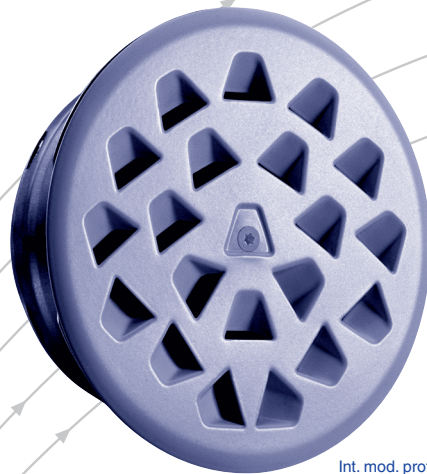


Step diffuser WAVESTEP

Type WST



Int. mod. prot. reg.

TROX[®] TECHNIK



The art of handling air

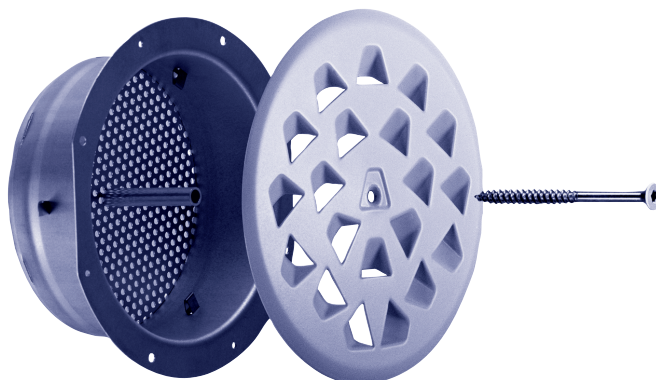
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Application

The circular step diffuser type WAVESTEP, supplied together with a spigot, is used primarily in theatres, cinemas or auditoriums.

The circular and compact inductive diffuser is fitted directly to the step risers. Because of its asymmetric wave-shape, 1/3 of the supply air leaves the face upward and lateral directions and 1/3 downwards and lateral direction.

Execution

- step diffuser WAVESTEP of steel plate, powder-coated, colour RAL 9010 matt (25% brilliance)
- spigot of galvanised steel plate
- fixing with central screw, retaining springs in the spigot

Safety instructions

CAUTION!

Risk of injury from sharp edges and corners, ridges and thin-walled sheet metal parts!

- Proceed carefully with all work.
- Wear protective gloves, safety shoes and protective helmet.

WARNING!

Danger from incorrect use. Misuse of the product may lead to dangerous situations.

The product must not be used:

- in areas subject to explosion hazards;
- in the open air without sufficient protection against weather effects;
- in atmospheres that may have a damaging and/or corrosive effect on the product due to scheduled or unscheduled chemical reactions.

CAUTION!

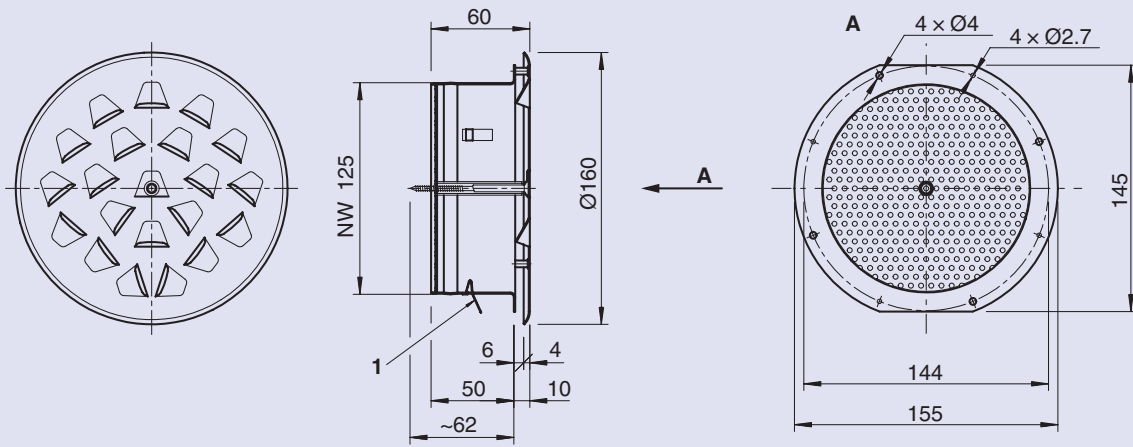
Damage to the product due to improper handling. Check the device for damage and contamination prior to operation!

