

Halton Rex REE, chilled beam - Technical description

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1 Introduction

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1.2 About this document

The purpose of this document is to give technical information and design examples for salespersons, technical support and designers.

1.3 Summary of changes

Release	Date	Description
1.1	03-Oct-2025	2.4 Structure and materials, 2.7 Specification and 2.8 Order code - Removed RAL 9010 as standard colour option.
1.0	26-june-2025	First published PDF version of REE with a new SEST coil (v2.0). For the previous version and all previous updates, refer to HIT.

2 Product description

2.1 Overview

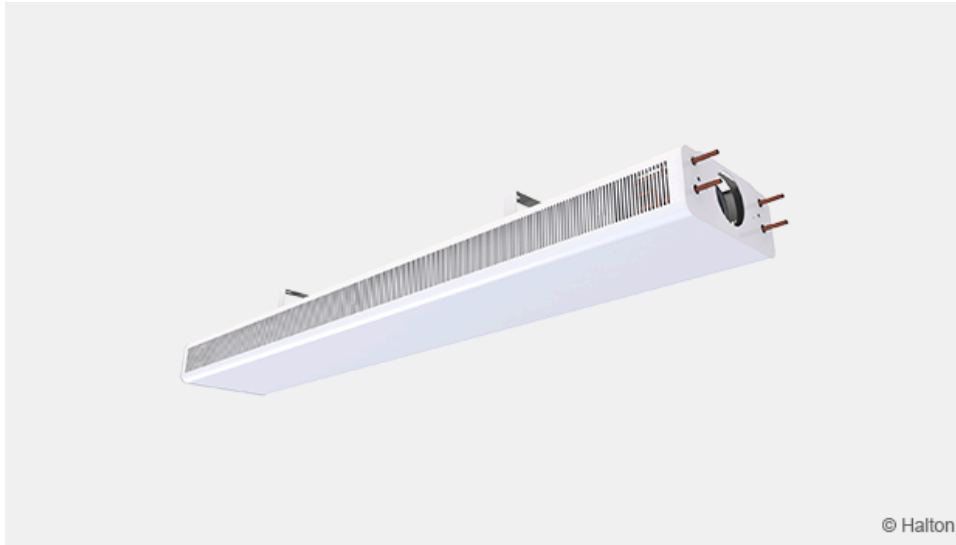


Fig. 1. Halton Rex REE chilled beam

Halton Rex REE chilled beam is a versatile system for demand-based ventilation systems. It functions as a combined unit for cooling, heating, and supplying air, making it ideal for exposed installation. Its built-in flexibility allows for quick and easy adaptation to changes in space layout and usage. It is an ideal system for applications where high-quality environmental conditions, demand-based ventilation, and individual room control are appreciated. There are also several different design options available.

Halton Rex REE is designed for typical office space ventilation requirements. The airflow adjustability is highly flexible, allowing it to be easily adapted to changed operation conditions and requirements from the design to the end of the building life cycle.

Application areas

- Office rooms
- Public spaces
- Open offices and meeting rooms

Key features

- Easy and fast selection with Halton eHIT design tool
- Individually adjustable velocity conditions with Halton Velocity Control (HVC)
- In-built flexibility of operation for partition wall relocations with Halton Velocity Control
- Individually adjustable supply airflow rate for changes in space layout using Halton Air Quality (HAQ) control
- Well suited for spaces with high cooling loads, low humidity loads, and demand-based ventilation requirements.
- Ideal solution for applications where high-quality indoor conditions, energy-efficient operation and individual room control are appreciated.
- In-built flexibility for partition wall relocations with Halton Velocity Control.
- It has a cable tray, duct cover, integrated control valves and actuators as accessories

- A model with Halton Workplace WRA room automation system package available.

2.2 Operating principle

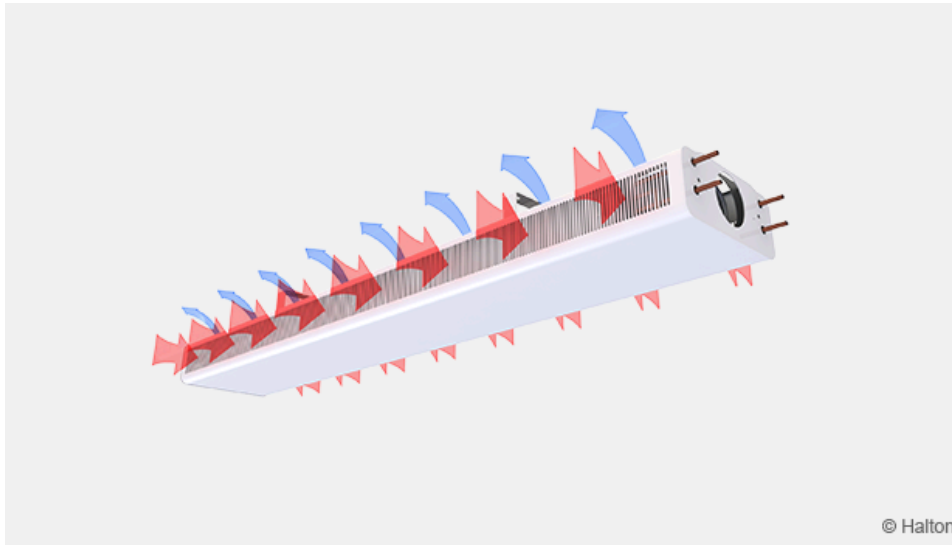


Fig. 2. Halton Rex REE operating principle

The Halton Rex REE unit is an active chilled beam for exposed installation.

The primary supply air enters the plenum of the active chilled beam and is delivered into the room through precision-engineered nozzles and the HAQ-control diffuser. The supply slots, positioned on the top of the beam, ensure optimal air distribution.

As the high-velocity supply air exits the nozzles, it generates jets that effectively induce ambient room air into the unit. The built-in heat exchanger then conditions this induced air, either cooling it or heating it as required. The resulting mixed airflow is discharged horizontally along the ceiling surface, which enhances air circulation and ensures uniform thermal comfort throughout the space.

The recommended minimum distance is 600 mm from the wall and 100 mm from the ceiling.

Supply air can be additionally discharged upwards towards the ceiling via the diffuser of Halton Air Quality control located on the top at the rear end of the chilled beam.

2.2.1 Velocity control in the occupied zone

Halton Velocity Control (HVC) is used for adjusting room air velocity conditions either when room layout is changed (e.g., in cases where the chilled beam is located near the partition wall) or when local, individual velocity conditions need to be altered. Halton velocity control adjustment has an impact on the induced room airflow through the heat exchanger, and therefore it either increases or decreases both the velocities in the occupied zone and the cooling/heating capacity of the chilled beam.

Halton Velocity Control involves manual velocity adjustment with three different positions (Fig. 3 and 4): 1 = Throttle, 2 = Normal, and 3 = Boost. The Halton velocity control system is divided into sections to enable the adjustment of conditions in different parts of the occupied zone. Depending on the length of the beam, optimal HVC damper module lengths between 500 and 1400 mm are used.

It is recommended to design the chilled beam in the normal position in order to allow both throttle and boost functions during the building's life cycle.

