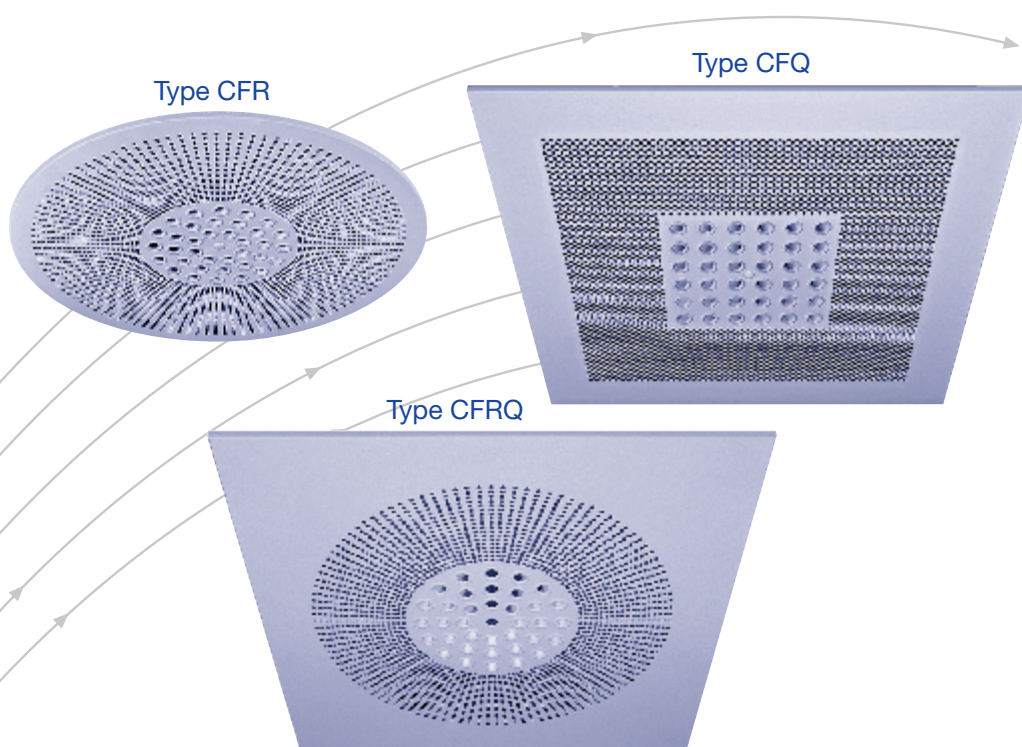


Ceiling air diffuser CENTERFLOW

- Type CF
- square and circular



Int. mod. prot. reg.

TROX[®] TECHNIK



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Contents · Application · Supply air characteristics

Contents

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Application

The ceiling air diffuser CENTERFLOW is not only highly inductive, but also interesting from the energy standpoint. It can be installed in almost any room with a height of 2.4 to 4.4 m, for which a technical impeccable solution and perfect, aesthetic integration are considered important.

The air diffusers can be fitted harmoniously in mineral fibre and/or metal plate ceilings.

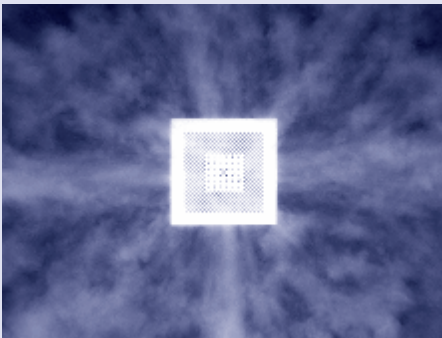
The CENTERFLOW can also be used for visual realisation, i.e. freely suspended.

The following executions are available:

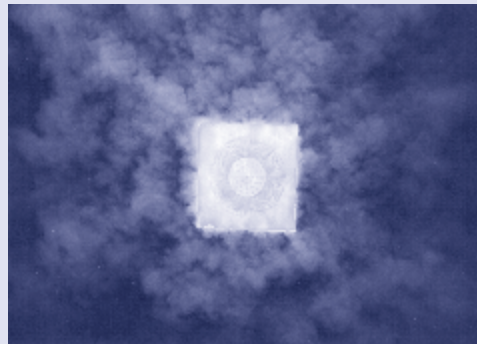
square		type CFQ
circular/square		type CFRQ
circular		type CFR

Supply air characteristics

Type CFQ



Type CFRQ



Position of supply air 6

Without details discharge possibility 6 will be delivered.



Position of supply air 4a

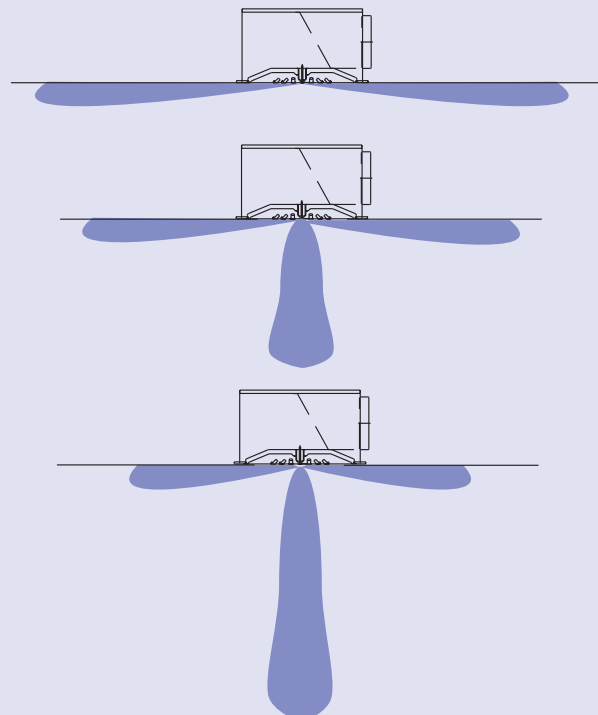
Special adjustment on request



Position of supply air 4b

For room heights >3.5 m.

