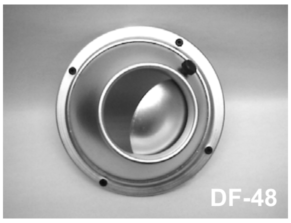
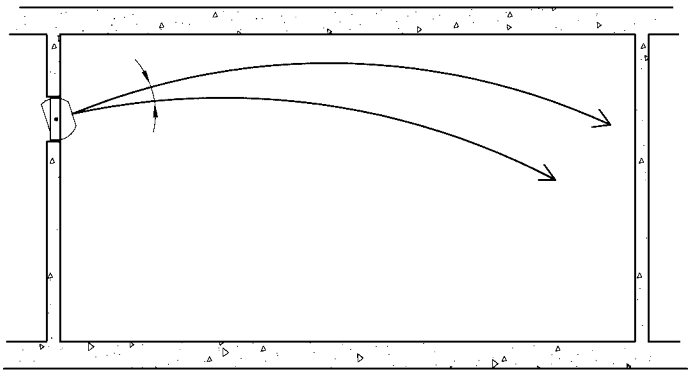
Contents



DF-47 rectangular diffuser

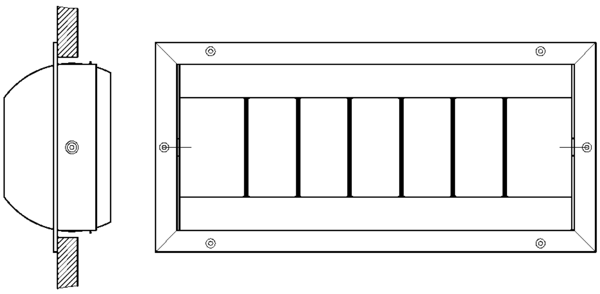
Description

The **DF-47** long-throw rectangular diffuser is manufactured entirely of anodised aluminium with a natural finish. The diffuser is composed of a drum allowing the unit to be swiveled, thereby permitting the inlet airflow to be vertically positioned at an angle of ±30º. The unit is also equipped with deflecting blades for distributing the air in horizontal fan-shape or concentrating the inlet airflow in the desired direction.



Application

These long-throw, high-flow diffusers are particularly useful when the air jet should reach some distance or should be fanned out. They are specially recommended for sport centres, industrial warehouses, clean rooms, recording studios, discotheques, large premises, etc.



Dimensions and mounting

The dimensions correspond to the size of the opening. The diffuser is always screw-mounted, either directly to the surface or using the **MM-47** mounting frame. Also available are **29-0-47** adjustment assemblies that can be accessed with a screwdriver from the front of the diffuser. See dimension tables on page 5.

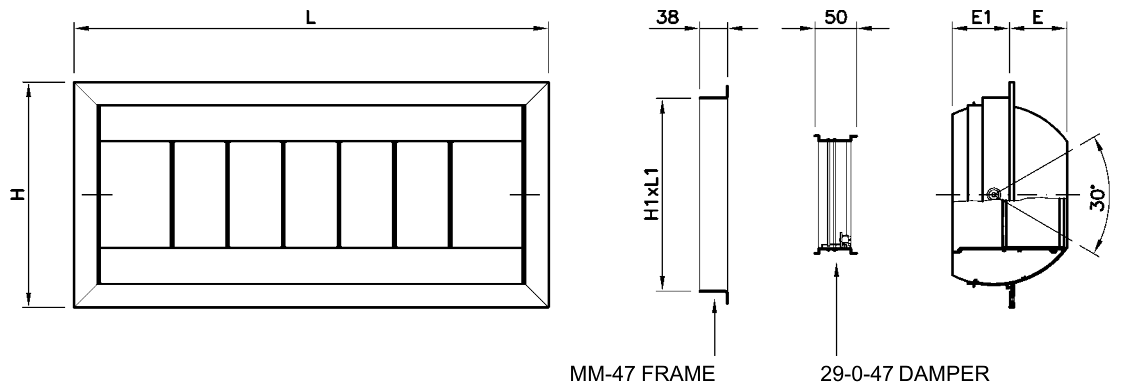
DF-47	*Rectangular, long-throw diffuser for manual operation.*
DF-47-CC	*Rectangular, long-throw diffuser for manual operation, adaptable to round duct.*
23, 26, 36 312, 410	*Five sizes (see page 5).*
29-O-47	*Volume control damper.*
MM-47	*Metal mounting frame.*
AE	*Motorised mechanism.*

Identification

The diffusers can be manually adjusted to adapt the inlet airflow to the needs of the room. The **AE** model is equipped with a motor that changes the direction of the air (up or down) for use with cold or hot air (summer or winter); this motor may be proportional or on-off (two positions).

DF-47 rectangular diffuser

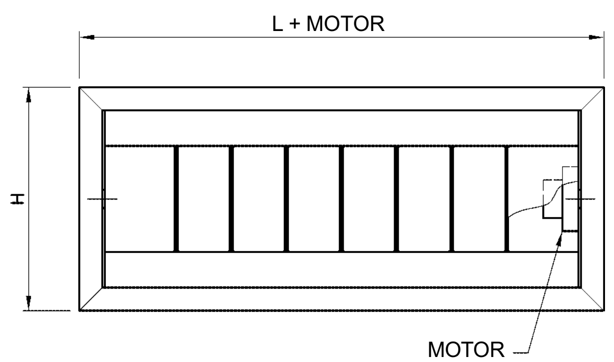
DF-47 dimensions



DF-47 dimensions

SIZE	L	H	OPENING L1	x H1	E	E1
DF-47-23	348	210	305	165	43	58
DF-47-26	652	210	610	165	43	58
DF-47-36	652	310	610	267	79	79
DF-47-312	1262	310	1219	267	79	79
DF-47-410	1110	422	1067	380	117	102

DF-47-AE dimensions (motorised)



The **AE** model with the motor drive is longer, due to the servo motor.

The **CC** model, constructed to be fitted directly to the round duct, can also be motor-driven **(AE).**

The diffusers can be swiveled ±30° around the horizontal symmetry axis.

DF-47 selection table

Q		Size	305x165	610x165	610x267	1219x267	1067x380
(m^3/h)	(l/s)	A_k (m^2)	0,0198	0,0383	0,0613	0,1213	0,1508
150	41,7	V_k (m/s)	2,1				
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)	4,6 2,7 1,4				
		ΔP_t (Pa)	3				
		L_{wA} - dB(A)	<15				
300	83,3	V_k (m/s)	4,2	2,2			
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)	9,1 5,5 2,7	6,6 3,9 2,0			
		ΔP_t (Pa)	10	3			
		L_{wA} - dB(A)	<15	<15			
450	125,0	V_k (m/s)	6,3	3,3	2,0		
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)	13,7 8,2 4,1	9,8 5,9 3,0	6,5 3,9 2,0		
		ΔP_t (Pa)	24	6	2		
		L_{wA} - dB(A)	27	<15	<15		
600	166,7	V_k (m/s)	8,4	4,3	2,7		
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)	18,3 11,0 5,5	13,1 7,9 3,9	8,7 5,2 2,6		
		ΔP_t (Pa)	42	11	4		
		L_{wA} - dB(A)	36	18	<15		
800	222,2	V_k (m/s)	11,2	5,8	3,6	1,8	
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)	24,4 14,6 7,3	17,5 10,5 5,2	11,6 7,0 3,5	8,3 5,0 2,5	
		ΔP_t (Pa)	74	20	8	2	
		L_{wA} - dB(A)	45	27	<15	<15	
1000	277,8	V_k (m/s)	14,1	7,2	4,5	2,3	1,8
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)	>30 18,3 9,1	21,9 13,1 6,6	14,5 8,7 4,4	10,3 6,2 3,1	7,5 4,5 2,2
		ΔP_t (Pa)	116	31	12	3	2
		L_{wA} - dB(A)	52	34	22	<15	<15
2000	555,6	V_k (m/s)		14,5	9,1	4,6	3,7
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)		>30 26,2 13,1	29,0 17,4 8,7	20,6 12,4 6,2	15,0 9,0 4,5
		ΔP_t (Pa)		123	48	12	8
		L_{wA} - dB(A)		56	43	25	19
3000	833,3	V_k (m/s)			13,6	6,9	5,5
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)			>30 26,1 13,1	>30 18,6 9,3	22,4 13,5 6,7
		ΔP_t (Pa)			107	27	18
		L_{wA} - dB(A)			56	38	32
5000	1388,9	V_k (m/s)				11,5	9,2
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)				>30 >30 15,5	>30 22,4 11,2
		ΔP_t (Pa)				76	49
		L_{wA} - dB(A)				54	48
6000	1666,7	V_k (m/s)					11,1
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)					>30 26,9 13,5
		ΔP_t (Pa)					71
		L_{wA} - dB(A)					54
7000	1944,4	V_k (m/s)					12,9
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)					>30 >30 15,7
		ΔP_t (Pa)					96
		L_{wA} - dB(A)					59

Notes

- This selection table is based on laboratory tests as per ISO 5219 (UNE 100.710) and ISO 5135 and 3741.
- ΔT is equal to 0°C (isothermal air).
- The behaviour of the air jet with different Δt is shown in the following charts.

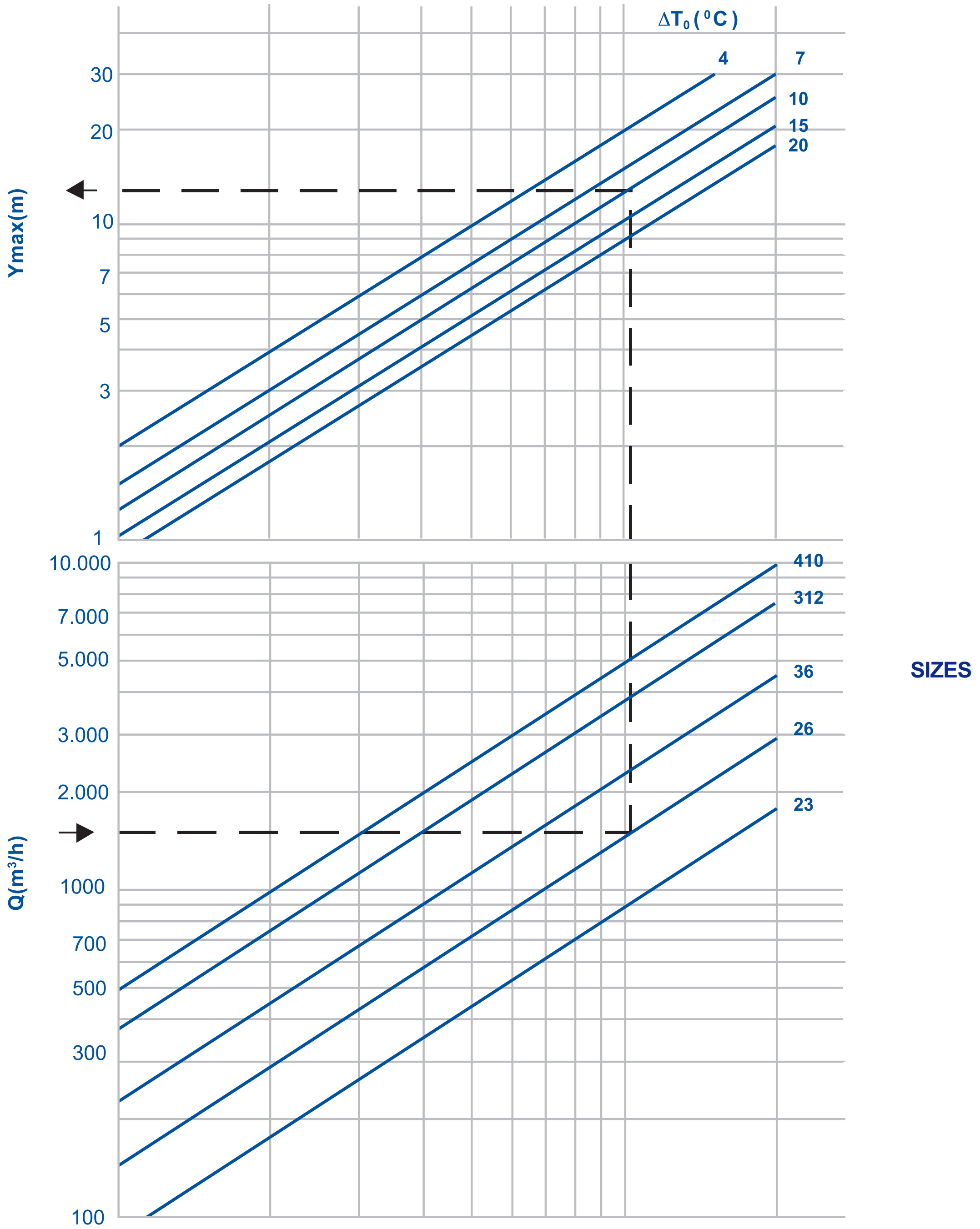
Symbols

Q = Air flow
V_k = Effective velocity
A_k = Effective area
ΔP_t = Total pressure drop
L_{wA} = Sound power
$X_{0,3}$ - $X_{0,5}$ - $X_{1,0}$ = Throw for a terminal air velocity of 0.3, 0.5 and 1.0 m/s, respectively.

DF-47 model

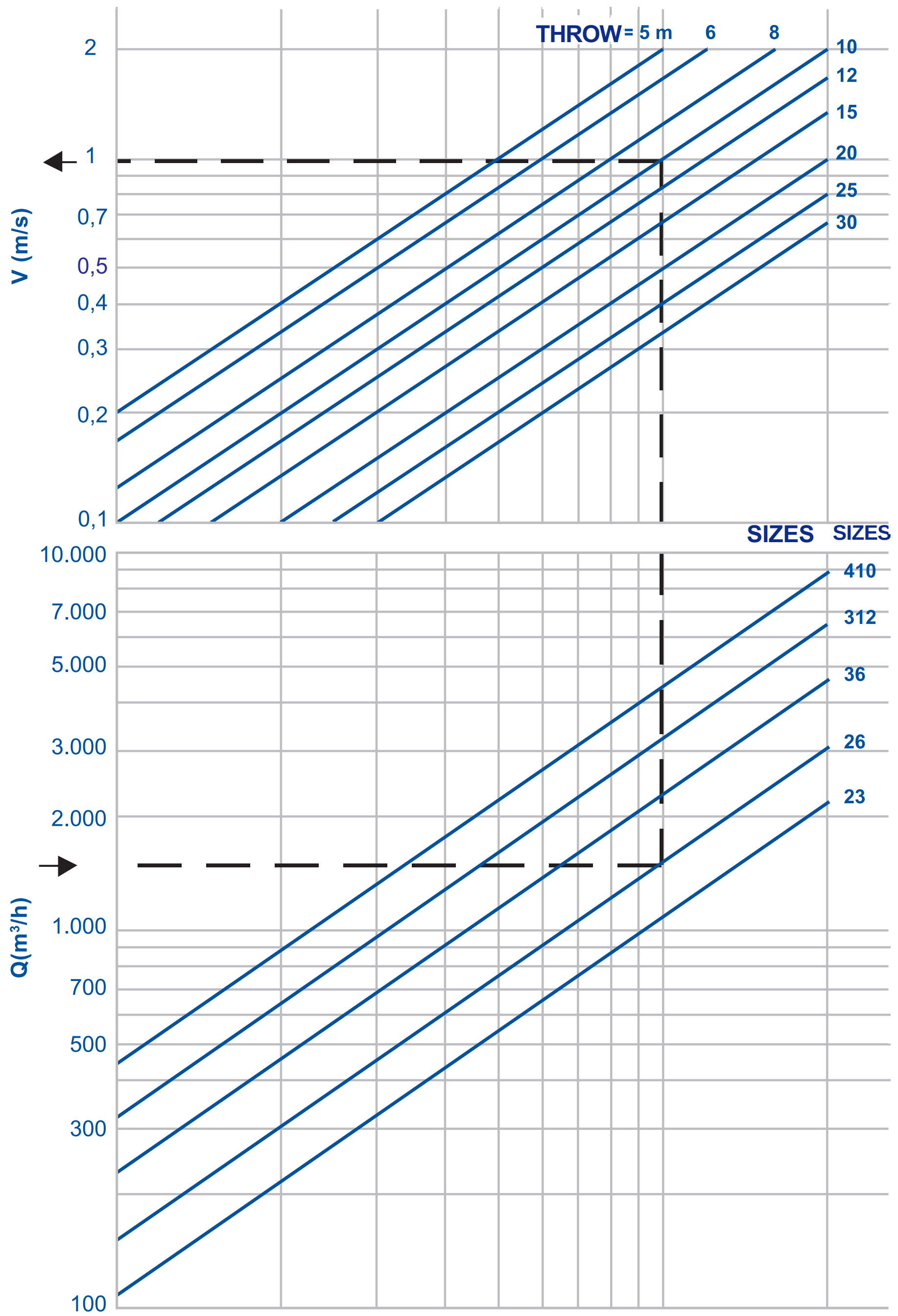
Selection charts

DF-47-1.-Maximum vertical penetration



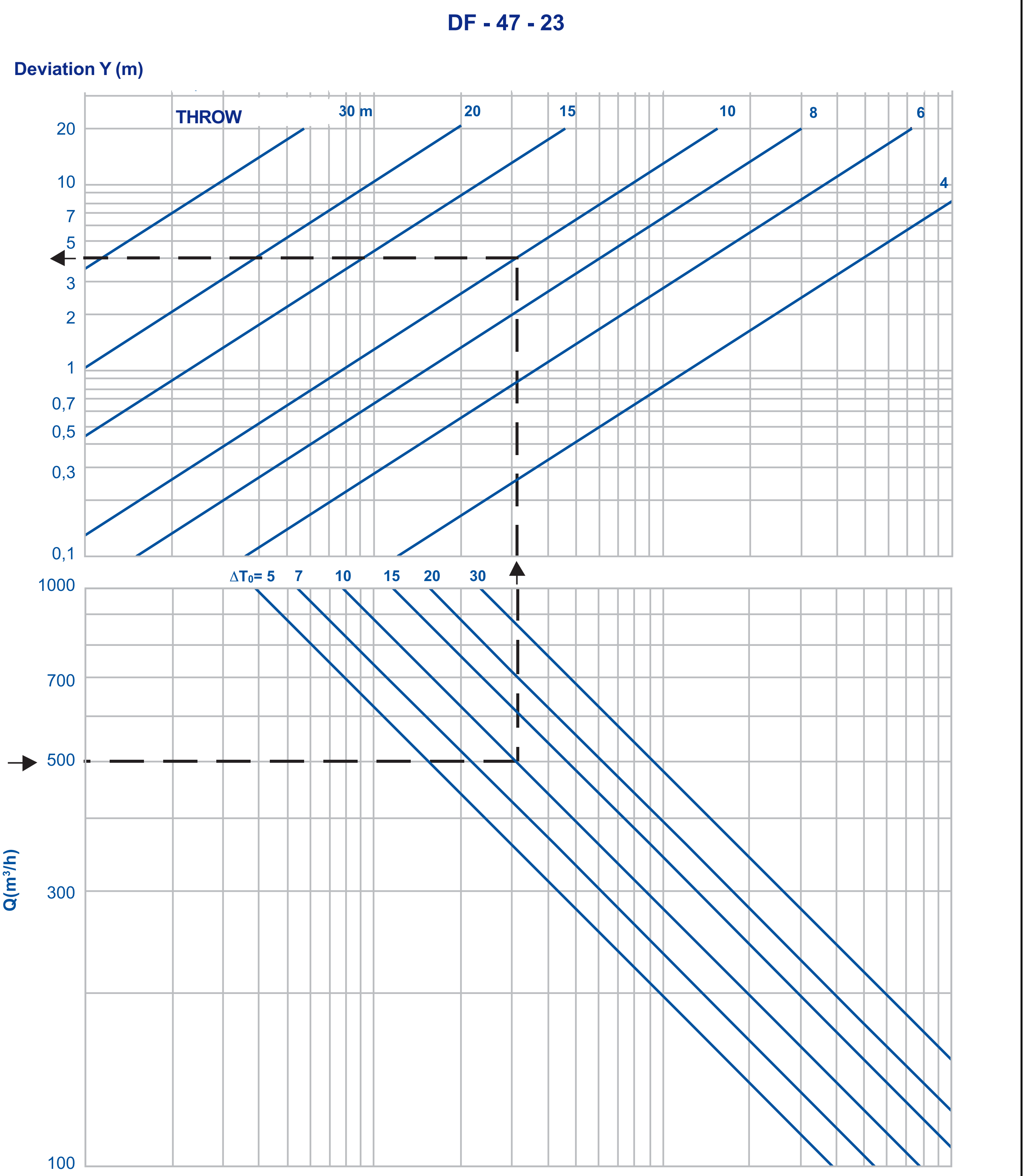
DF-47 model

DF-47-2.- Velocity of the air jet in the throw



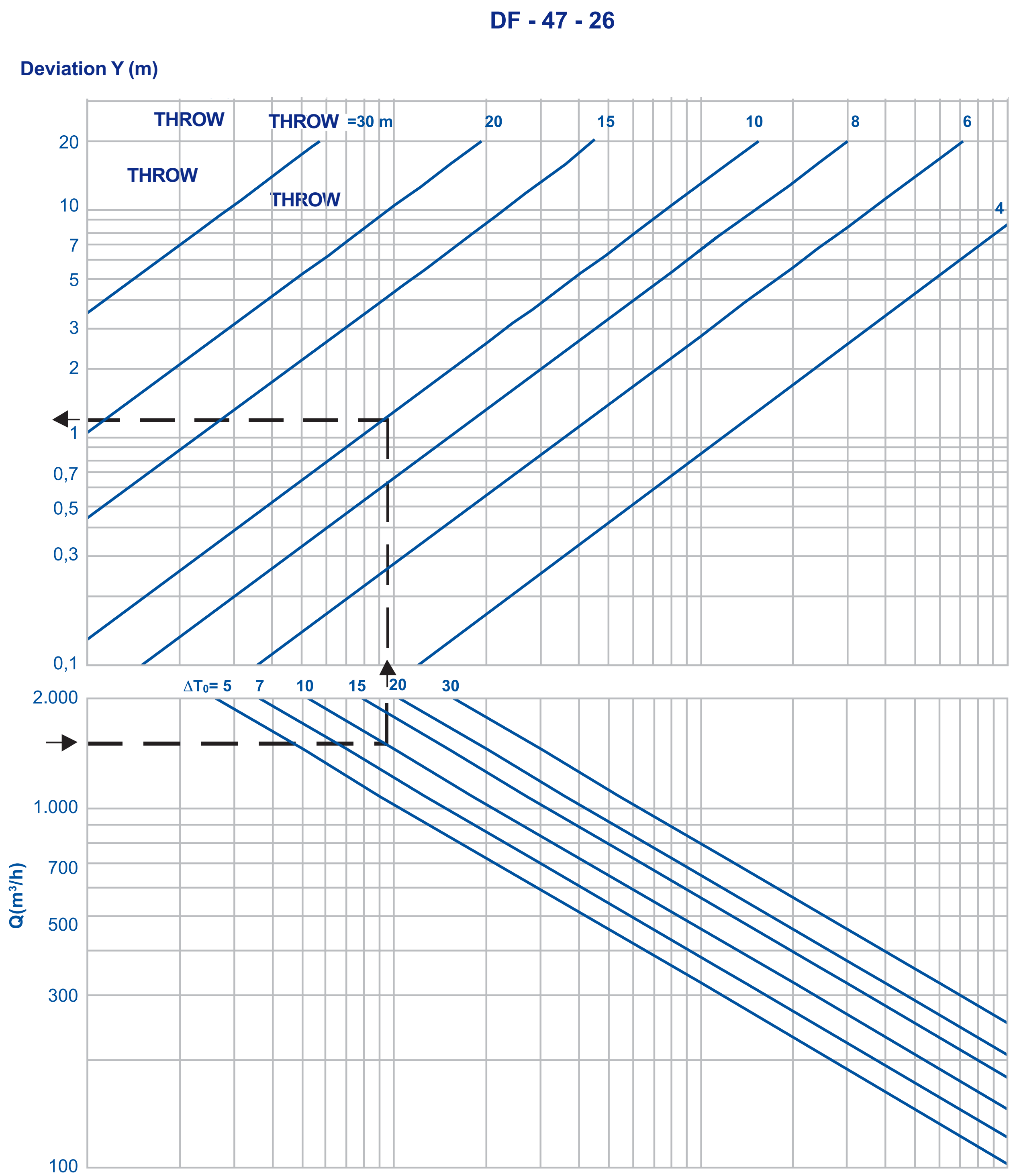
DF-47 model

DF-47-3.1.- Vertical deviation of the air jet (non-isothermal jets)



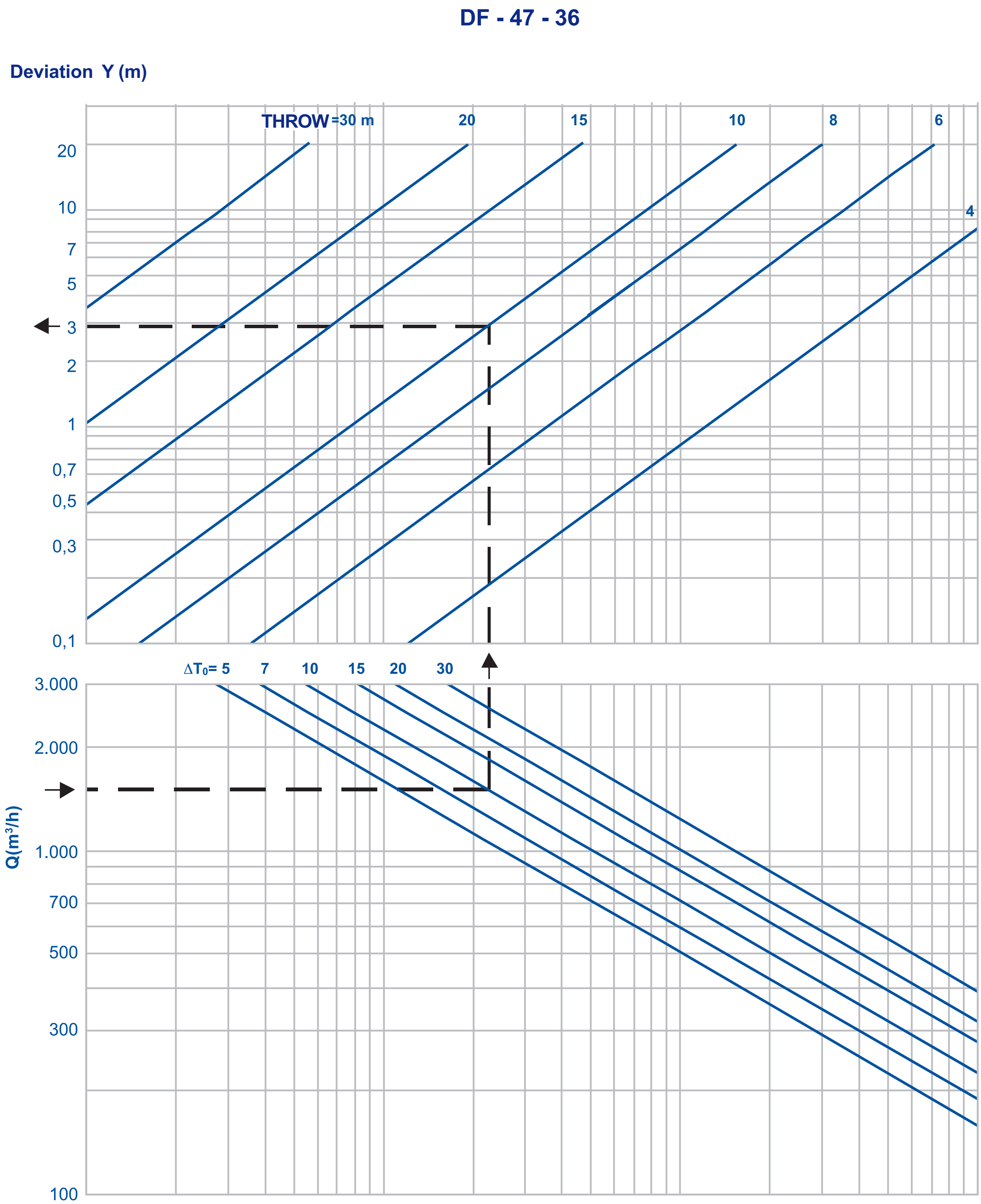
DF-47 model

DF-47-3.2.- Vertical deviation of the air jet (non-isothermal jets)



