

EAGLE Free

Circular ceiling diffuser with nozzles for suspended installation



QUICK FACTS

- Rotatable nozzles
- 100% flexible distribution pattern
- Provision for vertical air diffusion
- Swirl function
- Substantial induction capacity
- Designed for installation in rooms without suspended ceiling
- Easy access
- Can be supplied in a galvanized design
- Standard colour White RAL 9003
 - 5 alternative standard colours
 - Other colours upon request

AIR FLOW - SOUND PRESSURE ROOM (Lp10A) *)						
EAGLE F Size	25 dB(A)		30 dB(A)		35 dB(A)	
	l/s	m³/h	l/s	m³/h	l/s	m³/h
100	30	108	37	133	44	158
125	52	187	63	227	76	274
160	82	295	98	353	120	432
200	126	454	150	540	179	644
250	158	569	189	680	225	810
315	210	756	249	896	294	1058
400	252	907	300	1080	355	1278

Data presented for an open damper. The product's full working area in terms of pressure, flow and sound are evident from the sizing diagrams.

**) Lp10A = Sound pressure incl. A-filter with 4 dB room attenuation and 10 m² room absorption area.*

Technical description

Version

The supply air diffuser consists of a circular commissioning box and a removable diffuser face. The commissioning box contains a removable commissioning damper, fixed measurement tapping and sound absorbent insulation covered by a reinforced surface layer, rated to Fire resistance class B-s1,d0 conforming to EN ISO 11925-2. The diffuser face is equipped with aerodynamic, rotatable nozzles.

Materials and surface treatment

The diffuser face is made of sheet steel. The commissioning box is made of galvanized sheet steel. The diffuser is finished, internally and externally.

- 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.

The nozzles are made of plastic (PP-polypropylene).

Adaptation

Besides the standard sizes, the air diffusers can be ordered with adapted dimensions, alternative number of nozzles, special nozzle pattern, etc. EAGLE Free is also available in a galvanized version. For further particulars, get in touch with your nearest Swegon representative.

Project planning

The nozzles are rotatable through 360°. This makes it possible to achieve an infinite number of horizontal or vertical air diffusion combinations without altering the air flow, sound level or pressure drop. The measurement method for EAGLE Free is in accordance with the differential pressure method of measurement in the inlet air branch. This requires a length of straight duct upstream of the ceiling diffuser's measurement unit, as in table 1, so as not to exceed the specified measurement inaccuracy.

The measurement tapping for supply air is located in the duct connection of the air diffuser whereas the measurement tapping for extract air is located inside the commissioning box.

Installation

The air diffuser is normally suspended from the ceiling. An M8 pop nut, i.e. a threaded grommet that facilitates installation, is in the centre of the top of the air diffuser. On the size 315 and 400 air diffusers, there are two M8 pop nuts for more stable mounting, see figure 1.



Refer to the separate Installation-Commissioning-Maintenance document for detailed installation instructions.

Commissioning

Commissioning should be carried out with the wall diffuser face mounted. Pull the measuring tubes and damper adjustment cords out of the air diffuser through the nozzles. The rated coefficient of performance (K-factor) is specified on the identification label of the product and in the relevant commissioning instructions at www.swegon.com.

Maintenance

- Clean the air diffuser if needed with lukewarm water and dishwashing detergent added.
- The duct system can be accessed and lightly pulling the spring-loaded diffuser front downwards and then tilting, see figure 2.
- Dismantle the perforated air distribution plate located on the inlet as shown in figure 3.
- Loosen the damper in the inlet from its bayonet fastening by rotating to the side.

Environment

The Building Materials Declaration is available from www.swegon.com.

Table 1.