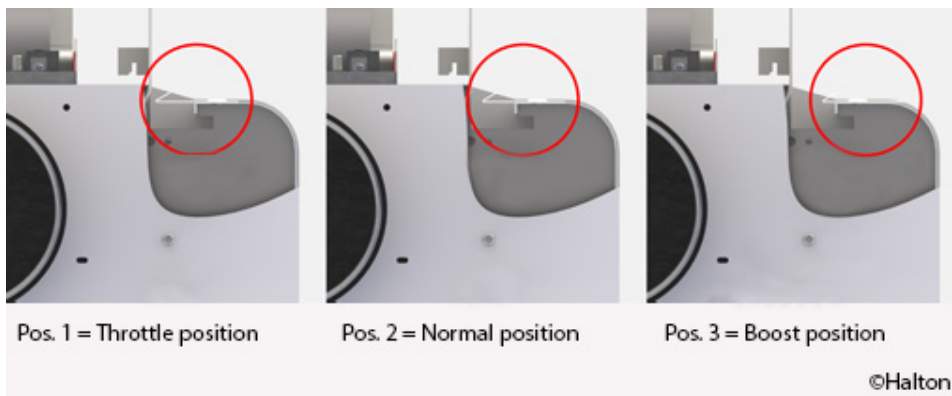


Fig. 3. Halton Velocity Control (HVC) from side

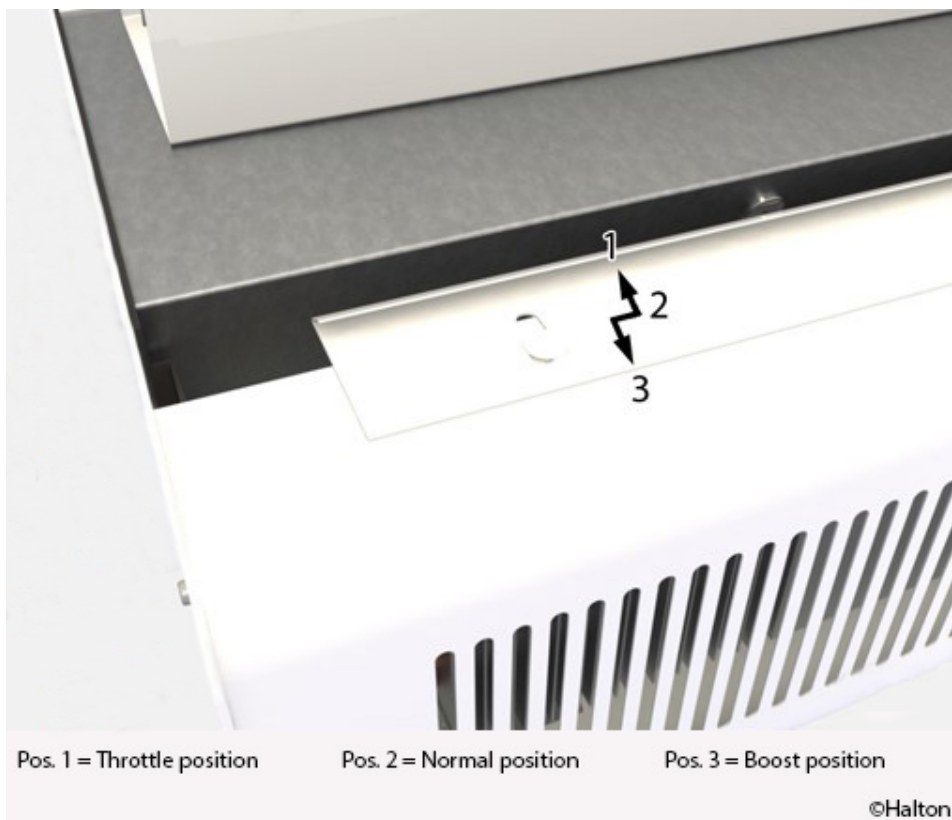


Fig. 4. Halton Velocity Control (HVC) from top

2.2.2 Airflow adjustment and control

The supply airflow of the chilled beam nozzle jets is dependent on effective length, nozzle type and static chamber pressure, which can be adjusted for, e.g., by using an airflow adjustment damper (e.g., Halton PTS).

Optional Halton Air Quality (HAQ) control is used for adjusting and/or controlling additional supply airflow rates in a room space. The airflow is dependent on the opening position of the control damper and the static chamber pressure.

Halton Air Quality (HAQ)

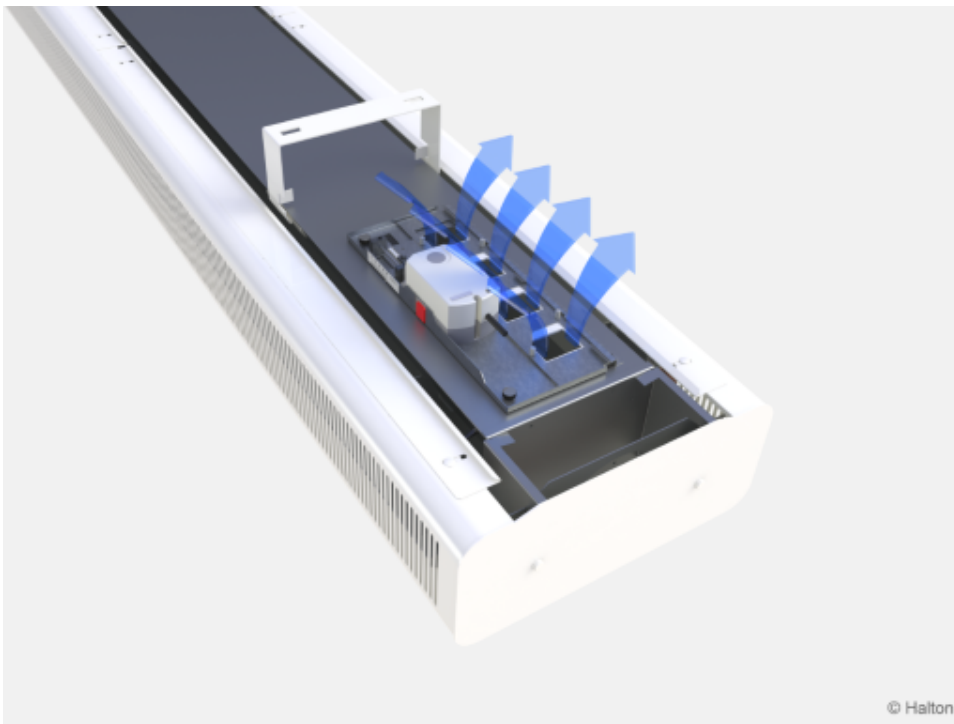


Fig. 5. Motorised control damper (HAQ)

Airflow rate control is needed when either room layout or the use of the space is changed (e.g., in a change from office to meeting room). The airflow rate can be adjusted either manually or via automatic demand-based control via a motorised control damper (Fig. 5). The actuator can be controlled by a room controller (not included) using a 0-10-VDC control signal.

A chilled beam equipped with HAQ manual airflow rate adjustment can be retrofitted into motorised demand-based control simply by replacing the HAQ-unit model and connecting the power supply and control signal from a room controller to the actuator.

The chilled beams are recommended to be connected to a constant pressure ductwork zone when,

- the HAQ adjustment has no impact on nozzle jet airflow
- the HAQ adjustment has no impact on either the coil cooling or heating capacities
- the HAQ airflow control has not significant impact to ductwork pressure conditions and respectively to airflow rates of other chilled beams in the same ductwork zone.

Demand-based air quality control and room air temperature control can be realised separately.

The appearance of different units - with constant, adjustable, or variable airflow - is identical. The Halton Air Quality control unit's position and the selection of the chilled beam nozzle size allow adjustment of the primary airflow rate in the space. Airflow adjustment damper (e.g., Halton PTS) can be used for balancing the airflow.

When a motorised air quality control (HAQ) unit is used, the maximum and minimum airflow rates are adjusted with the stroke limiters of the damper. The airflow adjustment damper (e.g., Halton PTS) is not recommended for use in balancing the airflow in this case.

Five different nozzle sizes are available, to enable attaining the minimum supply airflow rate of the chilled beam in a typical room module. Typically, units that are similar (in length or nozzle type) allow effective commissioning of the system.

The primary airflow rate of each beam is adjusted using the HAQ control unit during the installation and commissioning. There is no need to change or plug nozzles of the chilled beam.

Halton Air Quality control also allows increasing the airflow rate of a chilled beam, e.g., to meet the ventilation

requirements of meeting rooms (up to 4 l/s per m², below 35 dB(A)).

Controlling of the airflow can be based on CO₂ level. Alternatively, both air and water flow can be controlled based on temperature in two sequences. In that case, the airflow rate will be modulated in the first sequence, and if the temperature exceeds the chosen set point, the water valve will start to open.

2.2.3 Cooling and heating capacity control

The chilled beam can be equipped in the factory with either a adjustable k_v control valve (RA-C) or a pressure independent valve (AB-QM). AB-QM has an adjustable maximum limit for the water flow rate and there is a pressure difference measurement for ensuring that the pressure difference (min. 16 kPa) is sufficient for proper operation. Both control valves can be equipped with a thermal on/off-actuator. See the section "Features and options" for further information.

In heating mode, it is recommended that the temperature difference between the jet outlet and room air would not be greater than 3 °C. The inlet water temperature of the heat exchanger should not be higher than 35 °C. Optimal heating performance requires an appropriate primary air flow rate. Thus, the air handling unit shall be in operation during heating periods to ensure proper heating performance.

2.3 Dimensions and weight

Model with cooling coil and normal water pressure drop (TC=C and CR=N)

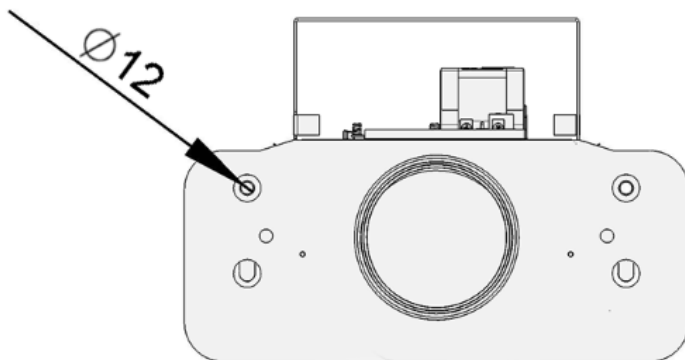


Fig. 6. TC=C and CR=N

Model with cooling coil and low water pressure drop (TC=C and CR=L)

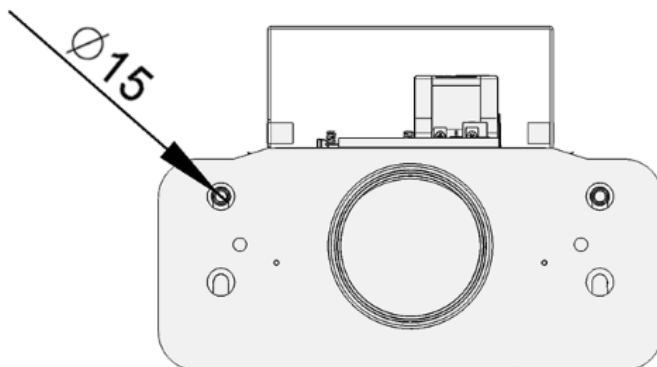


Fig. 7. TC=C and CR=L

Model with heating coil and normal water pressure drop (TC=H and CR=N)

