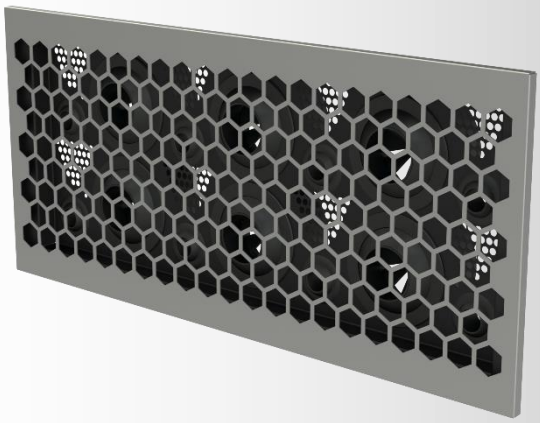
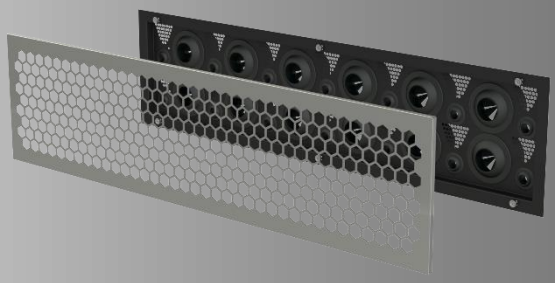
Technical documentation





LWD

Linear wall-mounted swirl air diffuser

Contents

Function and use 2
Models 2
Mounting 2
Processing 2
Accessories 3
Dimensions 4
Dimensions of accessories 5
Mounting options 6
Technical data 7
Legend 14
Order code LWD 15
Order code AK 16
Specification text 17

PERFORMANCE DATA

- LWD-…625-125… at 35 dB(A) 125 m³/h (35 l/s)
- LWD-…1025-125-… at 35 dB(A) 250 m³/h (69 l/s)
- LWD-…-625-225-… at 35 dB(A) 250 m³/h (69 l/s)
- LWD-…-1025-225-… at 35 dB(A) 500 m³/h (139 l/s)

SPECIAL FEATURES

- Suitable for supply air only
- Mounted directly into ducts or with plenum box
- Supply air ΔT to -8 K

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FUNCTION AND USE

The SCHAKO linear wall-mounted swirl air diffuser LWD for diverse requirements was developed for use in supply air systems.

The advanced and well-designed construction of the linear wall-mounted swirl air diffuser LWD allows high throw speeds at low noise levels. The high throw speeds result in good penetration depth of the room to be ventilated. This ensures that fresh air is circulated throughout the whole room and not just near the supply air grille itself. A further advantage of the linear wall-mounted swirl air diffuser LWD is that the entire air jet is split into a large number of individual jets, thus ensuring a high level of induction. The temperatures and velocities of the individual jets are very quickly reduced. This means that on the one hand the supply air does not drop into the occupied area in cooling mode and, on the other hand the air does not rise too fast towards the ceiling in heating mode.
The LWD wall-mounted swirl air diffuser with individually and manually adjustable nozzles enables individually adjustable air jets (45° swivelling range), depending on the requirement. Manual adjustment of the individual nozzles from the front is easy after removing the cover grille.

The linear wall-mounted swirl air diffuser LWD is suitable for installation directly into ducts. At an extra charge, a plenum box can be mounted. The damper in the spigot of the plenum box (at an extra charge) serves for easy air volume regulation.

All models can be used in 100% to 40% VAV systems.

MODELS

LWD-Q-…	for installation in walls/ducts/plenum box, individually adjustable nozzles
LWD-…-6-…	hexagonal design
LWD-…-125-…	one row of nozzles
LWD-…-225-…	two rows of nozzles
LWD-…-N-…	single design

MOUNTING

-- Screw mounting (-SM)
  - screws must be provided on site

PROCESSING

Faceplate

-- sheet steel (-SB), painted to:
  - in RAL colour 9010 (-9010, white, standard)
  - in a different RAL colour, freely selectable (-xxxx) (always 4 digits)

Frame/Nozzle plate

-- sheet steel (-SB), painted to:
  - in RAL colour 9010 (-9010, white, standard)
  - in a different RAL colour, freely selectable (-xxxx) (always 4 digits)

nozzles

-- Plastic:
  - similar to RAL colour 9010 (white, standard) (-DW)
  - similar to RAL colour 9005 (black) (-DS)
  - similar to RAL colour 9006 (white aluminium) (-DA)

ACCESSORIES

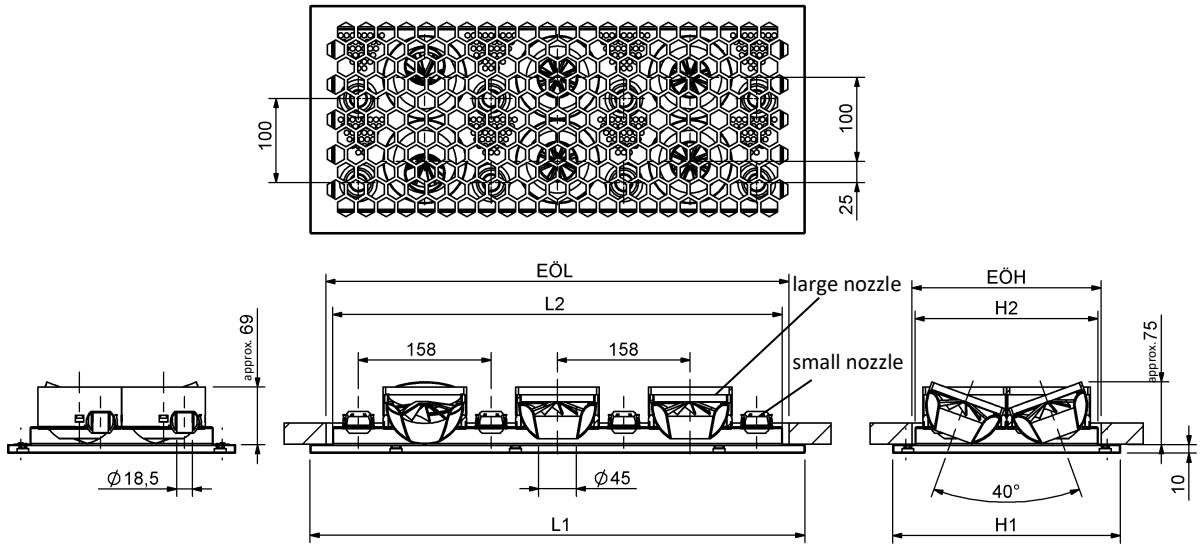
Plenum box (-AK-58-...)

Rectangular design, made of galvanised sheet steel (-SV), housing with round connection spigot and mounting brackets.

- Length:
  - 625 mm (-00625)
  - 1025 mm (-01025)
-- Height:
  - 125 mm (-125)
  - 225 mm (-225)
-- Single / band design:
  - single design (-N)
-- Mounting:
  - screw mounting (-SM) (screws must be provided on site)
-- Damper:
  - without damper (-DK0) (standard).
  - with damper (-DK2), made of galvanised sheet steel, in plenum box housing, with cable-operated adjustment, for easy air volume regulation.
-- Rubber lip seal:
  - without rubber lip seal (-GD0) (standard).
  - with rubber lip seal (-GD1) made of special rubber, at the connection spigot.
-- Insulation:
  - without insulation (-I0) (standard).
  - with internal insulation (-Ii), thermal insulation inside the plenum box.
  - with external insulation (-Ia), thermal insulation at the outside of the plenum box.
-- Height of plenum box:
  - Standard height of plenum box (-KHS).
  - Height of box in mm, freely selectable (-xxx) (minimum height [KHS] for spigot position S1 and standard box neck (75 mm) = spigot diameter D + 172 mm, minimum height [KHS] for spigot length S0 min. 200 mm) (always 3 digits).
-- Spigot diameter:
  - Standard spigot diameter (-SDS).
  - Spigot diameter (øD) in mm, freely selectable (-xxx, always with 3 digits).
-- Spigot position:
  - Spigot from above (-S0).
  - Lateral spigot on the plenum box (-S1) (standard).