Type of obstruction upstream of EAGLE F	Length of straight duct upstream of the EAGLE F	
	$m_2 = 5\%$	$m_2 = 10\%$
One 90° bend.	3 x Ød	2 x Ød
Two 90° bends in the same plane	4 x Ød	2 x Ød
Two 90° bends in alignment at right angles to one another.	4 x Ød	2 x Ød
One 45° damper	6 x Ød	3 x Ød
One T-piece	4 x Ød	3 x Ød

m_2 = Error of method according to NVG's Report T32:1982

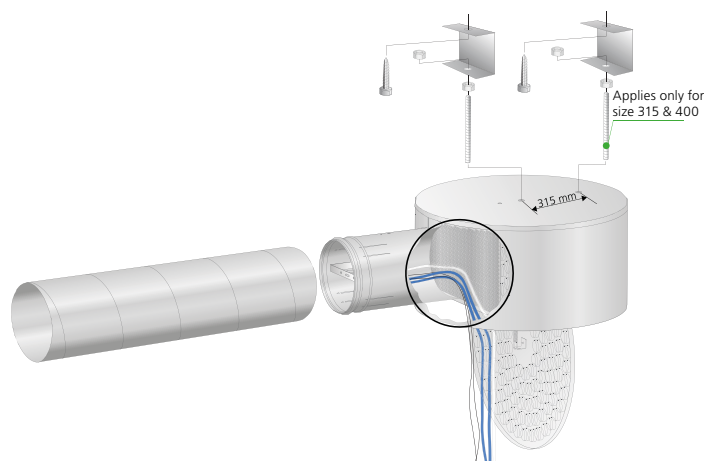


Figure 1a. Installation.

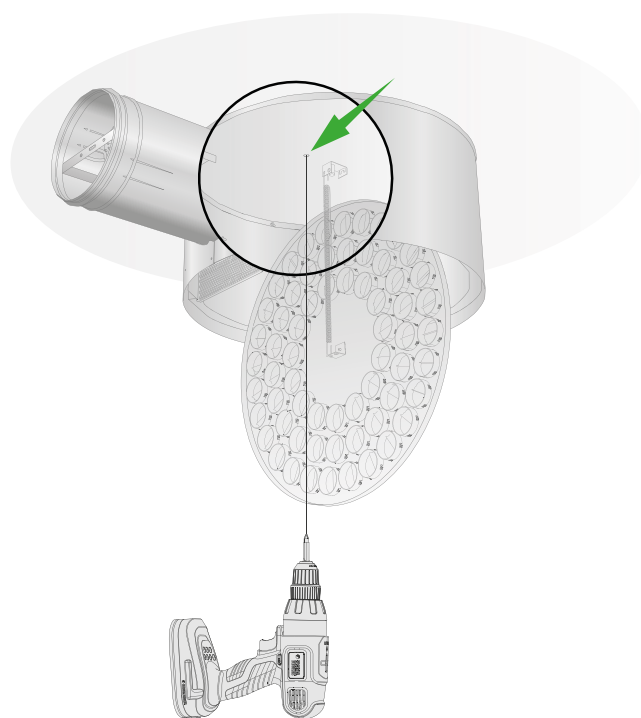


Figure 1b. Alternative installation.

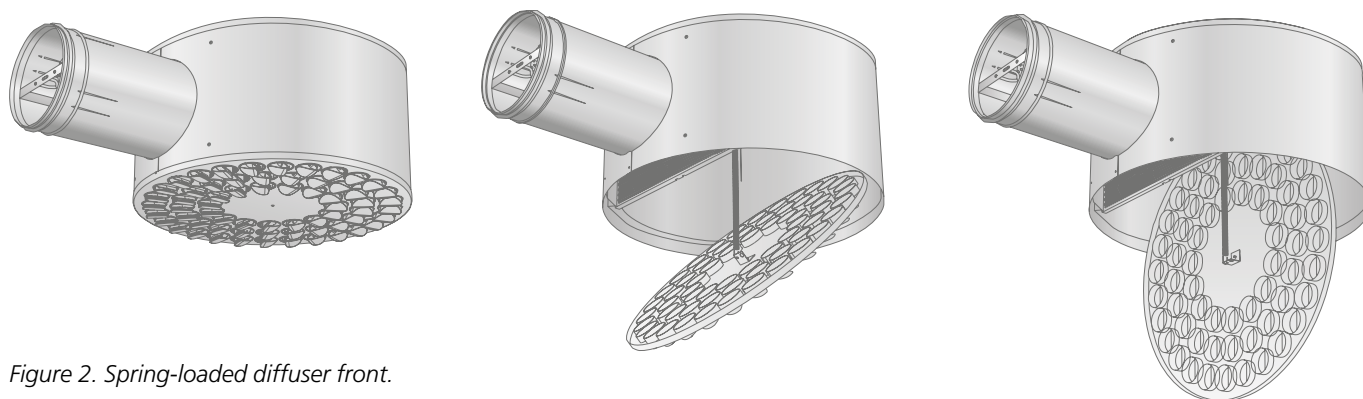


Figure 2. Spring-loaded diffuser front.

