Lindab **PKAL**

Formo - Perforated diffuser

Formo - Perforated diffuser PKAL

Description

PKAL is a square diffuser with perforated face plate and is adapted for lay-in T-bar ceiling 595x595. PKAL can be used for both supply and extract air.
PKAL is suitable for horizontal supply of cooled air and can be equipped with accessories of various types in order to achieve optimal function.

Installing a PKAL diffuser in a plenum box type MB can help to achieve a stable airflow to the diffuser as well as realise the potential for individual adjustment.
Damper type B is an unique linear cone damper which allows to use the full operational area (0-100%) and allows to balance with a high pressure drop over the box with low sound generation. Furthermore the construction of the damper gives an accurate and reliable measurement.
Damper type C and E are with rotating blade dampers for respectively supply and extract. Typically used in applications that don't require a high balancing pressure in the plenum box.

- Suitable for both supply and extract air
- Suitable for horizontal supply of cooled air
- Option of 1, 2 and 3-way supply air
- Plenum box with several damper options

Maintenance

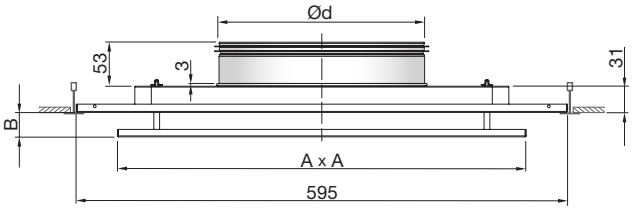
The face plate can be removed to enable cleaning of internal parts or to gain access to the duct or box. The visible parts of the diffuser can be wiped with a damp cloth.

Order Code

Product	PKAL	aaa	1
Type			
PKAL			
Connection dim Ød			
Ø125 - 250			
Ceiling type			
1			

Example: PKAL-200-1

Dimensions



PKAL Ød	A	B	Free area A	m
mm	mm	mm	m²	kg
125	235	27	0.018	3.6
160	295	27	0.023	3.9
200	395	27	0.030	4.2
250	495	31	0.043	4.6

PKAL is including ceiling adaption plate for lay-in T-bar ceiling 595 x 595.

Materials and finish

Material:	Galvanised steel
Standard finish:	Powder-coated
Standard colours:	RAL 9003 or RAL 9010, gloss 30

The diffuser is available in other colours. Please contact Lindab's sales department for further information.

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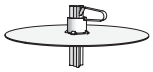
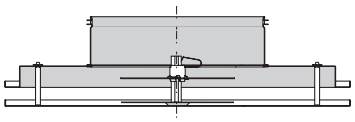
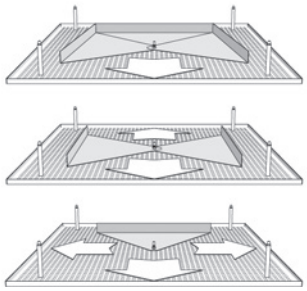
Accessories

DRZ - Balancing damper

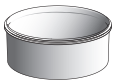




DAZ - Directional deflector (set)



MBZ - Extension piece

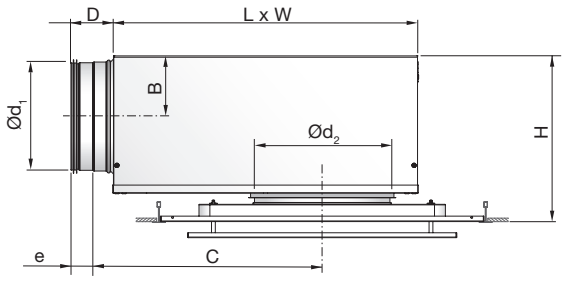


Order Code - accessories

Product aaa bbb
Type
Size

Example: DRZ-200

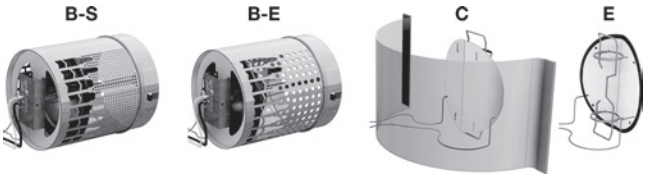
PKAL + MB plenum box



Ød1	Ød2	B	C	D	e	H*	L	W
mm		mm						
100	125	62	245	78	40	197 - 237	310	260
100	160	62	245	78	40	197 - 237	310	260
125	125	75	291	78	40	222 - 262	376	310
125	160	75	291	78	40	222 - 262	376	310
125	200	75	291	78	40	222 - 262	376	310
160	160	92	352	78	40	256 - 296	459	380
160	200	92	352	78	40	256 - 296	459	380
160	250	92	352	78	40	256 - 296	459	380
200	200	112	425	78	40	297 - 337	565	460
200	250	112	425	78	40	297 - 337	565	460
250	250	137	534	118	60	347 - 387	698	540