DIMENSIONS

LWD-Q-6-…-N-…



Available sizes of LWD-Q-6-…

L	L1	L2
625	589	535
1025	1063	1009

H	H1	H2
125	163	109
225	271	215

All combined lengths and heights available.
Special dimensions not available!

EÖL = installation opening in the length section (L2 + 16 mm)
EÖH = installation opening in the height section (H)

Screw mounting (-SM), see page 6.

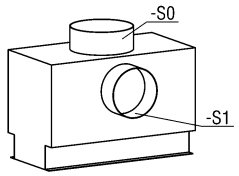
Number of nozzles LWD-Q-…

		L	
		625	**1025**
H	**125**	3 large nozzles 4 small nozzles	6 large nozzles 7 small nozzles
	225	6 large nozzles 8 small nozzles	12 large nozzles 14 small nozzles

DIMENSIONS OF ACCESSORIES

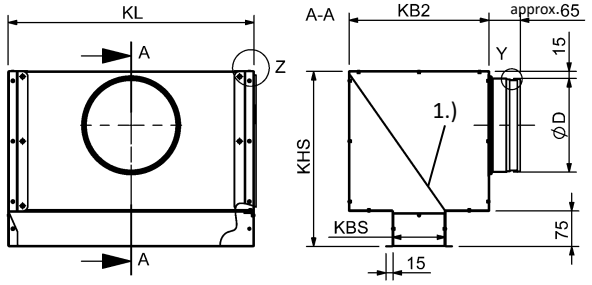
Plenum box (-AK-58-...)

Spigot position

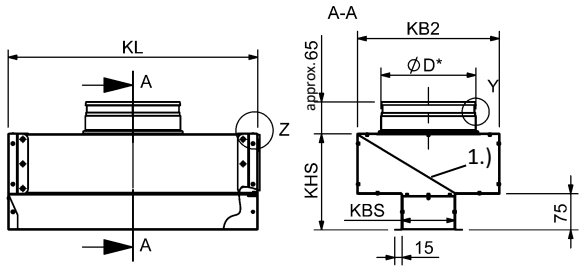


- Lateral spigot on the plenum box (-S1, standard)
- Spigot from above (-S0)

with lateral spigot on the plenum box (-S1, standard)



With spigot from above (-S0)



1.) Air diffuser plate

Available sizes of AK-58-...

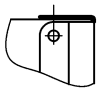
H	L	KL	KHS (-S1)	KHS (-S0)	KBS	KB2	øD (-S1 / -S0)
125	**625**	546	370	200	118	297	1 x dia. 198
	1025	1020	370		118	297	2 x dia. 198
225	**625**	546	420		227	347	1 x dia. 248
	1025	1020	420		227	347	2 x dia. 248

Minimum height of KHS for spigot position -S1 and for standard box neck (75 mm):
KHS min. = dia. D + 172 mm
Minimum height of KHS for spigot position -S0:
KHS min. 200 mm

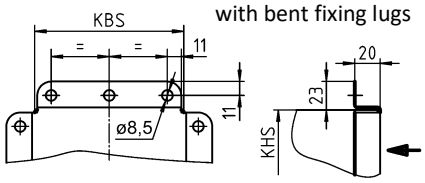
Minimum width of KB2 for spigot position -S0:
KB2 min. = dia. D + 30 mm
Minimum difference between KBS and KB2 = 40 mm
The KBS dimension cannot be changed.

Plenum box mounting:

Detail Z
State of delivery with fitted mounting brackets

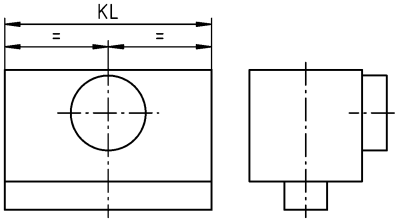


Detail Z
with bent fixing lugs

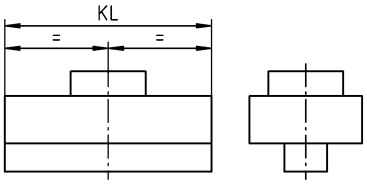


Number of spigots:

Lateral spigot (S1) (standard)
with one spigot from front



Spigot from above (S0)
with one spigot from above



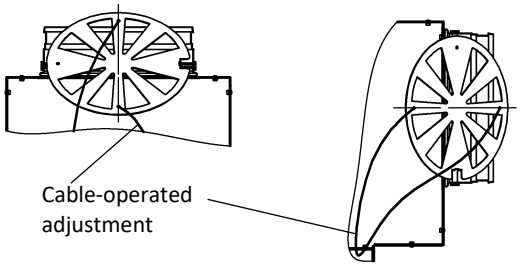
Installation opening with plenum box AK-58-...

EÖL = installation opening in the length section (L2 + 16 mm)
EÖH = installation opening in the height section (KBS+7)

Damper (-DK0/-DK2), for AK-58-...

-- without damper (-DK0) (standard)
-- with damper and cable-operated adjustment (-DK2)

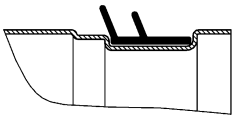
- DK2 (with cable-operated adjustment)
Spigot from above -S0 Lateral spigot on box -S1



Rubber lip seal (-GD0/-GD1), for AK-58-...

-- without rubber lip seal (-GD0) (standard)
-- with rubber lip seal (-GD1), made of special rubber

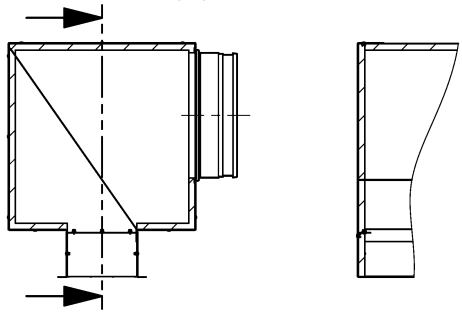
Detail Y



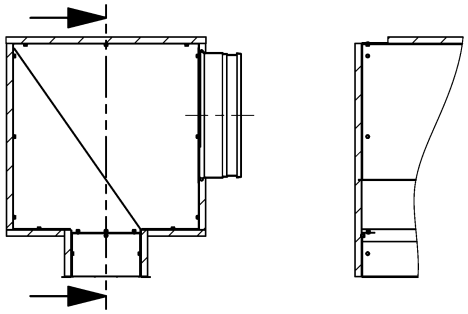
Insulation (-I0/-Ii/-Ia), for AK-58-...

-- without insulation (-I0) (standard)
-- with internal insulation (-Ii)
-- with external insulation (-Ia)

Internal insulation (-Ii)



External insulation (-Ia)

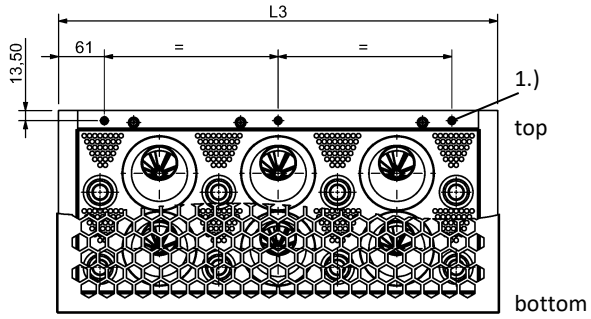


MOUNTING OPTIONS

Screw mounting (-SM)

for installation in walls/ducts/plenum box

LWD-Q-6-...-N-...



