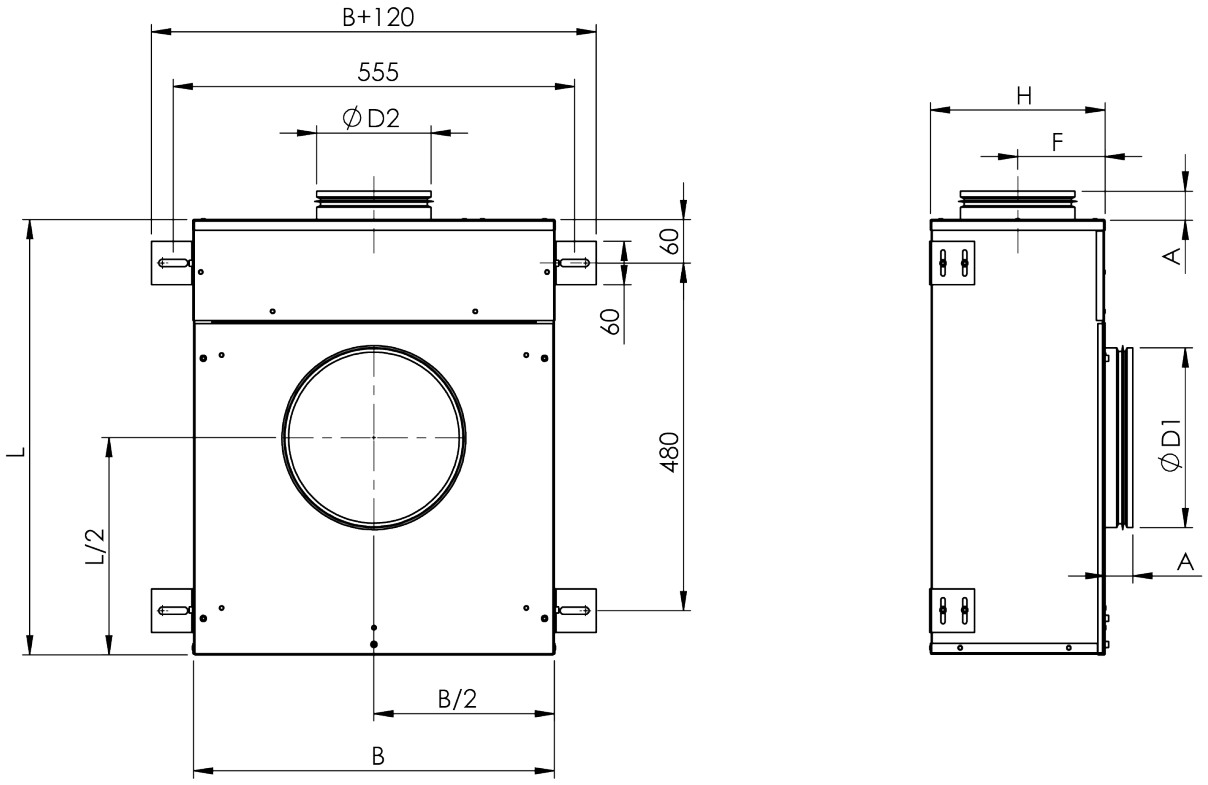
# HMF 单管布风器

## 概述

- 压力范围 200 Pa 到 1000 Pa
- 气流范围 120 m3/h 到 500 m3/h
- 230 VAC 610%，最大 10A，50/60 Hz
- 内置流量测量（自动型号）
- 最小/最大的阀位设定值（半自动）
- 双向可控硅控制加热线圈，可调节加热功率 (PWM) 0...100%
- 主/辅功能：多个辅助布风器可以连接到一个主布风器上
- 内部熔断丝 8A 或 10A 和 63 mA
- 可选配外部开关（如阳台门开关和钥匙卡开关）的输入端
- 网络可与高级能效和监管系统的适配器兼容
- 可选配能效功能，以减少不必要的冷却/加热成本
- 所有参数可在工厂预设或在调试时通过 PDA 现场设定
- 所有电缆连接均带快速接头
- 适合不同安装需要
- 带状态检测和手动复位功能的 90 °C 安全开关
- 最小流量警报（自动模式）和带有加热器截止功率过热限制功能的箱内温度测量
- HMF 布风器可配备有控制板和互连电缆
- 获得 MED 认证的 B-0/B-15 安装等级

