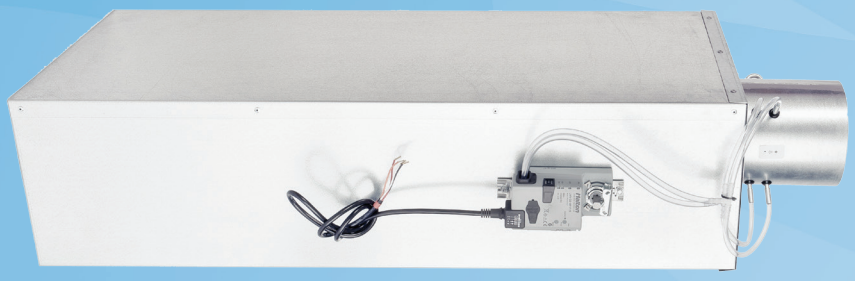
# BOX

Airflow management unit

20/BOX/1015/EN



## Solution

- Airflow management and control unit
- Variable or constant airflow rate operation
- Pressure-independent operation
- Galvanised steel construction
- Airflow management plenum with acoustic attenuation (high density mineral wool)
- Factory set airflow range limit

## Options & Accessories

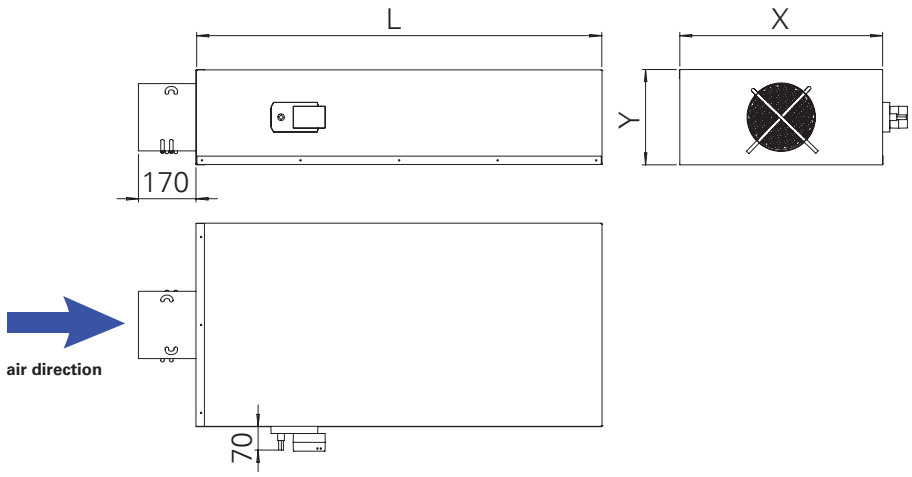
- Electrical reheating unit WBF or water reheating unit WBO
- Outlet plenum PBO with one or more  circular connections
- External insulation for radiated noise attenuation

## MATERIAL

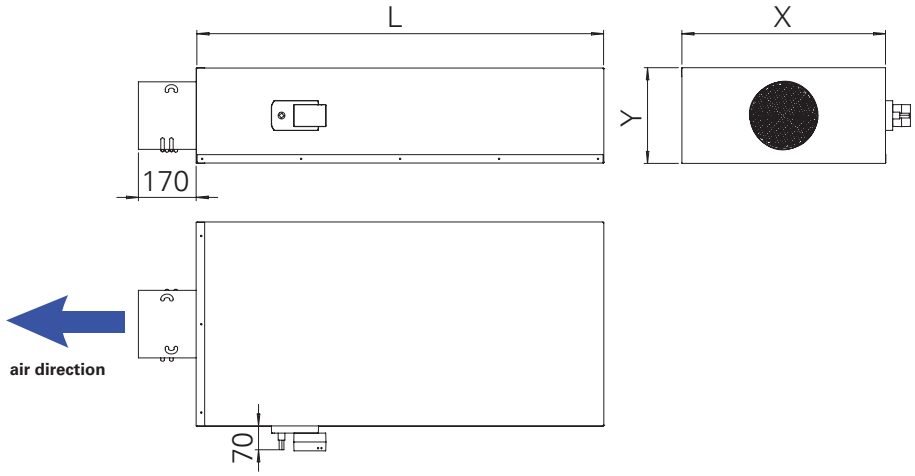
| PART | MATERIAL |
|---|---|
| Plenum | Galvanised steel |
| Measurement probe | Aluminium |
| Acoustic insulation | High density mineral wool |
| Blade | Galvanised steel |
| Perforated sheet steel | Galvanised steel |
| External insulation | Mineral wool protected by galvanised steel frame |

## DIMENSIONS

Supply BOX




Exhaust BOX




**Short version: BOX/S. Long version: BOX/L**

| | | | | BOX/S | BOX/L |
|---|---|---|---|---|---|
| | Diameter D [mm] | Width X [mm] | Height Y [mm] | Length L [mm] | Length L [mm] |
| 25 mm Insulation, I1 | 100 | 400 | 250 | 600 | 1000 |
| | 125 | 400 | 250 | 600 | 1000 |
| | 160 | 400 | 250 | 600 | 1000 |
| | 200 | 600 | 280 | 600 | 1200 |
| | 250 | 700 | 320 | 900 | 1400 |
| | 315 | 800 | 400 | 900 | 1600 |
| | 355 | 1000 | 450 | 900 | 1600* |
| | 400 | 1000 | 450 | 900 | 1600* |
| | 500 | 1300 | 550 | 900 | 1800* |
| 40 mm Insulation, I2 | 100 | 430 | 280 | 600 | 1000 |
| | 125 | 430 | 280 | 600 | 1000 |
| | 160 | 430 | 280 | 600 | 1000 |
| | 200 | 630 | 310 | 600 | 1200 |
| | 250 | 730 | 350 | 900 | 1400 |
| | 315 | 830 | 430 | 900 | 1600 |
| | 355 | 1030 | 480 | 900 | 1600* |
| | 400 | 1030 | 480 | 900 | 1600* |
| | 500 | 1330 | 580 | 900 | 1800* |

* in 2 parts.

Nb : The actuator is installed on the right side of the BOX (like drawing above); it can be installed on the left side on demand.

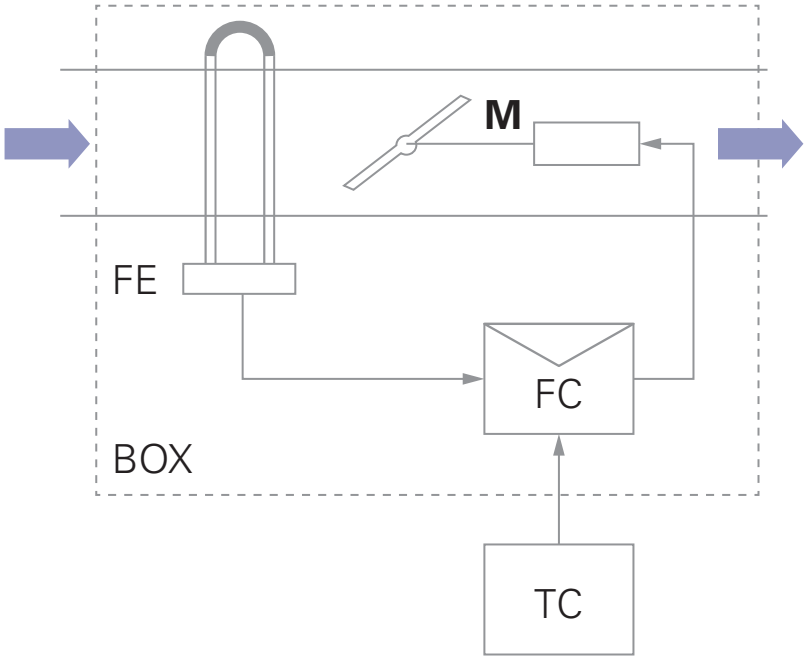
**FUNCTION**

The Halton BOX variable airflow rate management unit contains a complete regulation loop. This includes an aluminium probe measurement system to take the average value measured over the whole crossing surface, an actuator mounted on the blade axis and a controller.

The measurements made are sent to the controller which compares these values with the required setpoint value; depending on the measured difference, a signal is then sent to the actuator so that the unit compensates for this difference.

An analog signal that enables the setpoint to be shifted may also be sent to the controller. The flow rate is regulated between the min and max rate values programmed into the controller.

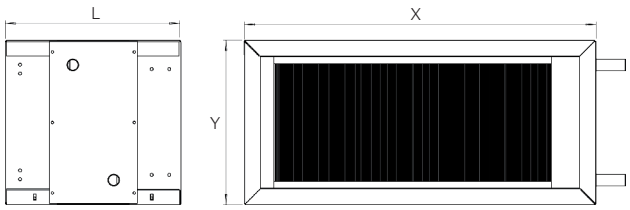
The regulation loop is closed and operates independently of the variations in upstream pressure. The regulation may also be static pressure regulation (in the duct or in the premises).




M: actuator
PE: dynamic pressure measurement probe
FC: airflow controller
TC: thermostat or room sensor

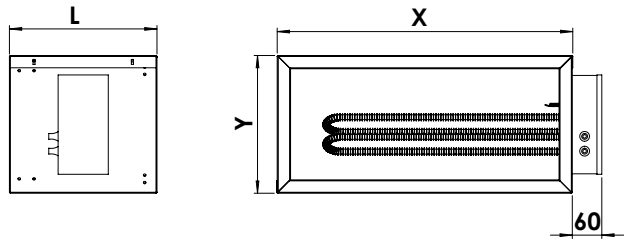
## WATER REHEATING UNIT WBO OPTION

- Rectangular water reheating to be mounted downstream of the airflow management unit BOX.
- Lateral water connection.
- Fixing on the BOX by toggle latches.
- Cooling coil with condensate tray can be manufactured upon request.




## ELECTRICAL REHEATING WBF OPTION

- Electrical reheating with electrical supply 230 V single phase (1 or 2 resistances), 230/400 V three phase (3 resistances).
- Safety thermostat with manual reset.
- Minimum air velocity: 2 m/s.