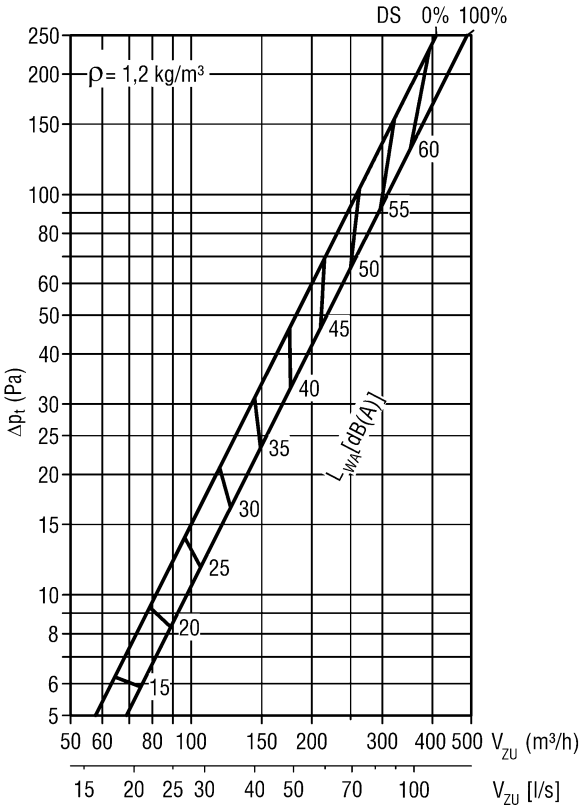
1.) Indentation for slotted shallow-raised countersunk-head tapping screw DIN ISO 7051 pitch 3.9 (on site)