Improper handling may lead to considerable material damage of the product.

- Do not use any acid or abrasive cleaning agents.
- Adhesives from sticky tape may lead to colour damage.
- Excessive moisture may lead to colour damage and corrosion.
- Use only cleaning agents, greases and oils that are expressly specified.

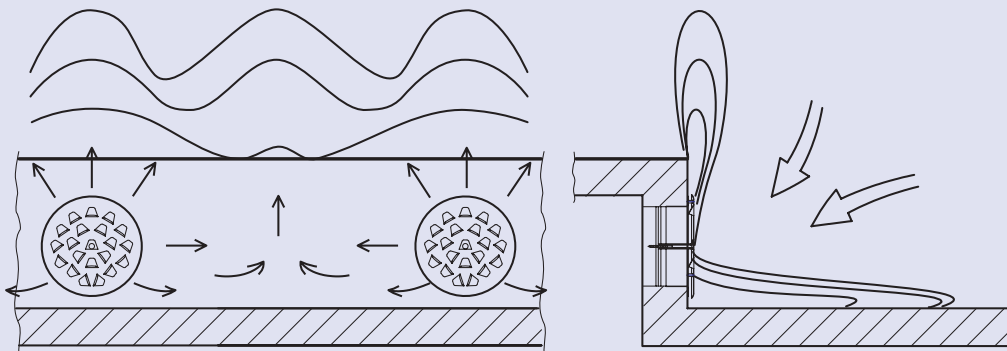
Dimensions · Flow pattern · Installation

Dimensions



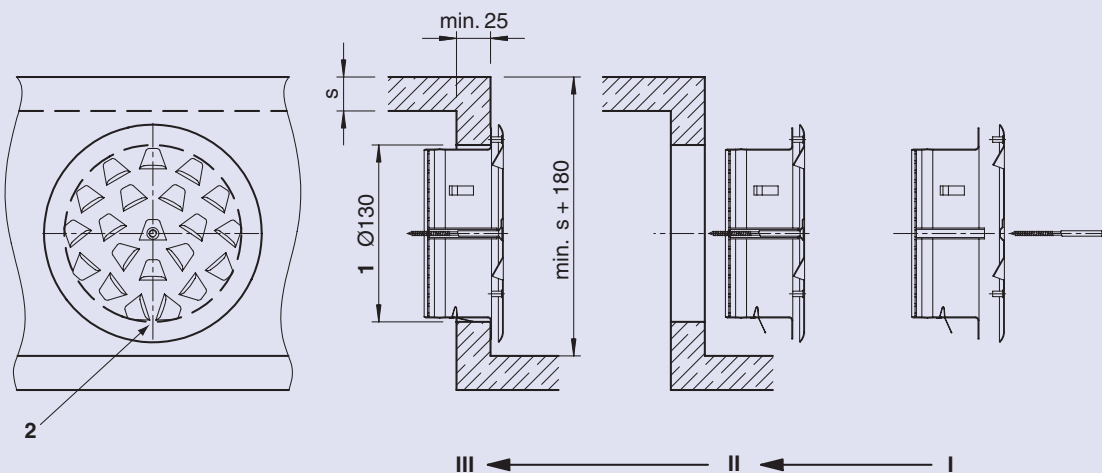
- A View without front plate
- 1 Retaining spring

Flow pattern



Installation

Installation using retaining springs



- 1 Recess
- 2 Attention to the position !

