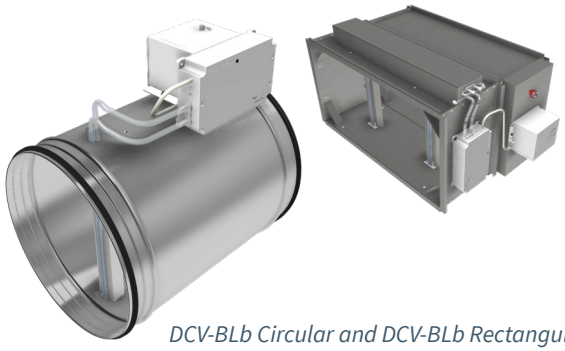
DCV-BLb AIRFLOW CONTROL UNIT

FBLb version C04



DCV-BLb Circular and DCV-BLb Rectangular.

INTRODUCTION

DCV-BLb is part of Lindinvent's series of smart and installation-efficient dampers and measuring devices for protective ventilation and climate control at workplaces.

FUNCTIONS

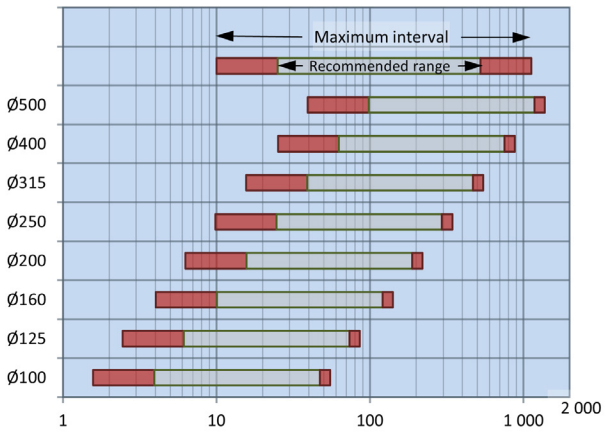
DCV-BLb consists of a damper with a measuring flange, a damper actuator, and an airflow controller. The unit cooperates with other control equipment via a local network (CAN loop) to control airflow.

CIRCULAR OR RECTANGULAR

DCV-BLb Circular (Ø100-500 mm) is delivered as a complete unit with all constituent parts connected. DCV-BLb Rectangular is supplied in parts to be assembled on-site. DCV-BLb Circular is available in the database for MagiCad. DCV-BLb Rectangular is drawn as damper JSPM and measuring unit SMRD.

See page 2 for a presentation of included parts.

QUICK GUIDE: FLOW RANGES FOR DCV-BLb CIRCULAR



Flow range [l/s] for each size of DCV-BLb Circular.

AIRFLOW MEASUREMENT AND CONTROL

Circular & Rectangular

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

k-factor Rectangular
Calculate k as follows:
k = 749 times A where A = Width(W) times Height(H) with 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 damper or from the table in the product description for SPMF.

PLACEMENT IN DUCT

For accurate airflow measurement, DCV-BLb must be correctly oriented in the airflow direction and preceded by an interference-free straight duct section corresponding to a length of 3.5 times the duct diameter.

When DCV-BLb is placed after a silencer, with a different cross-sectional area, DCV-BLb must be preceded by a straight duct section corresponding to 2.0 times the duct diameter where the length of the silencer is not included.

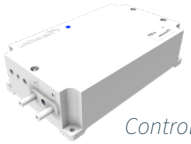
For DCV-BLb Rectangular, the required interference-free length is calculated by multiplying the equivalent duct diameter(de) calculated via the formula: de ≈ 1.15 times √ A, where A = Width(W) times Height(H)

After DCV-BLb, no minimum distance to a subsequent bend or other disturbance is required.

CONSTITUENT PARTS

The products below are included as parts of DCV-BLb. The damper and measuring flange are either circular or rectangular. See the product description for more complete technical specifications.

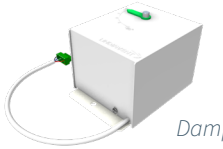
DCV-BLb and its constituent parts



Controller FBLb.