### WBO - WBF dimensions

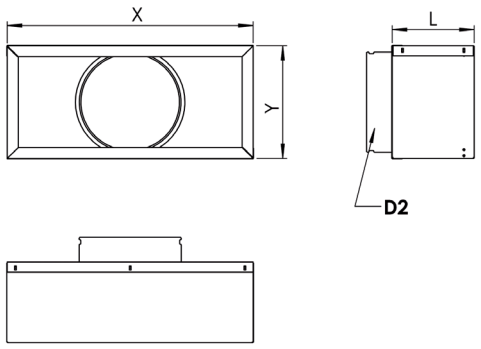
| | D | X | Y | L |
|---|---|---|---|---|
| 25 mm Insulation, I1 | 100 | 400 | 250 | 300 |
| | 125 | 400 | 250 | 300 |
| | 160 | 400 | 250 | 300 |
| | 200 | 600 | 280 | 300 |
| | 250 | 700 | 320 | 300 |
| | 315 | 800 | 400 | 500 |
| | 355 | 1000 | 450 | 600 |
| | 400 | 1000 | 450 | 600 |
| | 500 | 1300 | 550 | 600 |
| 40 mm Insulation, I2 | 100 | 430 | 280 | 300 |
| | 125 | 430 | 280 | 300 |
| | 160 | 430 | 280 | 300 |
| | 200 | 630 | 310 | 300 |
| | 250 | 730 | 350 | 300 |
| | 315 | 830 | 430 | 500 |
| | 355 | 1030 | 480 | 600 |
| | 400 | 1030 | 480 | 600 |
| | 500 | 1330 | 580 | 600 |

### Water reheating power

| Size | Airflow (m³/h) | Airflow (l/s) | Power | ΔP (Pa) |
|---|---|---|---|---|
| 100 | 58 | 16 | 425 | 2 |
| | 97 | 27 | 641 | 3 |
| | 136 | 38 | 824 | 5 |
| | 175 | 49 | 986 | 7 |
| | 214 | 59 | 1129 | 10 |
| | 251 | 70 | 1255 | 13 |
| 125 | 90 | 25 | 603 | 3 |
| | 155 | 43 | 904 | 6 |
| | 220 | 61 | 1149 | 10 |
| | 285 | 79 | 1363 | 15 |
| | 350 | 97 | 1555 | 21 |
| | 414 | 115 | 1727 | 28 |
| 160 | 144 | 40 | 859 | 6 |
| | 254 | 71 | 1266 | 13 |
| | 364 | 101 | 1593 | 23 |
| | 474 | 132 | 1877 | 35 |
| | 584 | 162 | 2115 | 49 |
| | 695 | 193 | 2326 | 65 |
| 200 | 227 | 63 | 1440 | 4 |
| | 427 | 119 | 2238 | 10 |
| | 627 | 174 | 2882 | 18 |
| | 827 | 230 | 3424 | 28 |
| | 1027 | 285 | 3889 | 40 |
| | 1226 | 341 | 4315 | 54 |
| 250 | 360 | 100 | 2320 | 4 |
| | 675 | 188 | 3611 | 11 |
| | 990 | 275 | 4644 | 19 |
| | 1305 | 363 | 5515 | 30 |
| | 1620 | 450 | 6288 | 43 |
| | 1936 | 538 | 6953 | 58 |
| 315 | 569 | 158 | 3530 | 5 |
| | 1039 | 289 | 5378 | 12 |
| | 1509 | 419 | 6849 | 22 |
| | 1979 | 550 | 8086 | 34 |
| | 2449 | 680 | 9145 | 49 |
| | 2920 | 811 | 10120 | 65 |
| 355 | 736 | 204 | 4577 | 4 |
| | 1395 | 388 | 7205 | 10 |
| | 2054 | 571 | 9286 | 19 |
| | 2713 | 754 | 11036 | 29 |
| | 3372 | 937 | 12535 | 42 |
| | 4032 | 1120 | 13856 | 56 |
| 400 | 900 | 250 | 5330 | 5 |
| | 1600 | 444 | 7899 | 13 |
| | 2300 | 639 | 9964 | 22 |
| | 3000 | 833 | 11702 | 34 |
| | 3700 | 1028 | 13188 | 49 |
| | 4400 | 1222 | 14557 | 65 |
| 500 | 1404 | 390 | 8749 | 5 |
| | 2643 | 734 | 13611 | 12 |
| | 3882 | 1078 | 17480 | 22 |
| | 5121 | 1423 | 20724 | 34 |
| | 6360 | 1767 | 23493 | 48 |
| | 7600 | 2111 | 25923 | 65 |

## PLENUM PBO OPTION

Plenum with 1 circular outlet to be mounted downstream of the airflow management unit BOX.




### PBO dimensions

| | D | X | Y | D2 | L |
|---|---|---|---|---|---|
| 25 mm Insulation, I1 | 100 | 400 | 250 | 125 | 200 |
| | 125 | 400 | 250 | 160 | 200 |
| | 160 | 400 | 250 | 200 | 200 |
| | 200 | 600 | 280 | 250 | 200 |
| | 315 | 800 | 400 | 355 | 200 |
| | 355 | 1000 | 450 | 400 | 200 |
| 40 mm Insulation, I2 | 100 | 430 | 280 | 125 | 200 |
| | 125 | 430 | 280 | 160 | 200 |
| | 160 | 430 | 280 | 200 | 200 |
| | 200 | 630 | 310 | 250 | 200 |
| | 315 | 830 | 430 | 355 | 200 |
| | 355 | 1030 | 480 | 400 | 200 |

Upon request, outlet plenum PBO:
- with side connection,
- with several connections.

## MODELS

The BOX airflow management unit is available in several versions.

The long version is used to reduce the airflow noise; the version with exterior sound proofing is used to reduce the radiated noise emitted by the unit.

| MODEL | APPLICATION | EXECUTION |
|---|---|---|
| BOX/S-S, IN=I1 | Supply. | Short version. 25 mm insulation. |
| BOX/L-S, IN=I1 | Supply. Low noise level to be complied. | Long version. Integrated sound attenuator. 25 mm insulation. |
| BOX/S-E, IN=I1 | Exhaust. | Short version. 25 mm insulation. |
| BOX/L-E, IN=I1 | Exhaust. Low noise level to be complied. | Long version. 25 mm insulation. |
| BOX/S-S, IN=I2 | Supply. | Short version. 40 mm insulation. |
| BOX/L-S, IN=I2 | Supply. Low noise level to be complied. | Long version. Integrated sound attenuator. 40 mm insulation. |
| BOX /S /E, IN=I2 | Exhaust. | Short version. 40 mm insulation. |
| BOX/L-E, IN=I2 | Low noise level to be complied. | Long version. 40 mm insulation. |

## CONTROL

### Control units (CU)

The Halton BOX airflow control damper can be equipped with several different control units for either airflow or duct pressure control.

### Airflow control

- For supply and exhaust installations
- Complete damper shut off
- Operating ambient temperature range from 0 to 50°C
- Ambient relative humidity < 95%, non-condensing
- Analog command signal: 0-10 V or 2-10 V.

### Available airflow controllers

EE: Halton NMV-D3-MP motor controller
EC: Halton LMV-D3-MP motor controller
EK: Halton NMV-D3-MF motor controller
EM: Halton LMV -D3-MF motor controller
EG: Siemens GLB181.1E motor controller
SR: Sauter ASV/115/CF152 motor controller
LK: Belimo LON LMV-D3-LON motor controller
LM: Belimo LON NMV-D3-LON motor controller
HM: Distech LON ECL-VAV-S motor controller
HK: Distech LON ECL-VAV-N controller with NM24ASR actuactor

The EE, EC, EM and EK airflow controllers feature a differential pressure sensor crossed by a low rate. Therefore these airflow controllers must not be used in a highly contaminated environment. The EG airflow controller pressure sensor is a model with membrane and is therefore sealed and no flow can cross it.

The table below provides the nominal airflow control ranges for standard controls (nominal pressure: 150 Pa):

| Size | NOMINAL RATE | | MINIMAL RATE (STD) | | MINIMAL RATE (SPECIAL) | |
|---|---|---|---|---|---|---|
| | m³/h | l/s | m³/h | l/s | m³/h | l/s |
| 100 | 287 | 80 | 58 | 16 | 28 | 8 |
| 125 | 469 | 130 | 90 | 25 | 46 | 13 |
| 160 | 808 | 224 | 144 | 40 | 84 | 23 |
| 200 | 1210 | 336 | 227 | 63 | 136 | 38 |
| 250 | 1940 | 539 | 360 | 100 | 214 | 59 |
| 315 | 3145 | 874 | 569 | 158 | 353 | 98 |
| 355 | 4031 | 1120 | 736 | 204 | 444 | 123 |
| 400 | 5159 | 1433 | 900 | 250 | 617 | 171 |
| 500 | 8160 | 2267 | 1404 | 390 | 971 | 270 |

**Nominal rate:** maximal admissible airflow for the BOX.
**Minimal airflow std:** minimal airflow, value for standard controls.
**Minimal airflow special:** minimal airflow, value for control with static or quasi-static pressure sensor.

### Pressure control

- Used for supply and exhaust
- Static pressure range depends on the probe (for example, EG control: adjustment from 0 to 300 Pa)
- Operating ambient temperature range from 0 to 50°C
- Ambient relative humidity < 95%, non-condensing

### Available airflow controllers

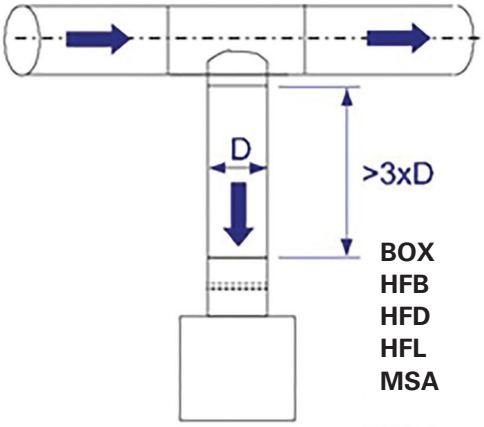
EG: Siemens GLB.181.1E
ES: Belimo VRP-STP + VFP-100 + NM24A-V
ER: Belimo VRP-STP + VFP-300 + NM24A-V
SR: Sauter ASV/115/CF152

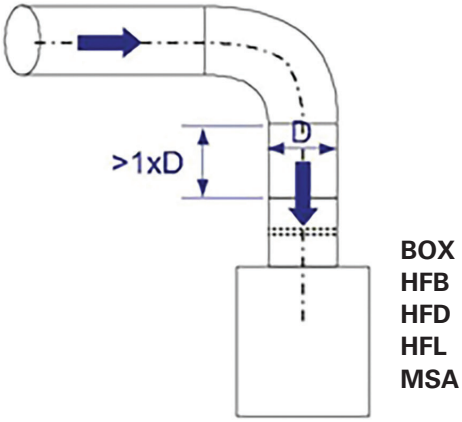
The two airflow controllers ES and ER feature a static regulation set point adjustment potentiometer.

**INSTALLATION**

**Safety distance**

The Halton BOX airflow control damper is installed taking into account the required safety distances (see figure). These distances are valid for supply and exhaust. If the safety distances below are not respected, the dynamic pressure measurement can be false.



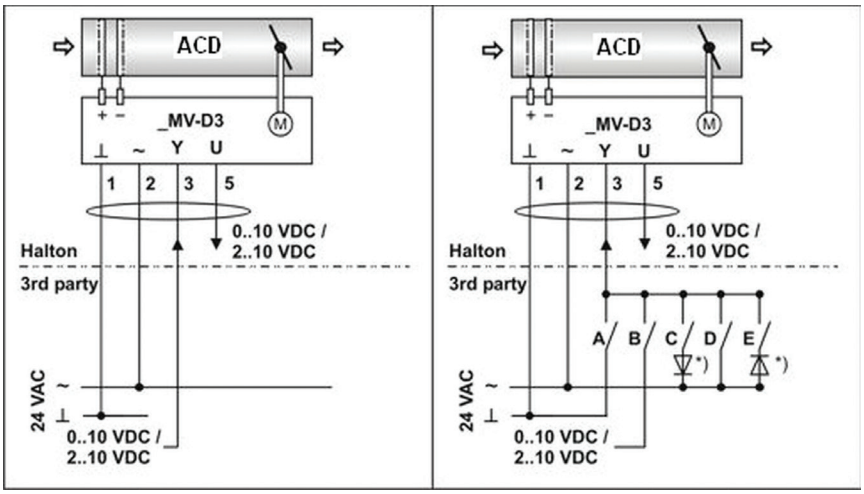




For the supply, in static pressure control, the minimum safety distance for the static measurement unit after the control damper is 5 x D in supply air applications. However, the pressure sensor position is typically halfway along or in the last third of in the last third of the duct branch length.

