

03



Swirl diffusers



Variable swirl
diffusers



Swirl diffusers, Variable swirl diffusers

Swirl diffusers are designed for air-conditioning of room with floor to ceiling heights from 2.6 to 4 m and temperature difference between supply and room air of +10K to -10K. Due to the rotary swirling motion of the air discharge, induction of room air occurs very quickly.

Variable diffusers are designed for rooms with changing thermal loads which require different conditioning (heating, cooling). They are suitable for rooms with floor to ceiling height of up to 10 m and recommended temperature difference between supply and room air +10K and -10K. Required conditioning is achieved by the means of manual or power driven blades adjusting.

Swirl and variable swirl diffusers are suitable both for comfort as well as industrial air-conditioning.

Overview

■ Swirl diffusers

Application

Swirl diffusers are designed for air-conditioning of room with floor to ceiling heights from 2.6 to 4 m and temperature difference between supply and room air of +10K to -10K. Due to the rotary swirling motion of the air discharge, induction of room air occurs very quickly. Swirl diffusers are suitable both for comfort as well as industrial air-conditioning.

Description

Swirl diffusers consist of plenum box made of galvanised sheet steel and diffuser face. Diffuser face is made of sheet steel powder painted in RAL 9010 or any RAL colour upon customer's request.

OD-8/TR

According to the temperature profile, OD-8/TR automatically adjusts the inlet air flow. The swirl effect is used in the cooling mode, while the vertical air flow is in effect during heating. During transition periods, the diffuser automatically adjusts the optimum discharge angle which contributes to increased comfort level in the room.

■ Variable swirl diffusers

Application

Variable diffusers are designed for rooms with changing thermal loads which require different conditioning (heating, cooling). They are suitable for rooms with floor to ceiling height of up to 10 m. and recommended temperature difference between supply and room air +10K and -10K. Required conditioning is achieved by the means of manual or power driven blades adjusting. Variable diffusers are suitable for both comfort and industrial conditioning.

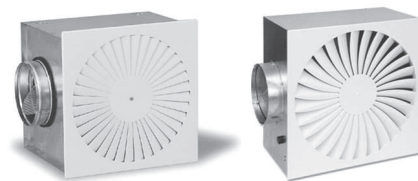
Description

Variable diffusers consist of plenum box made of galvanised sheet steel and diffuser. Diffusers are made of sheet steel or sheet aluminium (OD-11) and powder painted in RAL 9010 or any RAL colour upon customer's request.

OD-11V/TR

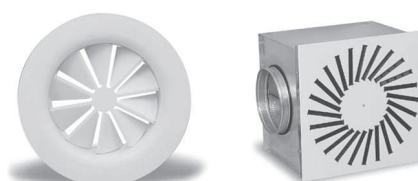
At OD-11V/TR diffuser, centrally adjustable blades can be adjusted automatically with the thermostat regulation. Thermostat perceives temperature of the supply air and automatically adjusts the blades angle.

