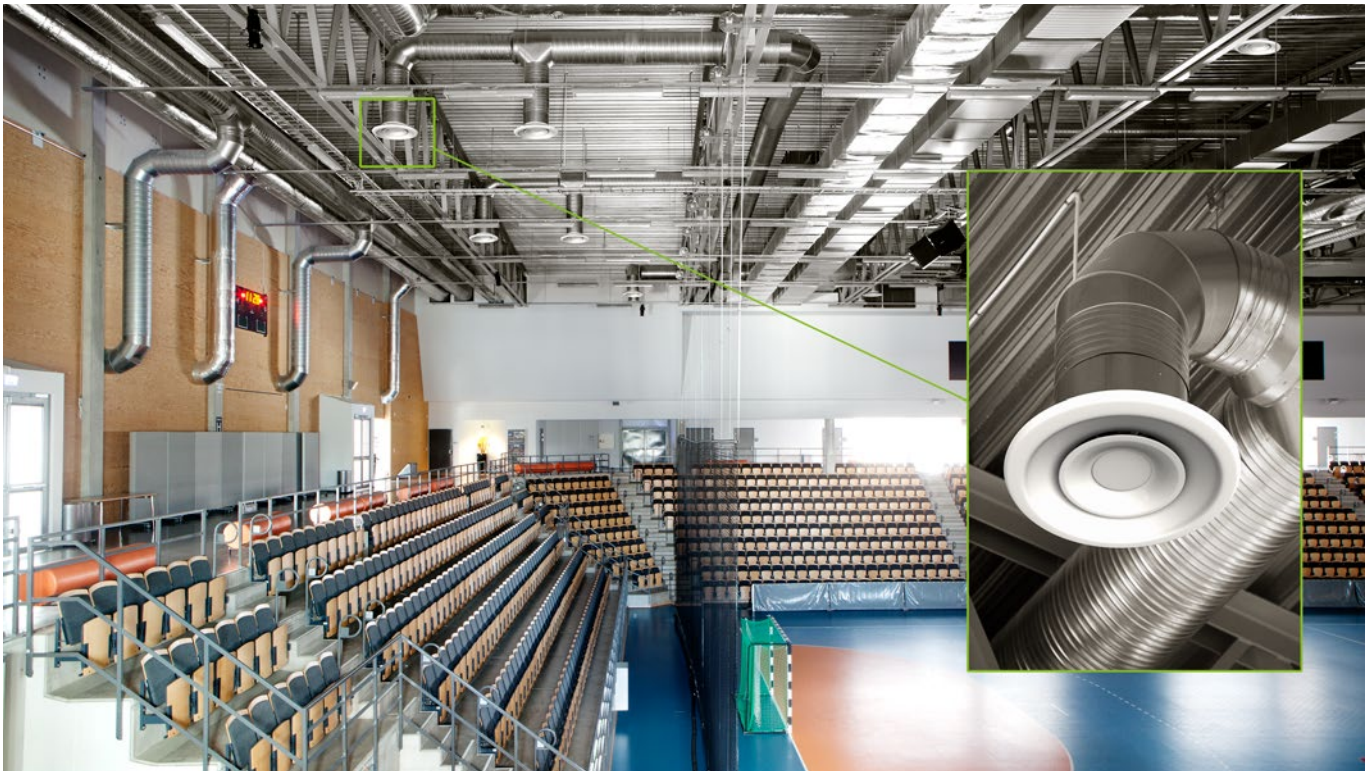


FALCON Ceiling

Circular ceiling air diffuser for supply air



QUICK FACTS

- Manages large supply airflows
- Horizontal or vertical distribution pattern
- Provision for motorised adjustment of the distribution pattern
- Suitable for airborne heating
- Can be used with the ALS commissioning box
- Cleanable
- Standard colour White RAL 9003
 - 5 alternative standard colours
 - Other colours upon request

AIR FLOW - SOUND PRESSURE ROOM (Lp10A) *)							
FALCON Ceiling		25 dB(A)		30 dB(A)		35 dB(A)	
Size		l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h
125		48	173	57	205	68	245
160		70	252	83	299	99	356
200		112	403	132	475	156	562
250		170	612	202	727	240	864
315		265	954	312	1123	370	1332
400		431	1552	505	1818	590	2124
500		631	2272	743	2675	875	3150
FALCON Ceiling	ALS Size	25 dB(A)		30 dB(A)		35 dB(A)	
Size		l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h
125	100-125	24	86	34	122	44	158
160	125-160	34	122	46	166	66	237
200	160-200	54	194	68	245	95	342
250	200-250	82	295	105	378	155	558
315	250-315	125	450	150	540	210	756
400	315-400	200	720	245	882	325	1170
500	400-500	310	1116	375	1350	450	1620

The data for the FALCON C + commissioning box combination is specified for 90 Pa total pressure and for a horizontal distribution pattern.

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

Contents

Technical description	3
Design	3
Materials and finish.....	3
Accessories	3
Project design	3
Installation.....	3
Commissioning with the ALS commissioning box.....	3
Maintenance.....	3
Sizing	4
Motor Properties.....	4
FALCON C + ALS – Horizontal.....	5
Air diffuser only – Vertical.....	6
FALCON C + ALS – Vertical	6
FALCON C and FALCON C + ALS – Supply air.....	7
FALCON C with ALS – Supply air – Horizontal distribution pattern	8
Air diffuser with commissioning box	8
FALCON C with ALS – Vertical distribution pattern....	9
Air diffuser with commissioning box	9
Dimensions and weights.....	11
Ordering key	12
Specification text.....	12

Technical description

Design

The FALCON C consists of two parts: an outer cone with rubber ring sealed-fitted spigot connection on the sizes up to and including size 400 as well as an aerodynamically designed outlet cone. The inner cone is height-adjustable and removable.