L	L3
625	584.5
1025	1058.5

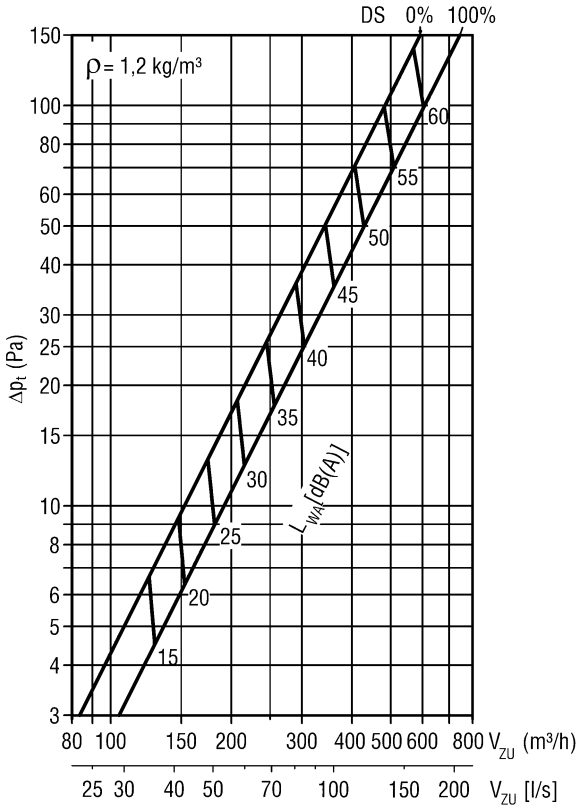
TECHNICAL DATA

Pressure loss and noise level

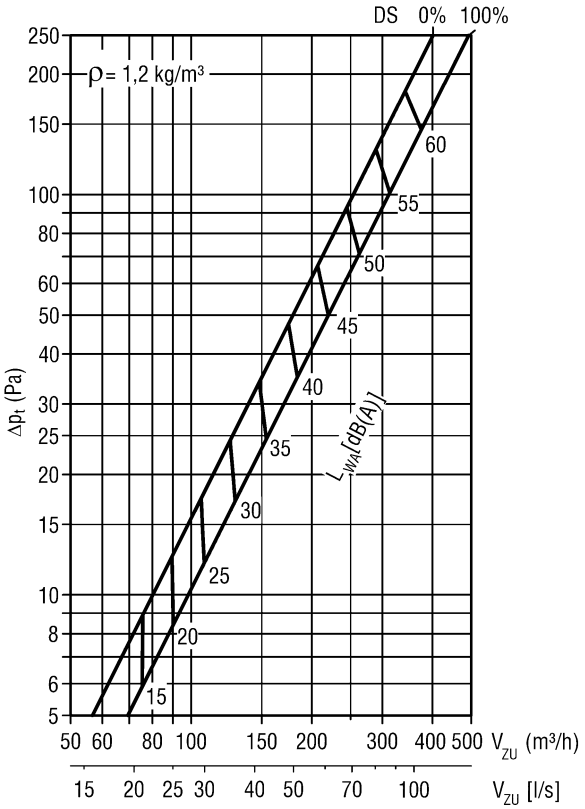
LWD-Q-6-...-00625-125-...-AK-58-...-S1



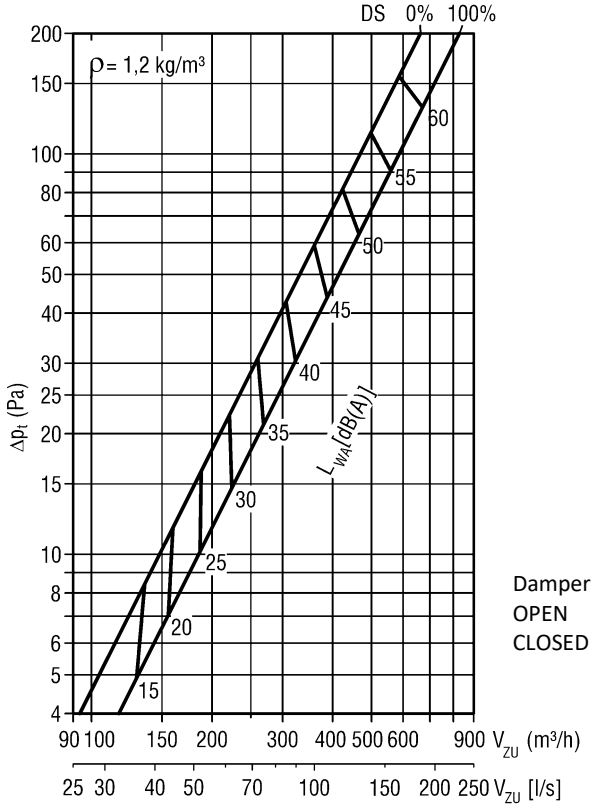
LWD-Q-6-...-00625-225-...-AK-58-...-S1



LWD-Q-6-...-00625-125-...-AK-58-...-S0

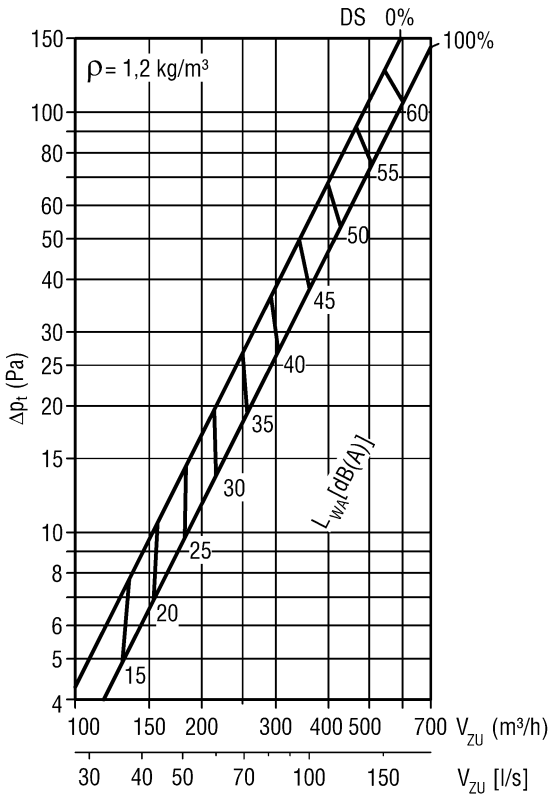


LWD-Q-6-...-00625-225-...-AK-58-...-S0

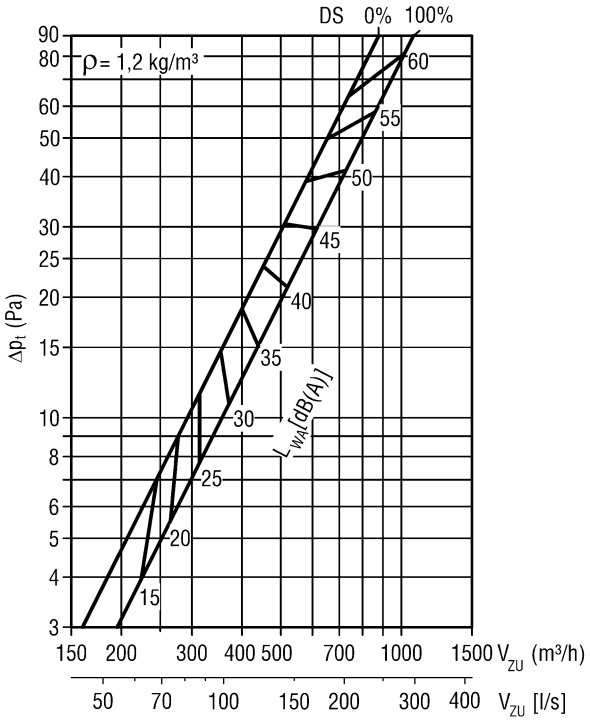


Damper position (DS):
OPEN = 100%
CLOSED = 0%

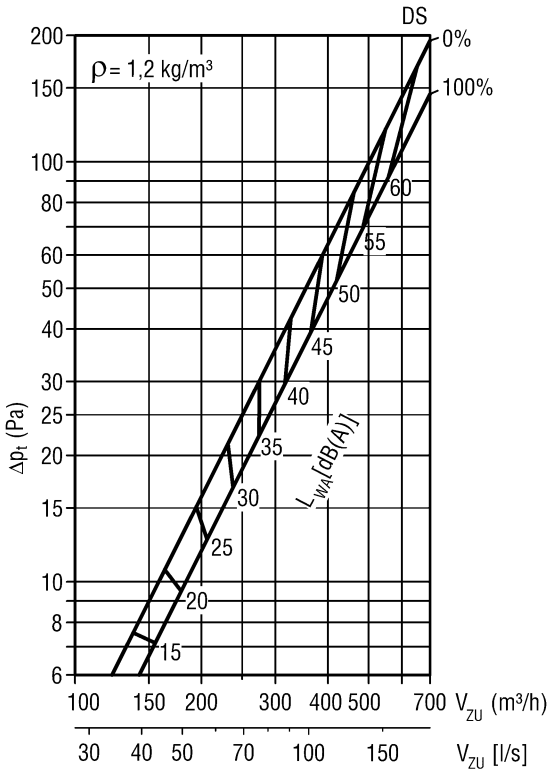
LWD-Q-6-...-01025-125-...-AK-58-...-S1



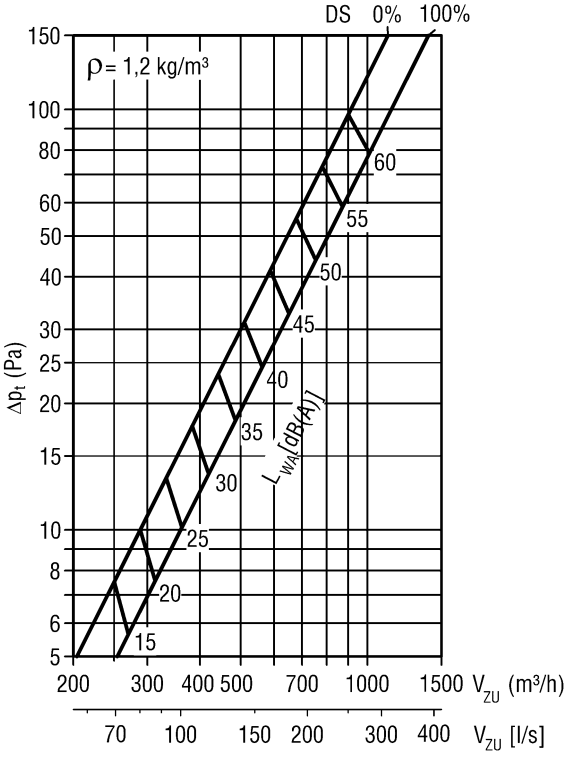
LWD-Q-6-...-01025-225-...-AK-58-...-S1



LWD-Q-6-...-01025-125-...-AK-58-...-S0



LWD-Q-6-...-01025-225-...-AK-58-...-S0

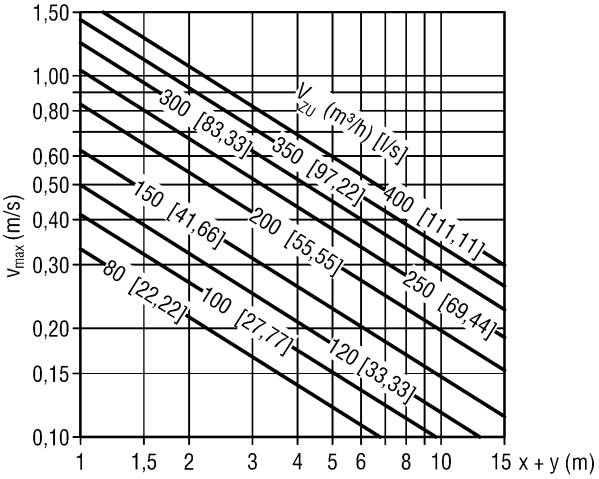


Damper position (DS):
OPEN = 100%
CLOSED = 0%

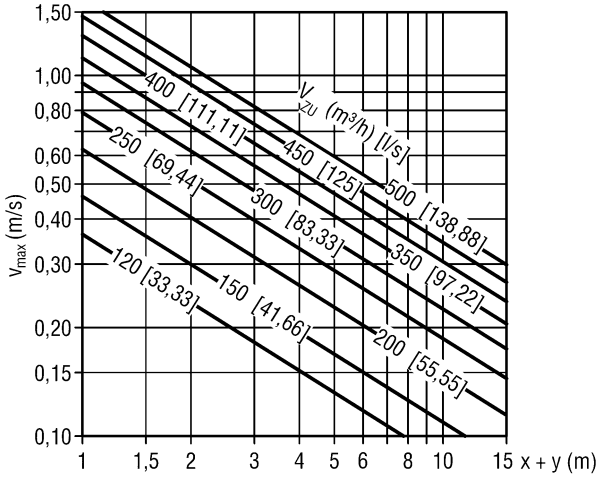
Maximum end velocity of jet (isotherm)

with coanda effect, straight throw slightly upwards

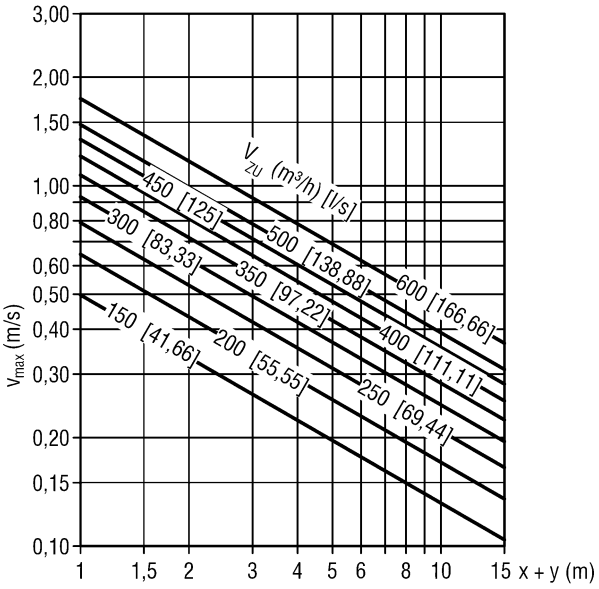
LWD-Q-6-...-00625-125-...