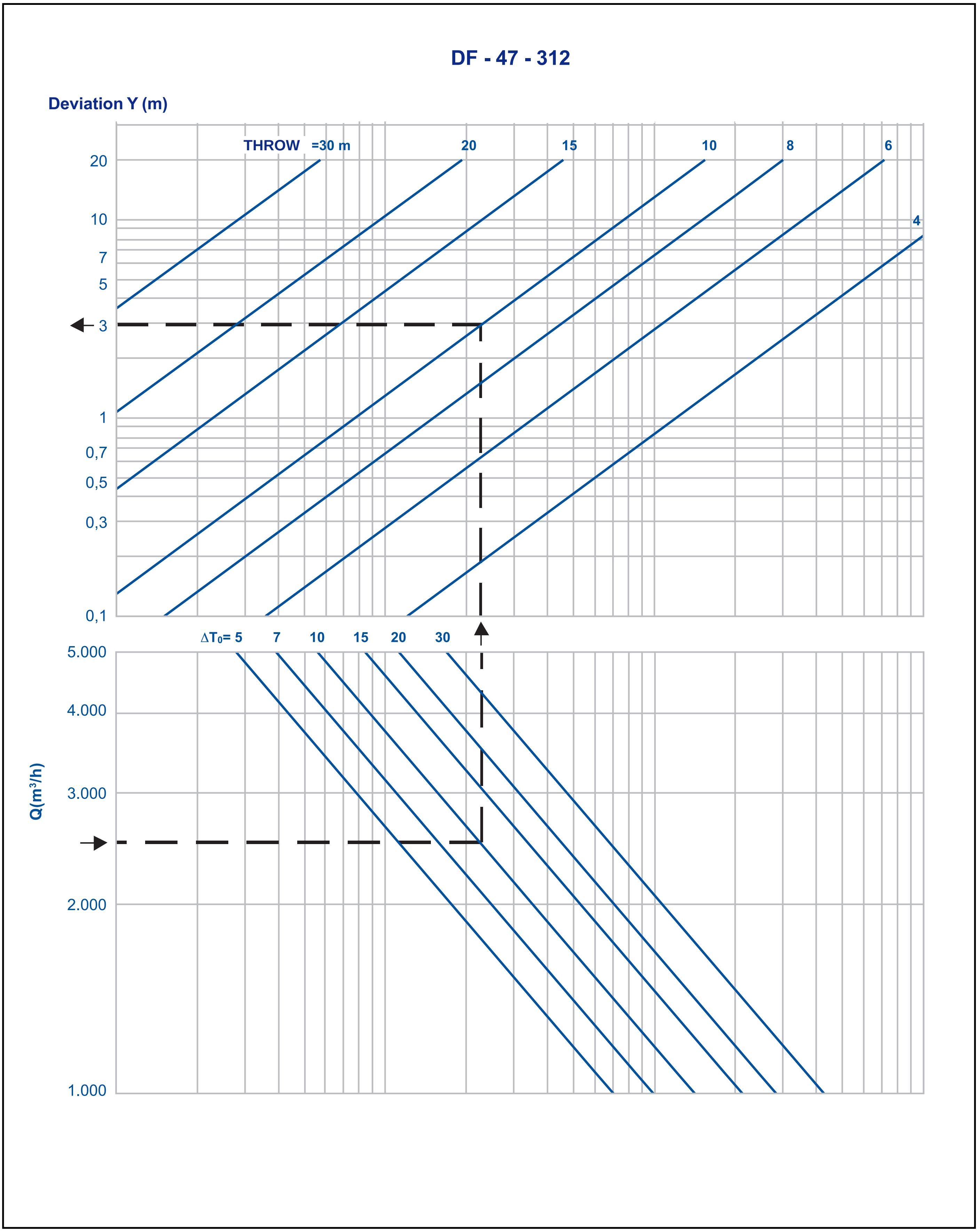
DF-47 model

DF-47-3.3.- Vertical deviation of the air jet (non-isothermal jets)



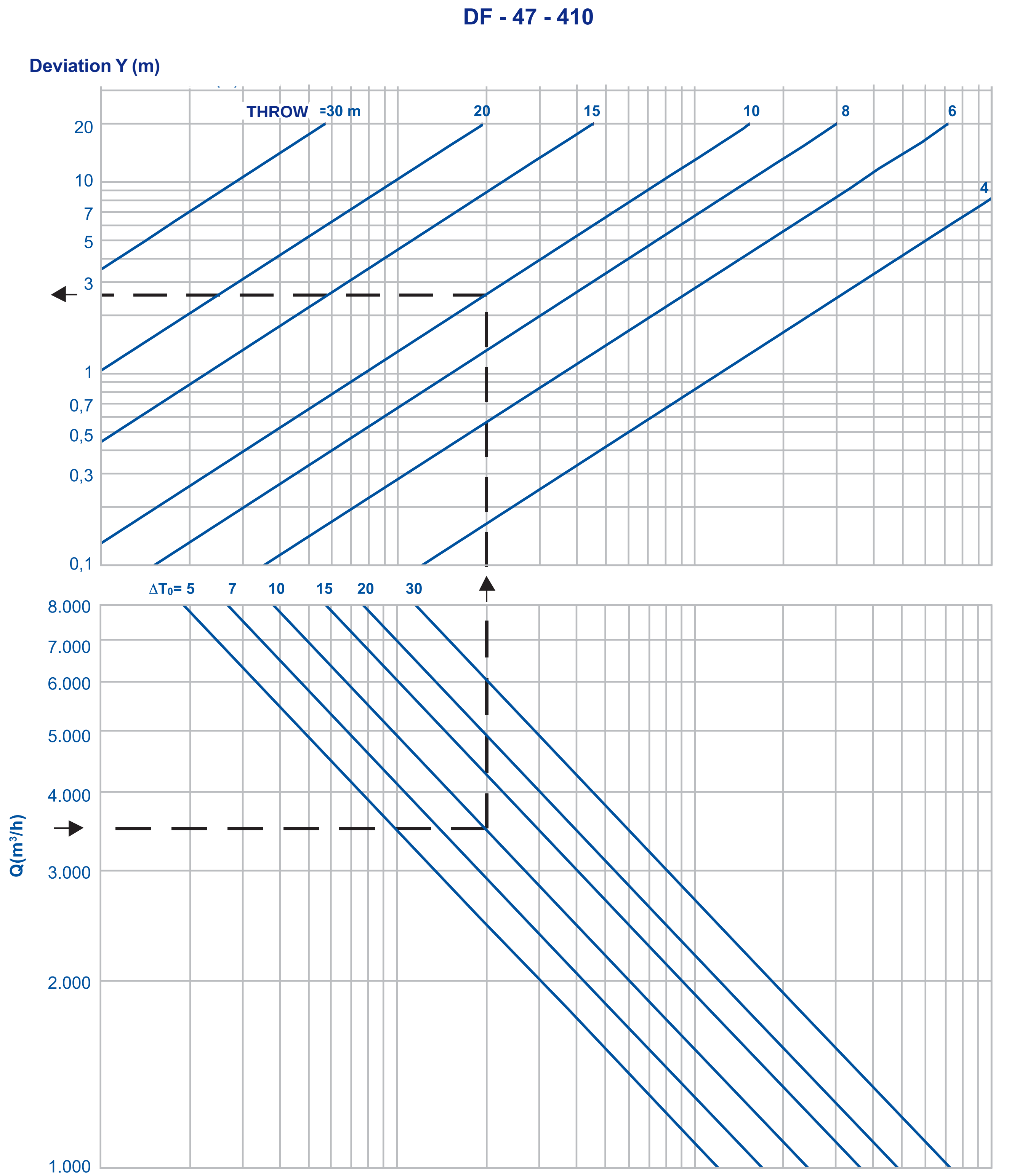
DF-47 model

DF-47-3.4.- Vertical deviation of the air jet (non-isothermal jets)



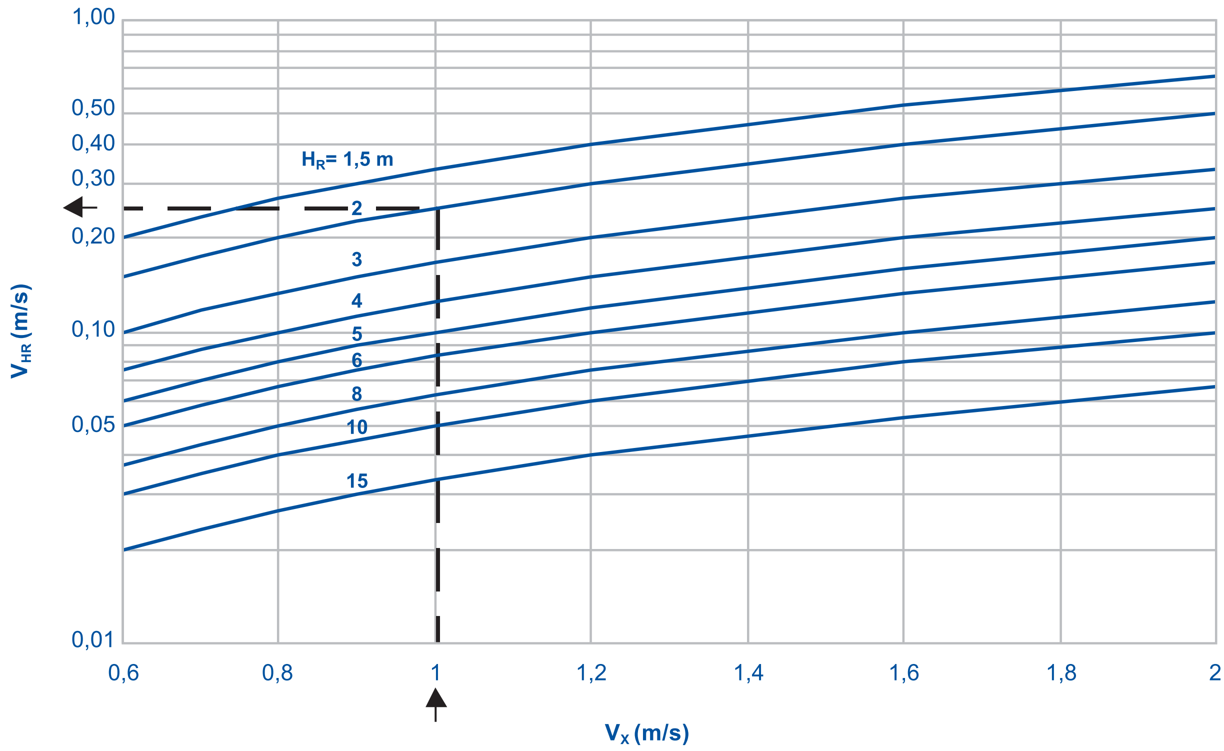
DF-47 model

DF-47-3.5.- Vertical deviation of the air jet (non-isothermal jets)

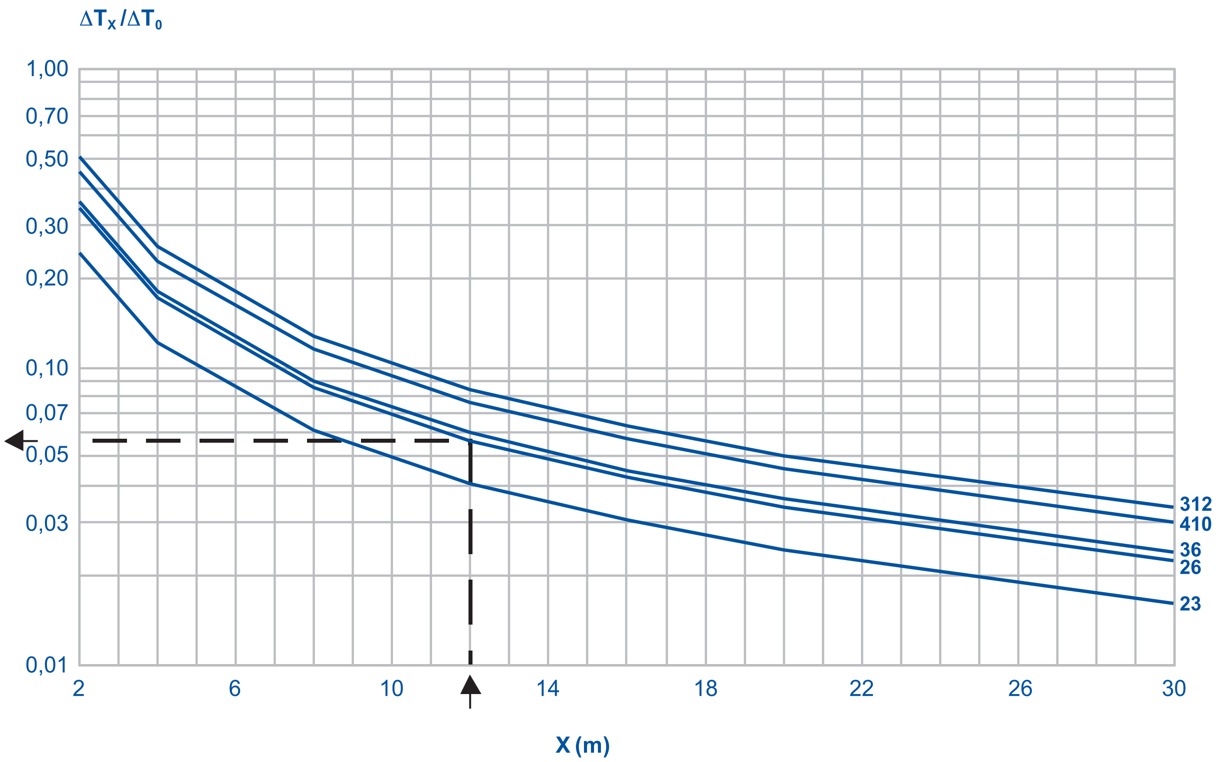


DF-47 model

DF-47-4.- Ratio between air flow velocities.

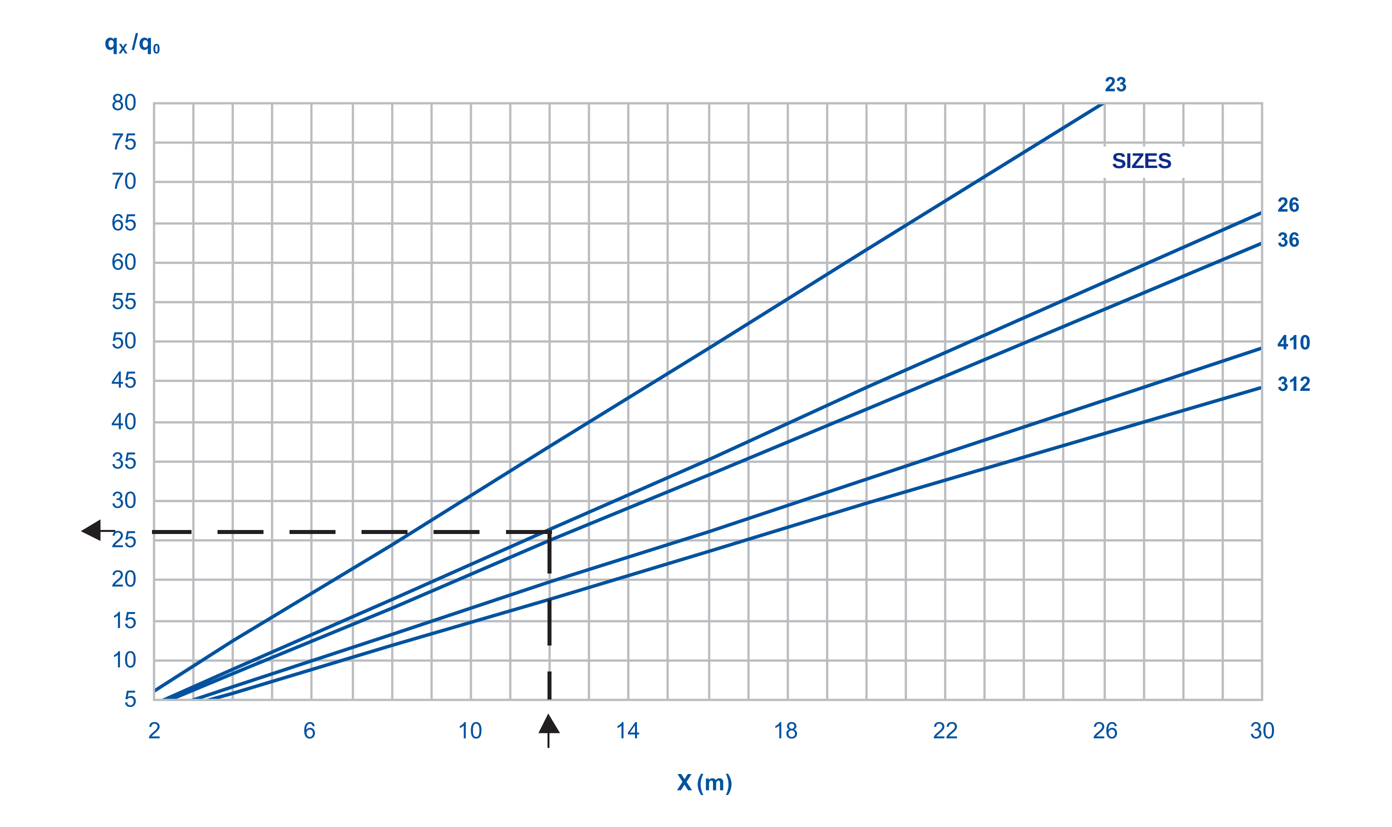


DF-47-5.- Ratio between temperature differences.

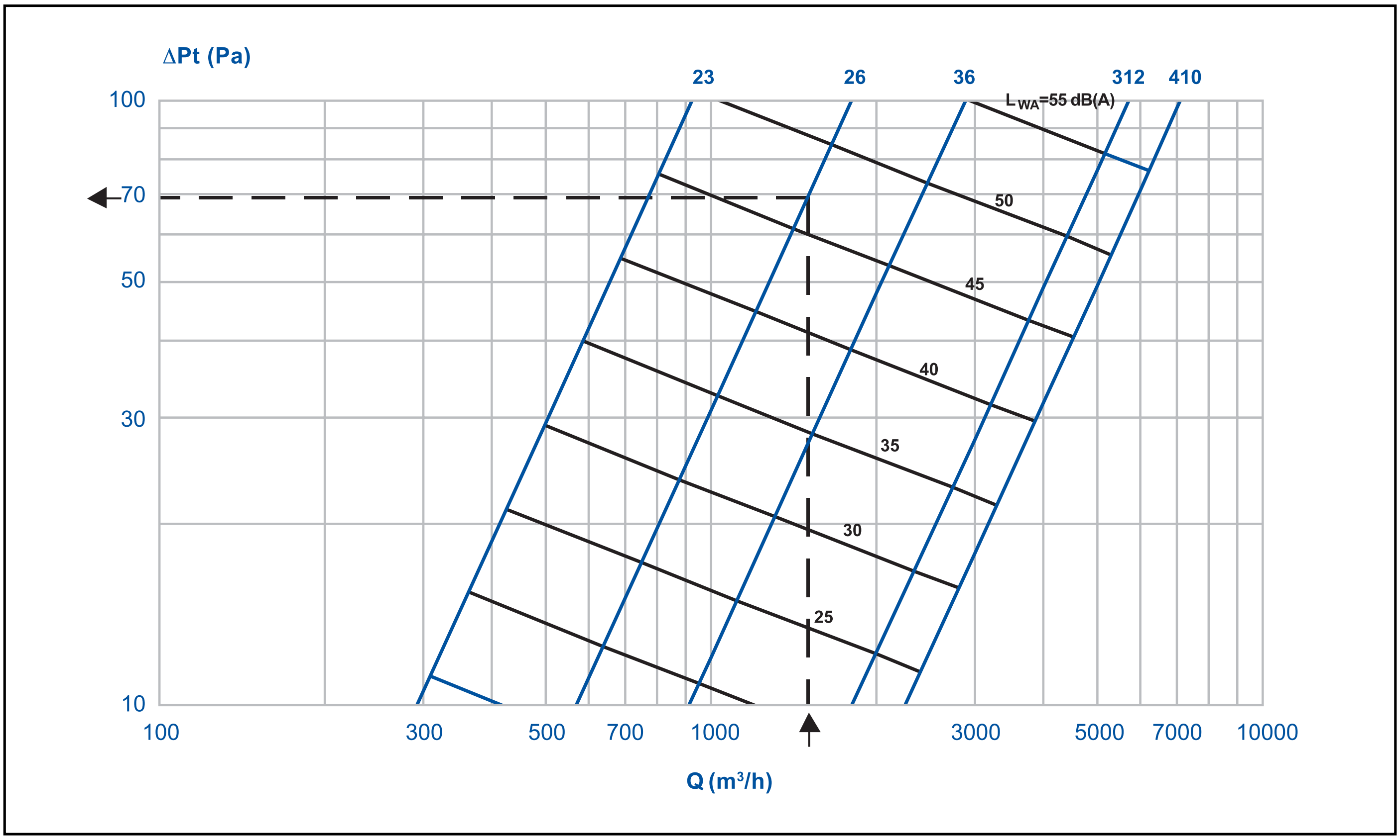


DF-47 model

DF-47-6.- Induction rate



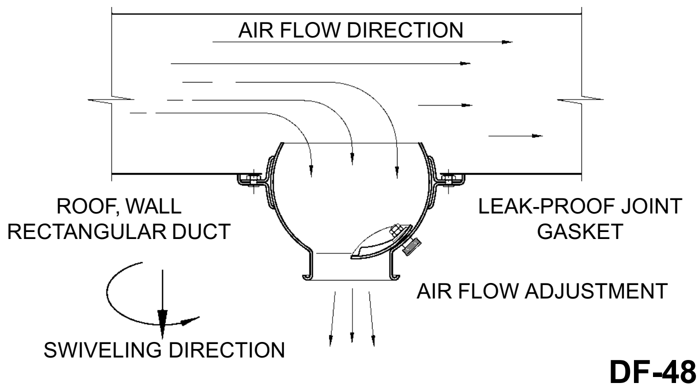
DF-47-7.- Pressure drop and sound power level



DF-48 spherical diffuser

Description

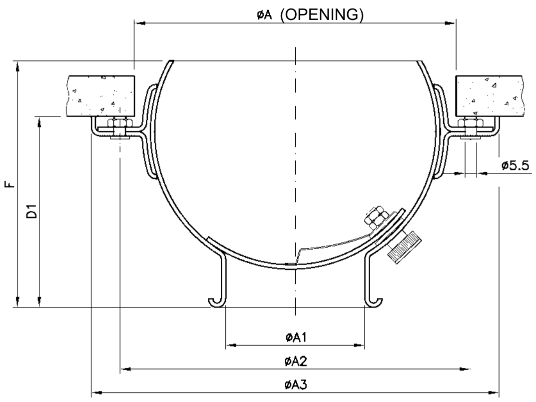
The **DF-48** long-throw, spherical diffuser in its standard version is manufactured entirely of anodised aluminium with a natural finish. By special order, the diffuser can be painted in any RAL colour. The diffuser has a volume control damper at the outlet.



DF-48

Application

The **DF-48** diffusers allow long throws with an acceptable noise level. The diffuser releases an occasional air jet with a throw of over 30 metres. They can be used for spot cooling and are especially appropriate for sport centres, industrial warehouses, clean rooms, recording studios, discotheques and large premises, as well as any area requiring precisely targeted air jets. The configuration allows the diffuser to be swiveled in any direction up to a maximum of ±35° in the horizontal or vertical direction.



DF-48

Dimensions and mounting

The diffusers must attached by screws. The units can be supplied with plenum boxes or a plate fitted in an assembly of up to six units. See dimensions on page 17.

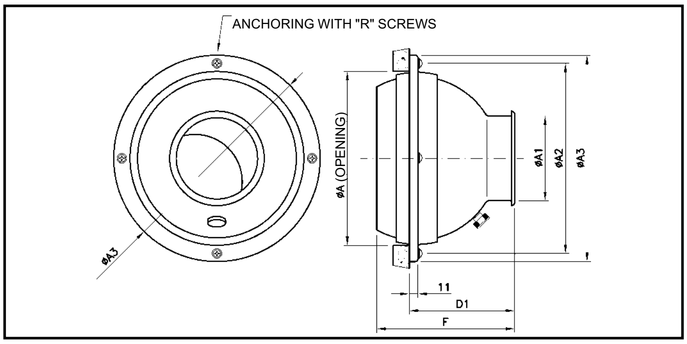
DF-48	*Spherical long-throw diffuser, manual operation.*
DF-48-C	*Spherical long-throw diffuser, manual operation with direct coupling collar to flexible duct.*
3, 5, 8, 12 16 y 20	*Six sizes (see page 19).*
DF-48-AE	*Motor drive.*
AC	*Plenum box or mounting plate.*

Identification

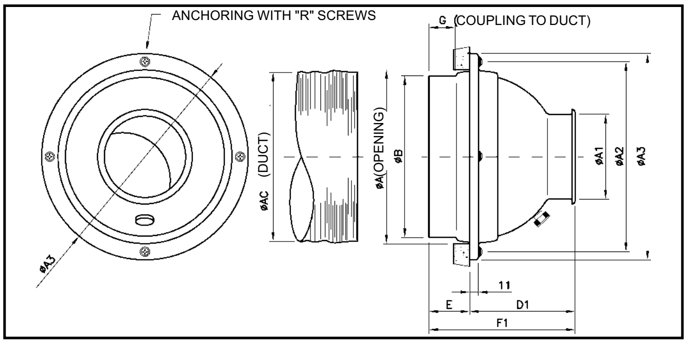
Six sizes. The motor drive swivels the diffuser vertically (up and down) within an angle of approximately 35°. For motor-driven operation, a separate motor is required for each diffuser, even in assemblies containing several units.

