Lindab **LCFV**

Visible diffuser

Visible diffuser

LCFV/LCFV-P

Description

LCFV is a VAV diffuser unit for supply air with circular unperforated face plate for free hanging installations.

LCFV includes a unique linear cone damper with integrated volume flow regulator used for VAV regulation directly in the unit.

The built-in VAV actuator is delivered pre-programmed with damper characteristic and in combination with a stable flow measurement over the damper, it makes the VAV regulation very accurate and reliable.

In Pascal system LCFV is controlled by a Regula Combi room controller where all room settings can be done after installation. This means that no factory settings or specific room labeling is needed for LCFV.

- Free hanging VAV unit with integrated volume flow regulator.
- Suitable in full variable airflow range with high under temperature.
- Unique linear cone damper.
- Up to 200 Pa with low sound level.
- Accurate and reliable VAV regulation.
- Settings can be done in Regula Combi after installation.

Maintenance

The face plate can be detached and the damper removed to enable cleaning of the internal parts or the duct. The visible parts of the diffuser can be wiped with a damp cloth.
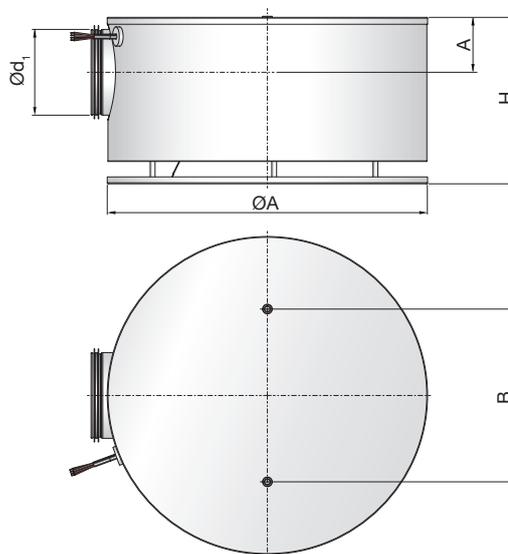
Order code

Product   **LCFV aaa b c**

Type
LCFV

Connection dim.
Ød 125-200

Design
    Standard
-P   With presence sensor (RJ45)*
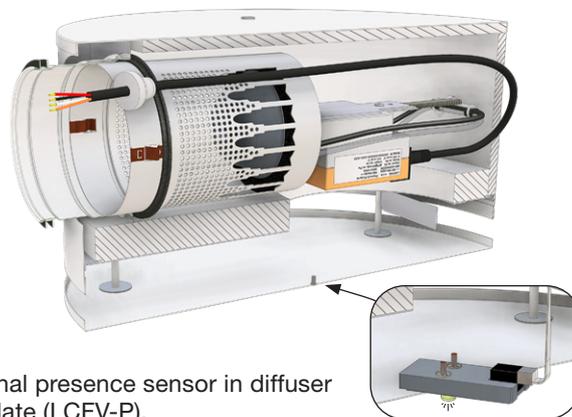
Motortype
MP, MOD/BAC, KNX

Example: LCFV-200-P-KNX

* = Only available with MP motortype.

Dimensions

Ød$_1$ mm	ØA mm	A mm	H mm	B mm	Weight kg
125	460	80	241	250	7.5
160	540	97	275	300	10.5
200	660	117	315	400	14.2

Construction

Optional presence sensor in diffuser faceplate (LCFV-P).

Motortype

Type	Documentation
MP	LHV-D3W-MP LIN
MOD/BAC	LHV-D3W-MOD LIN
KNX	LHV-D3W-KNX LIN

Materials and finish

Material: Galvanised steel
Standard finish: Powder-coated
Standard colour: White, RAL 9010, gloss 30 or
                           white 9003, gloss 30.

The diffuser is available in other colours. Please contact Lindab's sales department for further information.

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Technical data

Capacity

Volume flow q_v [l/s] and [m³/h], total pressure Δp_t [Pa], throw $I_{0.2}$ [m] and sound power level L_{WA} [dB(A)] can be seen in the diagrams.