# Dimensions




## HMF DIMENSIONS, unit material thickness 0.5 mm

| | L | B | H | F | A | ØD1 male/ female | ØD2 male |
|---|---|---|---|---|---|---|---|
| HMF-100 | 590 | 490 | 190 | 88 | 45 | 199/ 201 | 99 |
| HMF-125 | 590 | 490 | 230 | 118 | 45 | 249/ 251 | 124 |
| HMF-160 | 590 | 490 | 230 | 118 | 45 | 249/ 251 | 159 |

Note: male connection: outer dimension, female connection: inner dimensions. Note: Standard dimensions, modifications possible

## HMF DIMENSIONS, unit material thickness 0.75/1.0 mm

| | L | B | H | F | A | ØD1 male/ female | ØD2 male |
|---|---|---|---|---|---|---|---|
| HMF-100 | 600 | 500 | 200 | 88 | 40 | 199/ 201 | 99 |
| HMF-125 | 600 | 500 | 240 | 120 | 40 | 249/ 251 | 124 |
| HMF-160 | 600 | 500 | 240 | 120 | 40 | 249/ 251 | 159 |

Note: male connection: outer dimension, female connection: inner dimensions. Note: Standard dimensions, modifications possible

# Material and Finishing

| PART | MATERIAL |
|---|---|
| Casing | Hot galvanized steel or EN 1.4404 (AISI316L) as an option |
| Casing thickness | 0,5 mm or 0,75/1,0 mm as an option |
| Spigots | Hot galvanized steel and EPDM rubber. EN 1.4404 (AISI316L) as an option |
| Insulation | Mineral wool, s = 20 mm, MED approved or s = 25 mm as an option |
| Input/output unit | Aluminium/plastic/electronics |
| Reheat coil | EN 1.4301 (AISI304) |
| Cables | Halogen free |
| Airflow measurement probes and tubes | Aluminium/polyurethane |

# Product Models and Accessories

## HMF product options

- Pressure independent model (VAV/CAV)
- Pressure dependent model (VAV)
- Inputs for external switches such as balcony door and key card switches available as an option
- Network compatible with adapter for advanced energy efficiency and supervision system

available as an option
- Energy efficiency functions to reduce unnecessary cooling / heating costs available as an option

# Control panel features

Halton Marine HMF cabin units are available with three different control panel models; with rotating knob, push buttons with LED bar graph (available as option: IP54) and push buttons with LCD-display (available as option: IP54).

**Common features**

- Cabin temperature measurement
- Connector for bluetooth / communication adapter to set cabin parameters
- Software for parameter setting and trouble shooting
- Different colour options and custom labeling available as an option
- Delivered with IC-Cable (interconnection cable)
    - For control panel – cabin unit connection
    - Prefabricated with plugs on both ends
    - Cable plug on panel side is designed to be pulled through standard installation pipe
    - Halogen free and flame-retardant
    - Standard length 7 meters. Other lengths available.

**Control panel with rotating knob**

- Temperature adjustment by rotating knob

**Control panel with push buttons and LED bar graph**

- Temperature adjustment by push buttons
- Self diognose function
- LED intensity control and auto dimming

**Control panel with push buttons and LCD-display**

- Temperature adjustment by buttons
- Self diagnose function
- LCD intensity control and auto dimming
- Display for actual and set point temperatures available as an option
- Time display available as an option
- A customized background picture available as an option
- Several frame options available