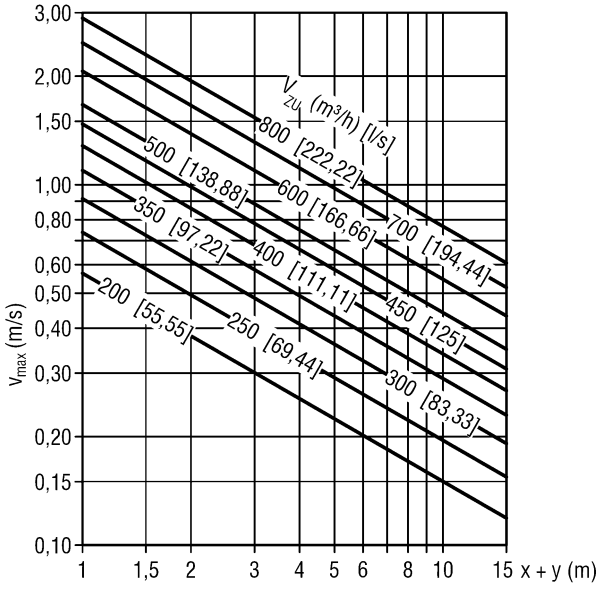
LWD-Q-6-...-001025-125-...



LWD-Q-6-...-00625-225-...



LWD-Q-6-...-01025-225-...

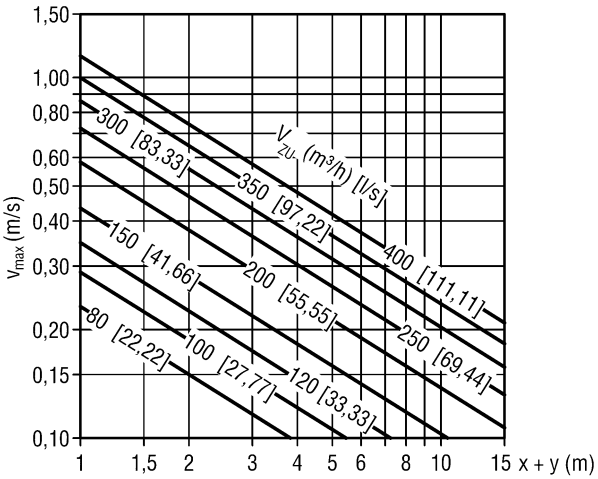


Correction factor for diverging air throw, upward throw

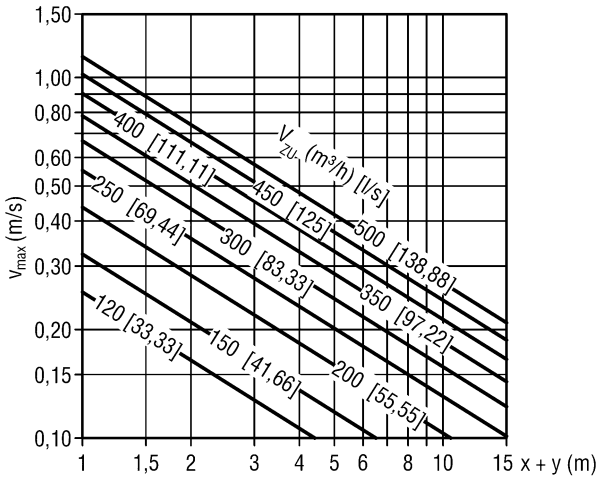
H	L	KF (-)
125	625	v_{max} (m/s) × 0.85
	1025	v_{max} (m/s) × 0.87
225	625	v_{max} (m/s) × 0.58
	1025	v_{max} (m/s) × 0.63

without coanda effect, straight throw slightly upwards

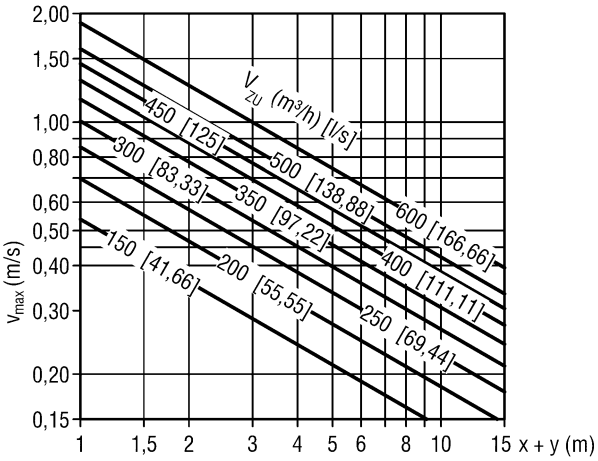
LWD-Q-6-...-00625-125-...



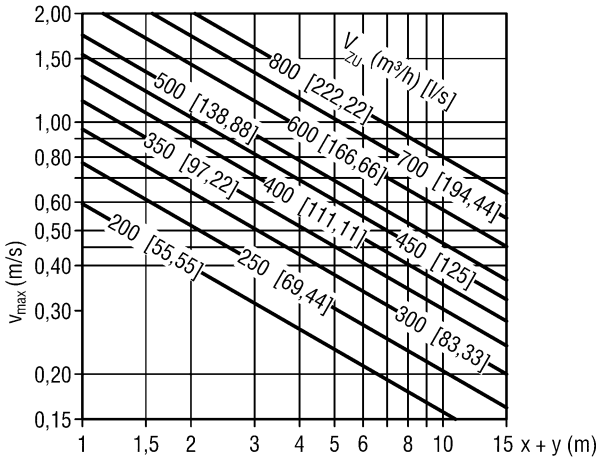
LWD-Q-6-...-01025-125-...



LWD-Q-6-...-00625-225-...



LWD-Q-6-...-01025-225-...



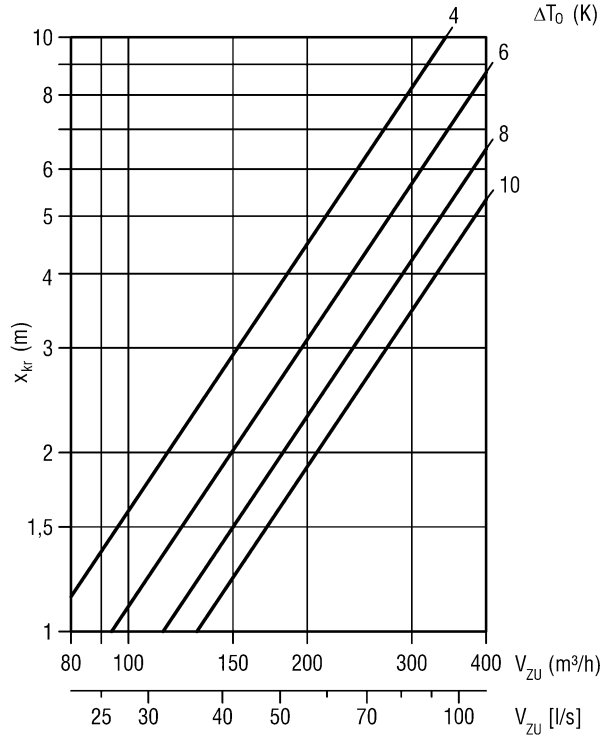
Correction factor for diverging air throw, upward throw

H	L	KF (-)
125	625	v_{max} (m/s) × 0.87
	1025	
225	625	v_{max} (m/s) × 0.63
	1025	