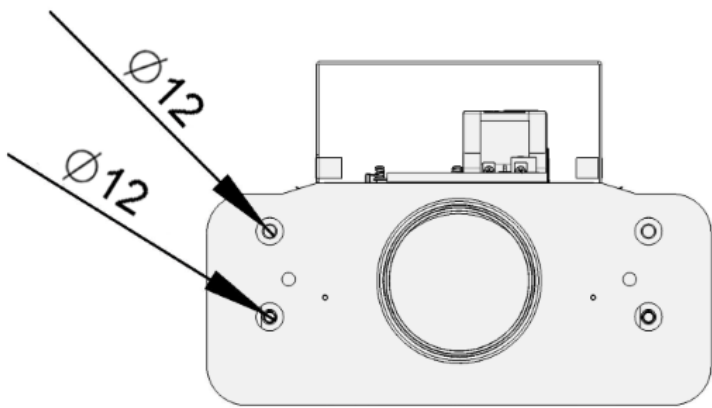


Fig. 8. TC=H and CR=N

Connection types, air and water

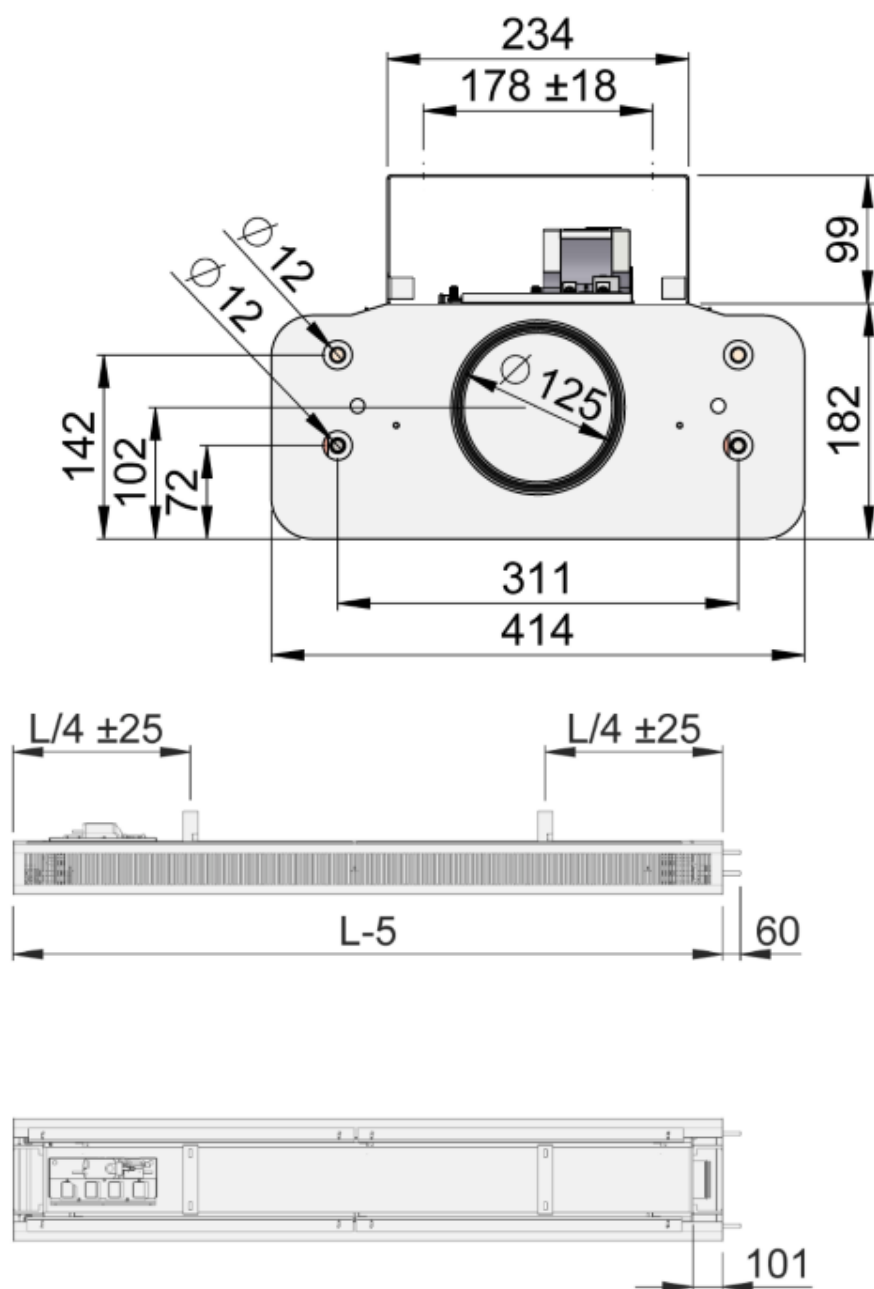


Fig. 9. Air and water connections at the same end (CT= S)

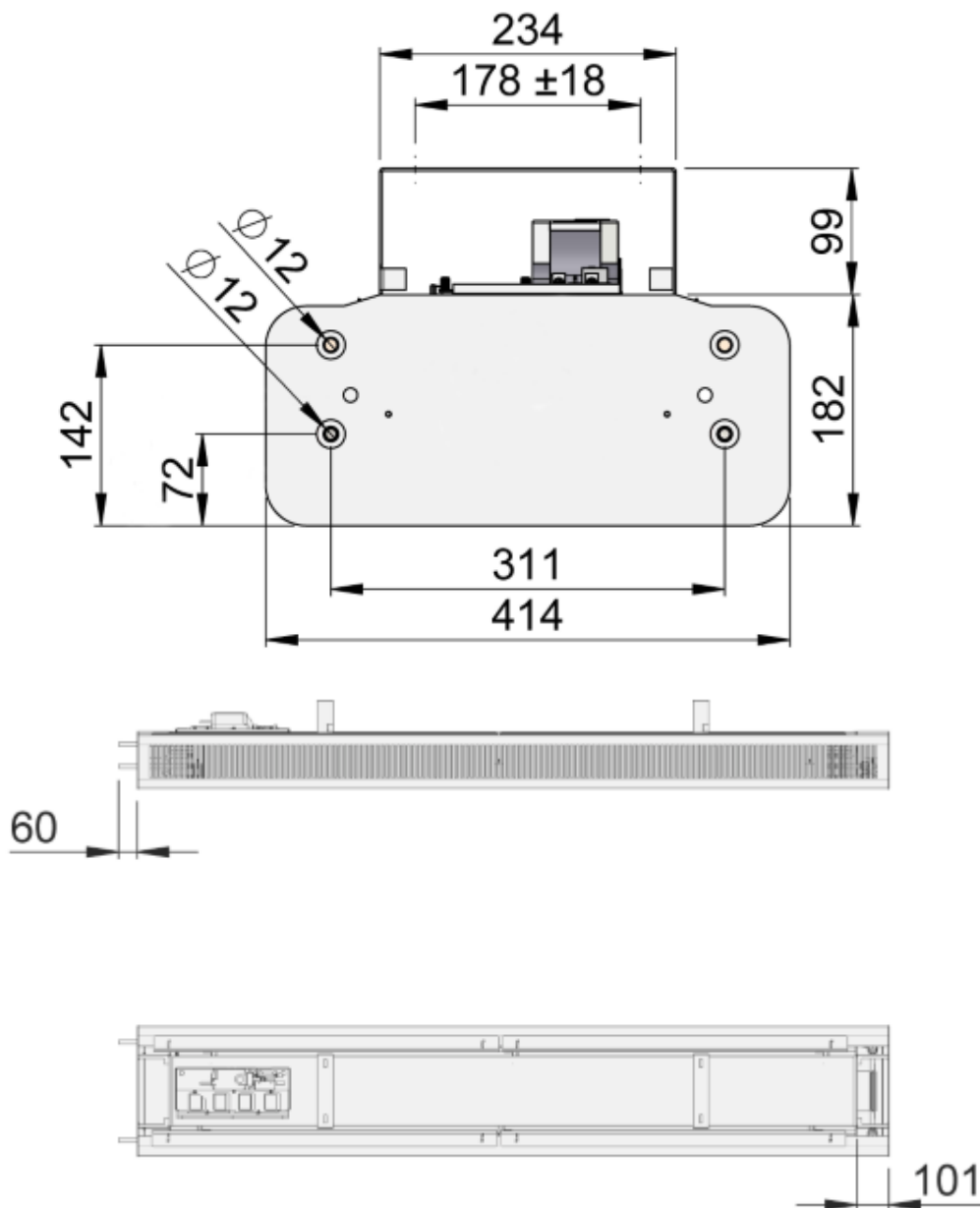
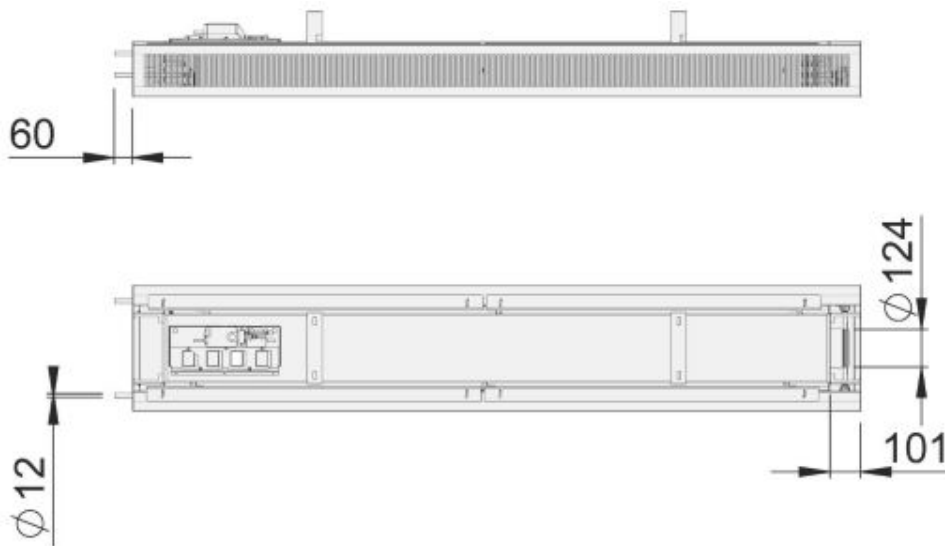


Fig. 10. Water connections at the opposite end (CT=O)

ØD	Coil length [mm]	Length L [mm]	Weight [kg/m, water excluded]
125	900, +100, ..., 4500	1200, +100, ..., 4800	16

Note: The front panel of the chilled beam is divided into two equal sections in chilled beams longer than 2400 mm when visual appearance options are VA = RO, RR, AO or AR. For visual appearance VA = SO the front panel is always made of one section.

