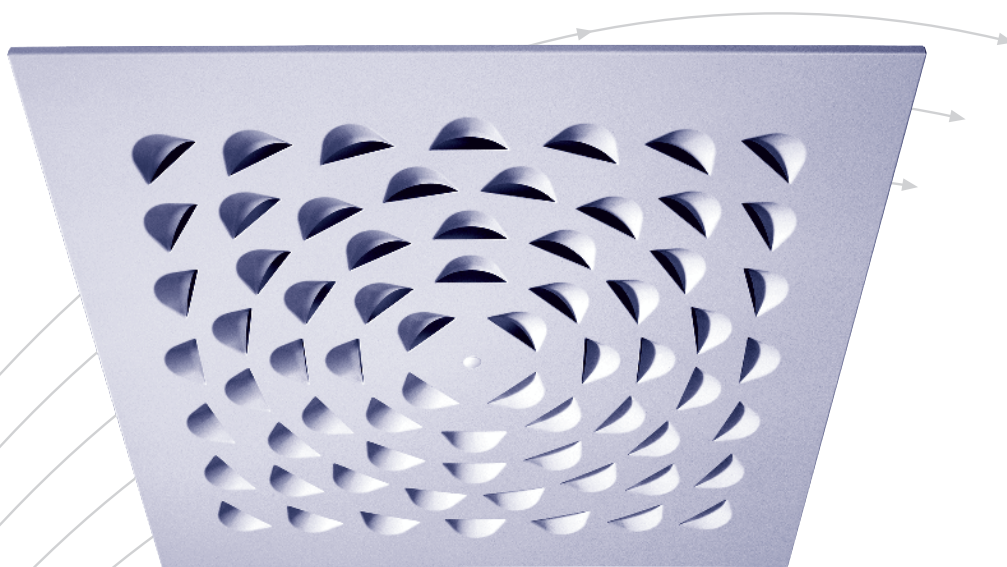


Ceiling air diffuser WAVESTREAM

- Type WQ
- highly inductive



Int. mod. prot. reg.

TROX® **TECHNIK**



TROX HESCO Schweiz AG
Walderstrasse 125
Postfach 455
CH - 8630 Rüti /ZH

Tel. +41 (0)55 250 71 11
Fax +41 (0)55 250 73 10
www.troxhesco.ch
info@troxhesco.ch

Contents · Application · Dimensions

Contents

Application · Realisation · Dimensions	2
Installation	3
Quick selection	4
Definitions	5
Technical Data	6 and 7
Order details	8

Realisation

- Ceiling air diffuser WAVESTREAM of steel plate, colour RAL 9010, matt, 25% brilliance
- Attachment by means of central screw

Informations about the plenum box see page 3.

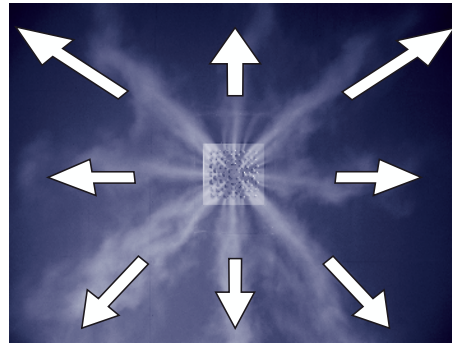
Remark

The WAVESTREAM replaces a ceiling plate.