The inner cone can be set to a new position by hand or its setting can be changed by a motor. The FALCON C with electric motor is available in sizes 315, 400 and 500. The motor-actuated model has a longer spigot connection. See the dimension table and Figure 6.

Materials and finish

The entire air diffuser is made of sheet steel and its interior and exterior surfaces are painted.

- 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. Made of galvanised sheet steel. The 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. Tightness class C on the housing according to SS-EN 12237.

Controller for resetting motor-actuated air diffusers:

VHC. The controller resets motor-actuated (24 V) air diffusers, which are designed for supply air below room temperature and above room temperature. The controlling parameter is the temperature difference between the supply air and the room air. See separate product datasheet for the VHC at www.swegon.com.

Project design

For airborne heating systems, the distribution pattern should be calculated according to computer-calculated values. Use our ProAir air diffuser selection computer program that is available at www.swegon.com.

The air diffuser is available as from size 315 and upward with motorised actuation of the cone position in order to via thermostat, or other external switch, control from horizontal to vertical air diffusion or vice versa.

Installation

Secure the inlet spigot to the connecting duct using blind rivets. If an ALS commissioning box is used, the sleeve coupling between the ALS and the FALCON C can be lengthened using an ordinary circular duct of up to 500 mm without having to lengthen the measuring tubes and damper adjustment cords. See Figure 1.



Commissioning with the ALS commissioning box

Commissioning should be carried out with the diffuser face mounted. Pull the measuring tubes and damper adjustment cords out of the air diffuser through the gap.

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 (COP) is specified on the product's identification label. K-factors can also be found in the relevant commissioning instructions at www.swegon.com.

Maintenance

Clean the air diffuser if needed with lukewarm water and dish-washing detergent added.

The duct system is accessible without the need for tools. The cone package can be dismantled by screwing out the plastic screws on the inner side of the outer cone. If an ALS commissioning box is used, move the air distribution plate out of the way and turn the damper unit out of its holder with a simple twist of the hand.

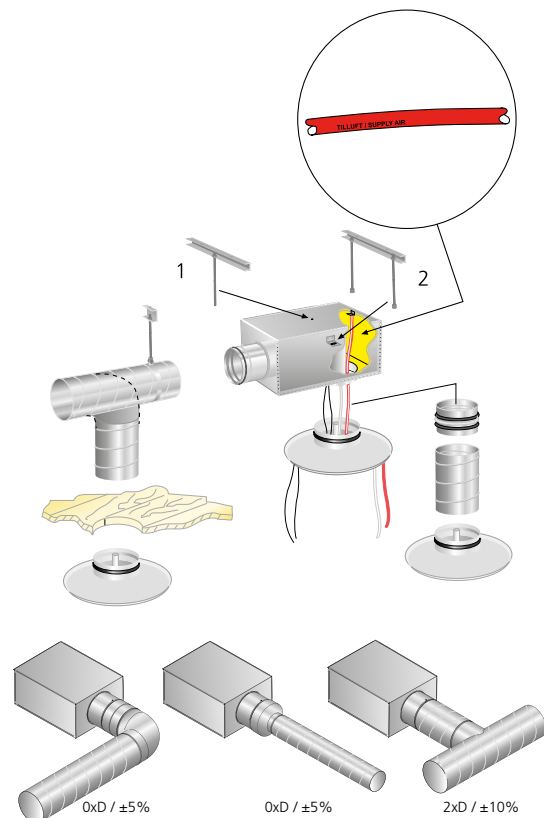


Figure 1. Installation. Commissioning.

Wiring diagram

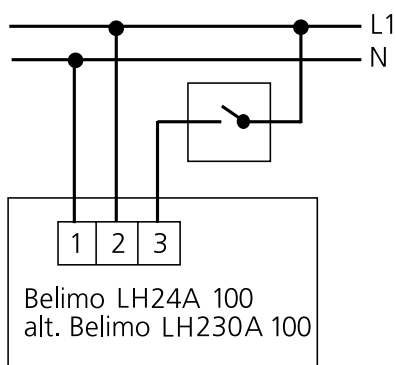


Figure 2. Wiring diagram for the FALCON C with motor – 2-point motor positioning control. The switch is not included.

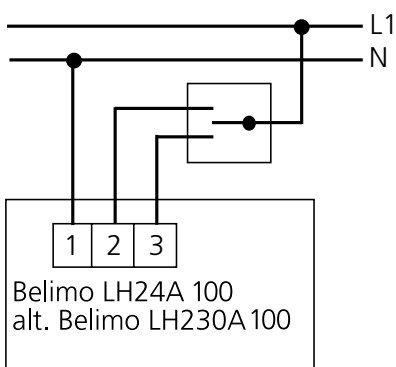


Figure 3. Wiring diagram for the FALCON C with motor – 3-point motor positioning control. The switch is not included.

Motor Properties

Motor	Supply voltage	Power consumption	Delay time
LH24A 100 ^{*)}	24 V AC 50/60 Hz	3 VA	150 s
LH230A 100 ^{**)}	230 V AC 50/60 Hz	5 VA	150 s

^{*)} Standard, stocked motor, can be connected to VHC controller.
^{**)} Non-stocked motor.