Control panel models; push buttons and rotating knob

LCD control panel

# Cabin ventilation configuration table

| | UNIT | HMM | HMM | HME | HME | HMF | HMF | HMF | HFR/M | HFR/M | HFR/M | HMR | HMR | HML |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TERMINAL UNIT WITH JUNCTION BOX | CONTROL PACKAGE | K01 | D03 | K01 | D03 | M00 | M01 | M02 | M00 | M01 | M02 | D21 | H21 | B00 |
| | Damper | manual | manual | manual | manual | electric | electric | electric | electric | electric | electric | electric | electric | electric |
| | Airflow measurement and control (VAV, CAV) | no | no | no | no | yes | no | yes | yes | no | yes | yes | yes | yes |
| | In-box temperature measurement | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | no | no | yes |
| | Reheater safety switch, manual reset | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | no | no | yes |
| | Safety switch state detection | no | yes | no | yes | yes | yes | yes | yes | yes | yes | no | no | yes |
| | Spare inputs (balcony door etc.) | no | no | no | no | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| | Parameter setting by service tool | no | yes | no | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| CONTROL PANEL | Cabin temperature measurement | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| | Controller with push buttons, 18 led bar | no | yes | no | yes | yes | no | no | yes | no | no | yes | no | yes |
| | Controller with knob | yes | no | yes | no | no | yes | yes | no | yes | yes | no | yes | no |
| | LCD room thermostat | no | optional | no | optional | optional | no | no | optional | no | no | optional | no | optional |
| | LED intensity control and auto dimming | no | yes | no | yes | yes | no | no | yes | no | no | yes | no | yes |
| | Self diagnose functionality | no | yes | no | yes | yes | no | no | yes | no | no | yes | no | yes |
| | Network compatible with adapter | no | yes | no | yes | yes | yes | yes | yes | yes | yes | yes | no | yes |
| | CO2 sensor available as an option | no | yes | no | yes | yes | no | no | yes | no | no | yes | no | yes |
| CABLES | Interconnection cable | IC4-X | IC6-X | IC4-X | IC6-X | IC6-X | IC6-X | IC6-X | IC6-X | IC6-X | IC6-X | IC6-X | IC6-X | IC6-X |
| | Master-Slave cable | MS4-X | MS2-X | MS4-X | MS2-X | MS2-X (MS5-X) | MS3-X | MS3-X | MS2-X (MS5-X) | MS3-X | MS3-X | MS2-X | MS3-X | MS2-X |

Please note: HMM and HME units are also available without a control package.

## Manually controlled airflows

Single duct units; HMM, HME

## Pressure dependent units

Single duct units: HMF, HFR/M

## Pressure independent units

Single duct units; HMF, HFR/M, HML
Dual duct units; HMR

# Accessories for HMF cabin units

**MS-Cable (master-slave cable)**

- For master cabin unit – slave cabin unit/units connection

- Prefabricated with plugs on both sides
- Halogen free and flame-retardant
- Standard length is 7 meters. Other lengths available as an option.

**Communication adapter**

- Bluetooth communication to external device
- For wireless connection to set cabin unit parameters and trouble shooting

**Network adapters**

- Network adapter (also available as WiFi) expands a stand-alone unit to network compatible unit (LON or Ethernet network)
- Enables supervision and advanced energy efficiency functions
- For more information, see Halton Networks for cabin ventilation -brochure or contact Halton Marine Sales office.

# Reheaters available

- Standard reheaters: 400W, 800W, 400+800W, 1200W, 1500W, 1800W
- Offshore reheaters: 400W, 800W, 1200W, 1600W (surface temperature below 90°C on operating airflow)

Practical power level may be software adjusted cabin by cabin. Cable and power supply design has to be done according to maximum available heating power.

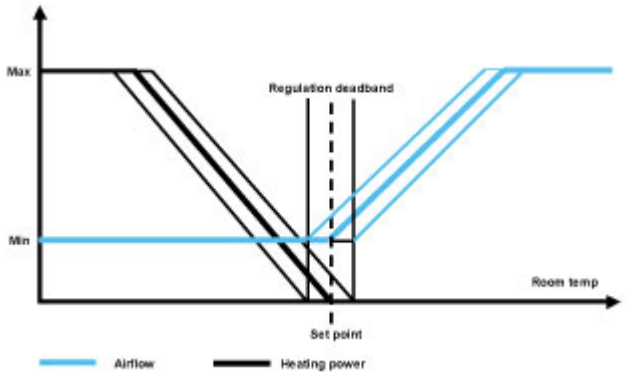
# Function

Control panel includes also a number of special features such as diagnostics function, room brightness measurement and re-programmability. The power supply and data transfer between cabin unit and control panel is carried out via interconnection cable.Temperature range is software adjustable between 10 and 30°C.

## FUNCTION OF VAV UNIT

When passenger demands lower temperature by using control panel unit, the damper opens in order to increase the flow of cold air towards the maximum value. When the required temperature in the cabin is achieved, the damper reference is held until the temperature demand changes. In heating mode, the damper restricts the airflow towards its minimum rate, and if the required temperature in the cabin is not thus achieved, the controller activates the electric reheater inside the unit in a stepless manner.