## WIRING

The wiring shall be carried out in accordance with local regulations and by professional technicians.

### Belimo control - Airflow control
### BOX; CU = EE, EC, EM or EK – Wiring and imperative command




| CODE | DESCRIPTION |
|---|---|
| 1 (^) | 24 VAC system neutral |
| 2 (~) | 24 VAC phase |
| 3 (w) | 2-10 or 0-10 VDC airflow setpoint signal input |
| 5 (U5) | 2-10 or 0-10 VDC airflow feedback signal output |
| *) | Diode |

The Halton service boundary is represented by dashes.

### Operating mode

There are two possible operating modes: 0 to 10 VDC and 2 to 10 VDC. The main differences between these modes are related to low airflow control and closing function.

### Closing and imperative command

Except the case where a relay cut off the control, the damper will be fully closed if:

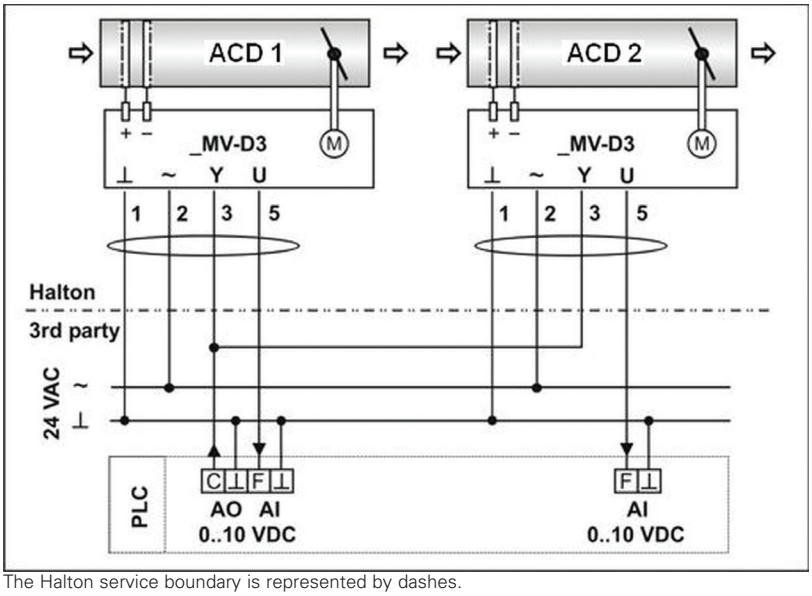
- 0-10 VDC mode: The BOX minimal airflow is set to 0 and the w control signal falls below 0,5V
- 2-10 VDC mode : the w control signal falls below 0,1V.

| Mode | - | 0...10 V | 0...10 V | 0...10 V | 0...10 V |
|---|---|---|---|---|---|
| | 2...10 V | 2...10 V | 2...10 V | 2...10 V | 2...10 V |
| Signal | ⊥ – | 0...10 V 2...10 V | ~ | ~ + | ~ |
| Function | 3 | 3 | 3 | 3 | 3 |
| Closed | a)CLOSED | | c)CLOSED | | |
| Min...Max airflow | | b)VAV | | | |
| CAV - Min airflow | Fully open - Min active airflow** | | | | |
| Full opening | | | | | e)OPEN* |
| CAV - Max airflow | | | | d) Max airflow | |

Closed contact, active function
Closed contact, active function, in 2...10 VDC only
Open contact

* Not available in 24 VDC power supply
** The controller closes when 0.5 V power cut mode is used.

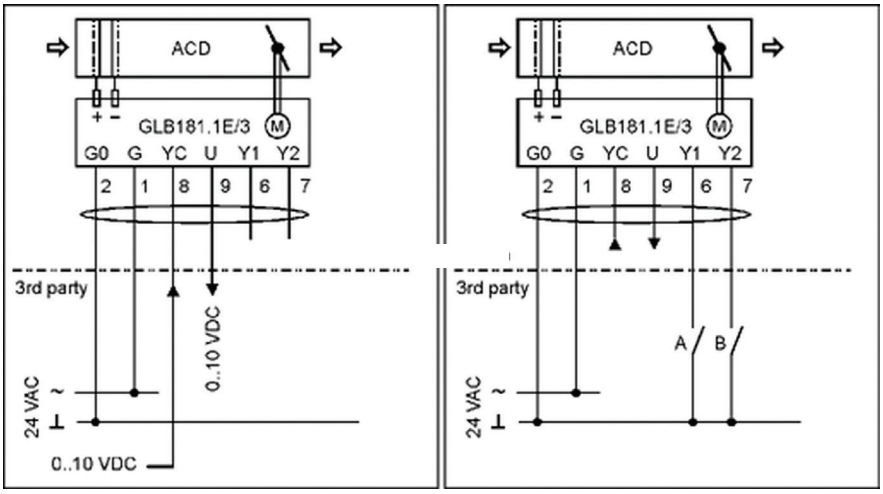
### Belimo control - Supply/exhaust parallel control - Airflow control
### BOX; CU = EE, EC, EK or EM




| CODE | DESCRIPTION |
|---|---|
| 1 (^) | 24 VAC system neutral |
| 2 (~) | 24 VAC phase |
| 3 (w) | 2-10 or 0-10 VDC airflow setpoint signal input |
| 5 (U5) | 2-10 or 0-10 VDC airflow feedback signal output |
| PLC | Building Management System |
| C (AO) | Airflow setpoint control signal |
| F (AI) | Actual airflow feedback input |

The Halton service boundary is represented by dashes.

## Siemens Control
## BOX; CU=EG (GLB181.1E/3)

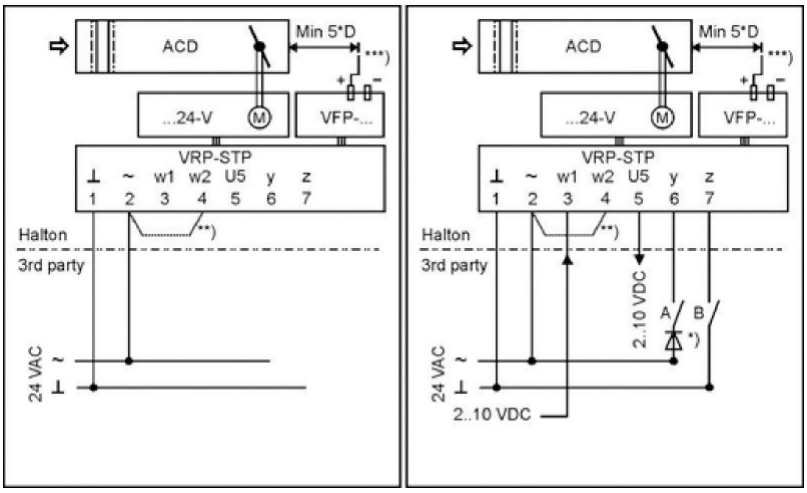



The Halton service boundary is represented by dashes.

| CODE | DESCRIPTION |
|---|---|
| 2 (G0) | 24 VAC system neutral |
| 1 (G) | 24 VAC phase |
| 8 (YC) | 0-10 VDC airflow setpoint signal input |
| 9 (U) | 0-10 VDC airflow feedback signal output |
| 6 (Y1) | Override input |
| 7 (Y2) | Override input |

| Constant flow | A | B |
|---|---|---|
| Closed | ON | OFF |
| Min. flow | OFF | OFF |
| Max. flow | ON | ON |
| Full opening | ON | OFF |

## BOX; CU=ES or CU=ER - Duct pressure control




The Halton service boundary is represented by dashes.

| CODE | DESCRIPTION |
|---|---|
| 1 (^) | 24 VAC system neutral |
| 2 (~) | 24 VAC phase |
| 3 (w1) | 2-10 VDC duct pressure setpoint signal input (if used) |
| 5 (U5) | 2-10 VDC duct pressure feedback signal output |
| 6 (y) | Actuator signal |
| 7 (z) | Override input |
| *) | Diode |
| **) | factory-fitted 2-4 jumper for the potentiometer setpoint; remove if w1 2-10 VDC input is used |
| ***) | Minimum safety distance for pressure tab after pressure control damper (5 x D) |

| Override | A | B |
|---|---|---|
| Closed | ON | OFF |
| Pressure control | OFF | OFF |
| Open | ON | ON |

The pressure controller has a setpoint potentiometer for pressure setpoint adjustment.

## COMMISSIONING

The actual airflow rate can be calculated as a function of differential pressure at the measurement probe and the measurement probe k factor. The proper k factor can be found in the documentation supplied with the product.

$$Q_v = k \times \sqrt{\Delta P\_m}$$

$Q_v$ : actual airflow rate [l/s]
k : k factor of the product
ΔP_m : diffrential pressure of the measurement probe [Pa]

The EE, EC, EK and EM airflow controllers are equipped with a dynamic pressure differential sensor which is subjected to a low airflow. Therefore, a manual manometer cannot be connected in parallel with the airflow controller for differential pressure measurement. If a manual manometer is used, the airflow controller power supply shall be switched off in order to stop damper movement during measurement of the airflow probe differential pressure. Note that the duct pressure might vary during the measurement.

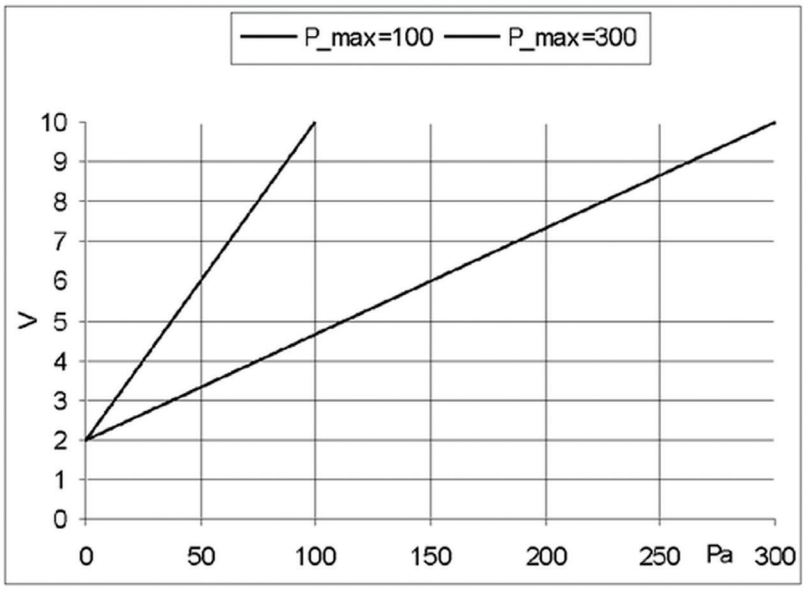
The EG airflow controller is equipped with a static membrane pressure sensor including an automatic zero point calibration, and there is no airflow through the differential pressure sensor of the controller. Therefore, a manual differential measurement manometer can be connected in parallel to the airflow controller (for example, with tube T-branches), and both measurements can operate in parallel with continuous control.