Application

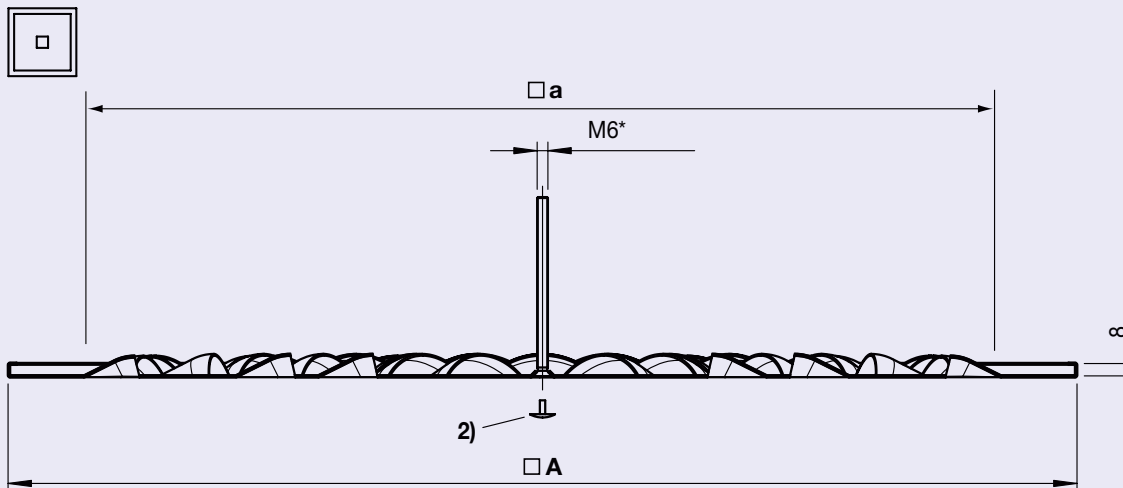
The WAVESTREAM square ceiling air diffuser is not only highly inductive, but also interesting from the energy standpoint. It can be installed in almost any room with a height of 2.4 to 4.4 m, for which a technical impeccable solution and perfect, aesthetic integration are considered important.

- Entirely metal design.
- Slim stamped design eliminates multiple edges and corners, known from plugged-nozzles diffusers.
- 8-jet outflow pattern with stronger diagonal jets promotes high volume rates per square-meter floor.
- Easy-to-attach and clean with one central screw.



Irrespective of whether it concerns a new building or a renovation, just remove the ceiling panels and install WAVESTREAM – there are no cut-outs or projections. The WAVESTREAM is the correct choice for either VAV or constant volume, because a large number of wave-shaped outlet openings ensure maximum induction.

Dimensions



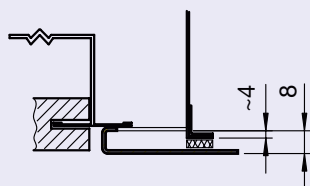
2) Plastic plug

*) Central screw is delivered as a loose part
M6 × 100 mm

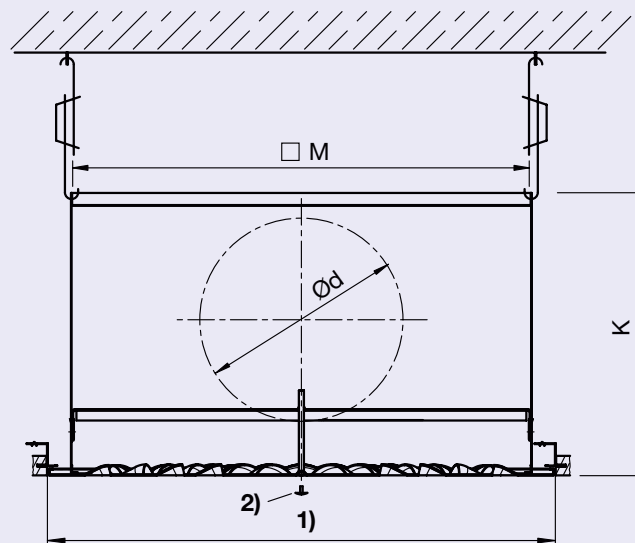
Type	ND	□ A	□ a	Grid dimension [mm]
WQ	598×500	598	512	600×600
	623×500	623	512	625×625

Type WQ

for grid dimensions \square 600 or \square 625 mm
pressed onto ceiling profile **from below**, with **square**
 plenum box.

