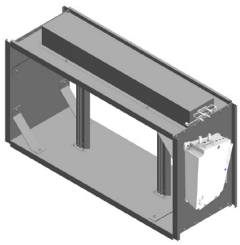
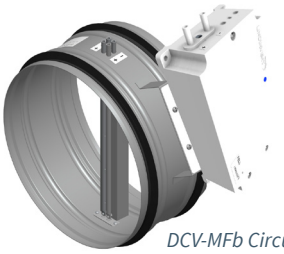
DCV-MFb AIRFLOW MEASURING UNIT

FBLb version C04



DCV-MFb Rectangular.



DCV-MFb Circular.

INTRODUCTION

DCV-MFb is part of Lindinvent's series of smart and installation-efficient dampers and measurement units for protective ventilation and on-demand control of indoor climate at workplaces.

FUNCTION

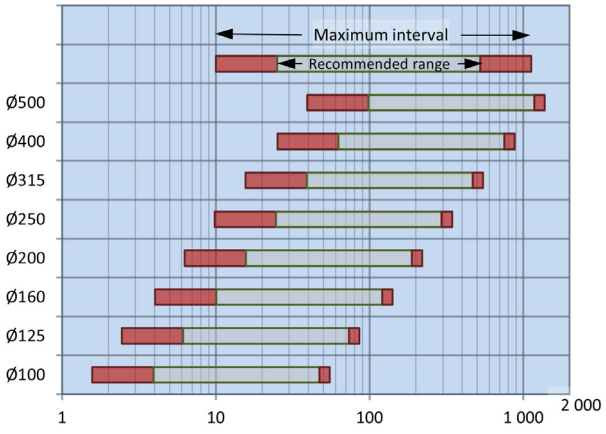
DCV-MFb consists of a measuring flange and an air-flow controller. The unit cooperates with other control equipment via a local network (CAN loop) for fast and accurate airflow measurement of supply or extract air.

CIRCULAR OR RECTANGULAR

The circular version (Ø100-630 mm) is delivered as a complete module with the constituent parts connected and ready for installation as a unit. DCV-MFb Rectangular is ordered as a set of parts to be assembled on site. DCV-MFb Circular is available in database for MagiCad. DCV-MFb Rectangular is drawn as measuring unit SMRD.

See page 2 for a presentation of included parts.

Quick guide to flow ranges for DCV-MFb Circular



Flow range [l/s] for SMED Ø100 to 500 mm.

AIRFLOW RANGES AND MEASUREMENT

Circular & Rectangular

Measurement range: 0.5 – 6.0 m/s
Maximum rangel: 0.2 – 7.0 m/s
Accuracy: ± 5 % or at least ± x l/s
(where x = The channel area in dm^2)
Airflow calculation (q): $q = k * \sqrt{\Delta p}$ [l/s]

k-factor Rectangular
Calculate k as follows:
k = 749 * A where A = Width(W) * Height(H) where measures W and H in meters
An example: SMRD 500x200 = 749 * 0,5 * 0,2 = 74,9

k-factor Circular
The k-factor can be read from the measuring flange or from the table in the product description for SMED.

PLACEMENT

For accurate measurement data: SMED (DCV-MFb) must be placed in the correct direction and preceded by an interference-free straight channel section corresponding to a length of 3.5 times the channel diameter. After SMED, no minimum distance to a subsequent bend or other disturbance is required.

When SMED (DCV-MFb) is placed after a silencer with a different cross-sectional area (smaller inner diameter, center body or center baffle), SMED shall be placed directly after a straight duct section, corresponding to 2.0 times the duct diameter where the length of the silencer is not included.

PARTS WITH SPECIFICATIONS

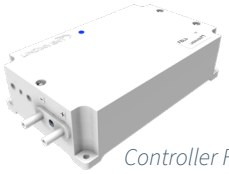
The products below are included as parts of DCV-MFb. The measuring flange is either for a circular or a rectangular design. See the product description for more complete technical specifications.