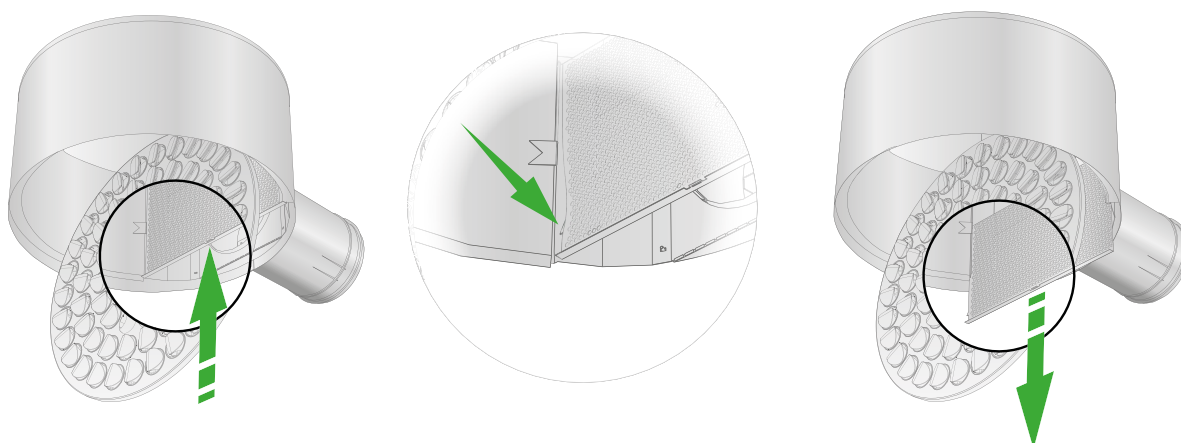


Figure 3. Dismantling of the perforated air distribution plate.

Sizing

- The sound level dB(A) applies to rooms with 10 m² equivalent sound absorption area.
- The throw $l_{0.2}$ is measured under isothermal discharge conditions.
- A max. permissible temperature below room temperature of 14 K is recommended when setting the nozzles for clockwise swirling air discharge (standard).
- To calculate the air stream diffusion, air velocities in the occupied zone or sound levels in rooms with other dimensions, please refer to our calculation software available on www.swegon.com.

Acoustic data

EAGLE F – Supply air

Sound power level L_w (dB)

Table K_{OK}

EAGLE F	Mid-frequency (octave band) Hz							
Size	63	125	250	500	1000	2000	4000	8000
100	-12	8	9	-3	-4	-5	-13	-21
125	-9	8	9	-2	-5	-4	-12	-21
160	-7	8	8	-2	-3	-5	-13	-21
200	-5	10	6	-1	-3	-5	-13	-20
250	-3	11	5	-2	-2	-6	-15	-21
315	0	11	5	0	-3	-8	-15	-21
400	4	12	5	2	-2	-9	-18	-26
Tol. ±	2	2	2	2	2	2	2	2

Sound attenuation ΔL (dB)

Table ΔL

EAGLE F	Mid-frequency (Octave band) Hz							
Size	63	125	250	500	1000	2000	4000	8000
100	27	16	12	13	14	11	9	13
125	25	14	10	14	12	9	8	12
160	21	13	11	12	10	8	9	11
200	18	12	11	11	8	7	8	12
250	18	10	10	10	6	6	9	11
315	15	7	7	8	6	6	8	11
400	14	6	6	8	5	5	7	10
Tol. ±	2	2	2	2	2	2	2	2

EAGLE F – Extract air

Sound power level L_w (dB)

