

LPA

LOCKZONE® Circular ceiling diffuser for supply- and extract air



QUICK FACTS

- Guide vane perforation with swirl spread pattern
- High induction capabilities
- Designed for mounting flush to ceiling
- Simple installation
- Can be used with the commissioning box ALS
- Standard colour White RAL 9003
 - 5 alternative standard colours
 - Other colours upon request

AIR FLOW - SOUND PRESSURE ROOM (Lp10A) *)							
LPA Size	25 dB(A)		30 dB(A)		35 dB(A)		
	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	
160	51	184	59	212	70	252	
200	76	284	86	310	98	353	
250	110	396	120	432	140	504	
315	150	540	175	630	205	738	
400	210	756	245	882	280	1008	
LPA Size	ALS Size	25 dB(A)		30 dB(A)		35 dB(A)	
		l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h
160	125-160	32	115	40	144	48	173
200	160-200	48	173	61	220	73	263
250	200-250	73	263	93	335	111	400
315	250-315	105	378	125	450	147	529
400	315-400	136	490	175	630	225	810

Data is shown for supply air. Data for the combination of LPA and ALS is presented at a total pressure of 50 Pa.

*) L_{p10A} = Sound pressure incl. A-filter with 4 dB room attenuation and 10 m² room absorption area.

Technical description

Design

Circular perforated diffuser for supply- or extract air consisting of two parts, diffuser face, and backing box. The spring suspended and rubber sealed diffuser face has a guide vane perforation in a swirl pattern. The backing box is fitted with a rubber sealed branch connection.

Materials and surface treatment

The backing box is manufactured in galvanized sheet steel. The diffuser face is manufactured in sheet steel and powder coated.

- Standard colour:
 - White semi-gloss, lustre 40, RAL 9003/NCS S 0500-N
- Alternative standard colours:
 - Silver gloss, lustre 80, RAL 9006
 - Grey aluminium gloss, lustre 80, RAL 9007
 - White semi-gloss, lustre 40, RAL 9010
 - Black semi-gloss, lustre 35, RAL 9005
 - Grey semi-gloss, lustre 30, RAL 7037
- Non-painted finish and other colours available on request.

Accessories

Commissioning box:

ALS, manufactured in galvanized sheet steel. ALS contains a removable commissioning damper, a fixed measurement and sound absorbing material with reinforced surface layer, to Fire Resistance Class B-s1,d0 according to EN ISO 11925-2. Tightness class C on the housing according to SS-EN 12237.

Planning

LPA is specifically designed for mounting in plasterboard ceilings. The circular shape of the diffuser face enables mounting of several LPA in a row in a plasterboard ceiling without risk of one or several diffusers being mounted askew. With its concealed mounting the LPA is very suitable for rooms with high demand on esthetical design, for example hotel lobby's or shops.

Installation

Mounting hole is drilled according to the drawing. The mounting frame is placed on top of the ceiling and is folded to a rectangular frame around the hole. The frame is fastened with screws through the ceiling, from below into the perforation. The backing box is placed in the hole with the four mounting angles tightly pressed against the ceiling. Screws are driven through the angles, through the plasterboard ceiling into the perforation of the mounting frame. Connecting duct or commissioning box is riveted to the spigot on the backing box of the LPA. The diffuser face is connected to the safety chain and pressed up into the spring seats.

If the commissioning box ALS is used, it should be fixed to the building construction. The distance between the backing box and the commissioning box can be extended with maximum 500 mm with the standard damper cords and measurement tubes retained. See Figure 1.

Commissioning

Commissioning should be performed with the diffuser face in place. Measurement tube and damper cords are pulled out through the perforations of the diffuser face. A manometer is connected to the measurement tube.

With the K-factor of the diffuser the desired commissioning pressure can be calculated. The damper is set at the correct position and a commissioning knot is tied on the cords to indicate the damper position. The damper is then locked into position. See figure 1.

Measurement accuracy and requirement on straight duct before the commissioning box, see Figure 1. The requirements of straight duct depends on the type of disturbance before the commissioning box. Figure 1 shows a bend, a dimensional change and a T-piece. Other types of disturbances requires at least 2xD straight (D = connection dimension) for measurement accuracy of $\pm 10\%$ of the flow.