For complete configuration, go to the LindQST Airborne calculator.

Frequency-related sound effect level

The sound effect level in the frequency band is defined as $L_{WA} + K_{ok}$. K_{ok} values are given in charts beneath the diagrams on the following pages.

Quick selection

Supply air

| Duct | $\Delta p_t \geq 50$ Pa | | $\Delta p_t \geq 50$ Pa | |
| $\varnothing d_1$ | 30 dB(A) | | 35 dB(A) | |
mm	l/s	m³/h	l/s	m³/h
125	55	198	71	256
160	76	274	99	356
200	129	463	154	553

Airflow limits

| LCFV | Lower regulation limit (0.56 m/s)* | | Airflow Nominal (7.0 m/s) | |
| Inlet | | | | |
$\varnothing d_1$	l/s	m³/h	l/s	m³/h
125	7	25	86	310
160	11	41	141	508
200	18	63	220	792

*) Lower airflow is still measured, but regulation switches between closed and 8% of V_{nom}, which is a fixed Belimo setting.

Leakage through closed damper

| Inlet | Closed damper leakage at 50 Pa** | |
$\varnothing d_1$	l/s	m³/h
125	4.8	17.3
160	5.4	19.4
200	8.3	29.9

**) The damper is class 0 according to EN 1751, but the table shows the approximate leakage when the damper is fully closed.
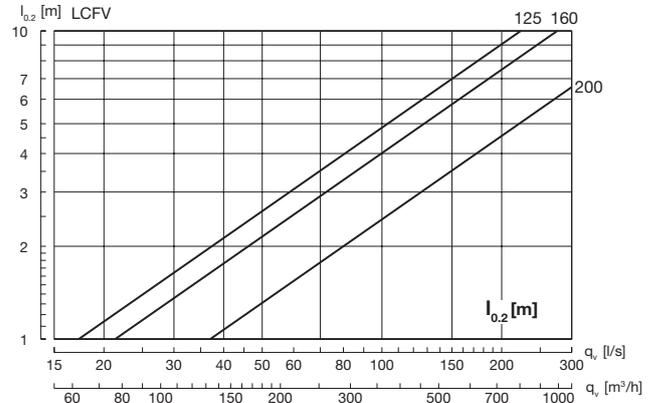
If calculating for other pressures, use an exponent = 0.6.

Rack stroke mechanically limited according to size

Size $\varnothing d_1$ mm	125	160	200
Rack stroke mm	110	137	157

Throw $I_{0.2}$

The throw is specified at a terminal velocity of 0.2 m/s.

Sound attenuation

Sound attenuation of the diffusers ΔL from duct to room, including end reflection, see table below.

| LCFV / LCFV-P | Sound attenuation ΔL [dB] | | | | | | | |
| Duct | Centre frequency Hz | | | | | | | |
$\varnothing d_1$	63	125	250	500	1K	2K	4K	8K
125	18	15	13	12	12	14	17	18
160	12	10	16	12	13	14	18	19
200	9	10	14	14	12	15	18	19

LCFV-P

As an option the frontplate can come with a build-in presence sensor.

The cable connection from the sensor is done with RJ45 to a connector next to the Belimo-cable lead out.