Table K_{OK}

EAGLE F	Mid-frequency (octave band) Hz							
Size	63	125	250	500	1000	2000	4000	8000
100	-13	9	9	-4	-6	-7	-14	-21
125	-10	8	9	-2	-7	-4	-11	-20
160	-12	8	6	-2	-4	-4	-10	-20
200	-6	9	3	-3	-2	-3	-13	-21
250	-6	9	2	-3	-1	-4	-13	-22
315	-3	8	1	-2	-1	-4	-10	-21
400	-1	7	1	0	-2	-4	-10	-24
Tol. ±	2	2	2	2	2	2	2	2

Sound attenuation ΔL (dB)

Table ΔL

EAGLE F	Mid-frequency (Octave band) Hz							
Size	63	125	250	500	1000	2000	4000	8000
100	27	16	12	13	14	11	9	13
125	25	14	10	14	12	9	8	12
160	21	13	11	12	10	8	9	11
200	18	12	11	11	8	7	8	12
250	18	10	10	10	6	6	9	11
315	15	7	7	8	6	6	8	11
400	14	6	6	8	5	5	7	10
Tol. ±	2	2	2	2	2	2	2	2

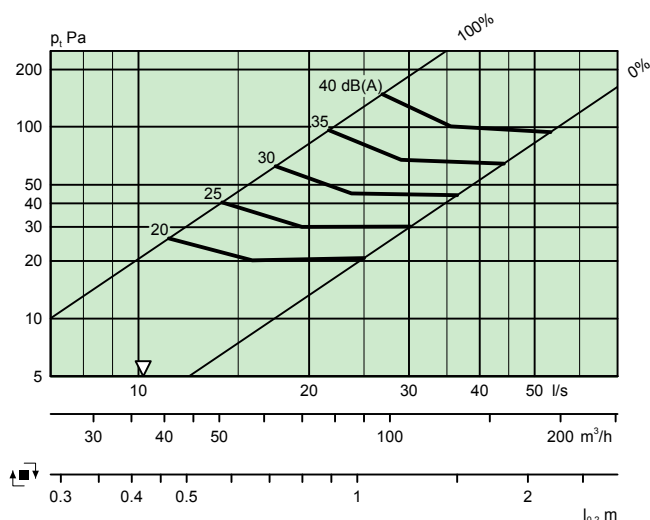
Sizing diagram

EAGLE F – Supply air

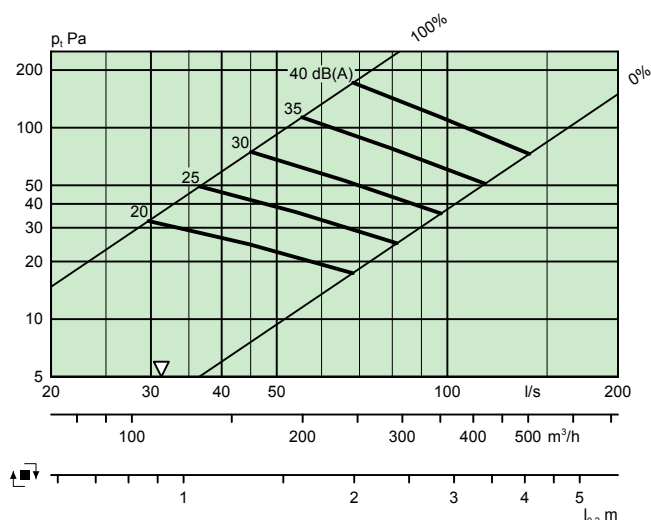
Air flow - Pressure drop - Sound level – Throw length

- The throw $l_{0.2}$ is measured under isothermal discharge conditions.
- A max. permissible temperature below room temperature of 14 K is recommended when setting the nozzles for clockwise swirling air discharge (standard).
- To calculate the air stream diffusion, air velocities in the occupied zone or sound levels in rooms with other dimensions, please refer to our calculation software available on www.swegon.com.
- The diagrams should not be used for commissioning.
- ∇ = Min. flow required for obtaining sufficient commissioning pressure.
- The dB(A) values apply to rooms with normal acoustic absorption, 4 dB room attenuation/10 m² equivalent room absorption area.
- The dB(C) value is normally 6-9 dB higher than the dB(A) value.
- For data regarding vertical distribution pattern, please refer to our calculation software available on www.swegon.com.
- For particulars of the throws, see Table 2: Factors for alternative nozzle settings.

