FläktWoods

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ILMAVIRTOJEN MITTAUS- JA SÄÄTÖOPAS

» KESÄKUU 2016

Sisältö

Poistoilmaventtiilit

Korvausilmaventtiilit

Säleiköt

Suutinkanavajärjestelmät

Jäähdytyspalkit

Ilmavirtasäätimet

Mittaus- ja säätölaitteet

Vanhat tuotteet

Käytetyt merkinnät

Tunnus	**Suureen nimi**	**Yksikkö**
q_v	ilmavirta	l/s, m^3/s, m^3/h
Δp_m	mittauspaine-ero	Pa
k	k-kerroin ($q_v = k \times \sqrt{\Delta p_m}$)	
D, d	halkaisija	mm
a, s	rako, asento, avaus	mm
L	suojaetäisyys häiriölähteeseen	m
n	suojaetäisyyskerroin	-
m_2	mittausmenetelmän epätarkkuus (menetelmävirhe)	- %
ρ_t	ilman tiheys mittaushetkellä	kg/m^3

Mittausmenetelmät

1. Paine-eron (Δp_m) mittaus kalibroiduista venttiileistä mittasondilla (KSO, KTS, STQA...).
   Säätö tapahtuu venttiilin avausta (a) tai reikien lukumäärää muuttamalla.

2. Paine-eron (Δp_m) mittaus kiinteällä, kalibroidulla anturilla varustetusta tulo-/poistoilmalaitteesta (RHKP, SVQC...).
   Säätö tapahtuu laitteessa olevien säätönarujen avulla säätöpellin asentoa muuttamalla, poistoilmalaitteessa EHC rakoa säätämällä.

3. Paine-eron (Δp_m) mittaus kiinteällä, kalibroidulla anturilla varustetusta tulo-/poistoilmalaitteesta (DVHA, DVQA...).
   Säätö tapahtuu erillisellä säätölaitteella.

4. Paine-eron (Δp_m) mittaus kanavaan asennetuista kiinteistä mittalaitteista (IRIS).

5. Paine-eron (Δp_m) mittaus Optivent- pääteyksiköistä.
   Säätö tapahtuu erillisen ohjeen mukaisesti.

Mittaus- ja säätöoppaan käyttö

Opas sisältää Fläkt Woods Oy:n vakiotuotteiden k-kertoimet (tarvittaessa tuotteista löytyvät tiedot myös käyrästö-muodossa.) Oppaassa on kunkin tuotteen kohdalla annettu tiedot poikkeuksellisista suojaetäisyyksistä, korjauskertoimista sekä mittaus- ja säätötoimista

Tuotekohtaiset heittokuvio-, ääni-, yms. tiedot löytyvät Fläkt Woods Oy:n tuotekansioista 3 ja 4.

k-kerroin on määritelty ilmavirran yksiköllä l/s

$$q_v = k \times \sqrt{\Delta p_m} \qquad \Delta p_m = (q_v / k)^2$$

Muita ilmavirran yksiköitä käytettäessä tehdään korjaus seuraavasti:

m^3/s: $q_v = 0.001 \times k\sqrt{\Delta p_m}$ $\Delta p_m = (q_v / (0.001 \times k))^2$

m^3/h: $q_v = 3.6 \times k\sqrt{\Delta p_m}$ $\Delta p_m = (q_v / (3.6 \times k))^2$

Esimerkki:
SVQ-125, etulevyn asento s=+30, on säädettävä niin, että ilmavirta q_v = 50 l/s

- luetaan k-kerroin sivulta 88
- sijoitetaan k = 13,0 mittauspaine-eron kaavaan, jolloin saadaan mittauspaine-eroksi

$$\Delta p_m = (50 / 13{,}0)^2 = 15 \text{ Pa}$$

- säädetään säätöpeltiä, kunnes haluttu mittauspaine-ero on saavutettu

Mittausvirheiden arvioiminen

$$m = \pm \sqrt{c_1^2 m_1^2 + c_2^2 m_2^2 + c_3^2 m_3^2 + \ldots + c_n^2 m_n^2}$$

m mittaustuloksen suhteellinen epätarkkuus %

m_1 mittausvälineen epätarkkuus (laitevirhe) %

m^2 mittausmenetelmän epätarkkuus (menetelmävirhe) %

m_3 mittarin lukemaepätarkkuus (havaitsemisvirhe) %

m_n muut mahdolliset epätarkkuudet %

$c_{1...n}$ kertoimet, joilla otetaan huomioon erillisten epätarkkuuksien vaikutus lopputulokseen. Kaava huomioi satunnaisvirheiden ja pienten vaikutussuunnaltaan tuntemattomien, systemaattisten virheiden vaikutuksen. Muihin verrattuna pienet virheprosentit voidaan jättää huomiotta, koska niiden vaikutus m:n arvoon on merkityksetön.

Esimerkki kokonaisvirheen arvioinnista:

m_1 = ± 4 % (tieto mittarin valmistajalta)
c_1 = 1/2 (paine-eron mittaus, $q_v = k \times \sqrt{\Delta pm}$) *)
m_2 riippuu mittausmenetelmästä ja asennustavasta

c_2 = 1
m_3 = 4 % (riippuu käytettävästä mittarista ja painealueesta)

c_3 = 1/2 (paine-eron mittaus) *)

*) esim. 10 %:n virhe mittauspaine-erossa vaikuttaa ilmavirtaan n. 5 %.

$$m = \pm\sqrt{(1/2)^2 \times 42 + 1 \times m_2^2 + (1/2)^2 \times 4^2} = \pm \sqrt{8 + m_2^2}$$

Antamalla menetelmävirheelle m_2 erilaisia arvoja, saadaan seuraava taulukko:

m_2=	5	7	10	12	15	20	%
m =	5.8	7.6	10.4	12.3	15.3	20.2	%

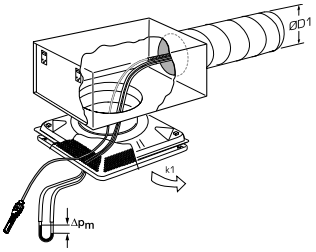
Ilman tiheyden vaikutus mittaustuloksiin

Oppaassa esitetyt k-arvot pätevät normaaliolosuhteissa (20 °C ja 101,3 kPa). Jos mittausolosuhteet poikkeavat näistä arvoista, saadaan todellinen ilmavirta (q_{vt}) k-kertoimen avulla lasketusta ilmavirrasta (q_v) seuraavasti:

$$q_{vt} = q_v \times \sqrt{(1{,}2 \,/\, \rho_t)}$$

RHKB, RHOB
(RHKH, RHOH + ATTC)

10/2011 lähtien



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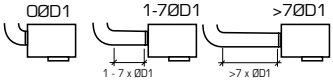
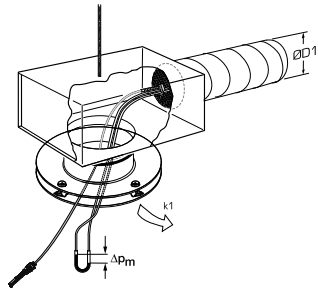
125	10,1	10,6	10,1
160	17,1	19,9	17,3
200	27,0	30,8	27,9
250	47,1	48,8	39,9
315	65,9	67,2	64,1



RPPA, ROPA
(RPPH, ROPH + ATTC)



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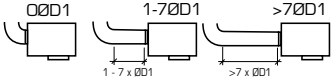
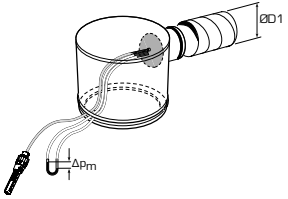


ROFB, RPFB



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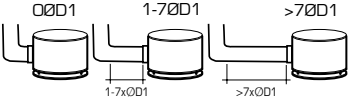
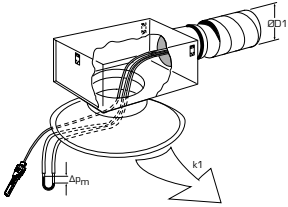
315	65,9	67,2	64,1
400	ks. IRIS-400, s. 68		



KHAA + ATTC

10/2011 lähtien



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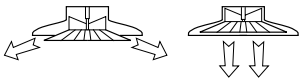
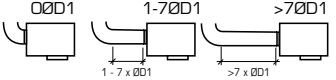
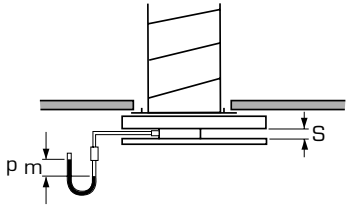




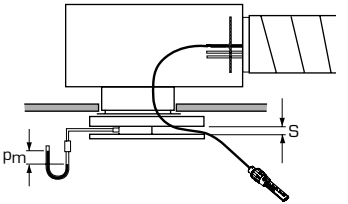
CTPB



CTPB	s, mm	20	25	30	35
125	k	5,7	6,3	6,9	7,6
CTPB	s, mm	25	30	35	40
160	k	8,8	9,3	10,5	11,4

CTPB + ATTC

10/2011 lähtien



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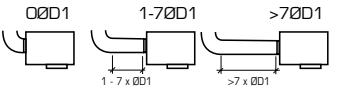
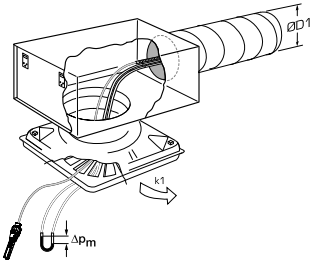


VFKB
(VFKH + ATTC)

10/2011 lähtien



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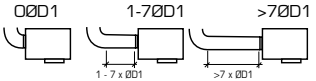
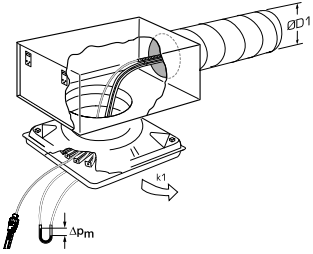


VSKB
(VSKH + ATTC)

10/2011 lähtien



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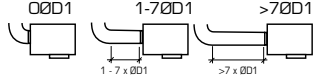
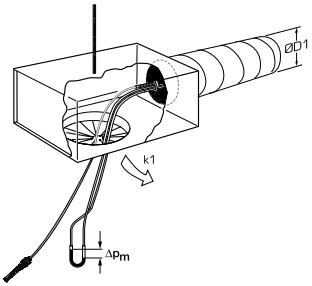


NWPP + ATTC



ØD1	0ØD1	1-7ØD1	>7ØD1
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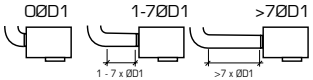
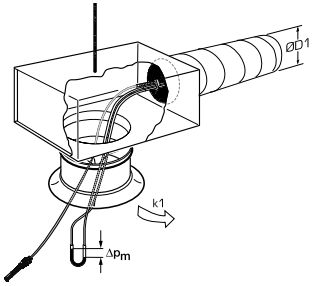


ODZA + ATTC



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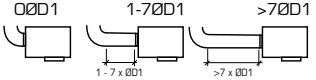
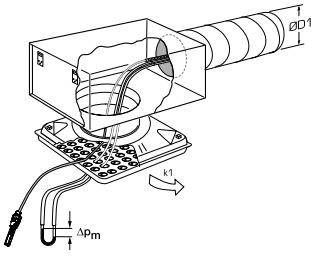
315	65,9	67,2	64,1



DYCC, DYKC
(DYCH, DYKH + ATTC)

10/2011 lähtien



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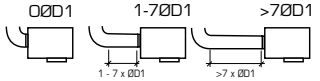
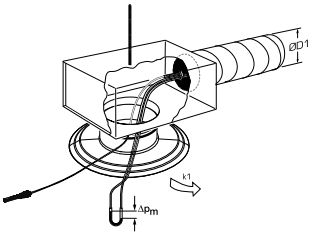


DYRB
(DYRH + ATTC)



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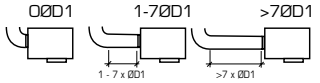
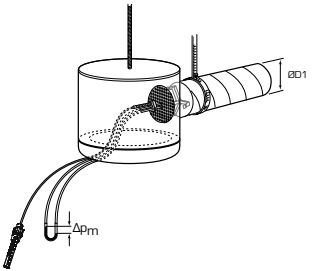


DYFB



ØD1	0ØD1	1-7ØD1	>7ØD1
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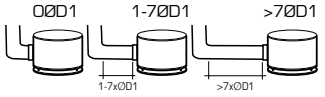
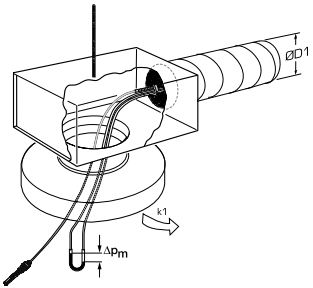
400	ks. IRIS-400, s. 68		



DYSC
(DYSH + ATTC)



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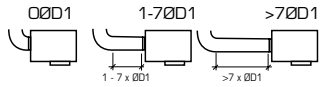
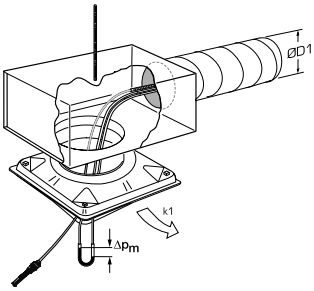


DYBA
(DYBH + ATTC)



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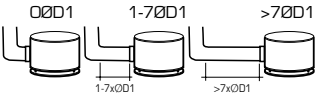

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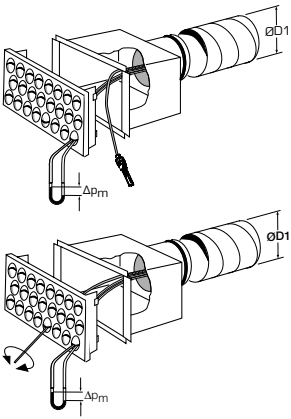

10/2011 lähtien

ØD1	k1	k2	k3
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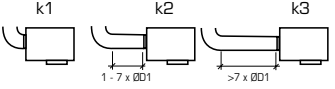
125	10,1	10,6	10,1
160	17,1	19,9	17,3
200	27,0	30,8	27,9

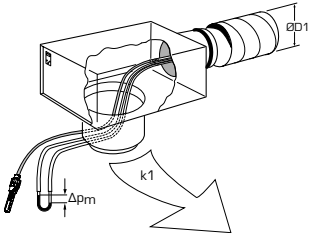
ennen 10/2011

ØD1	k1	k2	k3
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2

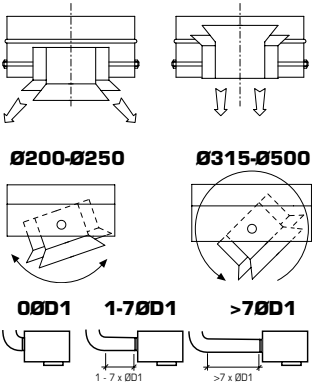


KHDA + ATTC

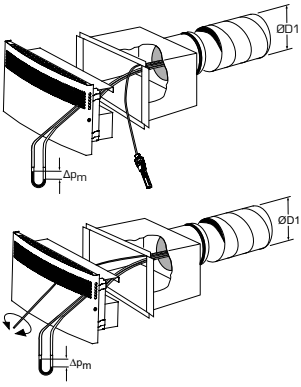
10/2011 lähtien



KHDA	ØD1	0ØD1	1-7ØD1	>7ØD1
200	160	17,1	19,9	17,3
250	200	27,0	30,8	27,9
315	250	47,1	48,8	39,9
400	315	65,9	67,2	64,1
500	-	-	-	-



SVQC

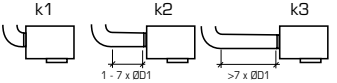


10/2011 lähtien

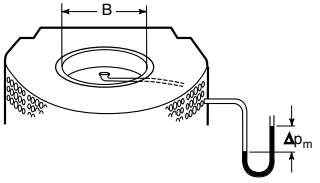
ØD1	k1	k2	k3
100	6,0	6,3	5,9
125	10,1	10,6	10,1
160	17,1	19,9	17,3
200	27,0	30,8	27,9

ennen 10/2011

ØD1	k1	k2	k3
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2

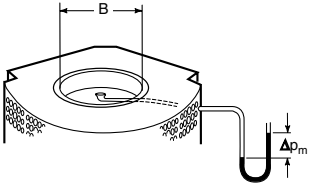


DVHA



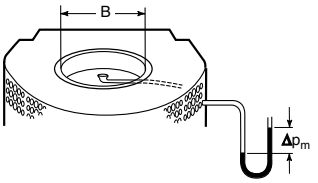
B	k
100	8
125	13
160	21
200	38
250	53
315	89
400	132
500	208

DVQA



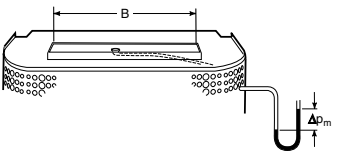
B	k
100	8
125	13
160	20
200	34
250	52
315	85
400	138

DVRA



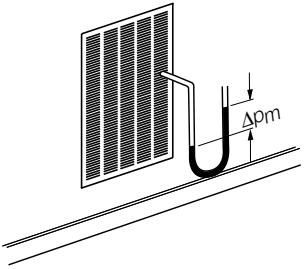
B	k
125	13
160	21
250	58
315	83
400	134
630	332

DVPA



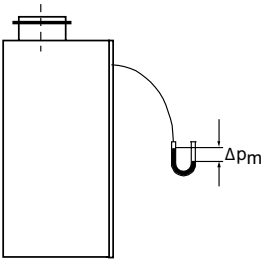
B	k
300	16
400	41
700	113
1200	264
1300	440

DVCA



DVCA	k
300-60	17
400-80	22

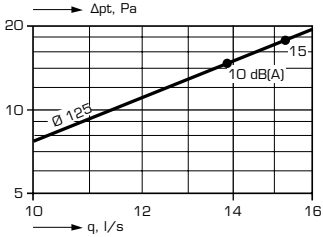
PNAA



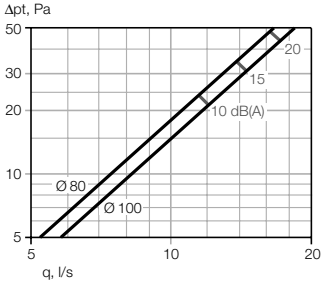
PNAA	Narujen väri		
	Sulkeva	Avaava	k
160	Oranssi-valkoinen	Valkoinen	28
200	Sininen-valkoinen	Valkoinen	57
250	Vihreä-valkoinen	Valkoinen	77
315	Musta	Valkoinen	98
400	Musta	Valkoinen	176

GFB, DASH, DUSH

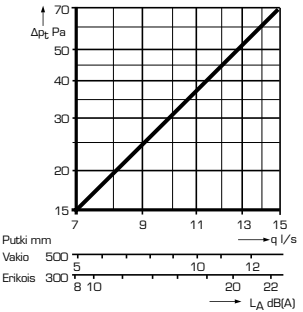
DUSH



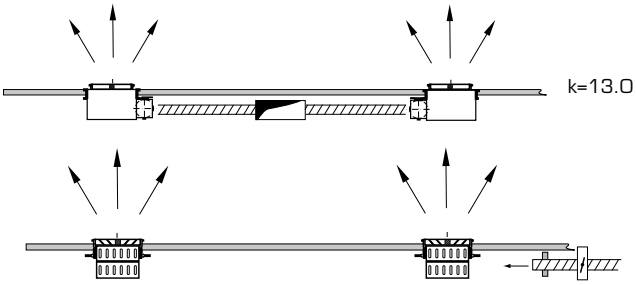
DASH



GFB

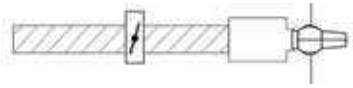


PWAA

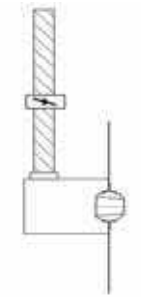


Ilmavirta säädetään kanavapellillä.