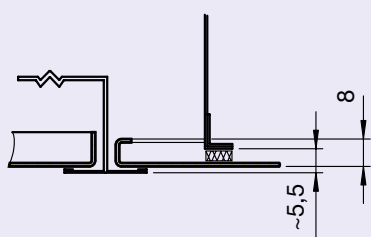


- 1) Grid dimension
- 2) Plastic plug

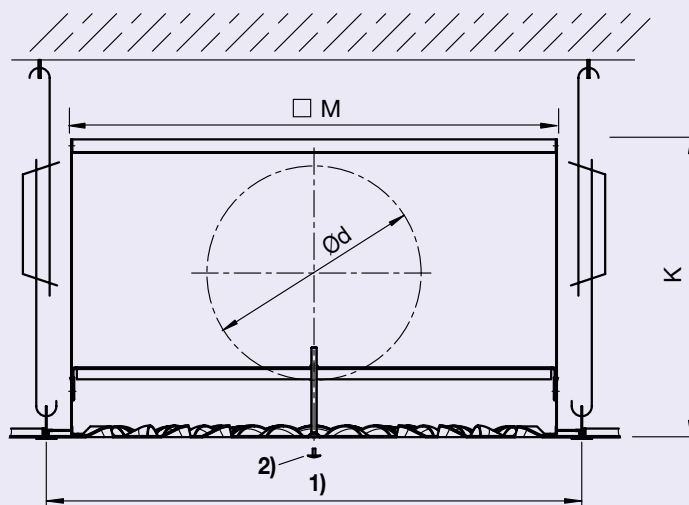


Type WQ

for grid dimensions \square 600 or \square 625 mm
inserted in ceiling profile **from above**, with **square**
 plenum box.



- 1) Grid dimension
- 2) Plastic plug

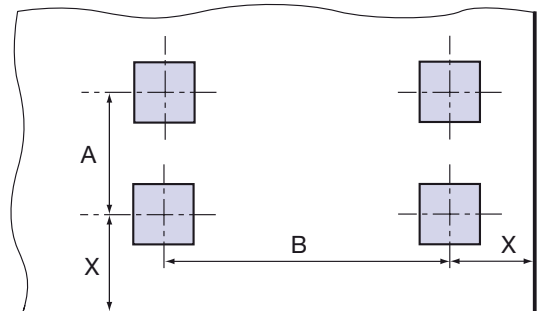
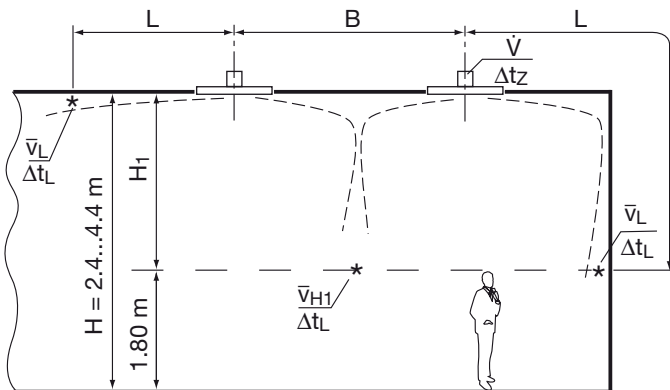


Type	ND	Grid dimension [mm]	Plenum box Details see prospect L-04-1-31e (TROX HESCO) or 2/16.4/... (TROX)			
			K	\square M	Ød	Type
 WQ	598×500	600×600	345	567	1×248	AKH04 ZL M0 (TROX HESCO) [AK004 ZL M0 (TROX)]
	623×500	625×625				

Quick selection

ND	A _{eff} [m ²]	q _v [l/s]	55.6		69.4		83.3		111.1		138.9 nominal 500		166.7		194.4	
		Ḃ [m ³ /h]	200	250	300	400	500	600	700							
598x500	0.0339	Δp _t [Pa]	6		10		15		26		41		59		81	
		L _{wA} [dB(A)]	<20		<20		23		31		37		42		46	
623x500	0.0339	L _{0.5/L0.3} [m]	—	—	—	1.7	—	1.9	1.8	2.3	2.0	2.7	2.3	3.1	2.5	3.5
		v̄ _{H1} [m/s]				0.13		0.15	0.19	0.16	0.22	0.17	0.24	0.19	0.26	0.20
Distance		A [m]	—			3.4		3.7	3.6	4.6	4.0	5.5	4.6	6.3	5.1	7.0