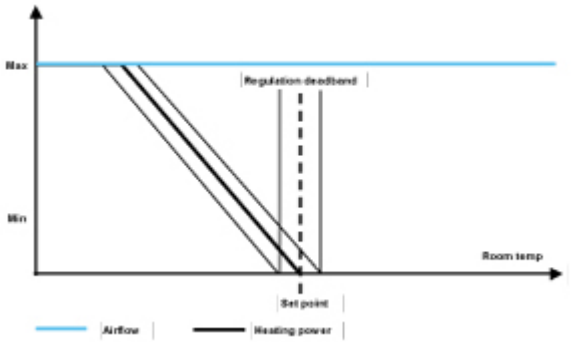
## Regulation diagram, VAV




## FUNCTION OF CAV UNIT

Airflow is kept in pre-set level in any condition. When passenger demands for a higher temperature by using control panel, the electric reheater inside the cabin unit will be activated in a stepless manner towards to maximum heating capacity or until desired temperature is achieved. When passenger demands for a lower temperature by using control panel, the electric reheater inside the unit will be deactivated in a stepless manner towards to zero heating capacity or until desired temperature is achieved.

## Regulation diagram, CAV




## Operating range for HMF

| HMF-100 | HMF-125 |
|---|---|
| 120 $m^3$/h – 350 $m^3$/h | 150 $m^3$/h – 500 $m^3$/h |

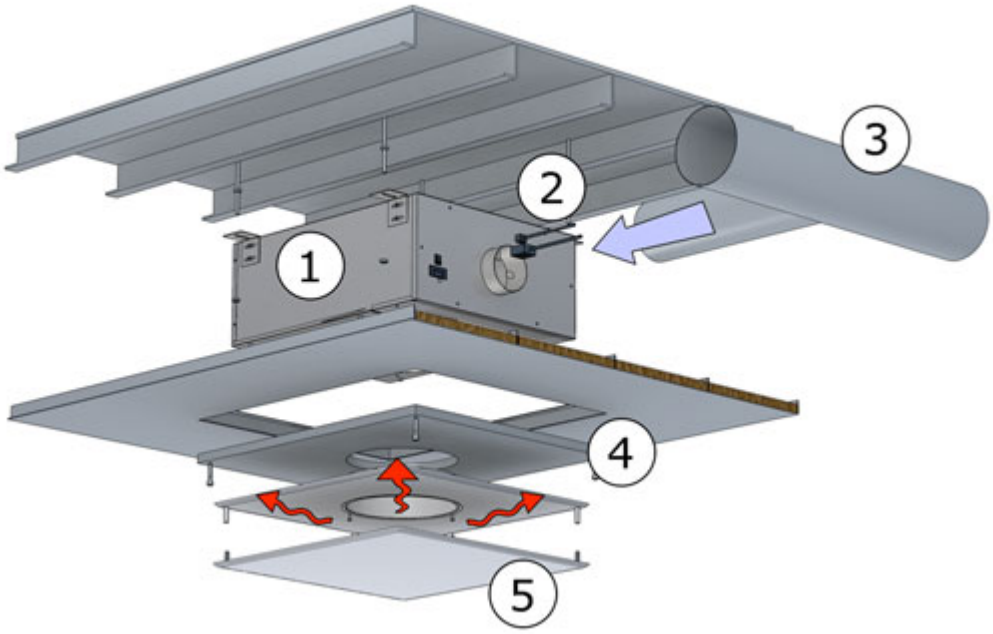
### Cabin unit's airflow measurement accuracy

| | AIRFLOW (m3/h) | | | | |
|---|---|---|---|---|---|
| | 120-150 | 151-200 | 201-300 | 301-400 | 401-500 |
| Accuracy* | ±20% | ±15% | ±10% | ±8% | ±6% |

*) ductowork pressure 200-1000 Pa (optimal)

Note: When comparing aiflow measurements between cabin unit and other device, cabin unit's airflow regulation dead-band has to be taken into account (± 10 $m^3$/h).

# Installation




### Cabin unit mounting instruction

Projects requirements and possibilities should be taken into account when designing the installation. For more information on the possibilities contact Halton Marine sales office.

Main principles in cabin unit installation:
1. Fix cabin unit above false ceiling using thread bar (as seen on picture) or frame installation
2. Connect power supply and IC cable to the unit. (cable installation should be done before this phase, see Interconnection Cable Mounting Instructions). As standard cabin unit has Ensto NAC 31 plug for the power supply (counterpart NAC 32 not include).
3. Connect supply air ducts to cabin unit inlets.
4. Close maintenance / installation hatch.
5. Connect and assemble diffuser to the cabin unit outlet.