DF-48 spherical diffuser Dimensions

DF-48 dimensions



DF-48-C dimensions



DF-48

MODEL	øA	øA1	øA2	øA3	D1	F	R
3	80	40	107	133	44	50	3
5	142	65	162	184	91	115	4
8	209	100	232	253	129	169	4
12	318	165	336	358	201	265	6
16	425	230	444	474	249	353	8
20	500	300	526	554	296	421	8

DF-48-C

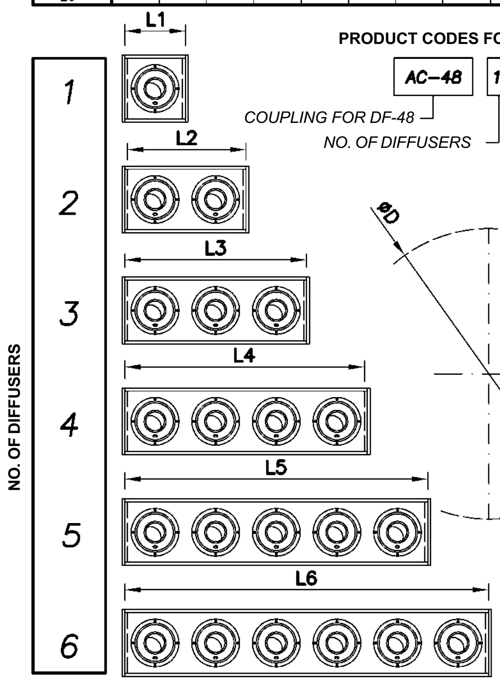
MODEL	øA	øA1	øA2	øA3	øAC	D1	E	F1	G	R
3	80	40	107	133	63	44	26	70	25	3
5	142	65	162	184	125	91	49	140	30	4
8	209	100	232	253	200	129	50	179	34	4
12	318	165	336	358	315	201	74	275	50	6
16	425	230	444	474	400	249	114	363	61	8
20	500	300	526	554	500	296	136	432	61	8

Dimensions of plenum boxes for connection to round duct

Dimensions of plates with diffuser assemblies

▩ — DIAMETERS FOR WHICH THE EQUIPMENT IS MANUFACTURED

MODEL	DUCT DIAMETER														OVERALL DIMENSIONS								
	250	315	355	400	450	500	560	630	710	800	900	1000	1200	1500	L1	L2	L3	L4	L5	L6	F	D1	H
3"	▩	▩	▩	▩	▩	▩									200	400	600	800	1000	1200	100	44	200
5"		▩	▩	▩	▩	▩	▩	▩							250	500	750	1000	1250	1500	120	91	250
8"				▩	▩	▩	▩	▩	▩						360	720	1080	1440	1800	2160	150	129	360
12"							▩	▩	▩	▩	▩	▩			470	940	1410	1880	2350	2820	180	201	470
16"									▩	▩	▩	▩	▩	▩	630	1260	1890	2520	3150	3780	220	249	630
20"											▩	▩	▩	▩	700	1400	2100	2800	3500	4200	250	296	700



PRODUCT CODES FOR ROUND DUCT COUPLING

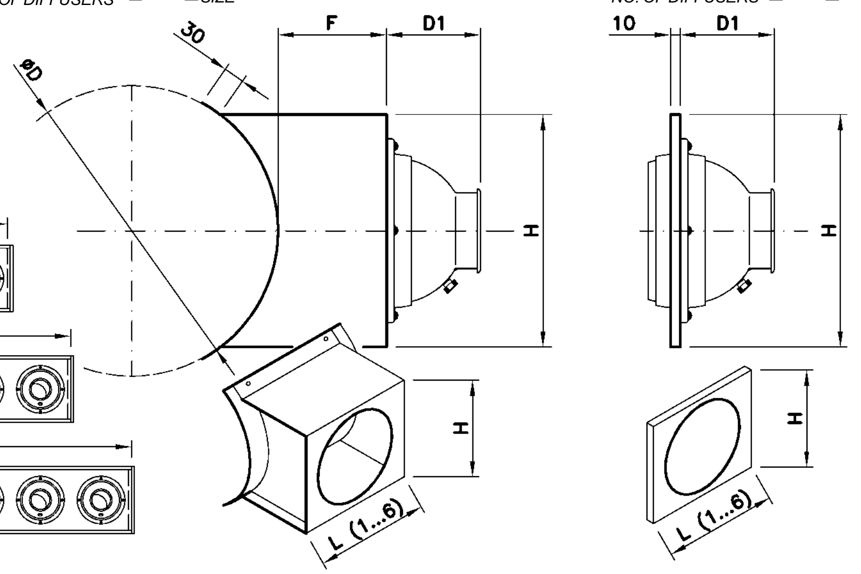
AC-48 | 1 | 03 | 0315

COUPLING FOR DF-48 — AC-48
NO. OF DIFFUSERS — 1
SIZE — 03
DUCT DIAMETER — 0315

PRODUCT CODES FOR ASSEMBLY PLATE

AC-48 | 1 | 03

COUPLING FOR DF-48 — AC-48
NO. OF DIFFUSERS — 1
SIZE — 03



DF-48 selection table

Q		Size	3	5	8	12	16	20
(m^3/h)	(l/s)	A_k (m^2)	0,0013	0,0033	0,0079	0,0214	0,0415	0,0707
25	6,9	V_k (m/s)	5,3	2,1				
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)	3,3 2,0 1,0	2,1 1,3 0,6				
		ΔP_t (Pa)	17	3				
		L_{wA} - dB(A)	<15	<15				
50	13,9	V_k (m/s)	10,7	4,2				
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)	6,7 4,0 2,0	4,2 2,5 1,3				
		ΔP_t (Pa)	68	11				
		L_{wA} - dB(A)	25	<15				
100	27,8	V_k (m/s)	21,4	8,4	3,5			
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)	13,4 8,0 4,0	8,4 5,0 2,5	5,4 3,3 1,6			
		ΔP_t (Pa)	274	43	7			
		L_{wA} - dB(A)	46	22	<15			
250	69,4	V_k (m/s)		21,0	8,8	3,2		
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)		21,0 12,6 6,3	13,5 8,1 4,1	8,2 4,9 2,5		
		ΔP_t (Pa)		266	46	6		
		L_{wA} - dB(A)		50	27	<15		
500	138,9	V_k (m/s)			17,6	6,5	3,3	
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)			27,1 16,3 8,1	16,5 9,9 4,9	11,8 7,1 3,5	
		ΔP_t (Pa)			185	25	7	
		L_{wA} - dB(A)			48	22	<15	
750	208,3	V_k (m/s)				9,7	5,0	2,9
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)				24,7 14,8 7,4	17,7 10,6 5,3	13,6 8,1 4,1
		ΔP_t (Pa)				57	15	5
		L_{wA} - dB(A)				34	17	<15
1250	347,2	V_k (m/s)				16,2	8,4	4,9
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)				>30 24,7 12,3	29,5 17,7 8,9	22,6 13,6 6,8
		ΔP_t (Pa)				158	42	14
		L_{wA} - dB(A)				50	33	19
2000	555,6	V_k (m/s)					13,4	7,9
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)					>30 28,4 14,2	>30 21,7 10,9
		ΔP_t (Pa)					108	37
		L_{wA} - dB(A)					47	33
2750	763,9	V_k (m/s)						10,8
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)						>30 29,9 14,9
		ΔP_t (Pa)						70
		L_{wA} - dB(A)						43
3500	972,2	V_k (m/s)						13,8
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)						>30 >30 19,0
		ΔP_t (Pa)						113
		L_{wA} - dB(A)						50

Notes

- This selection table is based on laboratory tests as per ISO 5219 (UNE 100.710) and ISO 5135 and 3741 standards.
- Δt is equal to 0°C (isothermal air).
- The behaviour of the air jet with different Dt is shown in the following charts.

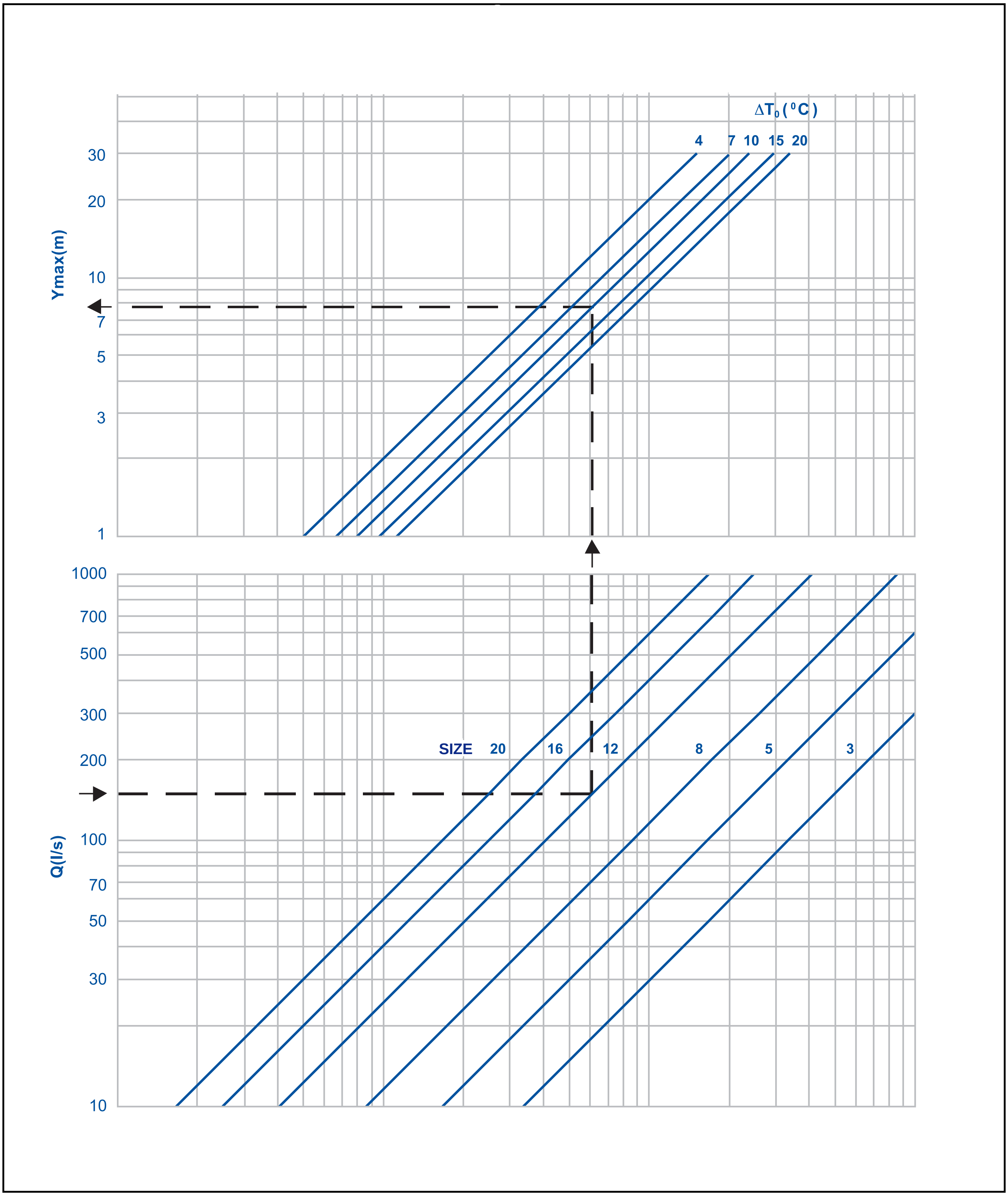
Symbols

Q = Air flow
V_k = Effective velocity
A_K = Effective area
ΔP_t = Total pressure drop
L_{wA} = Sound power
$X_{0,3}$ - $X_{0,5}$ - $X_{1,0}$ = Throw for a terminal air velocity of 0.3, 0.5 and 1.0 m/s, respectively.

DF-48 model

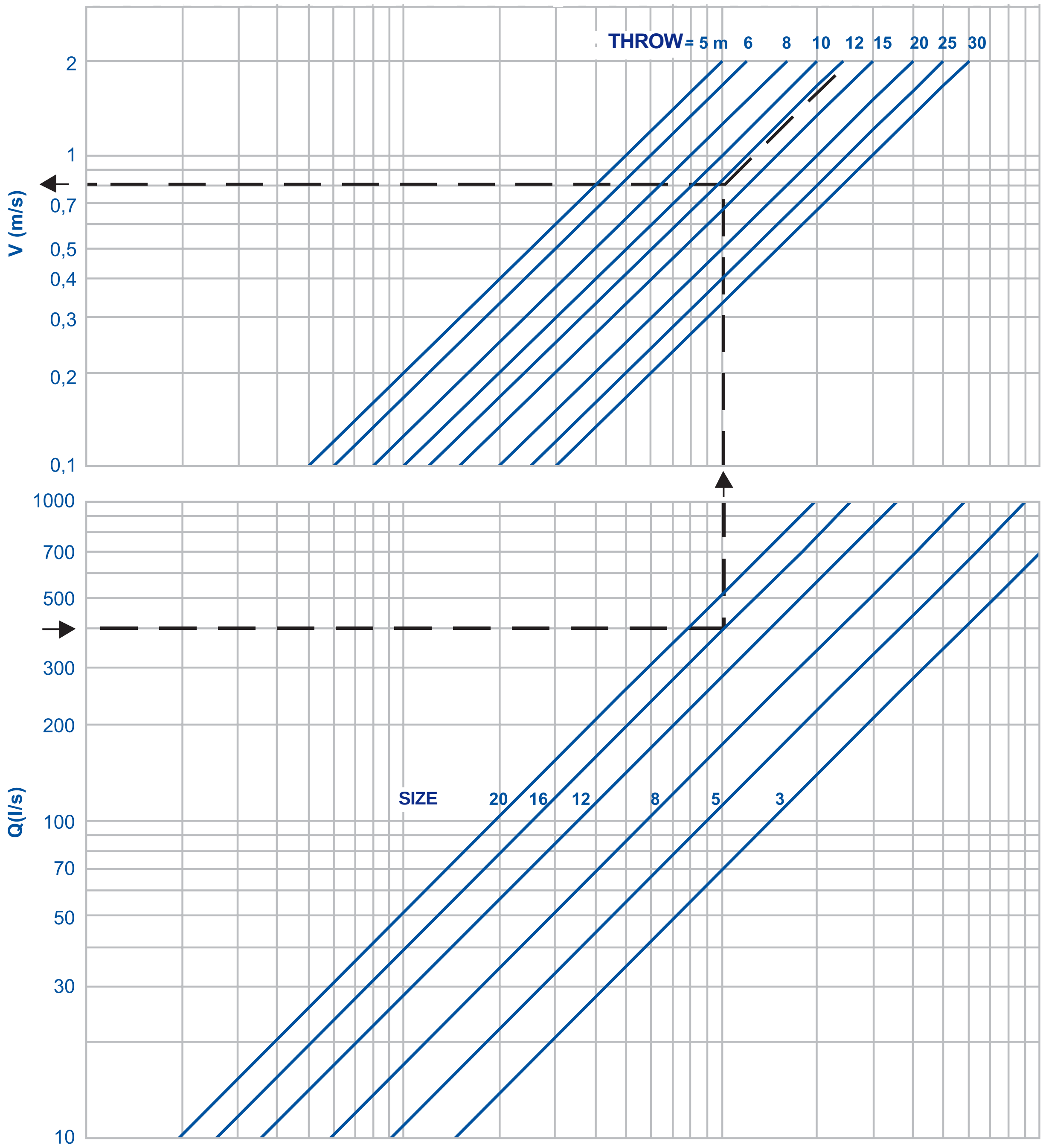
Selection charts

DF-48-1.- Maximum vertical penetration.



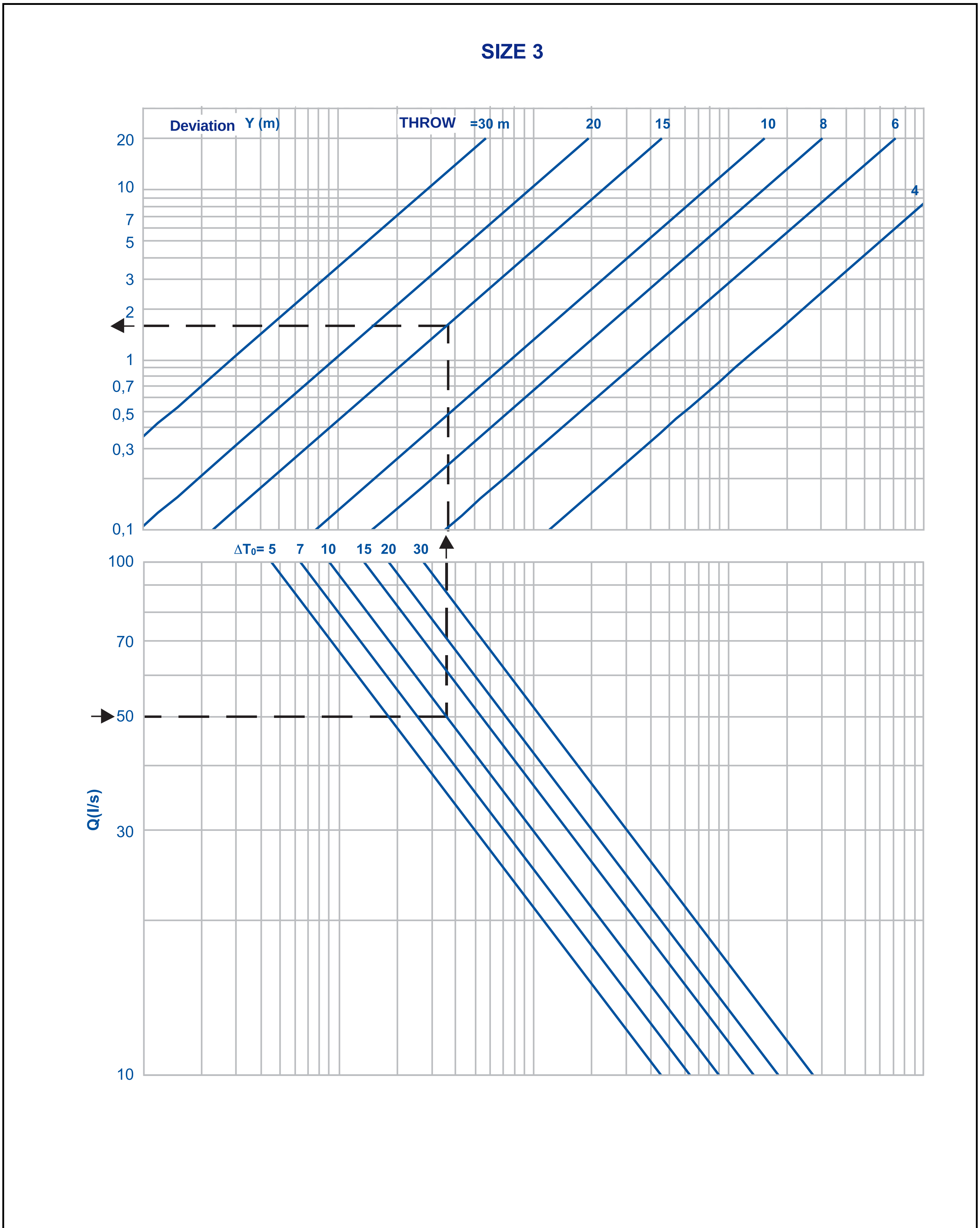
DF-48 model

DF-48-2.- Velocity of the air jet for the throw.



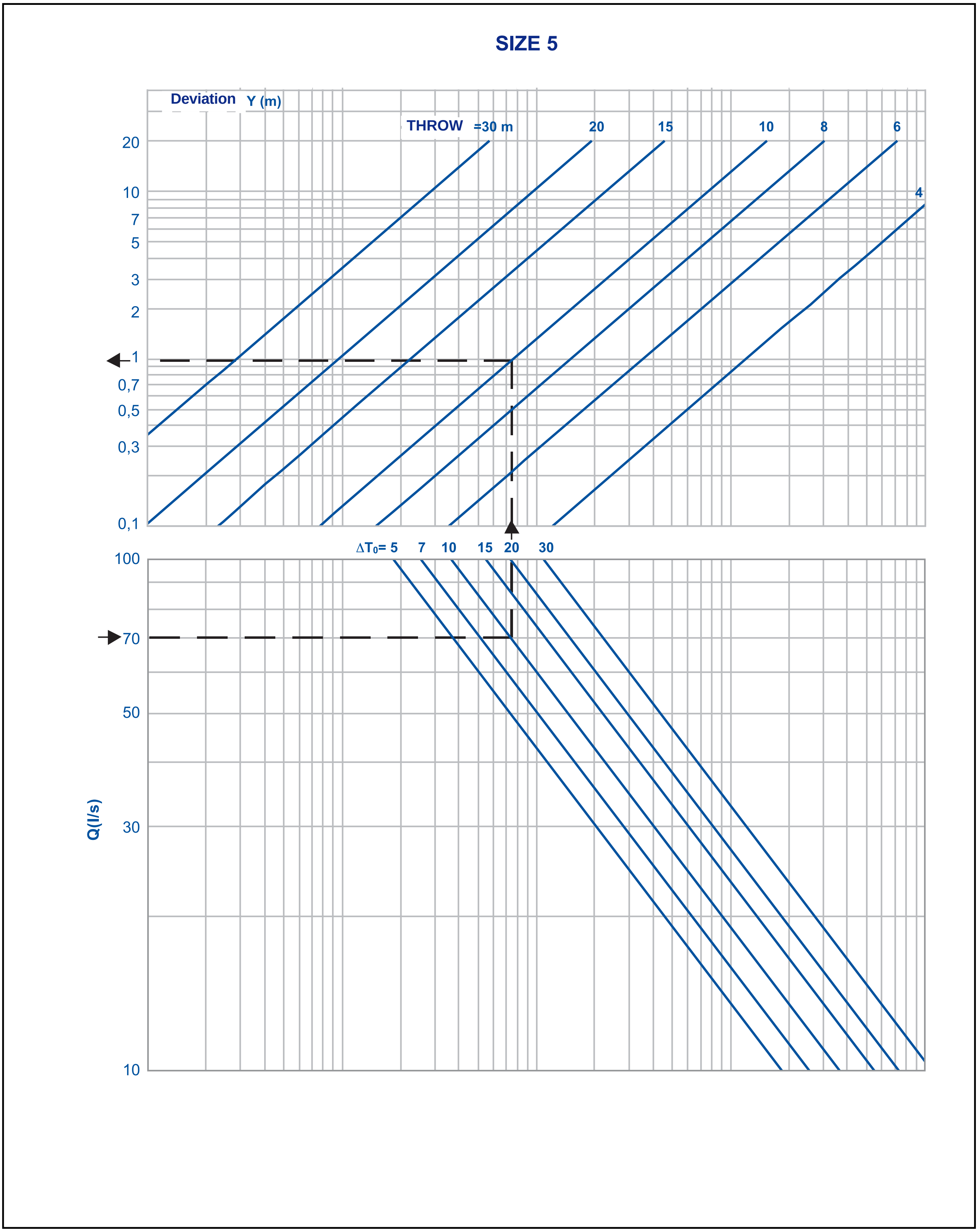
DF-48 model

DF-48-3.1.- Vertical deviation of the air jet (non-isothermal jets).



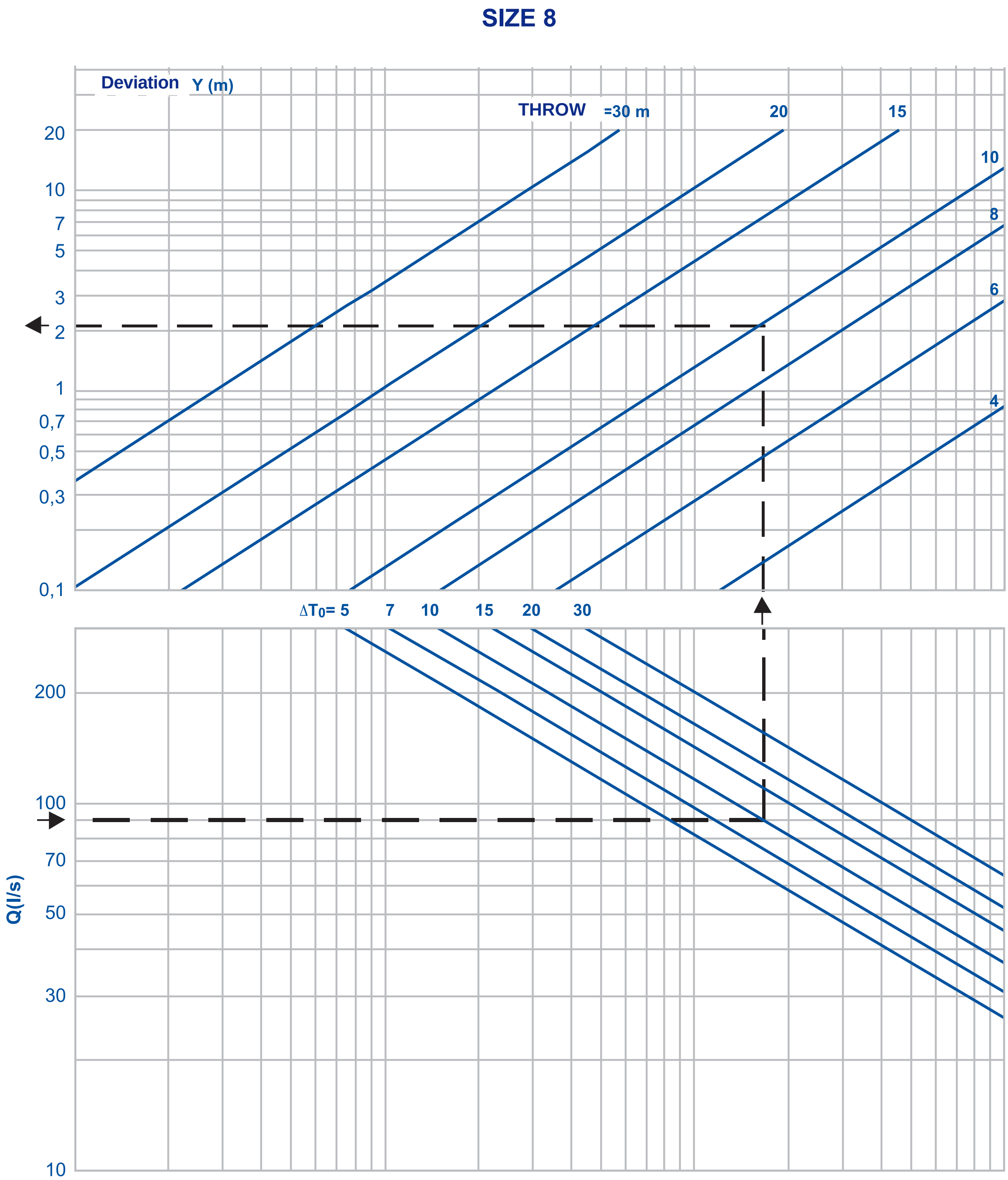
DF-48 model

DF-48-3.2.- Vertical deviation of the air jet (non-isothermal jets).



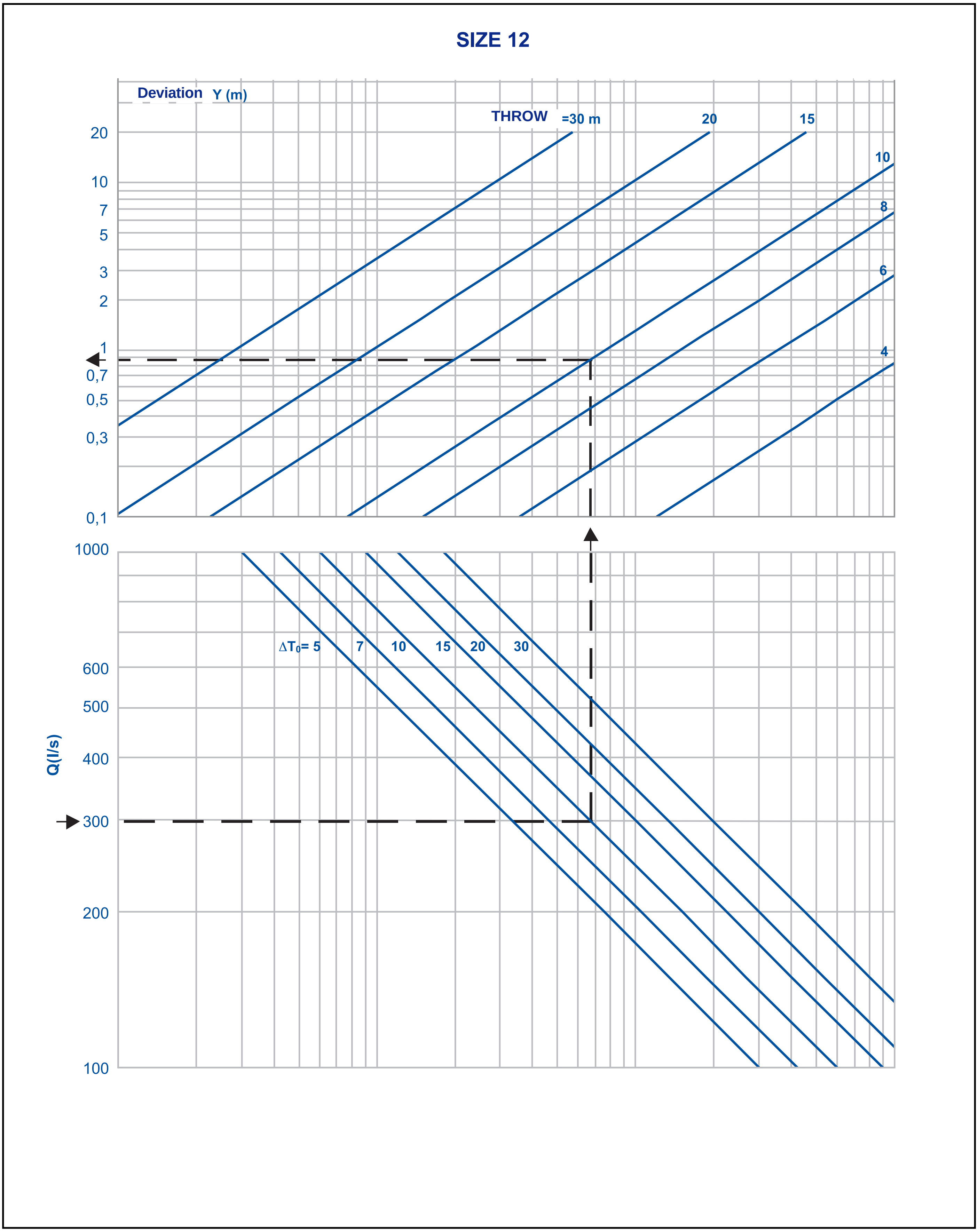
DF-48 model

DF-48-3.3.- Vertical deviation of the air jet (non-isothermal jets).