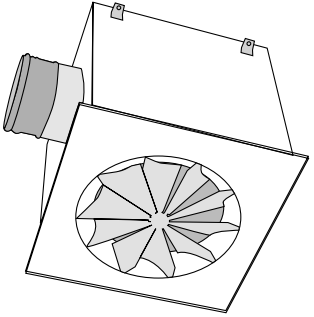
DD, DK, DKOA, DR, DS



Ilmavirta säädetään kanavapellillä.

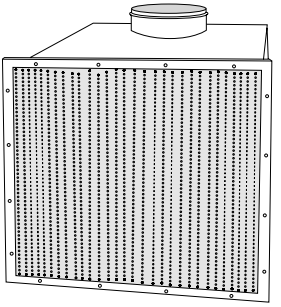


SPNH, SPNV



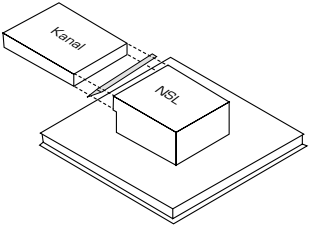
Ilmavirta säädetään pellillä ja mittanipalla.

SPWH, SPWV



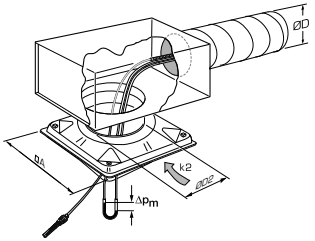
Ilmavirta säädetään pellillä ja mittanipalla.

NSLA



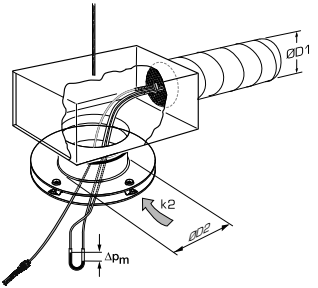
Ilmavirta säädetään pellillä ja mittanipalla.

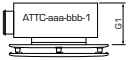
HPKB
(HPKH + ATTC)

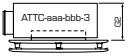


ØD2	A	k2 0 mm	k2 12 mm
160	425	13,0	16,6
160	595	14,4	16,0
200	425	16,1	25,0
200	595	20,4	24,4
250	595	25,6	31,5
315	595	33,1	43,2
400	595	41,2	63,8

RPPE, ROPE
(RPPH, ROPH + ATTC)







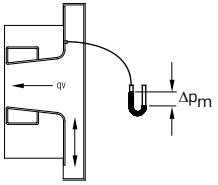
ØD1	ØD2	k2 25 mm	k2 40 mm
100	125	7,9	9,3
125	160	10,6	13,0
160	200	14,0	17,5
200	250	20,1	25,5
250	315	27,4	38,9
315	400	32,5	47,0

ØD1	ØD2	k2 25 mm	k2 40 mm
100	125	8,6	10,3
125	160	12,3	15,0
160	200	16,0	21,4
200	250	24,8	33,8
250	315	31,8	46,4
315	400	39,0	59,6

ØD1	ØD2	k2 25 mm	k2 40 mm
100	160	10,8	12,8
125	200	14,6	18,1
160	250	20,6	24,9
200	315	30,6	45,5
250	400	35,9	51,7

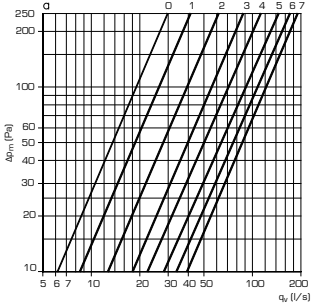
ØD1	ØD2	k2 25 mm	k2 40 mm
100	160	12,8	16,3
125	200	16,5	23,0
160	250	23,9	32,7
200	315	34,8	54,3
250	400	39,8	61,0

EHC

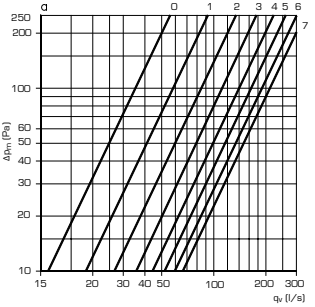


	k		
a	**300x150**	**500x150**	**800x150**
0	1,9	3,5	6,0
1	2,6	5,8	10,8
2	4,0	8,5	14,6
3	5,7	11,2	19,0
4	7,1	14,0	23,9
5	8,9	16,4	28,3
6	10,8	19,0	32,9
7	12,4	21,0	35,4

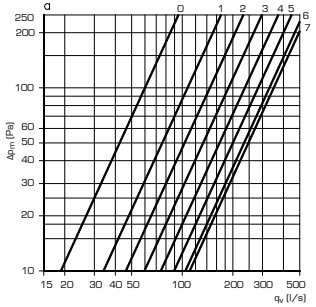
EHC-300x150



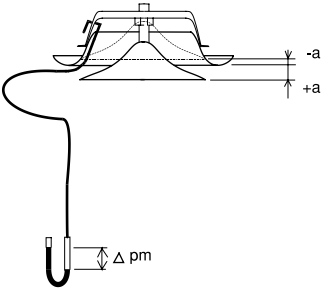
EHC-500x150



EHC-800x150



KE



a	-3	-2	0	3	6	9
ø80	0,3	0,5	0,9	1,6	2,3	2,8

a	-3	-2	0	2	4	6	8	10
ø100	0,5	0,7	1,2	1,8	2,5	3,2	4,1	4,9
9.1.06 →	0,6	0,9	1,4	1,9	2,5	3,0	3,6	4,1

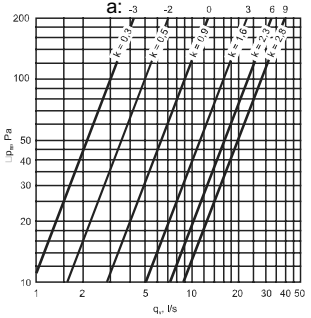
a	-7	-3	0	3	6	9	12	15
ø125	1,6	2,4	3,0	4,1	5,3	6,8	8,7	10,0
9.1.06 →	1,0	2,2	3,2	4,2	5,2	6,2	7,2	8,2

a	-5	-3	0	3	6	10	15
ø150	2,3	3,0	4,2	5,7	7,4	9,9	12,0
9.1.06 →	2,2	3,0	4,2	5,4	6,6	8,4	10,3

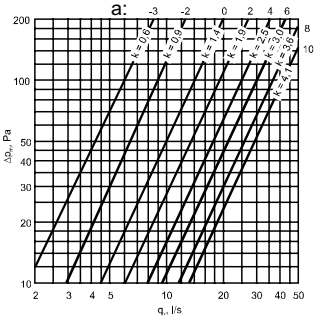
a	-10	-5	0	5	10	15
ø160	1,4	2,7	4,4	6,9	9,9	14,0
9.1.06 →	1,0	2,7	4,4	6,2	7,8	9,5

a	-3	0	3	6	9	12	15	20
ø200	1,5	3,0	4,7	6,6	8,8	11,1	13,5	17,3
13.2.06 →	1,4	3,4	5,4	7,4	9,4	11,2	13,2	16,6

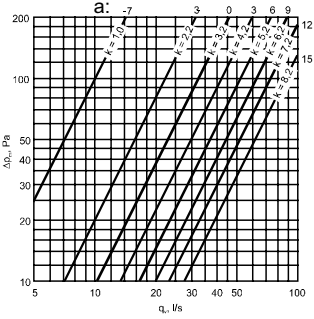
KE-80-C



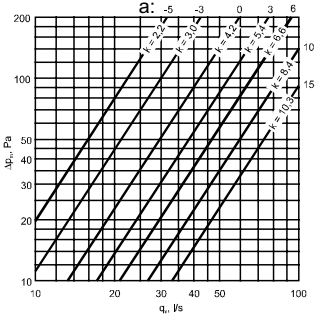
KE-100-C



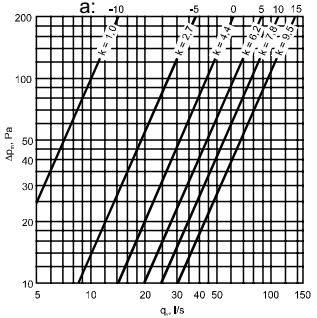
KE-125-C



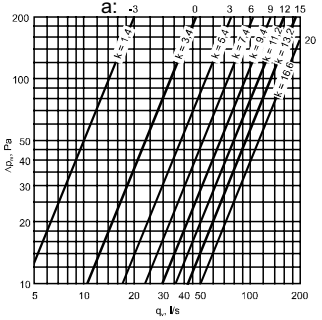
KE-150-C



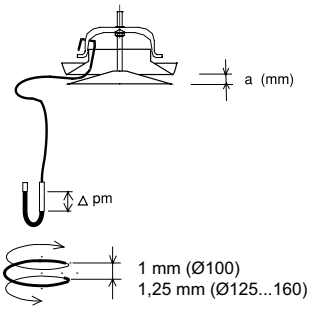
KE-160-C



KE-200-C



KTS

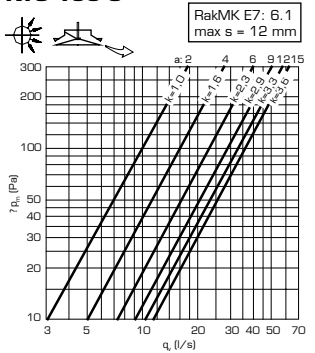


KTS-100-C			
a (mm)		06.2006 →	
2	0,9	1,0	1,1
4	1,5	1,6	2,0
6	1,9	2,3	2,7
9	2,3	2,9	4,0
12	2,8	3,3	5,1
15	3,3	3,6	-

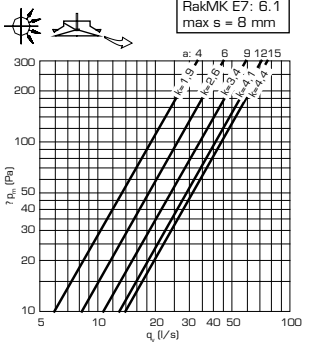
KTS-125-C			
a (mm)		06.2006 →	
4	2,0	1,9	2,2
6	2,6	2,6	3,1
9	3,3	3,4	4,2
12	3,8	4,1	5,5
15	4,4	4,4	7,0

KTS-160-C			
a (mm)		06.2006 →	
4	2,7	2,3	3,0
6	3,4	3,3	4,2
10	4,8	4,5	6,4
15	5,8	6,4	8,9
20	7,0	7,2	11,2

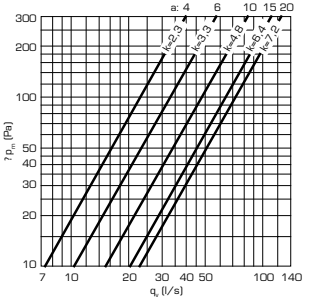
KTS-100-C



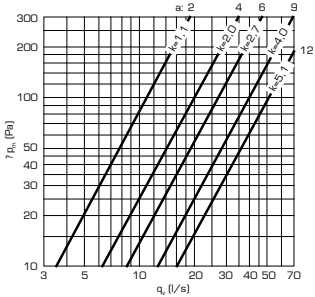
KTS-125-C



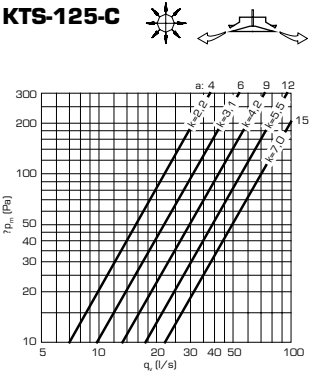
KTS-160-C



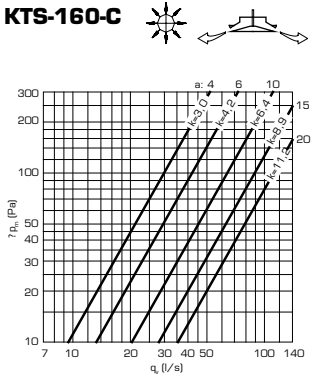
KTS-100-C



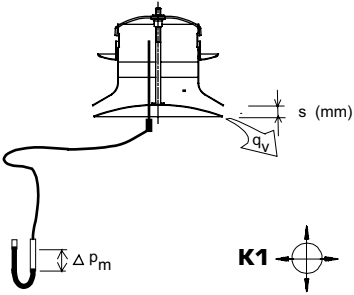
KTS-125-C



KTS-160-C



KTI



KTI-100-C

s (mm)	k1	k2	k3
2	1,0	1,1	0,8
3	1,6	1,5	1,1
4	2,0	1,8	1,4
6	3,0	2,5	1,7
8	3,8	3,2	2,2
10	4,8	3,9	2,6
12	5,6	4,2	3,0
16	-	-	3,6

KTI-125-C

s (mm)	k1	k2	k3
2	0,7	1,0	0,8
3	1,1	1,6	1,1
4	2,0	1,9	1,5
6	3,4	2,8	2,1
8	4,8	3,8	2,7
10	6,0	4,7	3,3
12	7,1	5,5	3,8
16	9,0	7,0	5,0

KTI-160-C

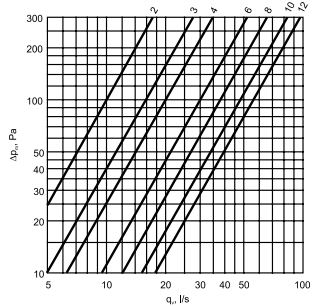
s (mm)	k1	k2	k3
2	1,6	-	-
3	2,4	2,3	1,6
4	3,2	2,7	2,1
6	4,7	3,8	2,9
8	6,3	5,0	3,6
10	7,7	6,1	4,4
12	9,1	7,1	4,9
16	11,8	9,2	6,5
20	14,3	11,2	7,8

KTI-200-C

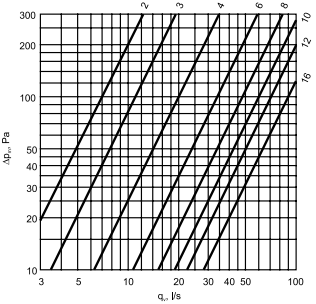
s (mm)	k1	k2	k3
3	2,9	2,5	1,8
4	3,8	3,0	2,7
6	5,7	4,4	3,6
8	7,4	5,7	4,5
10	9,3	7,1	5,4
12	11,0	8,3	6,4
16	14,6	11,0	8,0
20	17,9	13,5	9,8
25	21,9	16,2	11,7

KTI-100-C

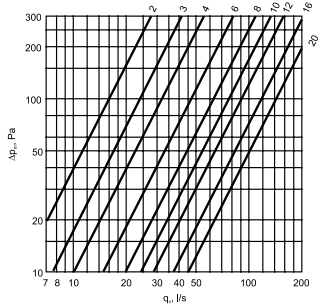
KTIK-100:
max s = 8 mm



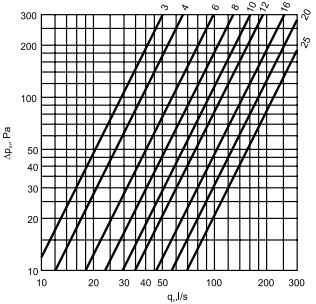
KTI-125-C



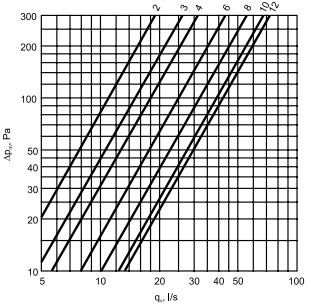
KTI-160-C



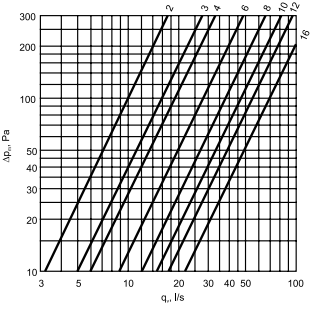
KTI-200-C



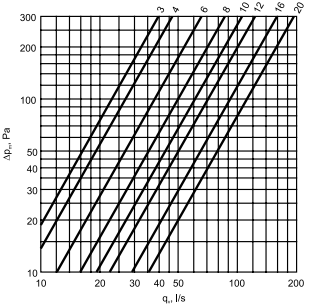
KTI-100-C



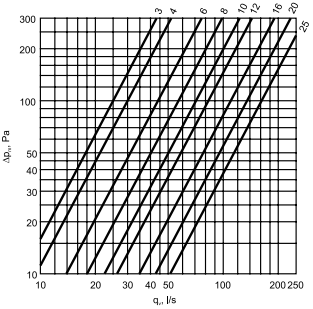
KTI-125-C



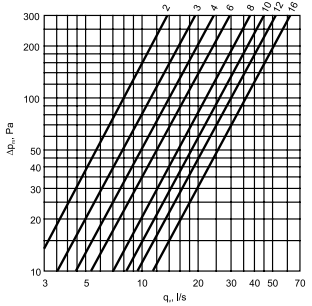
KTI-160-C



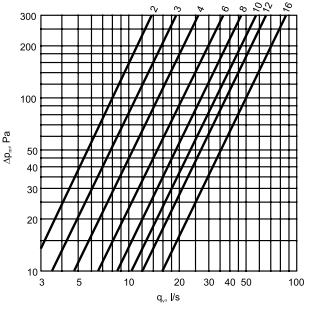
KTI-200-C



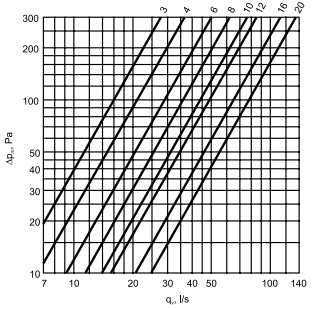
KTI-100-C



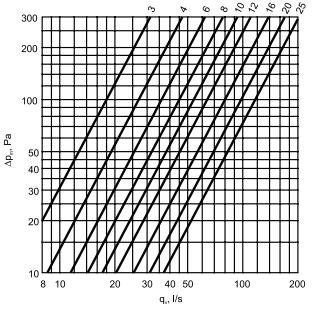
KTI-125-C



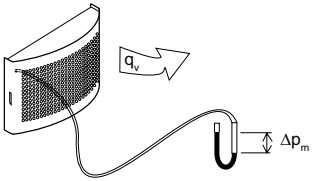
KTI-160-C



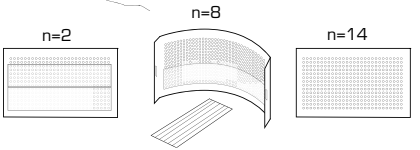
KTI-200-C



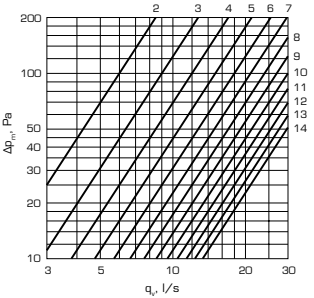
STQA



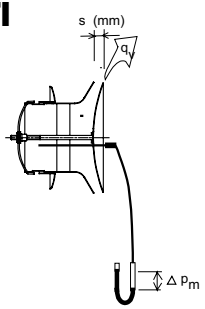
k	
n	**100 / 125**
2	0,6
3	0,9
4	1,2
5	1,5
6	1,8
7	2,1
8	2,4
9	2,7
10	3,0
11	3,3
12	3,6
13	3,9
14	4,2

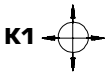


STQA-100-C / STQA-125-C



STI





STI-100-C

s (mm)	k1	k2	k3
0	0.6	-	0.6
2	1.6	-	1.6
3	2.1	-	1.8
4	2.7	2.5	2.1
6	3.6	3.3	2.4
8	4.6	4.1	2.9
10	5.6	4.8	3.2
12	6.1	5.3	3.6
16	7.0	6.3	4.3

STI-125-C

s (mm)	k1	k2	k3
0	0.8	-	0.8
2	2.0	-	1.5
3	2.5	-	1.9
4	3.2	2.6	2.2
6	4.4	3.5	2.8
8	5.8	4.4	3.3
10	6.9	5.2	3.9
12	7.8	6.1	4.5
16	10.3	7.8	5.6

