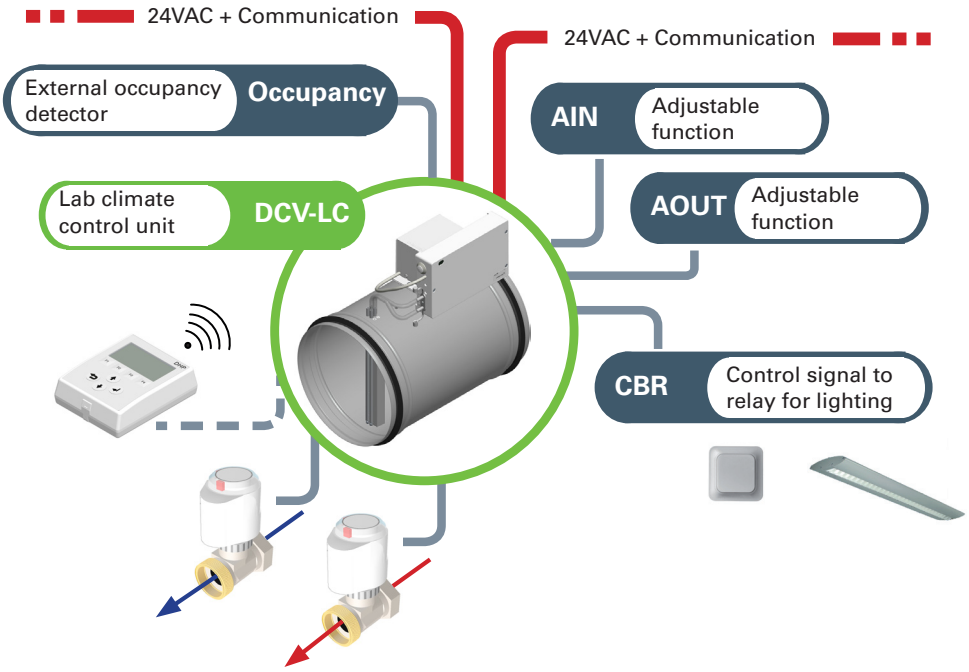
Product description

DCV-LC – Lab climate control unit

LCX Version A01

DCV-LC

Lab climate control



Connection diagram DCV-LC Circular.

Product description

DCV-LC – Lab climate control unit

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Contents Page

Products included (circular or rectangular design)

The products below are included in DCV-LC. The damper and measuring flange included are for either circular or rectangular duct.

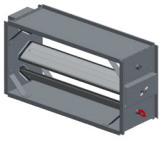
Lab climate controller LCX
- Internal flow sensor
- CAN connection
- Inputs and outputs for equipment/functions
- Pre-mounted in circular design

Controller LCX

Circular damper with measuring flange SPMF
- Measuring device with double measurement points
- Throttle damper with full damper blade
- Pre-mounted with controller LCX and damper actuator

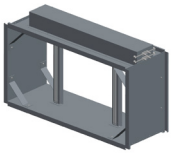
Damper SPMF

Rectangular damper JSPM
- Louvre damper
- Supplied with separate controller and damper actuator



Damper JSPM

Rectangular measuring flange SMRD
- Measuring device with double measurement points
- Supplied separately



Measuring flange SMRD

Damper actuator DA4 or DA8
- Supplied pre-mounted in circular design (DA4)
- Supplied separately with rectangular design (DA4 or DA8 depending on damper size)

Damper actuator DA4 (DA8)

DCV-LC – Lab climate control unit

LCX Version A01

Introduction DCV-LC

DCV-LC is included in Lindinvent's series of smart dampers and measuring units. The controller is intended to maintain a constant room temperature and/or carbon dioxide concentration in a laboratory by controlling the extract air.

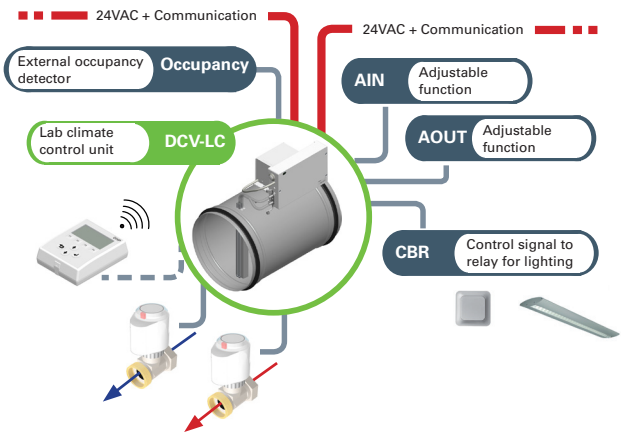
DCV-LC circular (Ø125-500) is supplied factory-assembled. For other sizes the damper, the measuring flange and the damper actuator with controller are supplied separately. DCV-LC is in the database for MagiCAD.

Function

- Can read and total other extract air flows in the zone via CAN so as to compensate its own or other extract air. A choice of function on start-up is used to state whether a balancing air flow controller acts as master or not.
- Can be started up to only control to its own reference values and send its current flow to the balancing master.
- Can occupancy control the air flow and demand control cooling and heating in sequence.
- Connections for a number of external sensors.
- Can connect lighting to motion-controlled lighting zones.
- Can be connected via node ID to a communication loop (CAN) for access to and communication with other concurrent nodes or systems via LINDINTELL or Gateway NCE with ModbusTCP/RTU.
- The controller has a great number of parameters that can be read and controlled from LINDINTELL/LINDINSPECT via CAN.

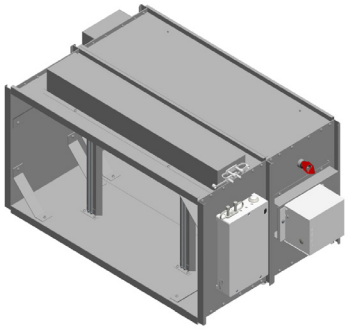
Connections for input and output signals

Many types of equipment/functions can be connected to the controller. For example, a fire signal can be connected and a buzzer alarm provided via relay. If no exchange to a superior system is possible via Modbus, a number of functions can instead be defined for the controller's inputs and outputs.



Connection diagram DCV-LC Circular. The controller is connected to a voltage feed and communication loop via Lindinvent's standard cable with two conductors for voltage feed and two twisted-pair conductors for communication.

DCV-LC Circular - Controller LCX and damper actuator mounted on a circular damper with measuring flange.



DCV-LC Rectangular - Controller LCX and damper actuator normally mounted on a rectangular damper with a connecting measuring flange.

User interface

- Communication via server with LINDINTELL/LINDINSPECT via CAN.
- Direct login on the controller via DHP hand unit (IR or wired communication)

LINDINTELL/LINDINSPECT

LINDINTELL is the software package that is installed on a central server. The software coordinates all optimisation and monitoring functions in Lindinvent's system for climate control and protective ventilation. LINDINTELL has functions for optimisation, oversteering and free programming.