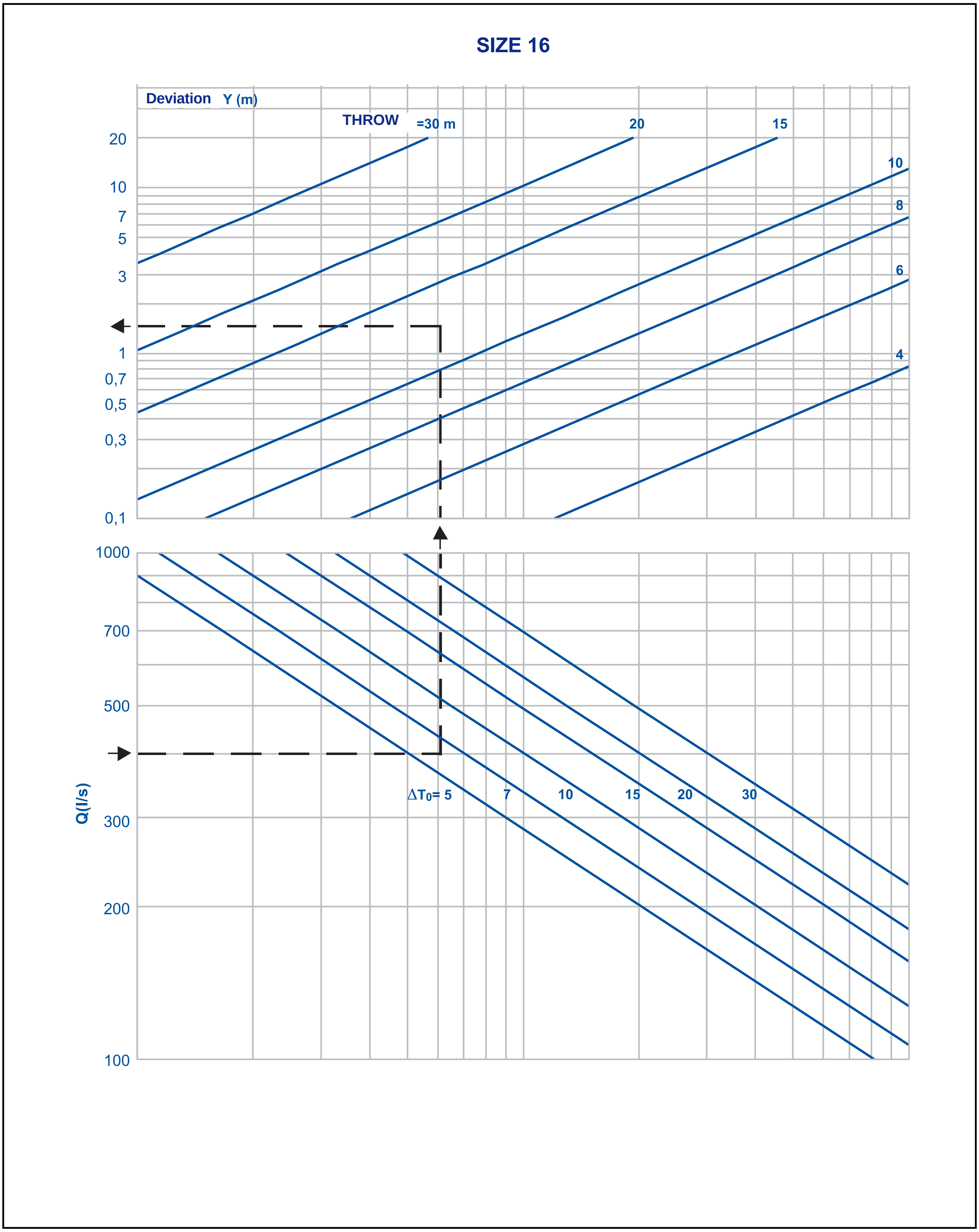
DF-48 model

DF-48-3.4.- Vertical deviation of the air jet (non-isothermal jets).



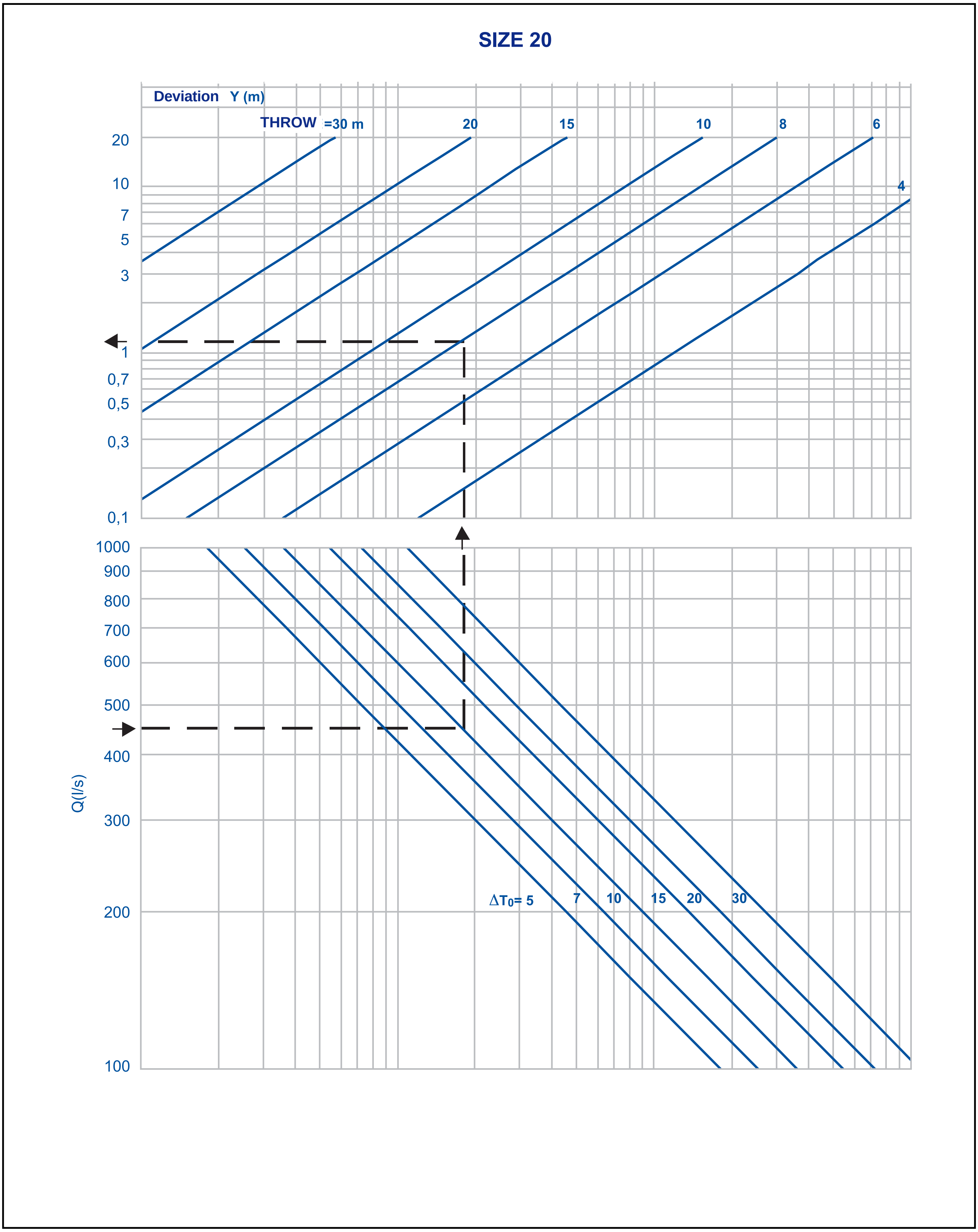
DF-48 model

DF-48-3.5.- Vertical deviation of air jet (non-isothermal jets).



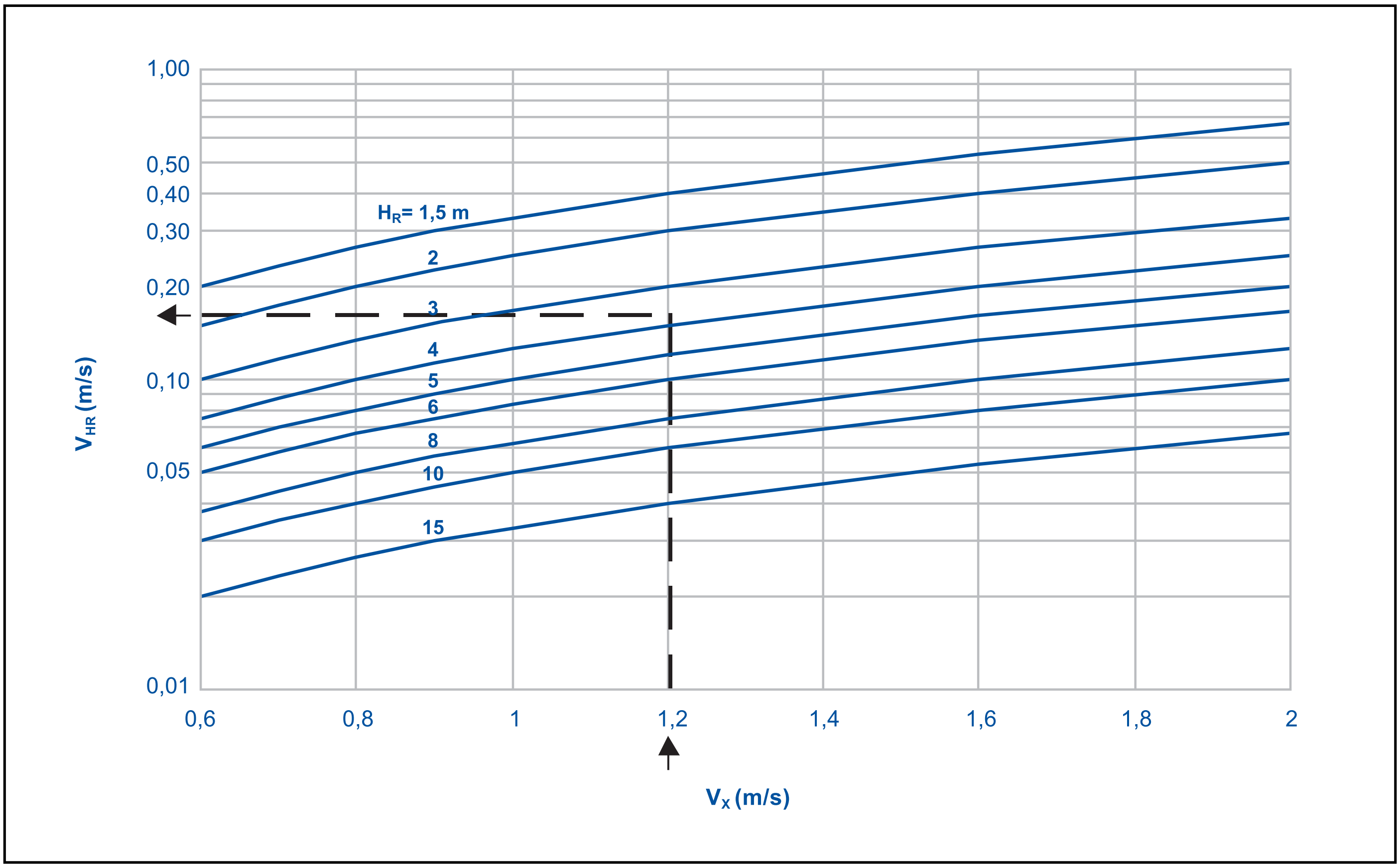
DF-48 model

DF-48-3.6.- Vertical deviation of the air jet (non-isothermal jets).

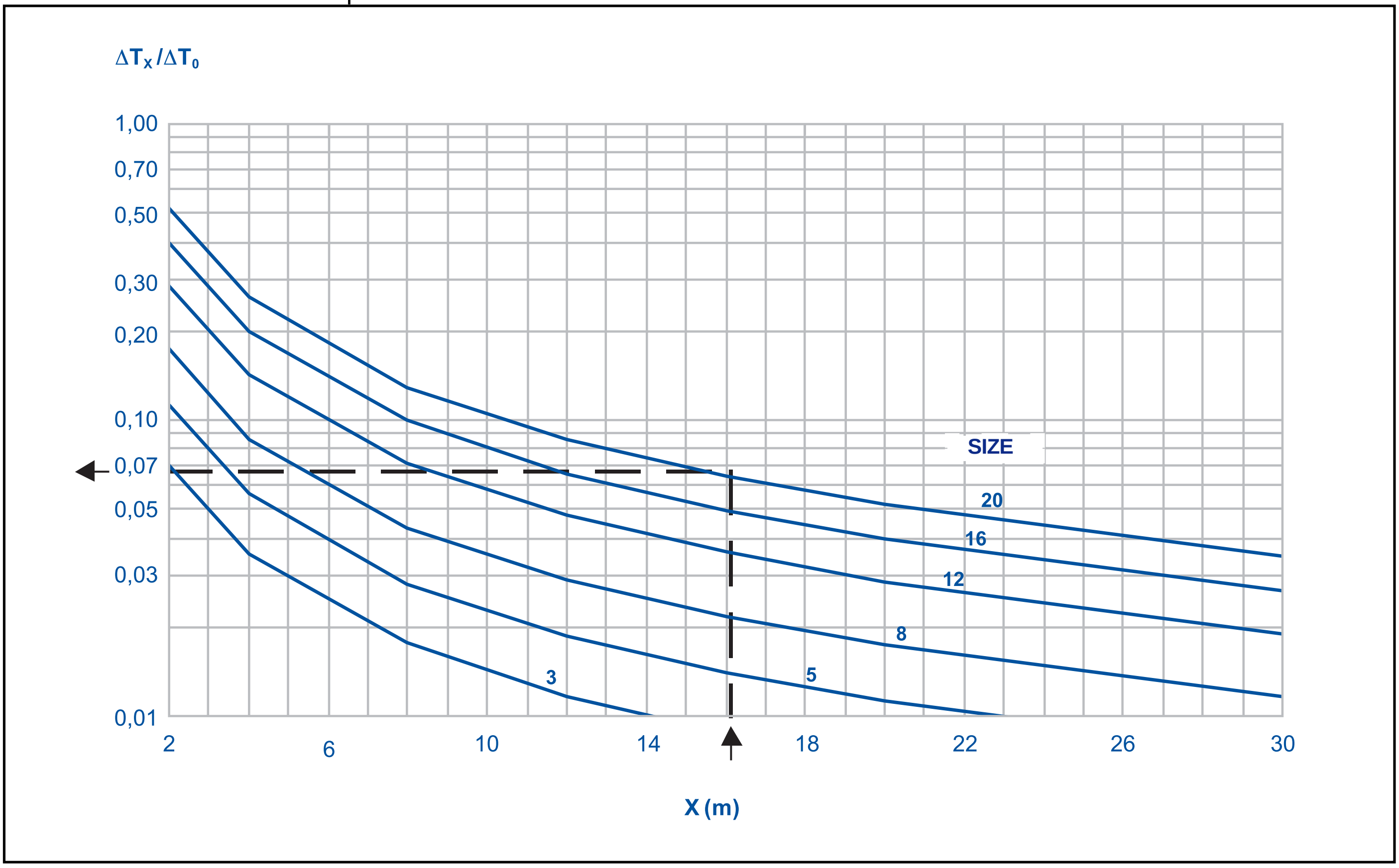


DF-48 model

DF-48-4.- Ratio between air flow velocities.

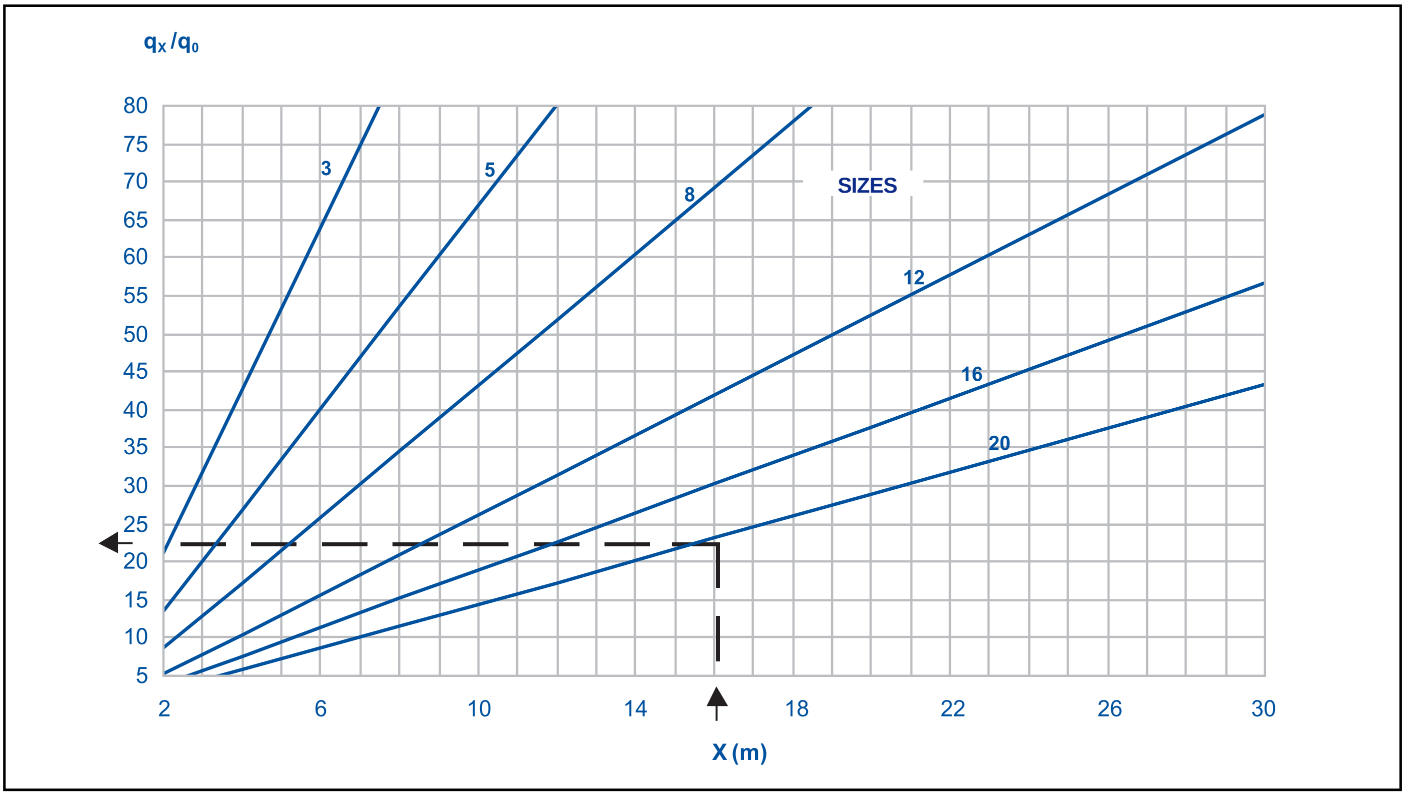


DF-48-5.- Ratio between temperature differences.

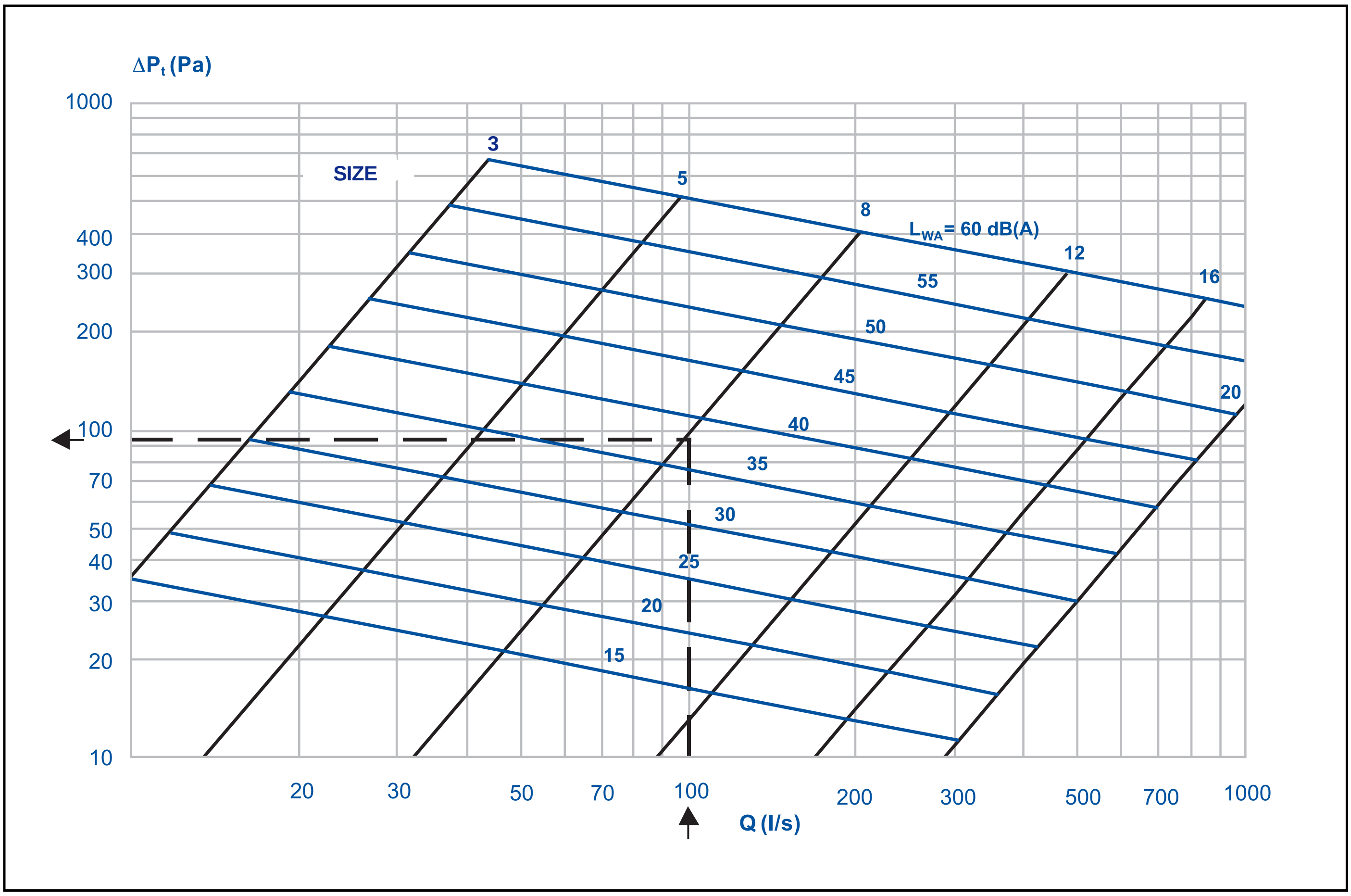


DF-48 model

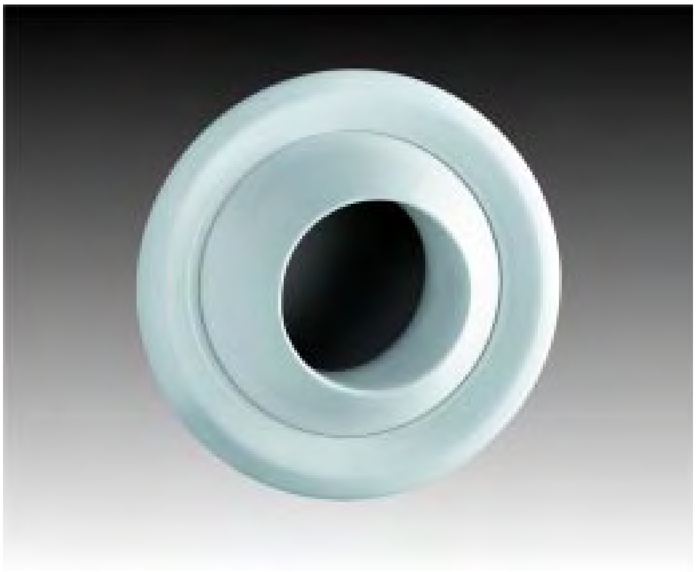
DF-48-6.- Induction rate.



DF-48-7.- Pressure drop and sound power level.



DF-49 model
Decorative long-throw nozzle



DF-49 long-throw nozzles

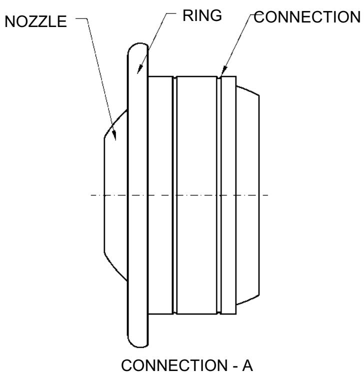
Interior architecture are increasingly designing larger spaces for hotels, shopping malls, salons, convention centres, airport vestibules, passenger stations, social halls, etc.
In addition to effective air blowing at a long distance through nozzles (originally designed for industrial facilities), the use of these terminal units in more comfortable surroundings requires utmost attention to the aesthetic design.

has introduced the **DF-49** diffuser to combine long-throw efficiency with a more harmonious design. The stylised lines of the nozzles and the possibility of matching current decorative styles make these diffusers a reliable, great-looking component for facilities with more stringent requirements in terms of design and comfort.

DF-49 long-throw nozzle

Description

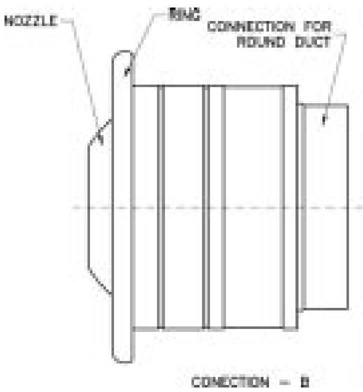
The **DF-49** long-throw nozzle and the decorative ring are manufactured in aluminium, with a standard paint finish in RAl 9010 white. The connection part is manufactured of galvanised steel sheet. The **DF-49** nozzle has an extraordinarily good aesthetic design and can be painted by special order to fit any decorative need.



DF - 49 - A

Application

The **DF-49** nozzles provide long throws with a low noise level, releasing a long air jet with exceptional precision to a length of over 30 metres. They can be used for spot cooling and are especially appropriate for large rooms requiring a decorative look, for instance, large vestibules, nightclubs or entertainment areas, department stores, hotels, etc. The configuration allows the nozzle to swivel in all directions up to a maximum of ±30° in the horizontal or vertical direction.



DF - 49 - B

Dimensions and mounting

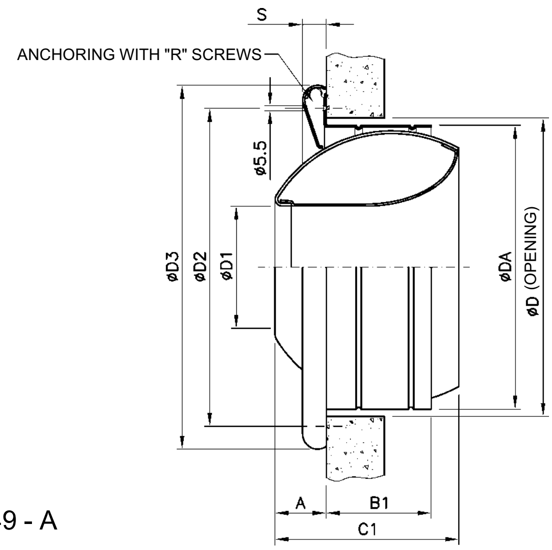
The diffusers are attached by screws that are hidden by the decorative ring. See page 31

DF-49	*Long-throw nozzles, manual operation.*
A ó B	*Connection system.*
5, 8, 12 16	*Four sizes (see page 33).*
AE	*Motor drive.*

Identification

Four sizes with manual swiveling. The motor drive swivels the nozzle in the vertical direction (up and down) at an angle of approximately ± 30°. For motor-driven operation one motor is required per nozzle, even in assemblies containing several units.

DF-49 long-throw nozzle



DF - 49 - A

Dimensions

Version **A** of the **DF-49** jet nozzles can be mounted directly to the duct, plenum box or surface.

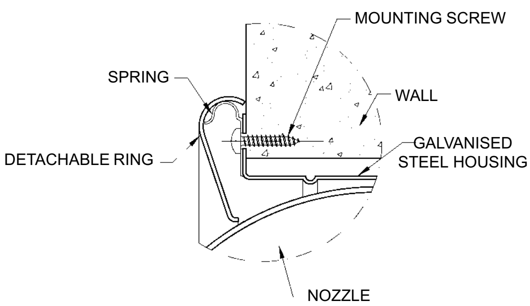
Version **B** allows a flexible duct of standard dimensions to be coupled directly to each nozzle.

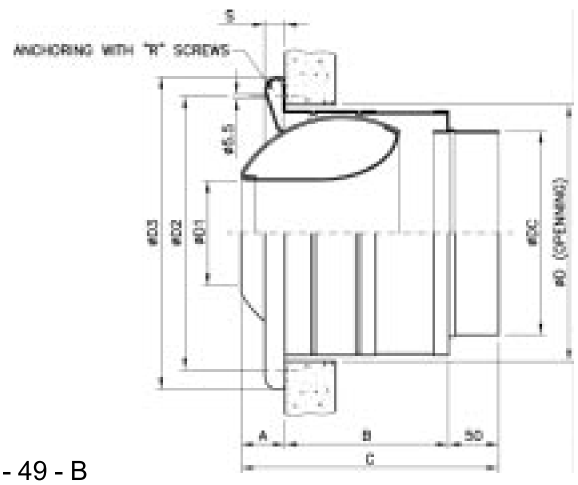
In both cases, the nozzles are fixed by screws, which are housed below a decorative ring which can be removed by simple pressure.