STI-160-C

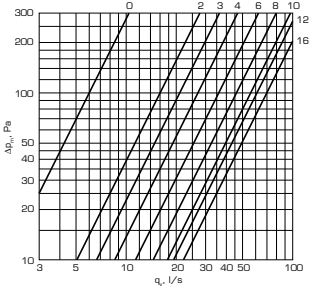
s (mm)	k1	k2	k3
0	1.0	-	1.0
2	2.1	-	2.1
3	2.7	-	2.6
4	3.6	3.3	3.1
6	5.0	4.2	4.1
8	6.5	5.5	4.9
10	8.1	6.6	5.6
12	9.6	7.7	6.5
16	12.7	9.9	7.7

STI-200-C

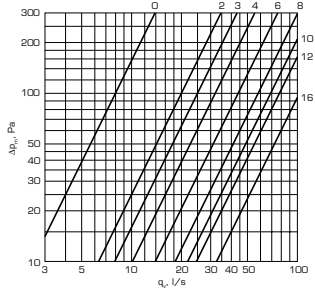
s (mm)	k1	k2	k3
0	1.8	-	1.8
2	3.0	-	3.0
3	3.4	-	3.2
4	4.7	3.9	3.8
6	6.7	5.3	4.9
8	8.5	6.9	6.3
10	10.0	8.4	7.5
12	12.2	9.7	8.5
16	16.1	12.3	10.3
20	19.4	14.9	12.1
25	23.3	17.8	14.6

STI-100-C

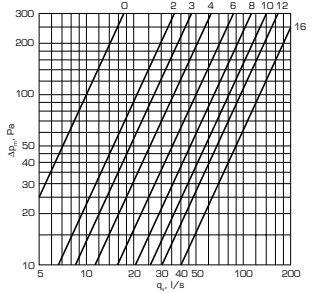
STIK-100:
max s = 6 mm



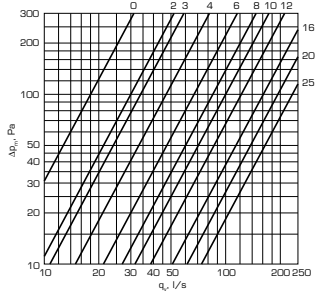
STI-125-C



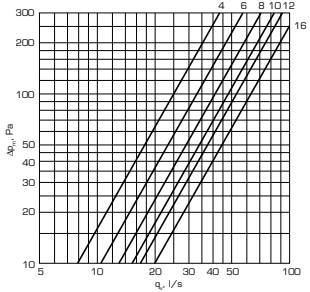
STI-160-C



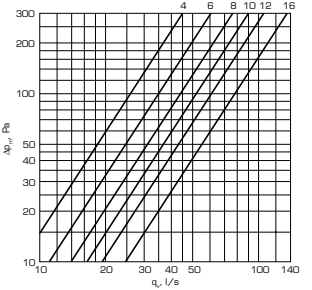
STI-200-C



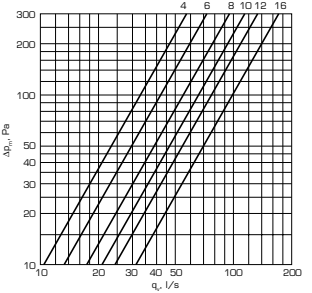
STI-100-C



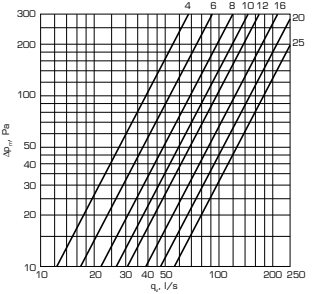
STI-125-C



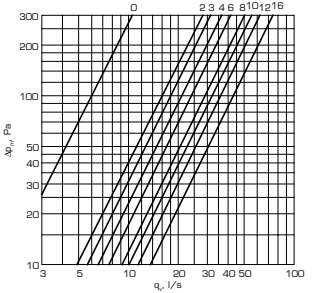
STI-160-C



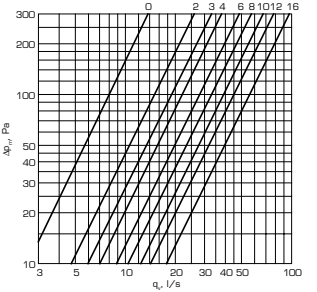
STI-200-C



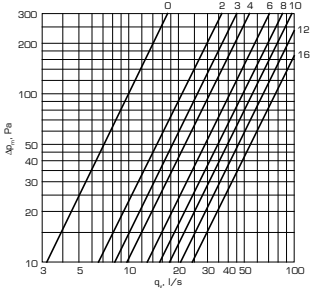
STI-100-C



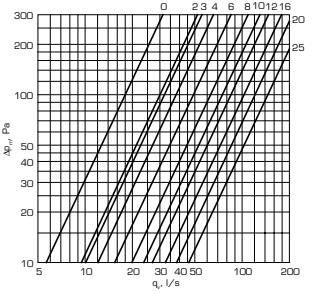
STI-125-C



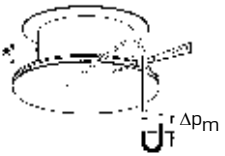
STI-160-C



STI-200-C

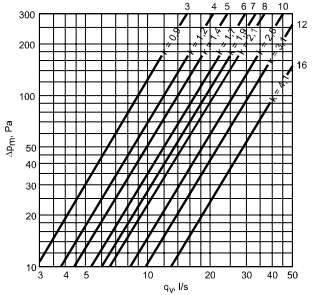


CTVB

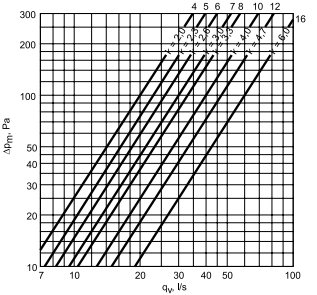


s	3	4	5	6	7	8	10	12	16	20
100	0,9	1,2	1,4	1,7	1,9	2,1	2,6	3,1	4,1	-
125	-	2,0	2,3	2,6	3,0	3,3	4,0	4,7	6,0	-
160	-	-	2,6	3,1	3,5	3,9	4,6	5,4	6,9	8,3

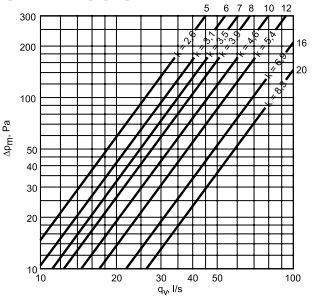
CTVB-100-C



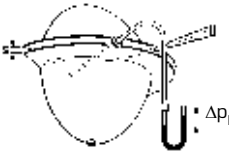
CTVB-125-C



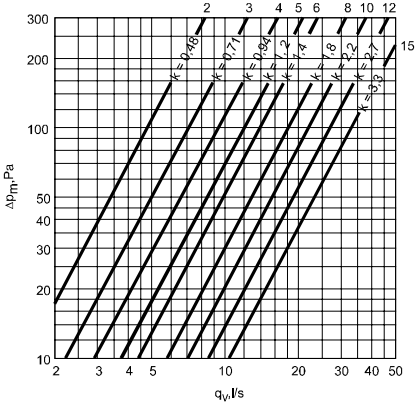
CTVB-160-C



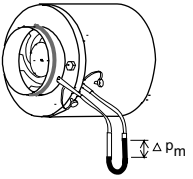
CTVK



s	2	3	4	5	6	8	10	12	15
100 / 125	0,48	0,71	0,94	1,2	1,4	1,8	2,2	2,7	3,3

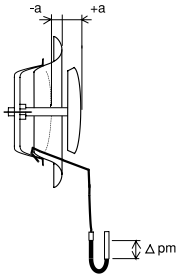


EHI



a (mm)	1	2	3	4	5	6	7	8
315	118,0	70,0	58,7	45,1	37,0	30,0	21,8	15,8
400	131,0	102,0	88,3	67,3	52,7	38,5	28,4	15,5

KK



a	-12	-10	-6	-3	0	3	6	9
ø80	0,3	0,5	0,8	1,1	1,3	1,6	1,9	2,1

a	-10	-8	-5	0	5	10
ø100	0,5	0,7	1,0	1,7	2,3	2,9
9.1.2006 →	0,5	0,7	1,1	1,7	2,3	2,9

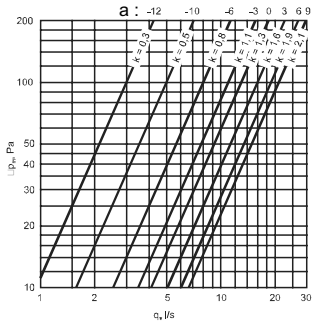
a	-17	-15	-12	-9	-6	-3	0	3	6	9
ø125	0,7	1,1	1,5	2,0	2,5	2,9	3,4	3,9	4,3	4,8

a	-15	-13	-10	-5	0	5	10
ø150	2,1	2,4	2,9	3,9	4,8	5,6	6,7
9.1.2006 →	1,8	2,1	2,7	3,6	4,5	5,4	6,3

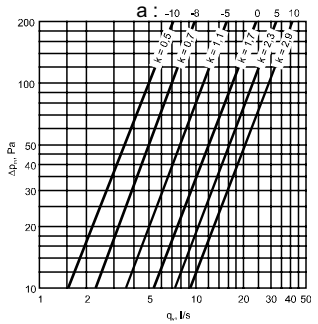
a	-20	-18	-15	-10	-5	0	5	10	12
ø160	1,4	1,7	2,3	3,3	4,3	5,3	6,3	-	-
9.1.2006 →	0,7	1,1	1,6	2,6	3,6	4,5	5,4	6,3	6,7

a	-25	-20	-15	-10	-5	0	10	20
ø200	1,4	2,5	3,7	4,9	6,1	7,3	9,8	12,5
13.2.2006 →	1,5	2,8	4,0	5,2	6,5	7,7	10,2	12,7

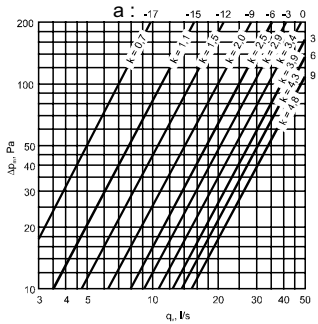
KK-80-C



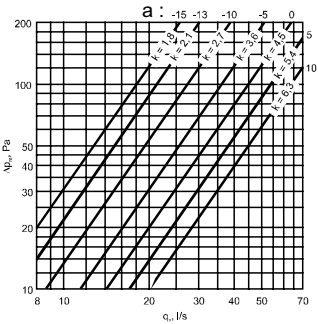
KK-100-C



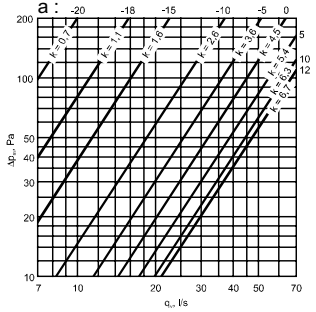
KK-125-C



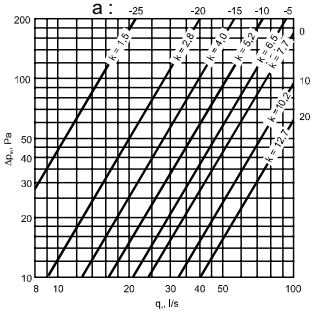
KK-150-C



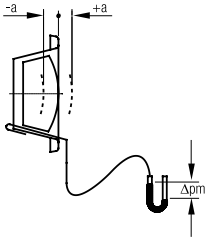
KK-160-C

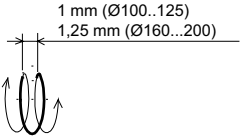


KK-200-C



KSO, KSOF, KSOV





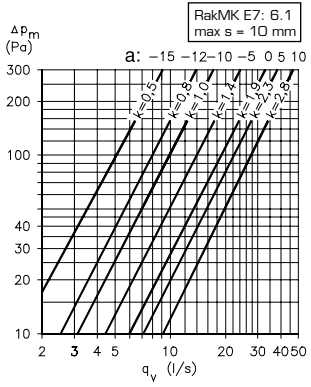
Ø100 a	k
-15	0,5
-12	0,8
-10	1,0
-5	1,4
0	1,9
5	2,3
10	2,8

Ø125 a	k
-10	1,5
-5	2,1
0	2,7
5	3,3
10	4,0

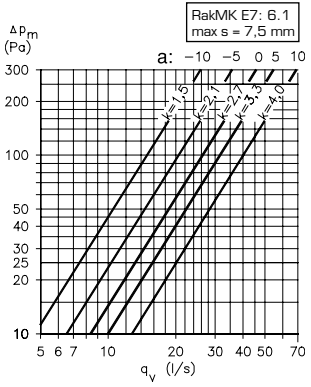
Ø160 a	k
-10	2,0
-5	2,8
0	3,6
5	4,4
10	5,3
15	6,2

Ø200 a	k
-3	1,8
0	2,4
5	3,8
10	5,0
15	6,3
20	7,5
25	8,6

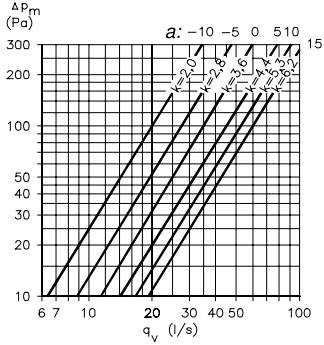
KSO/KSOF/KSOV-100-C



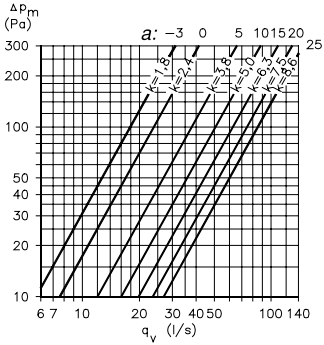
KSO/KSOF/KSOV-125-C



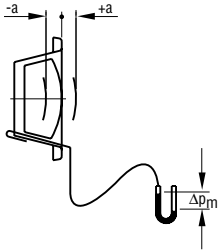
KSO/KSOF/KSOV-160-C



KSO/KSOF/KSOV-200-C



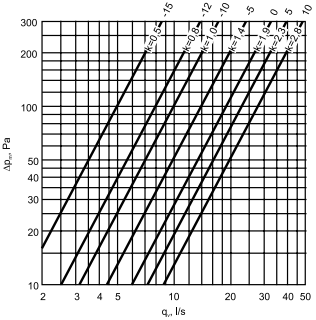
KSOM



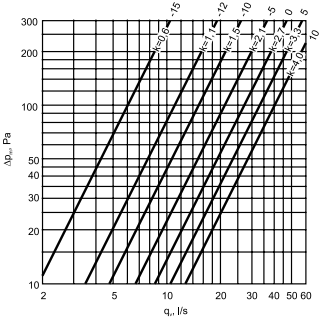
ø100 a	k
-15	0,5
-12	0,8
-10	1,0
-5	1,4
0	1,9
5	2,3
10	2,8

ø125 a	k
-15	0,6
-12	1,1
-10	1,5
-5	2,1
0	2,7
5	3,3
10	4,0

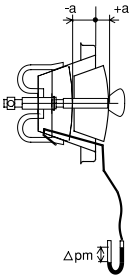
Ø100



Ø125



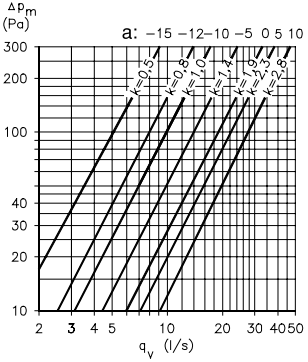
KSOS



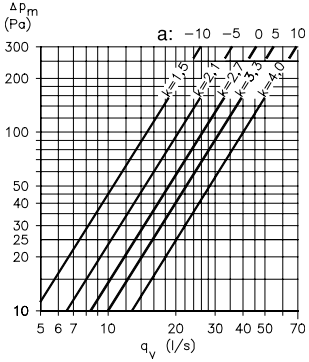
KSOS-100 a	k
-15	0,5
-12	0,8
-10	1,0
-5	1,4
0	1,9
5	2,3
10	2,8

KSOS-125 a	k
-10	1,5
-5	2,1
0	2,7
5	3,3
10	4,0

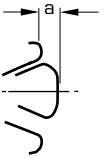
KSOS-100-C



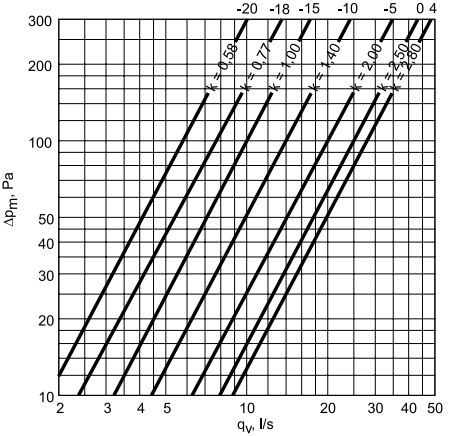
KSOS-125-C



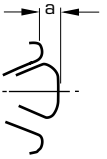
KGEA / KGEB-1



a	-20	-18	-15	-10	-5	0	+4
k	0,58	0,77	1,0	1,4	2,0	2,5	2,8



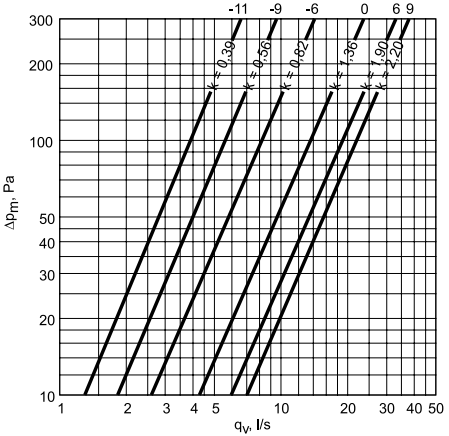
KGEB



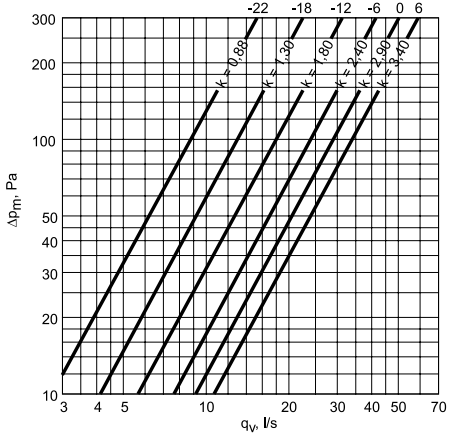
ø100	a	-11	-9	-6	0	+6	+9
	k	0,39	0,56	0,82	1,36	1,9	2,2
ø125	a	-22	-18	-12	-6	0	+6
	k	0,88	1,3	1,8	2,4	2,9	3,4
ø160	a	-24	-18	-12	-6	0	+6
	k	1,8	2,5	3,1	4,1	4,4	5,0
	k *)	1,8	2,5	3,1	3,9	4,6	5,4