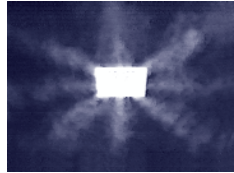
Base to v̄_{H1}:
 room height H = 3.3 m
 height of occupied zone = 1.8 m
 H₁ = 1.5 m
 distance A, see table
 distance B = 4.0 m
 difference of temperature = -8.0 K



L	m	Distance against the wall
$L_{0.5}/L_{0.3}$	m	Distance in relation to the final velocities 0.5 m/s or 0.3 m/s
\dot{q}_v	l/s	Volume flow rate per diffuser
\dot{V}	m ³ /h	Volume flow rate per diffuser
\dot{V}_{nominal}	m ³ /h	Nominal volume flow rate (with VAV: $\dot{V}_{\text{max}} = 1.19 \times \dot{V}_{\text{nominal}}$)
v_{eff}	m/s	eff. discharge velocity
A, B	m	Distance between the axes of two diffusers
X	m	Distance between diffuser centre and wall
H	m	Room height
H_1	m	Distance between ceiling and occupied zone
\bar{v}_{H1}	m/s	Mean flow velocity of room air between two diffusers in ceiling distance H_1
\bar{v}_L	m/s	Mean flow velocity of room air between wall in ceiling distance H_1
t_R	°C	Room air temperature
t_L	°C	Jet air temperature
Δt_z	K	Difference between room air and supply air temperature
Δt_L	K	Difference between room air and jet air temperature at distance
		$L = A/2 + H_1$
		$L = X + H_1$
A_{eff}	m ²	Effective air outlet surface area
Δp_t	Pa	Total pressure drop (supply air)
L_{WA}	dB(A)	A-weighted sound power level
L_{wNC}		NC rating of sound power level
		$L_{\text{wNC}} = L_{\text{WA}} - 6 \text{ dB}$
L_{wNR}		$L_{\text{wNR}} = L_{\text{wNC}} + 2 \text{ dB}$
$L_{\text{pA}}, L_{\text{pNC}}$		A-weighting or NC curve respectively of room sound power level
		$L_{\text{pA}} \sim L_{\text{WA}} - 8 \text{ dB}$
		$L_{\text{pNC}} \sim L_{\text{wNC}} - 8 \text{ dB}$
L_{wokt}	dB	Sound power level in the octave-centre frequencies
ΔL	dB	Insertion attenuation in the octave-centre frequencies
ΔL_A	dB	Octave-centre frequencies, correction value
f	Hz	Octave-centre frequencies

Technical Data

Type WQ



Correction table, octave-centre frequencies

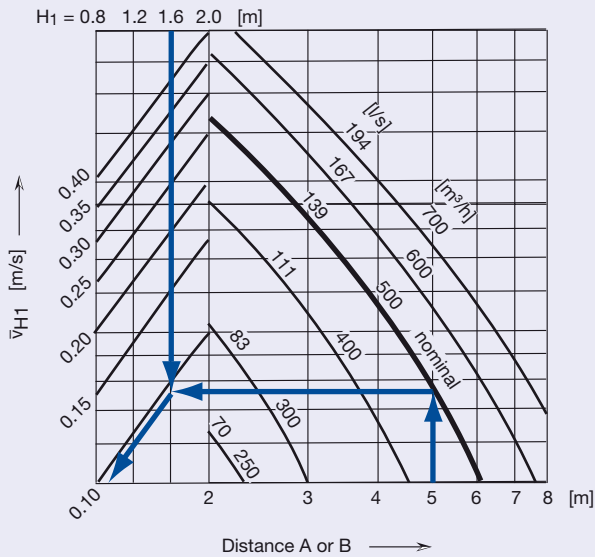
f	125	250	500	1k	2k	4k	8k	[Hz]
ΔL_A	+6	+5	-2	-7	-12	-17	-19	[dB]