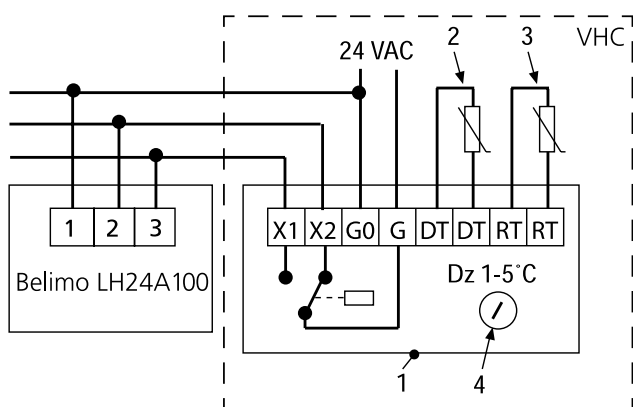


Figure 4. The wiring diagram shows the connections with the Belimo damper motor against the VHC. NOTE! Only available with 24 V AC power supply.

Key to Figure 4.

- 1 = VHC controller
- 2 = Duct temperature sensor (DT)
- 3 = Room temperature sensor (RT)
- 4 = Setting the switch-over temperature

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 length 1_{0.2} is measured under isothermal discharge conditions.
- The recommended max. permissible temperature below room temperature is 10 K.
- The horizontal distribution pattern is specified with the inner cone package set to its lower position. See the dimension drawing.
- The vertical distribution pattern is specified with the inner cone package set to its upper position. See the dimension drawing.

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

Acoustic data

FALCON C – Supply air

Air diffuser only – Horizontal

Sound power level, L_w (dB)

Table K_{OK}

Size	Mid-frequency (Octave band) Hz								
	FALCON C	63	125	250	500	1000	2000	4000	8000
125		5	11	8	0	-5	-11	-21	-27
160		3	12	7	1	-4	-8	-14	-23
200		6	13	7	1	-4	-8	-15	-22
250		9	13	6	1	-2	-9	-19	-27
315		12	16	9	0	-3	-11	-17	-25
400		14	12	8	1	-3	-10	-14	-22
500		15	12	7	1	-2	-8	-15	-23
Tol. ±		2	2	2	2	2	2	2	2

Sound attenuation ΔL (dB)

Table ΔL

Size	Mid-frequency (Octave band) Hz								
	FALCON C	63	125	250	500	1000	2000	4000	8000
125		21	16	12	7	2	0	0	0
160		18	14	10	5	1	0	0	0
200		17	13	9	4	0	0	0	0
250		18	11	7	3	0	0	0	0
315		20	10	6	2	0	0	0	0
400		19	9	5	1	0	0	0	0
500		12	7	3	1	0	0	0	0
Tol. ±		2	2	2	2	2	2	2	2

FALCON C + ALS – Horizontal

Sound power level, L_w (dB)

Table K_{OK}

Size	Mid-frequency (Octave band) Hz								
	FALCON C	63	125	250	500	1000	2000	4000	8000
125		3	10	7	-1	-2	-7	-13	-18
160		9	9	8	-2	-4	-6	-13	-18
200		7	11	8	-2	-4	-7	-13	-18
250		4	11	6	-2	-3	-7	-13	-16
315		6	11	5	-2	-1	-7	-13	-18
400		8	11	4	0	-2	-6	-12	-19
500		9	11	3	1	-1	-8	-14	-21
Tol. ±		2	2	2	2	2	2	2	2

Sound attenuation ΔL (dB)

Table ΔL

Size	Mid-frequency (Octave band) Hz								
	FALCON C	63	125	250	500	1000	2000	4000	8000
125		21	16	9	17	23	16	11	13
160		22	14	10	17	19	12	10	12
200		17	11	8	16	18	12	11	11
250		14	8	8	16	17	12	12	13
315		13	6	7	19	14	10	10	13
400		13	5	8	14	11	10	11	12
500		8	4	6	12	10	9	10	10
Tol. ±		2	2	2	2	2	2	2	2

Air diffuser only – Vertical

Sound power level, L_w (dB)

Table K_{OK}

Size	Mid-frequency (Octave band) Hz								
	FALCON C	63	125	250	500	1000	2000	4000	8000
125		-2	10	8	0	-6	-7	-15	-25
160		-6	7	7	2	-4	-6	-13	-26
200		-2	10	7	1	-3	-5	-14	-23
250		-2	9	7	1	-2	-7	-17	-28
315		4	13	9	1	-2	-10	-20	-25
400		7	10	8	2	-3	-8	-14	-22
500		9	10	7	1	-2	-7	-15	-24
Tol. \pm		2	2	2	2	2	2	2	2

Sound attenuation ΔL (dB)

Table ΔL

Size	Mid-frequency (Octave band) Hz								
	FALCON C	63	125	250	500	1000	2000	4000	8000
125		21	16	12	7	2	0	0	0
160		18	14	10	5	1	0	0	0
200		17	13	9	4	0	0	0	0
250		18	11	7	3	0	0	0	0
315		20	10	6	2	0	0	0	0
400		19	9	5	1	0	0	0	0
500		12	7	3	1	0	0	0	0
Tol. \pm		2	2	2	2	2	2	2	2

FALCON C + ALS – Vertical

Sound power level, L_w (dB)

Table K_{OK}

Size	Mid-frequency (Octave band) Hz								
	FALCON C	63	125	250	500	1000	2000	4000	8000
125		7	10	10	-2	-5	-8	-14	-18
160		8	11	11	-2	-8	-10	-15	-19
200		6	14	11	-3	-8	-10	-16	-19
250		5	14	10	-3	-7	-10	-18	-19
315		9	14	8	-4	-4	-8	-16	-19
400		11	15	7	-2	-5	-11	-16	-20
500		12	15	7	-1	-3	-11	-18	-25
Tol. \pm		2	2	2	2	2	2	2	2

Sound attenuation ΔL (dB)

