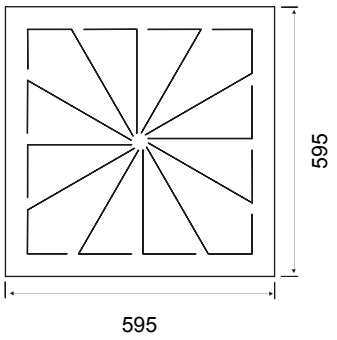
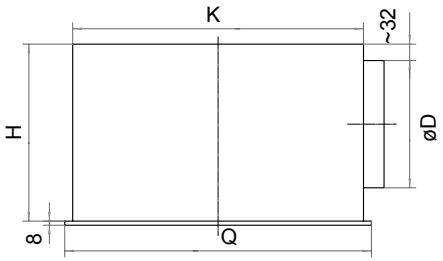
SWIRL AIR VENT OF THE NWQ-2 SERIES



NWQ-2 WITH AN EXPANSION BOX



WLK	ØD	H	K	Q
600	248	345	593	595
625	313	410	623	625

DESCRITPION

Swirl air vents of the NWQ-2 series are especially useful as air-supply vents and air-exhaust vents in comfort conditioning systems in places such as office and commercial spaces. Swirl, horizontal air-supply assures a high level of induction, fast balancing of temperature and fast decrease of the stream speed.
These air vents are best for supplying air with the temperaturre difference from +10 to -10K in rooms higher then 2.80m. Swirl air vents of the NWQ-2 series are made of a square front plate with a sealing tape and fixed air-directing elements, placed radially. In order to archive a low level of accoustic power, especially at high efficiency, triangular air-direcing elements reach the corners of the square air vent.

MATERIAL

Air vents made of galvanised steel sheet. Their external surface is covered with white powder veneer (RAL 9003)

ORDER REFERENCE

NWQ2 – 600 – RAL9003

- 600 — size: 600 i 625
- RAL9003 — colour

ORDER REFERENCE

SR / NWQ 2 - 200 - PZ - I - g – p

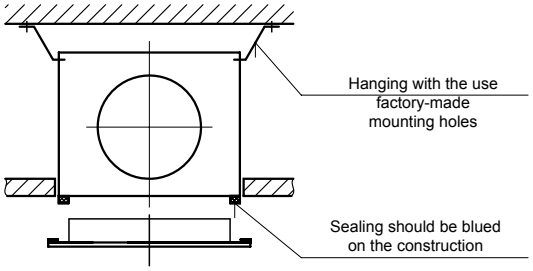
- p — Additional accessories
  P - mounting crossbar
- g — b side connection
  g top connection
- I — _ non-insulated
  I insulated
- PZ — _ no throttle
  PW throttle controlled from inside
  PZ throttle controlled from outside
- 200 — size
- NWQ 2 — diffuser type and verssion
- SR — SR expansion box
  PS spiro transition

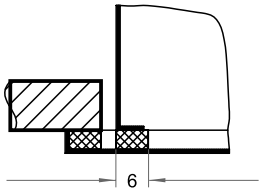
4

INSTALLATION

NWQ-2 air vents can be installed fused into the ceiling. The expansion box may be hung on cord or steel tape, using mountig holes in the box. The sealing, which is supplied with the air vent. should be glued to the edges of the expansion box. The front plate is fixed to the expansion box with a central screw and a crosspieces. The head of the screw is covered a decorative cap or is placed on the side part of the air vent.

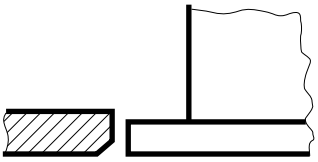
Installation in a ceiling



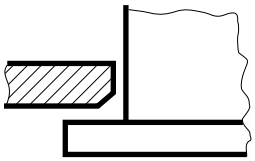


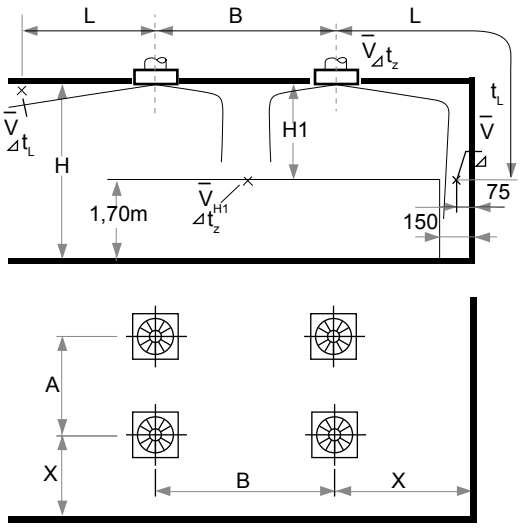
Fixing the front plate using the central screw