In terms of the motor drive system, the motor may be placed inside or outside the unit, depending on the connection system and motor type (each case should be analysed separately). Please contact us for more information.

DF–49–A

MODEL	øD	øD1	øD2	øD3	øDA	A	B1	C1	R	S
5	150	55	176	210	140	22	55	91	3	18
8	217	90	235	268	209	34	93	135	4	18
12	323	156	343	376	313	57	125	198	4	19
16	433	220	478	511	422	78	149	284	6	20





DF - 49 - B

DF–49–B

MODEL	øD	øD1	øD2	øD3	øDC	A	B	C	R	S
5	150	55	176	210	98	22	111	183	3	18
8	217	90	235	268	158	34	152	236	4	18
12	323	156	343	376	248	57	196	302	4	19
16	433	220	478	511	398	78	210	338	6	20

DF-49 selection table

Q		Size	5	8	12	16
(m^3/h)	(l/s)	A_k (m^2)	0,0025	0,0060	0,0184	0,0390
75	20,8	V_k (m/s)	8,3			
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)	11,4 6,9 3,4			
		ΔP_t (Pa)	37			
		L_{wA} - dB(A)	<15			
125	34,7	V_k (m/s)	13,9	5,8		
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)	19,1 11,4 5,7	11,5 6,9 3,4		
		ΔP_t (Pa)	103	17		
		L_{wA} - dB(A)	28	<15		
175	48,6	V_k (m/s)	19,4	8,1		
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)	26,7 16,0 8,0	16,1 9,6 4,8		
		ΔP_t (Pa)	202	34		
		L_{wA} - dB(A)	39	15		
250	69,4	V_k (m/s)	27,7	11,5	3,8	
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)	>30 22,9 11,4	22,9 13,8 6,9	12,9 7,8 3,9	
		ΔP_t (Pa)	411	69	7	
		L_{wA} - dB(A)	49	26	<15	
350	97,2	V_k (m/s)		16,1	5,3	
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)		>30 19,3 9,6	18,1 10,9 5,4	
		ΔP_t (Pa)		134	14	
		L_{wA} - dB(A)		36	<15	
500	138,9	V_k (m/s)		23,0	7,5	3,6
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)		>30 27,5 13,8	25,9 15,5 7,8	17,3 10,4 5,2
		ΔP_t (Pa)		274	28	6
		L_{wA} - dB(A)		47	17	<15
700	194,4	V_k (m/s)			10,6	5,0
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)			>30 21,7 10,9	24,3 14,6 7,3
		ΔP_t (Pa)			55	13
		L_{wA} - dB(A)			27	<15
1000	277,8	V_k (m/s)			15,1	7,1
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)			>30 >30 15,5	>30 20,8 10,4
		ΔP_t (Pa)			113	26
		L_{wA} - dB(A)			38	23
1400	388,9	V_k (m/s)			21,1	10,0
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)			>30 >30 21,7	>30 29,1 14,6
		ΔP_t (Pa)			222	51
		L_{wA} - dB(A)			48	33
1900	527,8	V_k (m/s)				13,5
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)				>30 >30 19,8
		ΔP_t (Pa)				93
		L_{wA} - dB(A)				42
2500	694,4	V_k (m/s)				17,8
		$X_{0,3}$ $X_{0,5}$ $X_{1,0}$ (m)				>30 >30 26,0
		ΔP_t (Pa)				161
		L_{wA} - dB(A)				50

Notes

- This selection table is based on laboratory tests as per ISO 5219 (UNE 100.710) and ISO 5135 and 3741.
- ΔT is equal to 0°C (isothermal air).
- The behaviour of the air jet with different Δt is shown in the following charts.

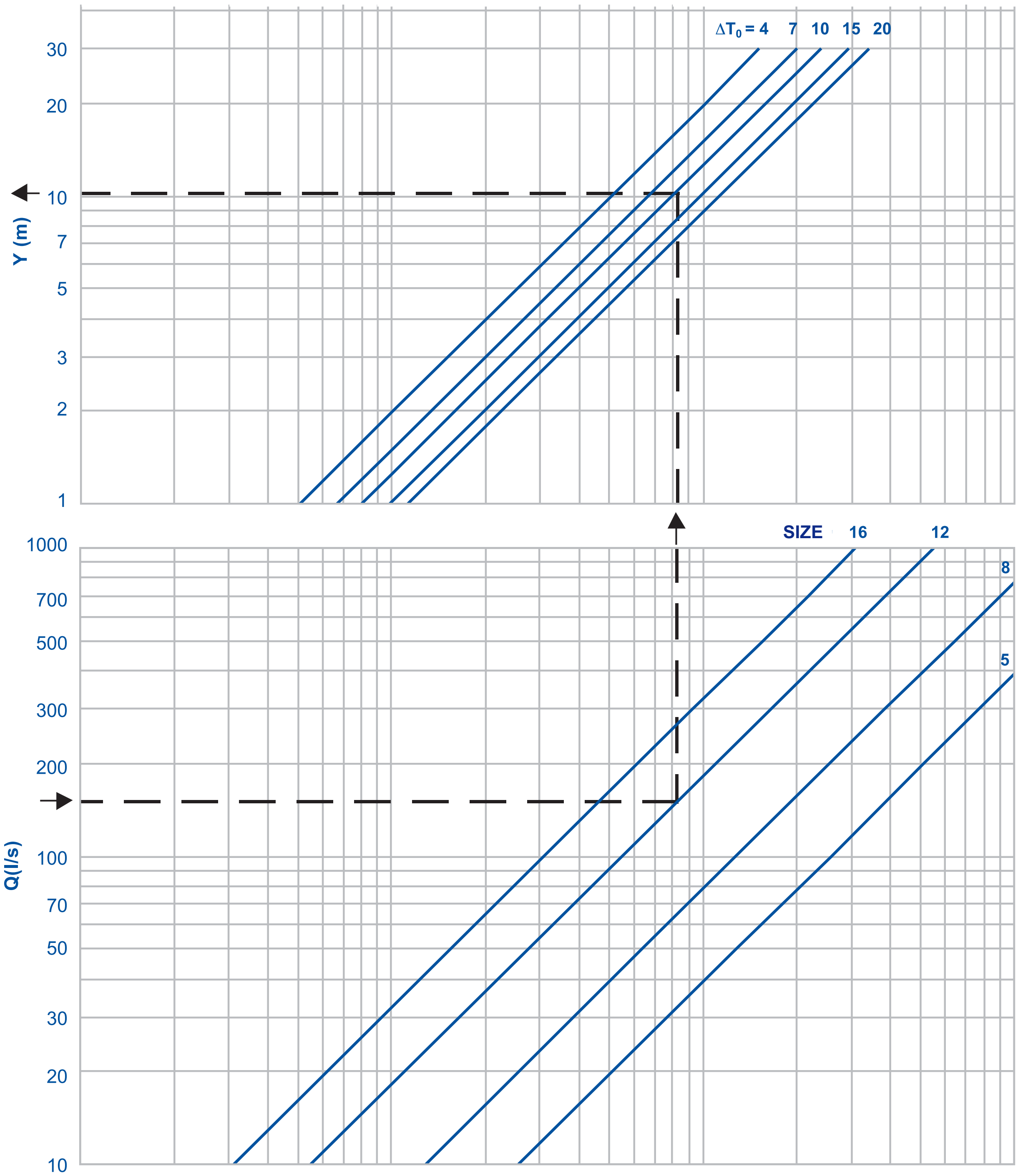
Symbols

Q = Air flow
V_k = Effective velocity
A_K = Effective area
ΔP_t = Total pressure drop
L_{wA} = Sound power
$X_{0,3}$ - $X_{0,5}$ - $X_{1,0}$ = Throw for a terminal air velocity of 0.3, 0.5 and 1.0 m/s, respectively.

DF-49 model

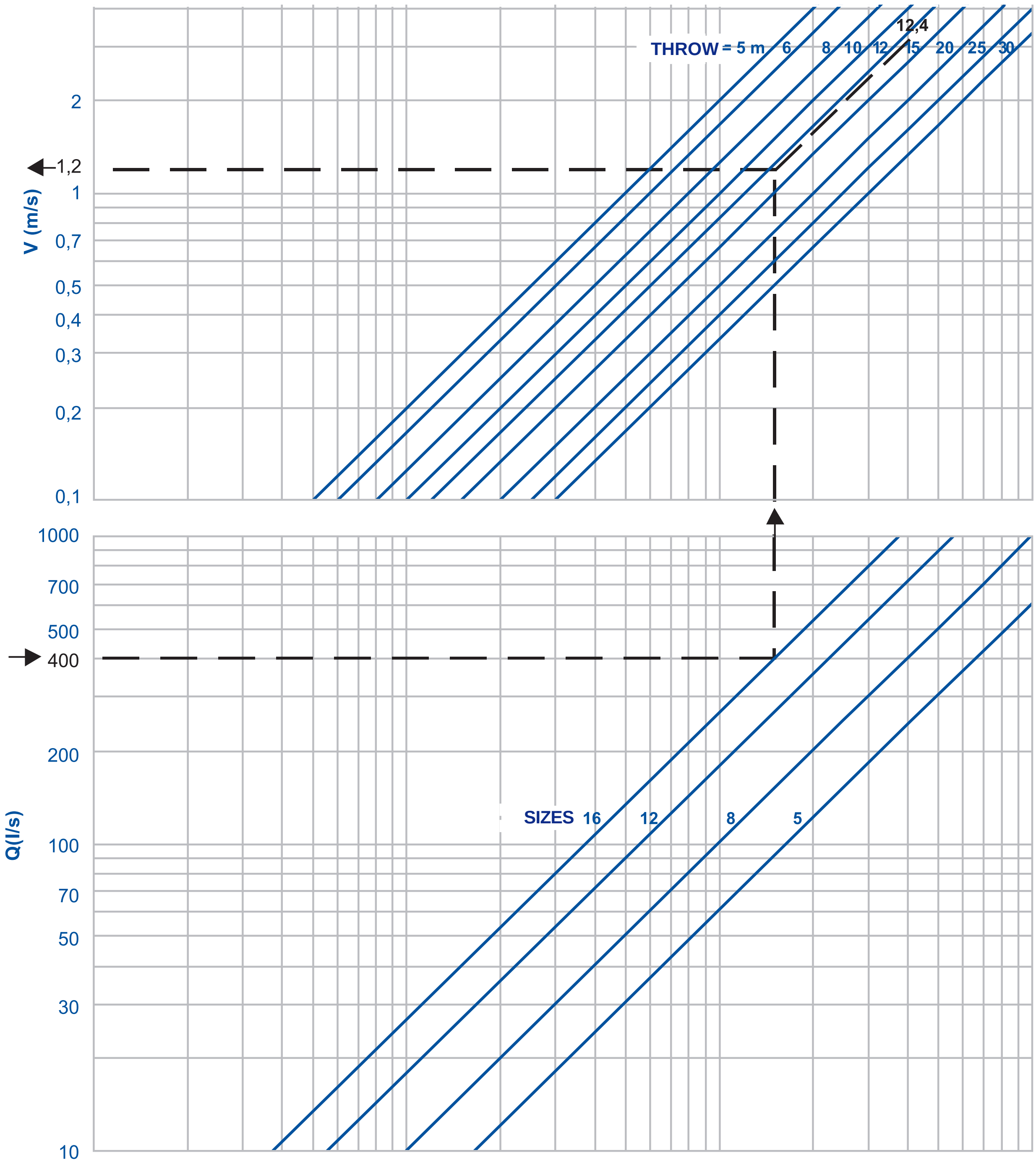
Selection charts

DF-49-1.- Maximum vertical penetration .



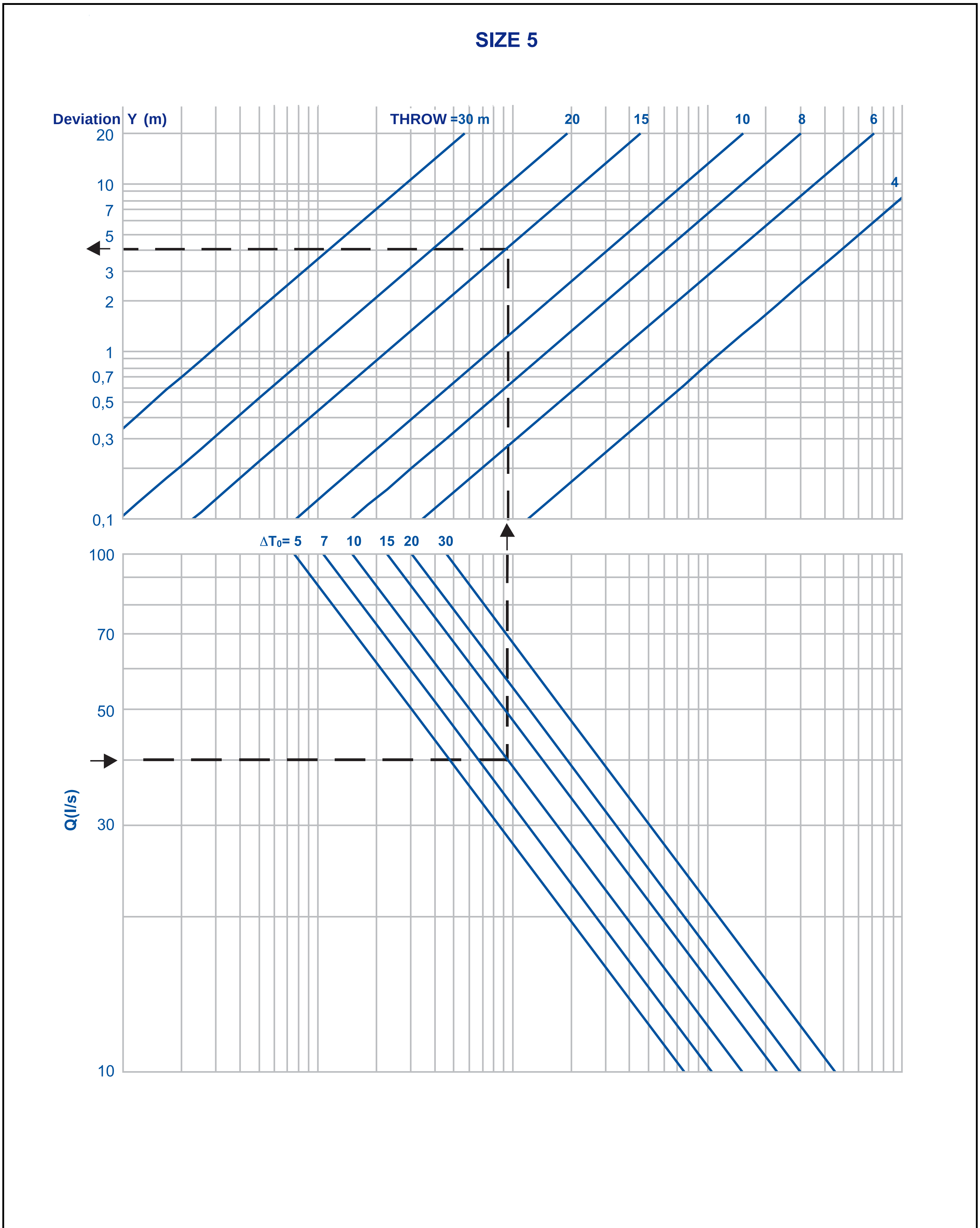
DF-49 model

DF-49-2.- Velocity of the air jet for the throw.



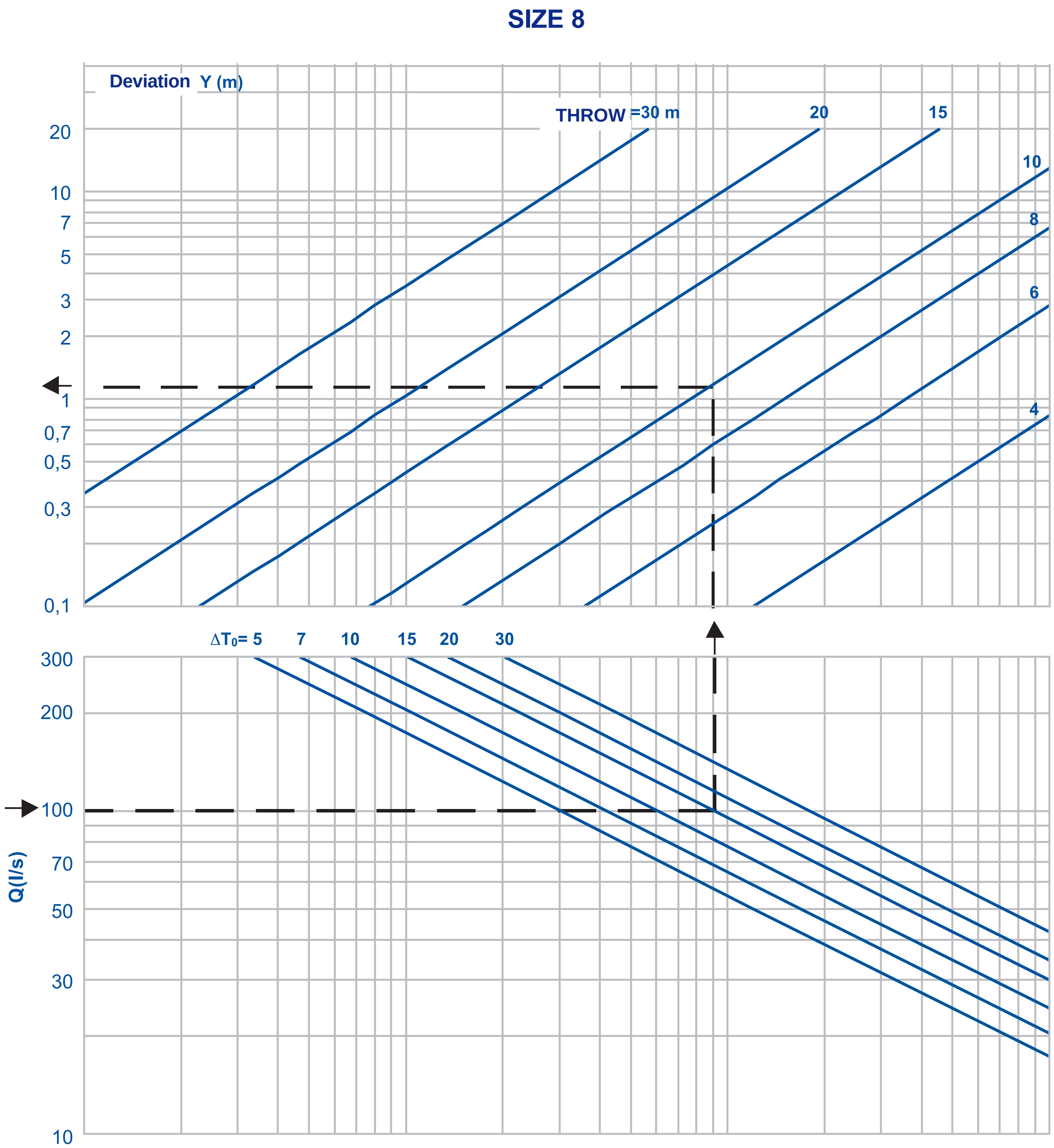
DF-49 model

DF-49-3.1.- Vertical deviation of the air jet (non-isothermal jets).



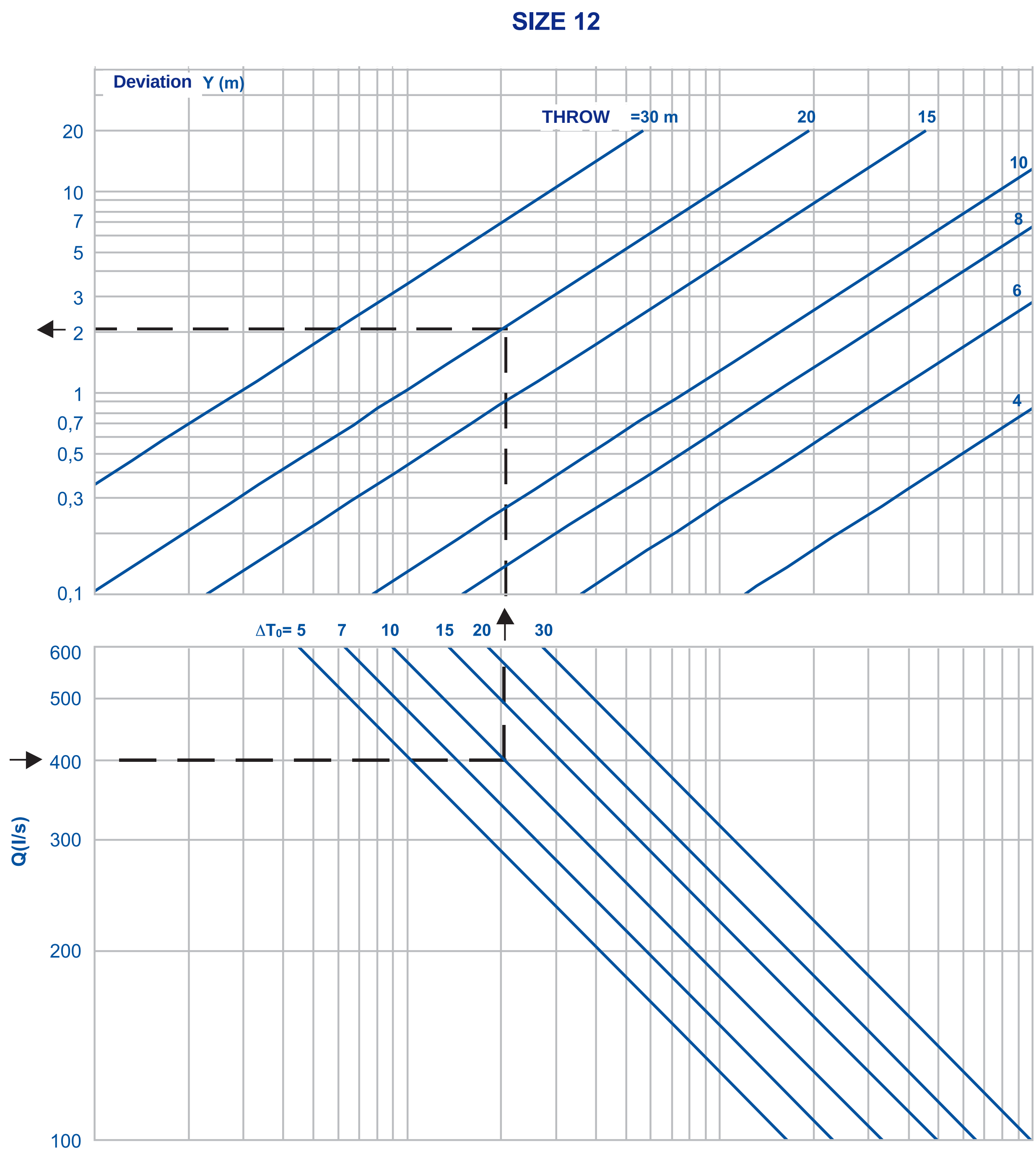
DF-49 model

DF-49-3.2.- Vertical deviation of the air jet (non-isothermal jets).



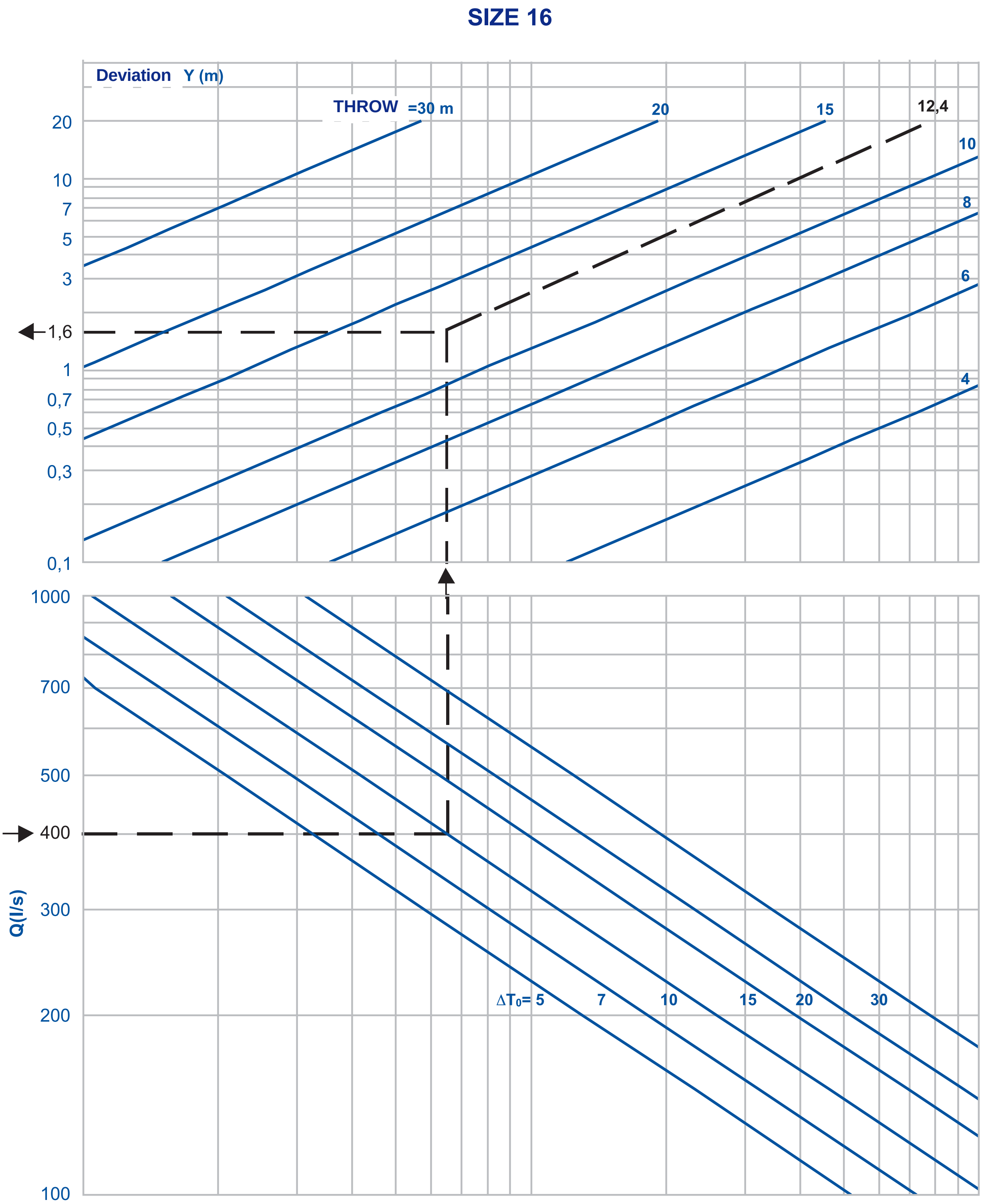
DF-49 model

DF-49-3.3.- Vertical deviation of the air jet (non-isothermal jets).