Special adjustment on request



Realisation Type CFQ et CFRQ

The CENTERFLOW ceiling air diffuser is made of steel plate, powder coated. A series of nozzles in oval form are arranged quadratically or circular in the middle of the plate. The nozzles are surcircled by a strip of perforated plate. Colour RAL 9010, matt, 25% brilliance.

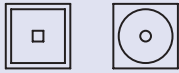
The ceiling air diffusers are designed for supply air in ceilings

with grid dimensions $\square 600$ or $\square 625$ mm and can be combined with a plenum box. Informations about the plenum box see page 4.

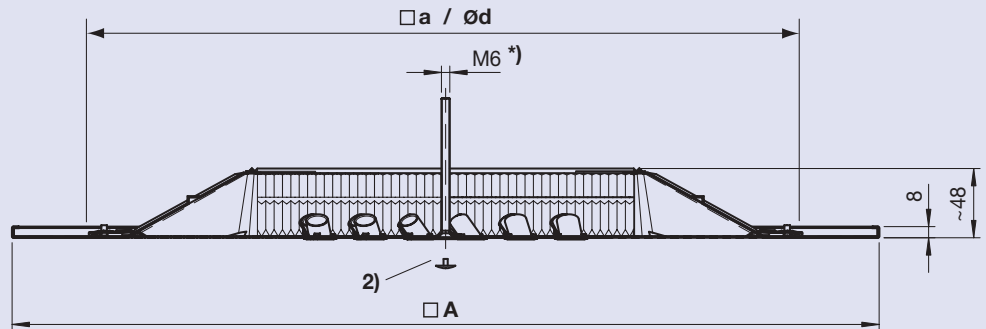
Remark

The CENTERFLOW replaces a ceiling plate.

Dimensions



- 2) Plastic plug
- *) Central screw M6×100 mm and plastic plug are delivered as loose part



Type	ND	$\square A$ [mm]	$\square a$ [mm]	$\varnothing d$ [mm]	Grid dimension [mm]	Number of nozzles in oval form
 CFQ	598×500	598	465	-	600×600	36
	623×500	623	465	-	625×625	
 CFRQ	598×500	598	-	520	600×600	36
	623×500	623	-	520	625×625	

Realisation Type CFR

The CENTERFLOW ceiling air diffuser is made of steel plate, powder coated. A series of nozzles in oval form are arranged quadratically or circular in the middle of the plate. The nozzles are surcircled by a strip of perforated plate. Colour RAL 9010, matt, 25% brilliance.

The **square** standard plenum box is made of galvanised steel

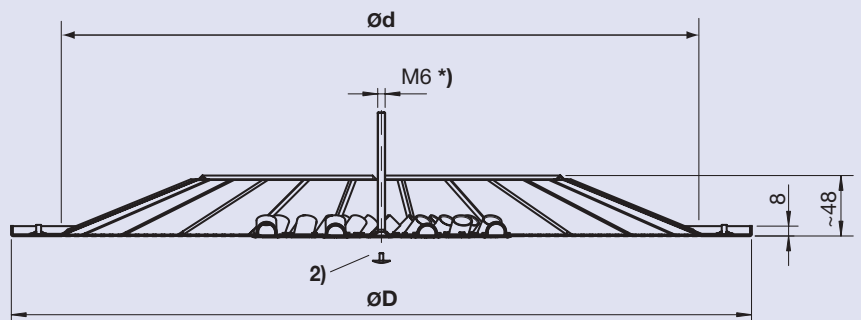
plate and designed also for use with CENTERFLOW type CFR. It needs a panel of a false ceiling with a circular recess of $D - 25$ mm. (Installation example see page 5.)


The **square** standard plenum box with a **circular** adapter is necessary for the **visual realisation**, i.e. freely suspended. Informations about the plenum box see page 5.

Dimensions



- 2) Plastic plug
- *) Central screw M6×100 mm and plastic plug are delivered as loose part

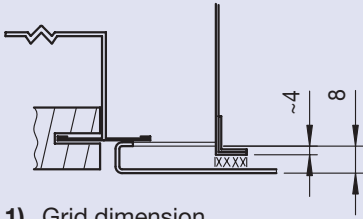
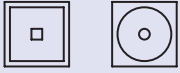


Type	ND	$\varnothing D$ [mm]	$\varnothing d$ [mm]	Number of nozzles in oval form
 CFR	600×500	600	520	36

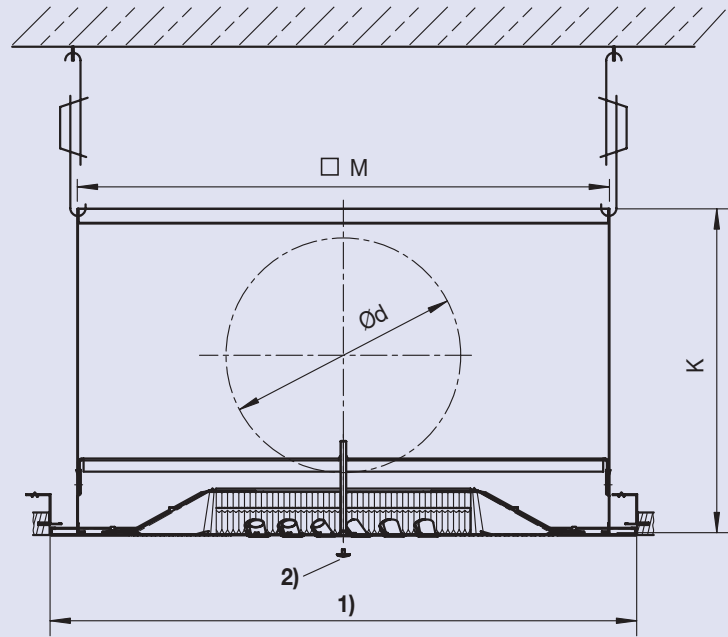
Installation

Type CFQ / CFRQ

For grid dimension □ 600 or □ 625 mm
pressed onto ceiling profile **from below**
 with **square** plenum box.