The K-factor is specified on the product marking, and is also available for download at www.swegon.com.

Maintenance

The diffuser can be cleaned when necessary, using lukewarm water with added detergent. The duct system is accessed when the diffuser face is removed, the distribution plate of the commissioning box pushed to the side and the damper turned anticlockwise from its locked position and removed. See figure 1.

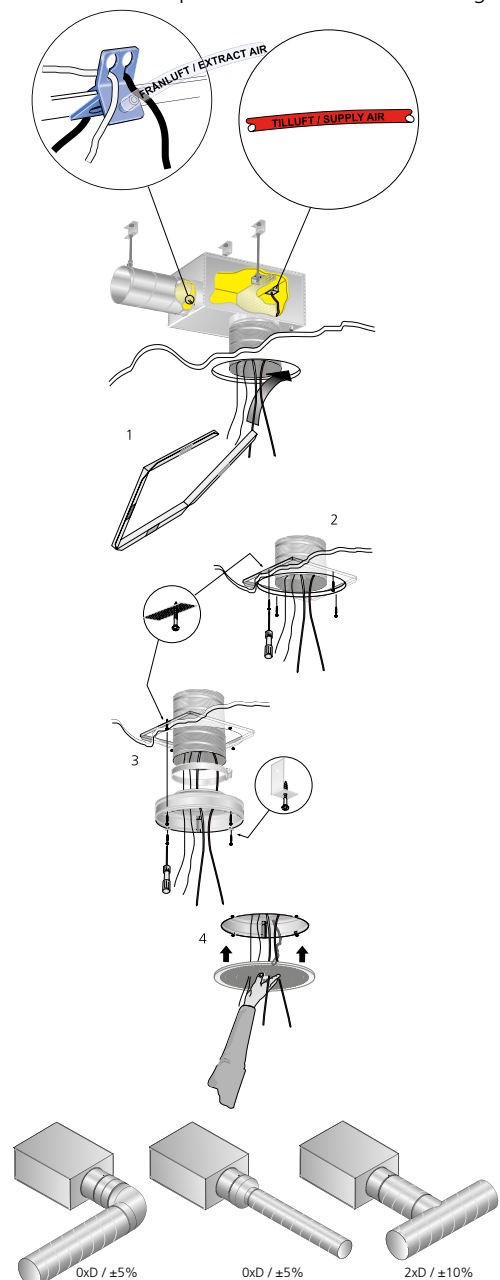


Figure 1. Installation. Commissioning.

Sizing

- Sound pressure level dB(A) applies to rooms with 10 m² equivalent sound absorption area.
- Sound attenuation (ΔL) below is shown in the octave band. Orifice attenuation is included in the values.
- Throw $I_{0.2}$ is measured at isothermal conditions
- The recommended maximum under-temperature for LPA is 14 K.
- For calculating the width of the air stream, air velocities in the occupied zone or sound levels in rooms with other dimensions, please refer to our web calculation softwares available for download at www.swegon.com.

L_w = Sound power level

L_{p10A} = Sound pressure level dB (A)

K_{ok} = Correction for producing the L_w value in the octave band

$L_w = L_{p10A} + K_{OK}$ gives the frequency divided octave band

Sound data – LPA – Supply air

Sound power level L_w (dB)

Table K_{OK}

Size LPA	Mid-frequency (octave band) Hz							
	63	125	250	500	1000	2000	4000	8000
160	-3	-2	0	1	1	-7	-20	-21
200	-5	0	0	0	2	-9	-24	-27
250	-3	0	1	1	2	-9	-21	-20
315	-4	-2	4	2	0	-10	-19	-20
400	0	-2	4	3	0	-12	-20	-19
Size LPA + ALS	Mid-frequency (octave band) Hz							
	63	125	250	500	1000	2000	4000	8000
160	0	6	6	1	-1	-8	-15	-15
200	3	5	5	0	-1	-8	-14	-15
250	1	6	3	0	0	-8	-15	-15
315	0	5	3	2	0	-10	-16	-17
400	3	5	2	2	1	-11	-17	-18
Tol. \pm	2	2	2	2	2	2	2	2