Insertion attenuation (incl. end reflection)
Interior of box not insulated

f	125	250	500	1k	2k	4k	8k	[Hz]
ΔL	11	6	4	5	8	10	9	[dB]

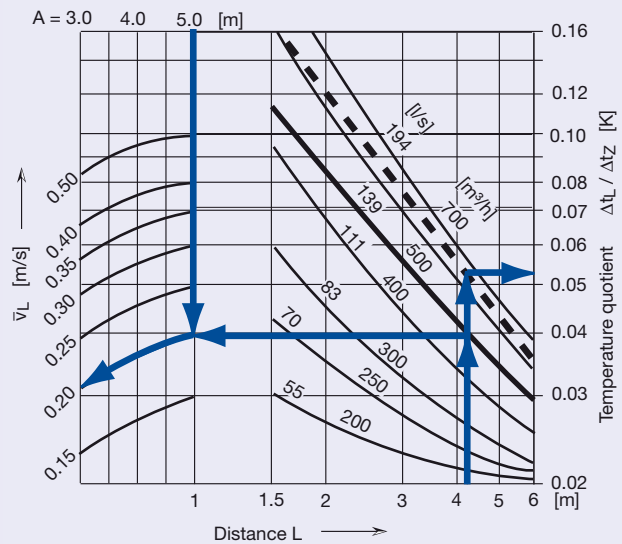
Room air velocity \bar{v}_{H1}

$\Delta t_z = +8 \text{ K}$ $A = B$



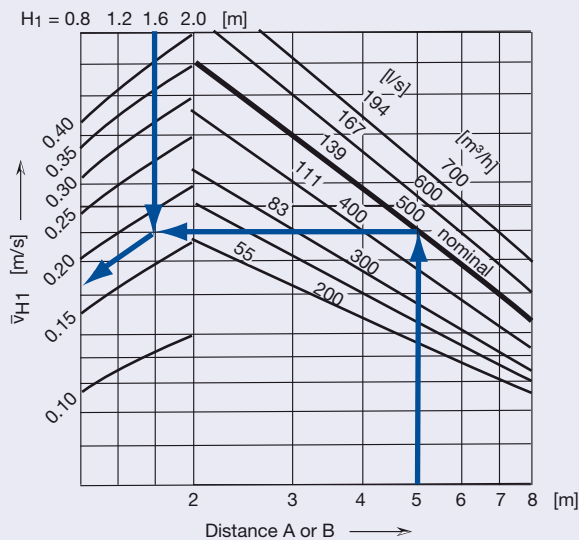
Room air velocity by the wall \bar{v}_L

$\Delta t_z = -8 \text{ K}$



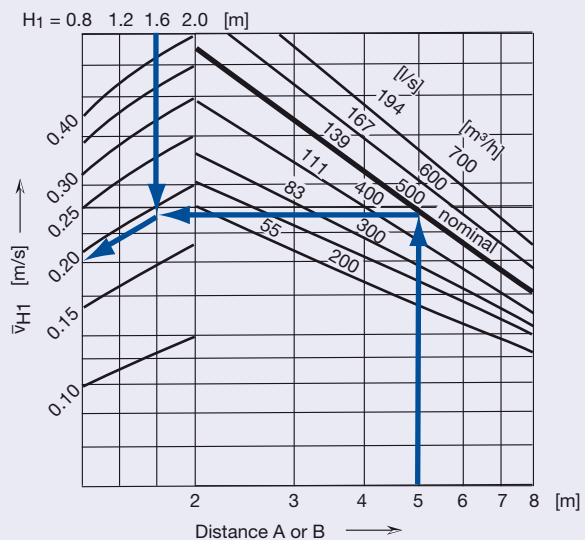
Room air velocity \bar{v}_{H1}

$\Delta t_z = -8 \text{ K}$ $A = B$



Room air velocity \bar{v}_{H1}

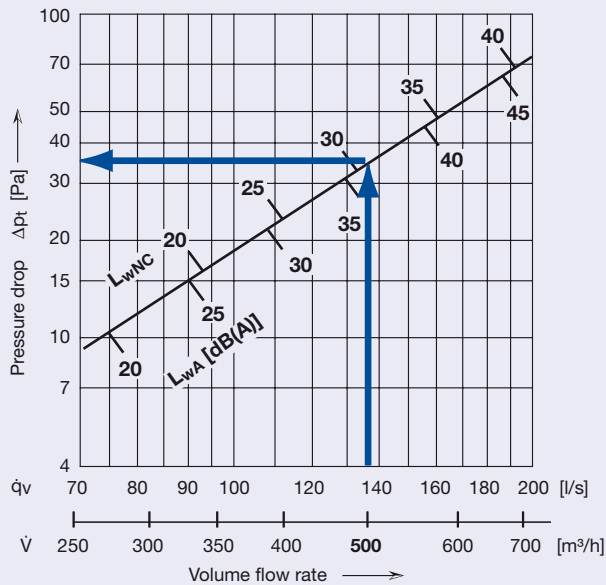
$\Delta t_z = -12 \text{ K}$ $A = B$



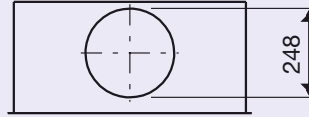
Type WQ



Sound power level and pressure drop



Connection diameter



Eff. velocity of exhaust air

\dot{V} [m³/h]	q_v [l/s]	v_{eff} [m/s]	$A_{eff} = 0.0339 \text{ m}^2$
200	55	1.7	