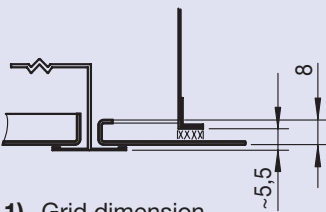
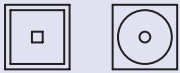


- 1) Grid dimension
- 2) Plastic plug

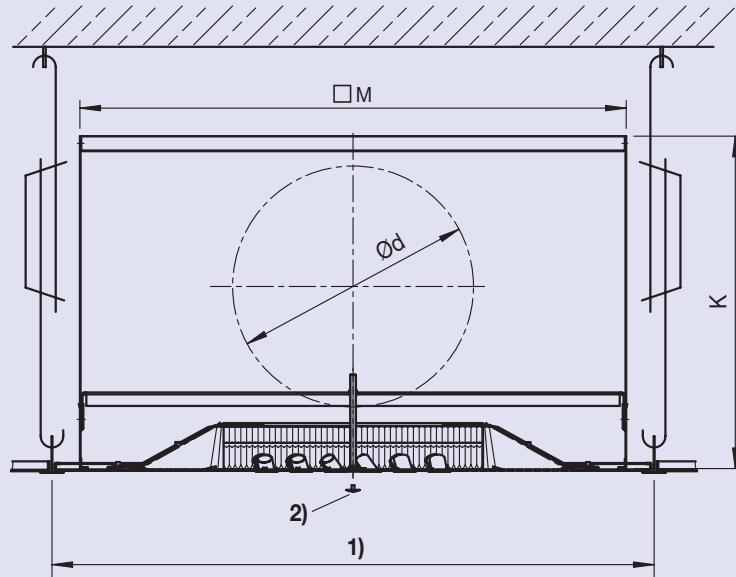


Type CFQ / CFRQ

For grid dimension □ 600 or □ 625 mm
inserted in ceiling profile **from above**
 with **square** plenum box.



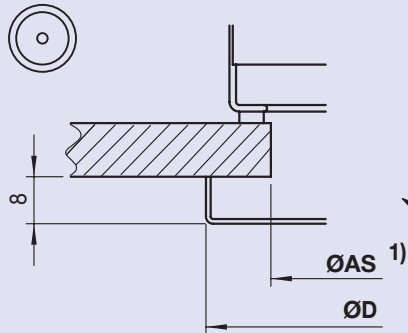
- 1) Grid dimension
- 2) Plastic plug



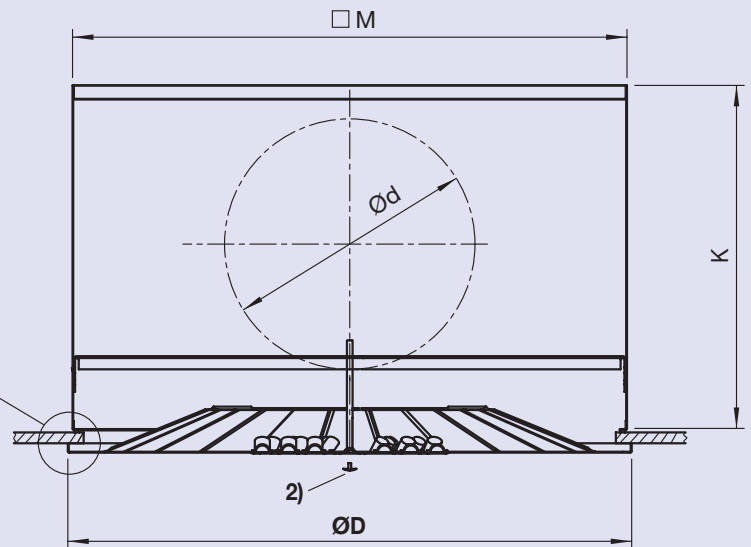
Type	ND	Grid dimension [mm]	Plenum box Details see prospect L-04-1-31e (TROX HESCO) or 2/16.4/... (TROX)			
			K	□ M	Ød	Type
CFQ	598×500	600×600	345	567	1×248	AKH04 ZL M0 (TROX HESCO) AK004 ZL M0 (TROX)
	623×500	625×625				
CFRQ	598×500	600×600				
	623×500	625×625				


Type CFR

Fitted in ceiling plates, already existing with **square** plenum box.



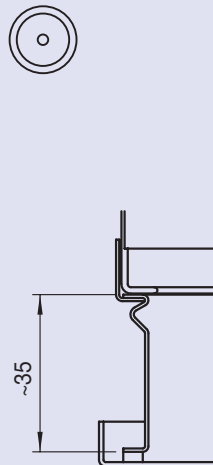
- 1) Recess
- 2) Plastic plug



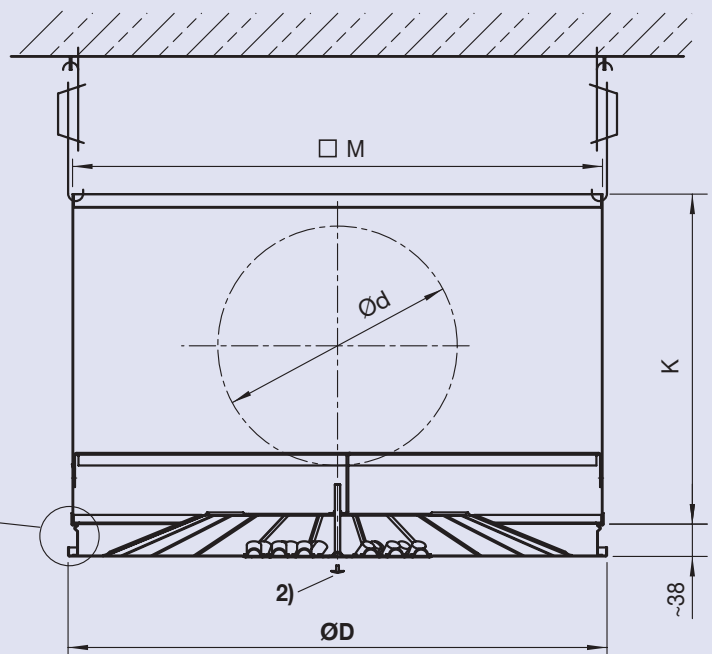
Type	ND	Recess ØAs [mm]	Plenum box Details see prospect L-04-1-31e (TROX HESCO) or 2/16.4/... (TROX)			
			K	□ M	Ød	Type
 CFR	600×500	575	345	567	1×248	AKH04 ZL M0 (TROX HESCO) AK004 ZL M0 (TROX)


Type CFR

Visual realisation, i.e. freely suspended with **square** plenum box, incl. **circular**.