Table ΔL

Size	Mid-frequency (Octave band) Hz								
	FALCON C	63	125	250	500	1000	2000	4000	8000
125		21	16	9	17	23	16	11	13
160		22	14	10	17	19	12	10	12
200		17	11	8	16	18	12	11	11
250		14	8	8	16	17	12	12	13
315		13	6	7	19	14	10	10	13
400		13	5	8	14	11	10	11	12
500		8	4	6	12	10	9	10	10
Tol. \pm		2	2	2	2	2	2	2	2

Sizing diagram

FALCON C and FALCON C + ALS – Supply air

Horizontal and vertical distribution pattern

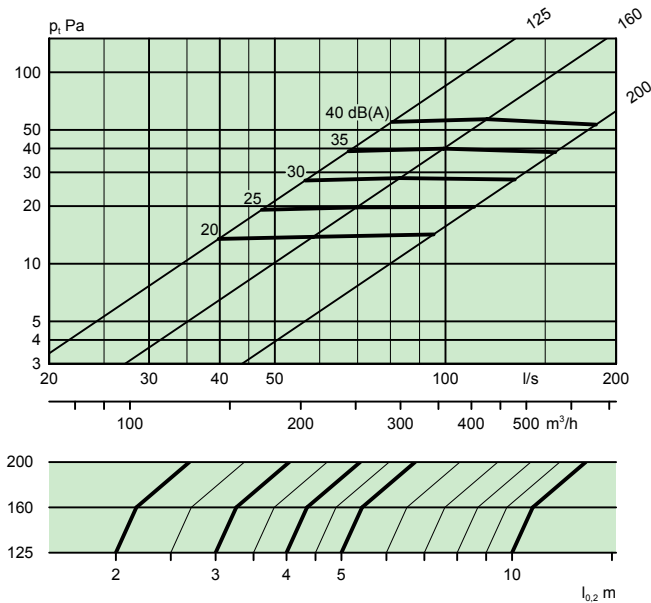
- The throw length $l_{0.2}$ is measured under isothermal discharge conditions.
- The recommended max. permissible temperature below room temperature is 10 K.