DCV-MFb parts

Measuring flange SMED.

Circular measuring flange - SMED

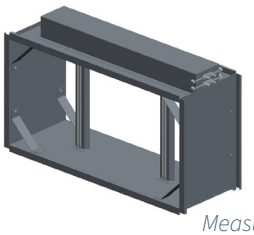
- Part of DCV-MFb Circular
- Measuring flange with double measurment points
- Sizes: Ø100 – Ø630 mm according to EN 1506:2007
- Material: Housing and measuring flange are manufactured as standard in galvanized sheet steel (C3) but can be ordered in stainless acid-resistant steel sheet (C5). Measuring tube in aluminium (C4). Duct sealing of EPDM rubber.
- Weight: After size (0.4 to 2.5 kg)



Controller FBLb.

Airflow controller - FBLb

- Part of DCV-MFb Circular and DCV-MFb rectangular
- Integrated digital airflow sensor
- CAN connection
- IP-class: IP53
- Operating temperature limits: 0°C to 40°C; <85% RH
- Temperature limit storage: -20°C to 50°C; <90% RH
- Weight: 0.3 kg
- Commissioned for function flow measuring



Measuring flange SMRD.

Rectangular measuring flange - SMRD

- Included in DCV-MFb Rectangular
- Measuring flange with double measurment points
- Case and measuring flanges of galvanized sheet steel (C3)
- Measuring tubes of aluminum (C4)
- Weight: After size (2 to 20 kg)

FUNCTIONAL DIAGRAM

Example: Laboratory with supply air via DCV-BLb and extract air measurement via DCV-MFb.

DCV-BLb:

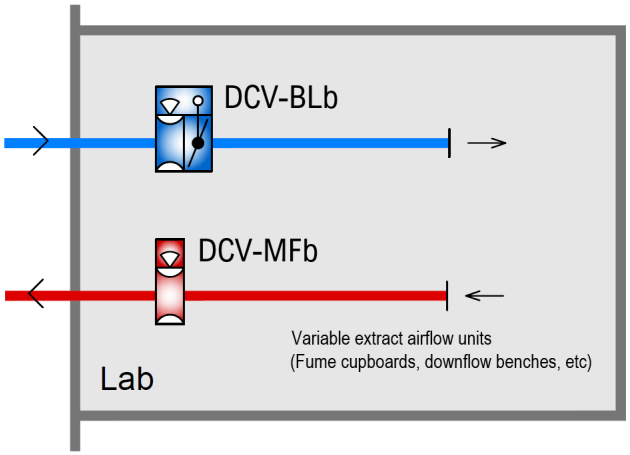
- Measures the supply air flow.
- Reads message from DCV-MFb about current extract airflow.
- Regulates the supply air via damper control to continuously balance the extract airflow.

The controller FBLb is commissioned for flow balancing.