- 2) Plastic plug



Type	ND	Plenum box Details see prospect L-04-1-31e (TROX HESCO) or 2/16.4/... (TROX)			
		K	□ M	Ød	Type
 CFR	600×500	345	590	1×248	AK017 ZL M0 (TROX)

Quick selection

Type CFQ



Dimension [mm]	A _{eff} [m ²]	q _v [l/s]	69.4	83.3	97.2	111.1	125.0	138.9 nominal 500	152.8	166.7								
		Ṡ [m ³ /h]	250	300	350	400	450	500	550	600								
598×500	0.0945	p _t [Pa]	7	10	13	17	22	27	33	39								
623×500		L _{wA} [dB(A)]	<20	25	29	33	37	40	43	45								
		L _{0.5} /L _{0.3} [m]	-	1.8	1.8	1.9	1.8	2.1	1.8	2.2	1.9	2.4	2.0	2.6	2.1	2.8	2.3	2.9
		v̄ _{H1} [m/s]		0.12	0.13	0.13	0.15	0.14	0.17	0.15	0.19	0.16	0.20	0.17	0.22	0.18	0.23	0.19
Distance	A	[m]	3.6	3.5	3.8	3.5	4.1	3.7	4.5	3.8	4.9	4.1	5.2	4.3	5.5	4.5	5.9	

Type CFRQ / CFR

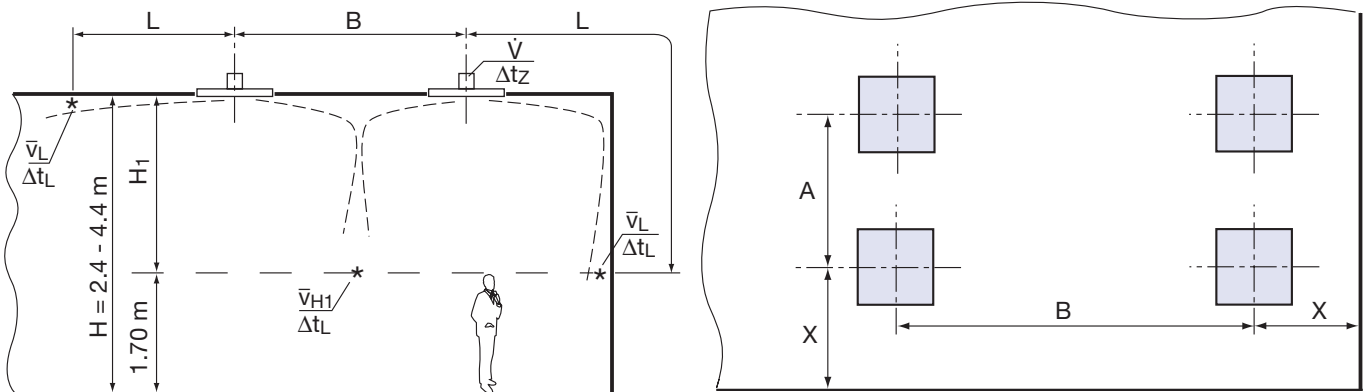


Dimension [mm]	A _{eff} [m ²]	q _v [l/s]	69.4	83.3	97.2	111.1	125.0	138.9 nominal 500	152.8	166.7								
		Ṡ [m ³ /h]	250	300	350	400	450	500	550	600								
598×500	0.048	p _t [Pa]	9	13	18	23	29	36	43	51								
623×500		L _{wA} [dB(A)]	20	25	31	35	39	43	46	49								
600×500		L _{0.5} /L _{0.3} [m]	-	1.8	-	1.8	1.7	2.0	1.8	2.1	1.9	2.3	2.0	2.5	2.1	2.7	2.3	2.8
		v̄ _{H1} [m/s]		0.11		0.12	0.14	0.13	0.16	0.14	0.17	0.15	0.19	0.16	0.20	0.17	0.22	0.18
Distance	A	[m]	3.5		3.7	3.5	4.0	3.6	4.3	3.7	4.6	3.9	4.9	4.1	5.2	4.3	5.5	

Quick selection valable for position 6.

Base for v̄ _{H1} :	Room height H	=	2.9 m
	Height of occupied zone	=	1.7 m
	H ₁	=	1.2 m
	Distance A	=	see table
	Distance B	=	4.0 m
	Difference of temperature	=	-8.0 K