Airflow controller - FBLb

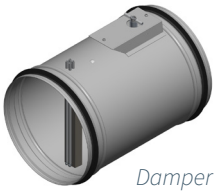
- Included in DCV-BLb Circular
- Supplied as part to DCV-BLb Rectangular
- Integrated digital airflow sensor
- CAN connection
- IP-class: IP53
- Operating temperature limits: 0°C to 40°C; <85% RH
- Temperature limit storage: -20°C to 50°C; <90% RH
- Weight: 0.3 kg
- To be commissioned for either: Flow balancing control, Constant flow control, Flow measuring or a function where DCV-BLb acts as a Slave



Damper actuator DBA.

Damper actuator - DBA

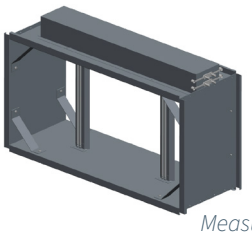
- Included in DCV-BLb Circular
- Supplied as part to DCV-BLb Rectangular
- Microprocessor controlled BLDC motor
- Indicator pin to show the damper opening angle
- IP-class: IP42 (mounted on the actuator holder)
- Operating temperature limits: 0°C to 40°C; <85% RH
- Temperature limit storage: -20°C to 50°C; <90% RH
- Weight: 0.9 kg



Damper SPMF.

Circular damper with measuring flange - SPMF

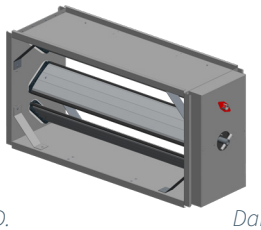
- Included in DCV-BLb Circular
- Measuring flange with double measurment points
- Full damper blade
- Actuator shelf adapted for Lindinvent's damper actuator
- Tightness class 3 according to VVS AMA
- Pressure class A according to VVS AMA
- Weight: After damper size (1 to 10 kg)



Measuring flange SMRD.

Rectangular measuring flange - SMRD

- Supplied as part to DCV-BLb 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)

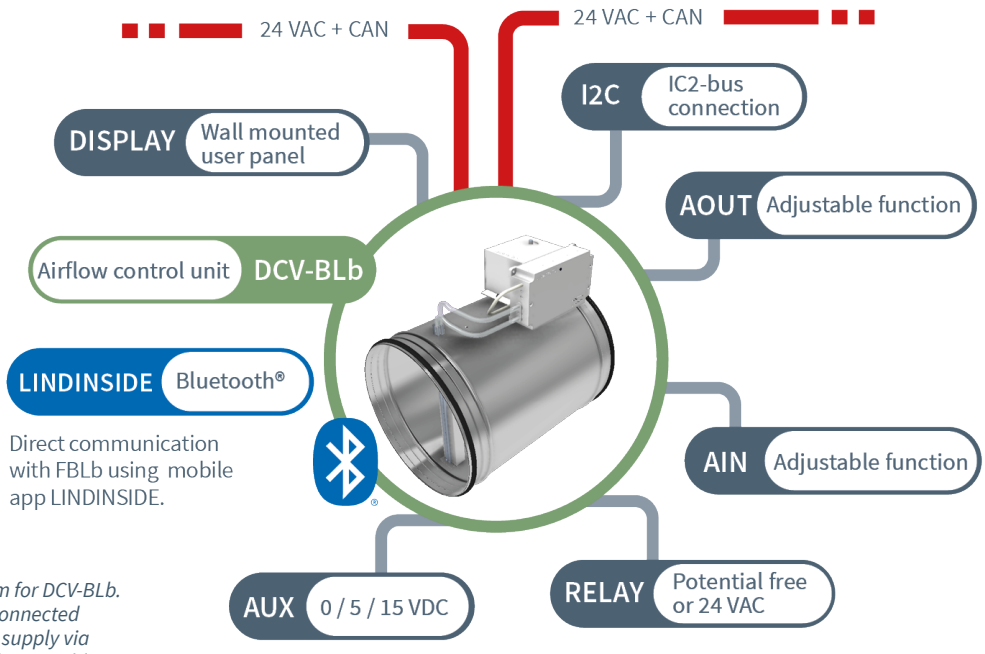


Damper JSPM.