Swirl diffusers



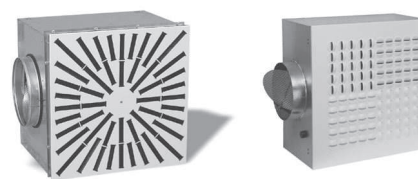
OD-4

OD-5



OD-7

OD-8



OD-9

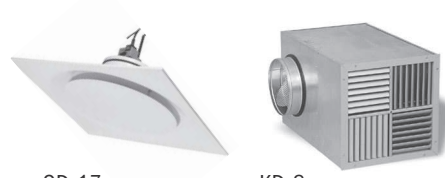
OD-15

Variable swirl diffusers



OD-11, OD-11V

OD-14












OD-17

KD-8

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Legend of symbols

- | | | |
|--|---|---|
| Al Element is made of aluminium profiles, aluminium sheet or aluminium casting. |  Element is intended to be built in the wall. |  Element is suitable for the supply of cool air (cooling). |
| St Element is made of steel sheet. |  Element is intended to be built in the ceiling or in the wall. | M Element allows regulation by electric motor (Belimo, Joventa electric motors). |
|  Element is powder painted in standard RAL 9010 colour. Other desired colour is to be specified in the order. |  Element for air conditioning of rooms with floor to ceiling heights room up to 4 m. | F EU... Element is intended for air filtration. The filter of class ... is built in. |
|  Shady symbol means possibility of optional material, surface protection, motor version, ... |  Element for air conditioning of rooms with floor to ceiling heights from 6 to 15 m. | CD The possibility of the automatic selection and calculation of the technical characteristics of grilles and difusers in regard to the given conditions with the assistance of the Klima ADE program. |
|  Element is intended to be built in the floor. |  Element is suitable for the supply of warm air (heating). | |

Active VAV diffuser OD-14

- Supply air unit for ceiling mounting in active and non-active version.
- Standard color is white RAL 9010 – 30 % gloss, other RAL colors on request.
- Supply (active) and exhaust (non-active) version.
- Nominal sizes from 160 – 250.
- Stable supply air throw length over a wide supply air temperature range – active version.
- Available with plenum with air flow adjustment and measuring device.
- Air flows from 40 to 700 m³/h.

RAL 9010



M



Active diffuser version comes standard equipped with the Belimo LH24A-MP100 actuator. Diffuser is made of steel (all parts) and powder coated in RAL 9010 – may be painted in any RAL colour on request.

Function (Active version)

The OD-14 is an active ceiling diffuser for supply air. Air is supplied to the room mainly through side slots, and this causes induction through the horizontal holes. The diffuser maintains high outlet velocity, not depending on air flow, and that means larger throw distances over the whole air flow range. The diffuser creates comfortable conditions and no draught in an occupied zone.

An external room controller varies the room air flow rate by changing the position of diffusers hat driven by the Belimo actuator with a standard 2-10V control signal.

Function (Non active version)

Non-active versions are mostly used for extracting air. They can, however, be used for supplying air, but without any regulation of air flow.

Servicing

Remove the perforated diffuser plate, and then turn the movable hat left a few times, in order to remove it (not possible with non-active versions). If you want to remove the diffuser, you must first remove the perforated diffuser plate, then remove the hat, remove the motor by loosening the actuator screws, and then loosen the screws which are holding the diffuser.

Clean the parts with a dry cloth. However, if you have removed the actuator, you can also use a damp cloth.

Actuator

Type	Stroke (adjustable in steps of 20 mm)	Operating range
BELIMO LH24A-MP100	Up to max. 100 mm	DC 2 ... 10 V = 0 ... 100 mm