FALCON C – Supply air

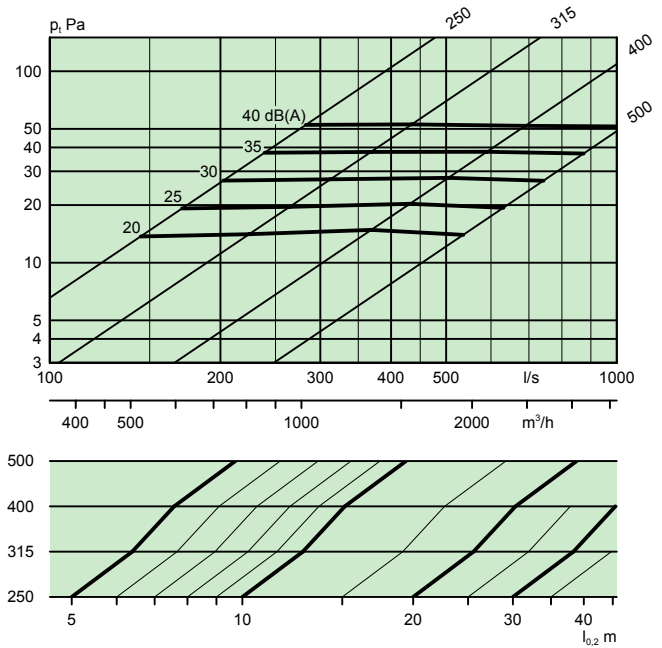
Air diffuser only

Air flow - Pressure drop - Sound level - Throw length

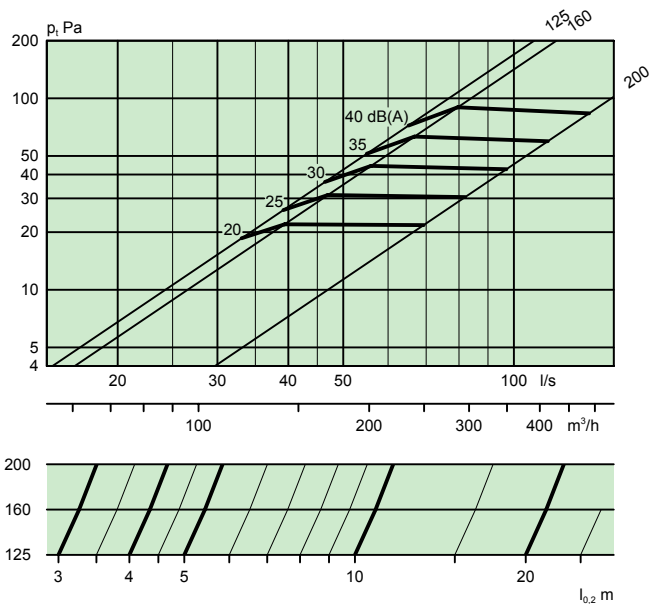
FALCON C 125 – 200 Horizontal



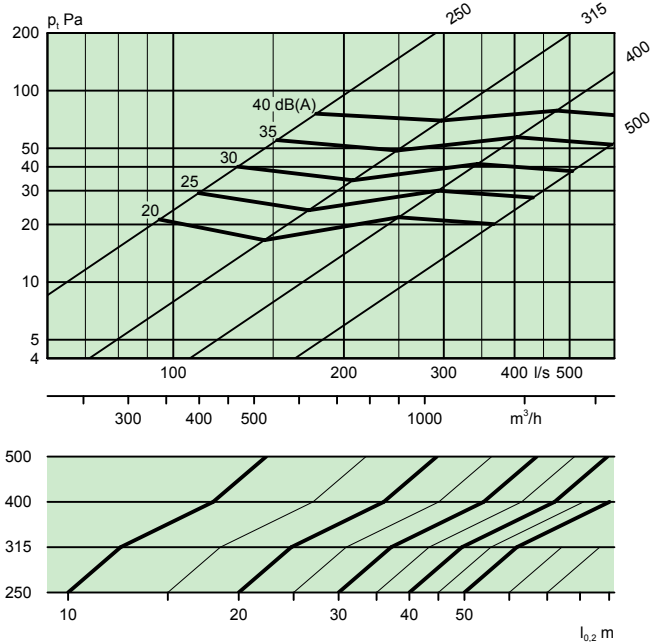
FALCON C 250 – 500 – Horizontal



FALCON C 125 – 200 Vertical



FALCON C 250 – 500 – Vertical



- 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, which is at www.swegon.com.
- The diagrams illustrate data for recessed air diffuser in a ceiling.
- The diagrams should not be used for commissioning.
- 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.

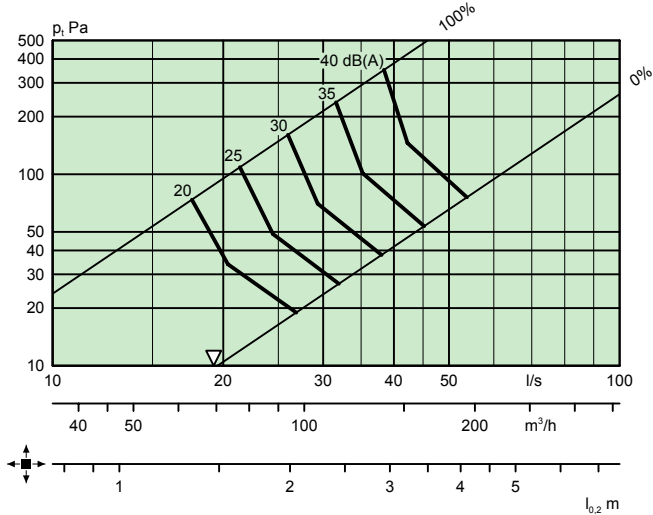
FALCON C with ALS – Supply air – Horizontal distribution pattern

Air diffuser with commissioning box

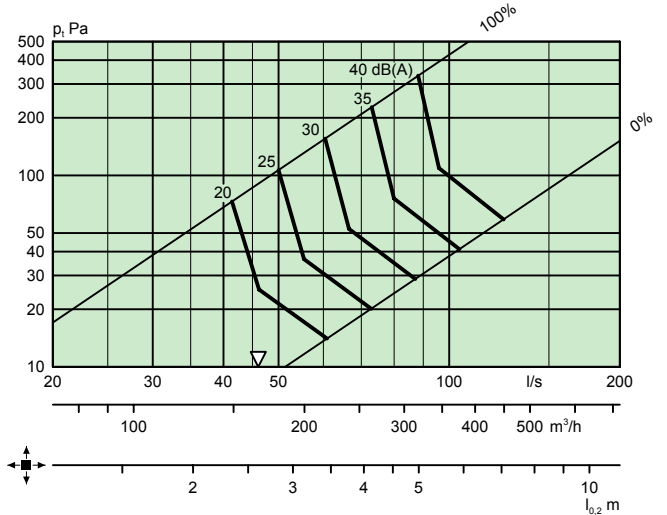
Airflow – Pressure drop – Sound level – Throw length

- ▽ = Min. airflow required for obtaining necessary commissioning pressure.