Cable tray



Length of the cable tray = 60 mm less than length of the beam.

2.4 Structure and materials

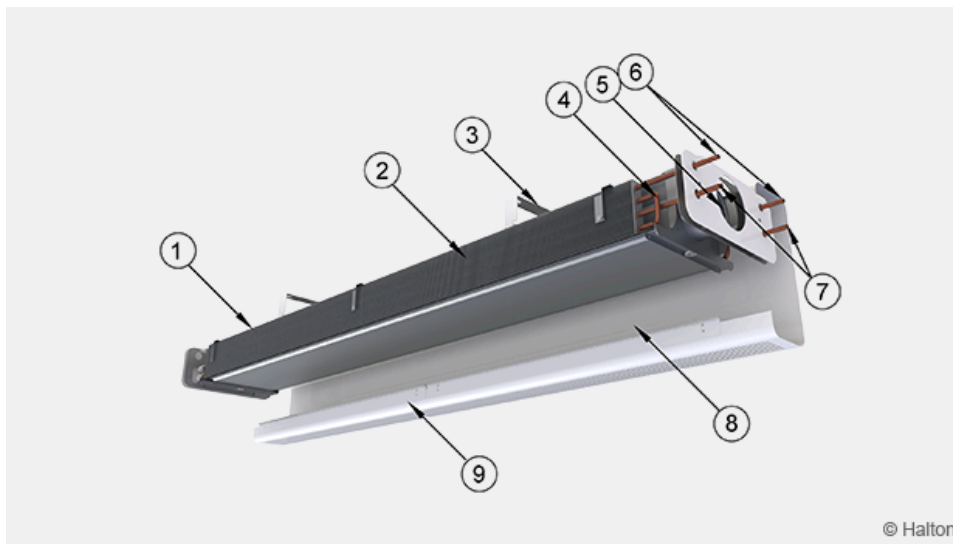


Fig. 11. Halton Rex REE structure

No.	Part	Material	Description	Note
1	Halton Air Quality control (HAQ)	-	-	-
2	Coil fins	Aluminium	-	-
3	Cable tray	Prepainted galvanised steel	Polyester-painted white (RAL 9003, 20% gloss)	Special colours available, polyester-epoxy-painted
4	Coil pipes	Copper	-	-
5	Supply air plenum	Galvanised steel	-	-

No.	Part	Material	Description	Note
6	Chilled water pipe connections	Copper	-	-
7	Heating water pipe connections	Copper	-	-
8	Front panel	Prepainted galvanised steel	Polyester-painted white (RAL 9003, 20% gloss)	-
9	Halton Velocity control (HVC)	Prepainted galvanised steel	-	-

Cooling/heating water pipe connections are Cu12/Cu15 with wall thickness of 0.9-1.0 mm fulfilling the requirements of European Standard EN 1057:1996.

The maximum operating pressure depends on water temperature level of the chilled/hot water pipework. It is 0.3 MPa at 92 °C, 0.6 MPa at 65 °C and 1.2 MPa at 20 °C water temperature level.

2.5 Features and options

Accessory	Code	Description	Note
Cooling or heating coil	TC = C	Coil with hot water circulation	Cooling copper water pipe connections are Ø 12 mm with normal pressure drop and Ø 15 mm with low pressure drop. (see " <i>Dimensions and weight</i> " section)
Combined cooling and heating coil	TC = H	Coil with hot and chilled water circulation	Cooling and heating copper water pipe connections are Ø 12 mm. (see " <i>Dimensions and weight</i> " section)
Coil water pressure drop	CR=N	Normal pressure drop	Low pressure drop option (CR=L)
Venting valves	VV = Y	Equipped with venting valves	-
Halton Air Quality control (HAQ damper)	AQ = MA	Manual operation	Located in the non-connection end of the beam

Accessory	Code	Description	Note
	AQ = MO	Motorised operation Power supply 24 VAC Control signal 0...10 VDC	-
	AQ = RE	Reservation for retrofitting of HAQ	In retrofitting, HAQ installation is possible afterwards.
Visual appearance	VA = See order code tab	For appearance options see Fig. 12-17	Selected options have the same performance data and dimensions.
Control valves and actuators	CV = see order code tab	See Control Valves and actuators below (table and Fig. 18)	-
Cable tray	AC = KH	Prepainted, see Fig. 19.	Length of the cable tray = Beam – 650 mm
Duct cover	Subproduct, DCB	Self-supporting cover plate. No need for installation brackets. See Fig. 20.	Available as tailored solution. Please contact sales.

Visual appearance options (VA)

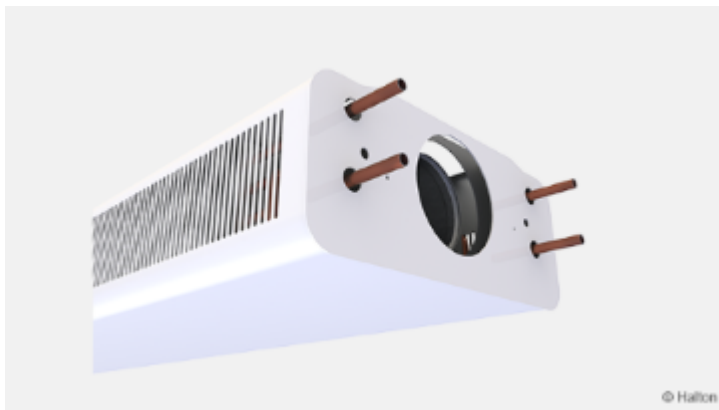


Fig. 12. Rounded, oval perforation (RO)

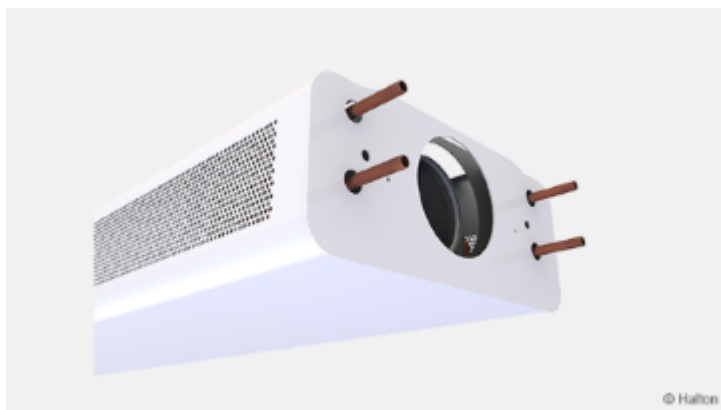


Fig. 13. Rounded, round perforation (RR)

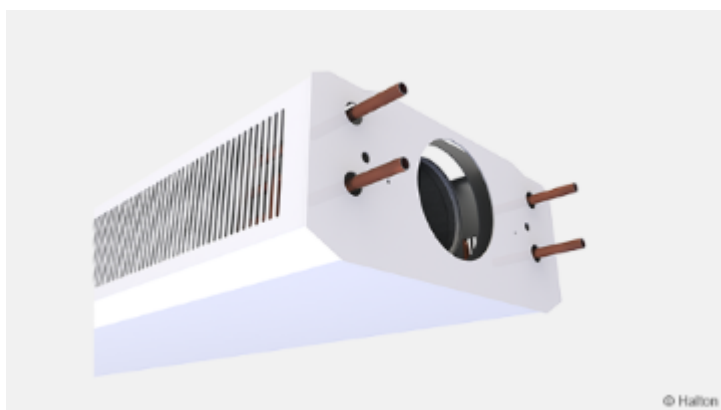


Fig. 14. Angular, oval perforation (AO)

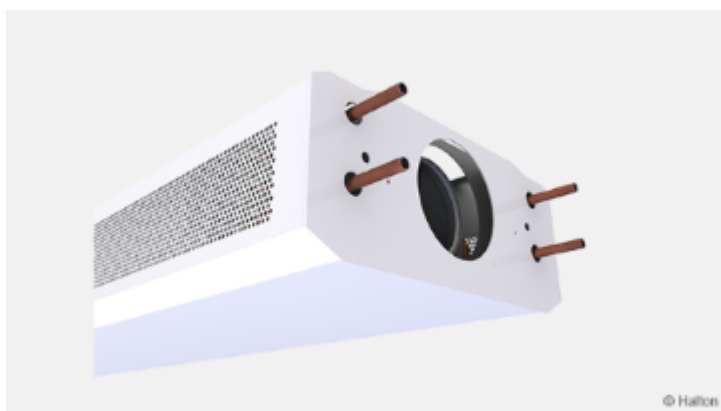


Fig. 15. Angular, round perforation (AR)