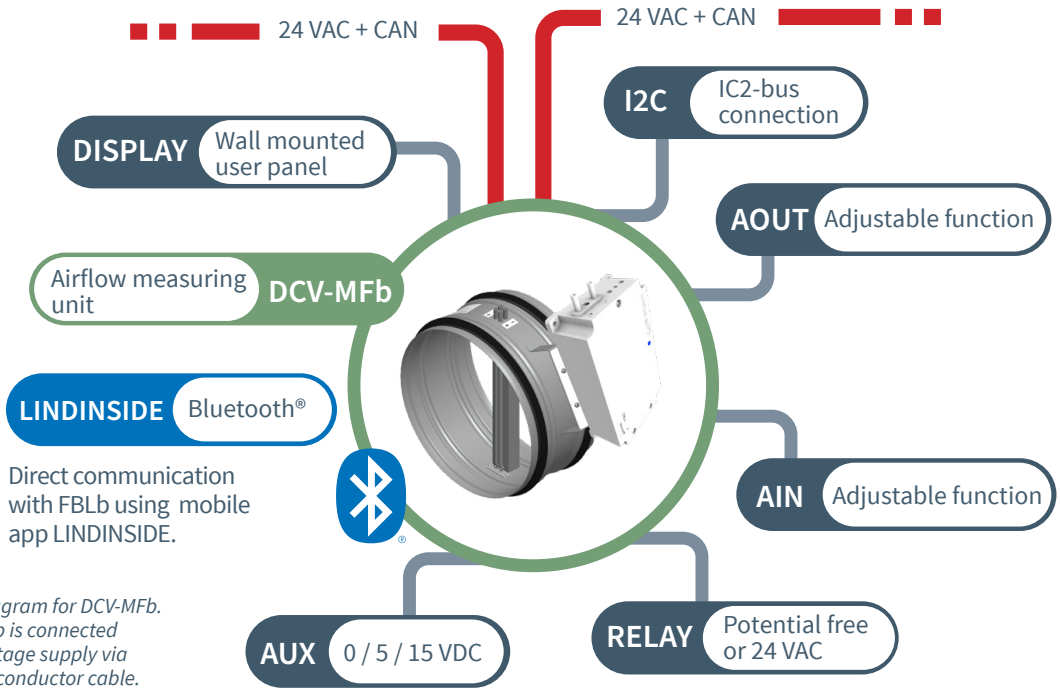
DCV-MFb:

- Measures the current total extract airflow from connected fume cupboards, down flow benches, etc.
- The extract airflow can be read by cooperating nodes via CAN.

The controller FBLb is commissioned for flow measurement.



CONNECTION DIAGRAM



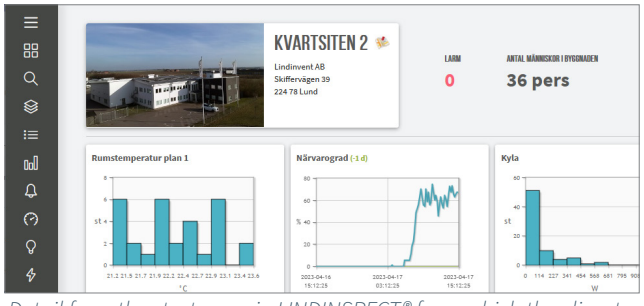
Connection diagram for DCV-MFb. Controller FBLb is connected to CAN and voltage supply via Lindinvent's 4-conductor cable.

CONNECTIONS

- 2 x terminals for 24 VAC + CAN
- Terminal AIN1 and AOUT1 (0-10 VDC)
- Terminal AIN2 and AOUT2 (general 0-10 VDC)
- Relay (24 VAC or potential-free)
- Terminal AUX for Generic power supply (0, 5, 15 VDC)
- Terminal for I2C-bus
- Module for Bluetooth®
- Terminal for user panel (FLOCHECK P version B02)

VISUALIZATION TOOL LINDINSPECT®

LINDINSPECT® is a powerful web-based tool which is part of the central unit system software. Everything from control units to supplementary systems for comfort and sustainable energy use is made accessible for central optimization, administration and visualization.



Detail from the start page in LINDINSPECT® from which the climate control can be visualized and administered.

USER INTERFACES

Look for details about a specific interface via its product name and product description.

- Login localy directly to the controller via mobile phone with the LINDINSIDE app
- Via Gate way NCE and Lindinvent's central unit running LINDINSPECT®
- Other parent system via Gateway NCE and Modbus-RTU or ModbusTCP
- Fixed panel FLOCHECK P, wired directly to FBLb

TROUBLESHOOTING AND ALARM NOTIFICATION

Systems with LINDINSPECT® log and set alarm flags in case of deviations. Alarms can also be indicated both acoustically and optically by connecting user panel FLOCHECK P to the controller.

EASY COMMISSIONING

The internal airflow sensor is delivered factory-calibrated. A few selected control variables, such as the current channel diameter or k-factor, are requested in connection with commissioning.