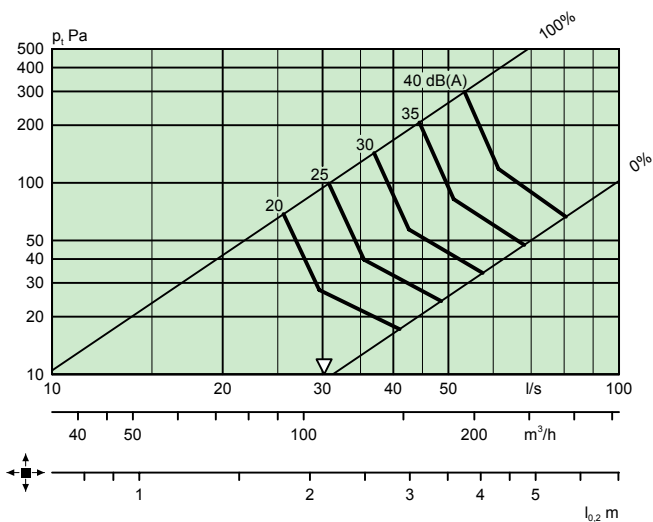
FALCON C 125 + ALS 100-125, Horizontal



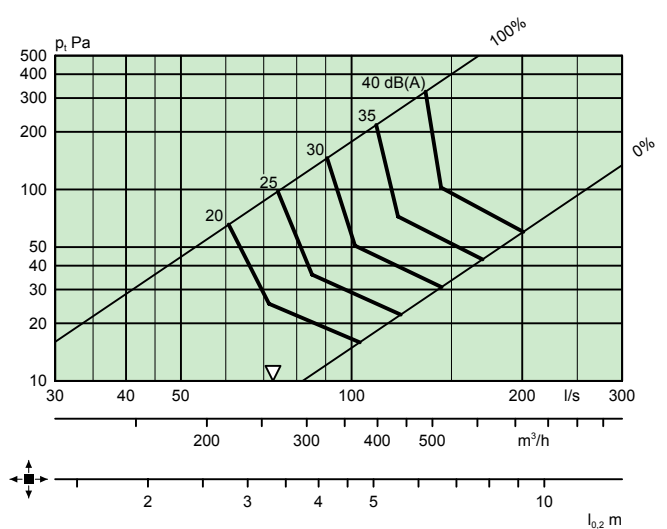
FALCON C 200 + ALS 160-200, Horizontal



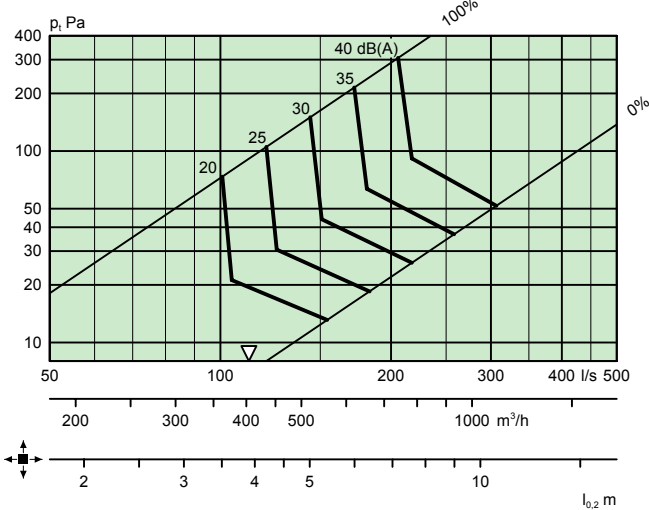
FALCON C 160 + ALS 125-160, Horizontal



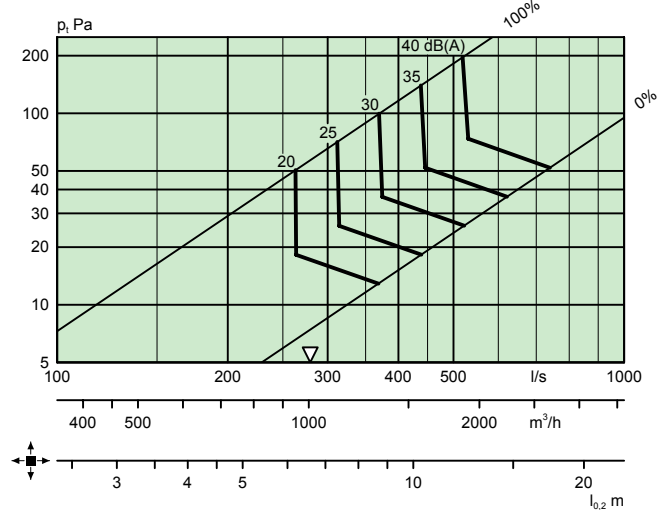
FALCON C 250 + ALS 200-250, Horizontal



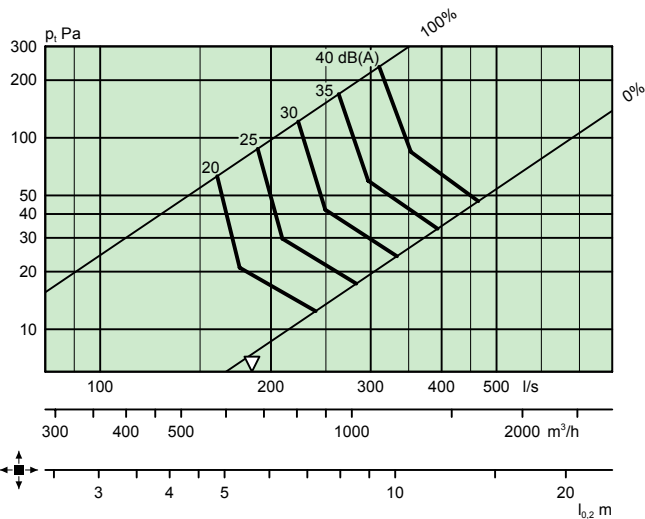
FALCON C 315 + ALS 250-315, Horizontal



FALCON C 500 + ALS 400-500, Horizontal



FALCON C 400 + ALS 315-400, Horizontal



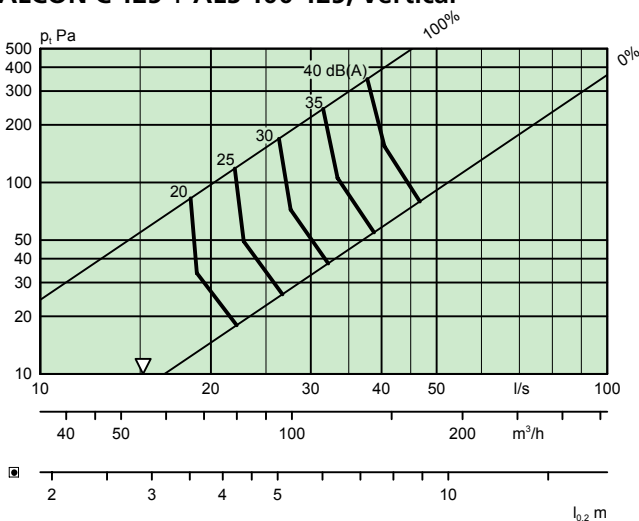
FALCON C with ALS – Vertical distribution pattern

Air diffuser with commissioning box

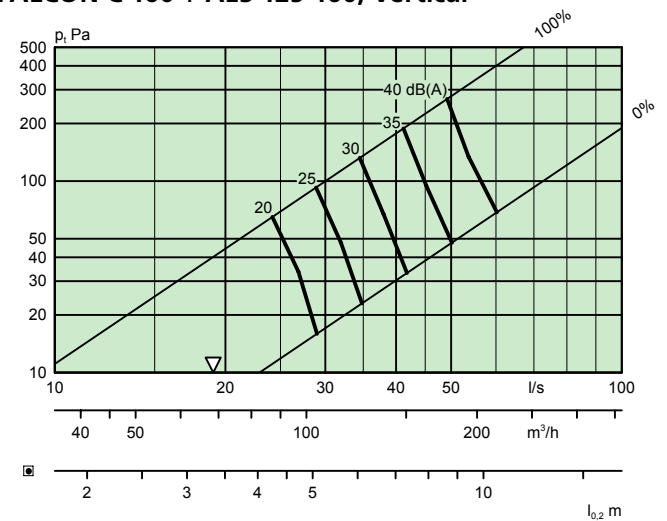
Airflow – Pressure drop – Sound level – Throw length

- ∇ = Min. airflow required for obtaining necessary commissioning pressure.