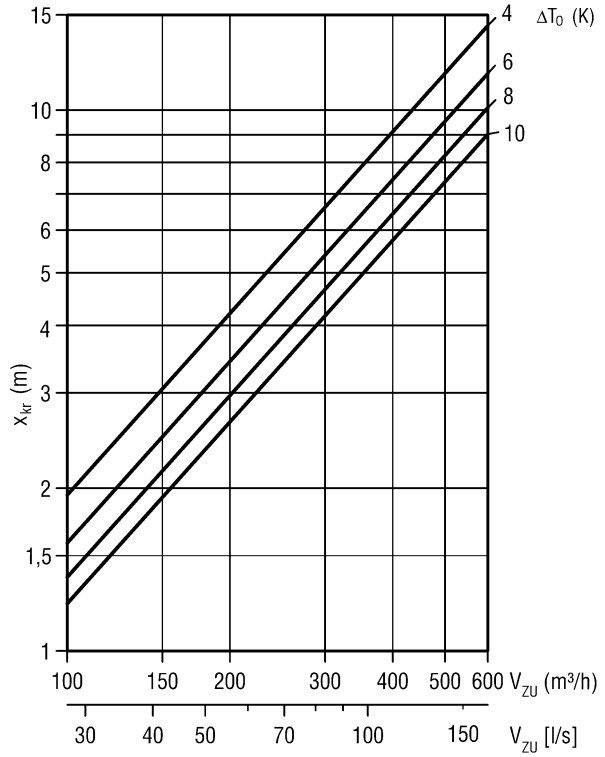
critical throw

with coanda effect, straight throw slightly upwards

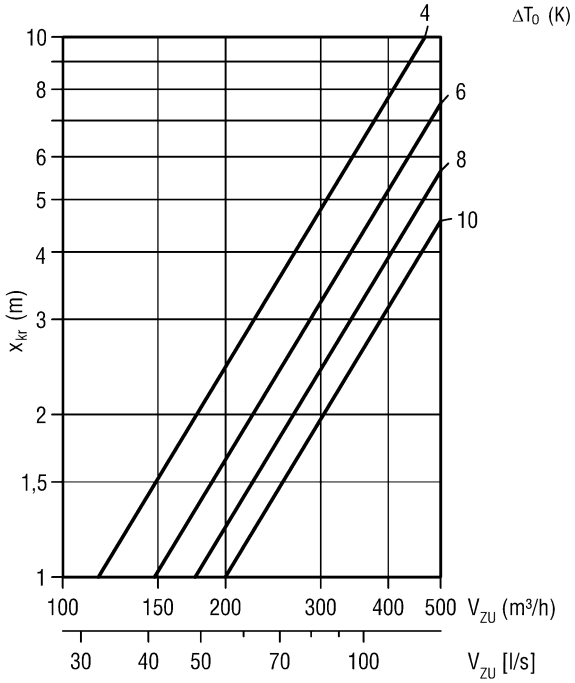
LWD-Q-6-...-00625-125-...



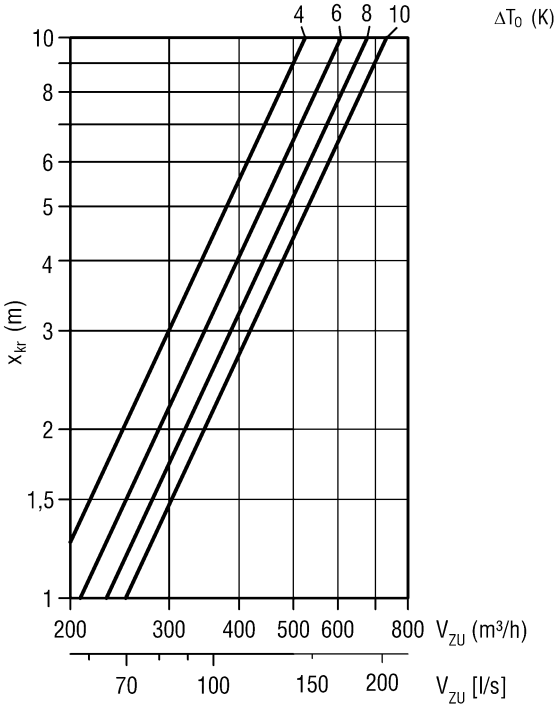
LWD-Q-6-...-00625-225-...



LWD-Q-6-...-001025-125-...



LWD-Q-6-...-01025-225-...



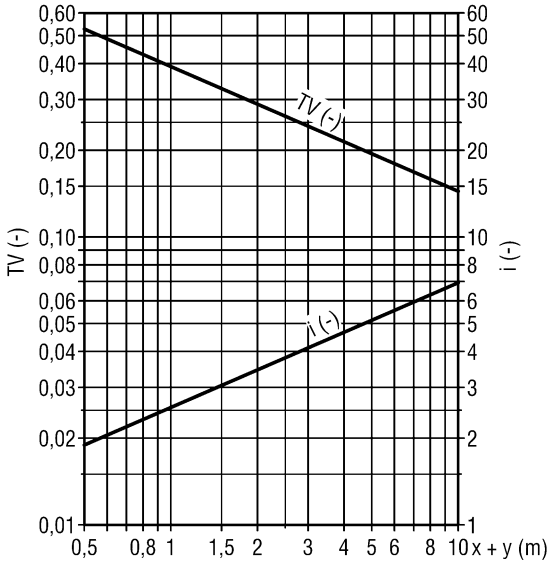
Correction factor for diverging air throw, upward throw

H	L	KF (-)
125	625	X_{kr} (m) x 0.62
	1025	X_{kr} (m) x 0.85
225	625	X_{kr} (m) x 0.70
	1025	X_{kr} (m) x 0.77

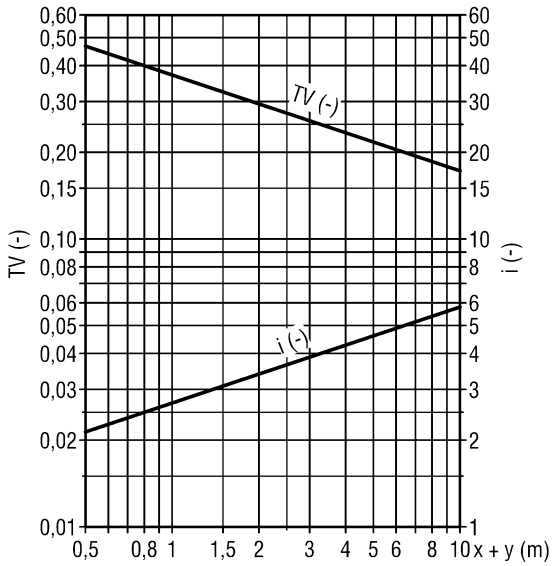
Induction ratios and temperature ratios

with coanda effect, straight throw slightly upwards

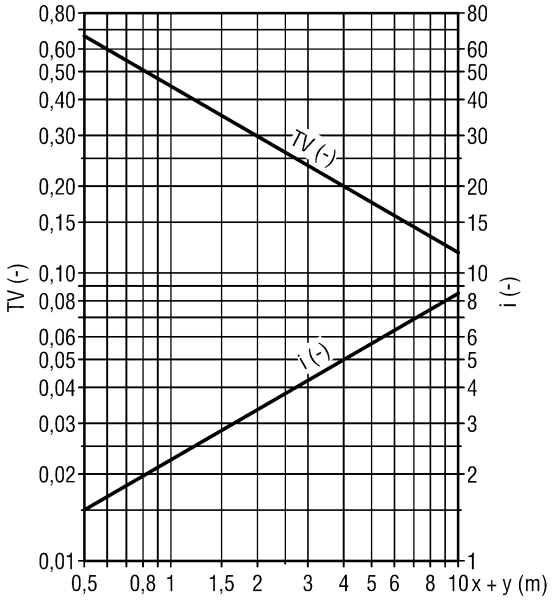
LWD-Q-6-...-00625-125-...