ORDER INFORMATION

DCV-MFb Circular (Ø100-630 mm)

Airflow measuring unit, Lindinvent AB,
DCV-MFb-[Size][Material]-[Colour]
Size(SMED): 100, 125, 160, 200, 250, 315, 400, 500, 630
Material: Galvanized sheet steel(C3), stainless acid-resistant sheet steel(C5), epoxy-coated sheet steel (E), powder-coated sheet steel(P)
Omitted material specification: Galvanized(C3)
Colour: RAL9003 (standard)
To be stated only for E and P. Other colours and gloss levels can be ordered.

Example:

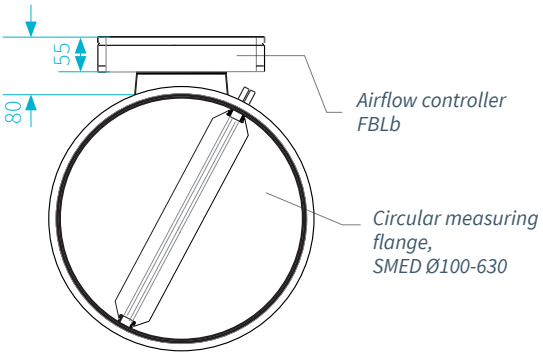
- DCV-MFb-250C3
  (DCV-MFb Circular galvanized)
- DCV-MFb-250P-RAL9003
  (Powder-coated, RAL9003)

DCV-MFb Rectangular

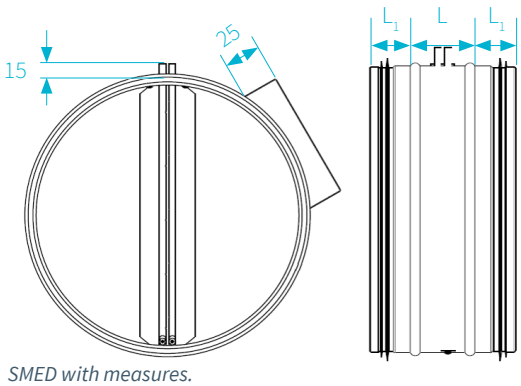
Airflow measuring unit, Lindinvent AB,
DCV-MFb-[WxH][Material]
Standard sizes WxH: from 200x200 mm to 1600x1000 mm
Width(W): from 200 to 1000 mm in intervals of 100 mm, then in intervals of 200 mm
Height(H): from 200 till 800 mm in intervals of 100 mm, then in intervals of 200 mm
Contact Lindinvent if you need non-standard dimensions.
Material: Galvanized(C3)

Example: DCV-MFb-600x300C3
Rectangular DCV-MFb is delivered as a construction kit with measuring flange SMRD and controller FBLb. The parts are delivered separately to be installed on site.

DIMENSIONS (mm)



Dimensions of DCV-MFb Circular.



SMED with measures.

Table1: SMED measures,weight and k-factor

Ø (mm)	L_i	L	Weight (Kg)	k-factor (k)
100	33	66	0,35	5,2
125	35	40	0,35	9,5
160	35	35	0,4	15,4
200	35	35	0,6	23,9
250	35	55	0,8	36,9
315	55	37	1,4	57,8
400	55	37	1,5	91,7
500	55	44	1,85	141
630	55	44	2,4	236

Airflow(q) = k-factor x $\sqrt{\Delta p}$ [l/s]

COMPLEMENTARY DOCUMENTATION

Document can be viewed on the product page at www.lindinvent.com

Document	Comments
Installation instructions	Combined installation instructions for DCV-MFb and airflow controller FBLb (mounting + connection).
Operation instructions	Short presentation of LINDINSIDE and control variables.
Maintenance instructions	Considered maintenance free. For cleaning and control measurement of the flange, see the maintenance instructions for SPMF.
External connection diagram	Shows how conductors from equipment are connected to FBLb.
Environmental product declaration	For assessment at Byggvarubedömningen.
Modbus list	Last entry in the modbus list for FBLb.
AMA-text	Available.