LINDINSPECT is a Web interface that has been developed to be used with LINDINTELL.

Simplified start-up

DCV-LC is supplied factory calibrated. A simplified start-up process is available. Initially you have to select operation mode. If you stay with the default settings the required remaining inputs are: Duct diameter (or the K-factor) and location on either the supply or extract air duct.

DCV-LC – Lab climate control unit

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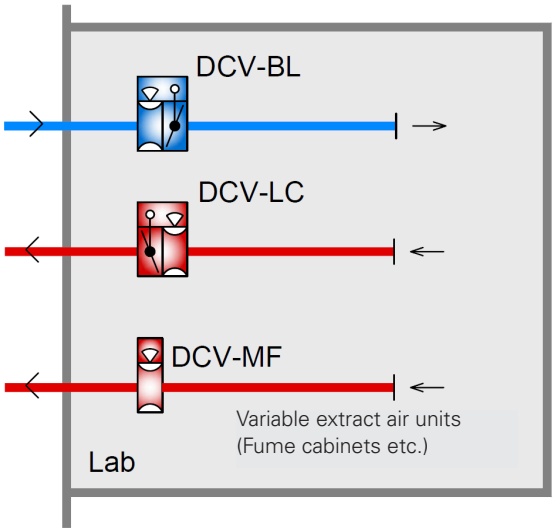
Functional chart lab with DCV-LC



Flow balancing

DCV-BL, operated for airflow balancing, can act as Master to DCV-LC. While DCV-LC is keeping trac of all extract air; DCV-BL is adding supply air according to a preset offset.

Climate control via DCV-LC

At increasing room temperature DCV-LC will increase the extract airflow. DCV-LC can also control additional cooling and heating in sequence.

Flow measuring with DCV-MF - variable extract air units

DCV-MF continuously measures the extract airflow from connected fume hoods, fume cabinets etc. The measured rate of airflow is read by DCV-LC and other concurrent nodes via CAN. DCV-LC can then, depending on selected function, adjust it's own airflow or not.

DCV-LC set to controll it's own meassured airflow without compensating for other extract airflows

DCV-LC adjust its own measured extract airflow level. The rate of airflow can be read by other nodes via CAN.

DCV-LC – Lab climate control unit

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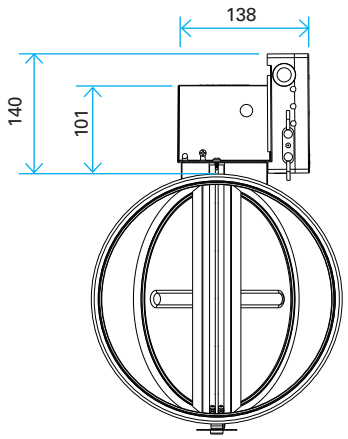
Dimensions DCV-LC



Dimensions to be considered when installing DCV-LC.

Ordering format

Circular Ø125-500
Lab climate control unit, Lindinvent AB,
type **DCV-LC-[Damper size][Material]-[Colour]**

Damper size = 125, 160, 200, 250, 315, 400, 500
Material = Galvanised (G), Epoxy lacquered (Epoxy lacquered; RAL9003; Gloss 85), Powder coated (P); Omitted material specification = Galvanised (G)
Colour = RAL9003; Glosslevel30 (Standard); Colour code is indicated for material P.

Example:
DCV-LC-250G (Circular DCV-LC in galvanised style)
DCV-LC-250P-RAL9003 (Power coated in colour RAL9003)

Circular connection Ø630
Lab climate control unit, Lindinvent AB,
type **DCV-LC-630(700x700)[Material]**

Material = Galvanised (G)

Example: DCV-LC-630(700x700)G
DCV-LC 630 supplied as a construction kit. The rectangular damper JSPM 700x700 with circular connection 630, a circular measuring flange with diameter 630, controller LCX and damper actuator are supplied individually to be assembled on site.

Rectangular
Lab climate control unit, Lindinvent AB,
type **DCV-LC- [WxH] [Material]**

Size: WxH = 200x200 -> 1600x1000 mm
Width (W): 200 to 1000 mm in intervals of 100, then in intervals of 200 mm.
Height(H): 200 to 800 mm in intervals of 100, then in intervals of 200 mm.
Contact Lindinvent where differing dimensions are required.
Material = G (Galvanised)

Example: DCV-LC-600x300G
Rectangular DCV-LC is supplied as a construction kit where damper JSPM, measuring flange SMRD, controller LCX and damper actuator are supplied individually to be assembled on site.

Lindinvent's system for climate control and protective ventilation is based on a server solution with LINDINTELL system software. LINDINSPECT is the web interface that has been developed to be used with LINDINTELL. LCX(DCV-LC), like other connected nodes, can be monitored and administered via LINDINSPECT.

Accessories

Examples of products that may be used in installations together with DCV-LC. Accessories are ordered separately. For technical specifications, see the respective product descriptions.

Extract air balancing
- Airflow control unit DCV-BL

Additional airflow measuring
- Measuring unit DCV-MF

User interface
- Handheld user panel DHP
- Fixed user panel FLOCHECK P

Other sensors
- Wall temperature and CO_2 sensor GTQV
- Occupancy detector PD-2400

Control boxes
- Lighting system control box CBR
- Electric radiator control box CBT
- Fan coil unit control box CBFS

Valve actuator
- A40405 (24VAC, NC),
- A41405 (24VAC, NO, On/OFF)
- APR40405 (0-10V, NC)

Lighting
- Relay box CBR

For Lighting control DALI: See SBD

Additional product documentation DCV-LC

Table 1: Additional documents for DCV-LC can be obtained via the product's website under Products at www.lindinvent.se

Document	Available	Not available	Comments
Installation Instruction	●		Combined installation instruction for DCV-LC and lab climate controller LCX (Assembly + connection).
Start-up instruction	●		Simplified start-up available. For the complete set of settings, see the start-up instruction for lab climate controller LCX.
Maintenance instruction		●	Regarded as maintenance-free. For cleaning and control measurement of measuring flange, see the maintenance instruction for SPMF.
External connection diagram	●		External connection diagram for LCX.
Environmental product declaration	●		To be assessed by Byggvarubedömningen.
User information		●	Not applicable.
Modbus list	●		Room climate controller LCX.
AMA text	●		

DCV-LC – Lab climate control unit

LCX Version A01

Introduction LCX

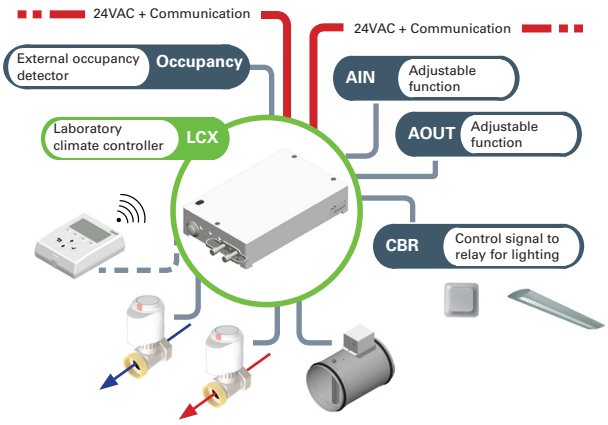
Laboratory climate controller LCX is factory calibrated and is included in room climate control unit DCV-LC. The controller is intended to maintain a constant room temperature and/or carbon dioxide concentration in a laboratory by controlling the extract air.