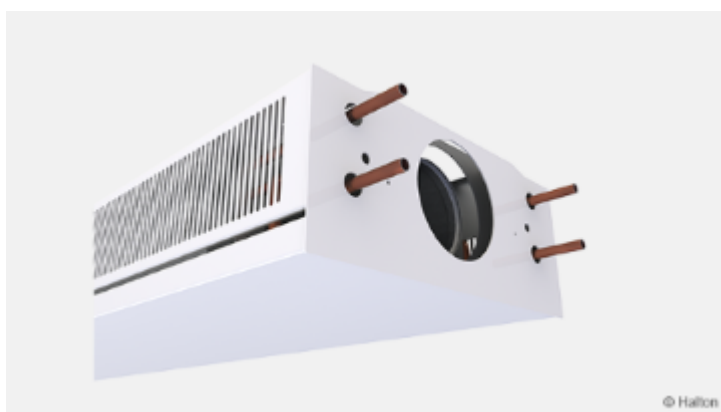


Fig. 16. Square with fixed front panel, oval perforation (SO)

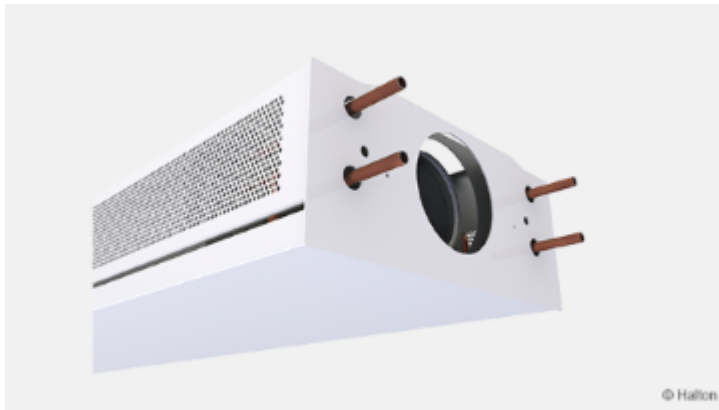


Fig. 17. Square with fixed front panel, oval perforation (SR)

Control valves and actuators

Code	Valve		Actuator		
	Name	Type	Name	Type	Voltage
DR1	RA-C	Adjustable K_v , value	TWA-A	N/A	-
DR2	RA-C	Adjustable K_v , value	TWA-A	On/Off, normally closed	24V AC/DC
DR3	RA-C	Adjustable K_v , value	TWA-A	On/Off, normally closed	230V AC
DA1	AB-QM	Constant flow, with test plugs	-	-	-
DA1	AB-QM	Constant flow, with test plugs	TWA-Q	On/Off, normally closed	24V AC/DC
DA1	AB-QM	Constant flow, with test plugs	TWA-Q	On/Off, normally closed	230V AC

Size of valve: Cooling and heating = Ø12

Length of cable for actuator: 1.2 m

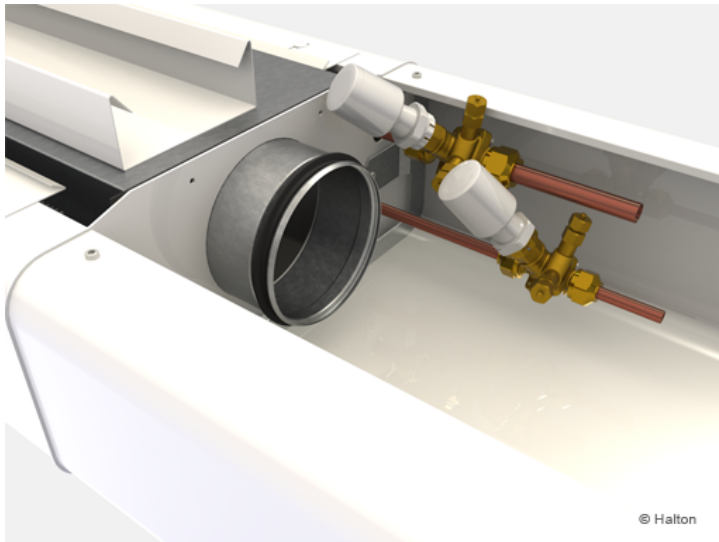


Fig. 18. Alternative location for valves (inside a duct cover)

Cable tray



Fig. 19. Cable tray in position

Duct cover

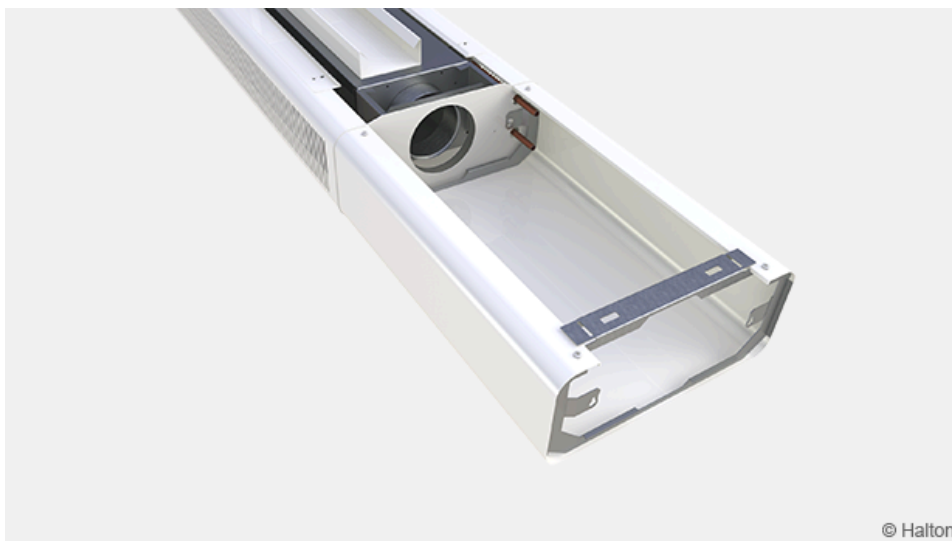


Fig. 20. Duct cover

2.6 System package

If required, the system package includes a valve with actuator, controller, humidity sensor, CO₂ sensor, and temperature sensor.

2.6.1 Halton Workplace WRA automation

Halton Workplace WRA room automation system package for Halton Rex REE.

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

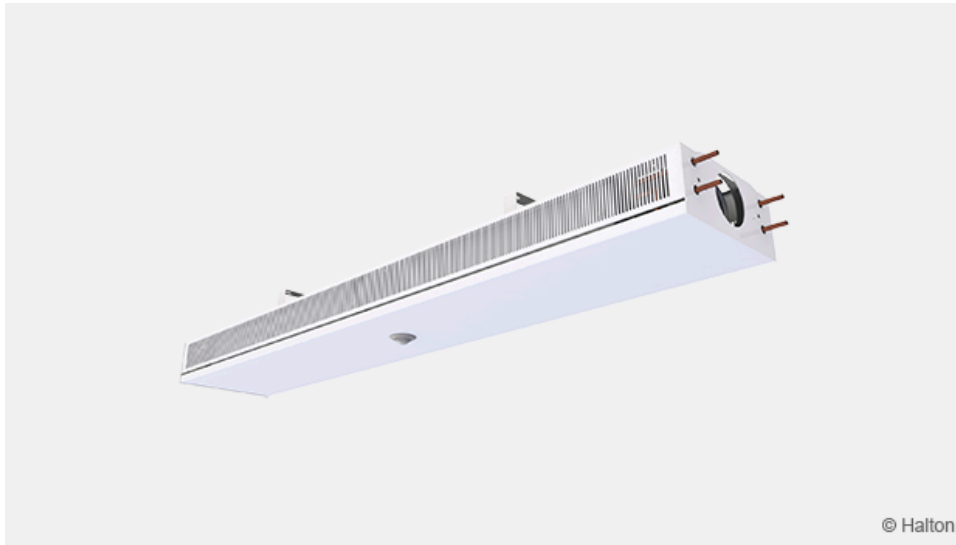


Fig. 21. Halton Workplace WRA room automation controller integrated to Halton Rex REE chilled beam

Halton Workplace WRA is a controller specially designed to control the automation system of office spaces and meeting rooms. It controls ventilation airflow, room temperature, and indoor air quality.

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.

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

2.6.2 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 essential part of the Halton Workplace system, controlling room units and airflow control dampers.
- Overall 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 diffusers

- Halton Max MDC zone control dampers
- Halton Workplace WSO system optimiser

2.6.3 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

2.6.4 Operating principle

The Halton Workplace WRA room automation controller operates with the Halton Workplace system's Variable Air Volume (VAV) dampers and active chilled beams. These dampers adjust 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 users' preferred indoor environment level, bringing maximum flexibility.