Sound attenuation ΔL (dB)

Table ΔL

Size LPA	Mid-frequency (octave band) Hz							
	63	125	250	500	1000	2000	4000	8000
160	19	14	9	4	3	5	5	4
200	19	14	8	3	3	4	5	5
250	16	11	5	4	2	3	4	4
315	14	9	4	2	2	2	3	3
400	13	8	4	1	0	0	0	0
Size LPA + ALS	Mid-frequency (octave band) Hz							
	63	125	250	500	1000	2000	4000	8000
160	19	14	10	17	19	12	10	12
200	16	11	8	16	18	12	11	11
250	13	8	8	16	17	12	12	13
315	11	6	7	19	14	10	10	13
400	10	5	8	14	11	10	11	12
Tol. \pm	2	2	2	2	2	2	2	2

Sound data – LPA – Extract air

Sound power level L_w (dB)

Table K_{OK}

Size LPA	Mid-frequency (octave band) Hz							
	63	125	250	500	1000	2000	4000	8000
160	-4	4	0	-1	1	-5	-14	-18
200	4	8	2	0	0	-5	-14	-18
250	1	3	3	1	0	-4	-13	-17
315	-3	-1	2	2	0	-6	-15	-18
400	2	2	3	3	0	-7	-16	-18
Size LPA + ALS	Mid-frequency (octave band) Hz							
	63	125	250	500	1000	2000	4000	8000
160	-2	9	7	0	-6	-7	-13	-18
200	3	9	7	-1	-5	-7	-13	-15
250	1	12	5	-2	-3	-8	-14	-17
315	4	10	3	-2	-2	-7	-16	-17
400	10	11	5	1	-1	-8	-14	-17
Tol. \pm	2	2	2	2	2	2	2	2

Sound attenuation ΔL (dB)

Table ΔL

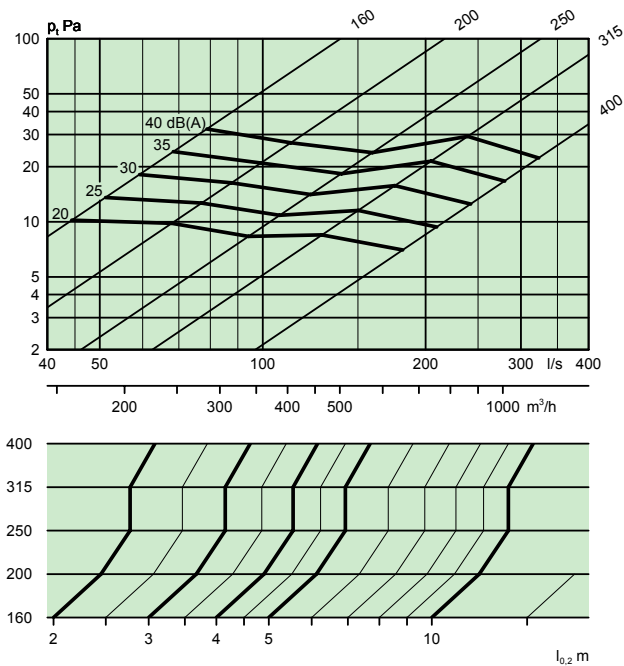
Size LPA	Mid-frequency (octave band) Hz							
	63	125	250	500	1000	2000	4000	8000
160	19	14	9	4	3	5	5	4
200	19	14	8	3	3	4	5	5
250	16	11	5	4	2	3	4	4
315	14	9	4	2	2	2	3	3
400	13	8	4	1	0	0	0	0
Size LPA + ALS	Mid-frequency (octave band) Hz							
	63	125	250	500	1000	2000	4000	8000
160	19	14	10	17	19	12	10	12
200	16	11	8	16	18	12	11	11
250	13	8	8	16	17	12	12	13
315	11	6	7	19	14	10	10	13
400	10	5	8	14	11	10	11	12
Tol. \pm	2	2	2	2	2	2	2	2