* Using accessory MBZ the H dimension will increase:
$Ød_2$ = 125 - 200 mm => H +40 mm
$Ød_2$ = 250 => H +60 mm

Damper options



Order Code

Product MB a bbb ccc d
Type
MB
Damper
B = Linear cone damper
C = Blade damper supply
E = Blade damper extract
Duct connection $Ød_1$
Ø100-250
Diffuser dimension $Ød_2$
Ø125 - 250
Function (Only for B damper)
S = Supply E = Extract

Example 1: PKAL-200 + MBB-160-200 -S
Example 2: PKAL-200 + MBC-125-200

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Technical data

Following PKAL+plenum box data are valid for MBB-S/-E. For MBC and MBE data, go to www.lindQST.com.

Capacity

Air flow q_v [l/s] and [m³/h], total pressure Δp_t [Pa], throw $l_{0.2}$ [m] and sound power level L_{WA} [dB(A)] can be seen in the diagrams.

Frequency-related sound power level

The sound power level in the frequency band is defined as $L_{WA}+K_{ok}$. K_{ok} values are specified in charts beneath the diagrams on the following pages.

Quick selection, supply air

PKAL + MBB-S		$\Delta p_t \geq 50$ Pa		$\Delta p_t \geq 50$ Pa	
Duct	PKAL	30dB(A)		35dB(A)	
$Ød_1$	$Ød_2$	l/s	m³/h	l/s	m³/h
100	125	33	119	39	140
100	160	39	140	47	169
125	125	40	144	48	173
125	160	51	184	61	220
125	200	58	209	70	252
160	160	59	212	70	252
160	200	67	241	84	302
160	250	77	277	99	356
200	200	83	299	100	360
200	250	96	346	118	425
250	250	118	425	139	500

Sound attenuation

Sound attenuation of the diffusers ΔL from duct to room, including and reflection, see table below.

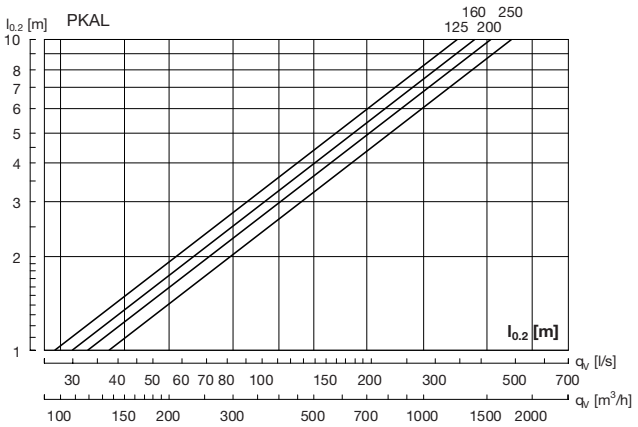
PKAL + MBB-S/-E		Sound attenuation ΔL [dB]							
Duct	PKAL	Centre frequency Hz							
$Ød_1$	$Ød_2$	63	125	250	500	1K	2K	4K	8K
100	125	19	16	7	19	18	18	18	21
100	160	21	16	5	15	17	18	16	19
125	125	18	13	9	20	13	19	18	19
125	160	12	13	8	19	13	16	17	19
125	200	16	11	5	16	13	15	15	17
160	160	17	17	11	19	18	17	20	20
160	200	14	14	7	21	15	16	18	19
160	250	15	15	5	17	13	15	16	18
200	200	15	10	6	16	17	15	19	18
200	250	12	9	5	14	17	15	17	17
250	250	14	8	8	14	16	17	17	18

Balancing

Balancing guide, see the MB installation instruction.

Throw $l_{0.2}$

Throw $l_{0.2}$ [m] can be seen in the diagram for isothermal air, at a terminal velocity of 0.2 m/s.