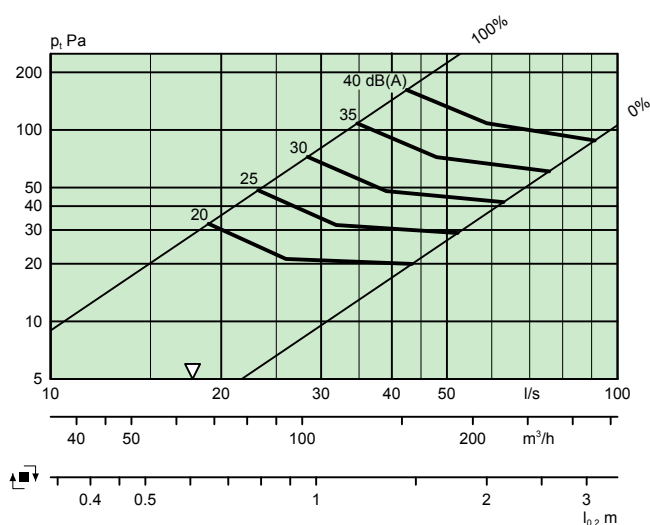
EAGLE F 100



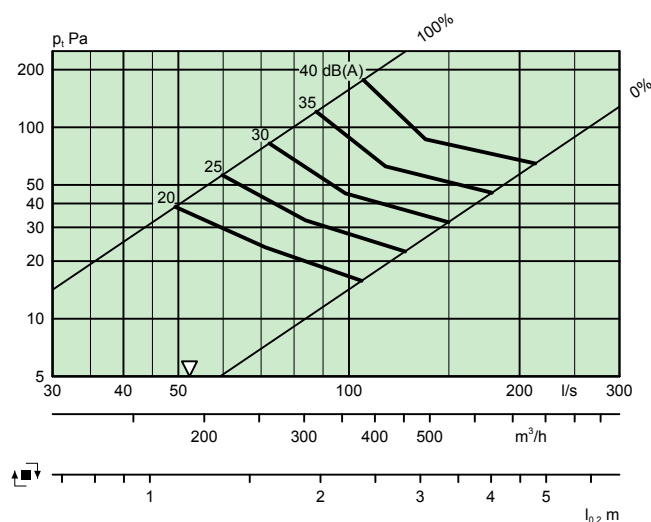
EAGLE F 160



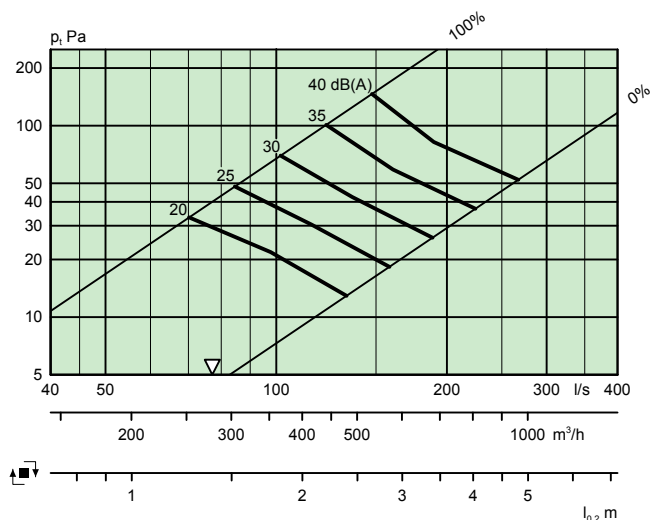
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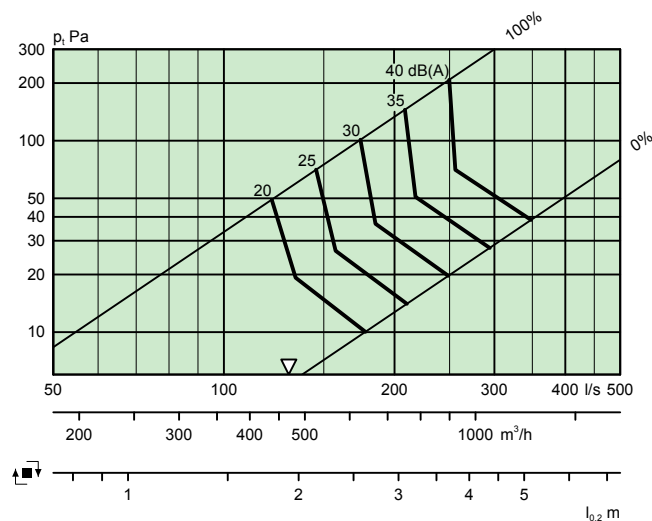
EAGLE F 200