*) 1.1.2003 alkaen

KGEB-100-C

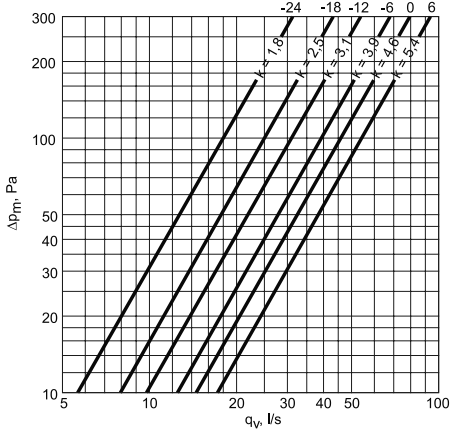


KGEB-125-C

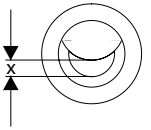


KGEB-160-C

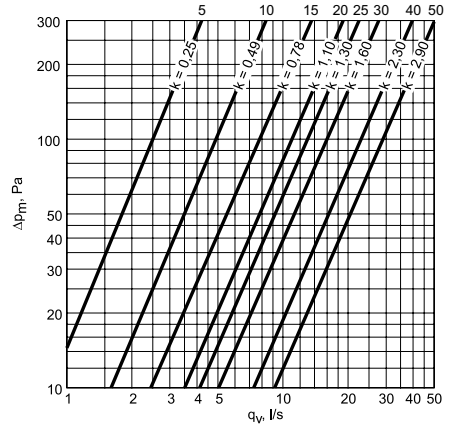
1.1.2003 ->



KGFC



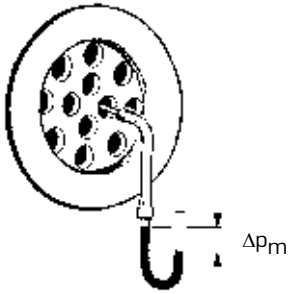
x (mm)	5	10	15	20	25	30	40	50
k	0,25	0,49	0,78	1,1	1,3	1,6	2,3	2,9



BYBA

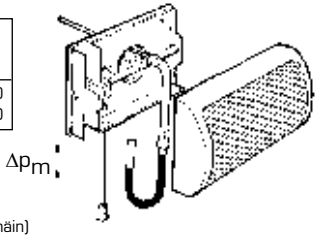
a	1	2	3	4	5	6
k	0,24	0,42	0,59	0,80	0,98	1,2

a	7	8	9	10	11	12
k	1,5	1,6	1,8	2,1	2,3	2,5



BYFA

k-kerroin	BYFA-3	BYFA-4		
		Pos, 1 [1]	2 [2]	3 [3]
Perusilmav.	1,10	0,70	0,80	0,90
Tehostettu iv	4,70	3,00	3,00	3,00

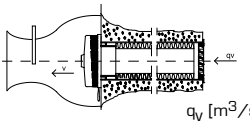


[1] Tila 1 = säätöpellissä 2 tulppaa (toimitetaan näin)

[2] Tila 2 = 1 tulppa poistettu

[3] Tila 3 = 2 tulppaa poistettu

KIV

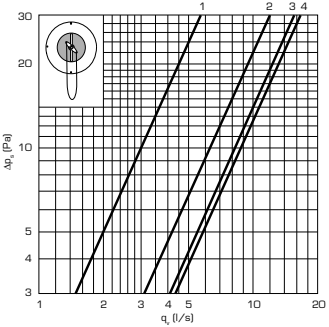


q_V [m^3/s]

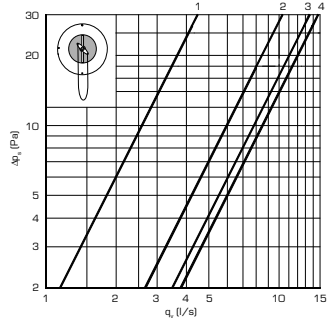
$v = q_V / 0{,}015$

$q_V = v * 0{,}015$

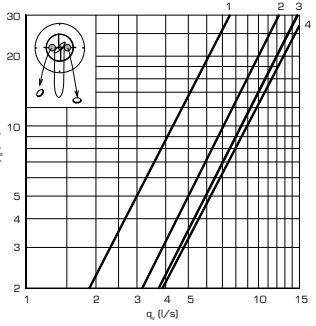
KIV-100



KIV-125

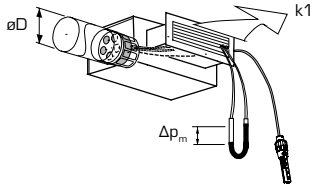


KIV-125

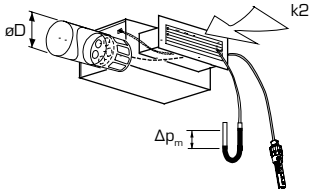


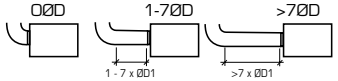
TG/TGE, AVS, SV, USR

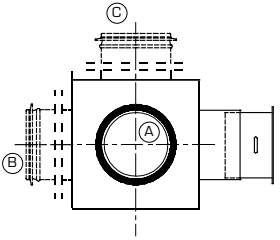
TG



TGE



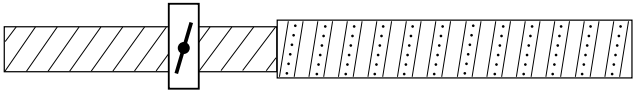




10/2011 lähtien

B x H	ØD	k1 TG			k2 (AVS) TGE			k2 (SV2, USR) TGE		
		0D	1-7D	>7D	A	B	C	A	B	C
200x100	125	10,1	10,6	10,1	9	11	10	11	13	11
300x100	160	17,1	19,9	17,3	15	17	16	19	21	19
400x100	160	17,1	19,9	17,3	22	22	22	25	31	26
500x100	200	27,0	30,8	27,9	34	28	25	34	37	36
600x100	250	47,1	48,8	39,9	36	32	36	38	35	39
800x100	250	47,1	48,8	39,9	53	47	46	60	50	51
1000x100	315	47,1	48,8	39,9	63	59	60	62	62	63
300x150	200	27,0	30,8	27,9	25	27	20	25	34	24
400x150	250	47,1	48,8	39,9	32	34	36	45	46	39
500x150	250	47,1	48,8	39,9	43	47	42	50	52	48
600x150	250	47,1	48,8	39,9	53	53	53	65	92	62
800x150	315	65,9	67,2	64,1	74	77	73	86	90	82
1000x150	315	65,9	67,2	64,1	109	91	96	118	106	103
400x200	250	47,1	48,8	39,9	45	52	43	47	63	45
500x200	315	65,9	67,2	64,1	60	63	63	74	74	61
600x200	315	65,9	67,2	64,1	75	77	71	80	89	70
800x200	315	65,9	67,2	64,1	82	107	104	105	131	107
1000x200	315	65,9	67,2	64,1	176	124	139	177	154	151

Activent



Ilmavirta säädetään pellillä

Koko	Suutinsektori				
	2x60°	180 °	240°	300°	360°
		2x90	2x120		
Ø200	2,83	4,24	5,66	7,0	8,49
Ø250	3,38	5,0	6,76	8,27	10,14
Ø315	4,47	6,71	8,94	11,31	13,42
Ø400	5,66	8,45	11,31	14,0	16,90
Ø500	6,76	10,14	13,52	16,90	20,28

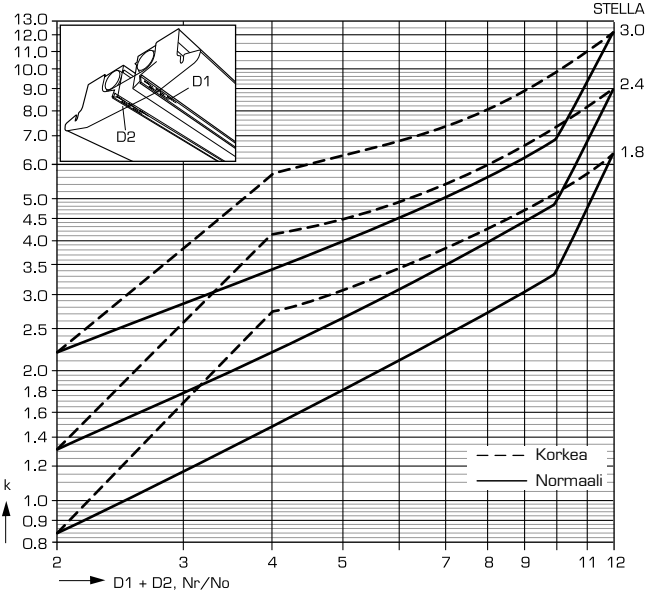
k-arvo antaa ilmavirran 1m kohden.

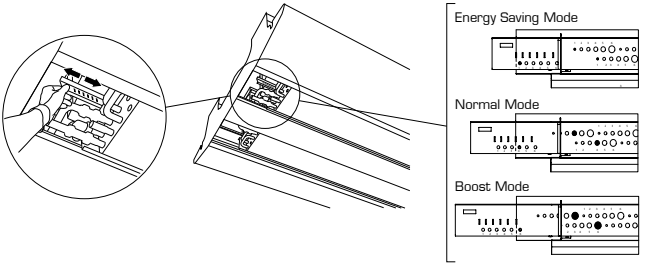
UNO

Suutinkampaa/m	3	4	8	16
k-varvo	1.3	1.9	3.6	7.2

k-arvo antaa ilmavirran 1m kohden.

IQFF STELLA


STELLA
3.0
2.4
1.8
D1
D2
k
Korkea
Normaali
D1 + D2, Nr/No


Energy Saving Mode
Normal Mode
Boost Mode

IQIF WEGA

IQIF-aaa-11-cc-d-e, IQIF-aaa-13-cc-d-e, IQIF-135-22-cc-d-e (Ø125)
IQIF-300-51-cc-d-e, IQIF-300-53-cc-d-e (Ø160)

Nro	k120	k135	k180	k240	k300
1	0,36	0,00	0,56	0,87	1,01
2	0,72	0,35	1,13	1,63	1,97
3	1,16	0,81	1,79	2,54	3,16
4	1,65	1,60	2,53	3,62	4,63
5	2,03	2,85	3,16	4,53	5,76
6	3,03	3,60	4,81	6,92	9,02

IQIF-aaa-71-cc-d-e, IQIF-aaa-73-cc-d-e (Ø100)

Nro	k120	k180	k240
1	0,36	0,56	0,87
2	0,72	1,13	1,63
3	1,16	1,79	2,54
4	1,65	2,53	3,38
5	2,03	3,08	4,08
6	2,89	4,32	5,55

D1 = D2

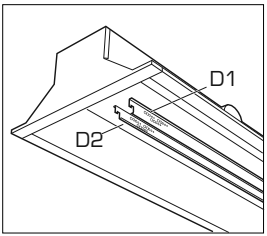
$q = k\sqrt{\Delta p_m}$ [l/s] [Pa]

$q = 3{,}6\,k\sqrt{\Delta p_m}$ [m^3/h] [Pa]

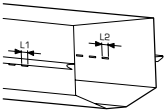
D1 ≠ D2

$q = \left(\frac{k_{D1}}{2} + \frac{k_{D2}}{2}\right)\sqrt{\Delta p_m}$ [l/s] [Pa]

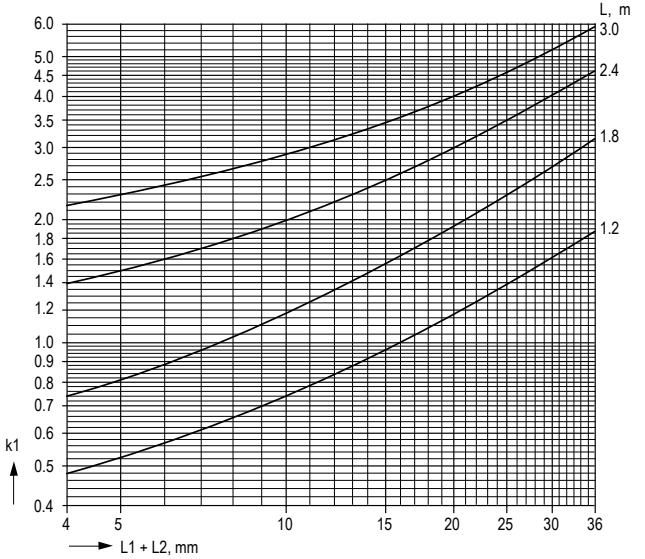
$q = 3{,}6\left(\frac{k_{D1}}{2} + \frac{k_{D2}}{2}\right)\sqrt{\Delta p_m}$ [m^3/h] [Pa]

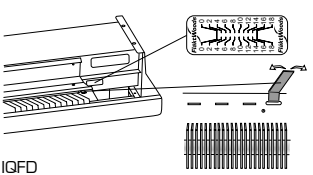


IQFD/IQFE

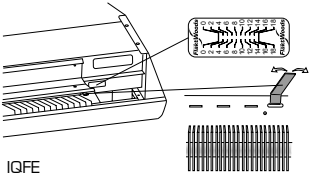


k1



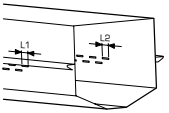


IQFD

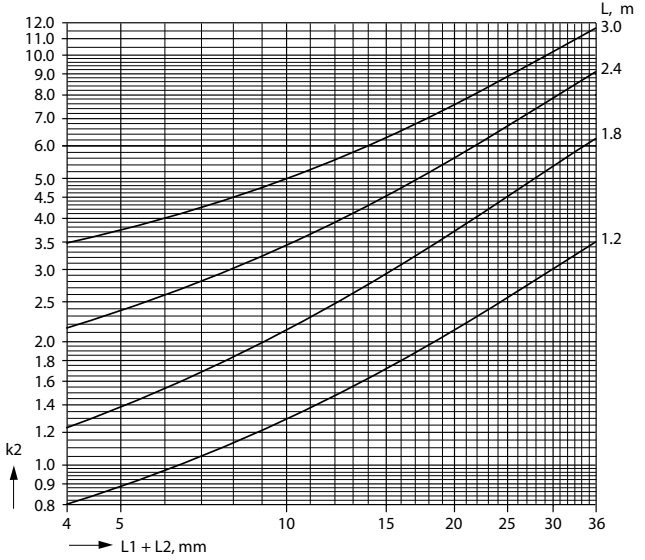


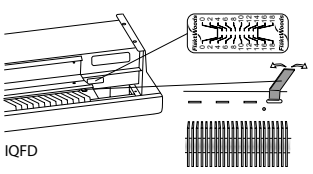
IQFE

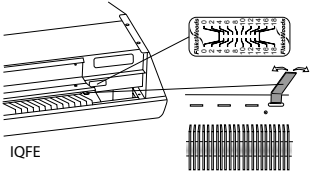
IQFD/IQFE


L1
L2

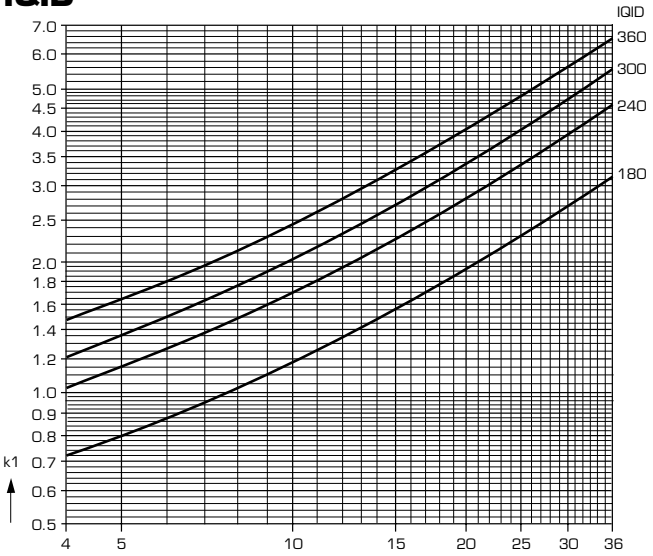
k2


L, m
3.0
2.4
1.8
1.2
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.8
1.6
1.4
1.2
1.0
0.9
0.8
k2
4
5
10
15
20
25
30
36
L1 + L2, mm

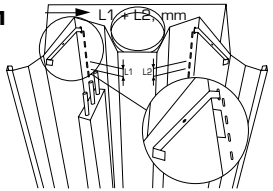

IQFD

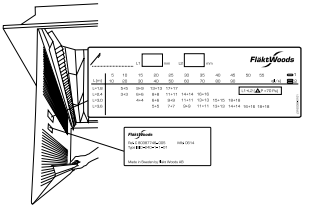

IQFE

IQID

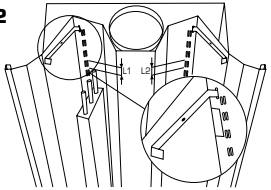

IQID
360
300
240
180
k1
7.0
6.0
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.8
1.6
1.4
1.2
1.0
0.9
0.8
0.7
0.6
0.5
4
5
10
15
20
25
30
36