Function

- Can read and total other extract air flows in the zone via CAN so as to compensate its own or other extract air. A choice of function on start-up is used to state whether a balancing air flow controller acts as master or not.
- Can be started up to only control to its own reference values and send its current flow to the balancing master.
- Can occupancy control the air flow and demand control cooling and heating in sequence.
- Connections for a number of external sensors.
- Can connect lighting to motion-controlled lighting zones.
- Can be connected via node ID to a communication loop (CAN) for access to and communication with other concurrent nodes or systems via LINDINTELL or Gateway NCE with Modbus TCP/RTU.
- The controller has a great number of parameters that can be read and controlled from LINDINTELL/LINDINSPECT via CAN.

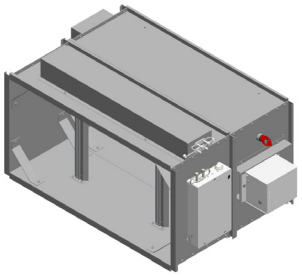
Connections for input and output signals

Many types of equipment/functions can be connected to the controller. If exchange to a superior system is desired but is not possible via Modbus, a number of functions can instead be defined for the controller's inputs and outputs.



Connection diagram LCX. The controller is connected to a voltage feed and communication loop via Lindinvent's standard cable with two conductors for voltage feed and two twisted-pair conductors for communication. The same cable is used for connection of a number of other accessories.

Laboratory climate controller LCX.



Laboratory climate control unit DCV-LC rectangular is included in the series of smart dampers. The unit is an assembly in which laboratory climate controller LCX is included.

User interface

- Communication via server with LINDINTELL/LINDINSPECT via CAN.
- Direct login on the controller via DHP hand unit (IR or wired communication)

LINDINTELL/LINDINSPECT

LINDINTELL is the software package that is installed on a central server and coordinates all optimisation and monitoring functions in Lindinvent's system designs for climate control and protective ventilation. LINDINTELL has, among other things, functions for optimisation, oversteering and free programming.

LINDINSPECT is a Web interface that has been developed to be used with LINDINTELL.

Control and alarm

Systems with LINDINTELL/LINDINSPECT can log values continually and set an alarm flag in the event of any deviations.

Simplified start-up

LCX is supplied factory calibrated. Simplified start-up is possible by stating duct diameter or K factor after function selection. It is not normally necessary to perform flow calibration on site.

DCV-LC – Lab climate control unit

LCX Version A01

Technical specifications LCX

General

Dimensions (mm)
200 x 125 x 45 (LxWxH)

Material
Polystyrene encapsulation

Net weight
0.4 kg

Paint colour
RAL 9003

IP classification
Encapsulation complies with IP53

Temperature limits
Operation: 0°C to 40°C; <85% RF
Storage: -20°C to 50°C; <90% RF

Electrical system

Supply voltage
24 VAC

Capacity
1.5 VA

CE marking
Complies with EMC and the Low Voltage Directive

Controlling the air flow

Airflow sensor
LCX is equipped with a sensor for measuring the air flow in a duct via connections to a measuring flange.

Range
Recommended range: 0.5–6.0 m/s
Maximum range: 0.2 - 7.0 m/s

Tolerance
±5 % or minimum ± x l/s (x = the duct area in dm^2)

Performance
Speed: Change regulated within 4 s (95% within 3 s)

Connections

- 2 x for 24 VAC + Communication loop (CAN)
- 1 x connection for 0-10 VDC analogue out for damper actuator
- 1 x 0-10 VDC analogue in for feedback from damper actuator
- 1 x terminal block for occupancy sensor 24VAC/13VDC/5VDC
- 1 x terminal block for lighting system control
- 1 x terminal block for a duct-monted temperature sensor (LCX with a pre-mounted duct temperature sensor is available to order)
- 1 x for two general 0-10 VDC (AIN2 and AIN3)
- 1 x for two general 0-10 VDC (AUT2 and AUT3)
- 1 x for DIN (G0, DIN1)
- 2 x for valve actuators (Triac 1 and Triac 2)
- IR transciever ”IRDA”
- RJ45 to wired communication with user panel DHP
- 1 x for generic voltage feed (G0, +5V, +13V)

Detail from start page in LINDINSPECT which is Lindinvent's web interface where LCX as well as other connected nodes can be visualized and administered.

Accessories

The following examples of accessories must be ordered separately:

External occupancy detector
See XPIR or PD-2400.

Balancing flow control
Flow control DCV-BL, which is included in Lindinvent's series of smart dampers and measuring units, is normally used for balancing supply and extract air in laboratory environments.

Lighting control
Lighting can be controlled via lighting relay box CBR together with an occupancy detector and/or push buttons.

Radiator control
Valve actuators for radiators can be connected for adjustment of heating and cooling in sequence. Parameters can be set for achieving cold intrusion protection.

Electric radiator control
Electric radiators and heaters can be controlled via electric radiator control box CBT.

Fan cooling
Additional cooling can be adjusted via fan coil unit control box CBFS/E.

Temperature and carbon dioxide (CO_2) sensor
See the products GTQD (Duct mounting) and GTQV (Wall mounting).

Fixed digital room panel
By connecting user panel FLOCHECK P to the controller, values and alarms can be managed in the premises.

Wireless communication via IR link
The hand-held user panel DHP, can be temporarily connected to LCX via IR link or FTP cable.

Additional product documentation LCX

Table 1: Additional documentation for LCX can be obtained via links on the product's website under Products at www.lindinvent.se

Document	Available	Not available	Comments
Installation Instruction	●		Combined installation instruction with DCV-LC (Assembly + connection).
Start-up instruction	●		Explains the complete menu structure with settings for laboratory climate controller LCX. See DCV-LC for simplified start-up.
Maintenance instruction		●	Regarded as maintenance-free.
External connection diagram	●		External connection diagram for LCX.
Environmental product declaration	●		Assessed by Byggvarubedömningen.
User information		●	Not applicable.
Modbus list	●		Laboratory climate controller LCX.
AMA text	●		

DCV-LC – Lab climate control unit

LCX Version A01

Introduction SPMF

SPMF is a throttle damper with a full damper blade equipped with a measuring flange with double measurement points. The damper requires low torque, which makes control quick and accurate. The actuator seat is adapted for Lindinvent's damper actuator. SPMF is included as a damper unit in the circular design of control unit DCV-RC, DCV-LC, DCV-BL and DCV-CF.