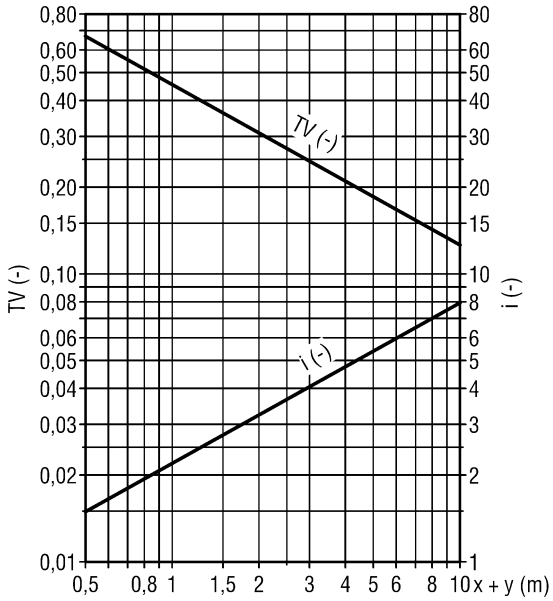
LWD-Q-6-...-001025-125-...



LWD-Q-6-...-00625-225-...



LWD-Q-6-...-01025-225-...



Correction factor for diverging air throw, upward throw

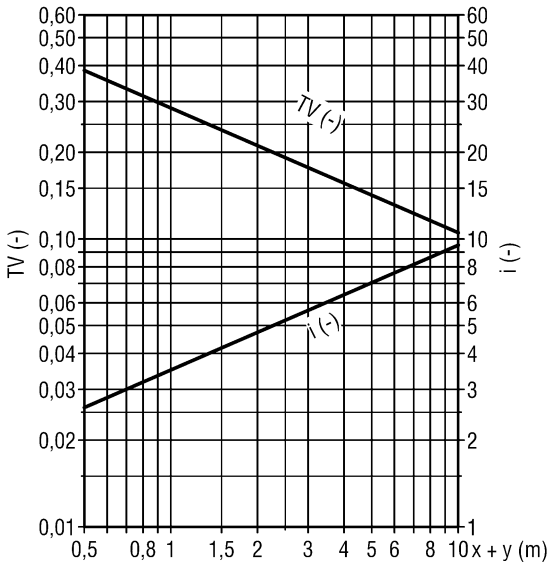
H	L	KF (-)
125	625	TV (-) x 0.62
	1025	TV (-) x 0.65
225	625	TV (-) x 0.69
	1025	TV (-) x 0.58

Correction factor for diverging air throw, upward throw

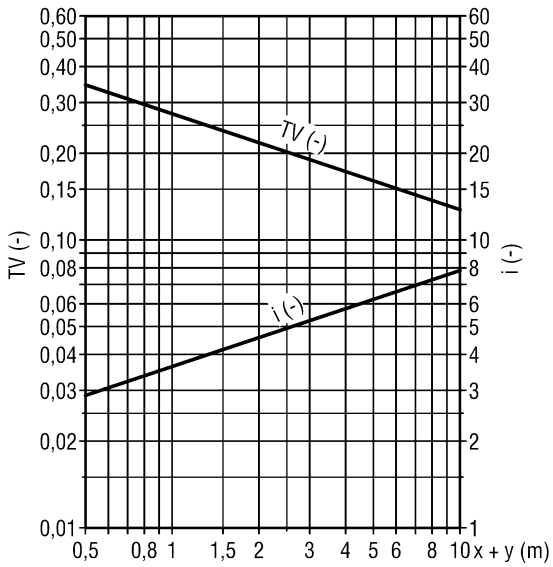
H	L	KF (-)
125	625	i (-) x 1.61
	1025	i (-) x 1.55
225	625	i (-) x 1.45
	1025	i (-) x 1.71

without coanda effect, straight throw slightly upwards

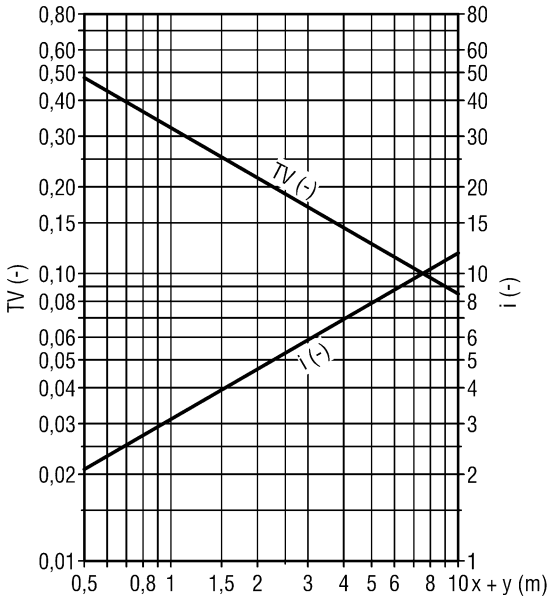
LWD-Q-6-...-00625-125-...



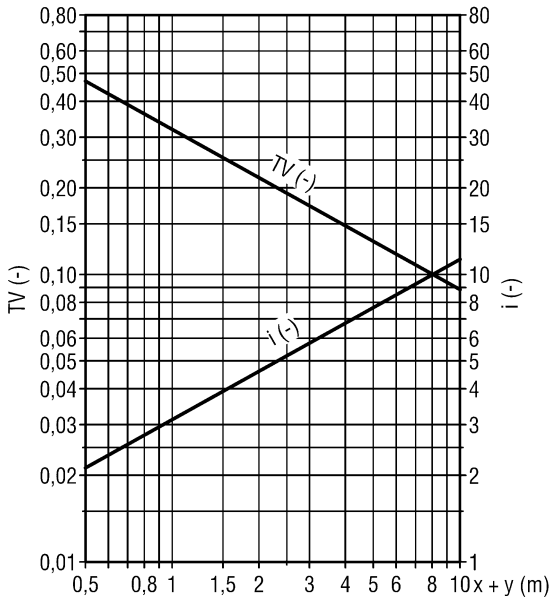
LWD-Q-6-...-01025-125-...



LWD-Q-6-...-00625-225-...



LWD-Q-6-...-01025-225-...



Correction factor for diverging air throw, upward throw

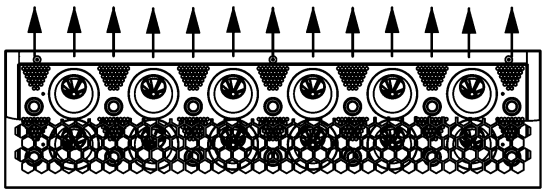
H	L	KF (-)
125	**625**	TV (-) x 0.62
	1025	TV (-) x 0.65
225	**625**	TV (-) x 0.69
	1025	TV (-) x 0.58

Correction factor for diverging air throw, upward throw

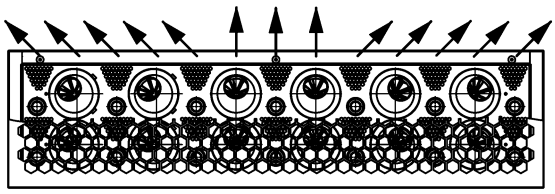
H	L	KF (-)
125	**625**	i (-) x 1.61
	1025	i (-) x 1.55
225	**625**	i (-) x 1.45
	1025	i (-) x 1.71

Air throw

straight throw slightly upwards



diverging throw upwards



LEGEND

V_{ZU}	(m^3/h) [l/s]	=	supply air volume
V_X	(m^3/h) [l/s]	=	total air jet volume at point x
v_{max}	(m/s)	=	maximum end velocity of jet
x+y	(m)	=	horizontal + vertical throw
x_{kr}	(m)	=	critical throw
t_{ZU}	(°C)	=	supply air temperature
t_R	(°C)	=	room temperature
Δp_t	(Pa)	=	pressure loss
A_{stirn}	(m^2)	=	face area
KF	(-)	=	Correction factor
L_{WA}	[dB(A)]	=	A-weighted sound power level
ρ	(kg/m^3)	=	density
i	(-)	=	induction ratio ($i = V_X / V_{ZU}$)
TV	(-)	=	temperature ratio ($TV = \Delta T_X / \Delta T_O$)
L	(mm)	=	length
H	(mm)	=	Height
ΔT_0	(K)	=	temperature difference between supply air temperature and room temperature ($\Delta T_{0 =} t_{ZU} - t_R$)
x	(m)	=	horizontal jet path
DS	(-)	=	Damper position