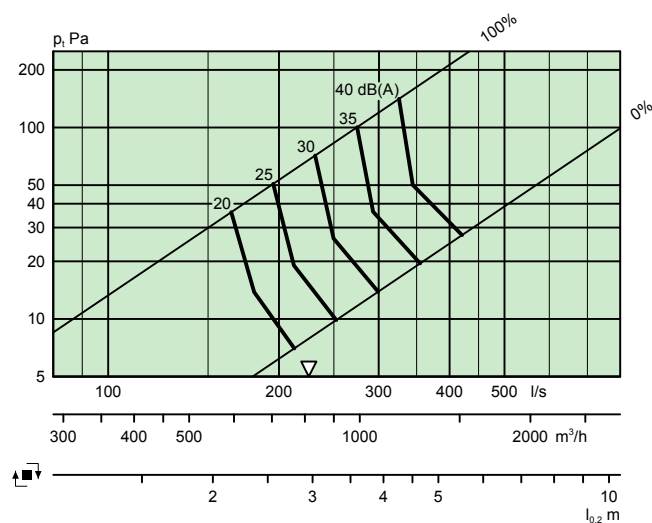
EAGLE F 250



EAGLE F 315



EAGLE F 400



Throw lengths

The throw $l_{0.2}$ is specified in the sizing graphs for standard nozzle settings, clockwise swirling air discharge. If a different setting is desirable, Table 2 can be used. See also figure 3, Nozzle settings, under Dimensions and Weights.

Table 2. Factors for alternative nozzle settings

4-way	3-way	2-way	1-way
1,5	2.1	2,5	3.8

Example:

According to the graph, the EAGLE F 250 has a throw of $l_{0.2} = 2.3$ m.

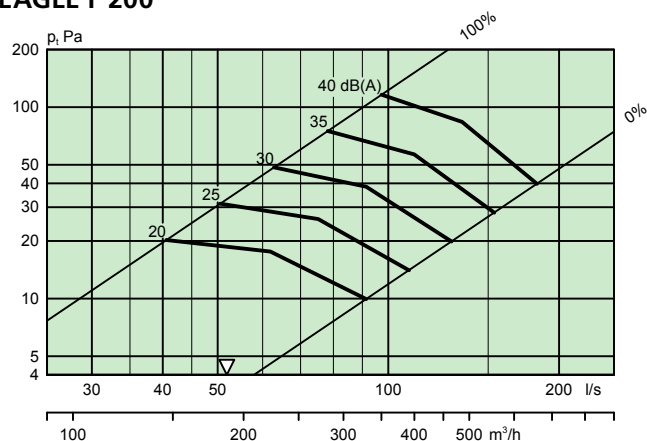
For 2-way air diffusion $l_{0.2} = 2.3 \times 2.5 = 5.75$ m.

EAGLE F – Extract air

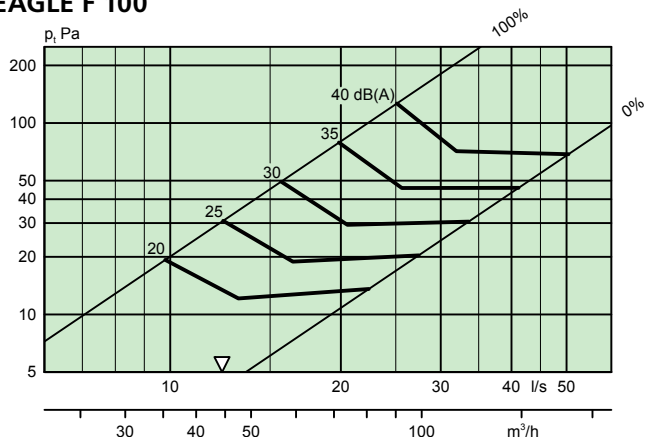
Air flow – Pressure drop – Sound level

- The diagrams should not be used for commissioning.
- ∇ = Min. flow required for obtaining sufficient commissioning pressure.
- The dB(A) values apply to rooms with normal acoustic absorption, 4 dB room attenuation/10 m² equivalent room absorption area.
- The dB(C) value is normally 6-9 dB higher than the dB(A) value.