SPMF – A Circular damper with measuring flange.

Function

SPMF is used together with Lindinvent's flow sensor and damper motor, which allows regulation of airflow at low air speeds. In combination with a measuring flange, see SMED or SMID, damper SPM can be used as an alternative to SPMF.

Ordering information

Circular damper with measuring flange, Lindinvent AB, [FC-]SPMF-[Size][Material]-[Colour]
Size: 125, 160, 200, 250, 315, 400, 500
Material: G (Galvanised), E (Epoxy lacquered; RAL9003; Gloss 85), P (Powder coated); Omitted material specification = G.
Colour: Stated only for material code P. RAL9003; Gloss level 30 is standard.

Example: SPMF-250P-RAL9003
SPMF can also be supplied in stainless steel, SS 23 33 or SS 23 43; state material in plain text when ordering.

To be placed after a straight duct section

For accurate measurement data: SPMF should be positioned in the correct direction and directly after a disturbance-free straight duct section corresponding to a length of 3.5 times the duct diameter.

Directly after SPMF no minimum distance to a subsequent bend or other disturbance is required.

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

Technical specifications

General

Material
The dampers are manufactured in galvanised steel plate, but can be supplied in other materials and surface treatments; see material under *Ordering information* above. Duct seal in EPDM rubber and damper blade seal in silicon rubber.

Size and classification
Sizes: Ø125 – Ø500 mm according to EN 1506:2007
SPMF: Tightness class 3 according to VVS AMA.
SPMF: Pressure class A according to VVS AMA.
FC-SPMF: Tightness class 1 according to VVS AMA.

Flow measuring
Recommended measuring range: 0.5 – 6.0 m/s
Maximum range: 0.2 – 7.0 m/s
Measurement accuracy*: ± 5% or minimum ± x l/s
(x = duct area in dm^2) *Applies together with Lindinvent's controller and damper actuator.

Dimensions

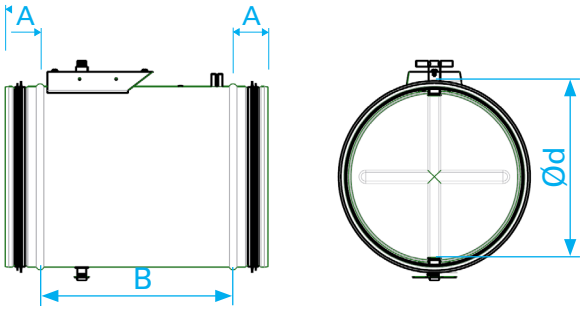


Diagram 1: Airflow intervals for SPMF-125 to SPMF-500

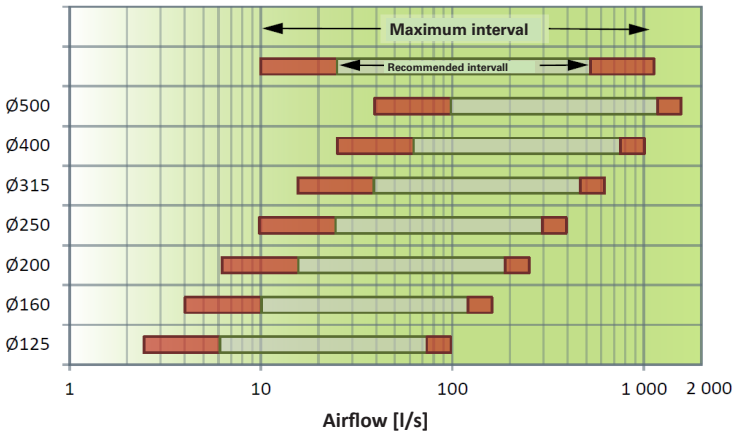


Table 1: Dimensions, weight and K-factor

Ød	A	B	Weight/ kg	K-factor (c)
125	38	150	1	9.5
160	38	180	1.5	15.4
200	38	200	2	23.9
250	60	240	2.5	36.9
315	60	290	4.5	57.8
400	78	350	6	91.7
500	78	410	9.6	141.0

Flow calculation: $q = c \times \sqrt{\Delta p}$ [l/s]

DCV-LC – Lab climate control unit

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Diagram 2 to 5 below: Total A-weighted sound power levels, dB (A) for SPMF-125 to SPMF-250.

Noise generation

$L_W = L_{WA} + K_0$

L_W = Sound power level [dB]
L_{WA} = Total A-weighted sound power level [dB (A)] is read from the sound level diagram for each SPMF dimension.
K_0 = Correction factor for actual frequency band is read from the table under each SPMF sound diagram.

Table 2: Tolerance sound power level L_W [dB]

Hz	63	125	250	500	1k	2k	4k	8k
± dB	6	4	3	3	3	3	3	3

Diagram 2: Sound diagram SPMF-125

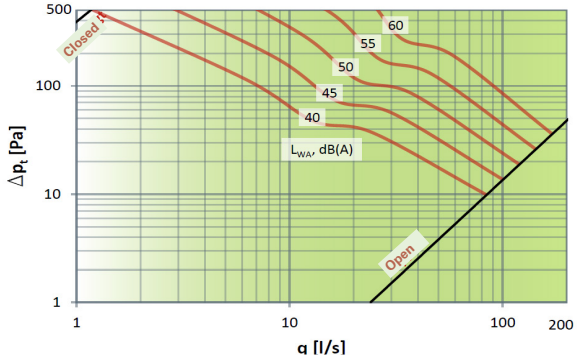

Table 3: Correction factor K_0 [SPMF-125]

Hz	63	125	250	500	1k	2k	4k	8k
K_0	13	13	10	3	-6	-10	-17	-23

Diagram 3: Sound diagram SPMF-160

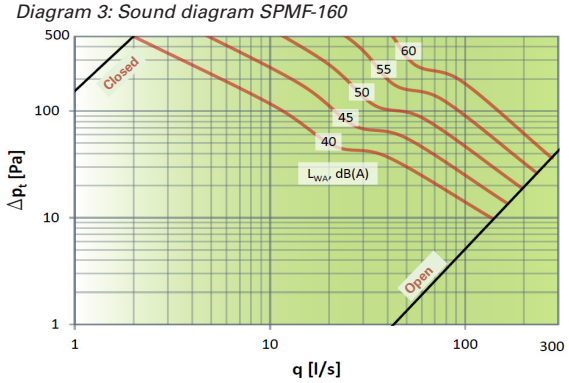

Table 4: Correction factor K_0 [SPMF-160]