Room automation: Halton Rex REE active chilled beams controlled with Halton Workplace WRA room automation controllers

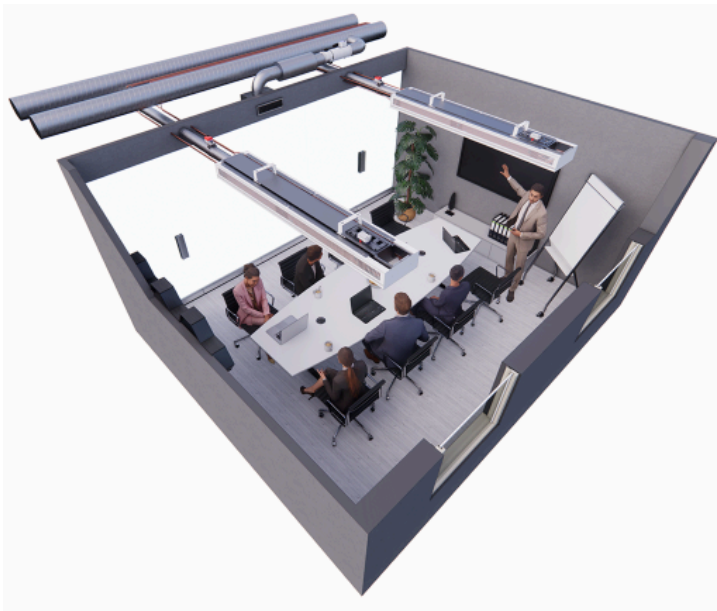


Fig. 22. Halton Rex REE active chilled beams with HAQ control and PTS damper, controlled with Halton Workplace WRA room automation controllers

2.6.5 Room automation

In this configuration, two Halton Workplace WRA room automation controllers (DXR2.E12P-102A) control two Halton Rex REE active chilled beams. Each chilled beam has heating and cooling valves, a motorised Halton Air Quality (HAQ) control, and integrated CO₂, occupancy and condensation sensors. Halton Workplace WRA

room automation controller has an integrated pressure sensor. A Halton PTS single-blade damper is used for controlling the minimum operating mode. The system also includes an exhaust VAV damper and a wall panel (QMX3.P37) with a temperature sensor and display. 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

- Chilled beam has heating and cooling valves
- Halton Rex REE chilled beam has motorised HAQ control
- Condensation, occupancy and CO₂ sensor integrated into chilled beam
- Exhaust airflow control
- Wall panel with temperature sensor and display
- Window switch control
- PTS damper for controlling minimum airflow
- Pressure sensor integrated into Halton Workplace WRA room automation controller

Schematic diagram

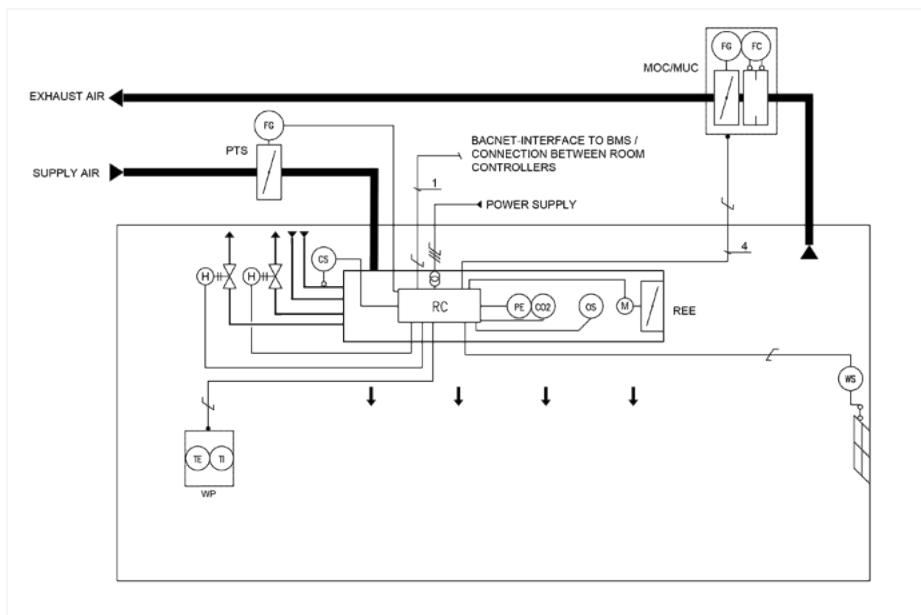


Fig. 23. Schematic drawing: Halton Rex REE chilled beam (4-pipe) controlled with Halton Workplace WRA room automation controller

Equipment list

Code	Equipment
RC	Controller unit
FG	Airflow damper actuator
FC	Airflow measurement
H	Water valve actuator
CS	Condensation sensor
OS	Occupancy sensor
PE	Pressure sensor
CO ₂	CO ₂ sensor
WP	Wall panel
TE	Temperature sensor
TI	Temperature display
WS	Window switch control

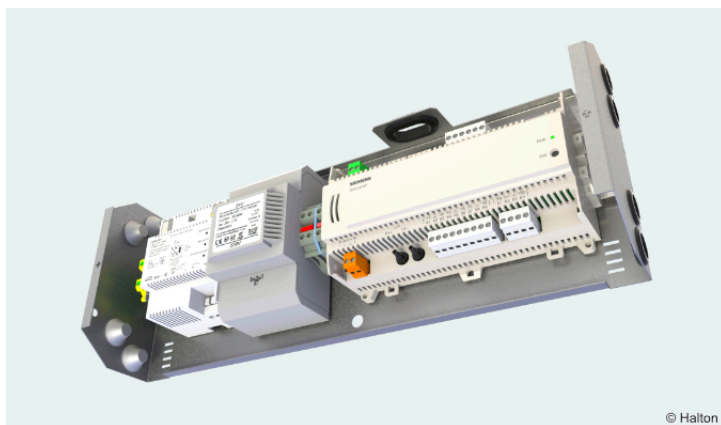


Fig. 24. Factory-installed Halton Workplace WRA room automation controller DXR2.E18-102A

2.6.6 Wiring diagram

For the wiring diagram of this configuration, see the Halton Workplace WRA room automation controller's product page or the section Product selection examples.

Components and order code examples for the system

- 2 x Active chilled beam: Halton Rex REE
 - REE-A-2800-2500; SP=N, TC=H, CR=N, VV=Y, CT=S, AQ=MO, VA=RR, CV=DA2, AC=KH, CO=SW, 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 MUC or Halton Max MOC
 - MUC-G-160, MA=CS
- 2 x standby, shut-off damper: Halton PTS

Note: For more information, check Halton Workplace WRA room automation controller's product page.

2.6.7 Cooling and heating water valve selection

Do the water valve selection in the Halton Workplace WRA room automation system package. The water valve sizing depends on the number of secondary and primary chilled beam units that a single controller controls. The whole chilled beam group cooling or heating uses one water valve to operate one room controller. The water valve is sized for the whole group when there are multiple chilled beams controlled with a single controller unit. There can be one primary chilled beam with a room controller and up to three secondary chilled beams.

See below the Water valve sizing for 1-4 chilled beams.

Number of chilled beams (pcs.)	Water valve type	Size for cooling (DN)	Size for heating (DN)	Installation
1	ABQM	DN15	DN15	Integrated to chilled beam
2	ABQM	DN20	DN15	Loose
3	ABQM	DN20	DN15	Loose

Number of chilled beams (pcs.)	Water valve type	Size for cooling (DN)	Size for heating (DN)	Installation
4	ABQM	DN25	DN15	Loose

Number of chilled beams (pcs.)	Water valve type	Size for cooling (DN)	Size for heating (DN)	Installation
1	VPP46..	DN15	DN15	Loose
2	VPP46..	DN20	DN15	Loose
3	VPP46..	DN20	DN15	Loose
4	VPP46..	DN25	DN15	Loose

2.7 Specification

Function

- The primary airflow rate is adjustable over a wide range via a separate supply air unit of the chilled beam.
- The induced room airflow rate is manually adjustable to three positions without influencing the primary air supply flow rate.
- Supply airflow rate is manually adjustable using an airflow damper, or equipped with an actuator for demand-based control of the airflow (optional).
- Control of supply airflow rate does not have any effect on coil cooling and heating capacities.

Structure

- The unit is an active chilled beam for exposed installation with bi-directional air supply.
- The front panel is openable and detachable from either side without any special tools.
- The chilled beam is 414 mm wide and 182 mm high, with inlet duct diameter of 125 mm.
- The front panel is openable and detachable from either side without any special tools.
- The chilled beam can be equipped with a duct cover to cover the connection duct and pipe installations (optional).
- The chilled beam can be equipped with a cable tray (optional).
- The cooling heat exchanger consists of eight 12 mm pipes connected in series.
- Two 12/15-mm connection pipes shall incorporate cooling within the heat exchanger. Optionally, two 12 mm connection pipes heating shall also be incorporated within the heat exchanger.
- The maximum operating pressure of the pipework is 1.0 MPa @ 70 °C.
- Each chilled beam is protected by removable plastic coating.
- Duct connection and pipe ends are sealed for transit.
- The adjustable airflow rate beam has only one duct connection.
- The appearance of the chilled beams with constant airflow and adjustable airflow rate is the same.

Materials

- The front panel and side panels are made of pre-painted galvanised steel plate (white, RAL 9003, 20%

gloss). All visible parts can be painted with special colours (RAL xxxx).

- All heat exchanger pipes are manufactured from copper, connection pipes with a wall thickness of 0.9-1.0 mm. Joints are factory pressure-tested.

Packaging and transport

- Each chilled beam is identifiable by a serial number printed on a label attached to the chilled beam.