### Duct pressure control

The actual measured airflow rate (qv) can be defined by the controller feedback signal (U5) and airflow controller nominal airflow (qv_nom).

| SIGNAL | FORMULA | CONTROLLER TYPE & MODE | NEUTRAL SYSTEM TERMINALS | SIGNAL TERMINALS |
|---|---|---|---|---|
| 2 to 10 VDC | Pst = 100Pa*(U-2)/8 | BOX;CU=ES (VRP-STP+VFP-100) | 1 (^) | 5(U5) |
| | Pst = 300Pa*(U-2)/8 | BOX;CU=ER(VRP- STP+VFP-300) | 1 (^) | 5(U5) |

The actual static duct pressure can also be read from the pictures below:



## SOUND DATA

BOX/L-S Airborne noise

| | | | Upstream pressure 100 Pa | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | Qv | Qv | F (Hz) | | | | | | | LwA | LpA | NR |
| mm | m³/h | l/s | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA | dBA | dB |
| 100 | 47 | 13 | 31 | 26 | 16 | 13 | 14 | 18 | 21 | 24 | 16 | 20 |
| | 158 | 44 | 42 | 36 | 25 | 14 | 15 | 20 | 22 | 26 | 18 | 21 |
| | 212 | 59 | 43 | 38 | 29 | 15 | 16 | 20 | 21 | 26 | 18 | 20 |
| | 287 | 79 | 43 | 38 | 29 | 15 | 16 | 20 | 21 | 26 | 18 | 20 |
| 125 | 79 | 22 | 32 | 31 | 19 | 14 | 15 | 20 | 23 | 26 | 18 | 22 |
| | 266 | 74 | 45 | 41 | 26 | 18 | 16 | 20 | 23 | 28 | 20 | 22 |
| | 349 | 97 | 46 | 44 | 31 | 20 | 17 | 21 | 22 | 30 | 22 | 21 |
| | 469 | 130 | 46 | 44 | 31 | 20 | 17 | 21 | 22 | 30 | 22 | 21 |
| 160 | 137 | 38 | 35 | 32 | 21 | 15 | 14 | 19 | 23 | 25 | 18 | 22 |
| | 457 | 127 | 44 | 41 | 30 | 21 | 18 | 20 | 23 | 30 | 22 | 22 |
| | 601 | 167 | 50 | 44 | 34 | 26 | 25 | 23 | 23 | 33 | 25 | 22 |
| | 808 | 224 | 50 | 44 | 34 | 26 | 25 | 23 | 23 | 33 | 25 | 22 |
| 200 | 220 | 61 | 37 | 31 | 21 | 16 | 15 | 19 | 23 | 26 | 18 | 22 |
| | 734 | 204 | 44 | 38 | 29 | 25 | 23 | 20 | 22 | 31 | 23 | 21 |
| | 972 | 270 | 48 | 42 | 35 | 32 | 30 | 26 | 24 | 37 | 29 | 25 |
| | 1210 | 336 | 48 | 42 | 35 | 32 | 30 | 26 | 24 | 37 | 29 | 25 |
| 250 | 353 | 98 | 40 | 31 | 19 | 21 | 14 | 17 | 21 | 26 | 18 | 20 |
| | 1181 | 328 | 48 | 42 | 28 | 21 | 18 | 21 | 22 | 32 | 24 | 21 |
| | 1559 | 433 | 52 | 46 | 33 | 25 | 23 | 23 | 23 | 36 | 28 | 22 |
| | 1940 | 539 | 52 | 46 | 33 | 25 | 23 | 23 | 23 | 36 | 28 | 25 |
| 315 | 576 | 160 | 43 | 36 | 28 | 21 | 25 | 23 | 29 | 33 | 25 | 28 |
| | 1915 | 532 | 54 | 47 | 37 | 30 | 30 | 29 | 31 | 40 | 32 | 30 |
| | 2531 | 703 | 57 | 50 | 41 | 34 | 34 | 33 | 33 | 43 | 35 | 32 |
| | 3146 | 874 | 57 | 50 | 41 | 34 | 34 | 33 | 33 | 43 | 35 | 32 |
| 355 | 736 | 204 | 43 | 38 | 29 | 23 | 26 | 25 | 30 | 34 | 26 | 29 |
| | 2452 | 681 | 55 | 53 | 41 | 35 | 34 | 32 | 32 | 44 | 36 | 31 |
| | 3244 | 901 | 59 | 53 | 41 | 35 | 34 | 32 | 32 | 44 | 36 | 31 |
| | 4032 | 1120 | 59 | 53 | 41 | 35 | 34 | 32 | 32 | 44 | 36 | 31 |
| 400 | 943 | 262 | 45 | 39 | 31 | 27 | 26 | 25 | 29 | 35 | 27 | 28 |
| | 3139 | 872 | 54 | 50 | 41 | 37 | 34 | 33 | 32 | 44 | 36 | 31 |
| | 4147 | 1152 | 58 | 52 | 45 | 41 | 39 | 37 | 35 | 48 | 40 | 34 |
| | 5159 | 1433 | 61 | 57 | 50 | 44 | 44 | 42 | 37 | 52 | 45 | 40 |

BOX/L-S Airborne noise

| | | | Upstream pressure 200 Pa | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | Qv | Qv | F (Hz) | | | | | | | LwA | LpA | NR |
| mm | m³/h | l/s | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA | dBA | dB |
| 100 | 47 | 13 | 33 | 30 | 21 | 14 | 14 | 19 | 23 | 25 | 17 | 22 |
| | 158 | 44 | 46 | 44 | 32 | 16 | 16 | 20 | 23 | 28 | 20 | 22 |
| | 212 | 59 | 50 | 46 | 34 | 19 | 19 | 21 | 24 | 30 | 22 | 23 |
| | 287 | 79 | 51 | 46 | 36 | 19 | 19 | 22 | 24 | 31 | 23 | 23 |
| 125 | 79 | 22 | 35 | 35 | 26 | 17 | 16 | 21 | 23 | 27 | 19 | 22 |
| | 266 | 74 | 49 | 45 | 34 | 19 | 18 | 21 | 23 | 31 | 23 | 22 |
| | 349 | 97 | 52 | 49 | 37 | 22 | 19 | 22 | 23 | 34 | 26 | 22 |
| | 469 | 130 | 56 | 52 | 39 | 26 | 23 | 24 | 25 | 36 | 28 | 24 |
| 160 | 137 | 38 | 37 | 38 | 26 | 16 | 17 | 21 | 23 | 28 | 20 | 22 |
| | 457 | 127 | 51 | 46 | 34 | 23 | 21 | 23 | 24 | 33 | 25 | 23 |
| | 601 | 167 | 57 | 49 | 39 | 29 | 28 | 26 | 25 | 38 | 30 | 24 |
| | 808 | 224 | 58 | 51 | 40 | 32 | 31 | 29 | 27 | 40 | 32 | 26 |
| 200 | 220 | 61 | 40 | 36 | 28 | 17 | 15 | 20 | 23 | 28 | 20 | 22 |
| | 734 | 204 | 51 | 46 | 33 | 27 | 25 | 22 | 23 | 35 | 27 | 22 |
| | 972 | 270 | 52 | 48 | 37 | 33 | 32 | 27 | 25 | 39 | 31 | 27 |
| | 1210 | 336 | 56 | 51 | 41 | 38 | 37 | 33 | 30 | 44 | 36 | 32 |
| 250 | 353 | 98 | 48 | 40 | 28 | 18 | 24 | 21 | 23 | 32 | 24 | 22 |
| | 1181 | 328 | 58 | 50 | 37 | 27 | 23 | 24 | 24 | 39 | 31 | 27 |
| | 1559 | 433 | 60 | 53 | 41 | 33 | 29 | 27 | 26 | 43 | 35 | 30 |
| | 1940 | 539 | 58 | 54 | 40 | 31 | 30 | 29 | 28 | 43 | 35 | 31 |
| 315 | 576 | 160 | 50 | 49 | 38 | 27 | 30 | 33 | 30 | 41 | 33 | 30 |
| | 1915 | 532 | 58 | 53 | 43 | 35 | 35 | 34 | 33 | 45 | 37 | 32 |
| | 2531 | 703 | 62 | 57 | 46 | 37 | 38 | 38 | 36 | 49 | 41 | 36 |
| | 3146 | 874 | 65 | 58 | 49 | 41 | 40 | 40 | 38 | 51 | 43 | 37 |
| 355 | 736 | 204 | 47 | 48 | 38 | 27 | 32 | 36 | 32 | 42 | 34 | 33 |
| | 2452 | 681 | 60 | 55 | 46 | 39 | 38 | 37 | 37 | 48 | 40 | 36 |
| | 3244 | 901 | 64 | 59 | 50 | 44 | 42 | 41 | 40 | 52 | 44 | 39 |
| | 4032 | 1120 | 66 | 61 | 53 | 46 | 45 | 44 | 42 | 55 | 47 | 41 |
| 400 | 943 | 262 | 49 | 48 | 39 | 31 | 33 | 34 | 31 | 42 | 34 | 31 |
| | 3139 | 872 | 59 | 55 | 47 | 44 | 42 | 39 | 36 | 51 | 42 | 37 |
| | 4147 | 1152 | 62 | 59 | 50 | 45 | 44 | 44 | 40 | 53 | 45 | 41 |
| | 5159 | 1433 | 62 | 59 | 50 | 45 | 44 | 44 | 40 | 53 | 45 | 41 |

