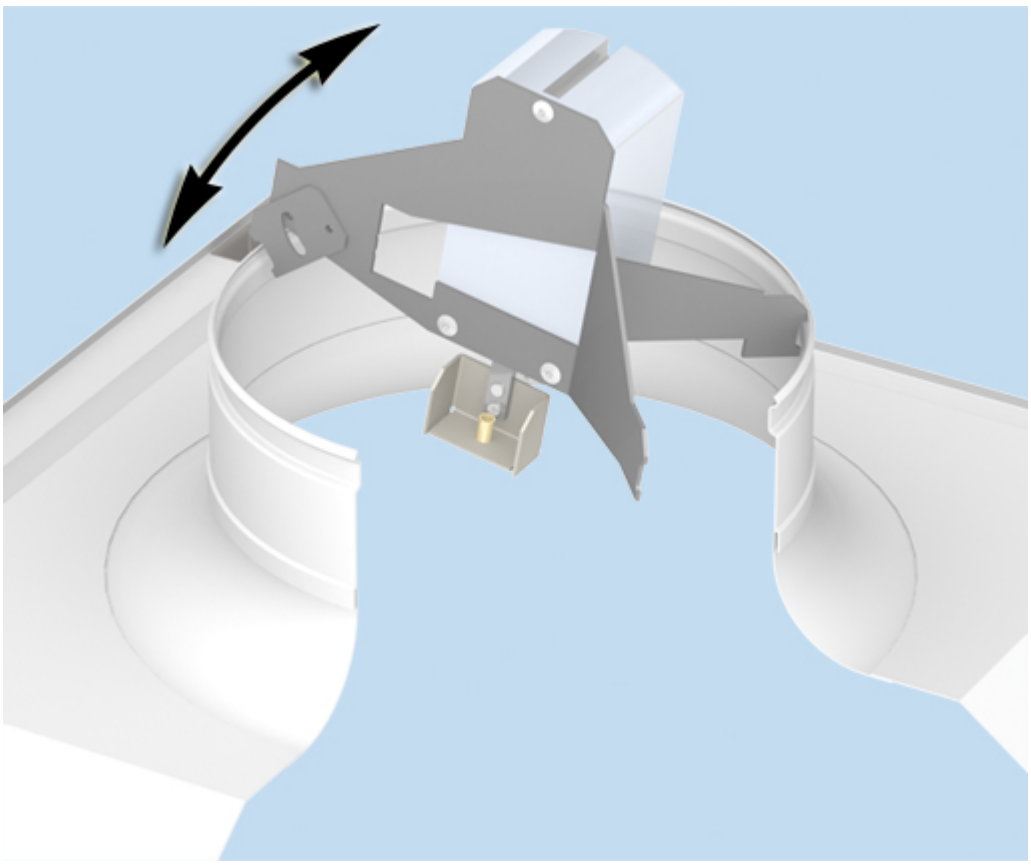
# Servicing




For servicing open the front panel of the diffuser and detach the flow control element.

Detach the flow control plate by opening the screw (1) and remove the plate (2).
Remove the motor assembly (3) on JDS body by pushing the mounting shaft and let it hang on the wire.





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

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

Replace all parts in opposite order. Ensure that the actuator is locked and the control plate is in right position.

# Specification

The Halton Jaz Conical VAV supply air diffuser is made of painted steel with a white (RAL 9003) standard colour.
Air is introduced into the space through the adjustable control plate and the side slots of front panel, ensuring a high mixing rate. The diffuser maintains appropriate discharge velocity throughout the total airflow range.

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

The diffuser has a gasket of rubber compound to ensure tight connection to the duct work.

The diffuser enables to be equipped with sensors and control system.

# Order code

## JDS/S-D; SP-CO-IO-ZT

**S = Model**
S Supply
E Exhaust

**D = Duct connection (mm)**
125, 160, 200, 250

## Other options and accessories

**SP = System package**
N No
Y Yes

**CO = Colour**
SW Signal white (RAL 9003)
X Special colour

**IO = Ceiling type**
NA Standard T-profile
DC Clip-In ceiling
FL Fineline-15

**ZT = Tailored product**

N No
Y Yes (ETO)

## Code example

JDS/S-200, SP=N, CO=SW, IO=NA, ZT=N