Hz	63	125	250	500	1k	2k	4k	8k
K_0	12	9	8	0	-4	-9	-15	-21

Diagram 4: Sound diagram SPMF-200

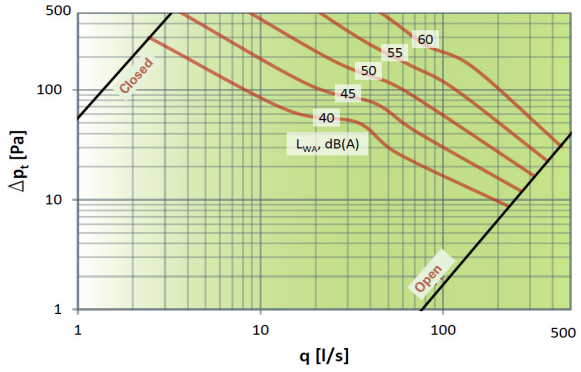

Table 5: Correction factor K_0 [SPMF-200]

Hz	63	125	250	500	1k	2k	4k	8k
K_0	14	8	6	0	-4	-9	-15	-21

Diagram 5: Sound diagram SPMF-250

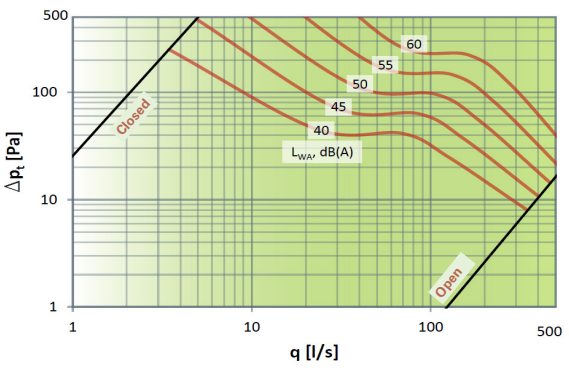

Table 6: Correction factor K_0 [SPMF-250]

Hz	63	125	250	500	1k	2k	4k	8k
K_0	15	9	7	0	-5	-10	-16	-24

DCV-LC – Lab climate control unit

LCX Version A01

Diagram 6 to 8 below: Total A-weighted sound power levels, dB (A) for SPMF-315 to SPMF-500.

Noise generation

$L_W = L_{WA} + K_0$

L_W = Sound power level [dB]
L_{WA} = Total A-weighted sound power level [dB (A)] is read from the sound level diagram for each SPMF dimension.
K_0 = Correction factor for actual frequency band is read from the table under each SPMF sound diagram.

Table 2: Tolerance sound power level L_W [dB]

Hz	63	125	250	500	1k	2k	4k	8k
± dB	6	4	3	3	3	3	3	3

Diagram 6: Sound diagram SPMF-315

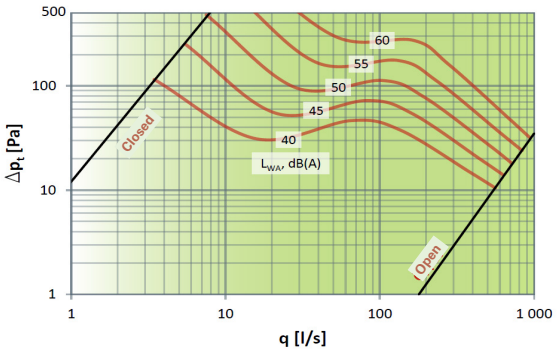

Table 7: Correction factor K_0 [SPMF-315]

Hz	63	125	250	500	1k	2k	4k	8k
K_0	15	8	5	1	-5	-11	-16	-24

Diagram 7: Sound diagram SPMF-400

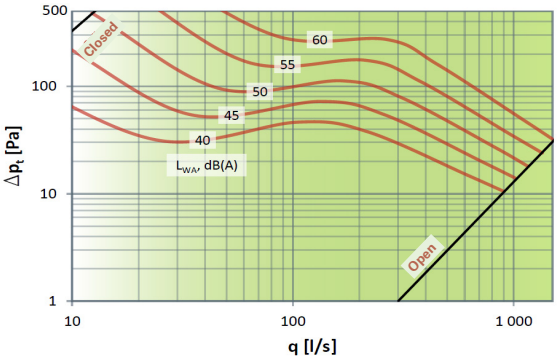

Diagram 8: Sound diagram SPMF-500

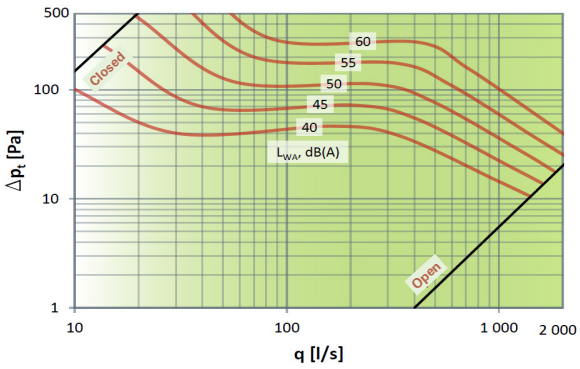

Table 8: Correction factor K_0 [SPMF-400]

Hz	63	125	250	500	1k	2k	4k	8k
K_0	12	7	4	0	-4	-12	-15	-23

Table 9: Correction factor K_0 [SPMF-500]

Hz	63	125	250	500	1k	2k	4k	8k
K_0	11	5	5	1	-4	-12	-15	-22

Additional product documentation SPMF

Table 10: Additional documentation for SPMF can be obtained via the product's website under Products at www.lindinvent.se

Document	Available	Not available	Comments
Installation Instruction		●	See the installation instruction for DCV-LC.
Start-up instruction		●	Not applicable.
Maintenance instruction	●		Cleaning of measuring flange and control measurement of air flow.
External connection diagram		●	Not applicable.
Environmental product declaration	●		Assessed by Byggvarubedömningen and Sundahus.
User information		●	Not applicable.
Modbus list		●	Not applicable.
AMA text	●		

DCV-LC – Lab climate control unit

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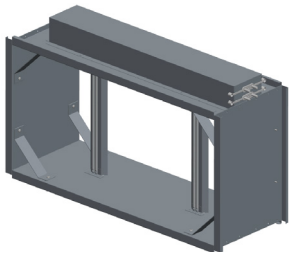
Introduction SMRD

SMRD is a measuring flange for rectangular ducts, built with one to four flanges depending on size. All flanges are connected to a double measuring point. SMRD is used in the rectangular design of measuring unit DCV-MF. SMRD is also used with damper JSPM to install a rectangular version of DCV-RC, DCV-LC, DCV-BL and DCV-CF.



SMRD – A rectangular measuring flange.