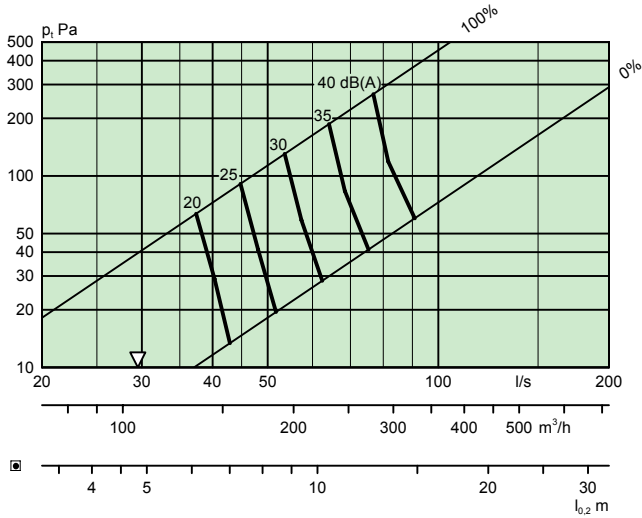
FALCON C 125 + ALS 100-125, Vertical



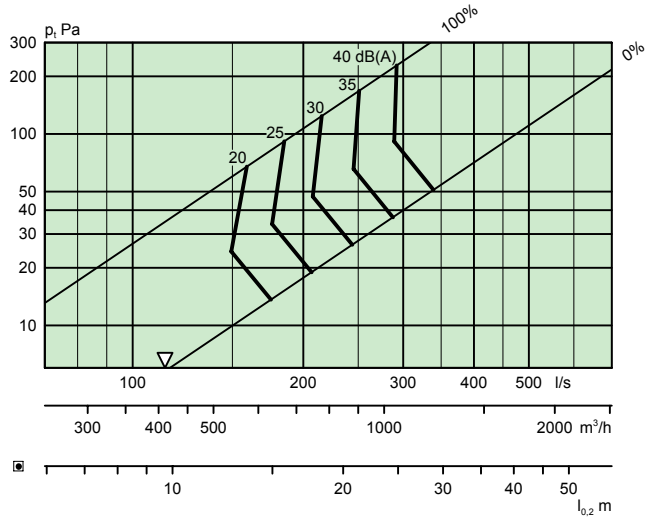
FALCON C 160 + ALS 125-160, Vertical



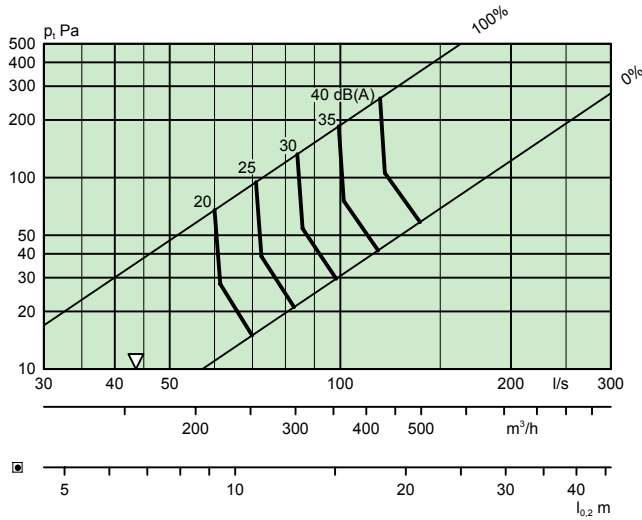
FALCON C 200 + ALS 160-200, Vertical



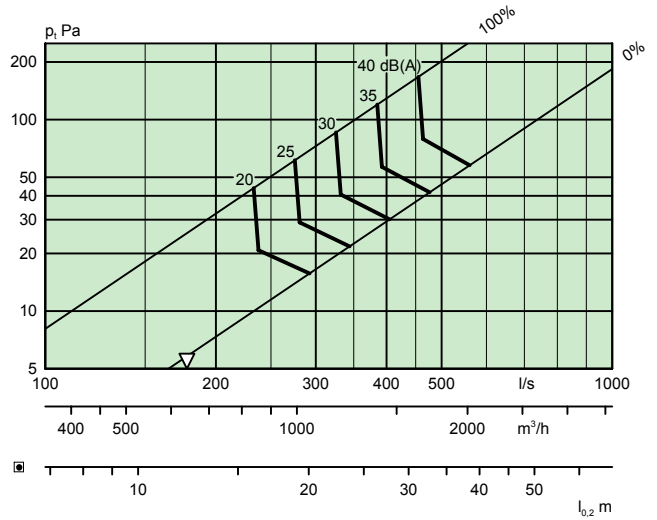
FALCON C 400 + ALS 315-400, Vertical



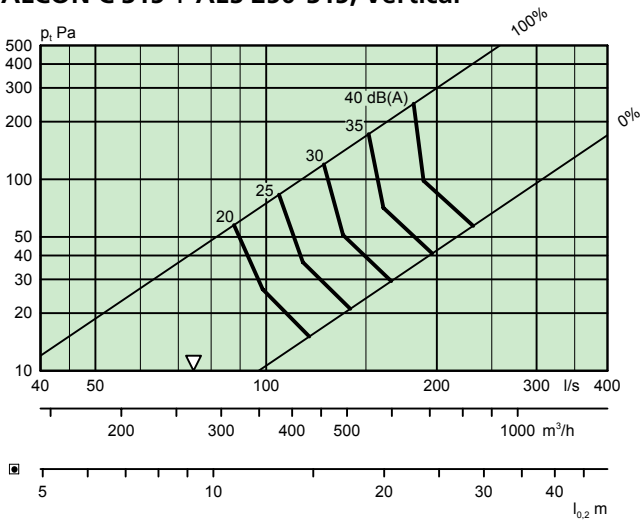
FALCON C 250 + ALS 200-250, Vertical



FALCON C 500 + ALS 400-500, Vertical



FALCON C 315 + ALS 250-315, Vertical



Dimensions and weights

FALCON C

Size	ØA	Ød	ØJ	F	F1	G	H	L	L1	Weight (kg)
125	305	124	270	75	45	9,5	10	–	–	1,0
160	305	159	270	65	45	13	10	–	–	1,0
200	378	199	330	75	45	14	13	–	–	1,5
250	477	249	420	95	45	17	16	–	–	2,2
315	591	314	530	110	45	20	20	325	45	3,4
400	703	399	630	125	45	24	24	330	45	5,1
500	853	499	780	135	45	30	30	340	45	8,0

Size of the opening = ØJ

FALCON C + ALS

Size	ØA	B	C	ØD	E	K	M	N	P	Weight (kg)
125	305	282	217	99	235	80	180	100	270	3,0
160	305	342	252	124	249	80	204	112	315	3,7
200	378	404	288	159	292	100	239	130	375	5,0
250	477	504	332	199	346	115	279	150	465	7,4
315	591	622	388	249	421	140	340	175	575	11,4
400	703	767	488	314	489	175	400	212	712	15,5
500	853	887	588	399	618	195	510	280	795	18,5

CL = Centre line

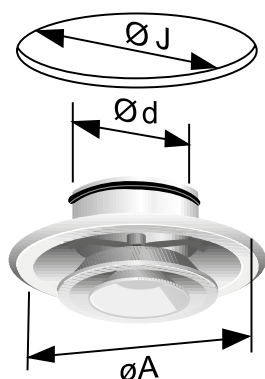


Figure 5. FALCON C, hand-actuated.