Engineering graphs – LPA – Supply air

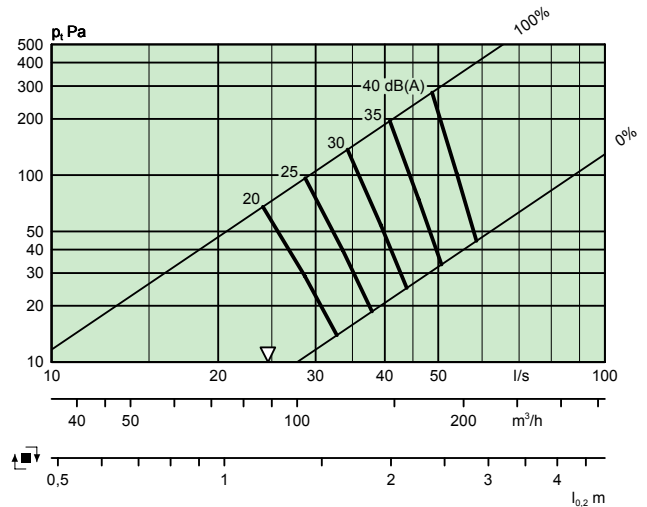
Airflow – Pressure drop – Sound level – Throw

- The graphs display data for LPA recessed into ceiling.
- The graphs should not be used for commissioning.
- Δ = Minimal flow to obtain sufficient commissioning pressure. The dB(A) values are valid for rooms with normal acoustic absorption of 4 dB.
- dB(C) values are normally 6-9 dB higher than dB(A) value.

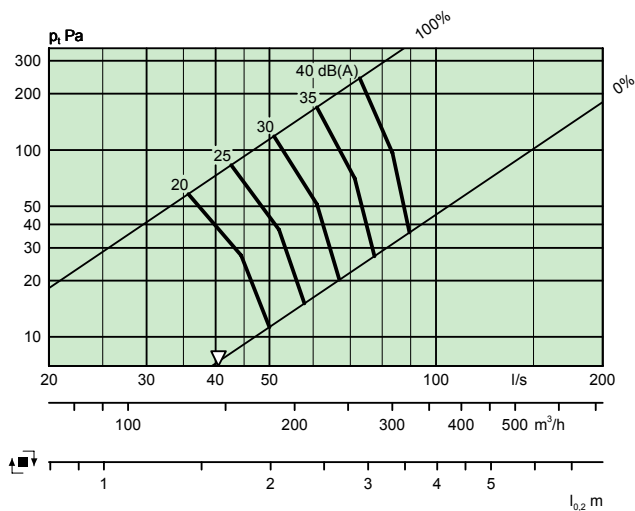
LPA 160, 200, 250, 315, 400 - Supply air