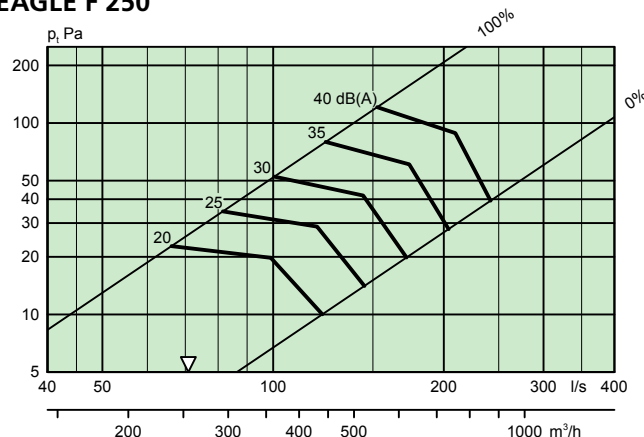
EAGLE F 200



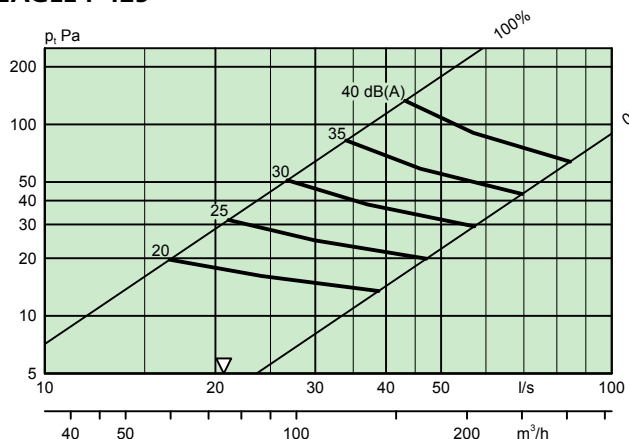
EAGLE F 100



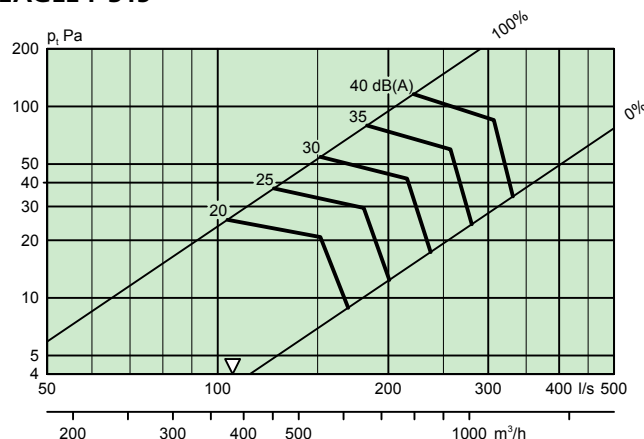
EAGLE F 250



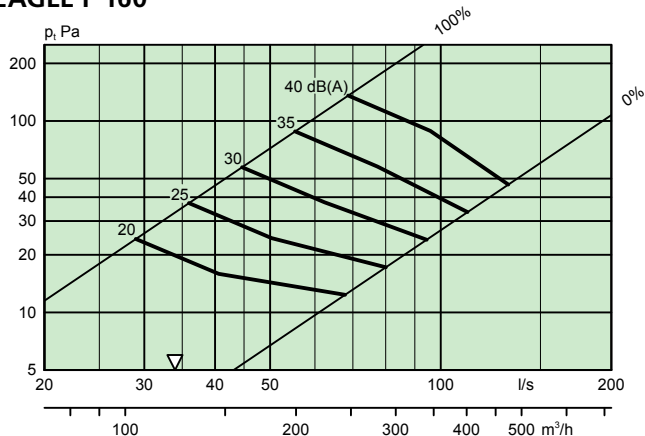
EAGLE F 125



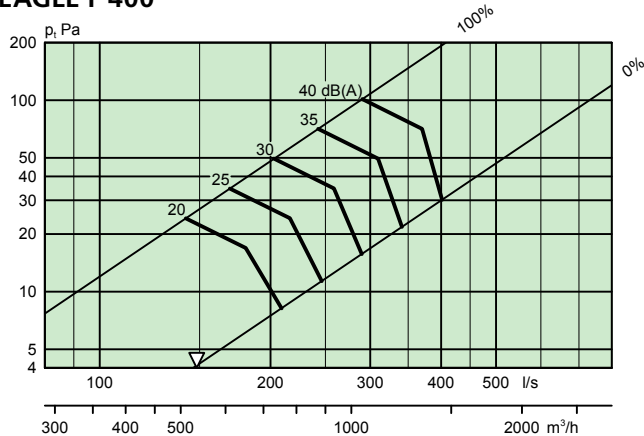
EAGLE F 315



EAGLE F 160



EAGLE F 400



Dimensions and weights Specification

Size	A	B	C	D	E	Number of nozzles	Weight, kg
100	304	192	118	99	96	19	2.8
125	380	217	210	124	108	31	4.1
160	456	252	220	159	126	42	5,7
200	568	288	230	199	144	64	8.3
250	568	338	275	249	169	72	9.2
315	700	388	330	314	194	98	13.6
400	700	488	350	399	244	115	16.1

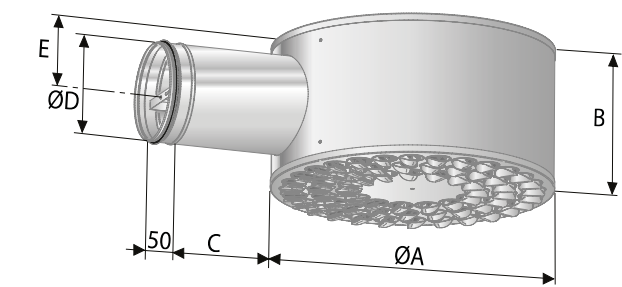


Figure 4. EAGLE F.

Nozzle setting, example

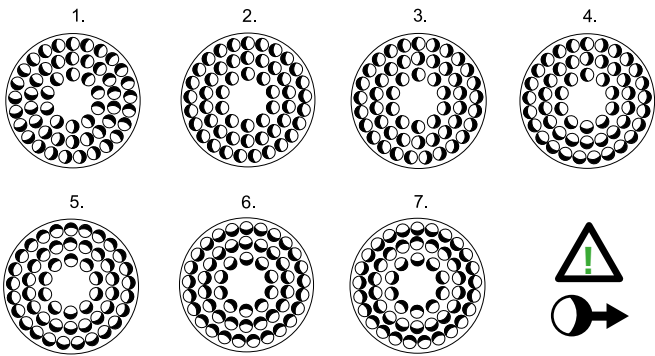


Figure 5. Nozzle settings.
NOTE: Air flow direction in figure
1. Clockwise swirl (standard)
2. 1-way
3. 2-way
4. 3-way
5. 4-way
6. V1, Vertical Concentrated
7. V2, Vertical, diffused

Product

Circular ceiling diffuser with nozzles EAGLE F f -aaa
Version
Nom. connection dimension, mm:

Standard range
Size: 100
125
160
200
250
315
400

Specification text

Swegon's complete circular type EAGLE Free Ceiling nozzle diffuser for visible installation in ceilings with the following functions:

- Complete round painted unit.
- 100% flexible distribution pattern
- Individually adjustable nozzles
- Removable commissioning damper with lockable setting
- Measurement function with low error of method
- Interior sound-absorbing lining with fibre-migration-proof surface layer
- Cleanable
- Powder-painted and baked white finish, RAL 9003/NCS S 0500-N

Size: EAGLE Ff -aaa xx items