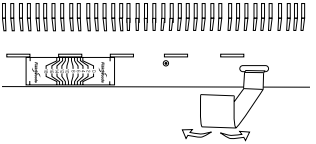
k1


L1 + L2 mm
L1
L2

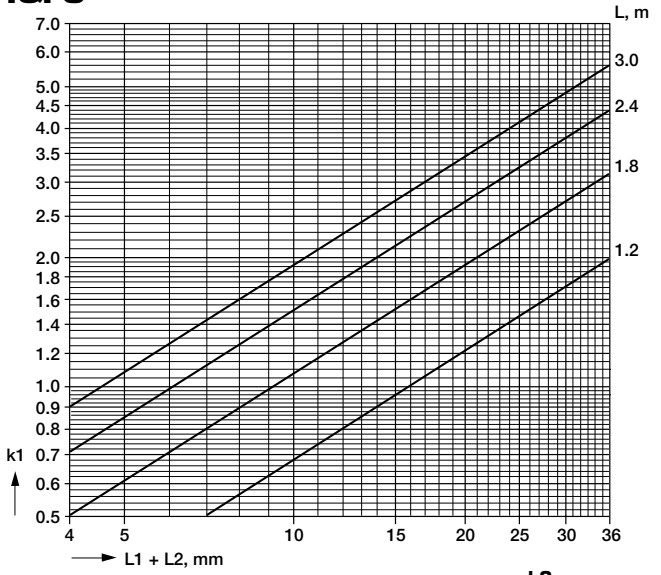

FläktWoods

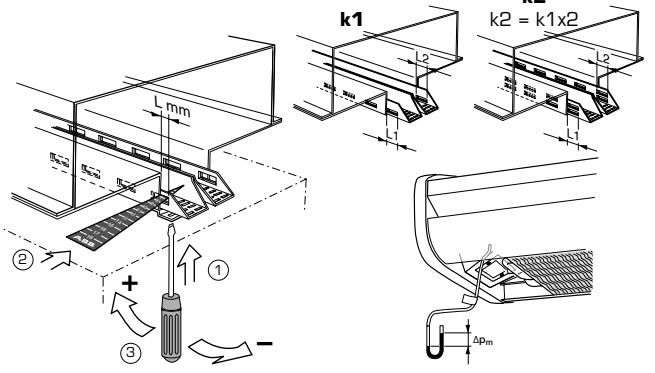
k2


L1
L2

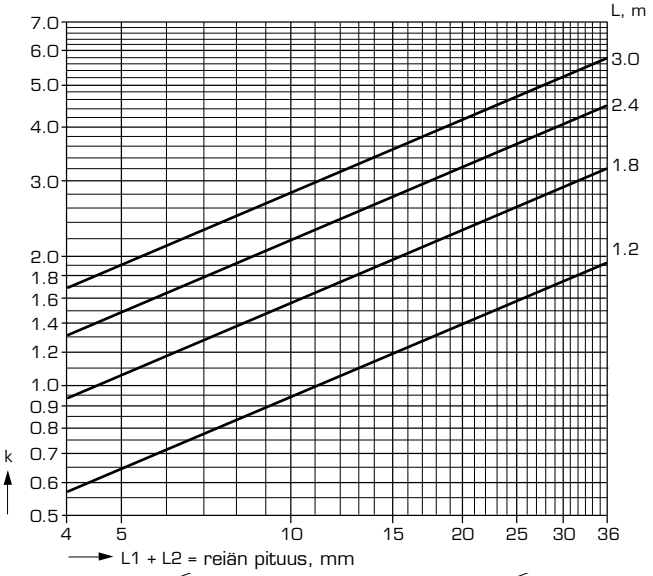


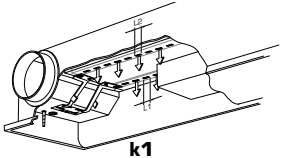
IQFC



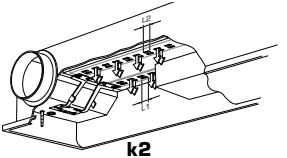


IQSA



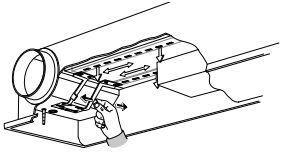


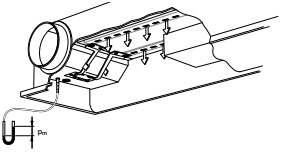
k1



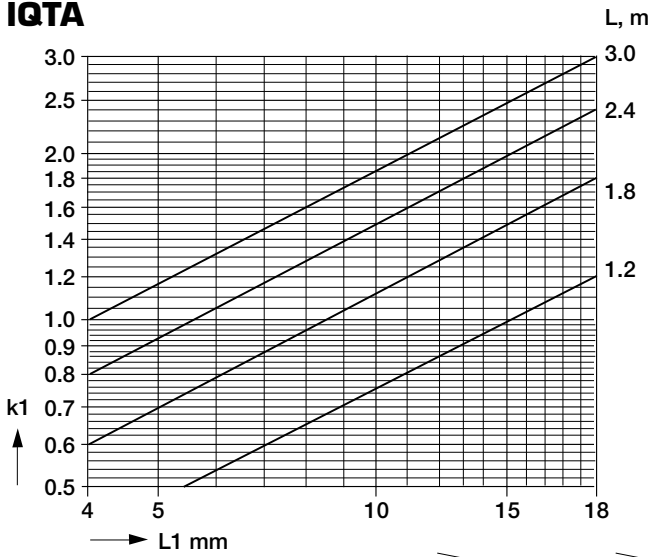
k2

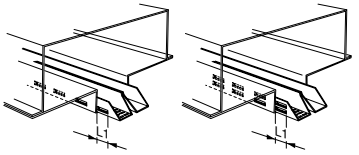
k2 = k1x2





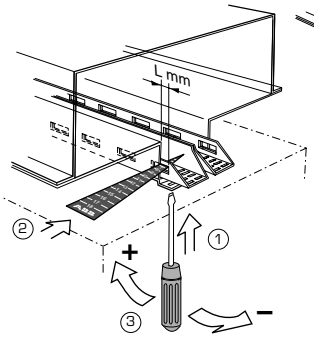
IQTA

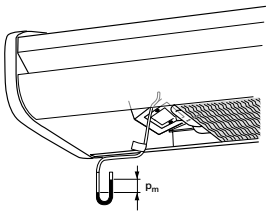




k1 **k2**

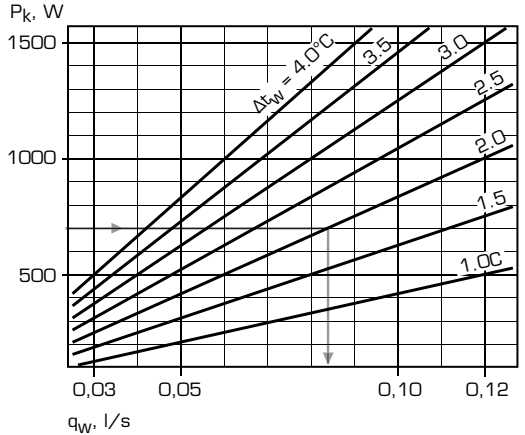
k2 = k1x2



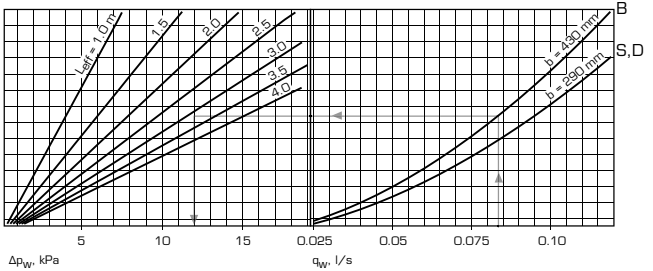


QP(S,B,D,)A

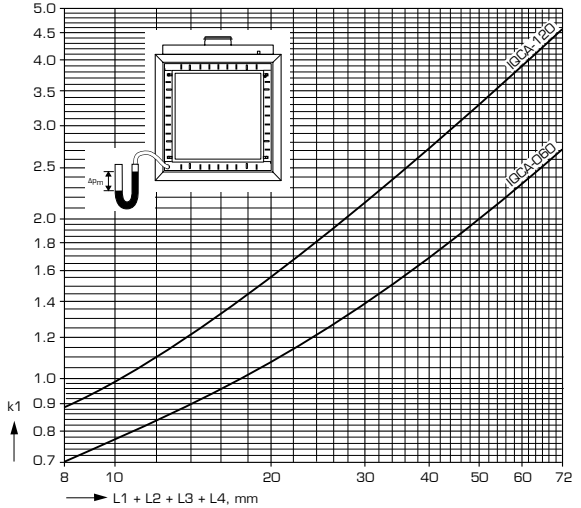
Vesivirta

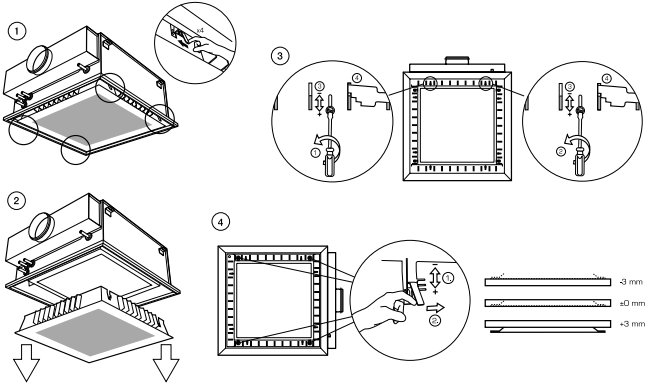


Painehäviö, vesi, kPa



IQCA


5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.8
1.6
1.4
1.2
1.0
0.9
0.8
0.7
k1
8
10
20
30
40
50
60
72
L1 + L2 + L3 + L4, mm
IQCA 1200
IQCA 0600
Δpm


1
2
3
4
-3 mm
±0 mm
+3 mm

EMA(S,E), EMS(S,D)

EMA(S,E)-1 ja EMS(S,D)-1 05/2014 lähtien

EMA(S,E)-5 ja EMS(S,D)-5/-6 08/2014 lähtien

Koko	**100**	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**
Ilmavirtasäädin									
EMAS, EMAE *	4,2	6,0	10	16	25	40	64	–	–
EMSS, EMSD *	4,2	6,0	10	16	25	40	64	90	165

*) K-arvo on keskiarvo koko käyttöalueelle (säätöläpän avaus 30-100%).

EMSF

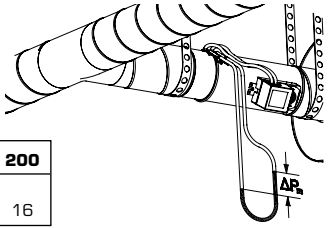
04/2015 lähtien

Koko	**100**	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**
Mittalaite									
EMSF	4,0	6,2	10	16	25	39	64	99	157

EHA(S,E), EHS(S,D), EHSF

Koko	**100**	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**
Ilmavirtasäädin									
EHAS, EHAE	5,6	11	20	32	52	77	121	–	–
EHSS, EHSD	5,6	11	20	32	52	77	121	184	275
Mittalaite									
EHSF	5,6	11	20	32	52	77	121	184	275

HVSA



Koko	**100**	**125**	**160**	**200**
Huoneistosäädinyksikkö				
HVSA	4,0	6,0	10	16

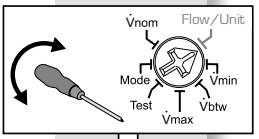
EMA(S,E), EMS(S,D) arvojen asettelu

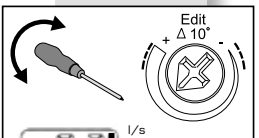
1

Ilmavirtayksikön valinta

Tehdasasetus

l/s





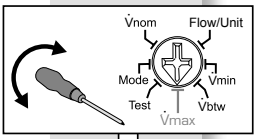
Valinnan jälkeen näyttö vilkkuu kaksi kertaa vahvistaen uuden asetuksen tallentamisen.

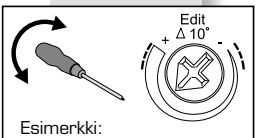
2

Vmax asettelu

Tehdasasetus

100% Vnom



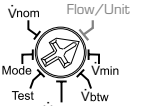


Esimerkki:

Vmax = 100 l/s

Valinnan jälkeen näyttö vilkkuu kaksi kertaa vahvistaen uuden asetuksen tallentamisen.

Asetukset tehtyäsi käännä toiminnonvalitsin osoittamaan toimintoa "Flow" saadaksesi ilmavirtanäytön aktiiviseksi.

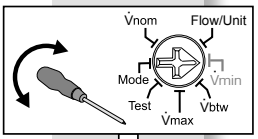


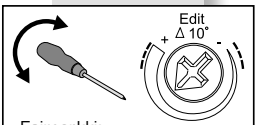
3

Vmin asettelu

Tehdasasetus

0% Vnom





Esimerkki:

Vmin = 50 l/s

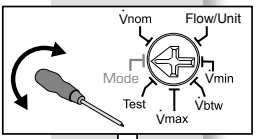
Valinnan jälkeen näyttö vilkkuu kaksi kertaa vahvistaen uuden asetuksen tallentamisen.

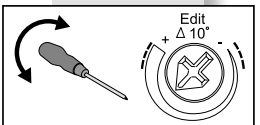
4

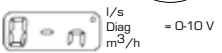
Ohjausviesti-alueen asettelu

Tehdasasetus

0-10 V

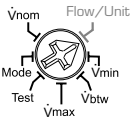






Valinnan jälkeen näyttö vilkkuu kaksi kertaa vahvistaen uuden asetuksen tallentamisen.

Asetukset tehtyäsi käännä toiminnonvalitsin osoittamaan toimintoa "Flow" saadaksesi ilmavirtanäytön aktiiviseksi.



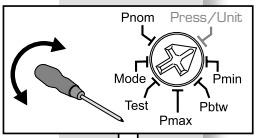
EMPA, EMPD arvojen asettelu

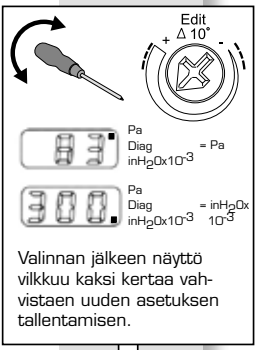
1

Paineyksikön valinta

Tehdasasetus

Pa





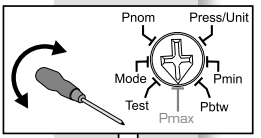
Valinnan jälkeen näyttö vilkkuu kaksi kertaa vahvistaen uuden asetuksen tallentamisen.

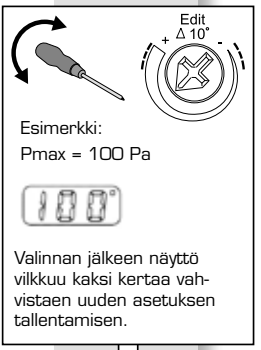
2

Pmax asettelu

Tehdasasetus

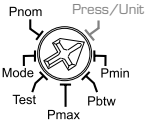
300 Pa





Valinnan jälkeen näyttö vilkkuu kaksi kertaa vahvistaen uuden asetuksen tallentamisen.

Asetukset tehtyäsi käännä toiminnonvalitsin osoittamaan toimintoa Press/Unit saadaksesi painenäytön aktiiviseksi.

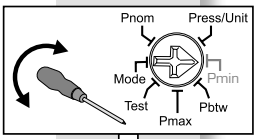


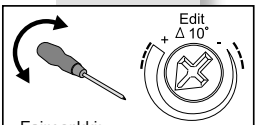
3

Pmin asettelu

Tehdasasetus

0 Pa





Esimerkki:

Pmin = 50 Pa

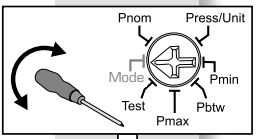
Valinnan jälkeen näyttö vilkkuu kaksi kertaa vahvistaen uuden asetuksen tallentamisen.

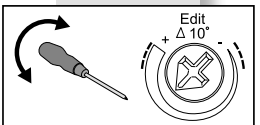
4

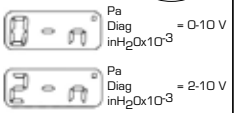
Ohjausviesti-alueen asettelu

Tehdasasetus

0-10 V

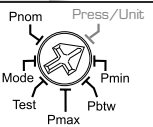




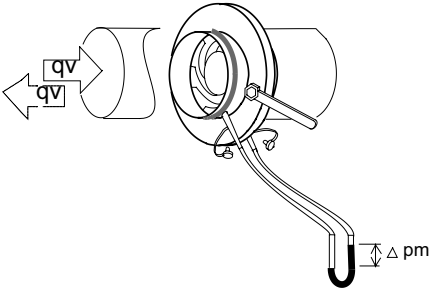


Valinnan jälkeen näyttö vilkkuu kaksi kertaa vahvistaen uuden asetuksen tallentamisen.

Asetukset tehtyäsi käännä toiminnonvalitsin osoittamaan toimintoa Press/Unit saadaksesi painenäytön aktiiviseksi.



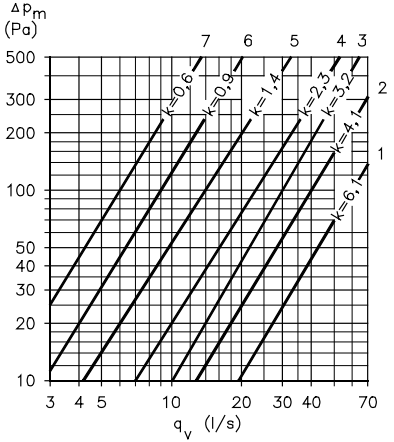
IRIS



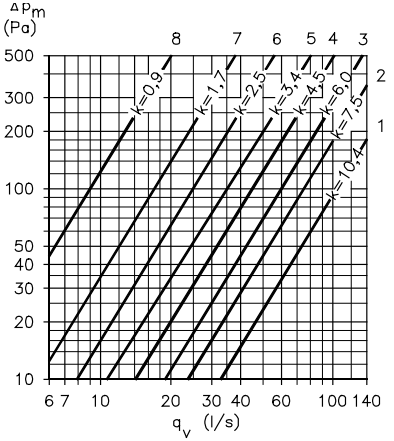
Ø	a							
	1	2	3	4	5	6	7	8
80	6,1	4,1	3,2	2,3	1,4	0,9	0,6	-
100	10,4	7,5	6,0	4,5	3,4	2,5	1,7	0,9
125	13,8	8,8	6,5	4,7	3,5	2,7	1,5	-
150	24,1	16,5	13,4	11,0	8,9	6,9	5,2	3,7
160	22,1	14,8	12,5	10,7	8,5	6,8	4,9	3,5
200	44,2	30,9	23,2	18,2	14,0	11,0	8,4	5,0
250	64,4	45,6	38,7	30,7	24,1	18,4	12,8	8,9
315	118,0	70,0	58,7	45,1	37,0	30,0	21,8	15,8
400	131,0	102,0	88,3	67,3	52,7	38,5	28,4	15,5
500	230,0	177,0	146,0	112,0	88,5	66,6	48,0	30,0
630	451,0	297,0	238,0	169,0	127,0	91,6	62,8	35,1
800	489,0	402,0	344,0	267,0	217,0	170,0	122,0	73,7

Ø	a						
	1,5	2,5	3,5	4,5	5,5	6,5	7,5
100	7,9	6,6	5,2	3,8	2,9	2,1	1,2
125	10,4	7,3	5,5	4,0	3,1	2,2	-
150	20,0	14,9	12,0	10,0	7,9	6,0	4,4
160	17,2	13,4	11,5	9,5	7,5	5,6	4,0
200	36,6	26,9	20,6	15,9	12,3	9,6	6,5
250	53,5	41,8	34,5	27,3	21,4	15,8	10,9
315	88,3	64,5	53,0	42,4	33,3	25,9	19,0

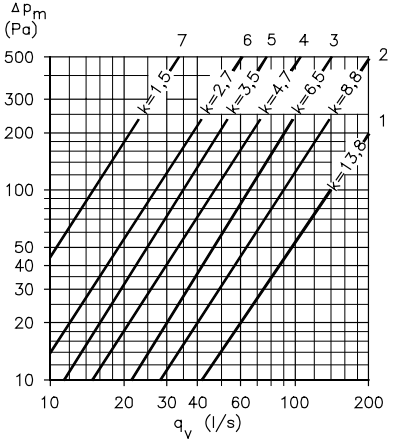
IRIS-080



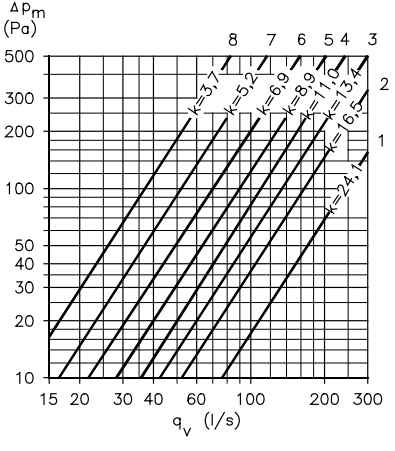
IRIS-100



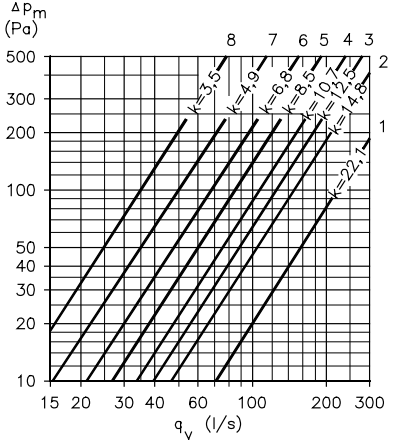
IRIS-125



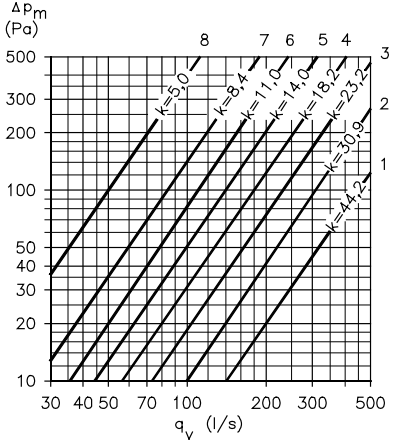
IRIS-150



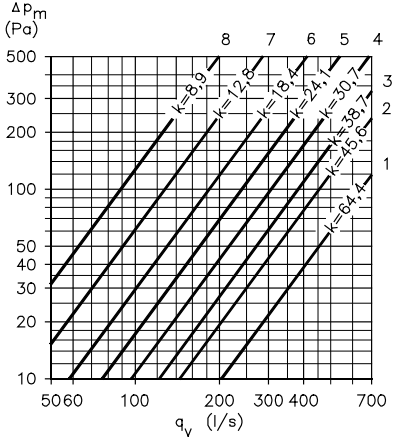
IRIS-160



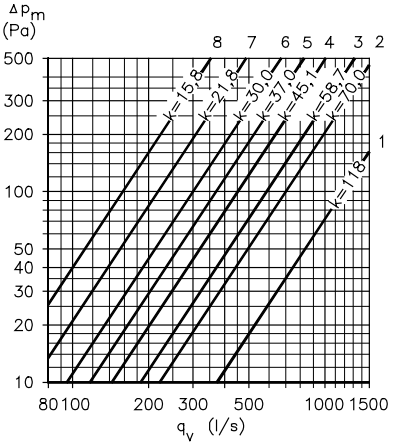
IRIS-200



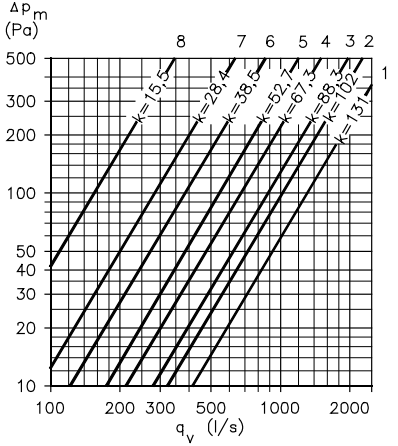
IRIS-250



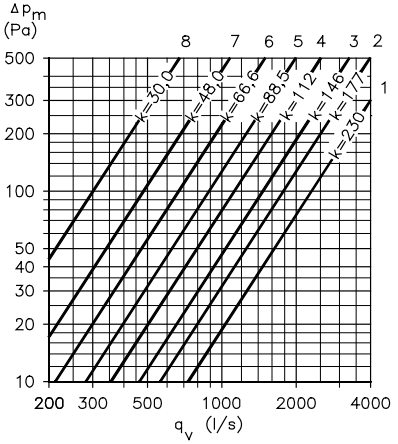
IRIS-315



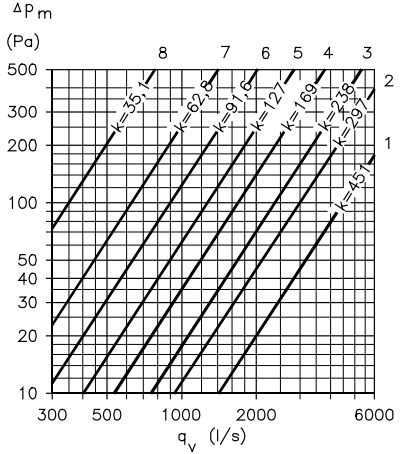
IRIS-400



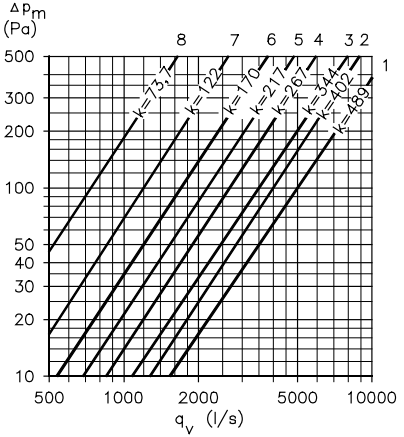
IRIS-500



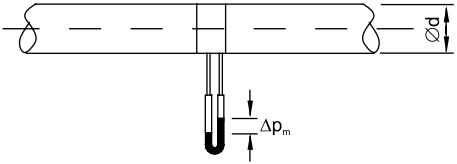
IRIS-630



IRIS-800



MR



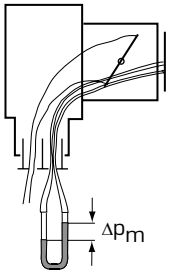
MR	k
100	4,0
125	7,4
160	13,6
200	23,4
250	40
315	66
400	114
500	180
630	294
800	481
1000	764
1250	1330