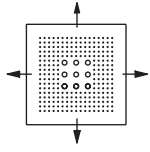
Definitions



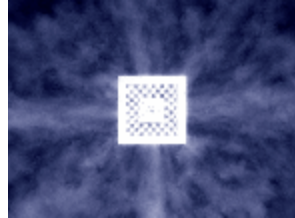
L	m	Distance $(X + H_1)$ blowing against the wall
$L_{0.5}/L_{0.3}$	m	Distance of the jet in relation to the end velocities 0.5 m/s resp. 0.3 m/s
\dot{q}_v	l/s	Volume flow rate per diffuser
\dot{V}	m ³ /h	Volume flow rate per diffuser
\dot{V}_{nominal}	m ³ /h	Nominal volume flow rate (for VAV: $\dot{V}_{\text{max}} = 1.19 \times \dot{V}_{\text{nominal}}$)
v_{eff}	m/s	Effective discharge velocity
A, B	m	Distance between the axes of two diffusers
X	m	Distance between diffuser centre and wall
H	m	Room height
H_1	m	Distance between ceiling and occupied zone
\bar{v}_{H1}	m/s	Mean flow velocity of room air between two diffusers in ceiling distance H_1
\bar{v}_L	m/s	Mean flow velocity of room air between wall in ceiling distance H_1
t_R	°C	Room air temperature
t_L	°C	Jet air temperature
Δt_z	K	Difference between room air and supply air temperature
Δt_L	K	Difference between room air and jet air temperature at distance $L = A/2 + H_1$ $L = X + H_1$
A_{eff}	m ²	Effective air outlet surface area
Δp_t	Pa	Total pressure drop (supply air)
L_{wA}	dB(A)	A-weighted sound power level
L_{wNC}		NC rating of sound power level $L_{\text{wNC}} = L_{\text{wA}} - 6 \text{ dB}$
L_{wNR}		$L_{\text{wNR}} = L_{\text{wNC}} + 2 \text{ dB}$
$L_{\text{pA}}, L_{\text{pNC}}$		A-weighting or NC curve respectively of room sound power level $L_{\text{pA}} \sim L_{\text{wA}} - 8 \text{ dB}$ $L_{\text{pNC}} \sim L_{\text{wNC}} - 8 \text{ dB}$
L_{wokt}	dB	Sound power level in the octave-centre frequencies
ΔL	dB	Insertion attenuation in the octave-centre frequencies
ΔL_A	dB	Octave-centre frequencies, correction value
f	Hz	Octave-centre frequencies

Technical Data

Type CFQ



Position 6



Correction table, octave-centre frequencies

f	125	250	500	1k	2k	4k	8k	[Hz]
ΔLA	+2	-1	-3	-4	-9	-18	-20	[dB]

Insertion attenuation (incl. end reflection)

Interior of box not insulated

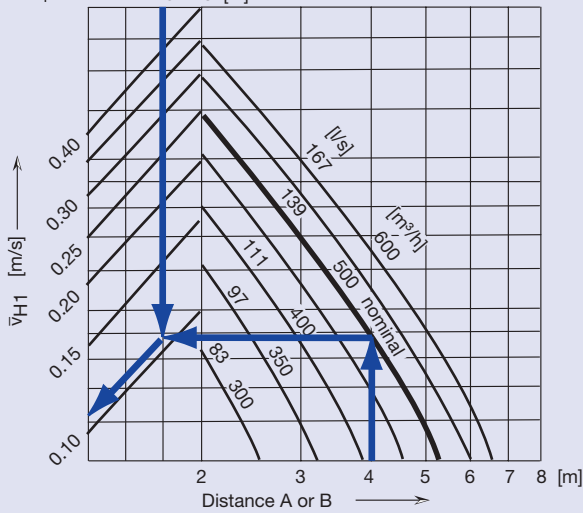
f	125	250	500	1k	2k	4k	8k	[Hz]
ΔL	11	6	4	5	8	10	9	[dB]