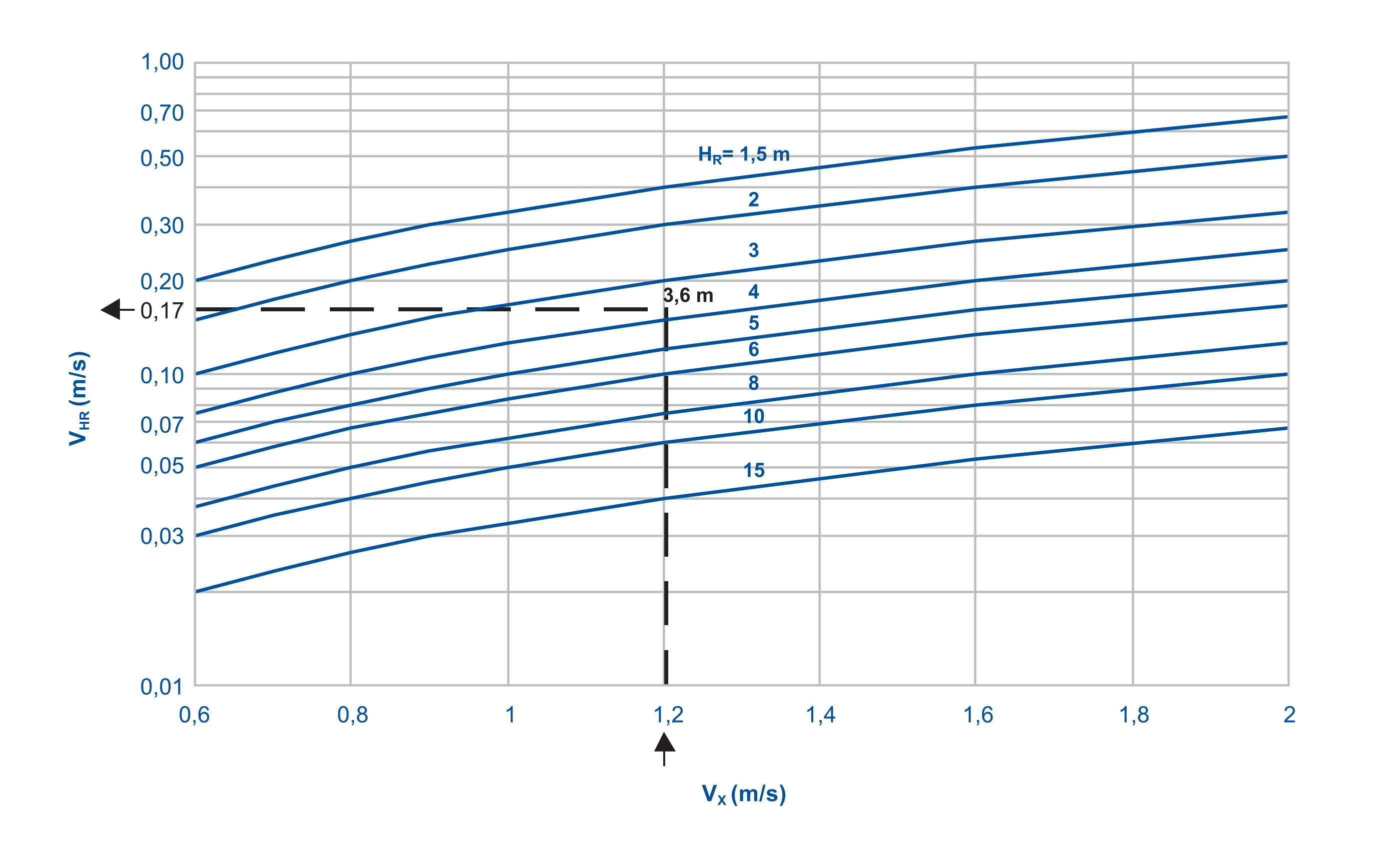
DF-49 model

DF-49-3.4.- Vertical deviation of the air jet (non-isothermal jets).

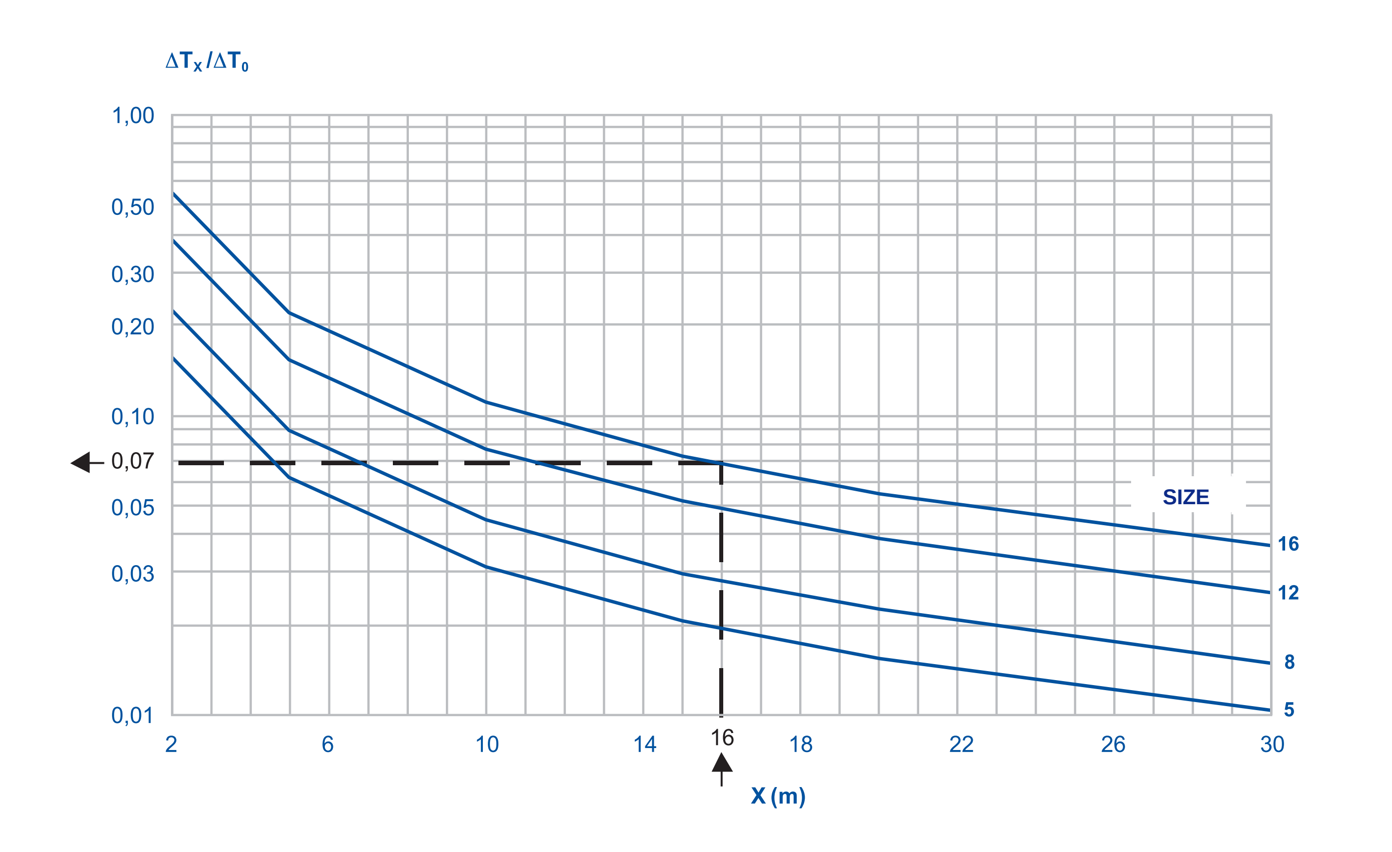


DF-49 model

DF-49-4.- Ratio between air flow velocities.

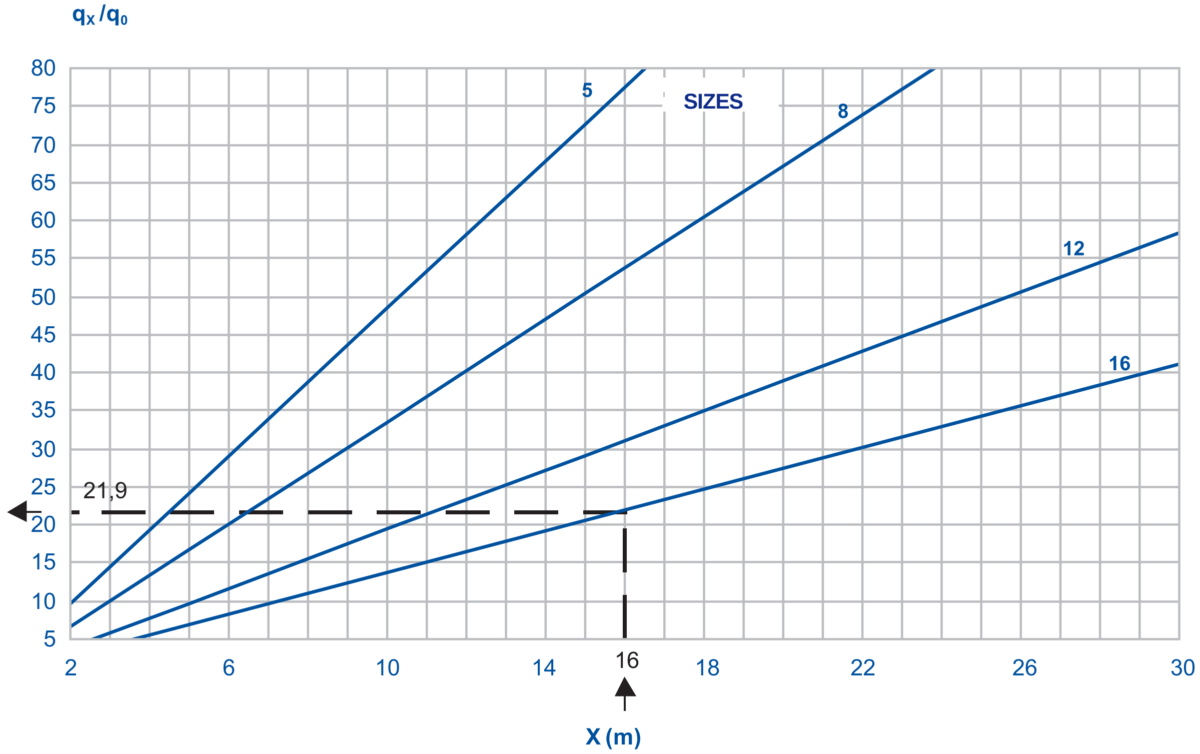


DF-49-5.- Ratio between temperature differences.

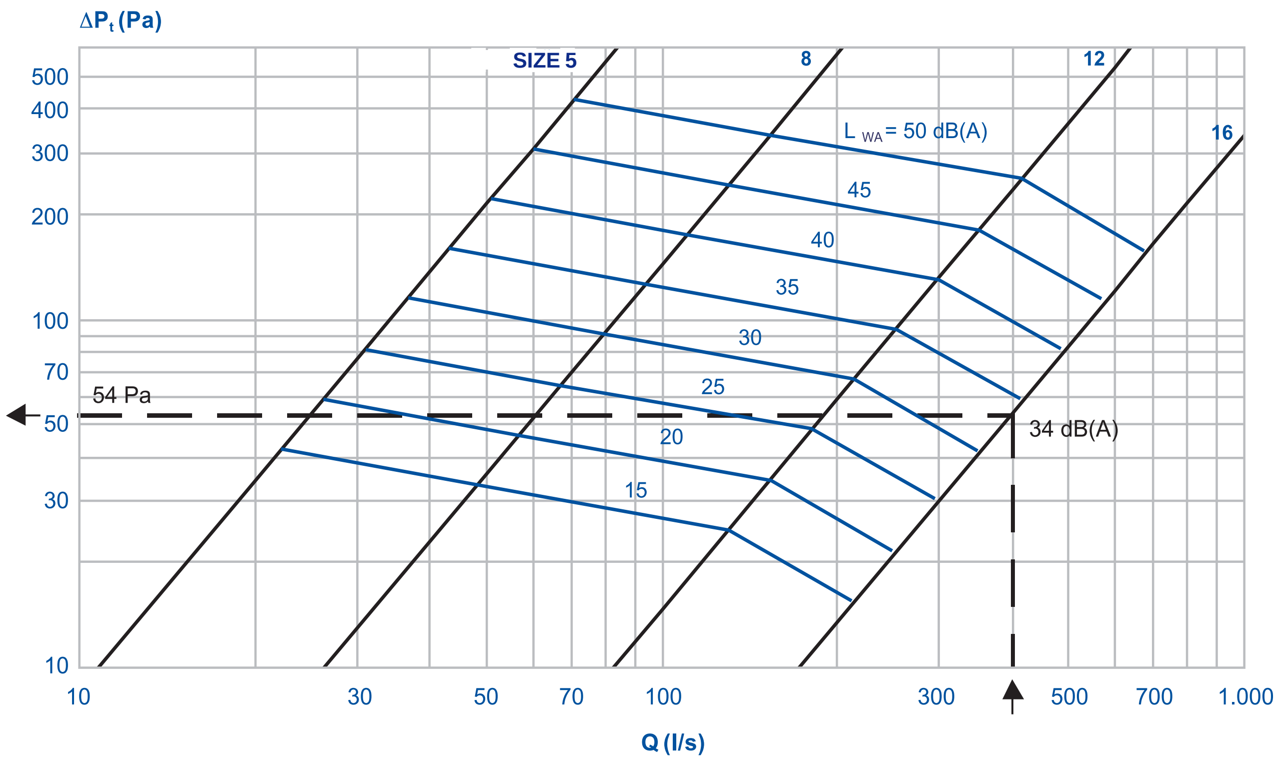


DF-49 model

DF-49-6.- Induction rate.



DF-49-7.- Pressure drop and sound power level.



DLA Series Long-throw diffusers

Selection. General information

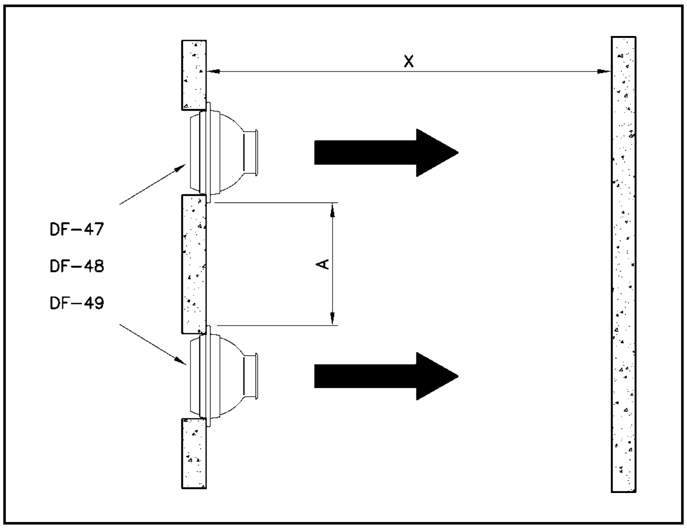
Important:

If, in a single line of **DF-47** rectangular diffusers, **DF-48** spherical diffusers or **DF-49** long-throw nozzles, the distance from one unit to the next is less than the product of 0.2 · **Throw (X)**, the values obtained in the charts for velocity and temperature difference in the throw (V_x y ΔT_X) will have to be divided by 0,71.

If **A < 0,2 • X**

V_X (actual) = V_X (chart) / 0,71

ΔT_X(actual) = ΔT_X(chart) / 0,71



Selection in a sample project

The approach used to select a diffuser from the **DLA** series is identical in all cases (**DF-47**, **DF-48** and **DF-49**). Therefore, the steps followed in the example included below -which uses the charts for long-throw nozzles (**DF-49** series)- are applicable to the selection of the other models (**DF-47** and **DF-48**) when the respective charts are used.

Note: To avoid potential errors when using the charts, we should point out that the flow rate is expressed **in m³/h in the DF-47** models because of the different equipment operating ranges and the use of logarithmic scales, but expressed **in l/s in the DF-48 and DF-49 models.**

Initial data

Two **DF-49** nozzles are located, one in front of the other at a distance of 24 m, with the following starting data based on the sketch attached in the Symbols section on page 43.

- L = 12 m
- H = 4 m (height from floor)
- Q_{nozzle} = 400 l/s
- Supply temperature = 15° C
- Room temperature = 25° C
- ΔT_0 = -10° C
- H_H = 2 m (height of occupied area)

The diffuser should be selected to obtain the following:

- Maximum velocity in the occupied area: 0,2 m/s.

- The vertical temperature gradient must not exceed 3°C.

- The sound power level of the selected equipment must not exceed 40 dB(A).

Selection

- DF-49 quick selection table (page 32)

Based on the sound power limit, size 16 is preselected.

- DF-49-7 chart (page 40)

Using size 16 for 400 l/s, the following values are obtained:

- ΔP_t = 54 Pa (pressure drop)

- L_{wA} = 34 dB(A) (sound power level)

- DF-49-2 chart (page 34)

For a supply angle of α_X= +15° C,
The throw will be l=L/cos 15°=12/0,966=12,42 m
According to the chart, the velocity for this throw is **V_x=1,2 m/s**

- DF-49-3.4 chart (page 38)

The impact point under isothermal conditions would be $H+H_C$=H+(L x tan 15°)=4+(12x0,268)=7,2 m
The chart indicates that for ΔT_0 = -10° C, throw: 12,42 m and Q: 400 l/s the vertical deviation is **Y = 1,6 m**, as the air jet is non-isothermal.
Therefore, the air jets have an impact point situation at a height from the floor of: 7,2-1,6=5,6 m.

- DF-49-4 chart (page 39)

For a height H_R=5,6-2=3,6m, entering with V_X=1,2 m/s gives a velocity of **$V_{HR}=V_H$=0,17 m/s** in the occupied area.

- DF-49-6 chart (page 40)

For a throw of $l+H_R$=12,42+3,6=16,02 we have **q_x/q_o=21,9.**

- DF-49-5 chart (page 39)

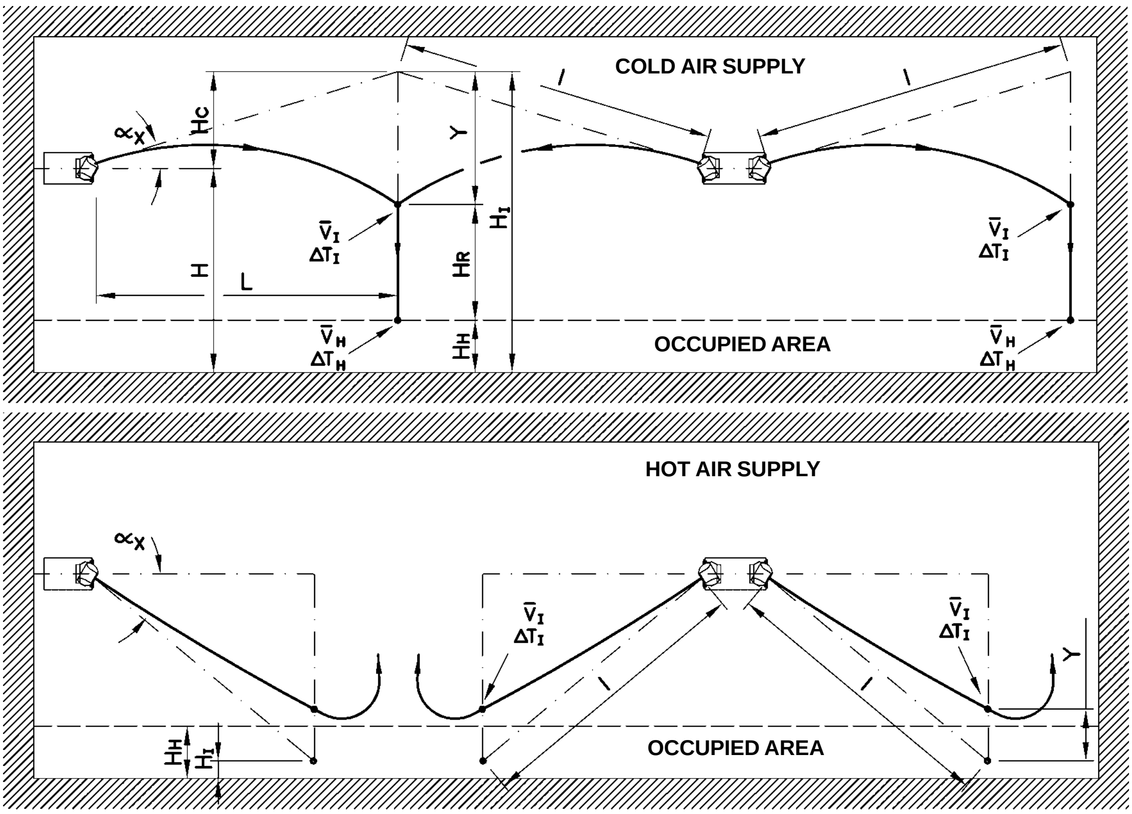
For a throw of $l+H_R$=12,42+3,6=16,02 we have $\Delta T_X/\Delta T_0$=0,07.
Therefore, the temperature of the air jet at its inlet in the occupied zone will be:

$$\Delta T_X = T_X - T_{Temperature} \rightarrow \quad T_X = T_{Temperature} + \Delta T_X = 25 + [0{,}07x(-10)] \rightarrow \mathbf{T_X = 24{,}3° C}$$

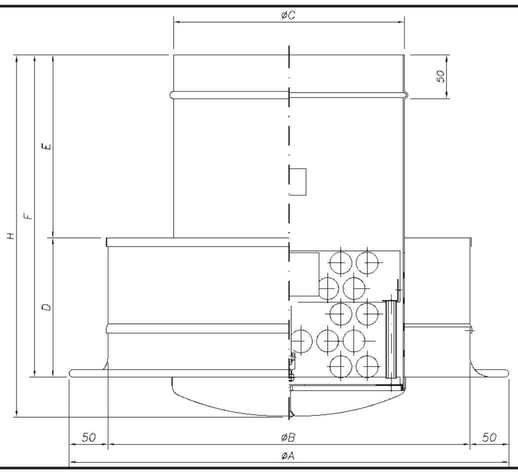
Symbols

Common symbols used in all tables and charts in the catalogue.

I(m): Distance between the equipment to the impact point of the jets (with another jet or wall) under **isothermal conditions**.
α_x(°): Supply angle.
L(m): Horizontal distance from the equipment to the impact point of the jets (with another jet or wall).
X(m): Throw of the air jet.
Y(m): Deviation of the air jet caused by a temperature difference between the supply and ambient air.
H(m): Installation height of the equipment.
H_H(m): Height of occupied area.
H_C(m): Height from the impact point of the jets (with another jet or wall) under isothermal conditions with respect to the equipment location.
H_I(m): Height from the impact point of the jets (with another jet or wall) under **isothermal conditions.**
H_R(m): Height from impact point of the jets (with another jet or wall) with respect to the point where the air velocity and temperature are to be determined (generally the occupied area).
Q(m^3/h ó l/s): Supply air flow.
A_K(m^2): Effective area.
V_X(m/s): Velocity of the jets at throw X.
V_H(m/s): Velocity of the jets in the occupied area.
V_K(m/s): Effective supply velocity.
V_{HR}(m/s): Velocity of the jets at a distance, H_R, below the impact point of the jets (with another jet or wall).
ΔT_O(°C): Temperature difference between the supply jets and room air.
ΔT_X(°C): Temperature difference between the jets (for throw X) and room air.
ΔT_h(°C): Temperature difference between the jets (in occupied area) and room air.
q_x/q_o: Induction rate. Quotient between the air flow for a throw X and the air flow supplied in the zone.
Y_{max}(m): Maximum throw with vertical supply of hot air (V_x=0 m/s).
ΔP_t(Pa): Total pressure drop .
L_{wA}[dB(A)]: Sound power level.



DGV variable geometry diffusers



DIMENSIONS in mm.							
MODELS	Ø A	Ø B	Ø C	D	E	F	H
250	425	325	249	190	250	440	495
315	500	400	314	190	250	440	495
400	600	500	399	190	250	440	510
500	730	630	499	190	250	440	510
630	900	800	629	260	320	580	650

DGV	*Round, variable-geometry diffuser series.*
P **-**	*With plenum box plus manual f.* *Without plenum box.*
+ M.MOT **+ M.MAN**	*With motor-driven operation.* *With manual operation.*
+ TR	*Thermoadjustable.*
Size	*From 250 to 630, according to table.*

Description

DGV round, variable-geometry diffuser constructed of steel plate. The standard finish is RAL 9010 white paint. By special order, the diffuser can be painted in any RAL colour.

Operation

The **DGV** diffuser is composed of two concentric modules. The inner module is moveable, and can be moved manually or by a servo drive. This sliding inner module was designed such that, when moved, it simply and efficiently changes the direction of the outlet airflow. The flow direction may be horizontal (for cold air) or vertical (for hot air) as well as any intermediate position, allowing the operation to be precisely adjusted to meet the necessary requirements.

Applications

The **DGV** variable-geometry diffusers are perfectly adaptable to industrial applications as well as areas requiring more comfortable conditions, and can be installed at heights of up to 15 metres (in drop and suspended ceilings). The variation in the air direction for cold or hot air (either manually or automatically with a servo drive or thermoadjustable) makes these units particularly suitable for the air conditioning of large spaces such as large vestibules, sport centres, industrial warehouses, airports, entertainment areas, etc.

Dimensions and operation

The attached table lists the overall dimensions of the diffusers. The overall dimensions of diffuser-plenum box assembly are also shown on page 46.

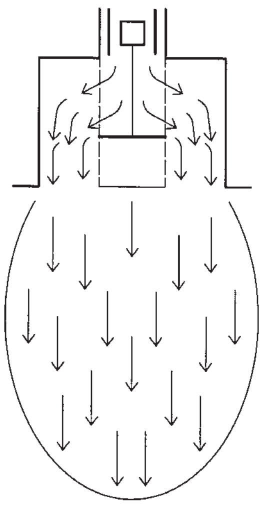
Identification

The code allows the various sizes and models of the **DGV** diffusers to be identified.
The servo drive can be accessed through the diffuser, preventing the need for access through the drop ceiling. The plenum boxes contains several suspension tabs. By special order, the plenum boxes can be supplied with internal insulation.

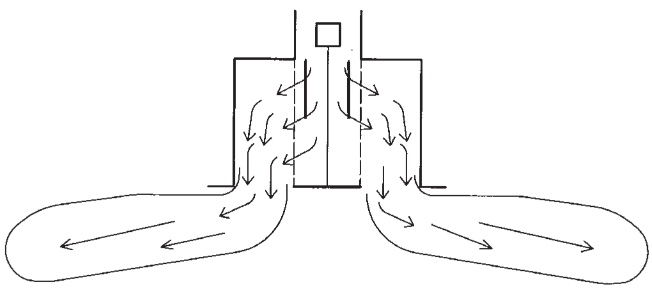
General information

- The **DGV-type** diffusers have a variable geometry and were designed to meet the air conditioning needs of areas which, depending on the thermal loads during the various seasons of the year, require cold or hot isothermal air. By changing the positioning of an internal device, the direction of the outlet airflow is changed, thereby achieving a horizontal or vertical throw, as well as adjustment within several intermediate positions.

- The **DGV-type** diffuser was designed by the Research & Development Department of **KOOLAIR, S.A.**, and tested and calibrated in our own Distribution and Acoustic Laboratory, which is equipped with the most advanced control and measurement systems. The most advanced theories on air diffusion in rooms have been used in its application, based on experiments and studies performed at the KOOLAIR laboratory in Spain.



Heating mode

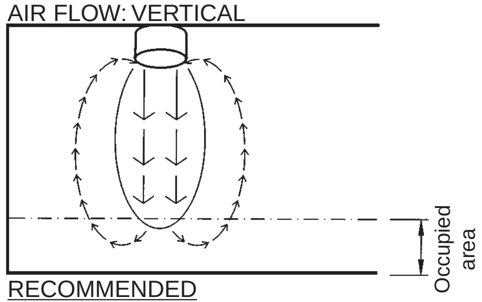


Cooling mode

Operating recommendations

HEATING (ΔT>0)

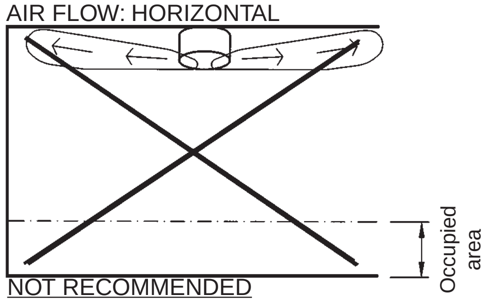
AIR FLOW: VERTICAL



RECOMMENDED
Acceptable mixture of supply air with the air in the occupied area.

HEATING (ΔT>0)

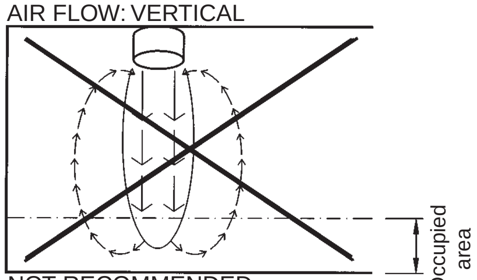
AIR FLOW: HORIZONTAL



NOT RECOMMENDED
Stratification of supply air. No renewal of air in the occupied area.

COOLING (ΔT<0)

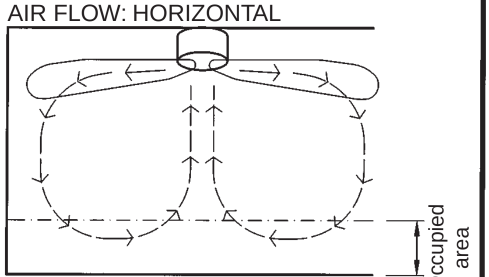
AIR FLOW: VERTICAL



NOT RECOMMENDED
High air velocity in occupied area. Possible draughts.

COOLING (ΔT<0)

AIR FLOW: HORIZONTAL



RECOMMENDED
Acceptable mixture of supply air with the air in the occupied area.