Figure 6. FALCON C, motor-actuated.

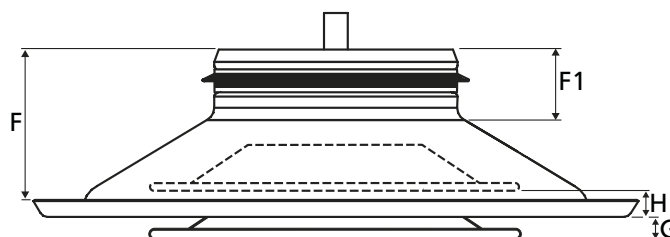


Figure 7. FALCON C, cone positions.

G = Lower position – horizontal diffusion
H = Upper position – vertical diffusion

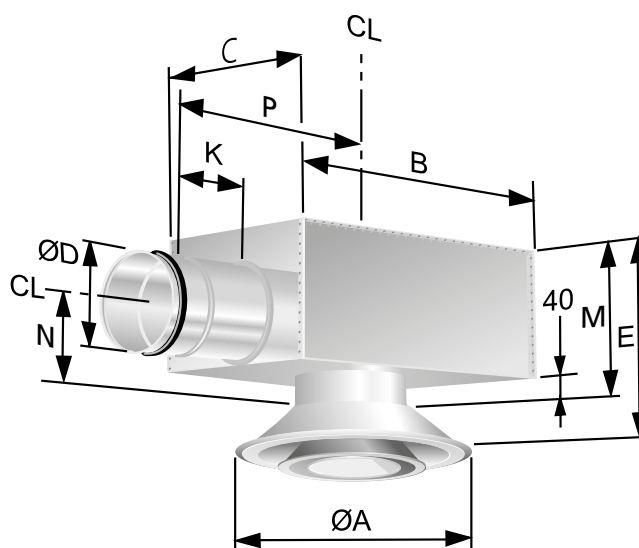


Figure 8. FALCON C + ALS. CL = Centerline

Ordering key

Product

Circular ceiling air diffuser for supply air FALCON C a -a -bbb

Version:

Hand-actuated: 1

Motor-actuated: 2 (315, 400, 500)^{*)}

Size: 125, 160, 200, 250, 315, 400, 500

^{*)} Standard, stocked motor LH24A 100

Accessories

Commissioning box ALS d -aaa – bbb

Version

For FALCON C	125	ALS	100-125
	160		125-160
	200		160-200
	250		200-250
	315		250-315
	400		315-400
	500		400-500

Control unit VHC a

Version

Specification text

Swegons circular type FALCON C multi-cone air diffuser for ceiling mounting with ALS commissioning box, with the following functions:

- Adjustable horizontal/vertical distribution pattern
- White powder paint sprayed and baked finish, RAL 9003/NCS S 0500-N
- Cleanable ALS commissioning box with removable commissioning damper with lockable blade position, measuring method with low systematic error and lined inside with sound absorbing material covered with reinforced surface layer

Size: FALCON Ca a – bbb + ALSd aaa-bbb xx items