

## DESCRIPTION

The step diffuser can be used for the ventilation of movie theatres, big halls, concert halls, etc. It can be installed on the floor or onto walls of stair area.

## CONSTRUCTION

Diffuser with slots arranged in square or circle

## MATERIAL AND FINISH

Galvanized sheet metal.

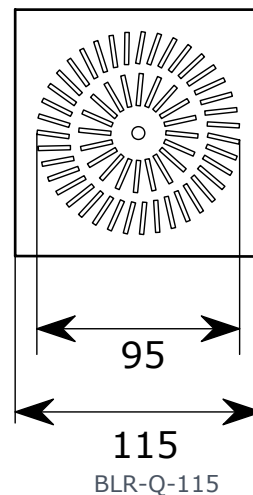
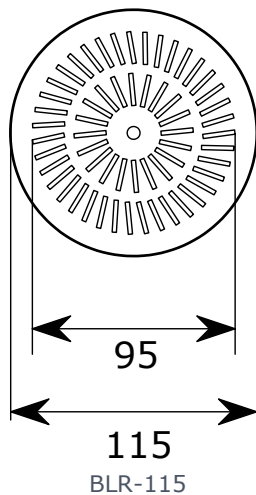
Standard finish: RAL 9010 matte.

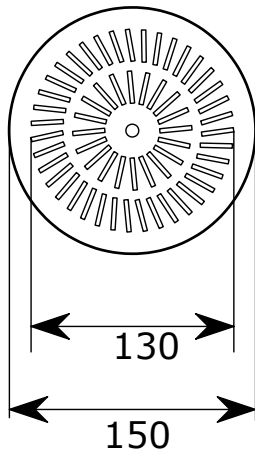
Optional finish: any colour from the RAL palette.

## INSTALLATION

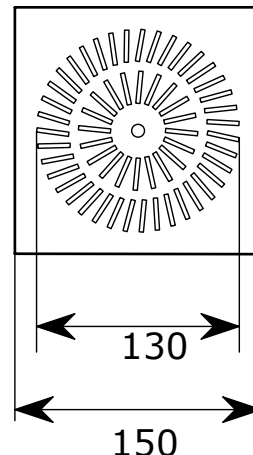
Central installation with screw, mounting bar, and mounting ring.

## DIMENSIONS

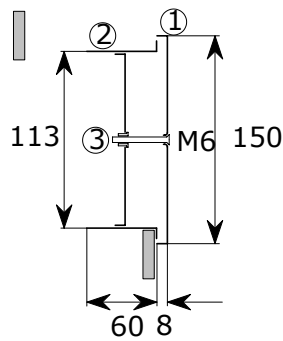
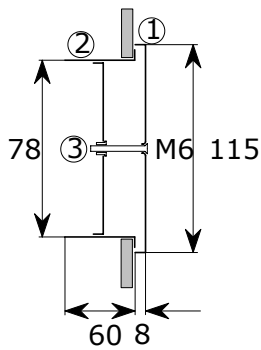