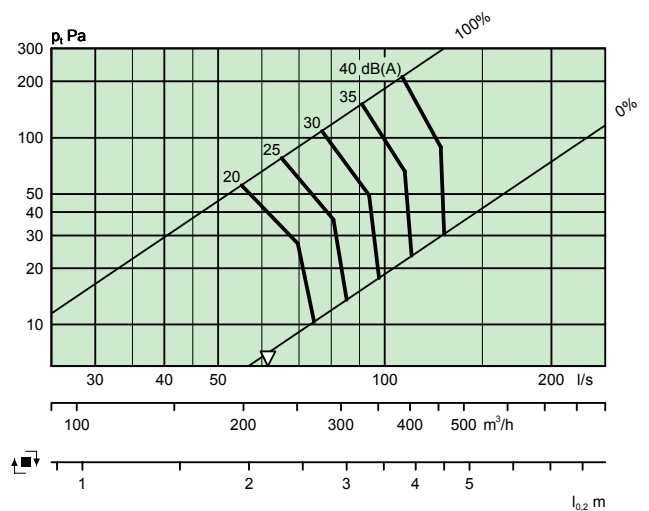
LPA 160 + ALS 125-160, Supply air



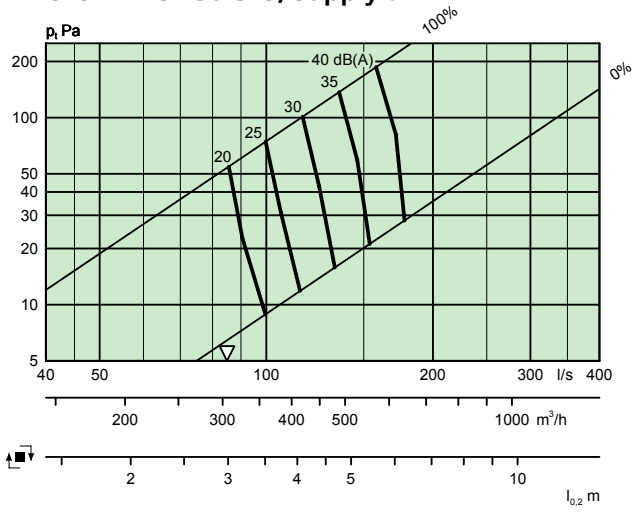
LPA 200 + ALS 160-200, Supply air



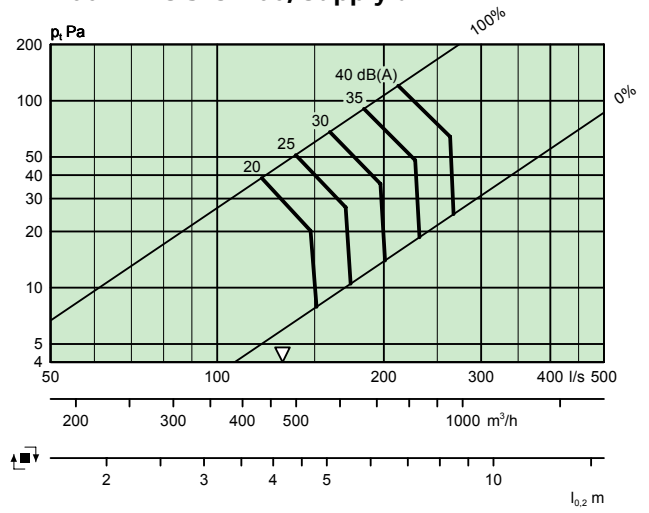
LPA 250 + ALS 200-250, Supply air



LPA 315 + ALS 250-315, Supply air



LPA 400 + ALS 315-400, Supply air

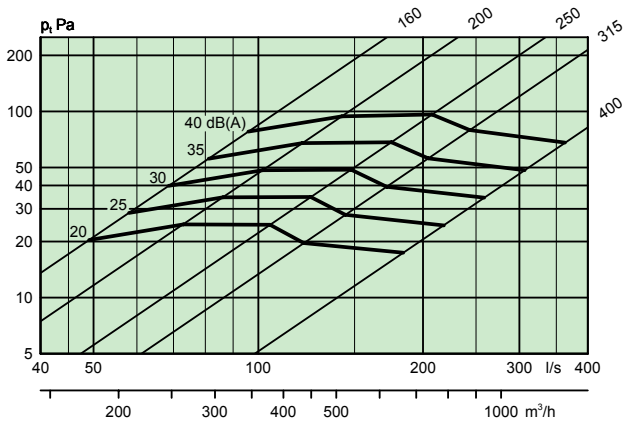


LPA - Extract air

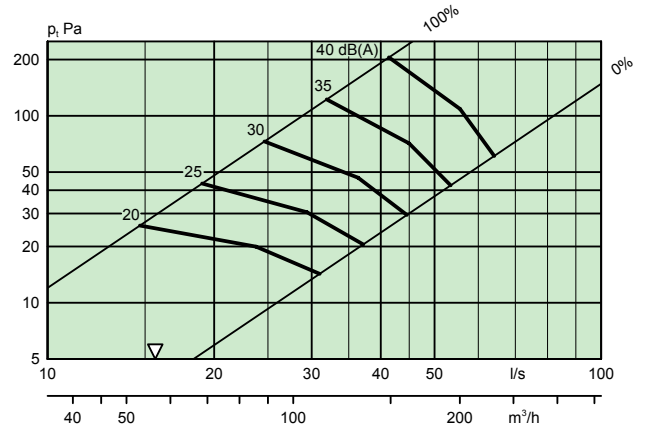
Airflow - Pressure drop - Sound level

- The graphs display data for LPA recessed into ceiling.
- The graphs should not be used for commissioning.
- ∇ = Minimal flow to obtain sufficient commissioning pressure.
- The dB(A) values are valid for rooms with normal acoustic absorption of 4 dB.
- dB(C) values are normally 6-9 dB higher than dB(A) value.