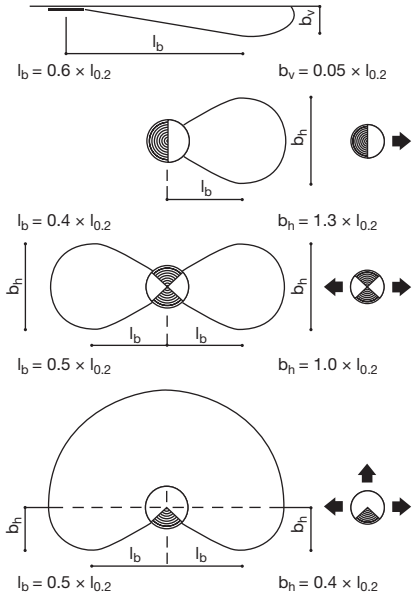


Correction throw $l_{0.2}$

PKAL Ød	1 - ways	2 - ways	3 - ways
125	2.6	1.8	1.4
160	2.5	1.7	1.3
200	2.4	1.7	1.3
250	2.3	1.7	1.3

Air jet distribution

l_b = Distance from the diffuser to the point where there is maximum dispersal.
b_v = Depth of the air jet on a vertical plane.
b_h = Width of the air jet on a horizontal plane.



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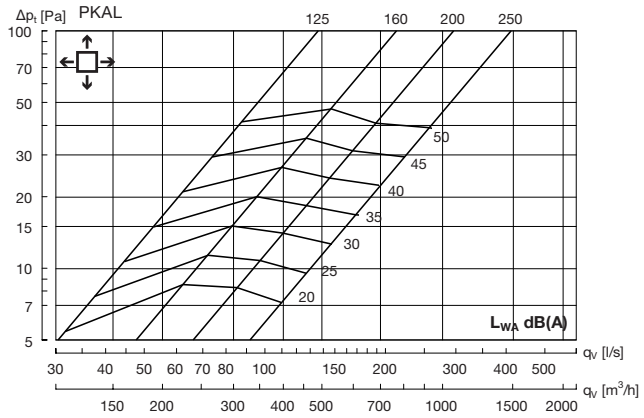
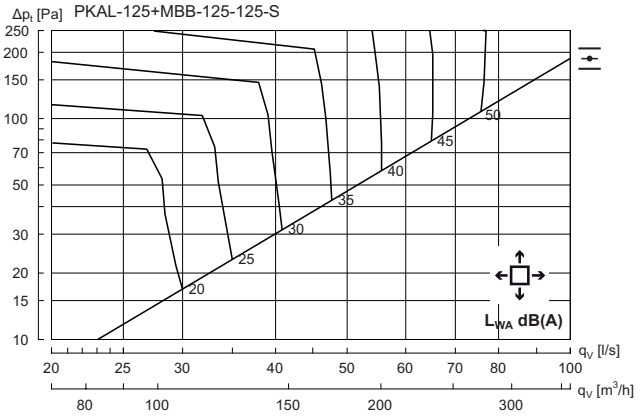
Technical data