Rectangular damper - JSPM

- Supplied as part to DCV-BLb Rectangular
- Opposed blade damper
- Actuator shelf adapted for Lindinvent's damper actuator
- Case of galvanized sheet steel (C3)
- Damper blades of aluminium (C4)
- Tightness class 2 according to VVS AMA
- Pressure class A according to VVS AMA
- Available with circular connection with size 700x700 or 800x800
- Weight: After damper size (3 to 40 kg)

CONNECTION DIAGRAM



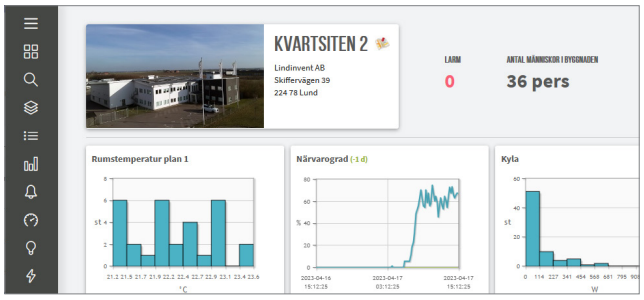
Connection diagram for DCV-BLb. Controller FBLb is connected to CAN and voltage supply via Lindinvent's 4-conductor cable.

CONNECTIONS

- 2 x terminals for 24 VAC + CAN
- Terminal for AIN1 and AOUT1 (0-10 VDC) used by the damper actuator
- Terminal for AIN2 and AOUT2 (general 0-10 VDC)
- DUT1 (RELAY) for potential-free switch alternatively 24 VAC
- 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 are requested in connection with commissioning.

FUNCTIONAL CHARTS

Cell office solution with DCV-BLb

Supply air via active diffusers and extract air through a ventilation grill to a corridor.

Supply air from active diffusers that:

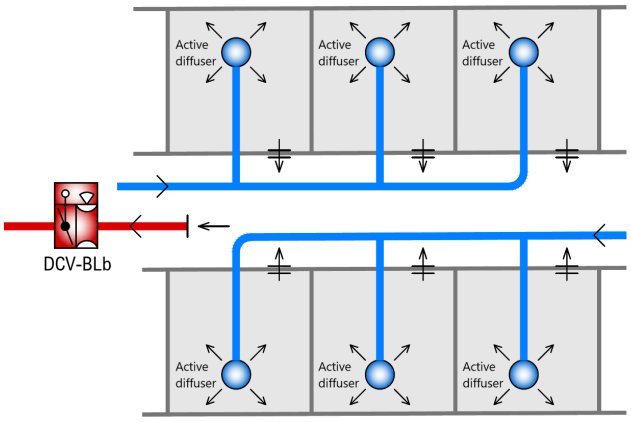
- Individually controls the climate in each office according to setpoints
- Notifies cooperating nodes, here DCV-BLb, of its individual current supply airflow

The diffusers can be operated from different supply air ducts.

DCV-BLb:

- Measures the extract air flow rate from the corridor
- Maintains the desired balance of air flow by incresing or decreasing the extract air flow from the corridor

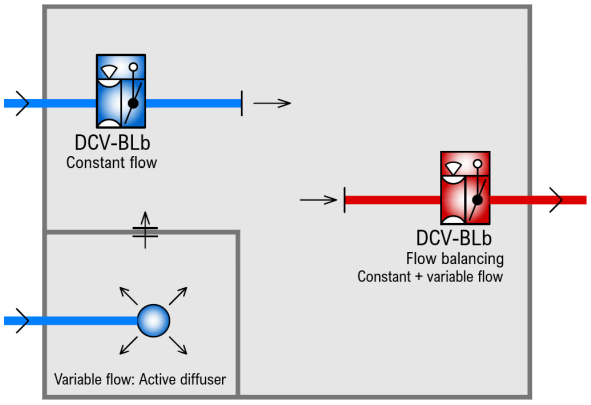
DCV-BLb is commissioned for airflow balancing.



Common extract air control in corridors.

Constant airflow and airflow balancing

- DCV-BLb on the supply air duct is commissioned for constant airflow control
- DCV-BLb on the extract air duct is commissioned to balance the total supply air flow



Constant airflow control with DCV-BLb.