Room air velocity

\bar{v}_{H1}

$\Delta t_z = +8 \text{ K}$ $A = B$

$H_1 = 0.8 \ 1.2 \ 1.6 \ 2.0 \text{ [m]}$

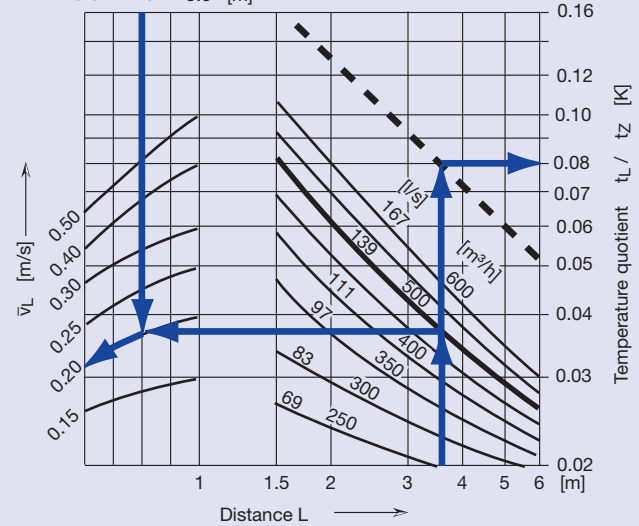


Room air velocity by the wall

\bar{v}_L

$\Delta t_z = -8 \text{ K}$

$A = 3.0 \ 4.0 \ 5.0 \text{ [m]}$

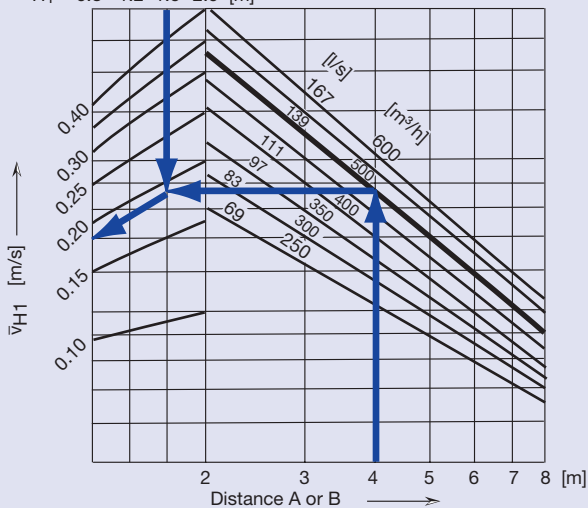


Room air velocity

\bar{v}_{H1}

$\Delta t_z = -8 \text{ K}$ $A = B$

$H_1 = 0.8 \ 1.2 \ 1.6 \ 2.0 \text{ [m]}$

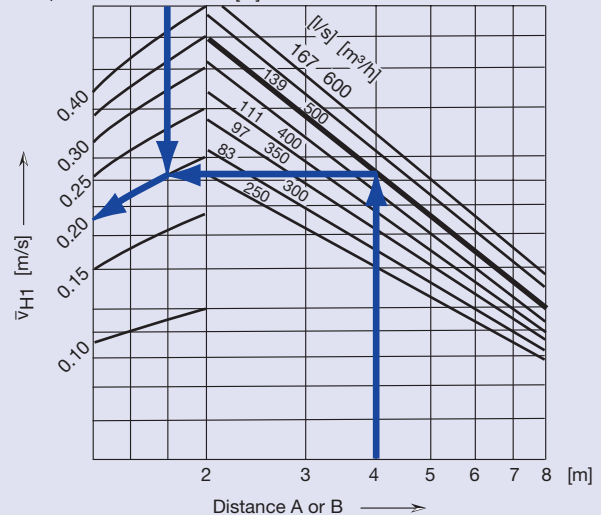


Room air velocity

\bar{v}_{H1}

$\Delta t_z = -12 \text{ K}$ $A = B$

$H_1 = 0.8 \ 1.2 \ 1.6 \ 2.0 \text{ [m]}$

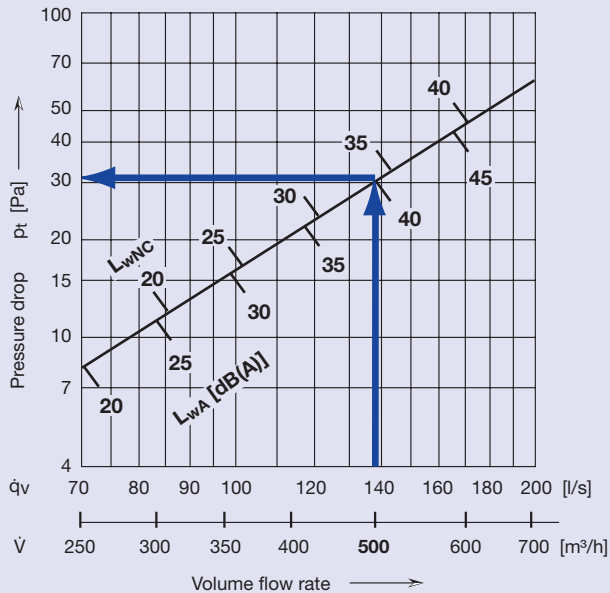


Type CFQ

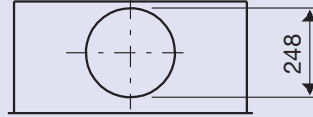


Sound power level and pressure drop

Position 6



Connection diameter



The specifications are valid with standard plenum box of TROX HESCO.

\dot{V} [m ³ /h]	\dot{q}_v [l/s]	v_{eff} [m/s]	$A_{eff} = 0.0766 \text{ m}^2$
250	69	0.7	
300	83	0.9	
350	97	1.0	
400	111	1.2	
450	125	1.3	
500	139	1.5	
550	153	1.6	
600	167	1.8	
650	181	1.9	

Example

Given

CENTERFLOW type CFQ	Spigot $\varnothing 248 \text{ mm}$		
Volume flow rate	139 l/s	\dot{q}_v	
	500 m ³ /h	\dot{V}	
Room height	3.3 m	H	
Occupied zone height	1.7 m		
Distance to the ceiling	1.6 m	H_1	
Distance between diffusers	4.0 m	A = B	
Difference of temperature	-12 K / -8 K / +8 K	Δt	

Solution

Sound power level	40 dB(A)	L_{wA}
Limite curve	34	L_{wNC}
Pressure drop	31 Pa	Δp_t

Octave spectrum

f	125	250	500	1000	2000	4000	8000	[Hz]
L_{wA}	40	40	40	40	40	40	40	[dB(A)]
ΔL_A	+2	-1	-3	-4	-9	-18	-20	[dB]
L_{wOkt}	42	39	37	36	31	22	20	[dB]

Insertion attenuation see page 8

Room air velocity 1.7 m over ground			
at -12 K	=	0.20 m/s	\bar{v}_{H1}
at -8 K	=	0.18 m/s	\bar{v}_{H1}
at +8 K	=	0.11 m/s	\bar{v}_{H1}

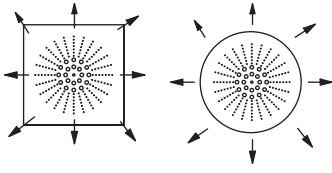
Velocity by the wall 1.7 m over ground

Throw of the jet = $A/2 + H_1$	=	3.6 m	L
at -8 K	=	0.20 m/s	\bar{v}_L

Difference of temperature		0.08	$\Delta t_L / \Delta t_z$
$(t_R - t_L)$ bei $\Delta t_L - 8 \text{ K} = 0.08 \times 8$	=	~0.6	Δt_L

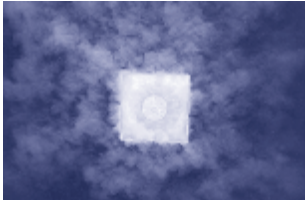
Technical Data

Type CFRQ / CFR



Correction table, octave-centre frequencies

f	125	250	500	1k	2k	4k	8k	[Hz]
ΔL_A	+1	0	-1	-7	-12	-20	-23	[dB]