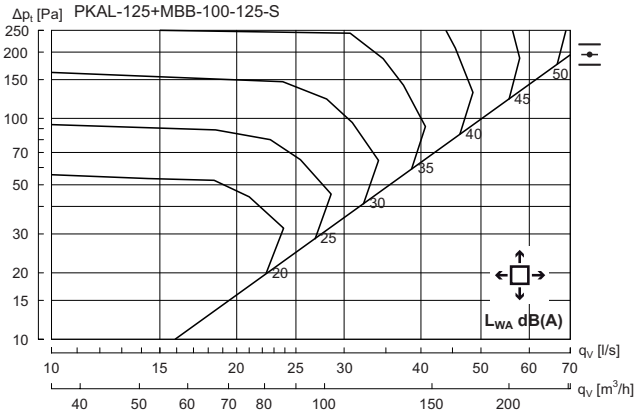
PKAL without box - supply air



PKAL 125 + MBB-S - Supply air



Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	9	5	-1	-4	-3	-11	-20	-26



Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	11	7	3	-5	-5	-11	-18	-25

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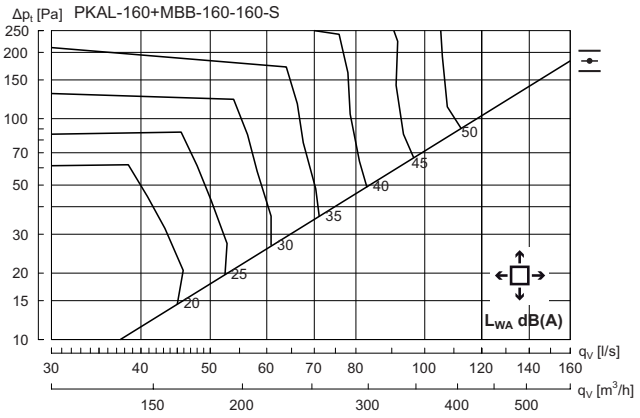
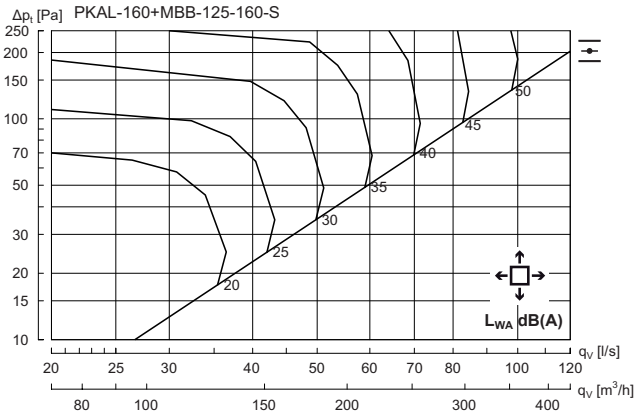
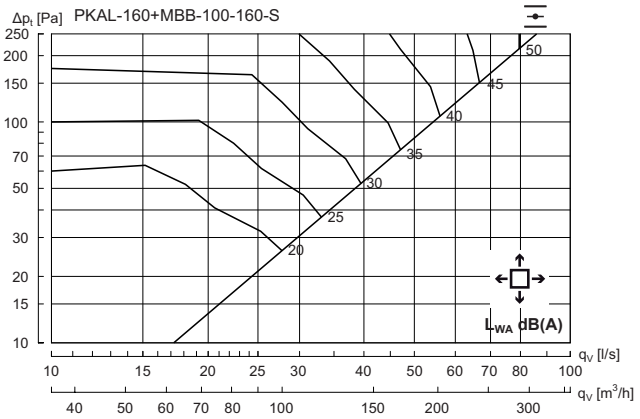
PKAL 160 + MBB-S - Supply air



Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	8	5	-2	-4	-3	-11	-21	-29

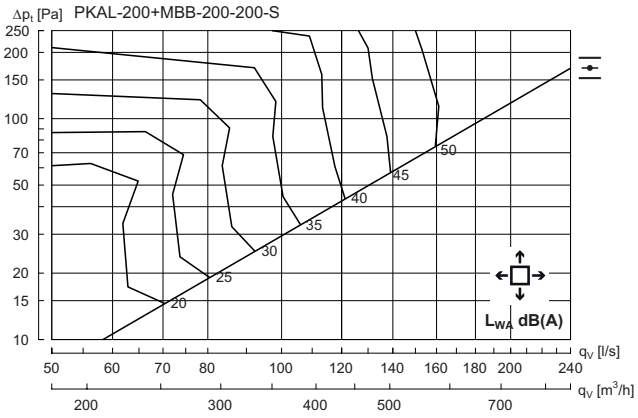


Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	9	5	1	-4	-4	-10	-17	-25

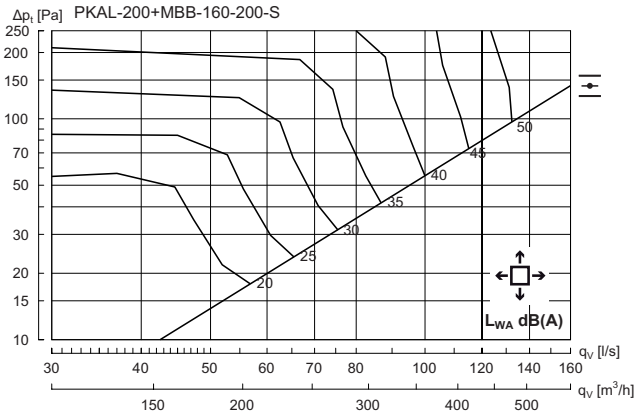


Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	9	4	1	-3	-5	-10	-15	-19

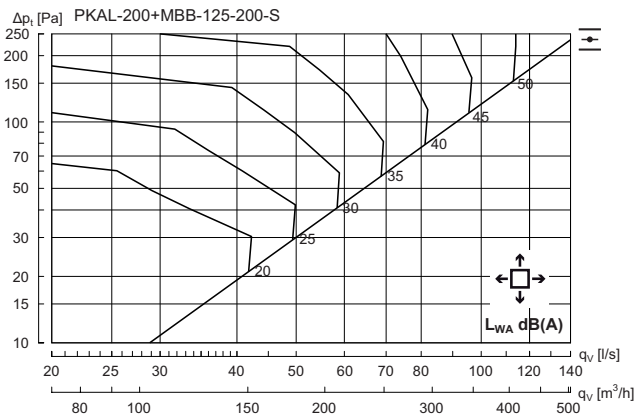
PKAL 200 + MBB-S - Supply air



Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	11	5	-3	-3	-3	-11	-22	-29



Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	10	5	-2	-4	-3	-10	-20	-26



Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	10	5	1	-4	-5	-10	-15	-22

Formo - Perforated diffuser PKAL

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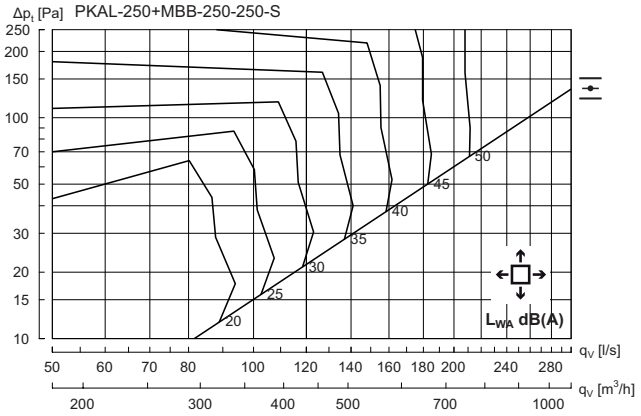
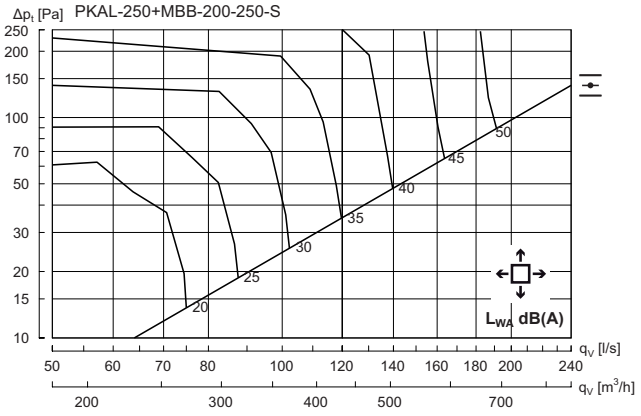
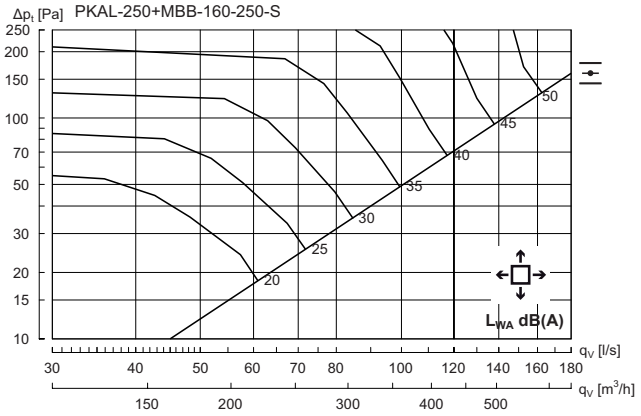
PKAL 250 + MBB-S - Supply air



Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	11	3	-4	-3	-3	-12	-22	-30



Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	10	5	-2	-3	-3	-11	-20	-28



Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	8	5	0	-4	-4	-10	-17	-23

Correction sound power level (L_{WA}) and pressure loss (ΔP_t).