BLR-150

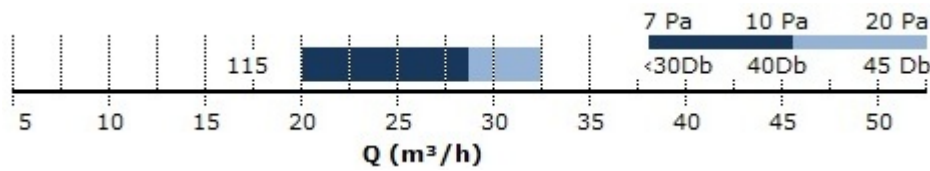


BLR-Q-150



- 1 – diffuser
- 2 – mounting ring
- 3 – screw

## SIMPLY SELECTION



## PRODUCT CODE

BLR

115

RAL 9010

**Colour**

Standard: RAL 9010 matte  
Optional: any RAL colour

**Dimension**

Standard: 115 mm  
Optional: any dimension

**Product**

BLR  
BLR-Q

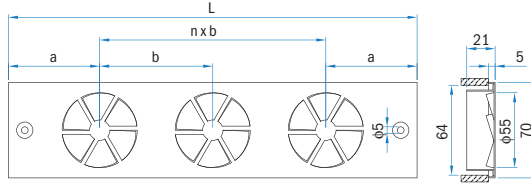
Description	BLR-110-9005		BLR-150-9005	
Order code	BLR-110-9005		BLR-150-9005	
Function	Supply		Supply	
Number of units	1 unit		1 unit	
Installation type	Step		Step	
Color	RAL 9005		RAL 9005	
<b>Requirements</b>				
Air volume qv	32 m <sup>3</sup> /h		63 m <sup>3</sup> /h	
Room attenuation Dr	8 dB		8 dB	
Distance to suspended ceiling	0 m		0 m	
ΔT	-4 °C		-4 °C	
<b>Results</b>				
Face velocity v	3.4 m/s		3.4 m/s	
Total pressure loss pt	38 Pa		24 Pa	
Horizontal airflow distance X	0.5 m	0.7 m	0.5 m	0.7 m
Air velocity maximum V.max	0.15 m/s	0.13 m/s	0.17 m/s	0.13 m/s
Air velocity medium V.med.	0.075 m/s	0.065 m/s	0.075 m/s	0.065 m/s
Sound power level LwA	31 dB(A)		29 dB(A)	
Sound pressure level LpA	23 dB(A)		21 dB(A)	
Sound pressure level (NC)	21 dB(A)		19 dB(A)	

## Staircase swirl diffuser BLR-Q



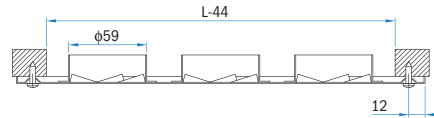
### Application

Staircase swirl diffusers BLR-Q are ideal for use in theatres, auditoria, concert halls, cinemas, etc. They can be installed vertically in steps or floors, which do not carry foot traffic. The permitted supply air temperature difference is  $\pm 6K$ .



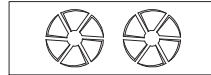
### Description

BLR-Q are made of galvanized sheet steel and powder coated in RAL 9010. On customer's request they are available in any other RAL colour.

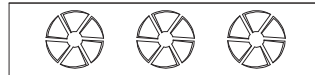


Dimensions BLR-Q-2...6			
Type	L (mm)	a (mm)	n x b
BLR-Q-2/2	200	60	1 x 80
BLR-Q-2/3	300	67	2 x 83
BLR-Q-2/4	400	68	3 x 88
BLR-Q-2/5	500	66	4 x 92
BLR-Q-2/6	500	62.5	5 x 75

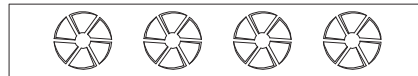
BLR-Q-2/2



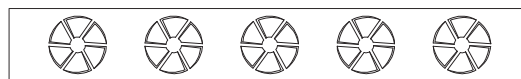
BLR-Q-2/3



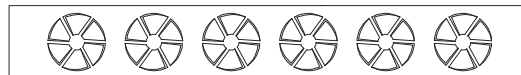
BLR-Q-2/4



BLR-Q-2/5



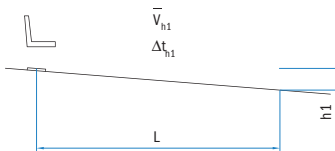
BLR-Q-2/6



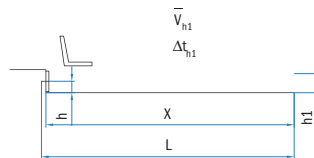
Effective discharge area	
No. of elements	A <sub>ef</sub> (m <sup>2</sup> )
2	0.00126
3	0.00189
4	0.00252
5	0.00315
6	0.00378

### Installation:

Floor installation:



Stair installation:



### PRODUCT CODE

**BLR-Q - 2 / 2**

1

1 No. of distributive elements

2

3

4

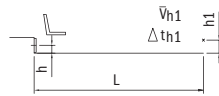
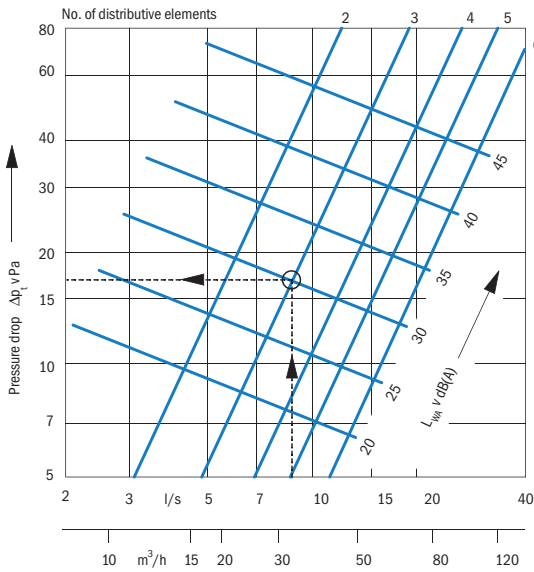
5

6

### Pressure drop and sound power level diagram

$L_{WA} = 30 \text{ dB (A)}$

$\Delta p_t = 17 \text{ Pa}$



### Definition of symbols

- $\dot{V}$  /element (l/s) Volume flow per individual element
- $\dot{V}$  (l/s) Volume flow per diffuser
- $h$  (m) Installation height above floor (min. 50 mm)
- $L$  (m) Distance from diffuser
- $h_1$  (m) Height of measurement point above floor
- $\bar{v}_{h1}$  (m/s) Time average air velocity at height  $h_1$  above floor
- $\Delta t_z$  (K) Temperature difference between supply air and room air\* Difference between core temperature at height  $h_1$  above floor and room temperature
- $\Delta t_{h1}$  (K) Total pressure drop
- $\Delta p_t$  (Pa)
- $L_{WA}$  (dB(A)) A-weighted sound power level
- $L_{WNC}$  NC rating of sound power level

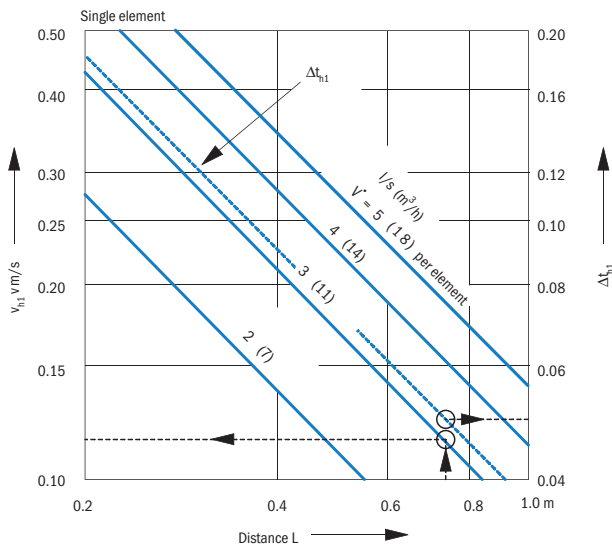
\*The room temperature is measured at 1.0 m to 1.3 m above the floor.

### Air velocity of the throw distances

$\bar{v}_{h1} = 0.12 \times 1.73 = 0.21 \text{ m/s}$

$\Delta t_{h1} = 0.051 \times 1.73 = 0.088$

$\Delta t_t = 0.088 \times (-3) = -0.26 \text{ K}$



### Calculation example

An auditoria with 130 seats is equipped with staircase swirl diffusers BLR-Q-2. The amount of supplied air is 1170 l/s, which means

$\dot{V} = 9 \text{ l/s per diffuser.}$

The diffuser is fixed vertically into the step.

Installation height above floor

$h = 0.15 \text{ m}$

Distance from diffuser

$L = 0.7 \text{ m}$

Distance of the measuring point from the floor

$h_1 = 0.15 \text{ m}$

Temperature difference between supply air and room air  $t_z = -3 \text{ K}$

### Correction factors

No. of elements	2	3	4	5	6
$\bar{v}_{h1} \times$	1.41	1.73	2.00	2.24	2.45
$\Delta t_t \times$	1.41	1.73	2.00	2.24	2.45