Quick selection - Technical data

Quick selection

Volume flow rate	20 m ³ /h 5.6 l/s	30 m ³ /h 8.3 l/s	40 m ³ /h 11.1 l/s	50 m ³ /h 13.9 l/s	
Pressure drop	6	14	24	38	Pa
Sound power level	<15	<15	18	25	dB(A)
Air velocity in the spigot	0.45	0.68	0.91	1.13	m/s

Definitions

‡	m ³ /h; l/s	Volume flow rate per diffuser
v _{gem}	m/s	Blow-out velocity measured with a windmill-type anemometer
v ₁₂₅	m/s	Velocity in the spigot: Ø 125 mm
Δt _u	K	Difference in temperature between the supply air and room air (see remark*)
Δp _s	Pa	Pressure drop
D	m	Distance between the diffusers
X _{max} , Y _{max}	m	Length of the diffusers
L _{wA}	dB(A)	A-weighted sound power level
L _{wOkt}	dB	Sound power level in the octave-centre frequencies
f	Hz	Frequency
ΔL _w	dB	Corrections in relation to octave centre frequencies
ζ	-	Resistance coefficient

*Remark:

The difference in the temperature of the supply air and the extract air depends on the height of the room as well as the type and position of the thermal loads.

Example of application

Given

Volume flow rate per diffuser	‡ 40 m ³ /h = 11.1 l/s
Temperature difference	Δt _u -4 K

Sought

Velocity	v _{gem} m/s
Pressure drop	Δp _s Pa
Sound power level	L _{wA} dB(A)
Length of jet	X _{max} m
Height of jet	Y _{max} m
Sound power level in octavo volume	L _{wOkt} dB