250	70	2.1	
300	83	2.5	
350	97	2.9	
400	111	3.3	
450	125	3.7	
500	139	4.1	
550	153	4.5	
600	167	4.9	

Example

Given

WAVESTREAM type WQ	Spigot $\text{Ø}248 \text{ mm}$	
Volume flow rate	139 l/s	q_v
	500 m³/h	\dot{V}
Room height	3.4 m	H
Occupied zone height	1.8 m	
Distance to the ceiling	1.6 m	H_1
Distance between diffusers	5.0 m	A = B
Difference of temperature	-12 K / -8 K / +8 K	Δt

Solution

Sound power level	37 dB(A)	L_{wA}
Limite curve	31	L_{wNC}
Pressure drop	36 Pa	Δp_t

Octave spectrum

f	125	250	500	1000	2000	4000	8000	[Hz]
L_{wA}	37	37	37	37	37	37	37	[dB(A)]
ΔL_A	+6	+5	-2	-7	-12	-17	-19	[dB]
L_{wOkt}	43	42	35	30	25	20	18	[dB]

Insertion attenuation see page 6

Room air velocity 1.8 m over ground		
at -12 K	= 0.19 m/s	\bar{v}_{H1}
at -8 K	= 0.17 m/s	\bar{v}_{H1}
at +8 K	= <0.10 m/s	\bar{v}_{H1}