From here RJ45 cable can be connected to Regula Control Pascal card, for quick and easy installation.
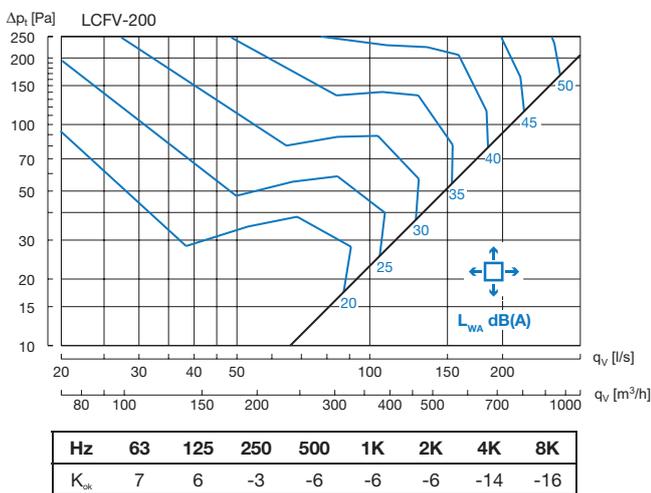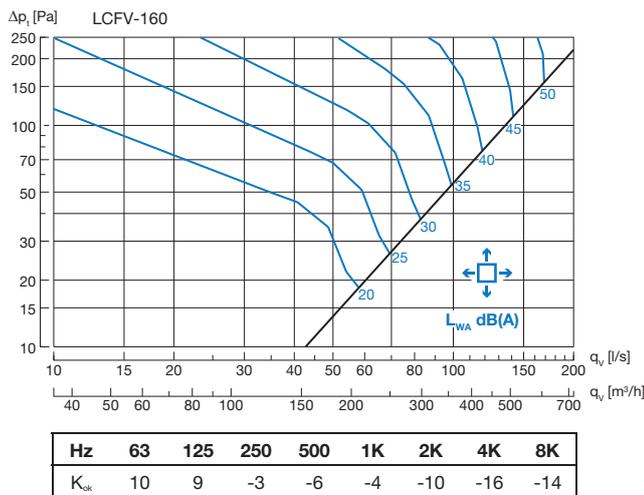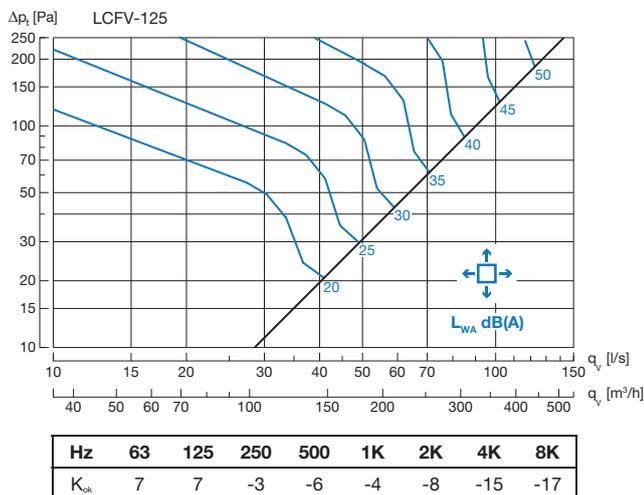
Alternatively, Regula Connect Pascal can be used with adapter or directly on patch wires.
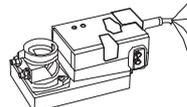
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Technical data

LCFV-125

Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	7	7	-3	-6	-4	-8	-15	-17

LCFV-160

Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	10	9	-3	-6	-4	-10	-16	-14

LCFV-200

Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	7	6	-3	-6	-6	-6	-14	-16

Type overview, MP versions

Type	Force	Power consumption	Rating	Weight
LHV-D3-MP-LIN	150 N	2.5 W	4.5 VA	Approx 550 g

No.	Designation	Wire colour	Function
1	⊥ –	black	AC/DC 24 V supply
2	~ +	red	
3	◄ Y	white	Reference signal / override / sensor
5	► U	orange	– Actual value signal – MP bus connection

Note !

- Supply via safety isolating transformer !
- In conventionally controlled systems it is recommended that the connections 1 to 5 (PP) are led to accessible terminals (e.g. floor distributor) in order to allow remote access for diagnostics and service work.

Type overview MOD versions

Type	Force	Power consumption	Rating	Weight
LHV-D3-MOD-LIN	150 N	2.5 W	4.5 VA	Approx 550 g
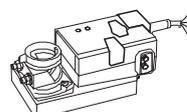
No.	Designation	Wire colour	Function
1	⊥ –	black	AC/DC 24 V supply
2	~ +	red	
3			
5	► MFT	orange	MP connection
6	D–	pink	BACnet / Modbus (RS485)
7	D+	grey	

Note !