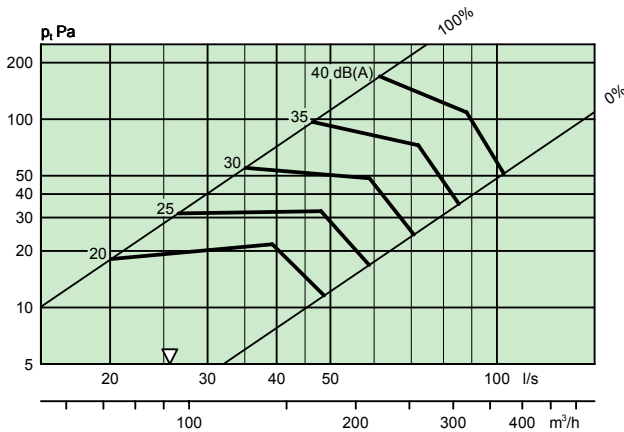
LPA 160, 200, 250, 315, 400 - Extract air



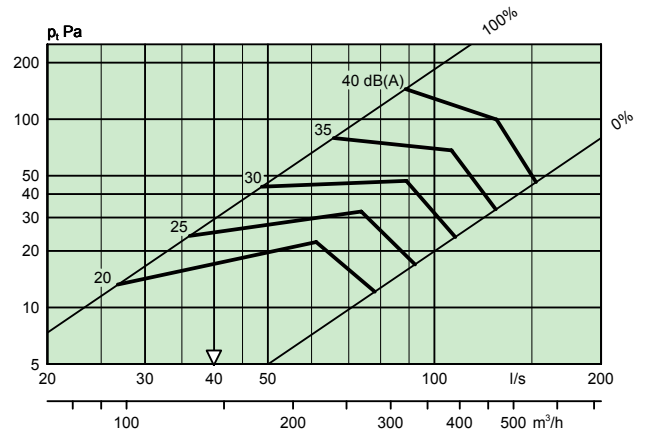
LPA 160 + ALS 125-160, Extract air



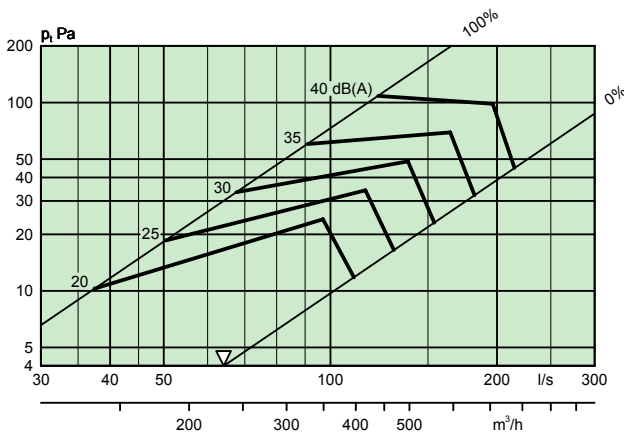
LPA 200 + ALS 160-200, Extract air



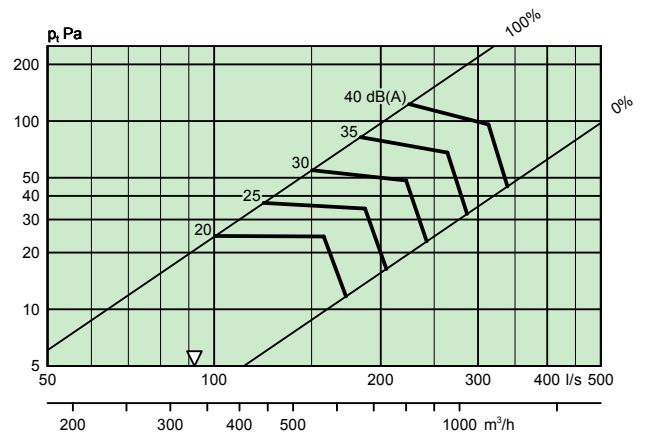
LPA 250 + ALS 200-250, Extract air



LPA 315 + ALS 250-315, Extract air



LPA 400 + ALS 315-400, Extract air



Dimensions and weight

LPA

Size	ØA	B	C	Ød	ØD	E
160	380	342	252	159	124	55
200	456	404	288	199	159	55
250	568	504	332	249	199	55
315	568	622	388	314	249	85
400	700	767	488	399	314	85

Size	F	G	H	ØJ	K	Weight, kg
160	204	170	315	325	80	4.9
200	239	185	375	410	100	6.9
250	279	205	465	510	115	9.6
315	340	260	575	510	140	15.4
400	400	300	722	640	180	22.7

ØJ = Dimension for hole cutting.
CL = Center line

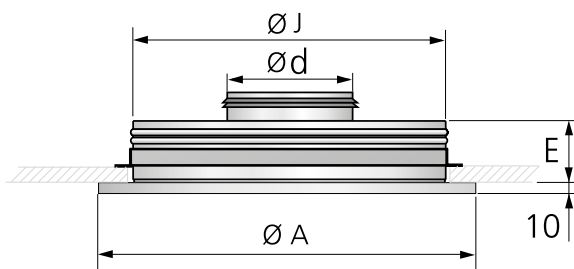