Installation fused into a false ceiling

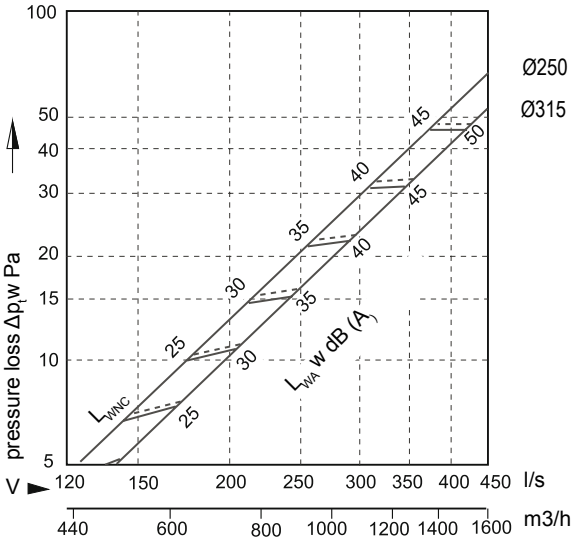


Installation in the ceiling opening

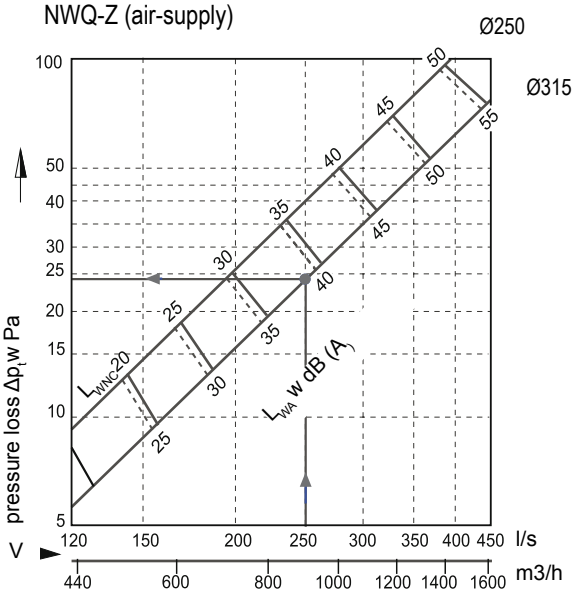




1. Level of acoustic and pressure loss Type NWQ-A (air-exhaust)



2. Level of acoustic power and pressure loss Type NWQ-Z (air-supply)



V w l/s	(m^3/h):	diffuser efficiency
A, B	w m:	Distance between two diffusers
L	w m:	Horizontal and vertical distance (X+H1) of the air flow towards the wall
X	w m:	distance from the center of diffuser to the wall
H_1	w m:	Distance between the ceiling and the area occupied by people
A_{eff}	w m^2:	Effective outflow surface 0,04467 m^2 (supplied air flow)
V_L	w m/s:	the maximum air flow velocity by the wall (average tim)
V_{H1}	w m/s:	the maximum air flow velocity between two diffusers at the distance from the ceiling H1 (average time)
Δt_z	w K:	Temperature difference between room air and supplied air
Δt_z	w K:	temperature difference between the room and the stream in the distance L=A/2 or B/2 + H_1 or L = X + H_1
Δp_t	w Pa:	Total pressure loss
L_{WA}	W dB(A):	sound power level with A scale
L_{WNC}	:	limit curve spectrum of the acoustic power
L_{WNR}	:	$L_{WNR}=L_{WNC}$ + 2
L_{pA}, L_{pNC}	:	The acoustic pressure level in the A scale or NC curve in the room $L_{pA} \sim L_{wA}$ - 8 dB $L_{WC} \sim L_{WC}$ - 8 dB
α	w °:	in o damper placement angle

Diagram 1 update. Choek position
SR plenum box denotation

NWQ-A	45°	90°
ΔP_t	x 2	x 5.2
L_{WA}	+2	+11
L_{WNC}	+5	+10

EXAMPLE

Thera are 4 unit of NWQ-2/625 x 313 (square with a 5 metre-long side, 2.5 m away from the wall) to be installed in a room (10x10m). Air vents are hung at the height of 3.6m, i.e. 1.9m over the human activity zone. 10 cycles of air exchange should be provided in the room. Natural sound damping of the room equals 8 dB. In the case of cooling, the air is supplied at a temperature difference of -10K.