BOX/L-S Airborne noise

| | | | Upstream pressure 500 Pa | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | Qv | Qv | F (Hz) | | | | | | | LwA | LpA | NR |
| mm | m³/h | l/s | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA | dBA | dB |
| 100 | 47 | 13 | 35 | 33 | 27 | 17 | 15 | 20 | 24 | 27 | 19 | 23 |
| | 158 | 44 | 50 | 46 | 40 | 23 | 21 | 23 | 26 | 33 | 25 | 25 |
| | 212 | 59 | 56 | 52 | 44 | 23 | 22 | 24 | 25 | 37 | 29 | 25 |
| | 287 | 79 | 60 | 54 | 45 | 24 | 23 | 26 | 26 | 38 | 30 | 26 |
| 125 | 79 | 22 | 37 | 36 | 34 | 23 | 17 | 22 | 26 | 31 | 23 | 25 |
| | 266 | 74 | 53 | 50 | 41 | 26 | 22 | 25 | 28 | 36 | 28 | 27 |
| | 349 | 97 | 57 | 55 | 42 | 27 | 24 | 26 | 28 | 39 | 31 | 27 |
| | 469 | 130 | 61 | 58 | 45 | 30 | 27 | 28 | 28 | 42 | 34 | 29 |
| 160 | 137 | 38 | 44 | 41 | 39 | 27 | 25 | 24 | 26 | 35 | 27 | 25 |
| | 457 | 127 | 58 | 54 | 43 | 28 | 26 | 31 | 32 | 41 | 33 | 31 |
| | 601 | 167 | 62 | 56 | 46 | 32 | 30 | 33 | 32 | 44 | 36 | 31 |
| | 808 | 224 | 65 | 60 | 48 | 35 | 34 | 34 | 33 | 47 | 39 | 34 |
| 200 | 220 | 61 | 48 | 41 | 38 | 26 | 20 | 23 | 27 | 35 | 27 | 26 |
| | 734 | 204 | 61 | 55 | 43 | 32 | 29 | 28 | 30 | 43 | 35 | 30 |
| | 972 | 270 | 64 | 58 | 45 | 36 | 34 | 31 | 31 | 45 | 38 | 34 |
| | 1210 | 336 | 64 | 59 | 46 | 40 | 39 | 36 | 33 | 48 | 40 | 35 |
| 250 | 353 | 98 | 55 | 47 | 36 | 33 | 29 | 28 | 31 | 39 | 31 | 30 |
| | 1181 | 328 | 67 | 57 | 46 | 34 | 30 | 33 | 35 | 47 | 39 | 34 |
| | 1559 | 433 | 70 | 60 | 47 | 35 | 33 | 38 | 40 | 50 | 42 | 39 |
| | 1940 | 539 | 69 | 63 | 49 | 37 | 34 | 40 | 38 | 52 | 44 | 41 |
| 315 | 576 | 160 | 52 | 60 | 53 | 37 | 38 | 40 | 39 | 52 | 44 | 41 |
| | 1915 | 532 | 65 | 60 | 52 | 43 | 43 | 43 | 41 | 53 | 45 | 40 |
| | 2531 | 703 | 68 | 63 | 54 | 45 | 45 | 44 | 46 | 55 | 48 | 45 |
| | 3146 | 874 | 68 | 63 | 54 | 45 | 45 | 44 | 46 | 55 | 48 | 45 |
| 355 | 736 | 204 | 51 | 59 | 52 | 38 | 39 | 43 | 41 | 52 | 44 | 40 |
| | 2452 | 681 | 66 | 63 | 54 | 45 | 45 | 46 | 44 | 55 | 48 | 43 |
| | 3244 | 901 | 70 | 66 | 58 | 48 | 48 | 47 | 45 | 59 | 51 | 46 |
| | 4032 | 1120 | 70 | 66 | 58 | 48 | 48 | 47 | 45 | 59 | 51 | 46 |
| 400 | 943 | 262 | 53 | 58 | 53 | 40 | 45 | 45 | 42 | 54 | 46 | 42 |
| | 3139 | 872 | 68 | 63 | 56 | 52 | 52 | 49 | 48 | 59 | 51 | 47 |
| | 4147 | 1152 | 67 | 63 | 55 | 52 | 51 | 48 | 46 | 59 | 51 | 46 |
| | 5159 | 1433 | 67 | 63 | 55 | 52 | 51 | 48 | 46 | 59 | 51 | 46 |

## SOUND DATA

BOX/L-E Airborne noise

| | | | Upstream pressure | | | | | | | | | 100 Pa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | Qv | Qv | F (Hz) | | | | | | | LwA | LpA | NR |
| mm | m³/h | l/s | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA | dBA | dB |
| 100 | 47 | 13 | 31 | 27 | 22 | 13 | 15 | 21 | 31 | 31 | 23 | 30 |
| | 158 | 44 | 43 | 38 | 33 | 20 | 17 | 22 | 31 | 32 | 24 | 30 |
| | 212 | 59 | 43 | 42 | 37 | 20 | 18 | 22 | 30 | 32 | 24 | 29 |
| | 287 | 79 | 43 | 42 | 37 | 20 | 18 | 22 | 30 | 32 | 24 | 29 |
| 125 | 79 | 22 | 31 | 29 | 24 | 14 | 15 | 22 | 31 | 31 | 23 | 30 |
| | 266 | 74 | 42 | 40 | 35 | 17 | 16 | 22 | 31 | 33 | 25 | 30 |
| | 349 | 97 | 41 | 43 | 37 | 21 | 18 | 23 | 31 | 34 | 26 | 30 |
| | 469 | 130 | 41 | 43 | 37 | 21 | 18 | 23 | 31 | 34 | 26 | 30 |
| 160 | 137 | 38 | 37 | 35 | 29 | 20 | 18 | 22 | 31 | 32 | 24 | 30 |
| | 457 | 127 | 44 | 42 | 37 | 22 | 18 | 23 | 31 | 34 | 26 | 30 |
| | 601 | 167 | 45 | 45 | 38 | 22 | 18 | 23 | 31 | 35 | 27 | 30 |
| | 808 | 224 | 45 | 45 | 38 | 22 | 18 | 23 | 31 | 35 | 27 | 30 |
| 200 | 220 | 61 | 38 | 39 | 29 | 18 | 16 | 21 | 30 | 32 | 24 | 29 |
| | 734 | 204 | 44 | 45 | 37 | 120 | 18 | 22 | 30 | 35 | 27 | 29 |
| | 972 | 270 | 47 | 49 | 41 | 26 | 22 | 25 | 30 | 39 | 31 | 29 |
| | 1210 | 336 | 49 | 53 | 45 | 31 | 26 | 27 | 30 | 42 | 34 | 31 |
| 250 | 353 | 98 | 37 | 38 | 26 | 18 | 17 | 21 | 30 | 32 | 24 | 29 |
| | 1181 | 328 | 45 | 47 | 35 | 20 | 17 | 21 | 30 | 35 | 28 | 29 |
| | 1559 | 433 | 48 | 52 | 638 | 26 | 20 | 22 | 30 | 40 | 32 | 29 |
| | 1940 | 539 | 48 | 52 | 38 | 26 | 20 | 22 | 30 | 40 | 32 | 29 |
| 315 | 576 | 160 | 40 | 37 | 26 | 18 | 18 | 22 | 31 | 33 | 25 | 30 |
| | 1915 | 532 | 49 | 49 | 38 | 23 | 21 | 23 | 31 | 39 | 31 | 30 |
| | 2531 | 703 | 51 | 53 | 41 | 29 | 25 | 25 | 31 | 43 | 35 | 31 |
| | 3146 | 874 | 51 | 53 | 41 | 29 | 25 | 25 | 31 | 43 | 35 | 31 |
| 355 | 736 | 204 | 40 | 36 | 26 | 20 | 19 | 22 | 30 | 32 | 24 | 29 |
| | 2452 | 681 | 46 | 48 | 40 | 27 | 23 | 23 | 31 | 40 | 32 | 30 |
| | 3244 | 901 | 49 | 51 | 46 | 36 | 31 | 26 | 31 | 45 | 37 | 34 |
| | 4032 | 1120 | 49 | 51 | 46 | 36 | 31 | 26 | 31 | 45 | 37 | 34 |
| 400 | 943 | 262 | 40 | 38 | 28 | 20 | 18 | 22 | 30 | 33 | 25 | 29 |
| | 3139 | 872 | 46 | 49 | 39 | 28 | 24 | 23 | 30 | 41 | 33 | 29 |
| | 4147 | 1152 | 49 | 52 | 46 | 36 | 31 | 26 | 30 | 45 | 38 | 34 |
| | 5159 | 1433 | 49 | 52 | 46 | 36 | 31 | 26 | 30 | 45 | 38 | 34 |

BOX/L-E Airborne noise

| | | | Upstream pressure | | | | | | | | | 200 Pa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | Qv | Qv | F (Hz) | | | | | | | LwA | LpA | NR |
| mm | m³/h | l/s | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA | dBA | dB |
| 100 | 47 | 13 | 30 | 30 | 23 | 13 | 16 | 22 | 31 | 31 | 23 | 30 |
| | 158 | 44 | 45 | 42 | 38 | 21 | 18 | 23 | 31 | 33 | 25 | 30 |
| | 212 | 59 | 46 | 46 | 41 | 23 | 20 | 24 | 31 | 35 | 27 | 30 |
| | 287 | 79 | 48 | 48 | 43 | 26 | 22 | 25 | 31 | 36 | 28 | 30 |
| 125 | 79 | 22 | 34 | 32 | 25 | 14 | 16 | 22 | 31 | 31 | 23 | 30 |
| | 266 | 74 | 47 | 44 | 40 | 24 | 18 | 23 | 31 | 35 | 27 | 30 |
| | 349 | 97 | 46 | 48 | 43 | 25 | 20 | 24 | 31 | 37 | 29 | 30 |
| | 469 | 130 | 47 | 51 | 45 | 28 | 22 | 26 | 31 | 39 | 31 | 30 |
| 160 | 137 | 38 | 37 | 37 | 31 | 30 | 19 | 23 | 31 | 32 | 24 | 30 |
| | 457 | 127 | 53 | 47 | 46 | 30 | 20 | 25 | 32 | 41 | 33 | 31 |
| | 601 | 167 | 52 | 51 | 46 | 30 | 21 | 25 | 32 | 41 | 33 | 31 |
| | 808 | 224 | 51 | 52 | 46 | 31 | 22 | 26 | 32 | 42 | 34 | 31 |
| 200 | 220 | 61 | 38 | 43 | 34 | 21 | 18 | 22 | 30 | 34 | 26 | 29 |
| | 734 | 204 | 51 | 51 | 44 | 27 | 23 | 26 | 30 | 41 | 33 | 29 |
| | 972 | 270 | 52 | 54 | 46 | 30 | 25 | 28 | 31 | 43 | 35 | 32 |
| | 1210 | 336 | 52 | 56 | 48 | 32 | 27 | 29 | 31 | 45 | 37 | 34 |
| 250 | 353 | 98 | 40 | 42 | 30 | 18 | 18 | 22 | 30 | 33 | 25 | 29 |
| | 1181 | 328 | 51 | 51 | 42 | 24 | 19 | 23 | 31 | 41 | 33 | 30 |
| | 1559 | 433 | 52 | 54 | 44 | 28 | 22 | 24 | 30 | 43 | 35 | 31 |
| | 1940 | 539 | 52 | 54 | 44 | 28 | 22 | 24 | 30 | 43 | 35 | 31 |
| 315 | 576 | 160 | 42 | 40 | 29 | 20 | 20 | 24 | 30 | 34 | 26 | 29 |
| | 1915 | 532 | 55 | 55 | 46 | 28 | 27 | 28 | 31 | 46 | 38 | 34 |
| | 2531 | 703 | 58 | 58 | 49 | 31 | 28 | 29 | 31 | 49 | 41 | 37 |
| | 3146 | 874 | 57 | 59 | 50 | 37 | 32 | 31 | 32 | 50 | 42 | 38 |
| 355 | 736 | 204 | 43 | 39 | 30 | 24 | 26 | 24 | 30 | 35 | 27 | 29 |
| | 2452 | 681 | 54 | 54 | 46 | 33 | 32 | 29 | 31 | 45 | 38 | 34 |
| | 3244 | 901 | 54 | 56 | 49 | 36 | 33 | 29 | 31 | 48 | 40 | 37 |
| | 4032 | 1120 | 56 | 58 | 54 | 44 | 38 | 33 | 32 | 33 | 45 | 42 |
| 400 | 943 | 262 | 44 | 40 | 33 | 24 | 23 | 23 | 31 | 36 | 28 | 30 |
| | 3139 | 872 | 54 | 54 | 45 | 34 | 31 | 28 | 30 | 46 | 38 | 34 |
| | 4147 | 1152 | 55 | 56 | 50 | 37 | 36 | 30 | 31 | 50 | 42 | 38 |
| | 5159 | 1433 | 55 | 56 | 50 | 37 | 36 | 30 | 31 | 50 | 42 | 38 |