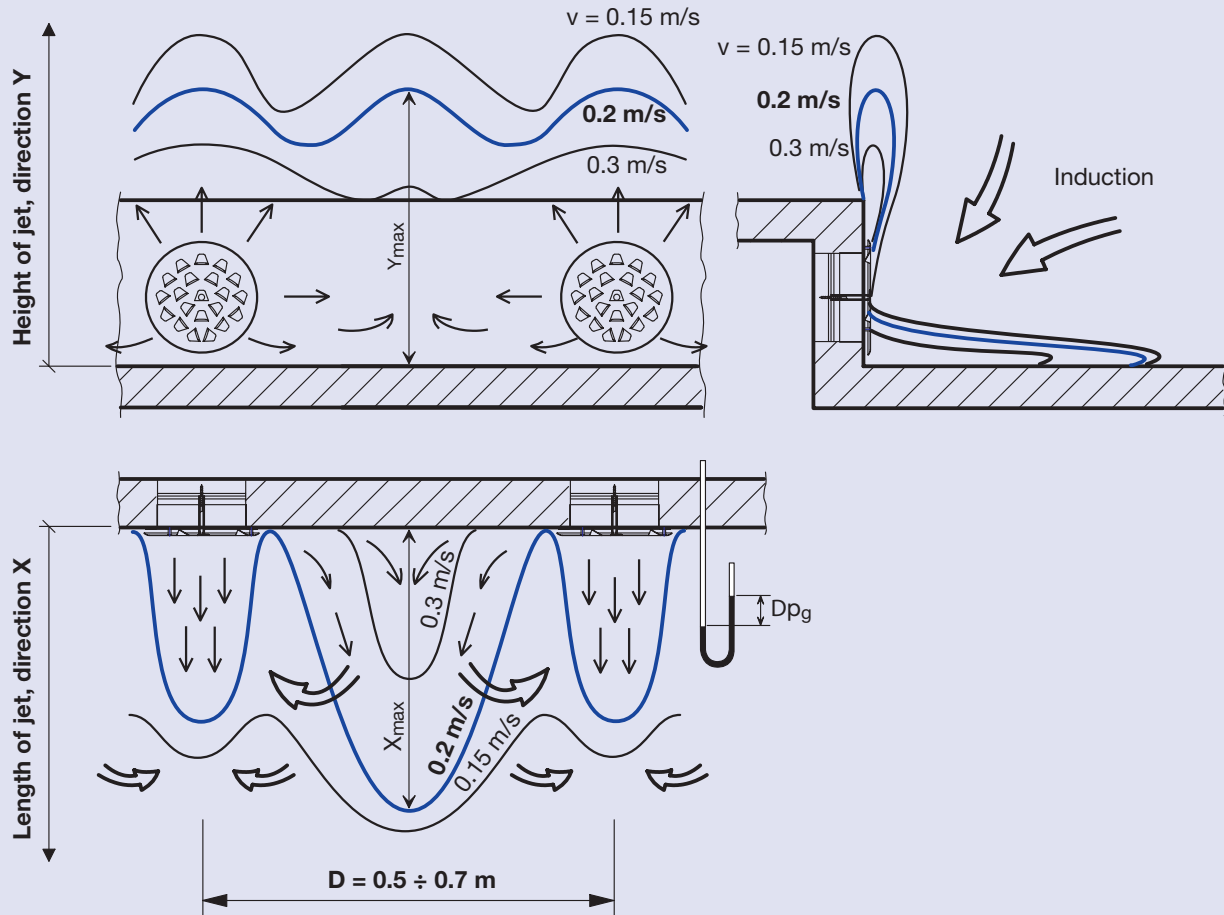
Solution

Velocity	v _{gem} 1.50 m/s
Pressure drop	Δp _s 24 Pa
Soundpower level	L _{wA} 18 dB(A)
Length of jet	X _{max} 0.48 m
Height of jet	Y _{max} 0.64 m

Sound power level in octavo volume L_{wOkt} see table

	Octave centre frequencies f							Hz
	125	250	500	1k	2k	4k	8k	
L _{wA}	18	18	18	18	18	18	18	dB(A)
Correction	0	-3	-3	-4	-11	-12	-9	dB
L _{wOkt}	18	15	15	14	7	6	9	dB

Curves of the same speed (Isovels)



Position of the velocity curve $v = 0.20 \text{ m/s}$

The table below shows the max. distance from the front of the diffuser at which the velocity is reduced to 0.20 m/s.

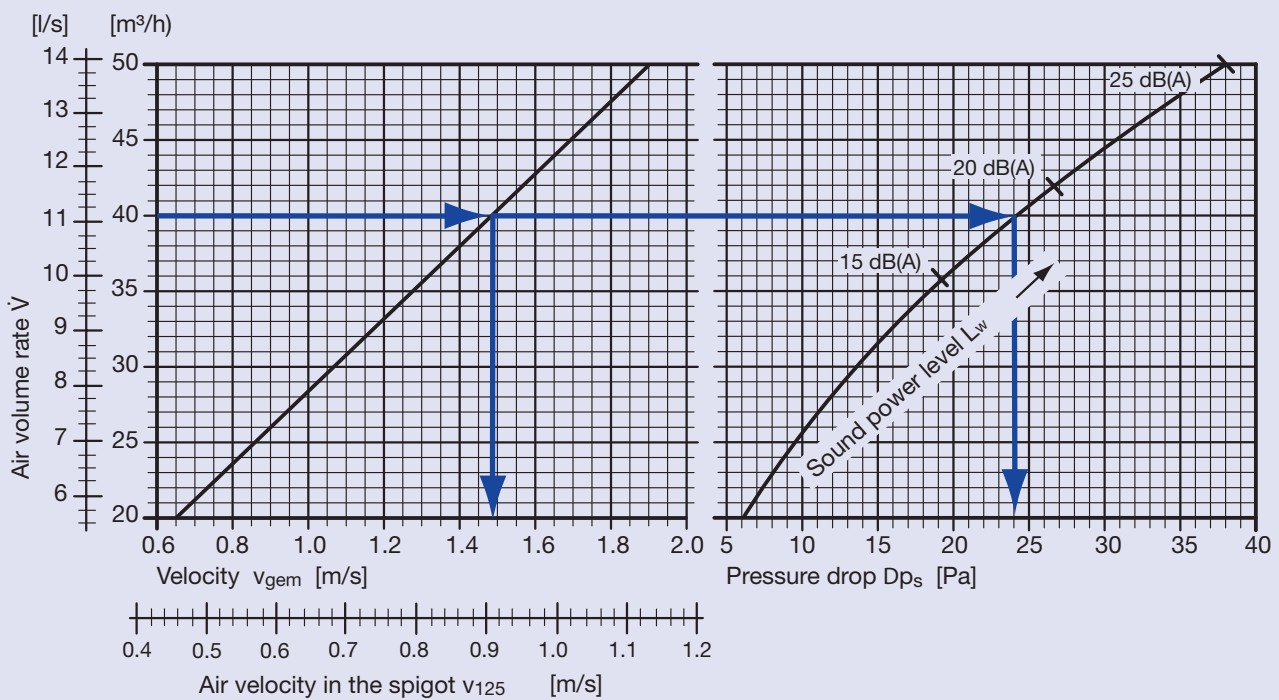
X_{\max} = distance in horizontal direction

Y_{\max} = distance in vertical direction

Δt_u is the difference in the temperature of the supply air and the room air at a height of about 1.1 m.