ORDER CODE LWD

01	02	03	04	05	06
Type	Model	Faceplate	Length	Height	Single / band design
Example					
LWD	-Q	-6	-01025	-125	-N

07	08	09	10	11
Material	Faceplate coating	Nozzle plate paint	Nozzle colour	Mounting
-SB	-9010	-9005	-DS	-SM

Sample
LWD-Q-6-01025-125-N-SB-9010-9005-DS-SM

Linear wall-mounted swirl air diffuser LWD | For installation in walls/ducts/plenum box | Hexagonal design | Grille length: 1,025 mm | One row of nozzles | Single design | Sheet steel | Painted in RAL colour 9010 (white) | Painted in RAL colour 9005 (black) | Plastic, similar to RAL colour 9005 (black) | With screw mounting

ORDER DETAILS

01 - Type
LWD = linear wall-mounted swirl air diffuser LWD

02 - Model
Q = for installation in walls/ducts/plenum box

03 - Faceplate
6 = hexagonal design

04 - Length
00625 = grille length 625 mm
01025 = grille length 1025 mm

05 - Height
125 = one row of nozzles
225 = two rows of nozzles

06 - Single / band design
N = single design

07 - Material
SB = sheet steel

08 - Faceplate coating
9010 = painted in RAL colour 9010 (white, standard)
xxxx = painted in a different RAL colour, freely selectable (always 4 digits)

09 - Nozzle plate paint
9010 = painted in RAL colour 9010 (white, standard)
xxxx = painted in a different RAL colour, freely selectable (always 4 digits)

10 - Nozzle colour
DW = plastic, similar to RAL colour 9010 (white) (standard)
DS = plastic, similar to RAL colour 9005 (black)
DA = plastic, similar to RAL 9006 (white aluminium)

11 - Mounting
SM = screw mounting

ORDER CODE AK

01	02	03	04	05	06	07	08
Type	Air diffuser	Length	Height	Single / band design	Mounting	Material	Damper
Example							
AK	-58	-00625	-125	-N	-SM	-SV	-DK2

09	10	11	12	13
Rubber lip seal	Insulation	Height of plenum box	Spigot diameter	Spigot position
-GD1	-I0	-KHS	-SDS	-S0

All fields must be filled when ordering.

Sample
AK-58-00625-125-N-SM-SV-DK2-GD1-I0-KHS-SDS-S0

Plenum box, rectangular design I for wall-mounted swirl air diffuser LWD I grille length: 625 mm I grille height: 125 mm I single design I screw mounting I galvanised sheet steel I with damper and cable-operated adjustment I with rubber lip seal I without insulation I standard height of box I standard spigot diameter I spigot from above

ORDER DETAILS

01 - Type
AK = plenum box, rectangular design

02 - Air diffuser
58 = for wall-mounted swirl air diffuser LWD

03 - Length
00625 = grille length 625 mm
01025 = grille length 1025 mm

04 - Height
125 = grille height 125 mm
225 = grille height 225 mm

05 - Single / band design
N = single design

06 - Mounting
SM = screw mounting (screws must be provided on site)

07 - Material
SV = galvanised sheet steel

08 - Damper
DK0 = without damper (standard)
DK2 = with damper and cable-operated adjustment

09 - Rubber lip seal
GD0 = without rubber lip seal (standard)
GD1 = with rubber lip seal

10 - Insulation
I0 = without insulation (standard)
Ii = With internal insulation
Ia = With external insulation

11 - Height of plenum box
KHS = standard height of plenum box
xxx = height of box in mm, freely selectable (always 3 digits) (minimum height [KHS] for spigot position S1 and standard box neck (75 mm) = spigot diameter D + 172 mm, minimum height [KHS] for spigot position S0 is min. 200 mm).

12 - Spigot diameter
SDS = standard spigot diameter
xxx = spigot diameter (D) in mm, freely selectable (always 3 digits)

13 - Spigot position
S0 = spigot from above
S1 = lateral spigot on the plenum box (standard)

SPECIFICATION TEXT

The SCHAKO linear wall-mounted swirl air diffuser LWD was developed for use in supply air systems. It is especially suitable for the air conditioning of rooms with high comfort requirements. The highly inductive introduction of supply air by multiple nozzles with in-built swirl discs creates a very good air throw pattern with a low sound power level.
High induction ensures that fresh air is circulated through the whole room and not just near the supply air diffuser. A further advantage of the linear wall-mounted swirl air diffuser LWD is that the entire air jet is divided into a large number of individual jets, thus achieving a high level of induction. The temperatures and velocities of the individual jets are very quickly reduced. This means that, on the one hand, the jet does not drop into the occupied area in cooling mode and, on the other hand, the jet ensures excellent functioning in heating mode. The LWD linear wall-mounted swirl air diffuser with individually and manually adjustable nozzles allows for an individually adjustable air jet (45° swivelling range), depending on the requirement. Manual adjustment of the individual nozzles from the front is easy following toolless dismounting of the faceplate, which is connected to the nozzle plate with a magnetic fastener.
High flexibility through a wide range of installation options. Installation in walls, plenum boxes and ducts. Cooling and heating modes are possible. Suitable for use in 100% to 40% VAV systems. The nozzle mounting plate is connected to the plenum box or air duct via screw mounting.
Product: SCHAKO **type LWD-…**

Model:
- for installation in walls/ducts/plenum box **(-Q).**

Faceplate:
- hexagonal design (**-6**)

Length:
- 625 mm (-00625)
- 1025 mm (-01025)

Height:
- nozzles, 1 row (**-115**)
- nozzles, 2 rows (**-215**)

Single / band design:
- single design (**-N**)

Material / paint:
- Sheet steel (**-SB**):

Faceplate coating:
- painted in RAL colour 9010 (white, standard) (**-9010**).
- painted in a different RAL colour, freely selectable (**-xxxx**) (always 4 digits)

Nozzle plate paint:
- painted to RAL colour 9005 (black, standard) (**-9005**).
- painted in a different RAL colour, freely selectable (**-xxxx**) (always 4 digits)

Nozzle colour:
- Plastic:
  - similar to RAL colour 9010 (white) (standard) (**-DW**).
  - similar to RAL colour 9005 (black) (**-DS**).
  - similar to RAL colour 9006 (white aluminium) (**-DA**).

Mounting:
- Screw mounting (**-SM**)
  - screws must be provided on site.

Accessories:
- Plenum box, in rectangular design, made of galvanised sheet steel (-SV), housing with round connection spigot and mounting brackets.
  - Grille length:
    - 625 mm (-00625)
    - 1025 mm (-01025)
  - Grille height:
    - 115 mm (-115)
    - 215 mm (-215)
  - Single / band design:
    - single design (-N).
  - Mounting:
    - Screw mounting (-SM) (standard, screws must be provided on site).
  - Damper:
    - without damper (-DK0) (standard).
    - with damper (-DK2), made of galvanised sheet steel, in plenum box housing, with cable-operated adjustment, for easy air volume regulation.
  - Rubber lip seal:
    - without rubber lip seal (-GD0) (standard).
    - with rubber lip seal (-GD1) made of special rubber, at the connection spigot.
  - Insulation:
    - without insulation (-I0) (standard).
    - with internal insulation (-Ii), thermal insulation inside the plenum box.
    - with external insulation (-Ia), thermal insulation at the outside of the plenum box.
  - Height of plenum box:
    - Standard height of plenum box (-KHS).
    - Height of box in mm, freely selectable (always 3 digits) (minimum height [KHS] for spigot position S1 and for standard box neck (75 mm) = spigot diameter D + 172 mm, minimum height [KHS] for spigot position S0 is min. 200 mm).
  - Spigot diameter:
    - Standard spigot diameter (-SDS).
    - spigot diameter (øD) in mm, freely selectable (-xxx, always with 3 digits)
  - Spigot position:
    - Spigot from above (-S0).
    - Lateral spigot on the plenum box (-S1) (standard).