BOX/L-E Airborne noise

| | | | Upstream pressure | | | | | | | | | 500 Pa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | Qv | Qv | F (Hz) | | | | | | | LwA | LpA | NR |
| mm | m³/h | l/s | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA | dBA | dB |
| 100 | 47 | 13 | 39 | 35 | 22 | 14 | 16 | 24 | 33 | 33 | 25 | 32 |
| | 158 | 44 | 43 | 45 | 41 | 26 | 22 | 26 | 31 | 35 | 27 | 30 |
| | 212 | 59 | 50 | 51 | 45 | 31 | 24 | 28 | 31 | 38 | 30 | 30 |
| | 287 | 79 | 52 | 53 | 48 | 33 | 27 | 31 | 32 | 41 | 33 | 31 |
| 125 | 79 | 22 | 33 | 34 | 27 | 16 | 16 | 22 | 31 | 31 | 23 | 30 |
| | 266 | 74 | 50 | 49 | 43 | 30 | 22 | 27 | 31 | 38 | 30 | 30 |
| | 349 | 97 | 53 | 53 | 46 | 34 | 25 | 29 | 32 | 41 | 33 | 31 |
| | 469 | 130 | 55 | 57 | 51 | 37 | 28 | 31 | 32 | 45 | 37 | 34 |
| 160 | 137 | 38 | 37 | 39 | 33 | 23 | 23 | 25 | 32 | 34 | 26 | 31 |
| | 457 | 127 | 52 | 51 | 47 | 37 | 28 | 31 | 34 | 43 | 35 | 33 |
| | 601 | 167 | 56 | 55 | 51 | 42 | 29 | 33 | 35 | 47 | 39 | 36 |
| | 808 | 224 | 59 | 58 | 54 | 45 | 30 | 34 | 36 | 50 | 42 | 39 |
| 200 | 220 | 61 | 39 | 46 | 36 | 28 | 25 | 26 | 30 | 37 | 29 | 29 |
| | 734 | 204 | 58 | 58 | 51 | 32 | 27 | 29 | 30 | 48 | 40 | 37 |
| | 972 | 270 | 60 | 61 | 53 | 38 | 32 | 34 | 34 | 50 | 42 | 39 |
| | 1210 | 336 | 62 | 63 | 55 | 43 | 35 | 38 | 37 | 52 | 44 | 41 |
| 250 | 353 | 98 | 39 | 44 | 34 | 26 | 24 | 25 | 30 | 36 | 28 | 29 |
| | 1181 | 328 | 58 | 58 | 46 | 33 | 26 | 29 | 31 | 45 | 38 | 35 |
| | 1559 | 433 | 61 | 61 | 51 | 36 | 28 | 31 | 32 | 50 | 42 | 38 |
| | 1940 | 539 | 61 | 61 | 51 | 36 | 28 | 31 | 32 | 50 | 42 | 38 |
| 315 | 576 | 160 | 45 | 45 | 35 | 26 | 25 | 29 | 32 | 38 | 30 | 31 |
| | 1915 | 532 | 63 | 60 | 49 | 37 | 35 | 35 | 33 | 50 | 42 | 39 |
| | 2531 | 703 | 66 | 63 | 53 | 40 | 38 | 37 | 34 | 54 | 46 | 42 |
| | 3146 | 874 | 67 | 66 | 57 | 43 | 39 | 39 | 35 | 57 | 49 | 46 |
| 355 | 736 | 204 | 47 | 43 | 37 | 31 | 33 | 33 | 30 | 40 | 32 | 30 |
| | 2452 | 681 | 60 | 59 | 50 | 41 | 41 | 39 | 37 | 52 | 44 | 39 |
| | 3244 | 901 | 63 | 63 | 54 | 44 | 43 | 41 | 38 | 55 | 47 | 43 |
| | 4032 | 1120 | 65 | 66 | 58 | 47 | 45 | 42 | 38 | 58 | 50 | 46 |
| 400 | 943 | 262 | 47 | 43 | 41 | 31 | 31 | 31 | 32 | 51 | 33 | 31 |
| | 3139 | 872 | 61 | 59 | 52 | 43 | 43 | 41 | 36 | 53 | 45 | 40 |
| | 4147 | 1152 | 63 | 62 | 55 | 45 | 43 | 40 | 36 | 55 | 47 | 43 |
| | 5159 | 1433 | 63 | 62 | 55 | 45 | 43 | 40 | 36 | 55 | 47 | 43 |

## SOUND DATA

BOX/L-S Radiated noise

| | | | Upstream pressure | | | | | | | | | **100 Pa** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | Qv | Qv | F (Hz) | | | | | | | LwA | LpA | NR |
| mm | m³/h | l/s | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA | dBA | dB |
| 100 | 47 | 13 | <15 | <15 | <15 | <15 | <15 | <15 | <15 | <15 | <15 | <15 |
| | 158 | 44 | 45 | 36 | 28 | 26 | 22 | 17 | 7 | 28 | 20 | 17 |
| | 212 | 59 | 47 | 37 | 29 | 27 | 24 | 18 | 13 | 29 | 21 | 19 |
| | 287 | 79 | 47 | 37 | 29 | 27 | 24 | 18 | 13 | 29 | 21 | 19 |
| 125 | 79 | 22 | <15 | <15 | <15 | <15 | <15 | <15 | <15 | <15 | <15 | <15 |
| | 266 | 74 | 47 | 38 | 27 | 18 | 17 | 3 | 7 | 25 | 17 | 12 |
| | 349 | 97 | 50 | 39 | 28 | 22 | 23 | 18 | 18 | 29 | 21 | 18 |
| | 469 | 130 | 50 | 39 | 28 | 22 | 23 | 18 | 18 | 29 | 21 | 18 |
| 160 | 137 | 38 | 40 | 27 | 21 | 19 | 14 | 13 | 11 | 23 | 15 | 11 |
| | 457 | 127 | 53 | 36 | 28 | 25 | 19 | 15 | 7 | 29 | 21 | 16 |
| | 601 | 167 | 54 | 39 | 25 | 24 | 19 | 15 | 5 | 29 | 21 | 15 |
| | 808 | 224 | 54 | 39 | 25 | 24 | 19 | 15 | 5 | 29 | 21 | 15 |
| 200 | 220 | 61 | 37 | 31 | 21 | 21 | 19 | 11 | 11 | 25 | 17 | 14 |
| | 734 | 204 | 47 | 36 | 23 | 26 | 27 | 24 | 21 | 32 | 24 | 22 |
| | 972 | 270 | 52 | 41 | 25 | 30 | 31 | 27 | 24 | 36 | 28 | 26 |
| | 1210 | 336 | 52 | 41 | 25 | 30 | 31 | 27 | 24 | 36 | 28 | 26 |
| 250 | 353 | 98 | 37 | 29 | 22 | 28 | 18 | 10 | 3 | 29 | 21 | 20 |
| | 1181 | 328 | 53 | 39 | 31 | 29 | 26 | 20 | 12 | 34 | 26 | 21 |
| | 1559 | 433 | 57 | 45 | 36 | 33 | 32 | 27 | 23 | 39 | 31 | 27 |
| | 1940 | 539 | 57 | 45 | 36 | 33 | 32 | 27 | 23 | 39 | 31 | 27 |
| 315 | 576 | 160 | 42 | 36 | 24 | 23 | 23 | 17 | 18 | 30 | 22 | 18 |
| | 1915 | 532 | 54 | 49 | 34 | 29 | 25 | 21 | 15 | 39 | 31 | 27 |
| | 2531 | 703 | 56 | 50 | 31 | 30 | 28 | 25 | 23 | 40 | 32 | 28 |
| | 3146 | 874 | 56 | 50 | 31 | 30 | 28 | 25 | 23 | 40 | 32 | 28 |
| 355 | 736 | 204 | 37 | 33 | 20 | 20 | 25 | 21 | 3 | 29 | 21 | 20 |
| | 2452 | 681 | 46 | 48 | 40 | 33 | 29 | 21 | 23 | 41 | 33 | 27 |
| | 3244 | 901 | 54 | 52 | 44 | 39 | 36 | 34 | 25 | 46 | 38 | 32 |
| | 4032 | 1120 | 54 | 52 | 44 | 39 | 36 | 34 | 25 | 46 | 38 | 32 |
| 400 | 943 | 262 | 34 | 41 | 27 | 27 | 26 | 21 | 22 | 34 | 26 | 21 |
| | 3139 | 872 | 47 | 37 | 37 | 30 | 27 | 24 | 26 | 37 | 29 | 25 |
| | 4147 | 1152 | 57 | 46 | 41 | 37 | 32 | 29 | 30 | 43 | 35 | 29 |
| | 5159 | 1433 | 57 | 46 | 41 | 37 | 32 | 29 | 30 | 43 | 35 | 29 |

BOX/L-S Radiated noise

| | | | Upstream pressure | | | | | | | | | **200 Pa** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | Qv | Qv | F (Hz) | | | | | | | LwA | LpA | NR |
| mm | m³/h | l/s | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA | dBA | dB |
| 100 | 47 | 13 | 20 | 29 | 22 | 20 | 11 | 5 | 3 | 20 | 12 | 10 |
| | 158 | 44 | 52 | 42 | 34 | 31 | 28 | 25 | 18 | 34 | 26 | 23 |
| | 212 | 59 | 56 | 45 | 38 | 35 | 32 | 30 | 21 | 38 | 30 | 27 |
| | 287 | 79 | 57 | 46 | 38 | 36 | 33 | 31 | 23 | 39 | 31 | 28 |
| 125 | 79 | 22 | 30 | 34 | 29 | 20 | 18 | 3 | 14 | 25 | 17 | 14 |
| | 266 | 74 | 53 | 38 | 28 | 23 | 25 | 19 | 10 | 30 | 22 | 20 |
| | 349 | 97 | 57 | 32 | 34 | 26 | 27 | 23 | 22 | 33 | 25 | 22 |
| | 436 | 121 | 59 | 44 | 38 | 30 | 30 | 27 | 20 | 36 | 28 | 25 |
| 160 | 137 | 38 | 41 | 34 | 29 | 23 | 22 | 17 | 17 | 28 | 20 | 17 |
| | 457 | 127 | 57 | 39 | 33 | 26 | 26 | 25 | 12 | 33 | 25 | 22 |
| | 601 | 167 | 57 | 39 | 29 | 27 | 27 | 25 | 11 | 33 | 25 | 22 |
| | 808 | 224 | 62 | 50 | 37 | 31 | 30 | 28 | 20 | 39 | 31 | 25 |
| 200 | 220 | 61 | 38 | 36 | 30 | 22 | 28 | 23 | 21 | 32 | 24 | 23 |
| | 734 | 204 | 54 | 47 | 30 | 28 | 34 | 29 | 26 | 39 | 31 | 29 |
| | 972 | 270 | 55 | 47 | 28 | 31 | 35 | 34 | 31 | 41 | 33 | 31 |
| | 1210 | 336 | 53 | 49 | 35 | 34 | 36 | 37 | 33 | 43 | 35 | 34 |
| 250 | 353 | 98 | 27 | 25 | 28 | 26 | 31 | 21 | 7 | 34 | 26 | 26 |
| | 1181 | 328 | 49 | 24 | 27 | 28 | 35 | 29 | 25 | 37 | 30 | 30 |
| | 1559 | 433 | 56 | 41 | 33 | 31 | 34 | 32 | 28 | 40 | 32 | 29 |
| | 1940 | 539 | 65 | 54 | 44 | 39 | 39 | 36 | 33 | 47 | 39 | 34 |
| 315 | 576 | 160 | 43 | 42 | 25 | 24 | 27 | 23 | 21 | 34 | 26 | 22 |
| | 1915 | 532 | 57 | 53 | 36 | 32 | 32 | 27 | 17 | 43 | 35 | 32 |
| | 2531 | 703 | 63 | 58 | 44 | 37 | 36 | 29 | 26 | 48 | 40 | 37 |
| | 3146 | 874 | 64 | 60 | 47 | 40 | 38 | 36 | 28 | 50 | 42 | 39 |
| 355 | 736 | 204 | 42 | 42 | 25 | 25 | 27 | 32 | 22 | 37 | 29 | 29 |
| | 2452 | 681 | 50 | 54 | 44 | 37 | 37 | 25 | 38 | 47 | 39 | 37 |
| | 3244 | 901 | 59 | 58 | 48 | 42 | 40 | 37 | 29 | 50 | 42 | 38 |
| | 4032 | 1120 | 62 | 59 | 51 | 46 | 42 | 39 | 38 | 53 | 45 | 39 |
| 400 | 943 | 262 | 39 | 46 | 35 | 31 | 33 | 27 | 23 | 40 | 32 | 28 |
| | 3139 | 872 | 54 | 55 | 49 | 36 | 46 | 38 | 29 | 51 | 43 | 41 |
| | 4147 | 1152 | 59 | 54 | 48 | 39 | 36 | 31 | 32 | 48 | 40 | 36 |
| | 5159 | 1433 | 59 | 54 | 48 | 39 | 36 | 31 | 32 | 48 | 40 | 36 |