PKAL + MBB-S		1 - ways		2 - ways		3 - ways	
Duct $Ød_1$	PKAL $Ød_2$	L_{WA}	Δp_t	L_{WA}	Δp_t	L_{WA}	Δp_t
100	125	+ 10	x 1.3	+ 4	x 1.1	+ 2	x 1.05
100	160	+ 5	x 1.1	+ 2	x 1.05	+ 1	x 1
125	125	+ 10	x 1.35	+ 6	x 1.1	+ 4	x 1.05
125	160	+ 10	x 1.4	+4	x 1.1	+ 1	x 1
125	200	+ 4	x 1.2	+ 2	x 1.05	+ 1	x 1
160	160	+ 13	x 1.8	+ 6	x 1.3	+ 2	x 1.1
160	200	+ 16	x 1.7	+ 10	x 1.2	+ 4	x 1.05
160	250	+ 10	x 1.3	+ 6	x 1.1	+ 3	x 1
200	200	+ 17	x 2.3	+ 11	x 1.4	+ 7	x 1.1
200	250	+ 13	x 1.8	+ 6	x 1.2	+ 4	x 1.1
250	250	+ 21	x 2.1	+ 11	x 1.4	+ 7	x 1.2

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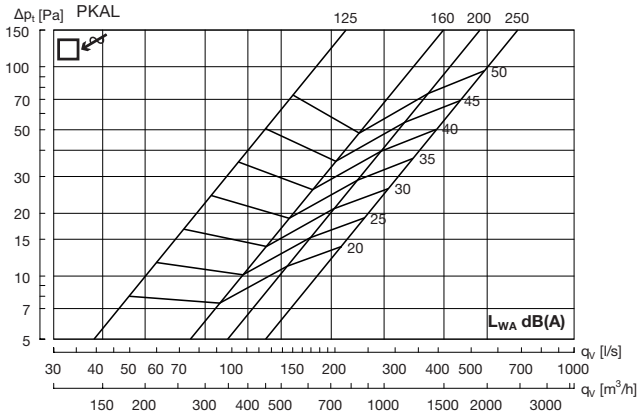
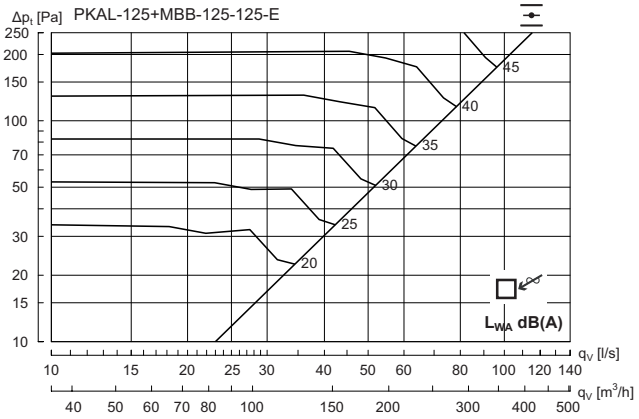
Technical data