- Supply via safety isolating transformer !
- Modbus signal assignment:
  $C_1 = D- = A$
  $C_2 = D+ = B$
- Supply and communication are not galvanically isolatd.
- Connect earth signal for devices with one another.

Type overview KNX versions

Type	Force	Power consumption	Rating	Weight
LHV-D3-KNX-LIN	150 N	2.5 W	4.5 VA	Approx 550 g
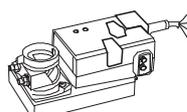
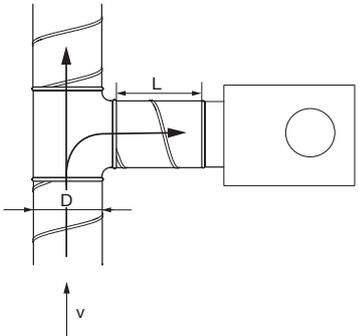| No.	Designation	Wire colour	Function
1	⊥ –	black	AC/DC 24 V supply
2	~ +	red	
3			
5	► MFT	orange	PP connection
6	D+	pink > red	KNX
7	D–	grey > black	

Note !

- Supply via safety isolating transformer !
- Signal assignment KNX:
  D+ = KNX+ (pink > red)
  D- = KNX- (grey > black)
- The connection to the KNX line should take place via WAGO connection terminals 222/221.

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Air flow measurement

Recommended lengths L of straight duct between a disturbance and LCFV.
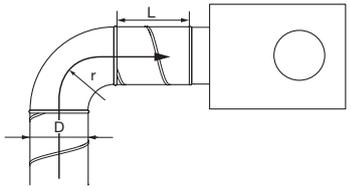
| Bend with radius r > D	1D
Box installed at the side branch of the distribution duct; for velocities in the distribution duct v > 4 m/s.	3D
A general disturbance (none of the cases above).	1D-4D

Accuracy

Damper position > 30% (Open = 100%)
The highest value of
±7% of reading or ±1% of V_{nom} (flow at 7 m/s).

Damper position < 30% (Open = 100%)
The highest value of
±7% of reading or ±2.5% of V_{nom} (flow at 7 m/s).

- - - Damper position < 30% (Open = 100%)
— Damper position > 30% (Open = 100%)
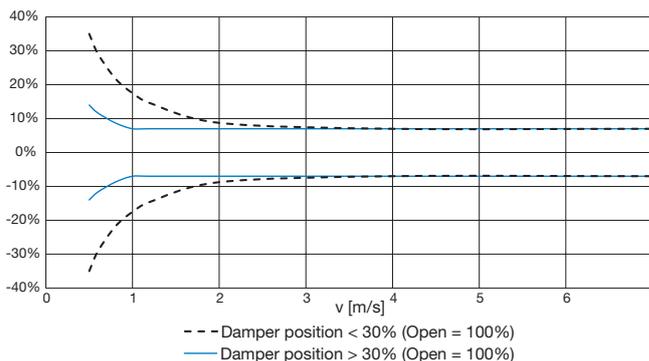
±7% or table value (highest).

LCFV	>30%	<30%
Ød$_1$	±1% V_{nom}	±2.5% V_{nom}
mm	l/s	l/s
125	±1.0	±2.2
160	±1.4	±3.5
200	±2.2	±5.5
250	±3.4	±8.6

Sound power level

Sound from Belimo motor, less than 25 dB (A) when regulating.
Max. 35 dB (A) when overriding to forced ventilation or closed.

Lindab factory settings:

Damper is programmed with size dependent calibration settings.

Analogue feedback signal is damper position as default.

When used for Pascal:
Settings for V_{max} = 100% and V_{min} = 0% should not be changed. Airflow limits are set in Regula Combi.

Most of us spend the majority of our time indoors. Indoor climate is crucial to how we feel, how productive we are and if we stay healthy.

We at Lindab have therefore made it our most important objective to contribute to an indoor climate that improves people's lives. We do this by developing energy-efficient ventilation solutions and durable building products. We also aim to contribute to a better climate for our planet by working in a way that is sustainable for both people and the environment.

Lindab | For a better climate

Lindab®
For a better climate