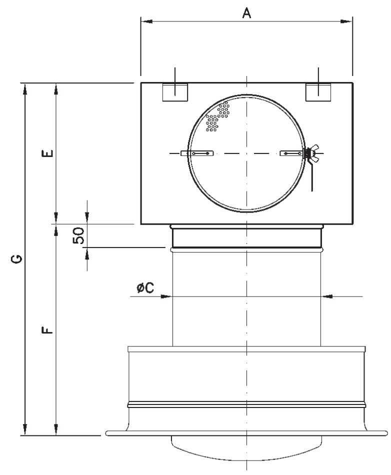
Photographs of DGV diffuser tests in the R&D Laboratory of KOOLAIR S.A.

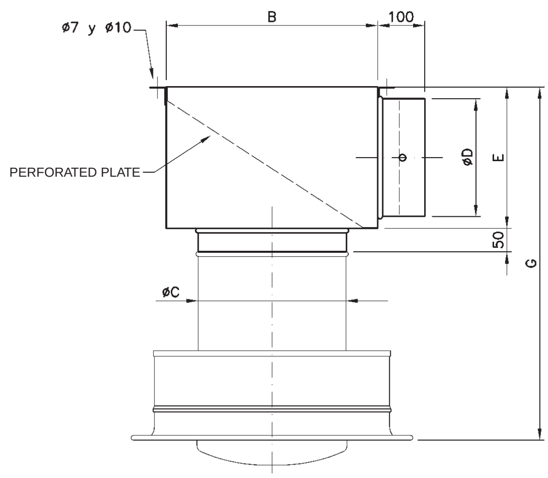
HOT AIR (ΔT>O)
(central core in high position)

ISOTHERMAL AIR (ΔT=O)
(central core in middle position)

COLD AIR (ΔT<O)
(central core in low position)

Plenum box for "DGV" diffuser (dimensions)

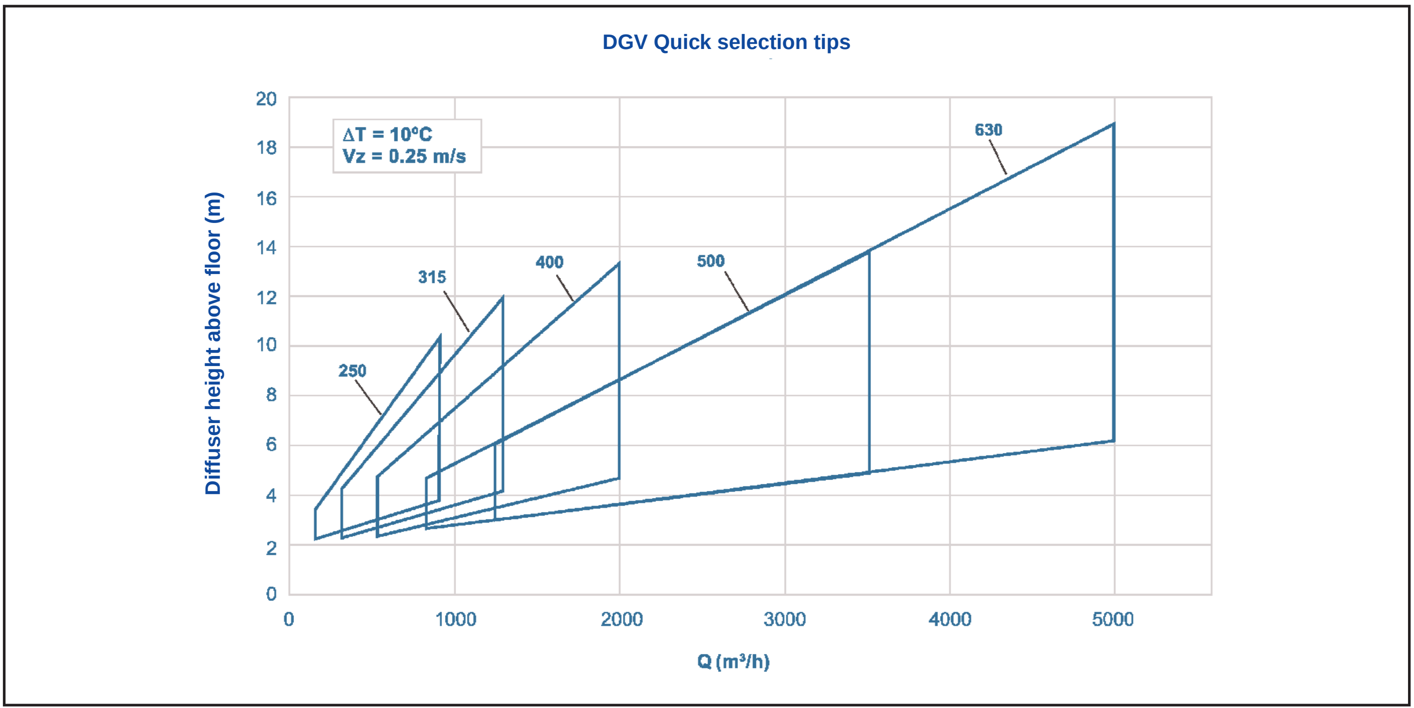




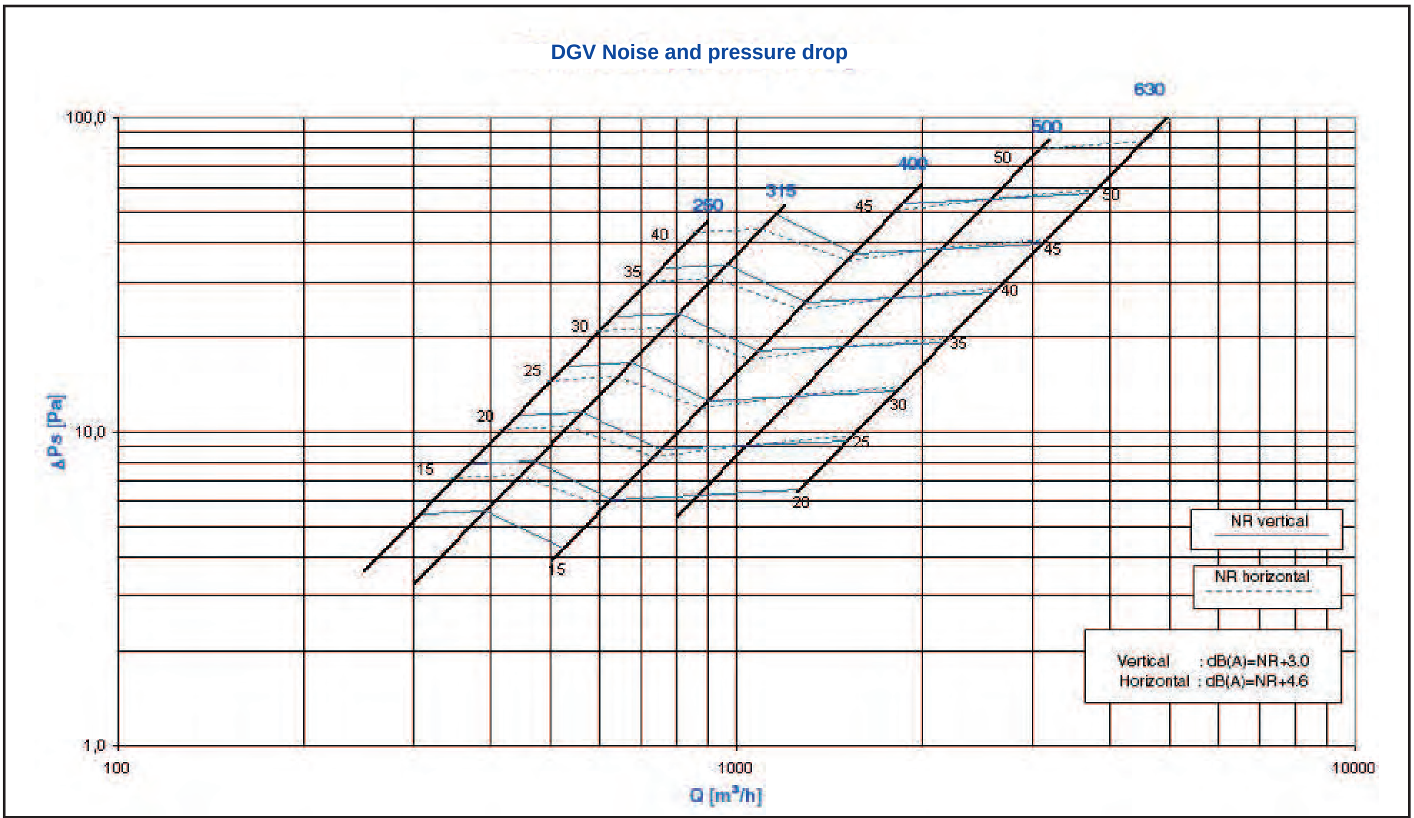
DIMENSIONS in mm							
MOD.	A	B	Ø C	Ø D	E	F	G
250	350	350	249	249	300	440	795
315	450	450	314	314	400	440	895
400	550	550	399	354	450	440	960
500	650	650	499	399	500	440	1010
630	800	800	629	499	600	580	1250

Selection

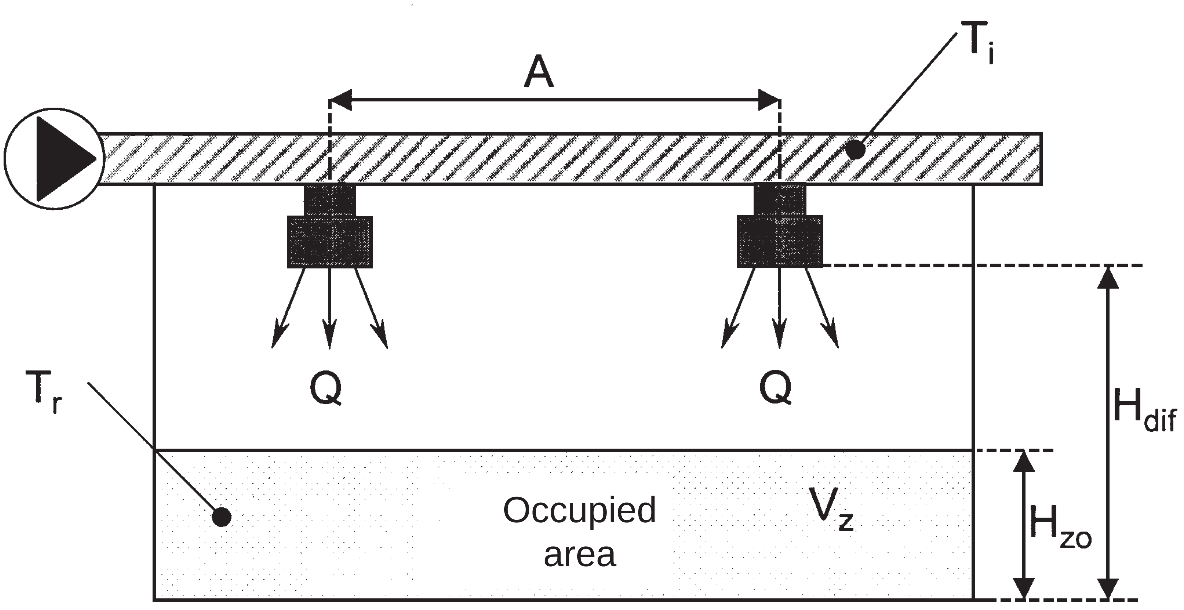
1) DGV quick selection chart



2) DGV noise level and pressure drop chart



Selection in a sample project



Conditions

• Hdif = 6.0 m

• Hzo = 1.8 m

• A = 5m

• Q = 800m³/h

• Ti = 35°C

ΔT = 15°C

• Tr = 20°C

• Lw < 40 dB (A)

• P < 30 Pa

• Vz = 0.25 m/s

The above data are used for the selection, following the steps indicated below:

Symbols

• H_{dif} = Distance from the supply mouth of the diffuser to the floor.

• H_{zo} = Height of occupied area.

• A = Distance between diffuser axes.

• Q = Air flow in each diffuser.

• T_i = Air supply temperature.

• T_r = Room temperature.

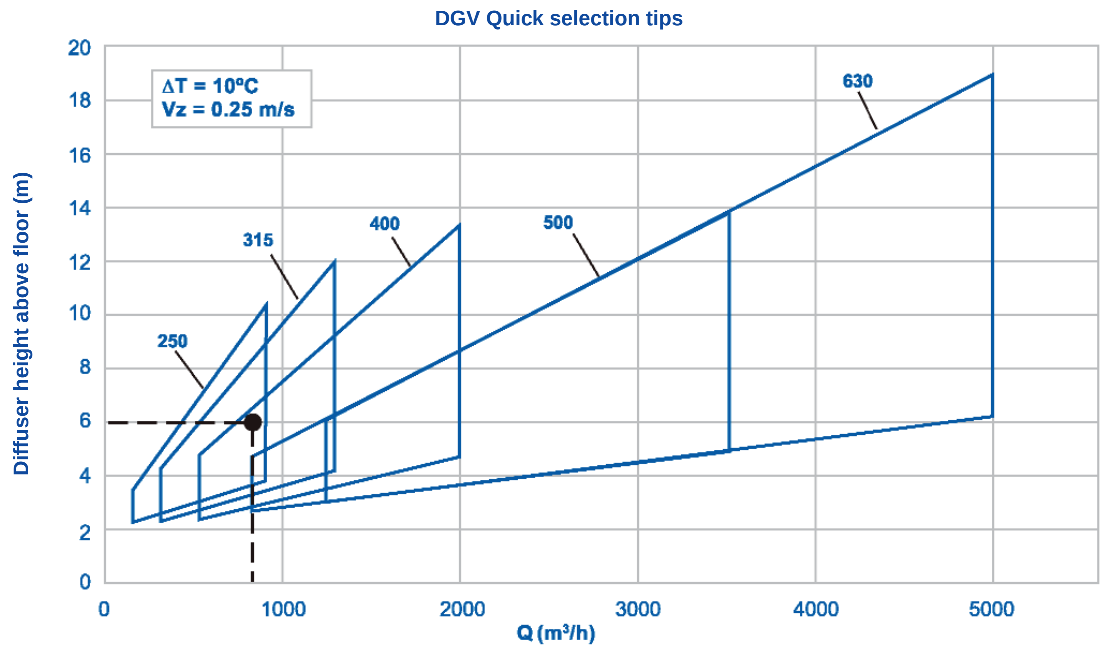
• ΔT = Difference between supply and room temperature.

• L_W = Sound power.

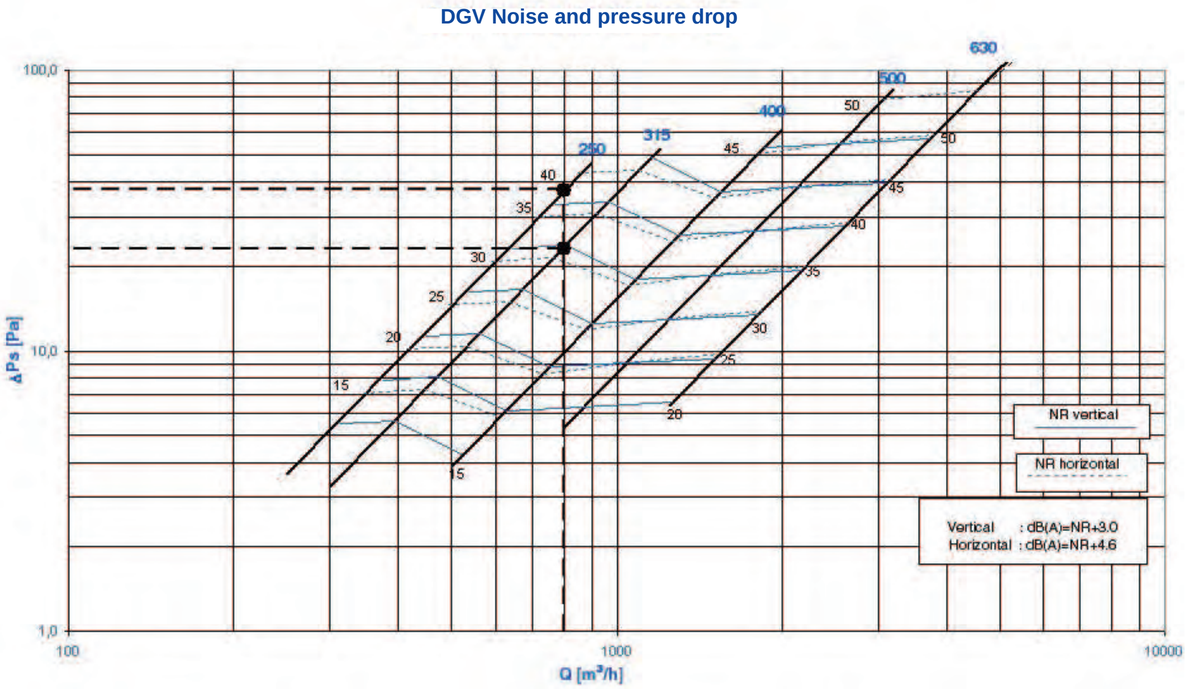
• P = Pressure drop.

• V_z = Maximum velocity in occupied area.

Step 1.
Quick selection tips for the model
Based on the flow rate and the distance, H_{diff}, from the diffuser supply outlet to the floor, the 250 or 315 models can be chosen.



Step 2.
Verification by noise level and pressure drop.
The data are obtained from the flow rate and the diffuser model.



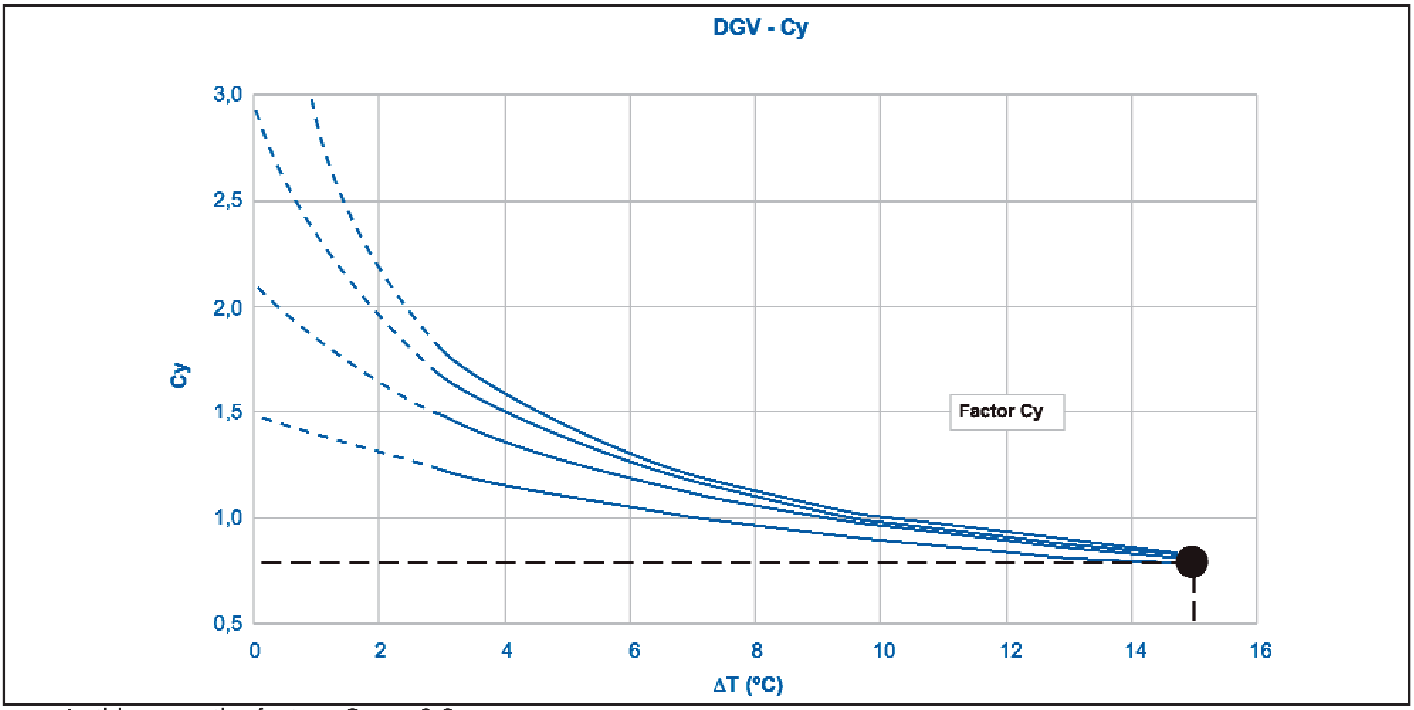
Comparison

Thus, the charts indicate that the selected diffuser is DGV 315.

Step 3.

Determination of the temperature correction factor (C_y).

It is necessary to know if the diffuser throw is within the operating limits. The next step (nº4) , is used to determine if the diffuser (in terms of throw) meets the needs required.
This is determined by the temperature differenc Δ T (°C) and the maximum velocity in the occupied area. V_z (m/s), both specified in the conditions of the selection in the sample project.



In this case, the factor «C_y» = 0,8

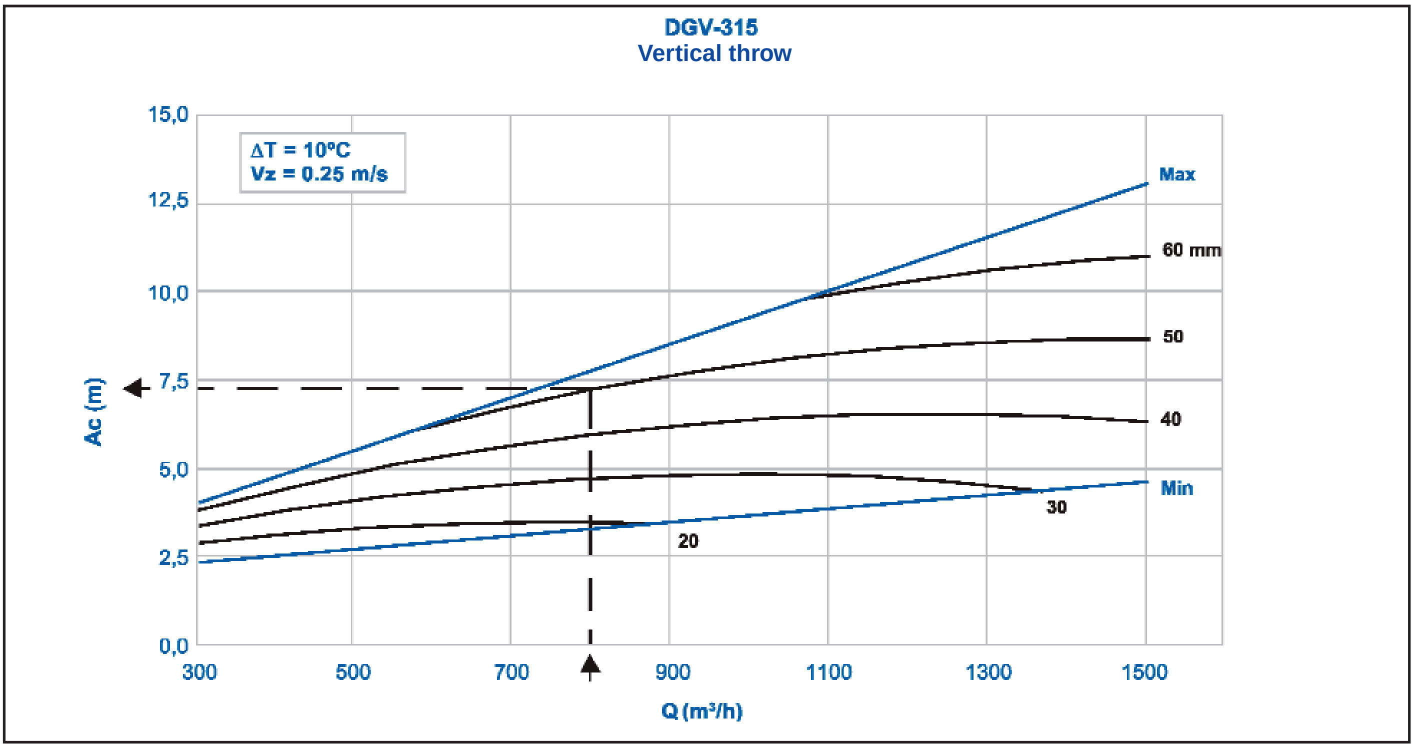
Step 4.

Verification of throw within the operating limits.

«A_c», is obtained from the following equation:

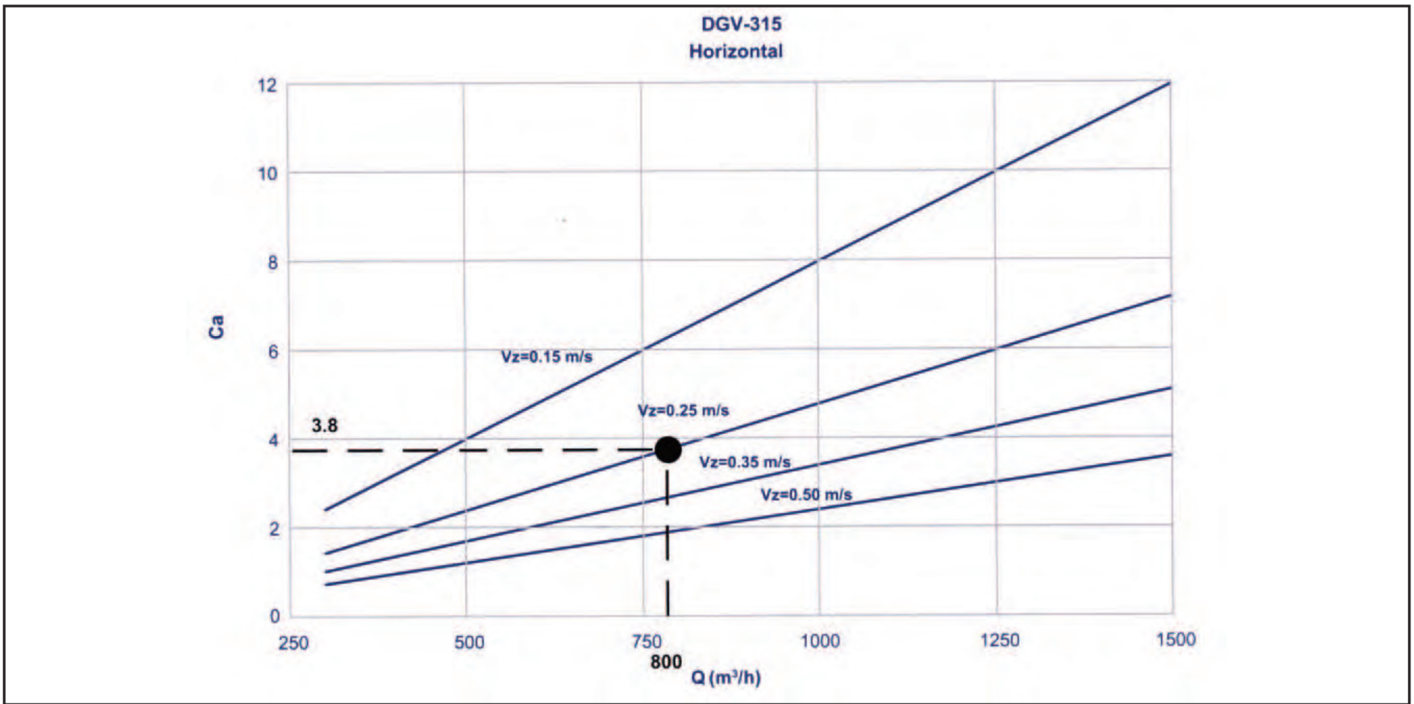
$$A_c = [(H_{dif} - H_{zo}) / C_y]+ H_{zo}$$
$$A_c = [(6 - 1,8) / 0,8]+ 1,8 = 7,05 \text{ m}$$

Once the value of «A_C», is determined, the following figure shows that the diffuser is within the operating limits (within the minimum and maximum lines). Likewise, it allows us to find the stroke (in mm) of the servo motor shaft that will keep the central core fixed at a convenient height, in order to ensure the performance for which it has been selected.