2.8 Order code

REE-S-L-C; SP-TC-CR-VV-CT-AQ-VA-CV-AC-CO-ZT

Main options	
S = Nozzle size	
A	Extra small
B	Small
C	Medium
D	Large
E	Extra large
L = Beam length [mm]	1200,+100, ..., 4800
C = Effective/coil length [mm]	900, +100, ..., 4500

Other options and accessories	
SP = System package	
N	No
Y	Yes
TC = Cooling/Heating functions (coil type)	
C	Cooling or heating
H	Cooling and heating
CR = Coil water pressure drop	
N	Normal
L	Low
VV = Venting valves	
N	No
Y	Yes
CT = Connection type (air and water)	
S	Air and water connections at the same end

Other options and accessories	
O	Air and water connections at the opposite ends
AQ = Air quality control (HAQ)	
MA	Manual (CAV)
MO	Motorised (VAV)
RE	Retrofit possibility
VA = Visual appearance	
RO	Rounded, oval perforation
RR	Rounded, round perforation
AO	Angular, oval perforation
AR	Angular, round perforation
SO	Square with fixed front panel, oval perforation
SR	Square with fixed front panel, round perforation
CV = Control valves and actuators	
NA	Not assigned
DR1	RA-C, no actuator
DR2	RA-C, actuator TWA-A 24 V, NC
DR3	RA-C, actuator TWA-A 230 V, NC
DA1	AB-QM, no actuator
DA2	AB-QM, actuator TWA-Q 24 V, NC
DA3	AB-QM, actuator TWA-Q 230 V, NC
AC = Accessories	
KH	Cable tray
CO = Colour	
SW	Signal white (RAL 9003)
X	Special colour (RAL xxxx)
ZT = Tailored product	
N	No
Y	Yes (ETO)
Sub-products	
DCB	Duct cover

Order code example

REE-A-2400-2100; SP=N, TC=C, CR=N, VV=Y, CT=S, AQ=MA, VA=RR, CV=DR2, AC=KH, CO=SW, ZT=N

3 Design information

3.1 Installation

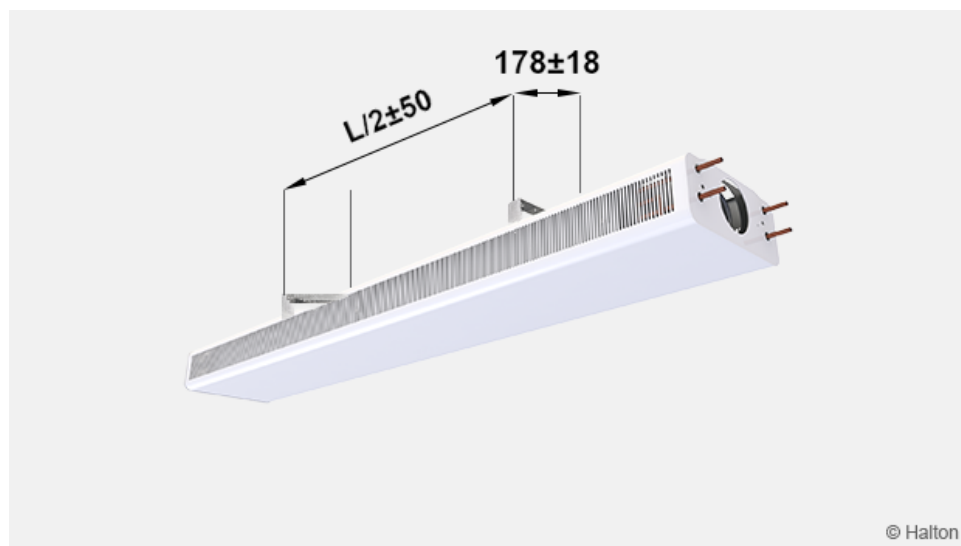


Fig. 25. Halton Rex REE installation dimensions

The Halton Rex REE unit is suitable for exposed installation in the ceiling, typically lengthwise in the room. It is recommended to position the beam no closer than 600 mm from the wall and 100 mm from the ceiling. The chilled beam ceiling brackets can be fixed directly to the ceiling surface or suspended using threaded drop rods (8 mm). It is recommended that the brackets are positioned one quarter of a unit length ($L/4$) away from the end of the beam.

Install the main pipelines of the cooling and heating water loops above the level of the chilled beams to enable venting of the pipework.

Connection of the motorised air quality control (HAQ):

Power supply	24 VAC
Control signal	0 ... 10 VDC

Installation with brackets



Fig. 26. Fixing of the beams done by pushing the beam to the ceiling brackets.

Secure all fixing points so that they are properly locked to the fixing slots.

Installation of the duct cover

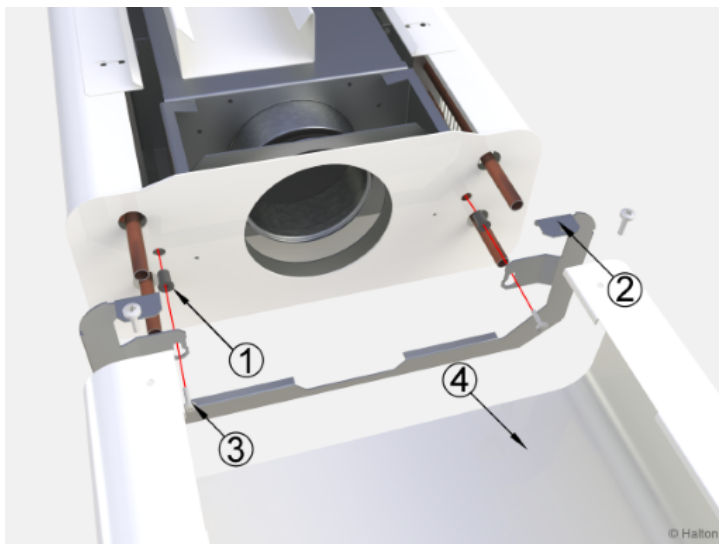


Fig. 27. Fixing of the duct cover

Key:

No.	Parts
1	Rivet nut (2 pcs)
2	Fixing plate
3	Screw (4 pcs)
4	Duct cover

When fixing the duct cover:

- Push first two rivet nuts (1) to the holes at the endplate

- Fix the screws loose (3/2 pcs) to the rubber nuts.
- Slide the fixing plate to right position
- Tighten the screws (3)
- Install the duct cover (4) and fix the screws (3/2 pcs)

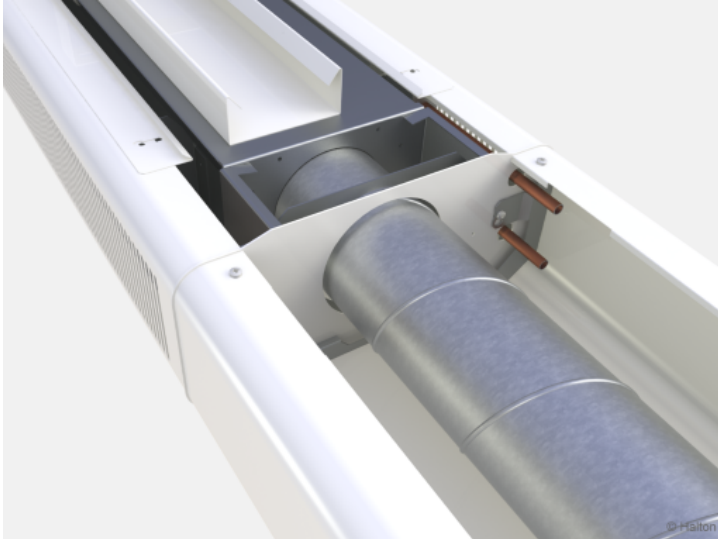


Fig. 28. Duct cover fixed to Halton Rex REE

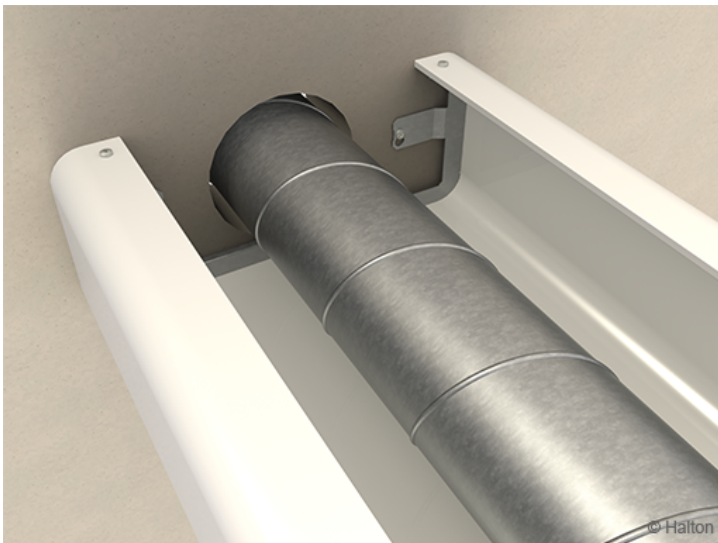


Fig. 29. Duct cover fixed to the wall

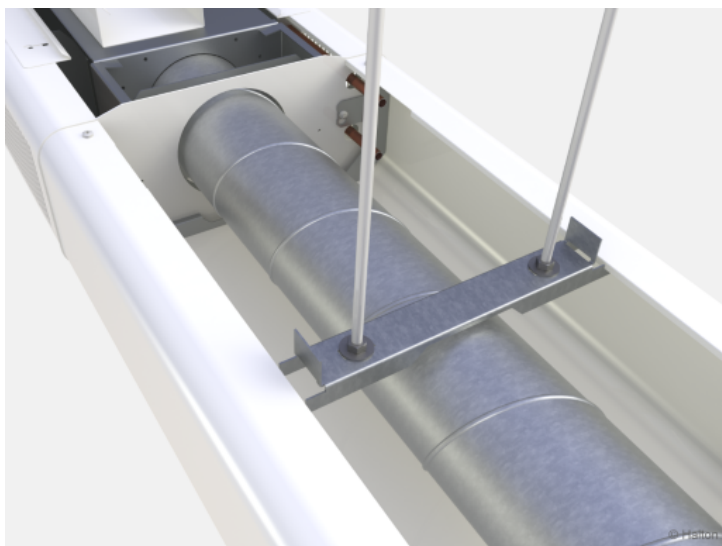


Fig. 30. Duct cover fixation with threaded rods from ceiling.