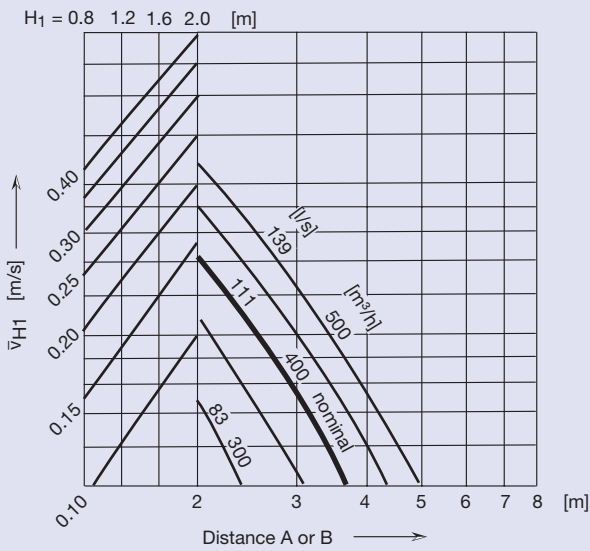
Position 6



Insertion attenuation (incl. end reflection)
Interior of box not insulated

f	125	250	500	1k	2k	4k	8k	[Hz]
ΔL	11	6	4	5	8	10	9	[dB]

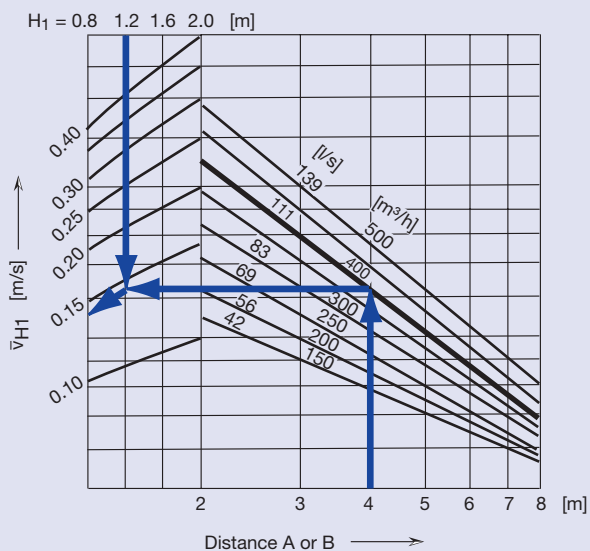
Room air velocity \bar{v}_{H1}
 $\Delta t_z = +8 \text{ K}$ $A = B$



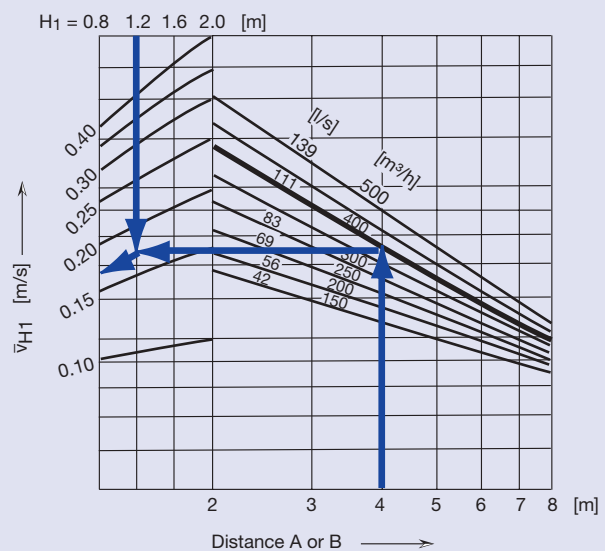
Room air velocity by the wall \bar{v}_L
 $\Delta t_z = -8 \text{ K}$



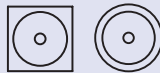
Room air velocity \bar{v}_{H1}
 $\Delta t_z = -8 \text{ K}$ $A = B$



Room air velocity \bar{v}_{H1}
 $\Delta t_z = -12 \text{ K}$ $A = B$

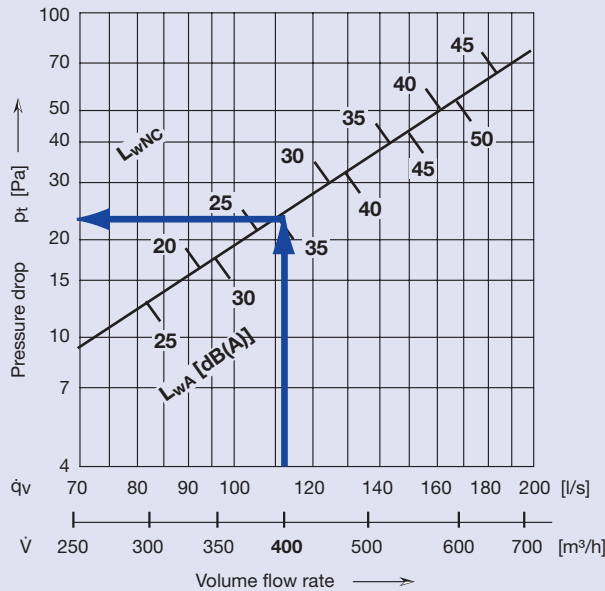


Types CFRQ / CFR

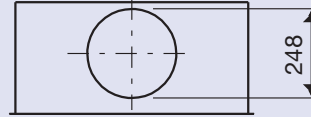


Sound power level and pressure drop

Position 6



Connection diameter



The specifications are valid with standard plenum box of TROX HESCO.

\dot{V} [m³/h]	\dot{q}_v [l/s]	v_{eff} [m/s]	$A_{eff} = 0.0485 \text{ m}^2$
150	42	0.8	
200	56	1.1	
250	69	1.4	
300	83	1.7	
350	97	1.9	
400	111	2.2	
450	125	2.5	
500	139	2.8	
550	153	3.1	

Example

Given

CENTERFLOW type CFRQ	Spigot $\varnothing 248 \text{ mm}$	
Volume flow rate	111 l/s	\dot{q}_v
	400 m³/h	\dot{V}
Room height	2.9 m	H
Occupied zone height	1.7 m	
Distance to the ceiling	1.2 m	H_1
Distance between diffusers	4.0 m	A = B
Difference of temperature	-12 K / -8 K / +8 K	Δt

Solution

Sound power level	35 dB(A)	L_{wA}
Limite curve	28	L_{wNC}
Pressure drop	23 Pa	Δp_t