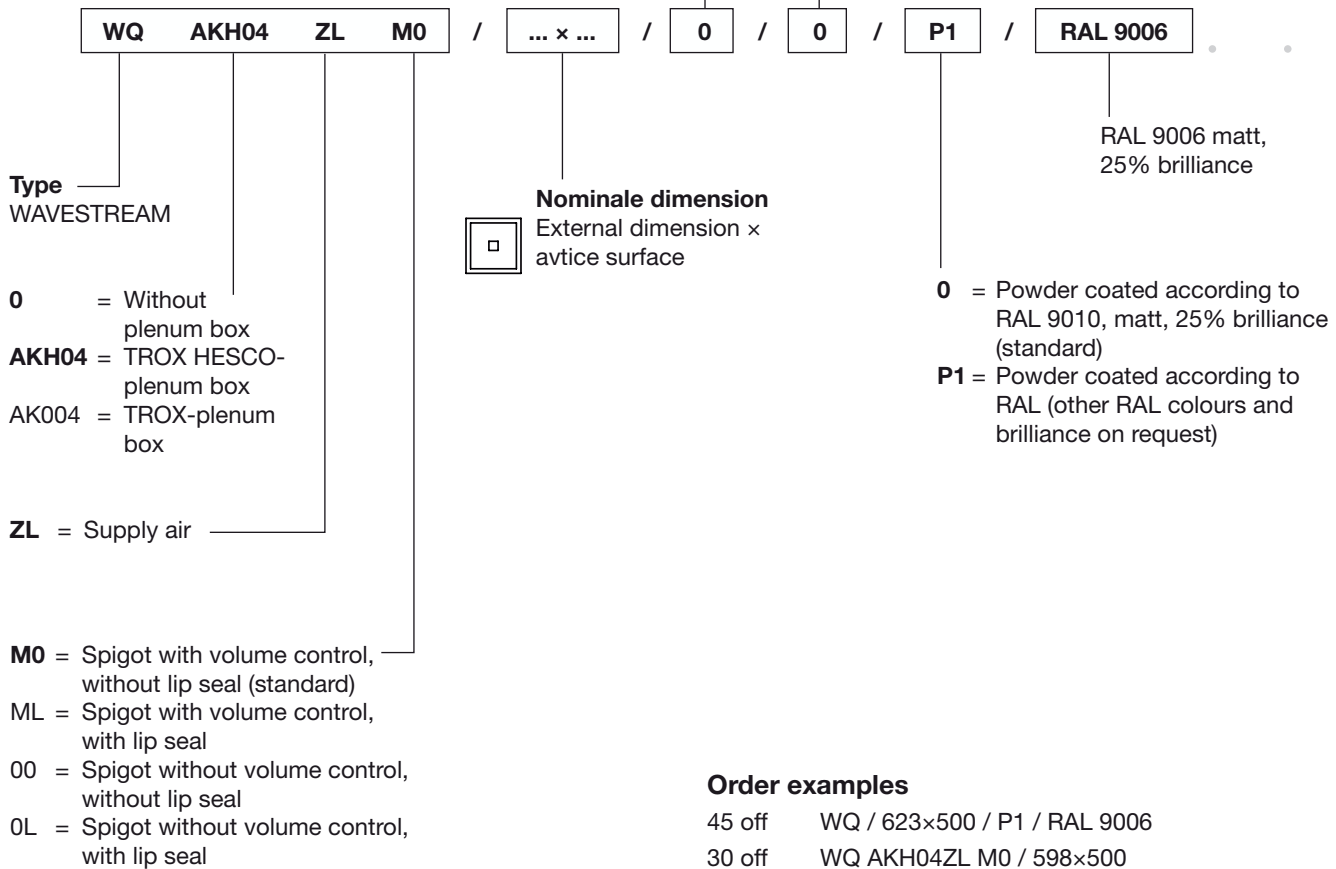
Velocity by the wall 1.8 m over ground		
Throw of the jet = $A/2 + H_1$	= 4.1 m	L
at -8 K	= 0.20 m/s	\bar{v}_L

Difference of temperature	0.053	$\Delta t_L / \Delta t_z$
$(t_R - t_L)$ bei $\Delta t_L -8 \text{ K} = 0.053 \times 8$	= -0.5 K	Δt_L

Order details

Order codes

No details for standard products



Order examples

45 off WQ / 623x500 / P1 / RAL 9006
30 off WQ AKH04ZL M0 / 598x500

Text for tendering purposes

WAVESTREAM ceiling air diffuser with concave, wave-shaped outlet openings arranged in a circle. High induction thanks to the fine division of the air volume into a large number of individual pulsating air jets. Low flow resistance. Entirely metal design. Attachment by means of central screw.

Standard plenum box of galvanised steel, with integrated cross bar for the M6 central screw, for quick and simple installation of the ceiling panel air diffuser. A connection with volume control for connecting a coiled tube or hose is included; the inlet box also contains an air distributor element. Central screw will be delivered separately.

Material

Ceiling air diffuser steel, powder-coated, RAL 9010, matt, 25% brilliance
Plenum box galvanised steel plate

Informations about the plenum box see page 3.

Options

- Other RAL colours
- Application for the extraction of air.