Order information

Rectangular damper, Lindinvent AB, type SMRD-[WxH]
Sizes (W x H) in combinations according to *Table 1*.
Width (W): from 200 to 1600 mm.
Height (H): from 200 to 1000 mm.
Length (L): Not relevant here (Always 220 mm)
Example: SMRD-600x300

Dimensions: Width(W) x Height(H) in mm

W/H	200	300	400	500	600	700	800	1000
200								
300								
400								
500								
600								
700								
800								
1000								
1200								
1400								
1600								

Table 1: Standard dimensions for W and H, available to order. The length (L) is always 220 mm. Units within the marked area are all available in MagiCAD.

To be placed after a straight duct section

For accurate measurement data: SMRD should be positioned in the correct direction and directly after a disturbance-free straight duct section is required of 3.5 x the length of the equivalent channel diameter.

Directly after SMRD no minimum distance to a subsequent bend or other disturbance is required.

When SMRD is placed after a silencer with a different cross-sectional area (smaller inner diameter, center body or center baffle), SMRD can be placed directly after a straight duct section corresponding to 2.0 x the length of the equivalent duct diameter is required where the length of the silencer is not included.

The equivalent duct diameter (de) is calculated by the following formula: $de \approx 1.15 \times \sqrt{A}$ (where A = W x H).

Technical specifications

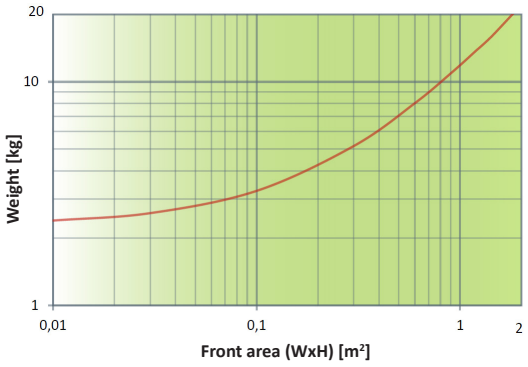
General

Material

The measuring device consists of a case and measuring flanges in galvanised steel plate. Measuring tubes in aluminium.

Weight

Diagram 1: Weight SMRD



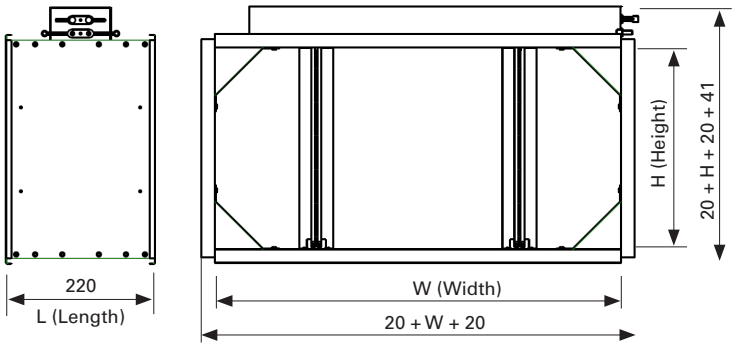
Flow measuring

Recommended measuring range: 0.5 – 6.0 m/s
Maximum range: 0.2 – 7.0 m/s
Measurement accuracy*: ± 5% or minimum ± x l/s
(x = duct area in dm²)
*Applies together with Lindinvent's controller and damper actuator.

K-factor and air flow calculation

K = 749 x A; A = Width (W) x Height (H) in metres.
Example: K-factor for SMRD 500x200 = 749x0.5x0.2 = 74.9
Air flow calculation (q): $q = K \times \sqrt{\Delta p}$ [l/s]

Measure in mm



DCV-LC – Lab climate control unit

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Pressure drop and sound data SMRD

Pressure drop
Total pressure drop for various cross section areas of SMRD can be read from the pressure drop diagram below.

Noise generation

$L_W = L_{WA} + K_0$

L_W = Sound power level [dB]
L_{WA} = Total A-weighted sound power level [dB (A)] is read from diagram 3.
K_0 = Correction factor for actual frequency band is read from table 2 for different cross section areas.

Table 2: Correction factor, K_0

Cross section area	Octave band (Hz)							
	63	125	250	500	1k	2k	4k	8k
0.1 m²	-3	-7	-2	-2	-5	-9	-17	-31
0.5 m²	+5	+1	+1	-3	-5	-10	-17	-30
1 m²	+5	+1	+1	-3	-5	-10	-17	-30
2 m²	+5	+1	+1	-3	-5	-10	-17	-30

Table 3: Tolerance sound data

Hz	63	125	250	500	1k	2k	4k	8k
± dB	6	4	3	3	3	3	3	3

Diagram 2: Static pressure drop [SMRD]

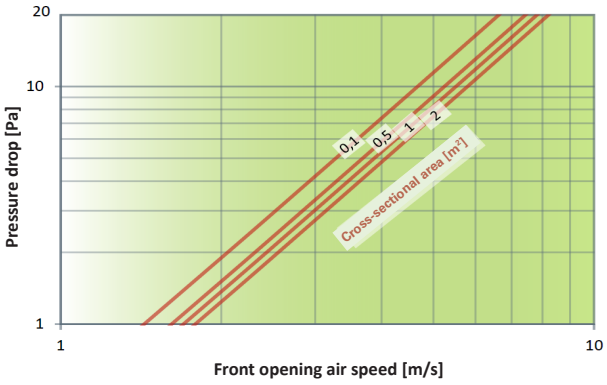
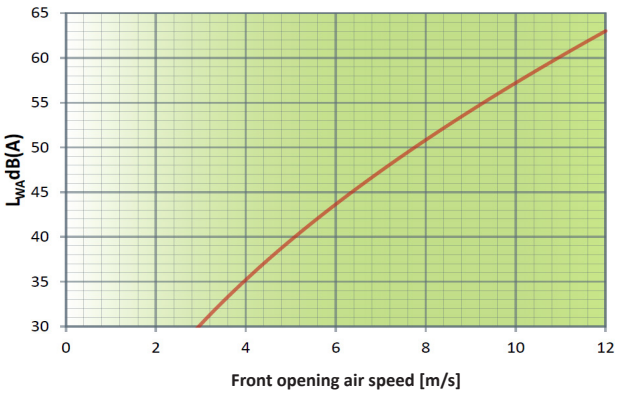


Diagram 3: Sound level [SMRD]



Additional product documentation SMRD

Table 4: Additional documentation for SMRD can be obtained via the product's website under Products at www.lindinvent.se

Document	Available	Not available	Comments
Installation Instruction		●	See the installation instruction for DCV-BL
Start-up instruction		●	Not applicable
Maintenance instruction	●		Cleaning and control measurement
External connection diagram		●	Not applicable
Environmental product declaration	●		Assessed by Byggvarubedömningen and Sundahus
User information		●	Not applicable
Modbus list		●	Not applicable
AMA text	●		

Product documentation can be downloaded via www.lindinvent.se/produkter/

DCV-LC – Lab climate control unit

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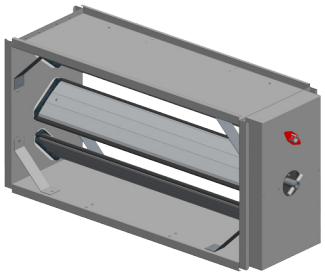
Introduction JSPM

JSPM is a fully sealed balancing damper with an actuator seat adapted for Lindinvent's damper actuator. The damper blades are linked via gears. JSPM is included in the rectangular design of control unit DCV-SP. JSPM is also included, along with the rectangular measuring flange SMRD, in the smart control units DCV-RC, DCV-LC, DCV-BL and DCV-CF.