Octave spectrum

f	125	250	500	1000	2000	4000	8000	[Hz]
L_{wA}	35	35	35	35	35	35	35	[dB(A)]
ΔL_A	+1	0	-1	-7	-12	-20	-23	[dB]
L_{wOkt}	36	35	34	28	23	15	12	[dB]

Insertion attenuation see page 10

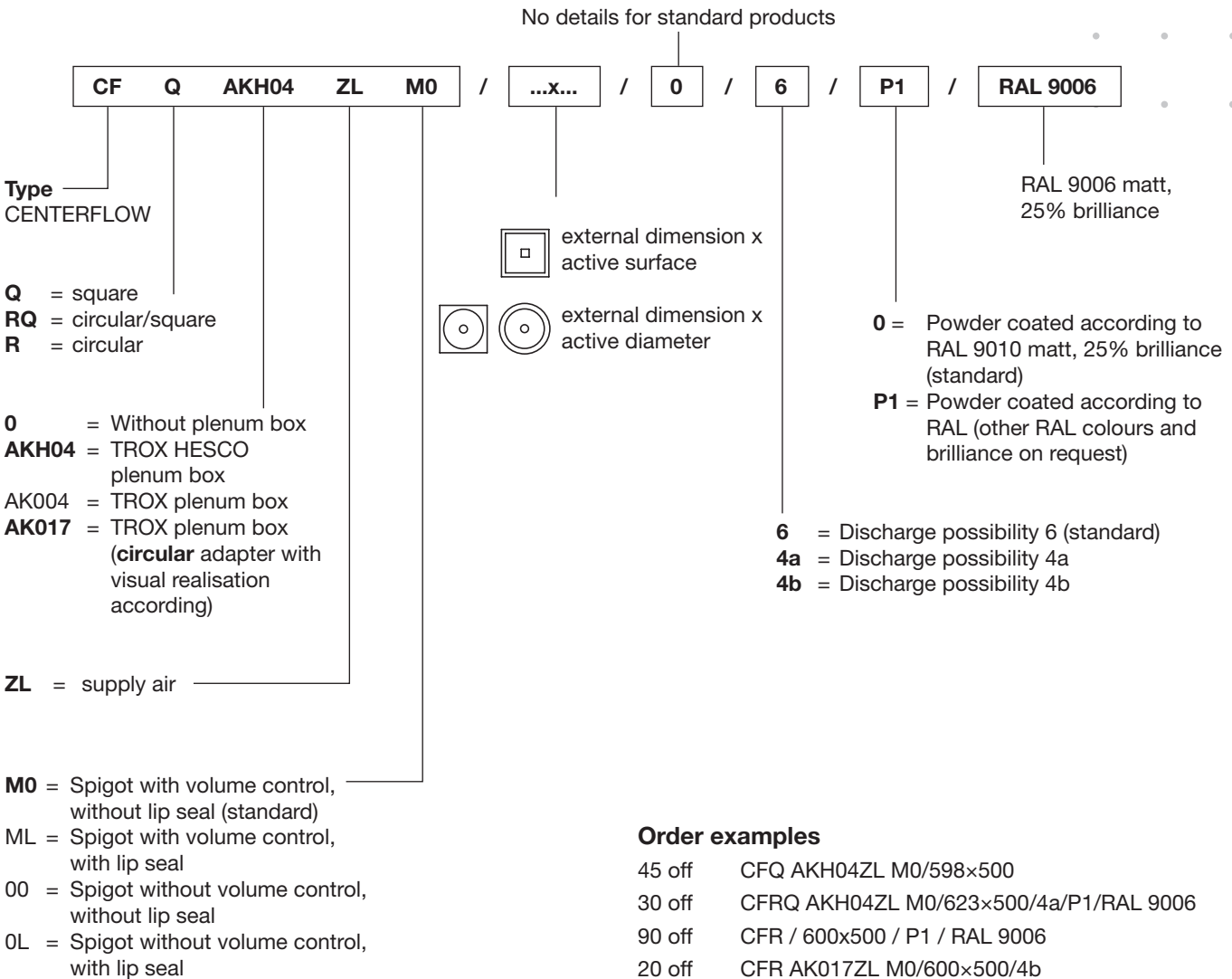
Room air velocity 1.7 m over ground		
at -12 K	= 0.17 m/s	\bar{v}_{H1}
at -8 K	= 0.14 m/s	\bar{v}_{H1}
at +8 K	= <0.10 m/s	\bar{v}_{H1}

Velocity by the wall 1.7 m over ground		
Throw of the jet = A/2 + H ₁	= 3.2 m	L
at -8 K	= 0.17 m/s	\bar{v}_L

Difference of temperature	0.07	$\Delta t_L / \Delta t_z$
($t_R - t_L$) bei $\Delta t_L - 8 \text{ K} = 0.08 \times 8$	= ~0.6 K	Δt_L

Order details

Order codes



Text for tendering purposes

Ceiling air diffuser CENTERFLOW with divided, swirling and pulsating blow out characteristics: in the center via all-circular swiveling nozzles in oval form, in the peripheral zone via perforated plate openings. Attachment by means of central screw.

A standard plenum box of galvanised steel, with integrated cross bar for the M6 central screw, for quick and simple installation of the ceiling panel air diffuser. A connection with volume control for connecting a coiled tube or hose is included; the inlet box also contains an air distributor element. Central screw will be delivered separately.

Order examples

45 off	CFQ AKH04ZL M0/598x500
30 off	CFRQ AKH04ZL M0/623x500/4a/P1/RAL 9006
90 off	CFR / 600x500 / P1 / RAL 9006
20 off	CFR AK017ZL M0/600x500/4b

Material

Ceiling air diffuser	steel, colour RAL 9010, matt, 25% brilliance, nozzles in oval form of plastic material, RAL 9010
Plenum box	galvanised steel plate

Details for the plenum box see pages 4 and 5.

The square standard plenum box, incl. **circular** adapter, is necessary for visual realisation, i.e. freely suspended.

Option

- Other RAL colours
- Quadratic cover plate with circular recess (in different dimensions) on request.