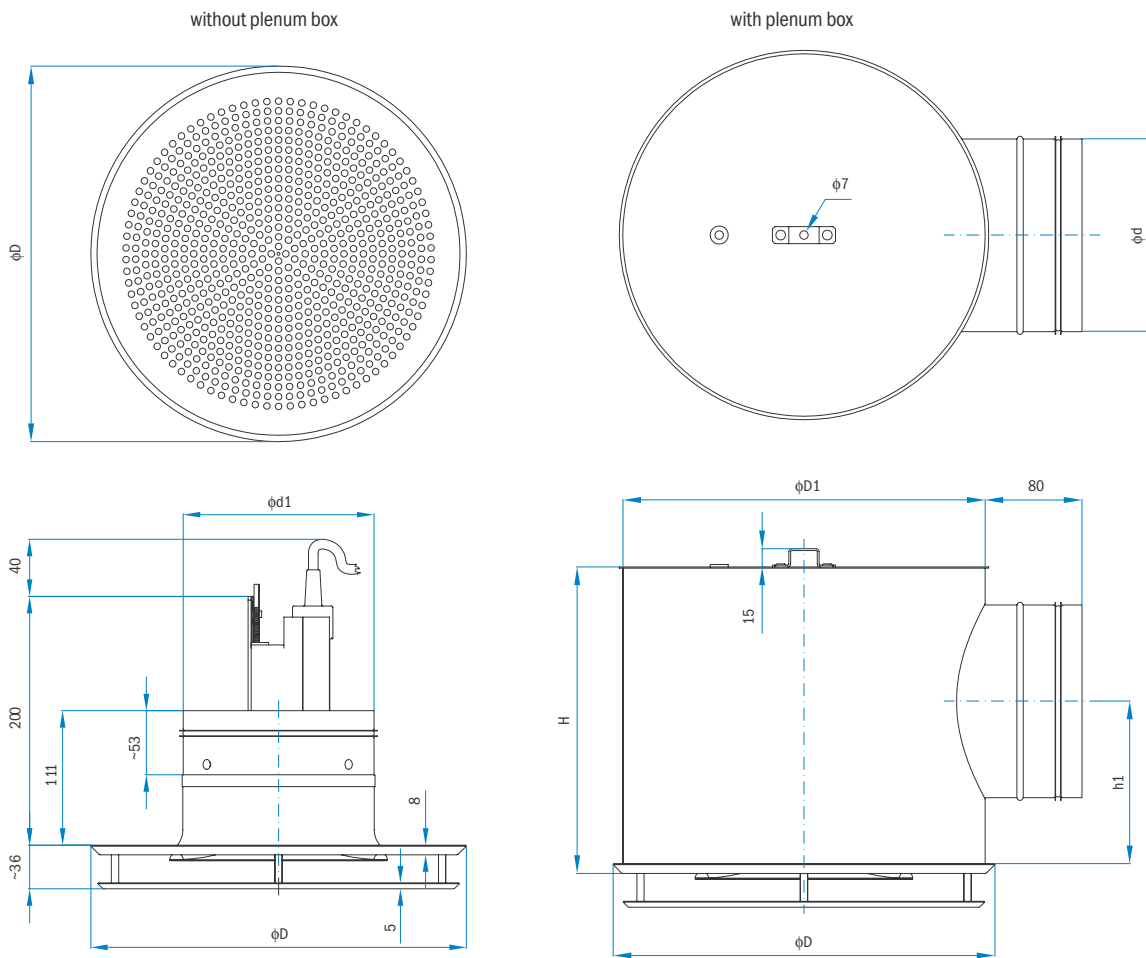
Quick selection table for active (VAV) version

	I/s	11	22	33	44	56	69	83	139	194
	m ³ /h	40	80	120	160	200	250	300	500	700
OD-14 160 B	L _{WA}	25	25.3	25.1	27.6	31.2	36.5	41		
	Δp _{ST}	5	8	9	16	14	22	36		
	L _{O2}	1.5	1.9	2.3	2.7	3.1	3.6	4.1		
OD-14 200 B	L _{WA}	21.5	22.7	23.2	24.1	24.5	27.2	32.6	44	
	Δp _{ST}	6	5	7	5	6	12	28	32	
	L _{O2}	1.5	1.9	2.2	2.5	2.9	3.3	3.7	5.4	
OD-14 250 B	L _{WA}		22.1	23	23.5	24.2	25	31	42	48
	Δp _{ST}		5	7	6	5	7	18	28	44
	L _{O2}		1.7	2	2.3	2.6	2.9	3.3	4.8	6.2

Quick selection table for non active version

	I/s	11	22	33	44	56	69	83	139	194
	m ³ /h	40	80	120	160	200	250	300	500	700
OD-14 160 R	L _{WA}	24.5	24.9	24.7	25.6	27.3	30.2	36.1		
	Δp _{ST}	5	9	11	15	20	26	31		
	L _{O2}	0.5	1	1.25	1.6	1.9	2.3	2.7		
OD-14 200 R	L _{WA}	23.8	24.2	24.5	25.1	25.4	26.2	29.8	35.2	
	Δp _{ST}	4	8	10	13	20	24	29	36	
	L _{O2}	0.5	0.9	1.1	1.4	1.7	2	2.3	2.6	
OD-14 250 R	L _{WA}		23.8	24.2	24.9	25.2	26	28.8	34.7	43
	Δp _{ST}		5	9	11	15	20	26	31	41
	L _{O2}		0.7	0.9	1.1	1.3	1.5	2	2.3	2.7