## Control Panel mounting instruction

1. Install LRC-1 CP unit back plate to the provided leveled place on the wall.
2. Fasten 3 screws (DIN 7981 or similar, max. head height 3mm) to fix CP unit to its place.
3. Connect LRC-1 interconnection cable to the interconnection connector. Max. allowed tractive force is 30 N.
4. Install LRC-1 CP unit front plate to the back plate
5. Fasten the screw in the bottom carefully. Max. Torque 0,3 Nm.

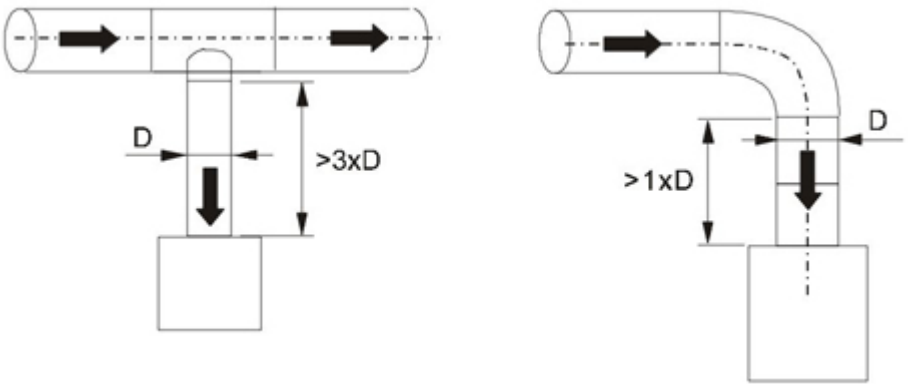
The LRC-1 CP unit should be positioned on the wall inside the room it will regulate. It is advised to avoid direct sunlight or position near heating/cooling source object.

## Interconnection Cable mounting instructions

Interconnection cable comes prefabricated with plugs on both sides. To install, draw it through the provided tube from cabin unit to CP unit (the plug on CP unit is small enough to allow drawing through tubes). Max. allowed tractive force is 30N. On the CP side, in the room, leave approximately 8 cm of the cable (the wires) outside the tube. The near end of the tube (CP-unit side) must be blocked (e.g. foam) to prevent condensation and thermal transfers reaching CP unit.

## Safety distances

A required safety distance as illustrated must be taken into account when installing the cabin unit. Airflow measurement accuracy cannot be guaranteed if safety distance is not taken into account.




# Commissioning

All parameters can be preset at the factory according to order. During commissioning all parameters can be modified wirelessly with portable device using LRC manager software.

Halton also provides supervision and commissioning services for the projects.

For more information contact Halton Marine Sales office.

# Weights

| Casing thickness | HMF-100 | HMF-125 |
|---|---|---|
| **0,5 mm** | 11 | 11,5 |
| **0,75/1,0 mm** | 17 | 18 |

# Product Code

| |
|---|
| **(C)=Diameter of inlet connection** |
| 100 |
| 125 |
| **(E)=Diameter of outlet connection** |
| 160 |
| 200 |
| 250 |
| **(C2)=Outlet connection type** |
| (A) Male with gasket |
| (B) Male without gasket |
| (C) Female |
| **(CP)=Location of Power Supply Connection** |
| (F) Front end |
| (B) Back end |
| (S) Side |
| **(CU)=Control Unit** |
| (B1) B00 (pressure independent, automatic) |
| (M0) M00 (pressure independent, automatic) |
| (I1) I00 (pressure dependent, semiautomatic) |
| **(RH)=Reheat Coil** |
| (NA) No reheater |
| (S1) Single coil 400 W |
| (S2) Single coil 800 W |
| (S3) Single coil 1200 W |
| (S4) Single coil 1500 W |
| (S5) Single coil 1800 W |
| (D1) Double coil 400 W + 800 W |
| **Code example** |
| HMF-125-160,C2=A,CP=B,CU=B1,RH=S1,ZT=Y |

# Sound attenuation

## Sound attenuation (dB)

| | f(Hz) | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|---|---|---|---|---|---|---|---|---|---|
| **HMF-100** | ΩL(dB) | 6,4 | 11,3 | 15,9 | 25,8 | 34,8 | 37,9 | 35,3 | 34,7 |
| **HMF-125** | ΩL(dB) | 4,9 | 9,6 | 16,2 | 24,9 | 33,4 | 36,8 | 35,4 | 35,6 |

ΩL: Sound attenuation not including end reflection