BOX/L-S Radiated noise

| | | | Upstream pressure | | | | | | | | | **500 Pa** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | Qv | Qv | F (Hz) | | | | | | | LwA | LpA | NR |
| mm | m³/h | l/s | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA | dBA | dB |
| 100 | 47 | 13 | 26 | 30 | 29 | 25 | 23 | 22 | 28 | 31 | 23 | 27 |
| | 158 | 44 | 49 | 44 | 37 | 34 | 32 | 30 | 26 | 38 | 30 | 27 |
| | 212 | 59 | 55 | 47 | 38 | 38 | 36 | 33 | 28 | 41 | 33 | 31 |
| | 287 | 79 | 62 | 52 | 45 | 41 | 39 | 37 | 33 | 45 | 37 | 34 |
| 125 | 79 | 22 | 34 | 36 | 36 | 28 | 27 | 22 | 18 | 33 | 25 | 22 |
| | 266 | 74 | 54 | 42 | 41 | 32 | 32 | 29 | 22 | 38 | 30 | 27 |
| | 349 | 97 | 59 | 44 | 43 | 34 | 35 | 32 | 27 | 41 | 33 | 30 |
| | 469 | 130 | 64 | 48 | 45 | 35 | 36 | 33 | 27 | 42 | 34 | 31 |
| 160 | 137 | 38 | 45 | 41 | 42 | 33 | 33 | 28 | 26 | 40 | 32 | 28 |
| | 457 | 127 | 54 | 51 | 40 | 32 | 33 | 33 | 31 | 41 | 33 | 30 |
| | 601 | 167 | 61 | 50 | 41 | 33 | 35 | 35 | 32 | 42 | 34 | 32 |
| | 808 | 224 | 65 | 34 | 41 | 37 | 38 | 37 | 33 | 44 | 36 | 34 |
| 200 | 220 | 61 | 35 | 39 | 43 | 35 | 37 | 33 | 28 | 43 | 35 | 32 |
| | 734 | 204 | 61 | 53 | 40 | 35 | 37 | 38 | 36 | 45 | 37 | 35 |
| | 972 | 270 | 65 | 54 | 41 | 36 | 40 | 40 | 39 | 47 | 39 | 38 |
| | 1210 | 336 | 65 | 59 | 43 | 38 | 42 | 43 | 43 | 50 | 42 | 42 |
| 250 | 353 | 98 | 52 | 32 | 36 | 35 | 36 | 32 | 24 | 40 | 32 | 31 |
| | 1181 | 328 | 56 | 41 | 37 | 34 | 41 | 42 | 37 | 46 | 38 | 39 |
| | 1559 | 433 | 53 | 45 | 43 | 37 | 40 | 39 | 24 | 46 | 38 | 36 |
| | 1940 | 539 | 68 | 57 | 49 | 42 | 42 | 40 | 39 | 51 | 43 | 38 |
| 315 | 576 | 160 | 46 | 49 | 45 | 32 | 34 | 29 | 27 | 44 | 36 | 32 |
| | 1915 | 532 | 59 | 60 | 44 | 38 | 40 | 44 | 35 | 51 | 43 | 41 |
| | 2531 | 703 | 64 | 63 | 47 | 41 | 42 | 39 | 38 | 53 | 45 | 42 |
| | 3146 | 874 | 65 | 65 | 50 | 41 | 43 | 40 | 32 | 55 | 47 | 44 |
| 355 | 736 | 204 | 43 | 53 | 37 | 32 | 34 | 41 | 40 | 46 | 38 | 39 |
| | 2452 | 681 | 58 | 58 | 50 | 45 | 42 | 43 | 42 | 53 | 45 | 41 |
| | 3244 | 901 | 62 | 64 | 54 | 43 | 45 | 43 | 37 | 56 | 48 | 44 |
| | 4032 | 1120 | 62 | 64 | 54 | 43 | 45 | 43 | 37 | 56 | 48 | 44 |
| 400 | 943 | 262 | 45 | 53 | 45 | 36 | 42 | 35 | 25 | 48 | 40 | 37 |
| | 3139 | 872 | 61 | 62 | 56 | 44 | 48 | 52 | 46 | 58 | 50 | 49 |
| | 4147 | 1152 | 62 | 65 | 57 | 42 | 41 | 34 | 35 | 57 | 49 | 46 |
| | 5159 | 1433 | 62 | 65 | 57 | 42 | 41 | 34 | 35 | 57 | 49 | 46 |

## SOUND DATA

BOX/L-E Radiated noise

| | | | Upstream pressure | | | | | | | | | **100 Pa** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | Qv | Qv | F (Hz) | | | | | | | LwA | LpA | NR |
| mm | m³/h | l/s | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA | dBA | dB |
| 100 | 47 | 13 | 35 | 34 | 16 | 17 | 12 | 13 | 21 | 23 | 15 | 20 |
| | 158 | 44 | 41 | 32 | 16 | 3 | 3 | 12 | 19 | 20 | 12 | 18 |
| | 212 | 59 | 45 | 35 | 33 | 14 | 10 | 6 | 9 | 24 | 16 | 14 |
| | 287 | 79 | 45 | 35 | 33 | 14 | 10 | 6 | 9 | 24 | 16 | 14 |
| 125 | 79 | 22 | 37 | 31 | 30 | 16 | 13 | 18 | 22 | 24 | 16 | 21 |
| | 266 | 74 | 48 | 40 | 32 | 18 | 15 | 18 | 22 | 28 | 20 | 21 |
| | 349 | 97 | 48 | 42 | 33 | 20 | 15 | 17 | 22 | 29 | 21 | 21 |
| | 469 | 130 | 48 | 42 | 33 | 20 | 15 | 17 | 22 | 29 | 21 | 21 |
| 160 | 137 | 38 | 35 | 29 | 26 | 7 | 3 | 10 | 7 | 21 | 13 | 10 |
| | 457 | 127 | 44 | 43 | 35 | 20 | 16 | 3 | 12 | 31 | 23 | 19 |
| | 601 | 167 | 38 | 49 | 36 | 23 | 16 | 13 | 8 | 34 | 26 | 22 |
| | 808 | 224 | 38 | 49 | 36 | 23 | 16 | 13 | 8 | 34 | 26 | 22 |
| 200 | 220 | 61 | 38 | 31 | 26 | 20 | 17 | 17 | 26 | 28 | 20 | 25 |
| | 734 | 204 | 49 | 42 | 31 | 20 | 15 | 14 | 24 | 31 | 23 | 23 |
| | 972 | 270 | 46 | 49 | 41 | 25 | 21 | 24 | 30 | 38 | 30 | 29 |
| | 1210 | 336 | 56 | 49 | 42 | 32 | 26 | 3 | 24 | 40 | 32 | 27 |
| 250 | 353 | 98 | 37 | 36 | 24 | 20 | 15 | 13 | 21 | 27 | 19 | 20 |
| | 1181 | 328 | 50 | 49 | 36 | 26 | 20 | 21 | 30 | 38 | 30 | 29 |
| | 1559 | 433 | 50 | 49 | 43 | 33 | 26 | 21 | 27 | 41 | 33 | 29 |
| | 1940 | 539 | 50 | 49 | 43 | 33 | 26 | 21 | 27 | 41 | 33 | 29 |
| 315 | 576 | 160 | 34 | 34 | 23 | 20 | 18 | 3 | 13 | 26 | 18 | 13 |
| | 1915 | 532 | 26 | 46 | 34 | 23 | 19 | 5 | 13 | 36 | 28 | 24 |
| | 2531 | 703 | 47 | 45 | 36 | 28 | 23 | 18 | 12 | 37 | 29 | 23 |
| | 3146 | 874 | 63 | 44 | 38 | 32 | 26 | 28 | 11 | 41 | 33 | 28 |
| 355 | 736 | 204 | 15 | 24 | 17 | 13 | 4 | 14 | 10 | 20 | 12 | 12 |
| | 2452 | 681 | 45 | 43 | 37 | 27 | 24 | 19 | 16 | 37 | 29 | 24 |
| | 3244 | 901 | 47 | 24 | 29 | 28 | 27 | 25 | 15 | 34 | 26 | 22 |
| | 4032 | 1120 | 47 | 24 | 29 | 28 | 27 | 25 | 15 | 34 | 26 | 22 |
| 400 | 943 | 262 | 31 | 37 | 21 | 20 | 17 | 12 | 22 | 29 | 21 | 21 |
| | 3139 | 872 | 46 | 48 | 23 | 20 | 4 | 6 | 7 | 37 | 29 | 28 |
| | 4147 | 1152 | 52 | 49 | 25 | 31 | 16 | 17 | 14 | 39 | 31 | 29 |
| | 5159 | 1433 | 52 | 49 | 25 | 31 | 16 | 17 | 14 | 39 | 31 | 29 |