Vanhat tuotteet

CTAA

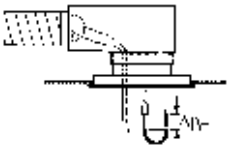
(toimitettu ennen 09.1996)

Number of slots	k1
1, 2	16.8
3, 4	26.9



CTBA (mittaus kanavassa)

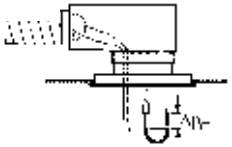
(toimitettu ennen 09.1996)



Koko	b = 1	b = 2, 5	b = 3	b = 4	b = 4
16–b	3,70	6,30	8,20	8,20	7,50
20–b	6,00	11,2	12,9	14,3	11,1
25–b	9,30	14,1	14,4	15,2	14,4
31–b	12,7	19,9	22,4	24,3	21,7
40–b	16,2	28,3	32,9	32,9	30,2
50–b	20,9	38,3	46,9	50,3	39,7

CTCA (mittaus kanavassa)

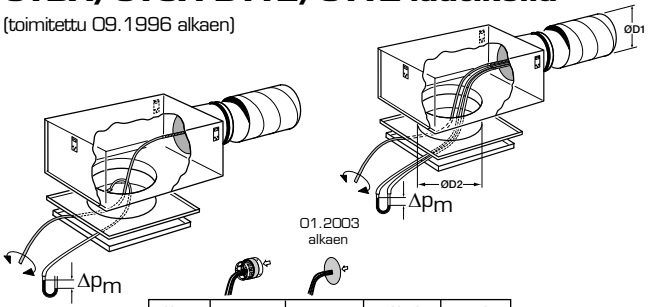
(toimitettu ennen 09.1996)



Koko	b = 1	b = 2, 5	b = 3	b = 4	b = 4
16–b	2,70	5,10	6,00	6,80	6,00
20–b	6,00	10,6	12,7	11,6	9,80
25–b	9,00	12,5	14,1	14,2	14,1
31–b	14,3	22,4	25,0	27,0	23,9
40–b	18,6	28,3	32,4	36,5	35,9
50–b	20,6	37,5	51,6	60,3	47,4

CTBA/CTCA DTTZ/CTTZ-laatikolla

(toimitettu 09.1996 alkaen)

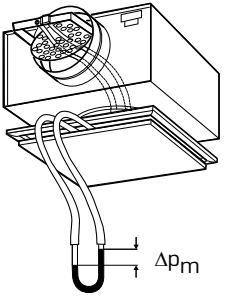


01.2003 alkaen

ØD1	k1	k1	ØD2	k2
100	7.40	7.40	160	13.7
125	13.0	13.0	200	20.0
160	25.3	21.5	250	28.5
200	38.0	36.0	315	35.4
250	63.5	63.5	400	43.0
315	97.0	97.0	500	80.0

Muut ilmalaitteet, säätö tasauslaatikossa CTTZ

(toimitettu 09.1996 alkaen)

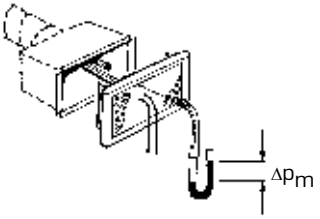


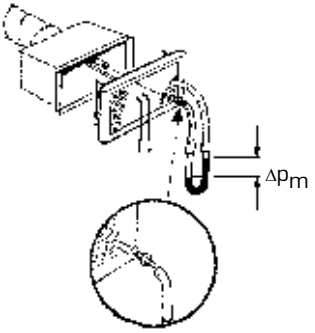
Pätee seuraaviin tuotteisiin

CTEL	DRAD	DRAR	CTUR
CTFA	DRAE	DRAK	UKH
CTFB	DRBA	DRBR	jne.
CTTZ	DRBE	DRBK	

Koko	Liitäntä mitta ØD1	k-arvo Tulo	k-arvo Meno
10	100	6,60	5,60
12	125	10,3	8,80
16	160	16,8	14,3
20	200	26,9	22,9
25	250	41,8	35,5
31	315	64,5	54,8

CTF(A,B,J)





Vanha versio jossa yksi mittapiste

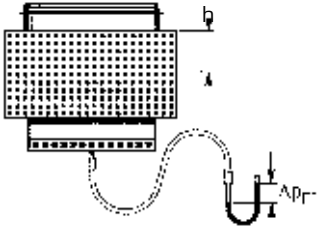
Koko	k1
08	4,50
10	7,90
12	10,6
16	12,2

Kaksi mittapistettä

(toimitettu ennen 08.1996)

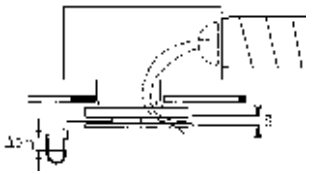
Koko	k1
08	3,80
10	6,60
12	10,3
16	16,8
20	26,8

CTKA



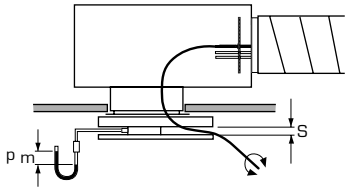
Koko	h	1–v	2–v	3–v	4–v
031	0	30,8	53,4	65,0	84,8
	50	25,6	45,5	58,9	77,1
	100	18,4	35,0	50,0	64,5
	125	14,1	27,6	39,4	51,6
	150	11,2	21,4	31,0	39,7
050	0	72,1	134	159	203
	100	49,6	95,4	134	177
	175	32,8	68,0	94,0	129
	200	28,8	58,6	80,0	111
	225	23,8	48,6	64,8	84,4
080	0	159	305	363	527
	150	120	231	309	453
	200	100	194	260	387
	250	83,0	165	232	335
	300	69,0	134	194	275
	350	51,0	100	144	206

CTPB + ATTA

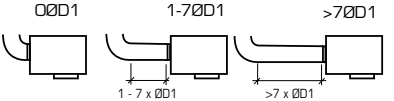


Koko	Mittaus laitteessa					Mittaus ATTA-laatikossa
125	avaus	20	25	30	35	ØD1 = 100 mm
	k-kerroin	5,70	6,30	6,90	7,60	k1 = 7,40
160	avaus	25	30	35	40	ØD1 = 125 mm
	k-kerroin	8,80	9,30	10,5	11,4	k1 = 13,0

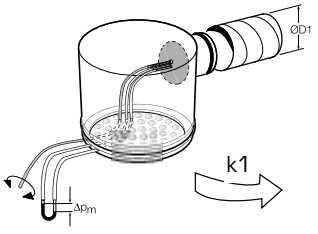
CTPB + ATTB



ØD1	**0ØD1**	**1-7ØD1**	**>7ØD1**
125	10,6	11,7	10,7
160	17,6	20,0	18,5

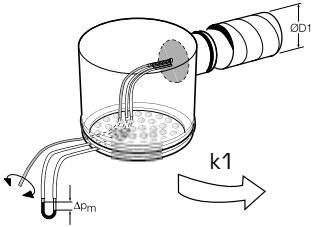


CYLD



		ATTA	
		03.2001 lähtien	03.2003 lähtien
Koko	ØD	k1	k1
100	100	7,4	7,4
125	125	13,0	13,0
160	160	21,5	15,9
200	200	36,0	24,5
250	250	63,5	37,7
315	315	97,0	64,8

CYLP, CYLO

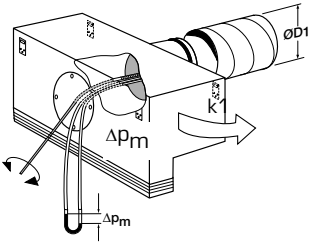


	DTTZ	ATTA	
	09.1996 lähtien	03.2001 lähtien	03.2003 lähtien
ØD1	**k1**	**k1**	**k1**
100	7,4	7,4	7,4
125	13,0	13,0	13,0
160	25,3	21,5	15,9
200	38,0	36,0	24,5
250	63,5	63,5	37,7
315	97,0	97,0	64,8

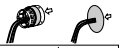
DAAD, DAAP

DAAP

Koko	k1
06	4,00
09	4,00
12	7,40
15	7,40



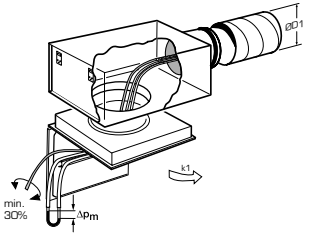
03.2001
lähtien



DAAD

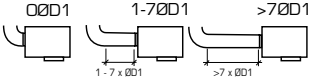
Koko	Rakojen lkm	k1	k1
06, 09	1	7,40	7,40
12, 15	1	13,0	13,0
06, 09	2	13,0	13,0
12, 15	2	25,3	21,5
Kaikki	3	25,3	21,5

DCKA

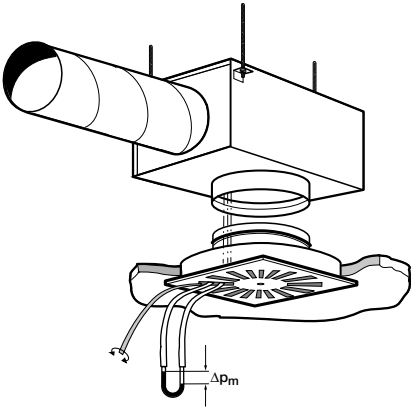


ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250	44,8	50,5	46,7
250 *	40,9	43,2	38,8
315	75,0	80,0	80,0
315 *	64,4	63,2	66,4

* 08.03.2010 lähtien

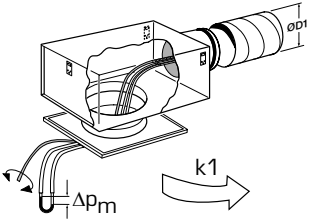


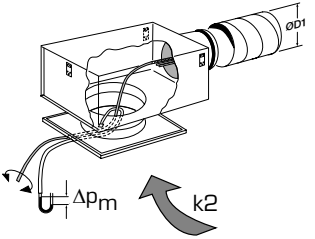
DS(K,R)S, DS(K,R)F



ØD	k1
160	15.9
200	24.5
250	37.7

DV(K,R)F, DV(K,R)S

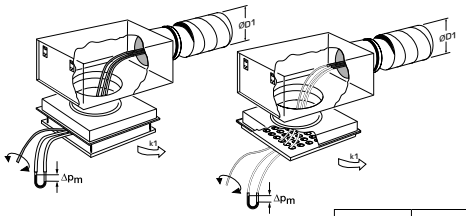




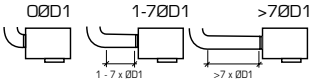
03.2001
lähtien

ØD1	k1	k1	k2
160	25,3	21,5	16,0
200	38,0	36,0	27,0
250	63,5	63,5	40,4

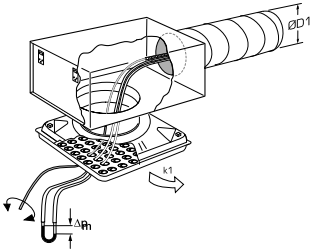
DYCB, DYKB + ATTB



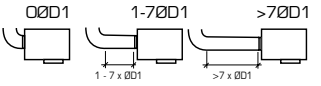
ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250	44,8	50,5	46,7
315	75,0	80,0	80,0



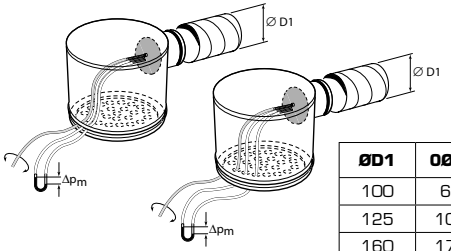
DYCC, DYKC (DYCH, DYKH + ATTB)



ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250	40,9	43,2	38,8
315	64,4	63,2	66,4

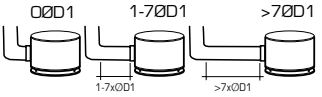


DYFA

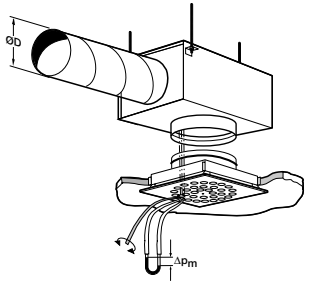


ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250 250 *	44,8 40,9	50,5 43,2	46,7 38,8
315 315 *	75,0 64,4	80,0 63,2	80,0 66,4

* 08.03.2010 lähtien

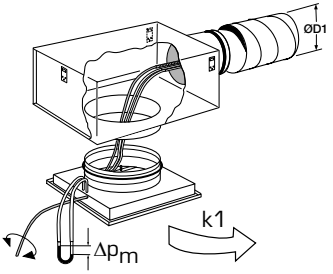


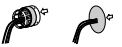
DYKA, DYCA



ØD	k1
100	7.4
125	13.0
160	15.9
200	24.5
250	37.7
315	64.8

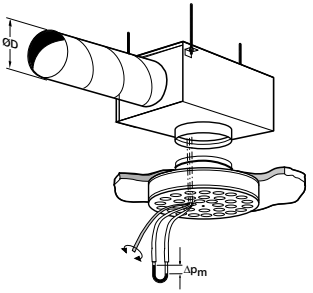
DYK(C,K)





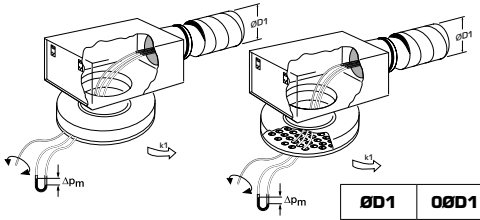
ØD1	k1	k1
125	13.0	13.0
160	25.3	21.5
200	38.0	36.0
250	63.5	63.5
315	97.0	97.0

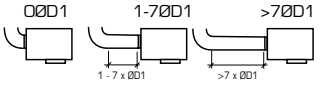
DYSA



ØD	k1
100	7.4
125	13.0
160	15.9
200	24.5
250	37.7
315	64.8

DYSB + ATTB



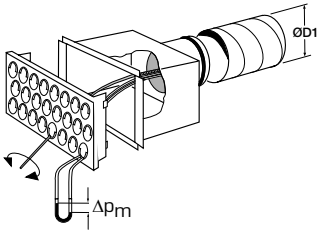


ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250 250 *	44,8 40,9	50,5 43,2	46,7 38,8
315 315 *	75,0 64,4	80,0 63,2	80,0 66,4

* 08.03.2010 lähtien

DYVA

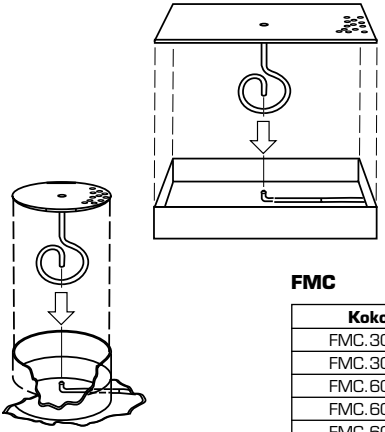
(toimitettu 05.1998 alkaen)



	DTTZ	ATTA	
	05.1998 lähtien	03.2001 lähtien	03.2003 lähtien
ØD1	k1	k1	k1
100	7.4	7.4	7.4
125	13.0	13.0	13.0
160	25.3	21.5	15.9
200	38.0	36.0	24.5

Floormaster FM-90

mittauspellillä



FMC

Koko	k-kerroin
FMC.303	3.16
FMC.306	3.16
FMC.603	8.27
FMC.606	8.27
FMC.608	11.0

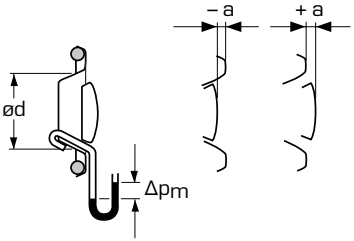
FMK, FMH, FMR

Liitäntämitta mm	k-kerroin
80	2.31
100	3.60
125	5.63
160	9.24
200	14.4
250	22.6
315	35.8
400	57.7
500	90.3
630	143
800	231
1000	360

FMP

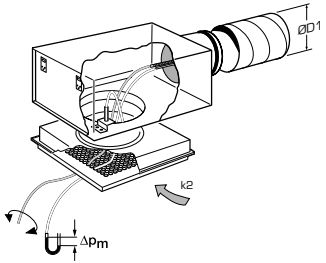
Koko	Korkeus		
	600	1200	2000
FMP.03	6.88		
FMP.04	9.19		
FMP.05	13.8	27.5	
FMP.06	18.4	41.3	
FMP.07	23.0	48.3	
FMP.08	32.1	64.2	110
FMP.09	41.3	82.7	138
FMP.10	48.3	101	179
FMP.11	68.8	129	220

Tuloilmalaite GPD.010



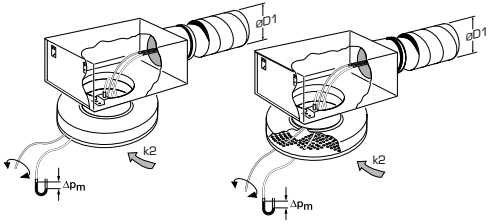
"a" mm	–15	–10	–5	0	5	10
k-kerroin	0.60	0.78	0.90	1.08	1.20	1.32