JSPM size 600x300 mm.

JSPM size 700x700/630 mm.

Function

The damper is used for controlling flow and pressure together with a Lindinvent controller and a damper actuator.

Order information

Rectangular damper, Lindinvent AB, type JSPM-[WxH]

Sizes (WxH) in combinations according to *Table 1*.
Width (W): from 200 to 1600 mm.
Height (H): from 200 to 1000 mm.
Length (L): Not relevant here (Always 220 mm)
Example: JSPM-400x300

JSPM may be ordered with circular connection Ø630 or Ø800. Designations as follows: *JSPM-700x700/630* or *JSPM-800x800/800*.

Dimensions: Width(W) x Height(H) in mm

W\H	200	300	400	500	600	700	800	1000
200	DA4	DA4	DA4	DA4	DA8	DA8	DA8	DA8
300	DA4	DA4	DA4	DA4	DA8	DA8	DA8	DA8
400	DA4	DA4	DA4	DA4	DA8	DA8	DA8	DA8
500	DA4	DA4	DA4	DA4	DA8	DA8	DA8	DA8
600	DA4	DA8	DA8	DA8	DA8	DA8	DA8	DA8
700	DA4	DA8	DA8	DA8	DA8	DA8	DA8	DA8
800	DA4	DA8	DA8	DA8	DA8	DA8	DA8	DA8
1000	DA4	DA8	DA8	DA8	DA8	DA8	DA8	DA8
1200	DA4	DA8	DA8	DA8	DA8	DA8	DA8	DA8
1400	DA4	DA8	DA8	DA8	DA8	DA8	DA8	DA8
1600	DA4	DA8	DA8	DA8	DA8	DA8	DA8	DA8

Table 1: Available standard dimensions for W and H. The length (L) is always 220 mm. Devices within the marked area are available in MagiCAD. The table shows which actuator DA4 or DA8 should be used for each damper.

Technical specifications

General

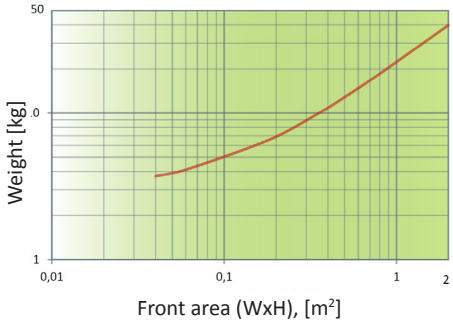
Material

The damper consists of a case in galvanised steel plate and damper blades in aluminium. The damper blades are equipped with end gaskets made of nylonplated EPDM-rubber and with length going gaskets made of silicon-rubber.

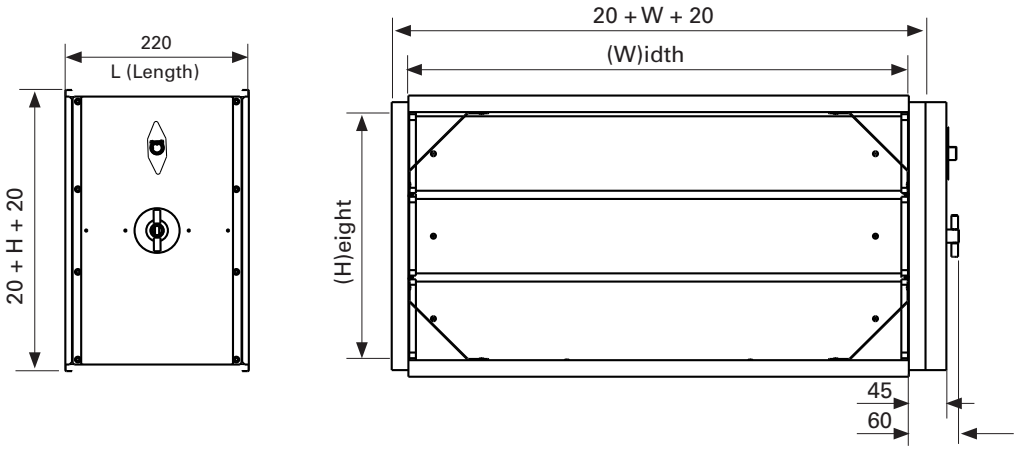
Tightness class 2 according to VVS AMA.
Pressure class A according to VVS AMA.

Weight

Diagram 1: Weight JSPM



Measure in mm



DCV-LC – Lab climate control unit

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Sound data JSPM

Noise generation

$L_W = L_{pA} + K_0 + K_k$

L_W = Sound power level, dB.
L_{pA} = Total A-weighted sound power level, dB (A), read from sound level diagram below for cross section area 1 m².
K_0 = Correction factor for actual frequency band read from table 2 for actual damper blade angle.
K_k = Correction factor for actual duct area is read from diagram 3.

Table 2: Correction factor K_0 [JSPM]

Damper angle	Octave band (Hz)							
	63	125	250	500	1k	2k	4k	8k
30 - 40°	-4	-6	-8	-8	-9	-12	-16	-19
50 - 60°	-5	-5	-8	-10	-10	-10	-13	-15
70 - 80°	-6	-4	-5	-7	-9	-9	-10	-12

Table 3: Tolerance sound power level L_W [JSPM]

Hz	63	125	250	500	1k	2k	4k	8k
± dB	6	4	3	3	3	3	3	3

Diagram 2: Noise generation (cross section area 1 m²) [JSPM]