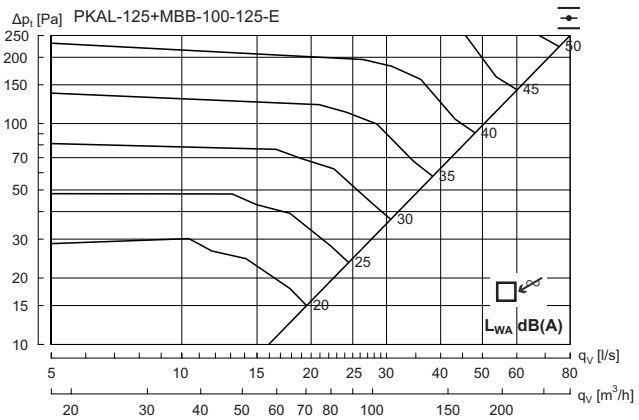
PKAL without box - Extract air



PKAL 125 + MBB-E - Extract air



Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	13	5	-1	-4	-4	-11	-15	-20

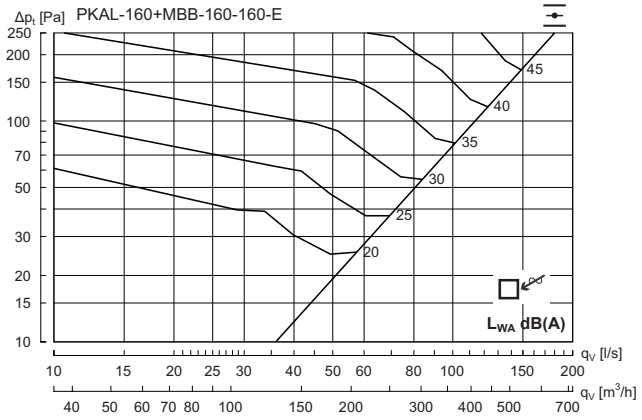


Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	13	-1	3	-3	-6	-10	-16	-19

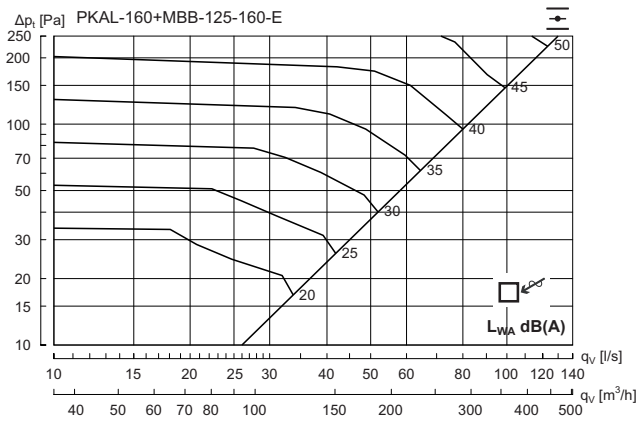
Formo - Perforated diffuser PKAL

Technical data

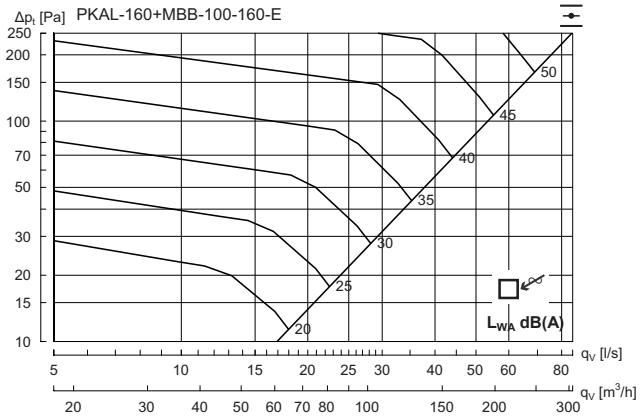
PKAL 160 + MBB-E - Extract air



Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	16	6	-1	-5	-4	-10	-15	-19

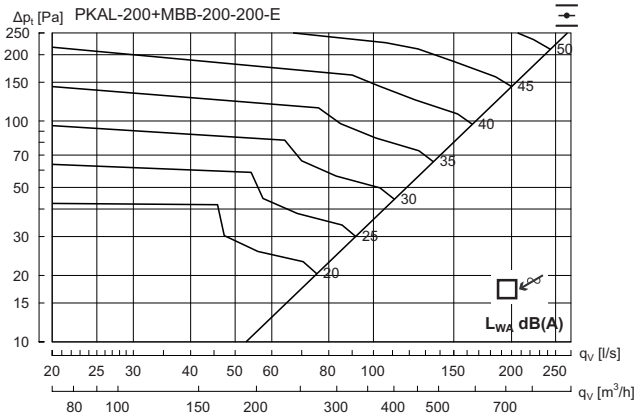


Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	13	5	0	-3	-5	-11	-15	-22

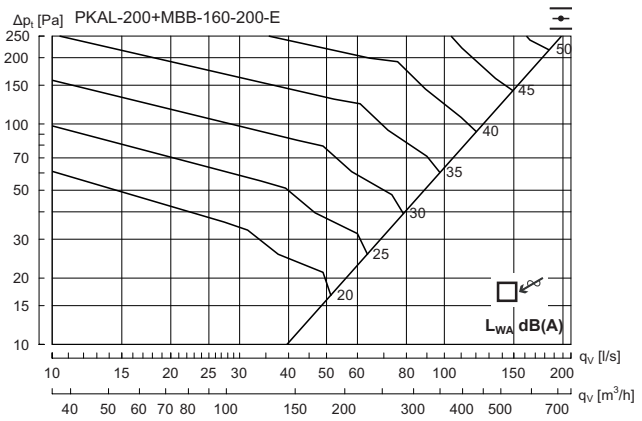


Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	10	-1	5	-3	-8	-11	-18	-25

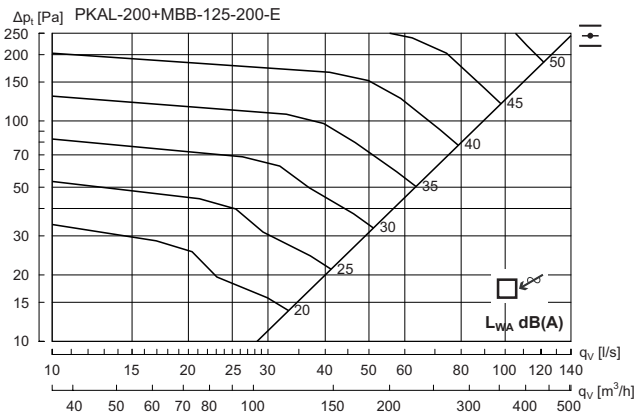
PKAL 200 + MBB-E - Extract air



Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	15	4	-1	-4	-5	-9	-16	-25



Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	15	6	-1	-5	-5	-9	-14	-20



Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	9	3	1	-4	-5	-10	-14	-21

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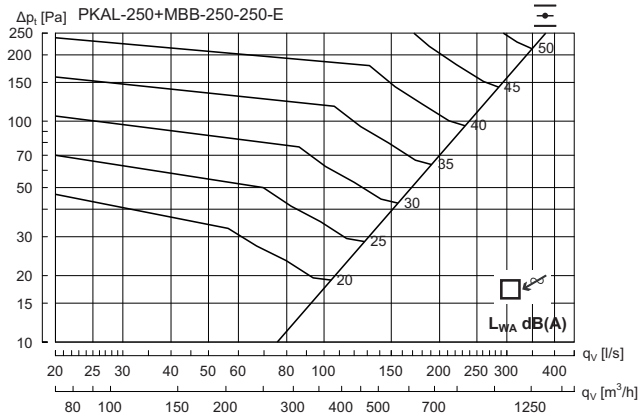
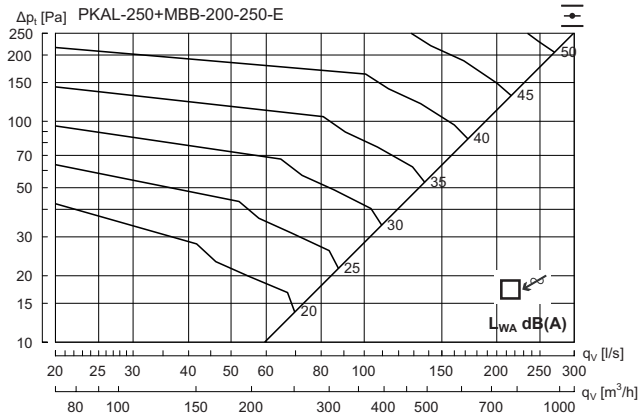
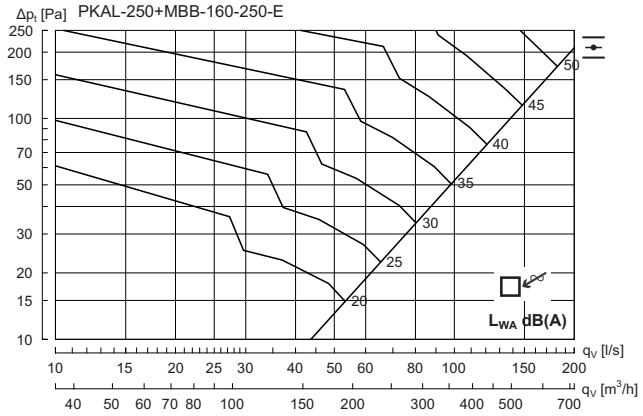
PKAL 250 + MBB-E - Extract air



Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	10	5	2	-3	-5	-11	-16	-25



Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	12	5	0	-3	-5	-10	-14	-23



Hz	63	125	250	500	1K	2K	4K	8K
K_{ok}	16	6	0	-5	-5	-9	-15	-21

Most of us spend the majority of our time indoors. Indoor climate is crucial to how we feel, how productive we are and if we stay healthy.

We at Lindab have therefore made it our most important objective to contribute to an indoor climate that improves people's lives. We do this by developing energy-efficient ventilation solutions and durable building products. We also aim to contribute to a better climate for our planet by working in a way that is sustainable for both people and the environment.

Lindab | For a better climate