Collaborative airflow balancing

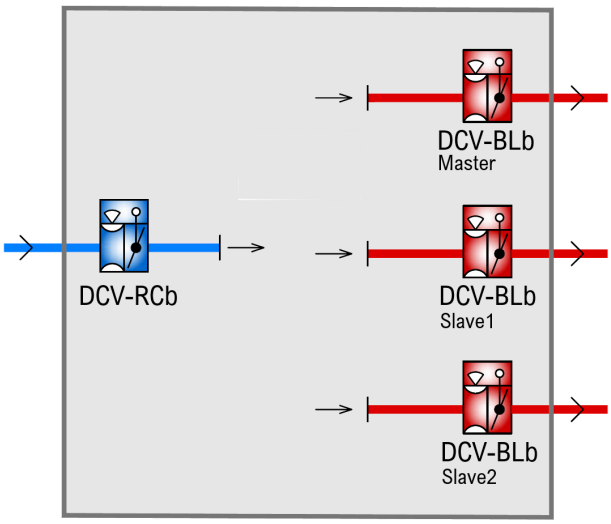
DCV-BLb:

- DCV-BLb (Master) measures its own flow and sums this up with the extract air measured by Slave1 and Slave2
- DCV-BLb (Slave1) and (Slave2) are both operated to act as slave to DCV-BL (Master)
- DCV-BLb (Master) reads the supply airflow communicated via DCV-RCb and regulates the extract airflow via its own and the slave units dampers to maintain the desired balancing

DCV-RCb:

- Measures the supply airflow rate
- Controlles the actual supply airflow to meet setpoints

For a space supplied by several variable supply air ducts: see the product description for DCV-RCb.



Collaborative airflow balancing.

ORDER INFORMATION

DCV-BLb Circular (Ø100-500 mm)

Airflow control unit, Lindinvent AB,
DCV-BLb-[Damper][Material]-[Colour]

Damper SPMF: 100, 125, 160, 200, 250, 315, 400, 500

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

DCV-BLb Circular (duct connection Ø630 mm)

Airflow control unit, Lindinvent AB,
DCV-BLb-630(700x700)[Material] or
DCV-BLb-630(800x800)[Material]

Size: 700x700 or 800x800 available
Material: Galvanized (C3)

Example: DCV-BLb-630(700x700)C3
DCV-BLb-630 is delivered as a construction kit. The rectangular damper JSPM 700x700 mm with circular connection 630, a circular measuring flange with diameter 630 mm, controller FBLb and damper actuator DBA are delivered separately to be installed on site.

DCV-BLb Rectangular

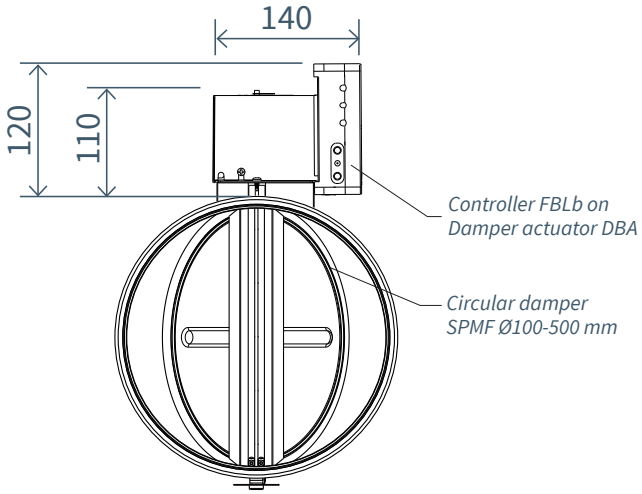
Airflow control unit, Lindinvent AB,
DCV-BLb-[WxH][Material]

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 to 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-BLb-600x300C3
Rectangular DCV-BLb is delivered as a construction kit where damper JSPM, measuring flange SMRD, controller FBLb and damper actuator DBA are delivered separately to be installed on site.

DIMENSIONS in mm



Dimensions of DCV-BLb Circular.

COMPLEMENTARY DOCUMENTATION

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

Document	Comments
Installation instructions	Combined installation instructions for DCV-BLb 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.