QUESTIONS:

Is it possible to achieve acceptable acoustics and in comfortable conditions?
What pressure loss do air vents cause?

V total = 10m * 10m * 3,6m * 10 h^{-1} = 3600 m^3/h
for 1 air vent = 900 m^3/h (250 l/s)

DIAGRAM 2

L_{WA} = 39 dB(A), Δp_t = 24 Pa
Acoustic pressure level in a room L_{pA} = 39 dB(A)
+6 dB(A) (increase for 4 air vents)
-8 dB(A) (natural dampening of a room) = 37 dB(A)
Acoustic requirements have been met

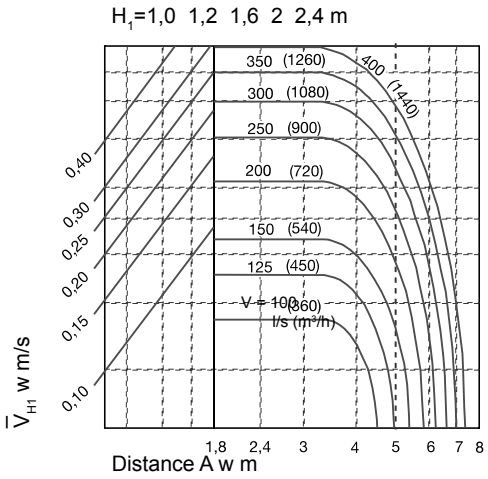
DIAGRAM 5:

A = 5 m i V = 900 m^3/h
H_1 = 3,6 m - 1,7 m = 1,9 m
V_{H1} = 0,12 m/s
Comfort criteria are met

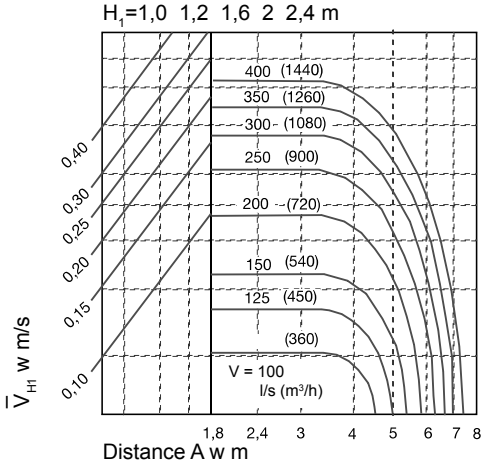
DIAGRAM 6:

L=X +H_1 = 2,5 m + 1,9 m = 4,4 m
V_L = 0,23
$\Delta t_L / \Delta t_Z$ = 0,072
Δt_L = 0,072 * (-10K) = -0,72K
Air velocity in the human activity zone, in the 0,5 m distance from the wall, equals about 0,5 * VL = 12 m/s

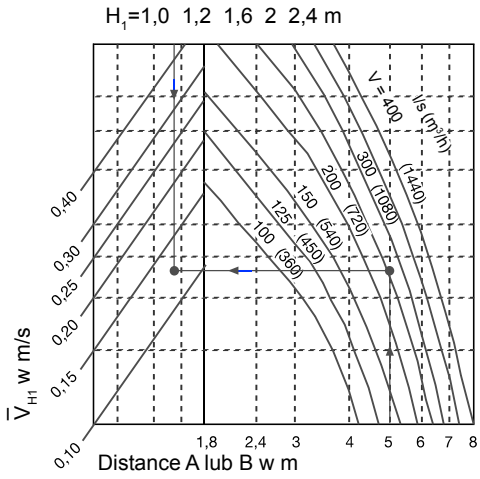
3. Air stream velocity for multi-row positioning of air vents, when B=4,0m



4. Air stream velocity for one- or multi-row positioning of air vents, when B = 6,0 m



5. Air stream velocity for square positioning of ait vents (A=B)



6. Air stream velocity along the wall and the temperature quotient