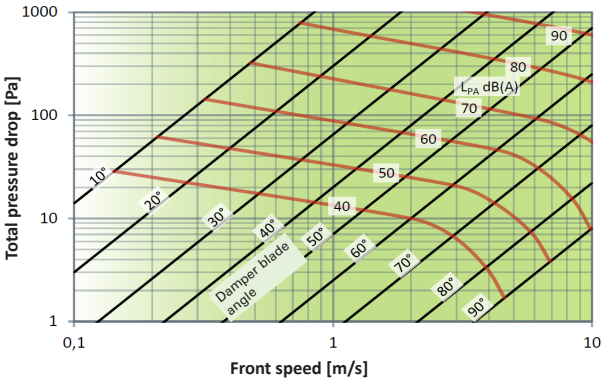
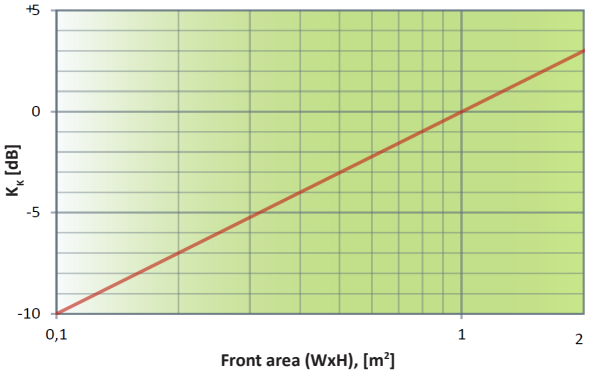


Diagram 3: Correction factor for duct area [K_k]



Additional product documentation JSPM

Table 4: Additional documentation for JSPM can be obtained via links on the product's website under Products at www.lindinvent.se

Document	Available	Not available	Comments
Installation Instruction		●	See installation instruction for DCV-SP
Start-up instruction		●	Not applicable
Maintenance instruction		●	Maintenance free
External connection diagram		●	Not applicable
Environmental product declaration	●		Assessed by Byggvarubedömningen and Sundahus
User information		●	Not applicable
Modbus list		●	Not applicable
AMA text	●		

Product documentation can be downloaded via www.lindinvent.se/produkter/

DCV-LC – Lab climate control unit

LCX Version A01

Introduction DA4 and DA8

The damper motors DA4 and DA8 are designed for Lindinvent's dampers for air flow and pressure control. All smart dampers in circular design are equipped with DA4 while DA8 is used for larger rectangular dampers as shown in Table1 below.

Function

The damper motor controls damper blades via signal from the connected regulator.

The motor cover is specially designed to act as holder for Lindinvent's regulators. Assembly and disassembly of the regulator on the cover is made easy and without tools.

Ordering information

Both DA4 and DA8 can be ordered with cabling mounted in two designs: Length 0.25 meters with a connector mounted or length 3 meters without a connector mounted.

Motor size: DA4 or DA8

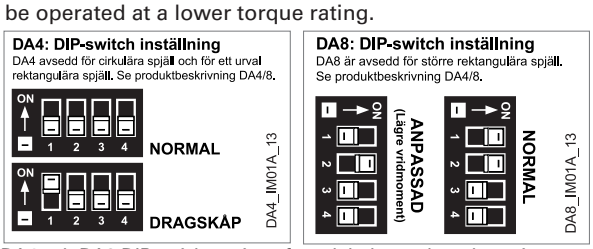
DA4 is used for Lindinvent's circular dampers Ø125 - Ø500 and for a selection of rectangular dampers. DA8 is used for Lindinvent's larger rectangular dampers, see Table 1 below. DA8 should also be used for the rectangular damper 700x700 with circular connection Ø630.

B\H	200	300	400	500	600	700	800	1000
200	DA4	DA4	DA4	DA4	DA8	DA8	DA8	DA8
300	DA4	DA4	DA4	DA4	DA8	DA8	DA8	DA8
400	DA4	DA4	DA4	DA4	DA8	DA8	DA8	DA8
500	DA4	DA4	DA4	DA4	DA8	DA8	DA8	DA8
600	DA4	DA8	DA8	DA8	DA8	DA8	DA8	DA8
700	DA4	DA8	DA8	DA8	DA8	DA8	DA8	DA8
800	DA4	DA8	DA8	DA8	DA8	DA8	DA8	DA8
1000	DA4	DA8	DA8	DA8	DA8	DA8	DA8	DA8
1200	DA4	DA8	DA8	DA8	DA8	DA8	DA8	DA8
1400	DA4	DA8	DA8	DA8	DA8	DA8	DA8	DA8
1600	DA4	DA8	DA8	DA8	DA8	DA8	DA8	DA8

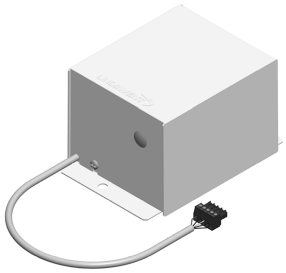
Table1: Rectangular damper JSPM showing it's size dependent designated actuator DA4 or DA8. Sizes within the marked area are available in MagiCAD.

Mode of operation

Both actuators are normally delivered with it's DIP-switch settings at "NORMAL", as shown bellow . DA4 is set to "DRAGSKÅP" when installed with Fume capboard controller FCL. DA8 can be switched to "ANPASSAD" to be operated at a lower torque rating.



DA4 och DA8 DIP-swich settings from labels used on the units.



DA4 with pre-mounted connector. Damper actuator for Lindinvent's controllers.

DCV-SP circular: Regulator SPL and damper motor DA4 mounted on a circular damper.

Technical specifications

General

Dimension
DA4: 140 x 97 x 80 mm (LxWxH)
DA8: 140 x 130 x 80 mm (LxWxH)

Material
Gearbox in metal
DA4: Thermoplastic encapsulation (PS)
DA8: Powder-coated steel plate encapsulation

Weight
DA4: Net weight 0.7 kg (0.25 m cable with connector)
DA8: Net weight 1.4 kg (0.25 m cable with connector)

Colour
RAL 9003

IP class
Encapsulation complies with IP42

Damper blade positioning
By turning a screw, any damper angle can be selected on a switched-off motor. The engine calibration is not affected by the damper position being set with the screw.

Electrical system

Supply voltage
24 VAC

Capacity
DA4: 2.3 VA (max 12 VA)
DA8: 2.3 VA (max 17 VA)

CE marking
Complies with EMC and the Low Voltage Directive

Performance

DA4: Running time 0-90° 6.5 s
DA8: Running time 0-90° 6.5 s

Input and output signals

Input signals
1 x 0-10 VDC control signal

Output signals
1 x 0-10 VDC feedback signal

Additional product documentation DA4/8

Table 1: Additional documentation for DA4/8 is available via the product's website under Products at www.lindinvent.se

Document	Available	Not available	Comments
Installation Instruction	●		
Start-up instruction		●	See start-up instruction for connected controller
Maintenance instruction		●	Regarded as maintenance-free
External connection diagram		●	Cable with connector for terminal block on controller.
Environmental product declaration	●		Assessed by Byggvarubedömningen
User information		●	Not applicable
Modbus list		●	Not applicable
AMA text		●	See corresponding controller

Product documentation can be downloaded via www.lindinvent.se/produkter/

Contact
www.lindinvent.se
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