BOX/L-E Radiated noise

| | | | Upstream pressure | | | | | | | | | **200 Pa** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | Qv | Qv | F (Hz) | | | | | | | LwA | LpA | NR |
| mm | m³/h | l/s | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA | dBA | dB |
| 100 | 47 | 13 | 34 | 36 | 29 | 17 | 13 | 14 | 21 | 25 | 17 | 20 |
| | 158 | 44 | 49 | 34 | 30 | 20 | 18 | 16 | 13 | 25 | 17 | 14 |
| | 212 | 59 | 50 | 36 | 35 | 21 | 19 | 18 | 15 | 28 | 20 | 16 |
| | 287 | 79 | 53 | 35 | 35 | 26 | 20 | 20 | 25 | 31 | 23 | 24 |
| 125 | 79 | 22 | 38 | 28 | 10 | 16 | 15 | 18 | 21 | 24 | 16 | 20 |
| | 266 | 74 | 55 | 44 | 33 | 23 | 21 | 21 | 23 | 30 | 23 | 22 |
| | 349 | 97 | 56 | 47 | 32 | 25 | 21 | 20 | 22 | 32 | 24 | 21 |
| | 436 | 121 | 57 | 49 | 39 | 27 | 23 | 20 | 22 | 35 | 27 | 22 |
| 160 | 137 | 38 | 29 | 18 | 23 | 17 | 20 | 12 | 12 | 24 | 16 | 15 |
| | 457 | 127 | 49 | 46 | 42 | 28 | 24 | 14 | 3 | 37 | 29 | 26 |
| | 601 | 167 | 48 | 51 | 44 | 29 | 26 | 21 | 12 | 40 | 32 | 28 |
| | 808 | 224 | 63 | 60 | 54 | 42 | 35 | 33 | 22 | 50 | 42 | 39 |
| 200 | 220 | 61 | 38 | 27 | 21 | 28 | 26 | 23 | 26 | 32 | 24 | 25 |
| | 734 | 204 | 57 | 45 | 37 | 28 | 24 | 18 | 24 | 36 | 28 | 23 |
| | 972 | 270 | 51 | 53 | 46 | 29 | 24 | 27 | 30 | 43 | 35 | 32 |
| | 1210 | 336 | 67 | 61 | 49 | 42 | 35 | 29 | 11 | 49 | 41 | 37 |
| 250 | 353 | 98 | 40 | 39 | 35 | 31 | 27 | 24 | 21 | 36 | 28 | 23 |
| | 1181 | 328 | 56 | 51 | 40 | 31 | 29 | 26 | 33 | 41 | 33 | 32 |
| | 1559 | 433 | 58 | 55 | 47 | 35 | 30 | 27 | 31 | 46 | 38 | 34 |
| | 1940 | 539 | 58 | 55 | 47 | 35 | 30 | 27 | 31 | 46 | 38 | 34 |
| 315 | 576 | 160 | 41 | 40 | 32 | 30 | 26 | 28 | 25 | 36 | 28 | 25 |
| | 1915 | 532 | 46 | 50 | 38 | 31 | 29 | 28 | 19 | 41 | 33 | 28 |
| | 2531 | 703 | 53 | 51 | 44 | 34 | 31 | 30 | 8 | 44 | 36 | 31 |
| | 3146 | 874 | 58 | 52 | 49 | 36 | 33 | 32 | 3 | 47 | 39 | 36 |
| 355 | 736 | 204 | 40 | 39 | 28 | 27 | 25 | 22 | 11 | 33 | 25 | 20 |
| | 2452 | 681 | 52 | 41 | 40 | 32 | 29 | 25 | 12 | 39 | 31 | 27 |
| | 3244 | 901 | 54 | 50 | 43 | 36 | 34 | 30 | 24 | 44 | 36 | 31 |
| | 4032 | 1120 | 56 | 48 | 47 | 37 | 36 | 34 | 25 | 46 | 38 | 35 |
| 400 | 943 | 262 | 36 | 39 | 27 | 27 | 23 | 20 | 20 | 33 | 25 | 19 |
| | 3139 | 872 | 43 | 51 | 32 | 13 | 12 | 11 | 8 | 40 | 32 | 31 |
| | 4147 | 1152 | 52 | 52 | 39 | 45 | 35 | 30 | 10 | 47 | 39 | 37 |
| | 5159 | 1433 | 52 | 52 | 39 | 45 | 35 | 30 | 10 | 47 | 39 | 37 |

BOX/L-E Radiated noise

| | | | Upstream pressure | | | | | | | | | **500 Pa** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | Qv | Qv | F (Hz) | | | | | | | LwA | LpA | NR |
| mm | m³/h | l/s | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA | dBA | dB |
| 100 | 47 | 13 | 33 | 39 | 34 | 20 | 18 | 16 | 21 | 28 | 20 | 20 |
| | 158 | 44 | 45 | 31 | 33 | 29 | 28 | 26 | 20 | 33 | 25 | 23 |
| | 212 | 59 | 53 | 40 | 40 | 29 | 29 | 27 | 21 | 35 | 27 | 24 |
| | 287 | 79 | 56 | 37 | 33 | 27 | 27 | 20 | 25 | 32 | 24 | 24 |
| 125 | 79 | 22 | 34 | 29 | 15 | 17 | 18 | 20 | 22 | 26 | 18 | 21 |
| | 266 | 74 | 55 | 42 | 36 | 25 | 27 | 25 | 27 | 34 | 26 | 26 |
| | 349 | 97 | 59 | 47 | 39 | 29 | 28 | 26 | 26 | 36 | 28 | 25 |
| | 469 | 130 | 62 | 52 | 45 | 44 | 39 | 31 | 28 | 46 | 38 | 35 |
| 160 | 137 | 38 | 31 | 11 | 27 | 24 | 26 | 29 | 7 | 33 | 25 | 26 |
| | 457 | 127 | 57 | 50 | 46 | 35 | 30 | 32 | 17 | 42 | 34 | 30 |
| | 601 | 167 | 60 | 55 | 50 | 39 | 33 | 32 | 14 | 46 | 38 | 34 |
| | 808 | 224 | 64 | 59 | 53 | 44 | 38 | 36 | 14 | 50 | 42 | 38 |
| 200 | 220 | 61 | 33 | 36 | 36 | 38 | 36 | 34 | 28 | 42 | 34 | 31 |
| | 734 | 204 | 67 | 49 | 44 | 37 | 35 | 21 | 24 | 44 | 36 | 30 |
| | 972 | 270 | 58 | 61 | 52 | 40 | 33 | 36 | 36 | 50 | 42 | 38 |
| | 1210 | 336 | 68 | 61 | 50 | 45 | 38 | 31 | 23 | 50 | 42 | 37 |
| 250 | 353 | 98 | 40 | 49 | 47 | 43 | 39 | 38 | 33 | 48 | 40 | 35 |
| | 1181 | 328 | 61 | 53 | 47 | 41 | 39 | 38 | 35 | 48 | 40 | 35 |
| | 1559 | 433 | 66 | 56 | 50 | 42 | 40 | 39 | 35 | 50 | 42 | 37 |
| | 1940 | 539 | 66 | 56 | 50 | 42 | 40 | 39 | 35 | 50 | 42 | 37 |
| 315 | 576 | 160 | 41 | 48 | 45 | 42 | 39 | 38 | 25 | 47 | 39 | 35 |
| | 1915 | 532 | 53 | 56 | 45 | 40 | 37 | 38 | 27 | 48 | 40 | 35 |
| | 2531 | 703 | 65 | 63 | 48 | 42 | 40 | 41 | 32 | 53 | 45 | 42 |
| | 3146 | 874 | 74 | 68 | 50 | 44 | 42 | 43 | 36 | 58 | 50 | 48 |
| 355 | 736 | 204 | 49 | 46 | 39 | 41 | 43 | 36 | 21 | 47 | 39 | 38 |
| | 2452 | 681 | 60 | 51 | 44 | 41 | 37 | 37 | 29 | 47 | 39 | 34 |
| | 3244 | 901 | 64 | 57 | 48 | 43 | 40 | 39 | 29 | 51 | 43 | 37 |
| | 4032 | 1120 | 65 | 57 | 51 | 45 | 42 | 40 | 32 | 52 | 44 | 39 |
| 400 | 943 | 262 | 47 | 46 | 41 | 41 | 37 | 36 | 21 | 45 | 37 | 33 |
| | 3139 | 872 | 58 | 57 | 34 | 37 | 22 | 26 | 25 | 47 | 39 | 37 |
| | 4147 | 1152 | 60 | 59 | 37 | 40 | 35 | 35 | 27 | 49 | 41 | 39 |
| | 5159 | 1433 | 60 | 59 | 37 | 40 | 35 | 35 | 27 | 49 | 41 | 39 |

**SPECIFICATION**

The Halton BOX airflow management unit is used for airflow adjustment in variable air volume installations, in supply as well as exhaust.

It is composed of:
- a circular inlet spigot equipped with an aluminium airflow measurement probe,
- a damper blade
- a rectangular part equipped with a sound attenuator, allowing air expansion.

The airflow measurement probe measures the average differential pressure across the whole surface of the inlet spigot, thus it allows the correct measurement of the airflow crossing the unit.
The damper actuator is made of two blades with a kinematic link, it enables the reduction of airborne noise as soon as the air enters the unit.
When closed, the damper is air tight.
The main blade is equipped with a gasket to reduce the friction and thus the needed torque of the actuator. The electric power consumption of the regulation loop is also reduced.

The Halton BOX casing airtightness is optimised by a construction with with limited cuttings. The acoustic part of the unit shall be equipped with an asymmetric sound attenuator, enabling an additionnal acoustic attenuation, particularly in the low frequency-range.

The Halton BOX selection is carried out according to its airflow range.
The minimum and maximum airflow values are indicative and can differ by control type or brand.
The Halton BOX is delivered factory-set according to the customer demand.
Factory parameters values as well as identification of the unit in the installation are marked on each unit.

This inside facing consitutes a smooth and washable surface thus limits the microbial development. Thus the unit can be used in areas such as hospitals, laboratories, electronic industries,...

The unit is made of galvanised steel and measurement probes of aluminium.
The unit sound attenuation is made of Euroclass A2 s1 d0 high density mineral wool with coating to avoid tearing, even at high velocities. The insulating material is also inert to bacterial development and can be used in demanding spaces such as hospitals, laboratories, electronic environment… .
The unit can be equipped with a 40 mm thick insulation to reduce radiated noise emission.
For supply application, the unit can be equipped with a hot water reheater or an electric reheater.

## PRODUCT CODE

BOX/V-M-D CU VR TF IN ACC

V = Version

L : Long

S : Short

M = Model

S : Supply

E : Exhaust

D = Diameter

100, 125, 160, 200, 250, 315, 355, 400, 500

CU = Control Unit

EE: NMV-D3-MP-F. HI (10Nm, MP bus included)

EC: LMV-D3-MP-F. HI (5 Nm, MP bus included)

EK: NMV-D3-MF-F.1 HI (10 Nm without MP bus)

EM: LMV-D3-MF-F.1 HI (5 Nm without MP bus)

EG: GLB181.1E/3

SR: ASV/115/CF152 (Sauter fast actuator)

LK: LMVD3-LON

LM: NMVD3-LON

HM: ECL-VAV-S

HK: ECL-VAV-N + NM24A-SR

ES: VRP-M + VFP-100 + NM24A-V-ST

ER: VRP-M + VFP-300 + NM24A-V-ST

VR = VRD3

NA: Without VRD3

Y: With VRD3

TF = Transformer

Y: With 230/24V transformer

N: Without transformer

IN = Insulation

I1: Standard 25 mm insulation

I2: 40 mm insulation

ACC

Y : Yes, includes an accessory (reheater or connection box)

N : No accessory

Code example

BOX/L-S-E-200 CU=EM TF=N /N=/1 ACC=Y