Δt_u [K]	20 m ³ /h 5.6 l/s		30 m ³ /h 8.3 l/s		40 m ³ /h 11.1 l/s		50 m ³ /h 13.9 l/s	
	X_{\max} [m]	Y_{\max} [m]	X_{\max} [m]	Y_{\max} [m]	X_{\max} [m]	Y_{\max} [m]	X_{\max} [m]	Y_{\max} [m]
0	0.11	0.32	0.23	0.52	0.36	0.72	0.49	0.92
-3	0.20	0.26	0.32	0.46	0.45	0.66	0.58	0.86
-6	0.28	0.20	0.41	0.40	0.54	0.60	0.67	0.80

Pressure drop, volume flow rate, velocity



Resistance coefficient $\zeta_{125} = 50$

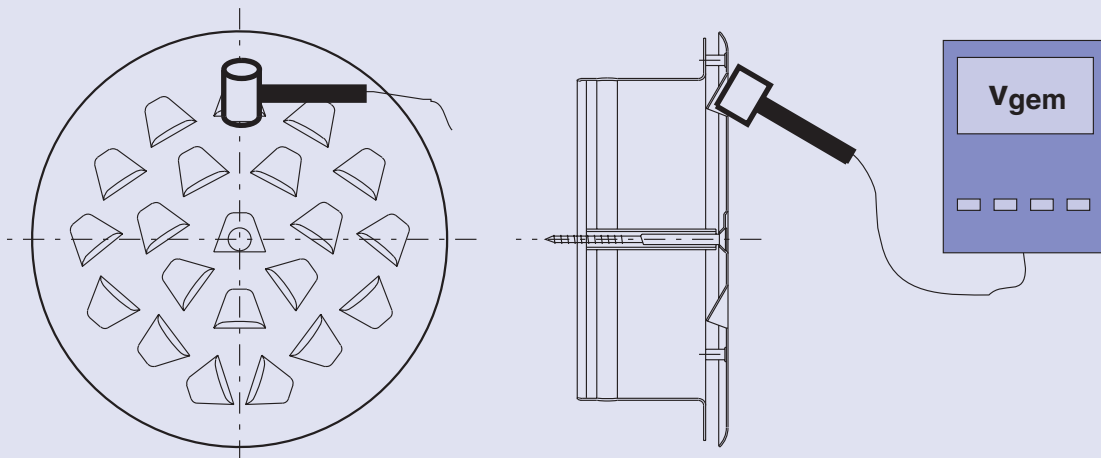
The resistance ζ_{125} relates to the connection diameter 125 mm.

Linear sound power level in the octave band

Correction table ΔL_w in relation to $dB(A)$

	Octave centre frequencies f							
	125	250	500	1k	2k	4k	8k	Hz
$\square L_w$ to $dB(A)$	0	-3	-3	-4	-11	-12	-9	dB

Measurement method - determination of the volume flow rate via v_{gem}



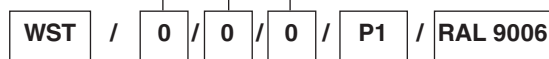
Remark: v_{gem} is measured on the uppermost nozzle.

Measuring device for blow-out velocity v_{gem} : Mini-Air 5, windmill-type anemometer, probe diameter = 20 mm
(Tolerance up to $\pm 20\%$)

Order details

Order codes

No details for standard products



Type

Step diffuser type WAVESTEP

RAL 9006 = RAL 9006 silky sheen, 25% brilliance
(all RAL colours possible)

Order example

300 off WST / P1 / RAL 9006

0 = Powder coated according to RAL 9010,
silky sheen, 25% brilliance (standard)

P1 = Powder coated according to RAL
(all RAL colours and brilliance on request)

Text for tendering purposes

Step diffuser type WAVESTEP with concave shaped openings arranged in a circle. High induction due to a number of individual pulsating air jets. Low resistance. Fixation of the step diffuser by means of retaining springs and central screw.

Material:

Step diffuser - steel plate, powder coated according to RAL 9010, 25% brilliance.
Spigot - galvanised steel
Nominal diameter: Ø 125 mm
Outside dimension: Ø 160 mm

Options: - other RAL colours