After the ceiling bracket is on its place the cover plate can be locked to the right position by bending the fixing part as shown above (arrows).

3.2 Commissioning

Cooling

The recommended cooling water mass flow rate is 0.02 ... 0.10 kg/s, resulting in a temperature rise of 1 ... 4 °C in the heat exchanger. To avoid condensation, the recommended inlet water temperature of the heat exchanger is 14 ... 16 °C.

Heating

The recommended heating water mass flow rate is 0.01 ... 0.04 kg/s, resulting in a temperature drop of 5 ... 15 °C in the heat exchanger. The maximum recommended temperature of the inlet water for the heat exchanger is 35 ... 45 °C.

Balancing and control of water flow rates

Balance the water flow rates of the Halton Rex REE chilled beam with the RA-C control valve by selecting the designed kv value in the valve body. When using an automatically balancing combination valve AB-QM, set the designed water flow rate in the valve body and verify the pressure difference (min. 7.5 kPa) between the measurement nipples of the valve. The pressure difference over the valve must be 16 kPa, to ensure proper operation. The cooling and heating capacity of the chilled beam are controlled by regulating the water mass flow rate.

Adjustment of supply airflow rate

Each Halton Rex REE chilled beam is equipped with a measurement tap for static pressure measurement, which enables fast and accurate measurement of the supply airflow rate through the effective part of the beam. The airflow rate is calculated using the formulas below:

Total airflow rate (q_v)

$$q_v = q_{v1} + q_{v2}$$

q_v	Total airflow rate, l/s or m ³ /h
-------	--

q_{v1}	Nozzle jet airflow rate, h
q_{v2}	Air quality control diffuser

Nozzle jet airflow rate (q_{v1})

$$q_{v1} = k * l_{eff} * \sqrt{\Delta p_m}$$

k	k-factor (from table below)
l_{eff}	Length of the coil [m]
Δp_m	Measured static chamber pressure [Pa]

Nozzle	k [l/s]	k [m ³ /h]
A	0.71	2,56
B	0.99	3,56
C	1.36	4,90
D	2.09	7,52
E	3,33	11,99

The supply airflow rate of the Halton Air Quality control unit is determined by measuring Halton Rex REE chilled beam static pressure and reading the opening position of the HAQ unit. The airflow rate is calculated using the formula below.

Air quality control diffuser airflow rate (q_{v2})

$$q_{v2} = a * k * \sqrt{\Delta p_m}$$

a	HAQ position
$\sqrt{\Delta p_m}$	Measured static chamber pressure [Pa]

k [l/s]	k [m ³ /h]
0,17	0,61

3.2.1 Adjustment of the airflow in constant airflow applications

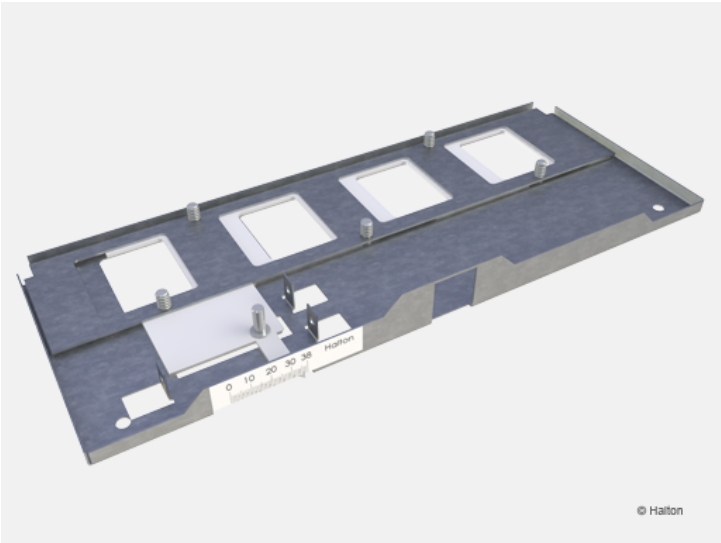


Fig. 31. Manual Halton Air Quality (HAQ)

Define the position of HAQ in millimetres that correspond to airflow rate at the actual chamber pressure level.

Adjustment of HAQ is done manually with the help of position scale by adjusting the opening of the unit. It is possible to verify the opening in millimetres on the position scale.

In order to ensure accurate adjustment it is recommended to adjust HAQ-position and in the same time read the targeted chamber pressure using a manometer.

It is also possible to remove the HAQ-unit from the frame by opening two knurled-head screws (4) for the adjustment.

3.2.2 Adjustment of the airflow range in variable airflow applications

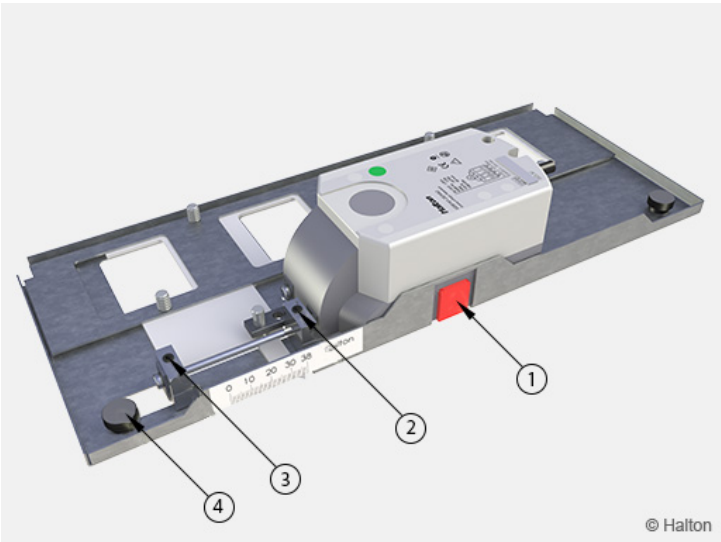


Fig. 32. Motorised Halton Air Quality (HAQ)

Key:

No.	Parts
1	Release of the actuator

No.	Parts
2	Restriction of the max. opening
3	Restriction of the min. opening
4	Knurled head screw (2 pcs)

Switch-off the power supply of the actuator.

Disengage the actuator gear into manual override position by releasing the knob.

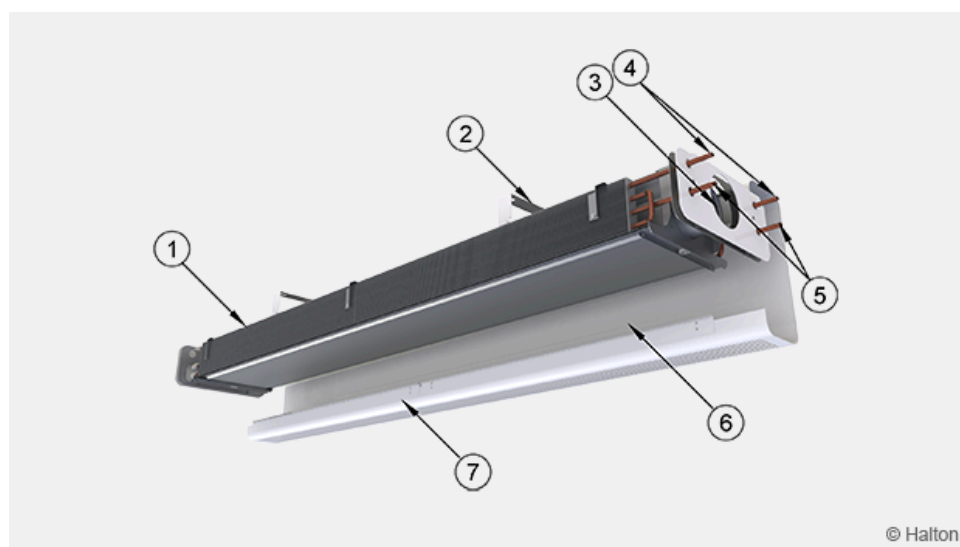
Define the maximum and minimum positions, in millimetres that correspond to maximum and minimum airflow rates at the actual chamber pressure level. The maximum and minimum positions are adjusted with two hexagonal socket set screws (see image above, points 2 and 3). It is possible to verify the opening in millimetres on the position scale.

Switch on the power supply (24 V_{AC}) of the actuator. The actuator calibrates the min. and max. positions automatically according to the set limits.

The actuator can be controlled from this point on by using a 0...10V_{DC} control signal. (0 V_{DC} = min. position, 10 V_{DC} = max. position).

It is also possible to remove the HAQ-unit from the frame by opening two knurled-head screws (4) for the adjustment.

3.3 Maintenance



Key:

No.	Parts
1	Halton Air Quality control (HAQ)
2	Cable tray
3	Supply air connection
4	Chilled water pipe connections

No.	Parts
5	Heating water pipe connections
6	Front panel
7	Halton Velocity control (HVC)

Open the front panel of Halton Rex REE. In beams longer than 2400 mm, the front panel can be opened in two sections. Clean the supply air plenum, duct, and finned coils of the heat exchanger using a vacuum cleaner, taking care not to damage the finned coils. Clean the front panel and, if necessary, the side plates with a damp cloth.

Open the access panel, and check at regular intervals that the airflow adjustment damper (if applicable) and water flow control valves are working.

The air quality control (HAQ) damper actuator can be accessed from on top of the chilled beam for service, if required.