Dimensions

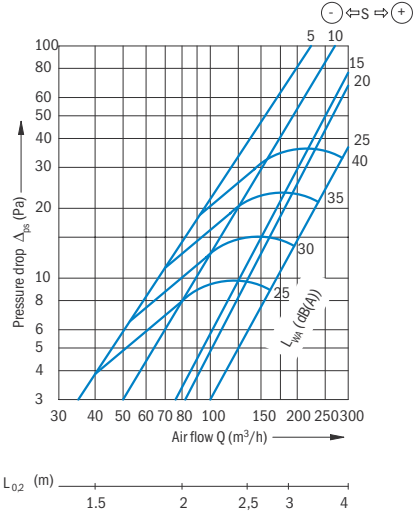


Size	ϕD	ϕd	$\phi D1$	H	h1
160	310	158.7 - 159.3	290	253	135
200	450	198.6 - 199.3	430	353	195
250		248.5 - 249.3		403	

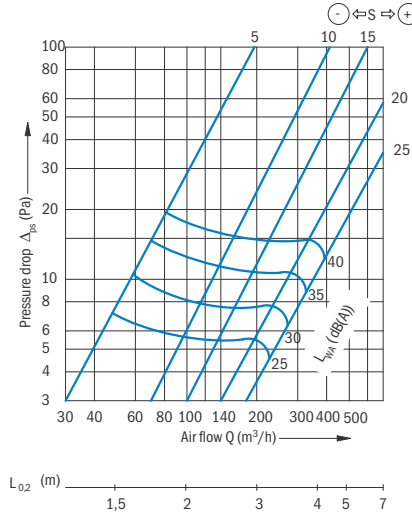
Pressure drop, throw pattern and sound data