Step 5.
Determination of the correction factor to calculate the minimum distance between diffusers

This factor is known as C_a. and is obtained from the following chart, using the air flow per diffuser (Q m^3/h) and the maximum velocity in the occupied area (V_z m/s).



where the factor C_a = 3.8 from the following equation, yielding the following minimum distance, A, between diffusers:

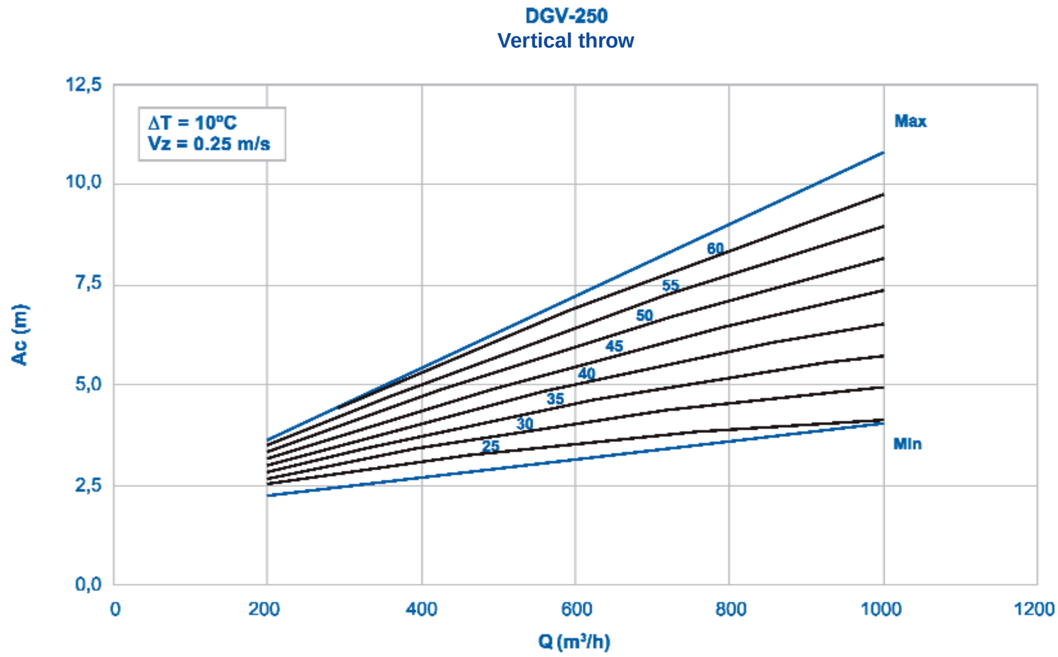
$A = C_a / (H_{dif} - H_{zo})$
$A = 3,8 / (6 - 1,8)$
$A = 0,9$ m

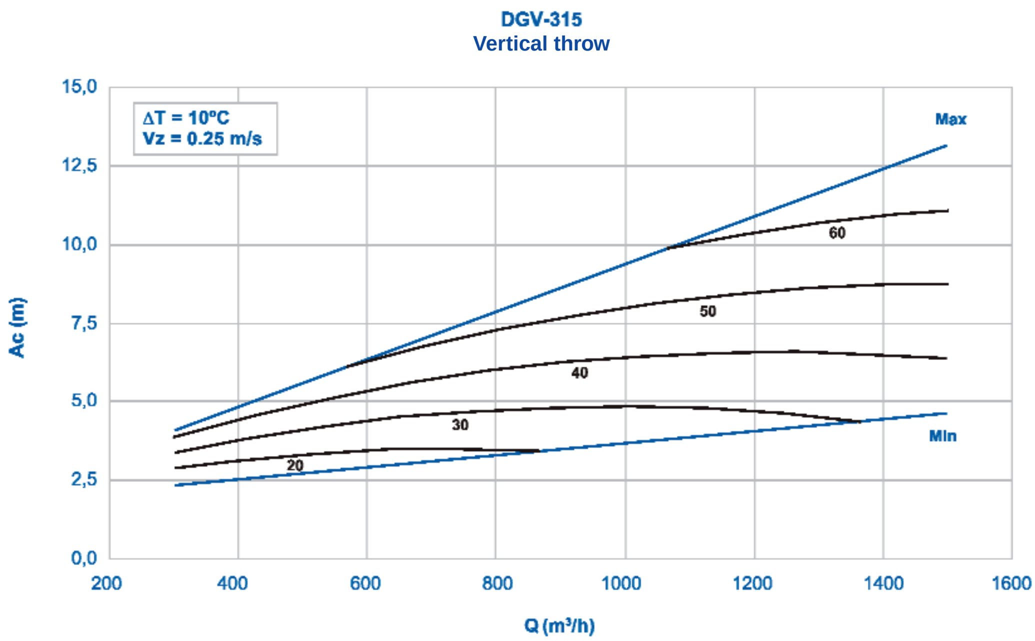
As in the selection example, the projected distance between diffusers, A, is 5 m and the minimum distance recommended by the chart is 0.9 m. Therefore, the selection is correct.

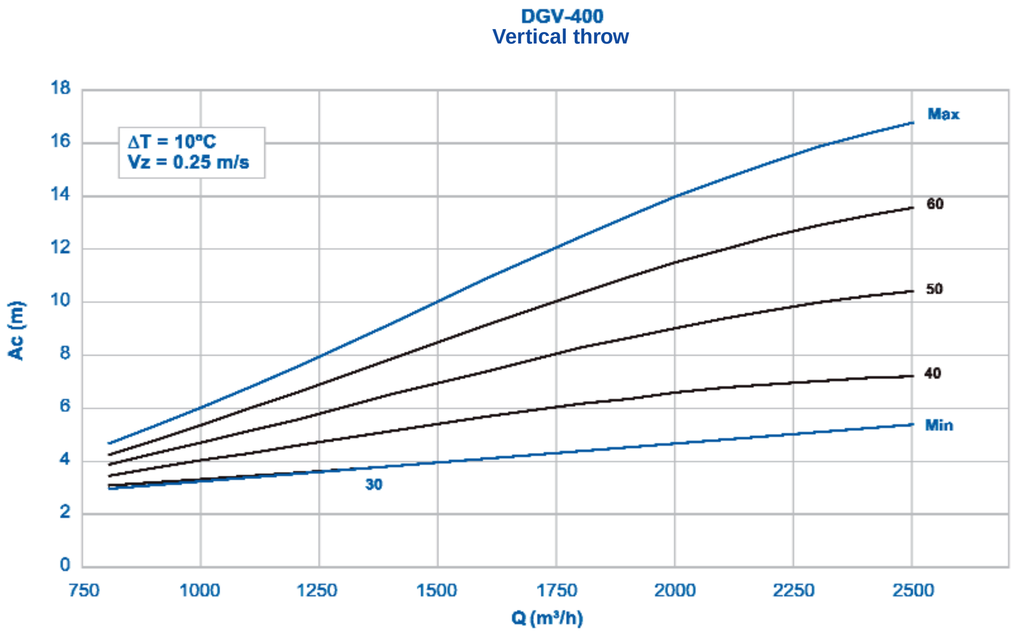
Conclusion

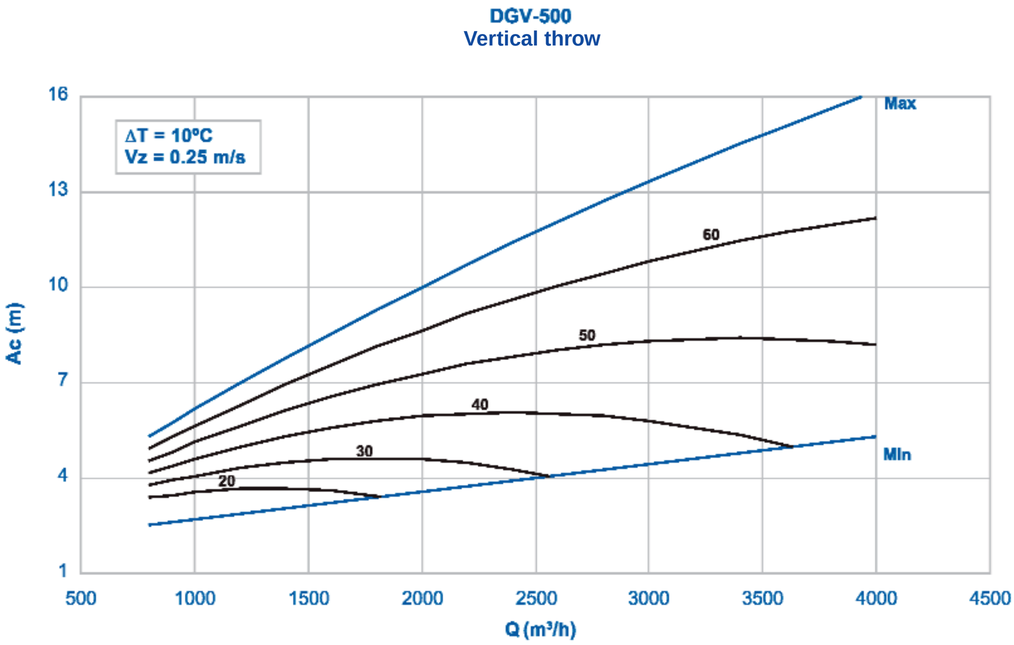
Diffuser selected: **DGV-315**
Air flow rate: 800 m^3/h
Pressure loss: 24 Pa
Sound power: 38 dB (A)
Temperature difference ΔT: 15°C
Maximum velocity in occupied area:: 0,25 m/s.
Stroke of the electrical servo drive: 50 mm.

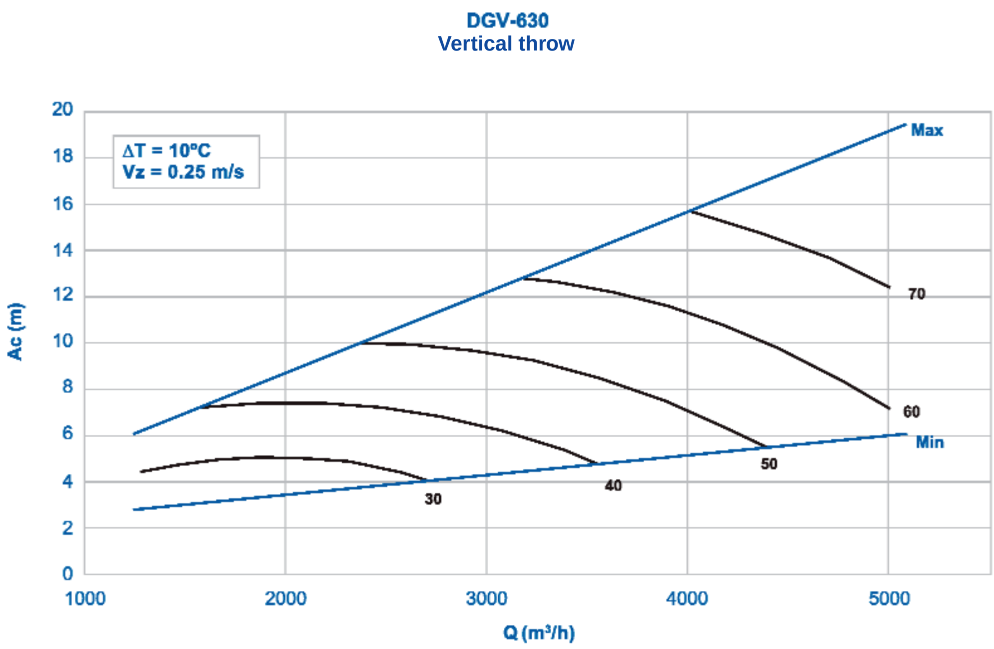
Selection charts to determine the factor, A_c (operating limits)





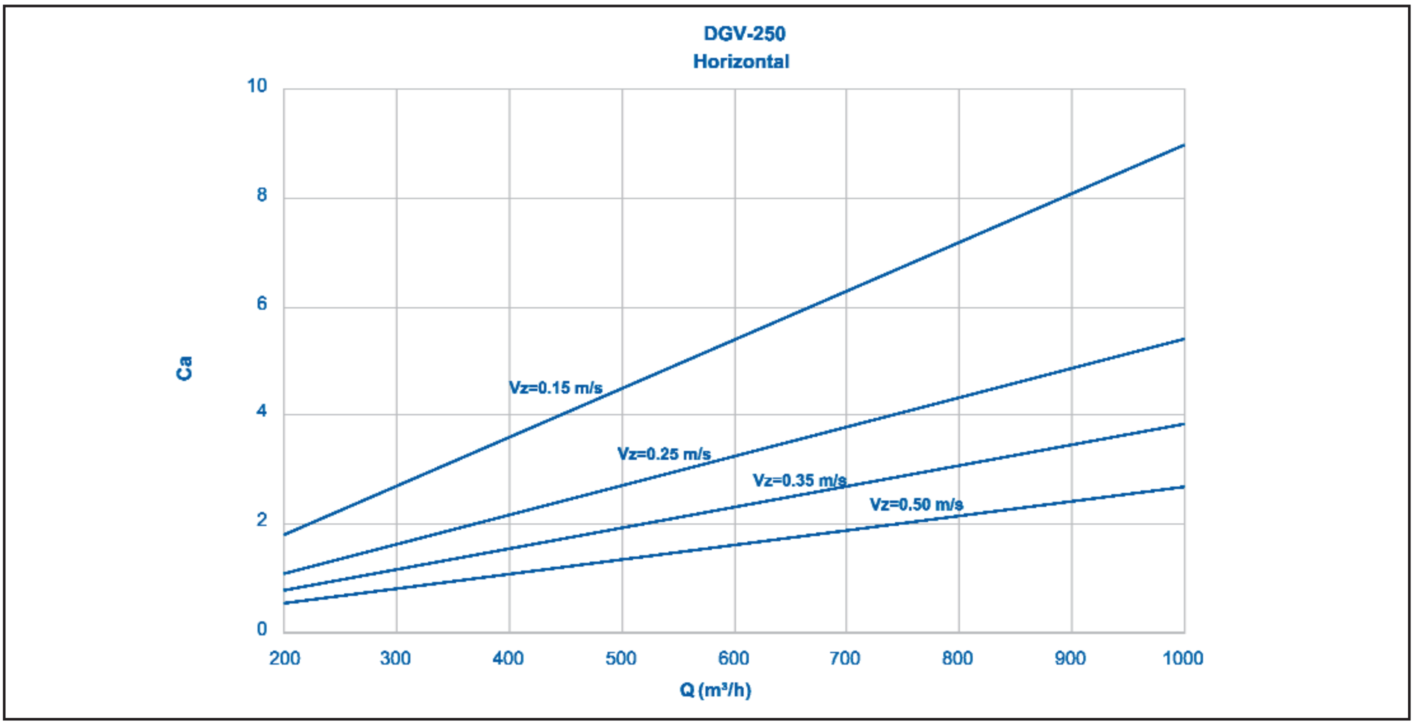

DGV-400
Vertical throw
ΔT = 10°C
Vz = 0.25 m/s
Ac (m)
Q (m³/h)
18
16
14
12
10
8
6
4
2
0
750
1000
1250
1500
1750
2000
2250
2500
Max
60
50
40
Min
30

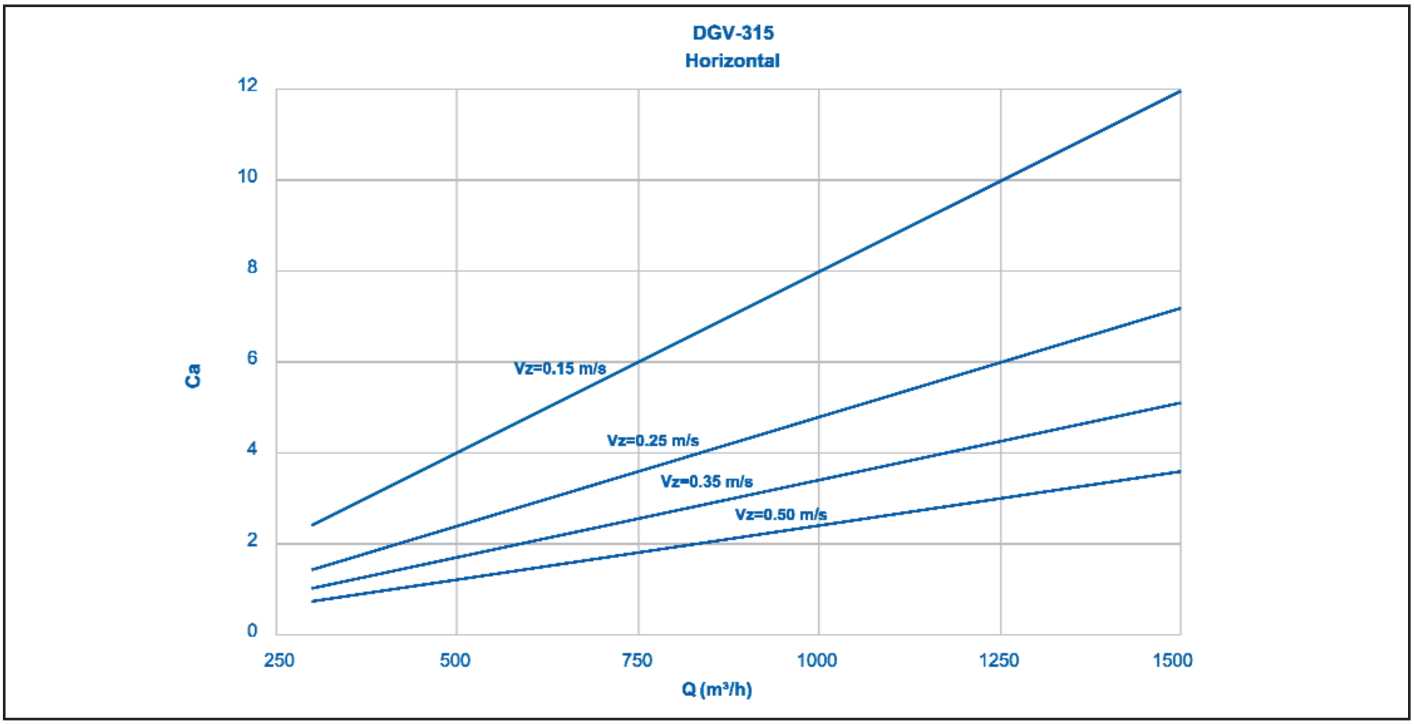

DGV-500
Vertical throw
ΔT = 10°C
Vz = 0.25 m/s
Ac (m)
Q (m³/h)
16
13
10
7
4
1
500
1000
1500
2000
2500
3000
3500
4000
4500
Max
60
50
40
30
20
Min

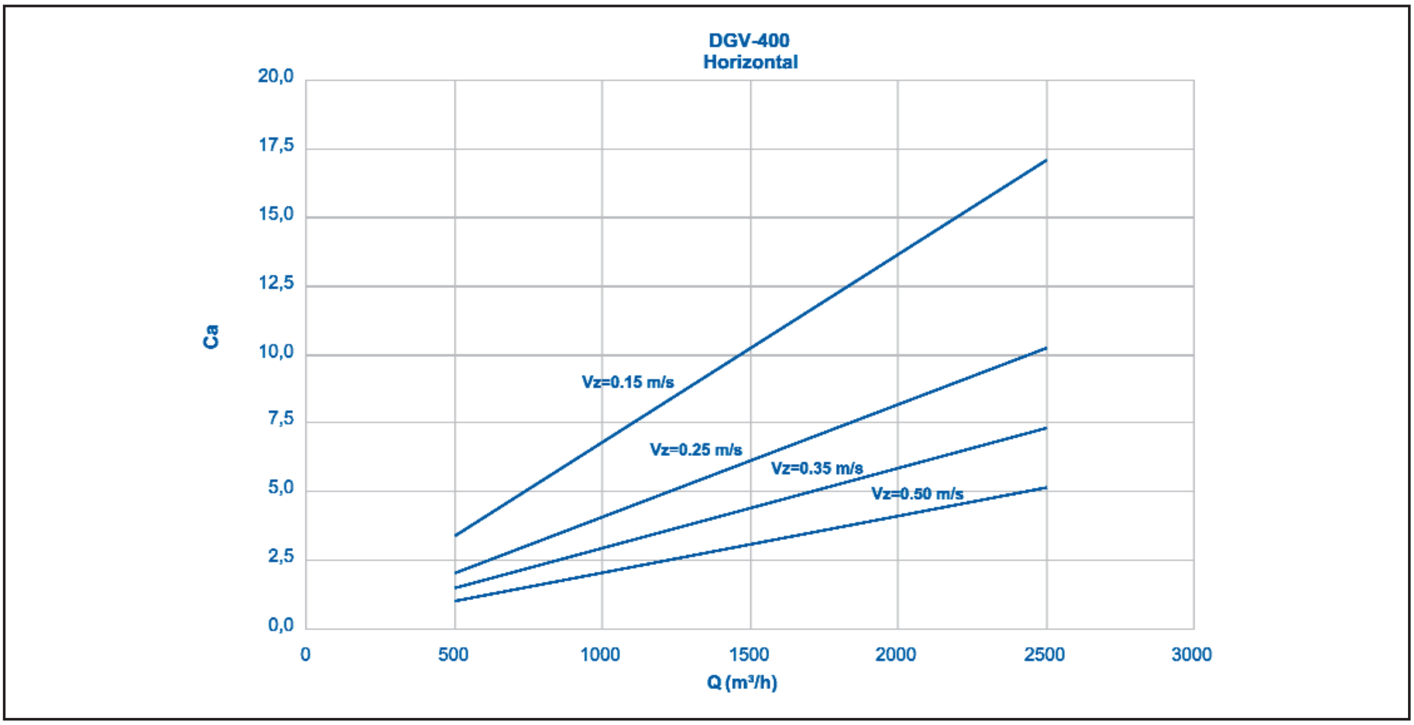


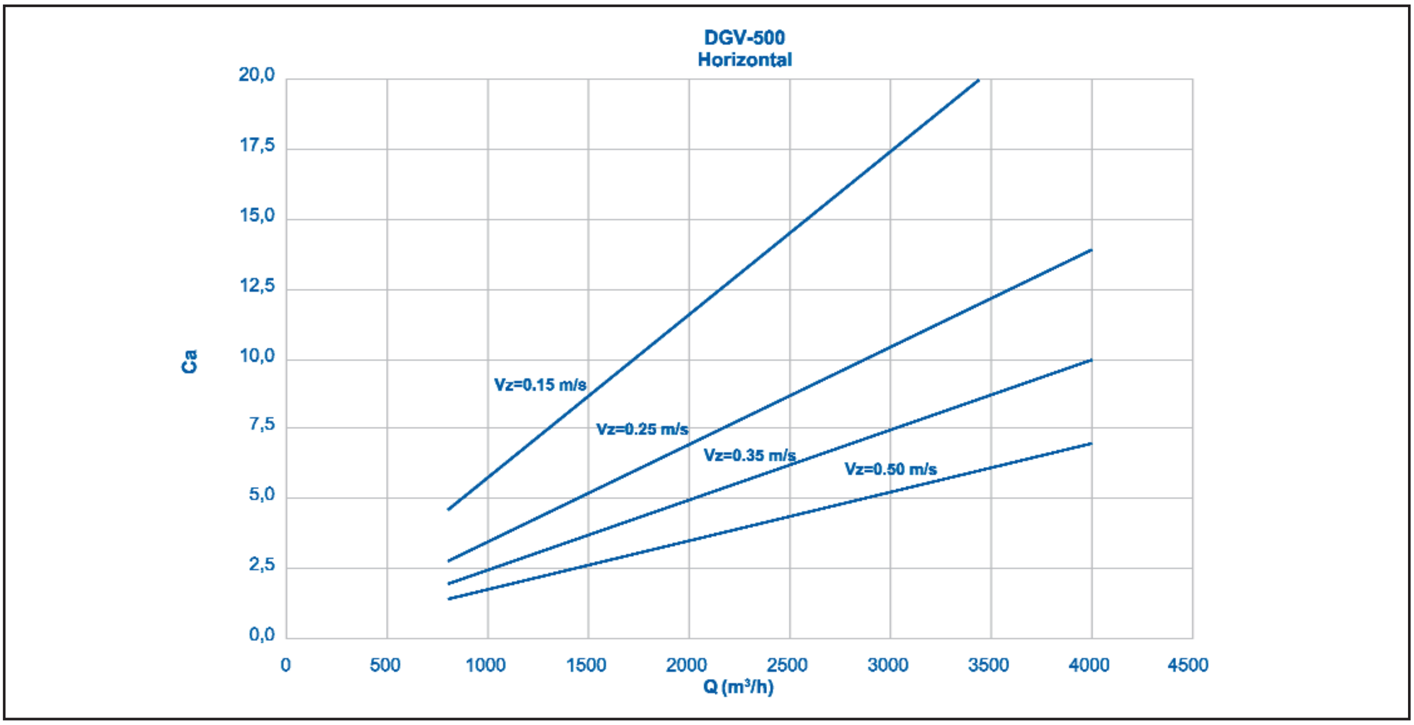
Where A_C is the vertical throw over the floor. The stroke (in mm) of the diffuser disc required to obtain the specified throw is shown on the curves.
The minimum and maximum values are the limits between which the throw can be changed.

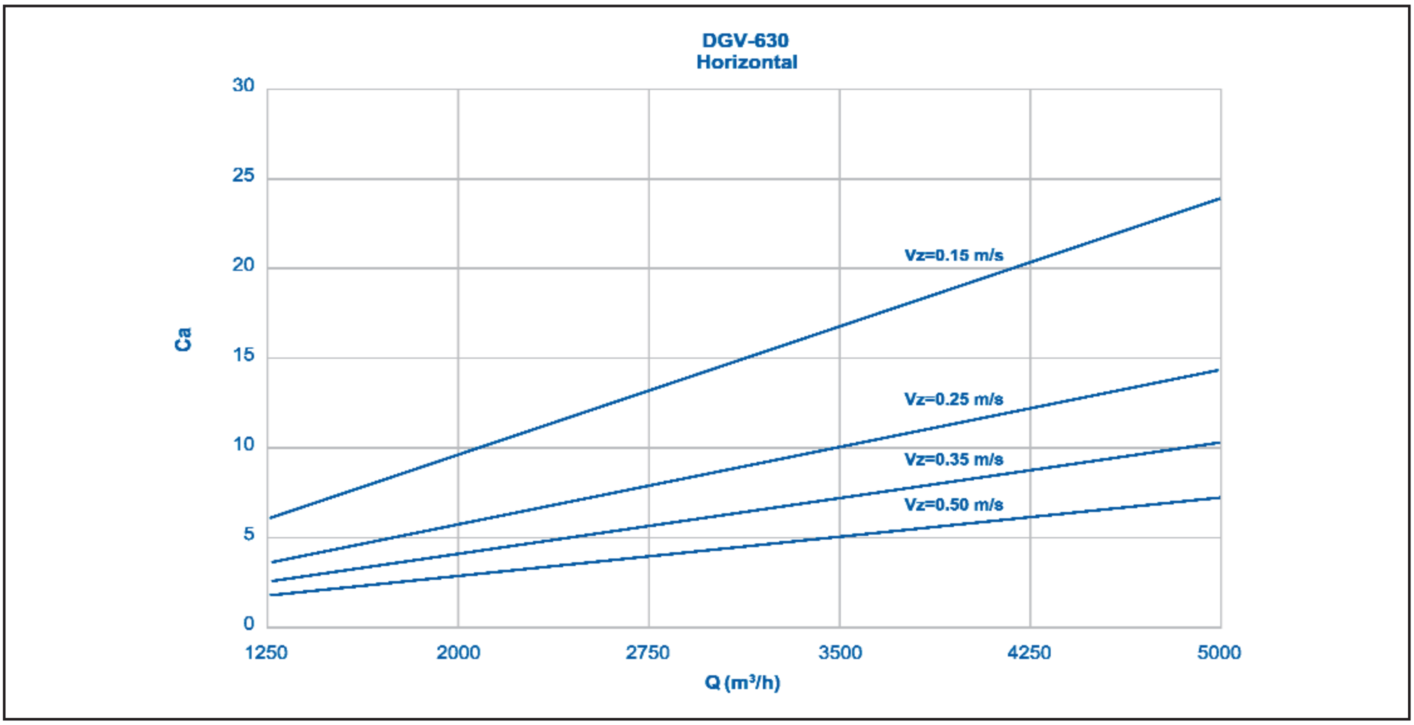
Selection charts to determine the factor, C_a (minimum distance between diffusers)






DGV-400
Horizontal
Ca
Q (m³/h)
Vz=0.15 m/s
Vz=0.25 m/s
Vz=0.35 m/s
Vz=0.50 m/s
20,0
17,5
15,0
12,5
10,0
7,5
5,0
2,5
0,0
0
500
1000
1500
2000
2500
3000


DGV-500
Horizontal
Ca
Q (m³/h)
Vz=0.15 m/s
Vz=0.25 m/s
Vz=0.35 m/s
Vz=0.50 m/s
20,0
17,5
15,0
12,5
10,0
7,5
5,0
2,5
0,0
0
500
1000
1500
2000
2500
3000
3500
4000
4500



Motor-driven operation

The motor-driven operation system should be determined for each specific case. Please contact our Technical Department to carry out the respective study.