HPKA + ATTB



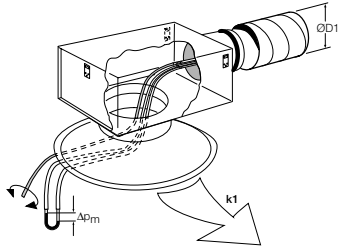
ØD	k2
100	14,6
125	18,6
160	27,8
200	38,5
250	48,9

HPSA + ATTB



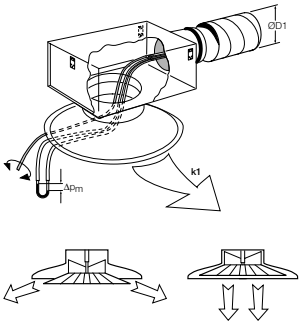
ØD1	k2
100	16,8
125	24,9
160	31,1
200	44,1

KH



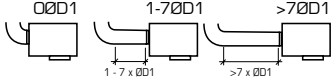
Koko	ød	øD	k1	k1	k1
100	100	100	7.40	7.40	7.40
125	100	125	7.40	7.40	7.40
125	125	125	13.0	13.0	13.0
160	125	160	13.0	13.0	13.0
160	160	160	25.3	21.5	15.9
200	160	200	25.3	21.5	15.9
200	200	200	38.0	36.0	24.5
250	200	250	38.0	36.0	24.5
250	250	250	63.5	63.5	37.7
315	250	315	63.5	63.5	37.7
315	315	315	97.0	97.0	64.8
400	315	400	97.0	97.0	64.8

KH + ATTB

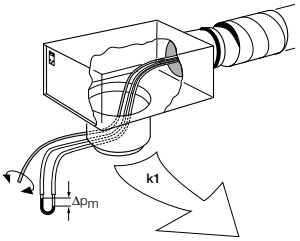


ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250 250 *	44,8 40,9	50,5 43,2	46,7 38,8
315 315 *	75,0 64,4	80,0 63,2	80,0 66,4

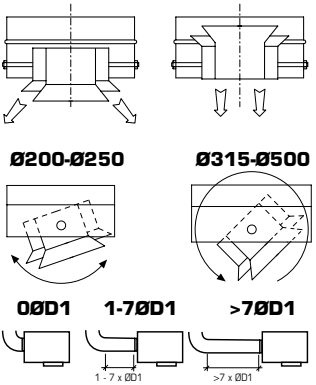
* 08.03.2010 lähtien



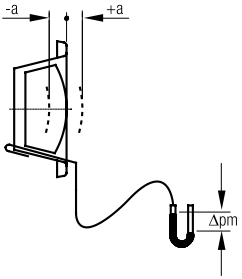
KHD + ATTB



KHD	ØD1	0ØD1	1-7ØD1	>7ØD1
200	160	17,6	20,0	18,5
250	200	26,9	31,6	29,2
315	250	44,8	50,5	46,7
400	315	75,0	80,0	80,0
500	–	–	–	–



KS



KS-100 Avaus a	k
-9	0.6
-6	0.75
-3	0.95
0	1.2
3	1.45
6	1.75
9	2.0
12	2.2

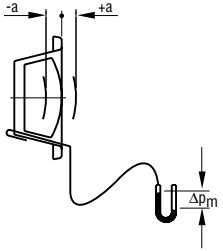
KS-125 Avaus a	k
-12	1.7
-9	1.95
-6	2.25
-3	2.7
0	2.95
6	3.8
9	4.25

KS-150 Avaus a	k
-12	2.3
-6	2.9
0	3.9
6	5.0
12	6.4

KS-160 Avaus a	k
-12	1.4
-9	1.8
-6	2.3
-3	2.8
0	3.3
3	3.8
6	4.2

KS-200 Avaus a	k
-12	5.4
-6	6.45
0	7.8
6	9.0
12	10.1
15	11.0

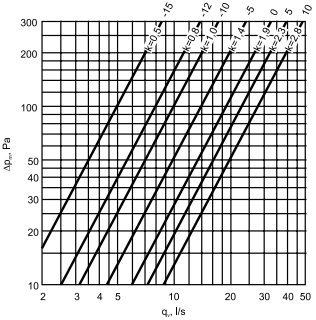
KSO-M, KSO-MH



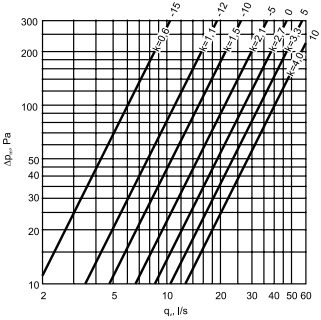
ø100 a	k
-15	0,5
-12	0,8
-10	1,0
-5	1,4
0	1,9
5	2,3
10	2,8

ø125 a	k
-15	0,6
-12	1,1
-10	1,5
-5	2,1
0	2,7
5	3,3
10	4,0

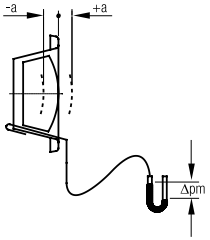
KSO-M-100

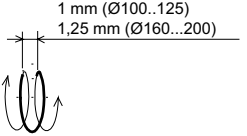


KSO-M-125



KSOP / KSO-P





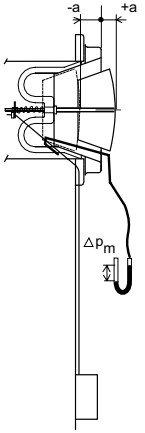
Ø100 a	k
-15	0,5
-12	0,8
-10	1,0
-5	1,4
0	1,9
5	2,3
10	2,8

Ø125 a	k
-10	1,5
-5	2,1
0	2,7
5	3,3
10	4,0

Ø160 a	k
-10	2,0
-5	2,8
0	3,6
5	4,4
10	5,3
15	6,2

Ø200 a	k
-3	1,8
0	2,4
5	3,8
10	5,0
15	6,3
20	7,5
25	8,6

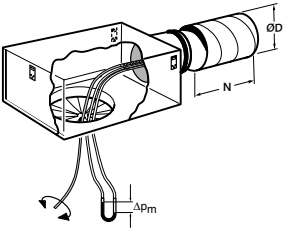
KVM



KVM-100 Avaus a	k
-15	0.5
-12	0.8
-10	1.0
-5	1.4
0	1.9
5	2.3
10	2.8

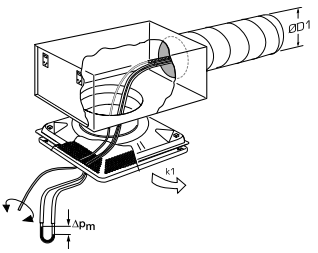
KVM-125 Avaus a	k
-10	1.5
-5	2.1
0	2.7
5	3.3
10	4.0

NWPPlus

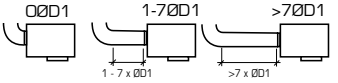


ØD, mm	**k**	**Nmin, mm**
125	13,0	500
160	25,3	500
200	38,0	500
250	63,5	750
315	97,0	750

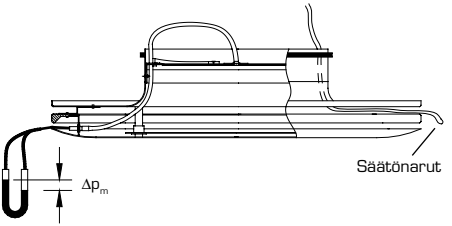
RHKB, RHOB
(RHKH, RHOH + ATTB)



ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250	40,9	43,2	38,8
315	64,4	63,2	66,4

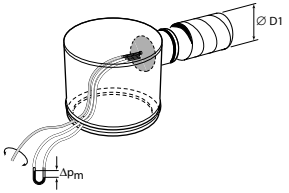


RHU



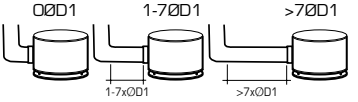
RHU	Narujen väri		k
	Sulkeva	Avaava	
100	Puna-valkoinen	valk.	5,9
125	Musta-valkoinen	valk.	15,0
160	Oranssi-valkoinen	valk.	15,0
200	Sini-valkoinen	valk.	24,4
250	Vihreä-valkoinen	valk.	24,4

ROFA, RPFA

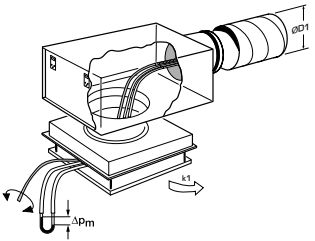


ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250 250 *	44,8 40,9	50,5 43,2	46,7 38,8
315 315 *	75,0 64,4	80,0 63,2	80,0 66,4

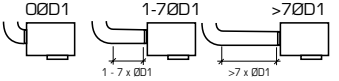
* 08.03.2010 lähtien



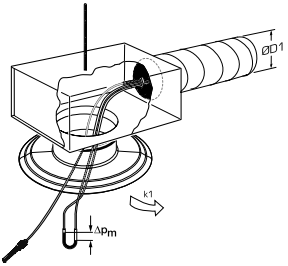
ROKA, RPKA + ATTB



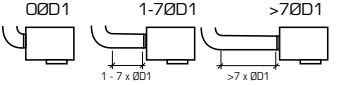
ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250	44,8	50,5	46,7
315	75,0	80,0	80,0



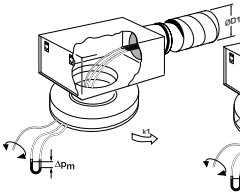
RORB, RPRB
(RORH, RPRH + ATTC)

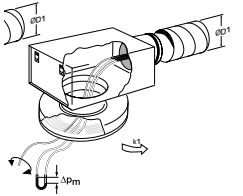


ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,0	6,3	5,9
125	10,1	10,6	10,1
160	17,1	19,9	17,3
200	27,0	30,8	27,9
250	47,1	48,8	39,9
315	65,9	67,2	64,1

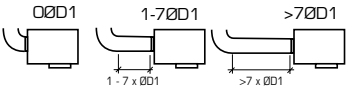


ROSA, RPSA + ATTB

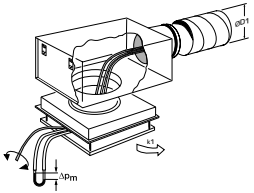




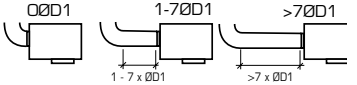
ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250	44,8	50,5	46,7
315	75,0	80,0	80,0



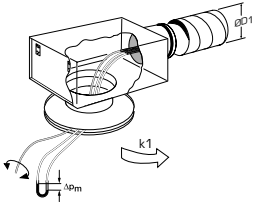
RSKO, RSKP + ATTB



ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250	44,8	50,5	46,7
315	75,0	80,0	80,0

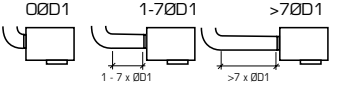


RSRO, RSRP + ATTB

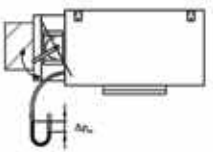


ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250 250 *	44,8 40,9	50,5 43,2	46,7 38,8
315 315 *	75,0 64,4	80,0 63,2	80,0 66,4

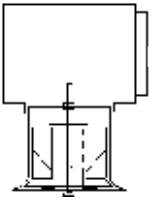
* 08.03.2010 lähtien



SDZA



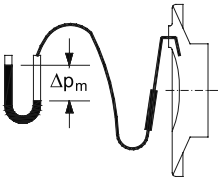
Ilmavirta mitataan ilmavirransäätimellä ja säädetään kanavapellillä tai vaihtoehtoisesti liitoslaatikossa olevalla kanavapellillä.



SDZA ilman liitäntälaatikkoa

SDZA	k
315	37,3
400	58,9
500	79,0
630	133,4
710	169,3

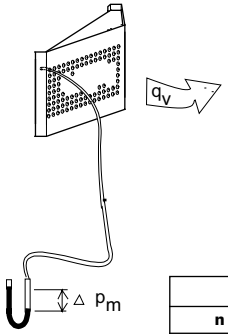
SE

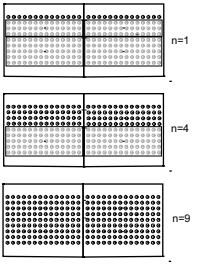


SE-100 Reikiä auki	k
3	1.1
4	1.3
5	1.5
6	1.6
7	1.9

SE-125 Reikiä auki	k
3	1.7
4	2.2
5	2.6
6	3.1
7	3.3

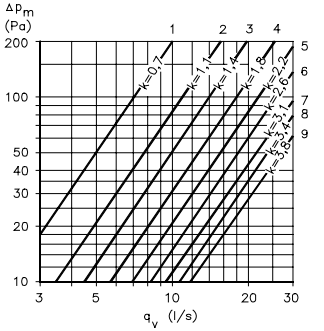
STH



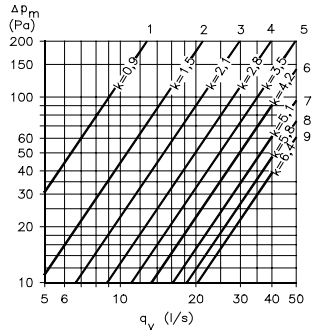


k		
n	**100**	**125**
1	0,7	0,9
2	1,1	1,5
3	1,4	2,1
4	1,8	2,8
5	2,2	3,5
6	2,6	4,2
7	3,1	5,1
8	3,4	5,8
9	3,8	6,4

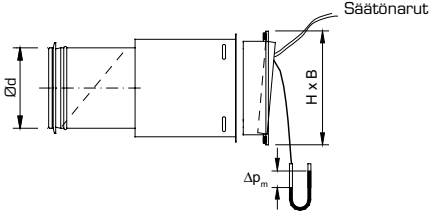
STH-100



STH-125

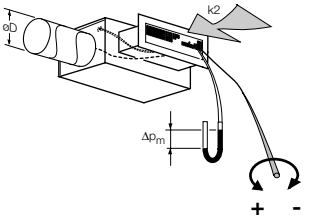


SVB säätönaruilla



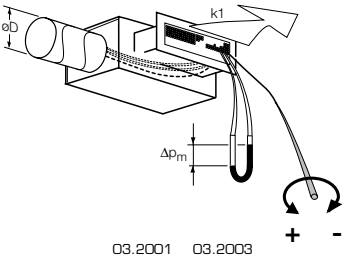
SVB-	H x B	k	
		Etulevy	
		auki	kiinni
80	125 x 320	3,7	3,2
100	175 x 420	4,9	4,4
125	175 x 520	7,0	6,4
160	225 x 620	10,4	8,9
200	245 x 820	14,0	12,5

SVE



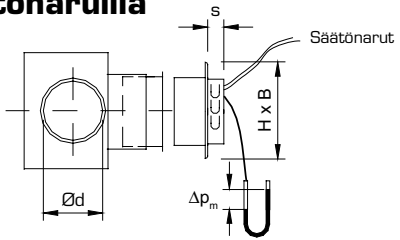
Koko	**B x H**	**k2**	
		s = 30 mm	**s = 0 mm**
100	366 x 128	9.30	7.0
125	516 x 128	15.2	11.8
160	616 x 128	20.1	18.0
200	716 x 178	44.6	34.1

SVQ



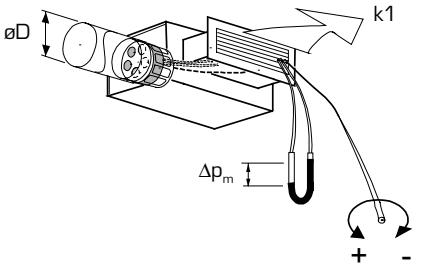
ØD	B x H	k1	k1	k1
100	366 x 128	7.40	7.40	7.40
125	516 x 128	13.0	13.0	13.0
160	616 x 128	25.3	21.5	15.9
200	716 x 178	38.0	36.0	24.5

SVQ säätönaruilla



SVQ-	H x B	k	
		Etulevyn säätö	
		s = 30 mm	s = 0 mm
100	125 x 367	6,8	5,8
125	126 x 517	11,8	9,7
160	126 x 617	16,2	14,4
200	176 x 717	27,1	24,7

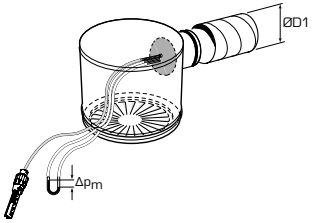
TG



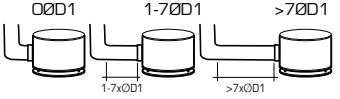
B x H	ØD	k1 3.2001 asti	k1 3.01 - 2.03	k1 3.03 - 9.11
200x100	125	13,0	13,0	13,0
300x100	160	25,3	21,5	15,9
400x100	160	25,3	21,5	15,9
500x100	200	38,0	36,0	24,5
600x100	250	63,5	63,5	37,7
800x100	250	63,5	63,5	37,7
1000x100	250	63,5	63,5	37,7
300x150	200	38,0	36,0	24,5
400x150	250	63,5	63,5	37,7
500x150	250	63,5	63,5	37,7
600x150	250	63,5	63,5	37,7
800x150	315	97,0	97,0	64,8
1000x150	315	97,0	97,0	64,8
400x200	250	63,5	63,5	37,7
500x200	315	97,0	97,0	64,8
600x200	315	97,0	97,0	64,8
800x200	315	97,0	97,0	64,8
1000x200	315	97,0	97,0	64,8

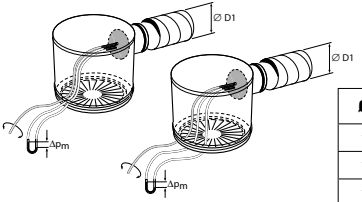
VFFA

10/2011 lähtien



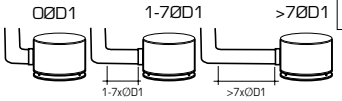
ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,0	6,3	5,9
125	10,1	10,6	10,1
160	17,1	19,9	17,3
200	27,0	30,8	27,9
250	47,1	48,8	39,9
315	65,9	67,2	64,1



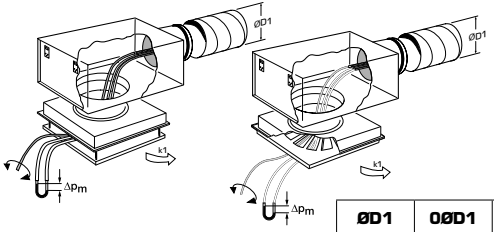


ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250 250 *	44,8 40,9	50,5 43,2	46,7 38,8
315 315 *	75,0 64,4	80,0 63,2	80,0 66,4

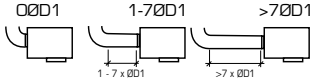
* 08.03.2010 lähtien



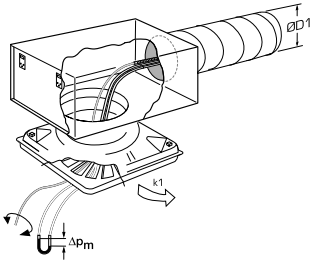
VFKA + ATTB



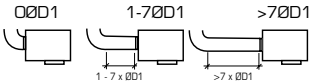
ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250	44,8	50,5	46,7
315	75,0	80,0	80,0



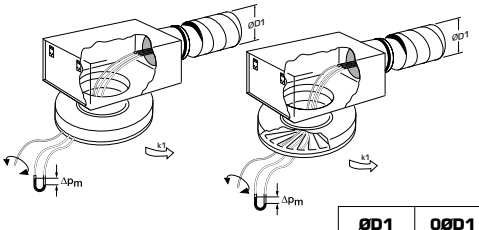
VFKB (VFKH + ATTB)



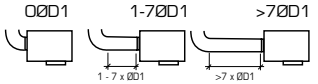
ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250	40,9	43,2	38,8
315	64,4	63,2	66,4