a) Active (VAV) version

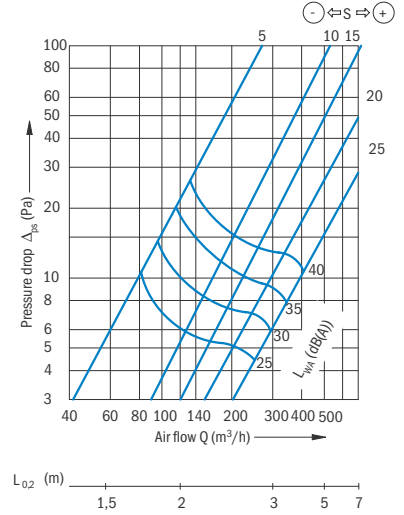
Size 160



Size 200

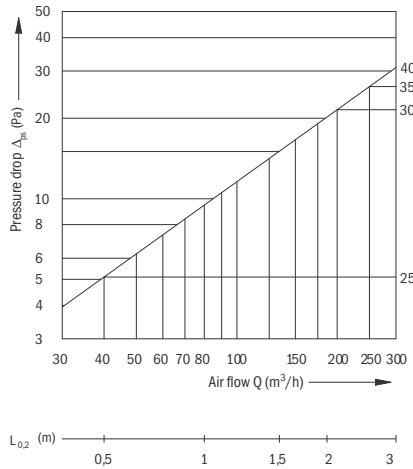


Size 250

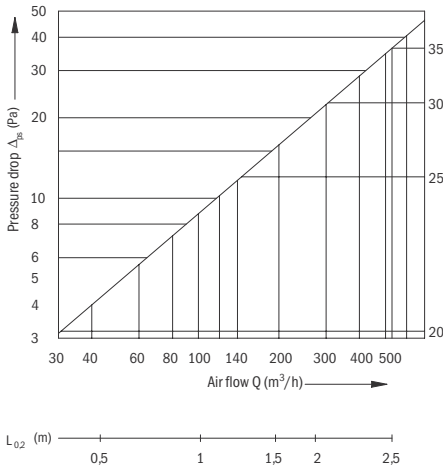


b) Non active version

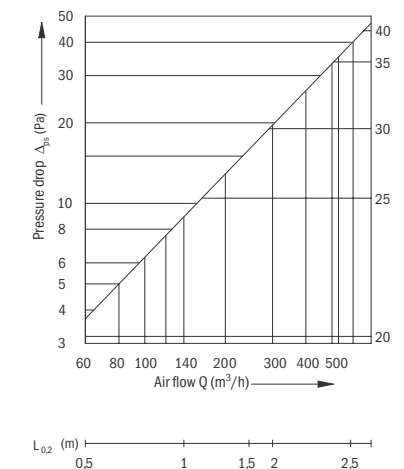
Size 160



Size 200



Size 250



Installation

OD-14 shall be installed with plenum, and the spigot should be at least 3D upstream of the plenum, in order to ensure a reliable air flow measuring.

Safety wire for the bottom plate comes as standard equipment, and prevents eventual falling of the plate in critical situations.

OD-14 is electrically connected to a ready-to-connect cable plug. The cable can be removed from the actuator by a special Belimo system.

Check that the actuator settings correspond to the factory settings – the direction switch must be set in position 0. When the supply voltage is switched on for the first time, i.e. at commissioning or after pressing the » gear disengagement« switch, the actuator travels to the home position (see table below).

Commissioning

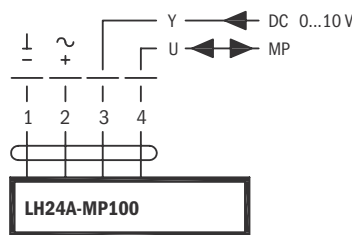
Make sure that the direction setting button on the actuator is in position 0. Then, fully open the hat (via the 10V input signal or by hand pressing the clutch). Check the duct pressure is at the intended level. If not, check the system (fan, damper).

Adjustment

The diffuser air flow rate is measured and adjusted using a damper in the spigot of the plenum. Air flow rate is calculated using the pressure difference and K1 factor.

Wiring diagram

Pos. direction of stroke switch	Home position
 1 Y = 0 V	extended
 2 Y = 0 V	retracted



Actuators can be connected in parallel. Please refer to the performance data!
 (For supply voltage):
 A switch that disconnects the pole conductors (1 contact gap 3 mm) is required for isolation from the supply.

TECHNICAL DATA – BELIMO LH24A-MP100

Electrical data		
Nominal voltage	AC 24 V, 50/60 Hz / DC 24 V	
Power supply range	AC 19.2 ... 28.8 V / DC 21.6 ... 28.8 V	
Power consumption	In operation	2.5 W @ nominal force
	At rest	1.2 W
	For wire sizing	5 VA
Connection	Cable 1 m, 4 x 0.75 mm ²	

Functional data		Factory settings
Actuating force	Min. 150 N @ nominal voltage	
Control	Control signal Y	DC 0 ... 10 V, input impedance 100 kΩ
	Operating range	DC 2 ... 10 V
Position feedback (Measuring voltage U)	DC 2 ... 10 V, max. 0.5 mA	
Position accuracy	±5 %	
Manual override	Gearing latch disengaged with pushbutton, detentable	
Running time	150 s / 100 mm	
Sound power level	Max. 35 dB (A) ... at 150s running time	

Safety	
Protection class	III Safety extra-low voltage
Degree of protection	IP54 in any mounting position
EMC low-voltage directive	CE according to 89/336/EEC
Ambient temperature range	-30 ... +50 °C
Non-operating temperature	-40 ... +80 °C
Ambient humidity range	95 % r.H., non-condensating (to EN 60730-1)
Maintenance	Maintenance-free

Other	
Weight	515 g

Calculation

$$q_v = K1 \cdot \sqrt{\Delta p_m}$$

q_v Calculated air flow rate (l/s)

K1 Factor from the table (on measuring connection too; depends on mounting)

Δp_m Measured pressure difference (Pa)

Ordering key

OD-14/1/L/B/K