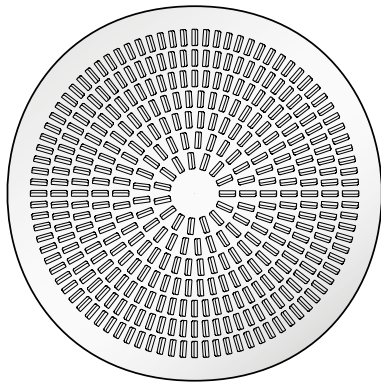


Figure 2. LPA.

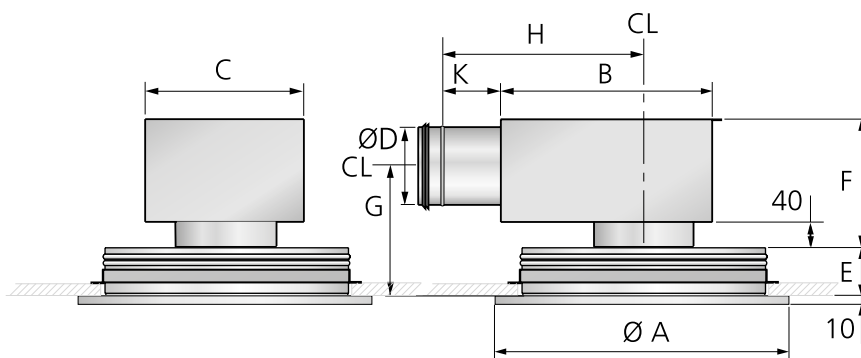


Figure 3. LPA + ALS.

Order key

Product

Circular ceiling diffuser for plasterboard ceilings LPA a -aaa

Version

Nom. connection dimension, mm
160, 200, 250, 315, 400

Accessories

Commissioning box ALS d -aaa - bbb

Version

For LPA	160	ALS	125-160
	200		160-200
	250		200-250
	315		250-315
	400		315-400

Specification example

Swegons perforated circular ceiling diffuser of the type LPA with the commissioning box ALS containing the following functions:

- LOCKZONE guide vane perforation
- Removable commissioning damper with lockable controls
- Measurement function with low method error
- Internal acoustic lining with reinforced surface layer
- Powder painted in white, RAL 9003/NCS S 0500-N

Size: LPAa 200 xx items

Accessory: ALSd 160-200 xx items