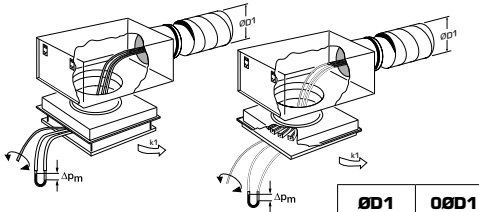
VFSA + ATTB



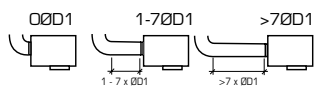
ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250	44,8	50,5	46,7
315	75,0	80,0	80,0



VSKA + ATTB

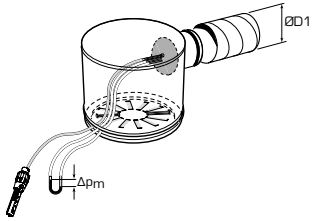


ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250	44,8	50,5	46,7
315	75,0	80,0	80,0

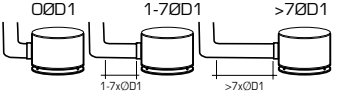


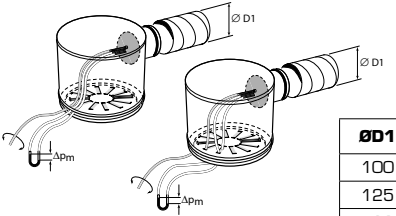
VSFA

10/2011 lähtien

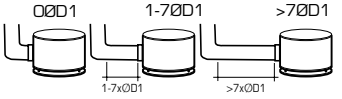


ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,0	6,3	5,9
125	10,1	10,6	10,1
160	17,1	19,9	17,3
200	27,0	30,8	27,9
250	47,1	48,8	39,9
315	65,9	67,2	64,1



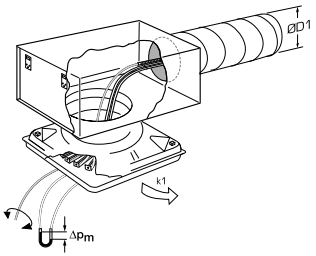


ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250 250 *	44,8 40,9	50,5 43,2	46,7 38,8
315 315 *	75,0 64,4	80,0 63,2	80,0 66,4

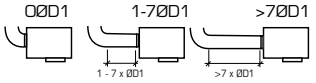


* 08.03.2010 lähtien

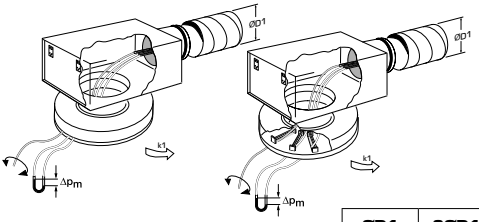
VSKB (VSKH + ATTB)



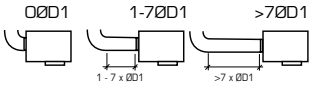
ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250	40,9	43,2	38,8
315	64,4	63,2	66,4



VSSA + ATTB

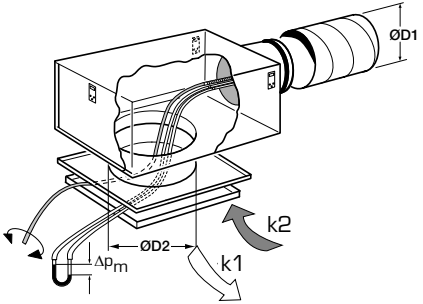


ØD1	0ØD1	1-7ØD1	>7ØD1
100	6,7	7,0	6,3
125	10,6	11,7	10,7
160	17,6	20,0	18,5
200	26,9	31,6	29,2
250	44,8	50,5	46,7
315	75,0	80,0	80,0



Varimix ATTA/ATFA tasauslaatikolla

CTDK (CTDA)	RHRO = RSRO + ATTA
CTDL (CTDB)	RHRP = RSRP + ATTA
CTEK (CTEA)	RHKO = RSKO + ATTA
CTEL (CTEB)	RHKP = RSKP + ATTA



	DTTZ 09.1996 lähtien	ATTA 03.2001 lähtien	ATTA 03.2003 lähtien	ATFA		
ØD1	**k1**	**k1**	**k1**	**ØD2**	**k2** [1)]
100	7.4	7.4	7.4	125	–
125	13.0	13.0	13.0	160	12.2
160	25.3	21.5	15.9	200	19.7
200	38.0	36.0	24.5	250	26.0
250	63.5	63.5	37.7	315	31.5
315	97.0	97.0	64.8	400	46.0

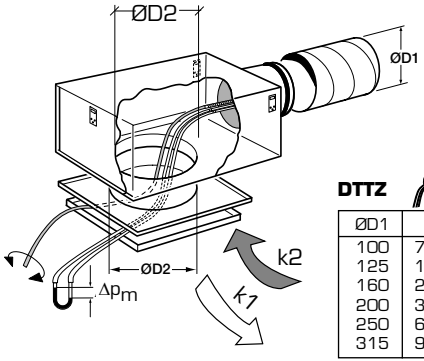
1) Nämä arvot pätevät 25 mm:n nimellisraolla.

Varimix
jossa mittaus tasauslaatikossa DTTZ

(toimitettu 09.1996 alkaen)

RHRO = RSRO + DTTZ
RHRP = RSRP + DTTZ

RHKO = RSKO + DTTZ
RHKP = RSKP + DTTZ



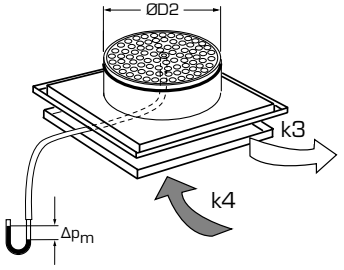
DTTZ

03. 2001 lähtien

ØD1	k1	k1	ØD2	k2
100	7.40	7.40	125	–
125	13.0	13.0	160	22.5
160	25.3	21.5	200	33.7
200	38.0	36.0	250	52.0
250	63.5	63.5	315	74.6
315	97.0	97.0	400	97.0

Varimix jossa mittaus laitteessa

CTDA, CTDB, CTEA, CTEB



	ØD2	k3	k3	k3	k3	k4
CTDA	125	6.50	7.60	7.50	7.80	–
	160	8.90	10.7	11.3	12.4	–
	200	13.7	16.9	16.1	17.4	–
	250	18.2	22.4	21.4	23.4	–
	315	25.9	32.4	29.7	34.5	–
	400	–	38.2	34.2	40.1	–
CTDB	125	5.90	6.50	6.80	7.10	6.40
	160	7.70	9.40	9.80	10.5	9.90
	200	13.2	16.9	15.5	17.6	14.6
	250	19.0	23.8	21.4	25.0	20.0
	315	24.8	31.8	28.5	34.2	33.0
	400	–	39.8	30.0	41.3	53.2
CTEA	125	6.90	7.90	7.90	8.30	–
	160	10.4	12.9	13.2	14.1	–
	200	13.7	16.9	16.1	17.4	–
	250	19.0	22.5	21.3	24.6	–
	315	26.6	33.6	31.2	36.4	–
	400	–	43.6	37.8	45.7	–
CTEB	125	6.60	7.30	7.50	7.80	6.40
	160	10.0	11.6	12.3	13.1	9.90
	200	12.4	15.9	15.2	16.6	14.6
	250	16.8	22.0	19.9	23.9	20.0
	315	27.5	31.0	30.2	36.4	33.0
	400	–	38.8	36.6	44.6	53.2

EMA(S,E)

toimitettu ennen 05/2014 (EMAS/EMAE-1) ja ennen 08/2015 (EMAS/EMAE-5)

Koko	100	125	160	200	250	315	400	500	630
Ilmavirtasäädin									
EMAS, EMAE	4,0	6,0	10	16	25	40	64	–	–

EHO(S,E)

Koko	100	125	160	200	250	315	400	500	630
Ilmavirtasäädin									
EHOS, EHOE	5,6	11	20	32	52	77	121	–	–

EMO(S,E), EMS(S,D)

20.06.2008 alkaen

Koko	100	125	160	200	250	315	400	500	630
Ilmavirtasäädin									
EMOS, EMOE	4,0	6,0	10	16	25	40	64	–	–
EMSS, EMSD	4,0	6,0	10	16	25	40	64	98	152

EMOE, EMOS, EMSS, EMSD, EMSF

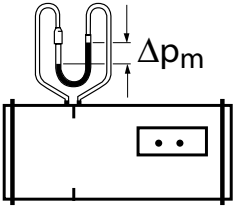
(toimitettu ennen 20.06.2008)

Koko	100	125	160	200	250	315	400	500	630
Ilmavirtasäädin									
EMOE, EMOS	5,18	10,0	19,0	31,0	46,0	75,0	117	–	–
EMSS, EMSD	5,18	10,0	19,0	31,0	46,0	75,0	117	171	240
Mittalaite									
EMSF	5,18	10,0	19,0	31,0	46,0	75,0	117	171	240

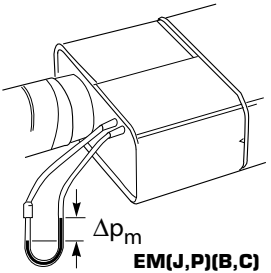
(toimitettu ennen 04/2015)

Koko	100	125	160	200	250	315	400	500	630
Mittalaite									
EMSF	4,0	6,0	10	16	25	40	64	98	152

Säätö- ja mittalaitteet, EMSM, EM(J,P)(B,C), EMJT, EMJF



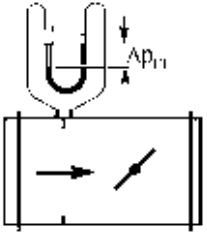
EMSM, EMSF, EMSS, EMSD



EM(J,P)(B,C) EMJT, EMJF EMOE, EMOS

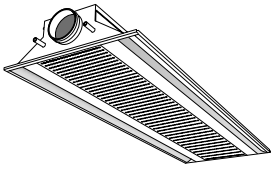
Koko	080	100	125	160	200	250	315	400	500
Säätö- ja mittalaite EMSM	–	5.18	10.0	18.9	32.9	52.1	90.8	142	224
Ilmavirtasäädin EM(J.P)(B.C)	–	5.18	10.0	18.9	32.9	52.1	90.8	142	–
EMJ(T.F)	–	3.70	5.90	10.7	19.5	34.5	64.8	117	–

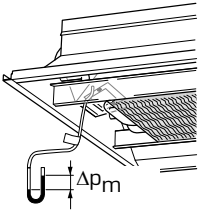
EHCA, EHCB

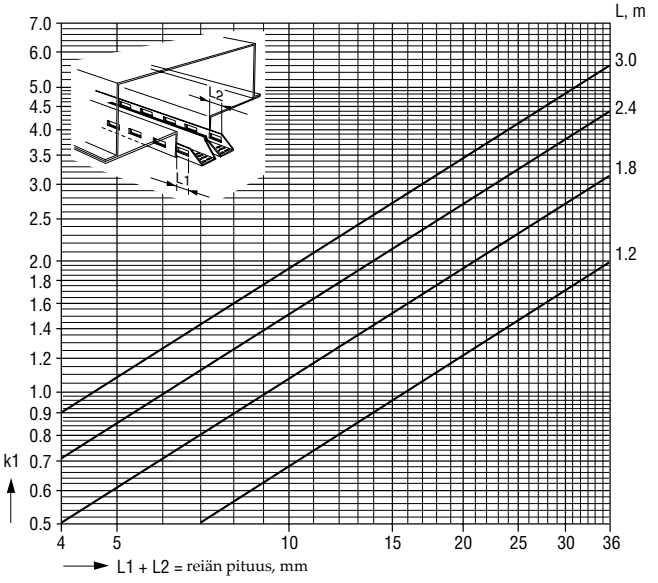


Koko Ilmavirtasäädin	008	010	012	016	020	025	031	040	050
EHC(A,B)	2.54	5.18	10.0	18.9	32.9	52.1	90.8	142	224

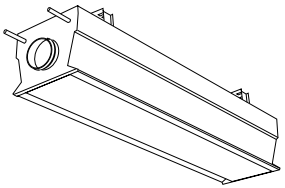
IQIB/IQIC

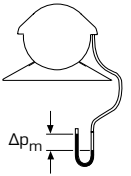


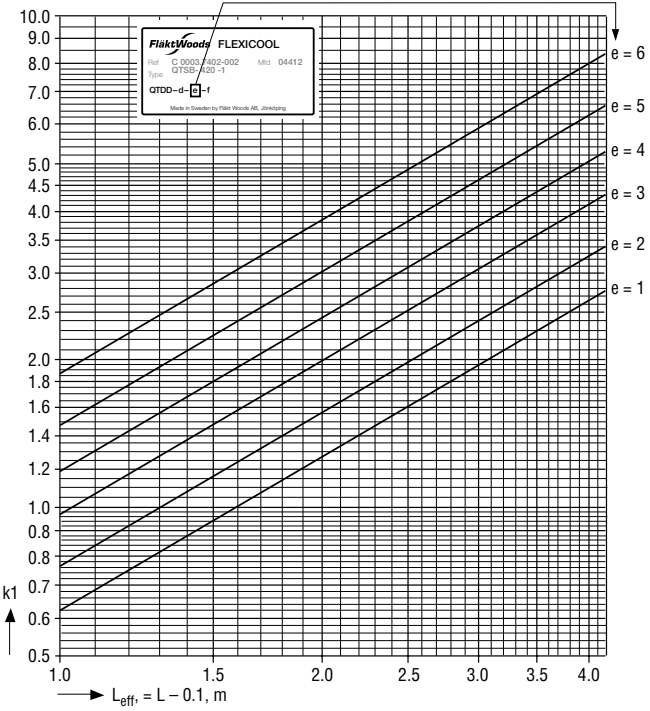




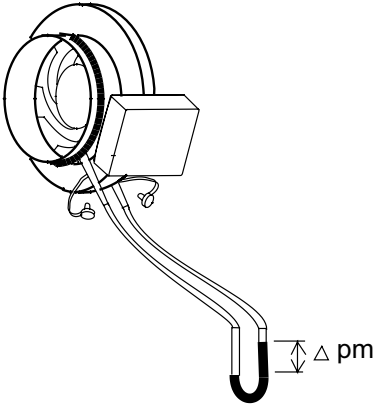
QTSB (QTSS)




Δp
m


Fläkt Woods FLEXICOOL
Ref C 0003 7402-002 Mfd 04412
Type QTSB -620 -1
QTDD–d–e–f
Made in Sweden by Fläkt Woods AB, Jönköping
e = 6
e = 5
e = 4
e = 3
e = 2
e = 1
k1
10.0
9.0
8.0
7.0
6.0
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.8
0.7
0.6
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
L_eff, = L – 0.1, m

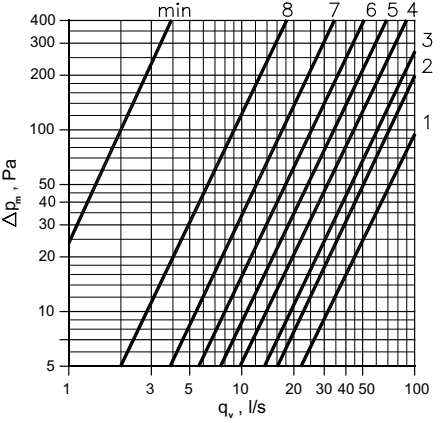
IRIS-M



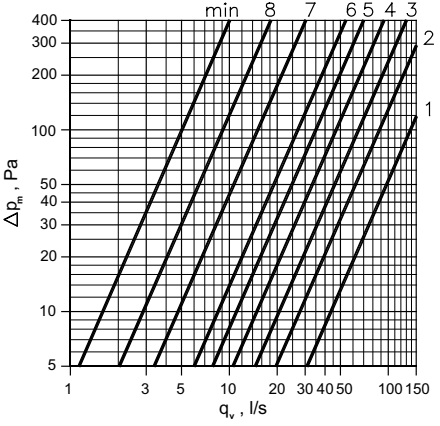
Ø	a								
	1	2	3	4	5	6	7	8	min
100	10,4	7,5	6,0	4,5	3,4	2,5	1,7	0,9	0,2
125	13,8	8,8	6,5	4,7	3,5	2,7	1,5	0,9	0,5
160	22,1	14,8	12,5	10,7	8,5	6,8	4,9	3,5	2,1
200	44,2	30,9	23,2	18,2	14,0	11,0	8,4	5,0	1,1
250	64,4	45,6	38,7	30,7	24,1	18,4	12,8	8,9	3,2
315	118,0	70,0	58,7	45,1	37,0	30,0	21,8	15,8	10,3

Ø	a							
	1,5	2,5	3,5	4,5	5,5	6,5	7,5	8,5
100	7,9	6,6	5,2	3,8	2,9	2,1	1,2	0,4
125	10,4	7,3	5,5	4,0	3,1	2,2	1,0	-
160	17,2	13,4	11,5	9,5	7,5	5,6	4,0	2,6
200	36,6	26,9	20,6	15,9	12,3	9,6	6,5	3,0
250	53,5	41,8	34,5	27,3	21,4	15,8	10,9	6,1
315	88,3	64,5	53,0	42,4	33,3	25,9	19,0	12,9

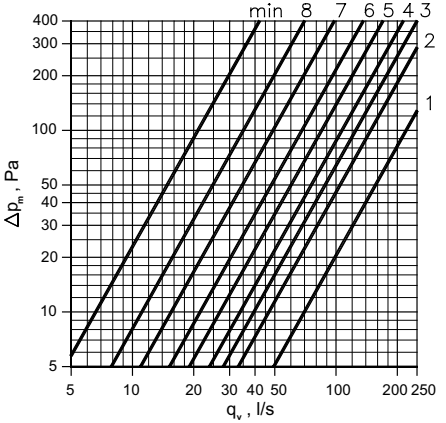
IRIS-M-100



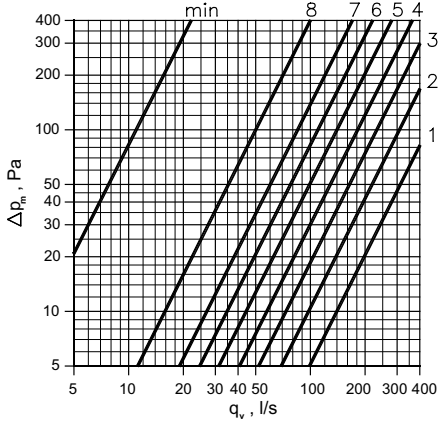
IRIS-M-125



IRIS-M-160



IRIS-M-200



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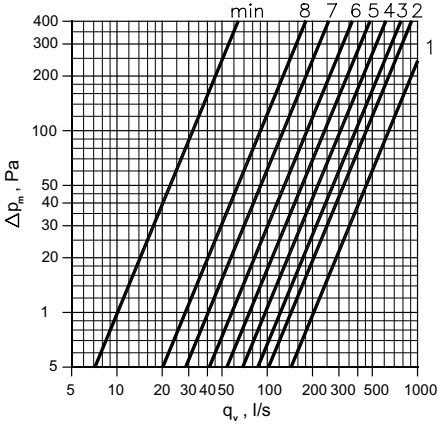
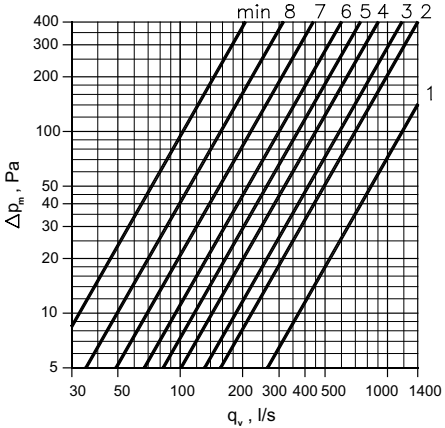
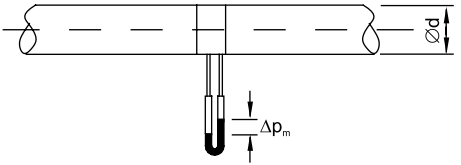


IRIS-M-315



MRS



MRS	k
100	4,0
125	7,4
160	13,6
200	23,4
250	40
315	66

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