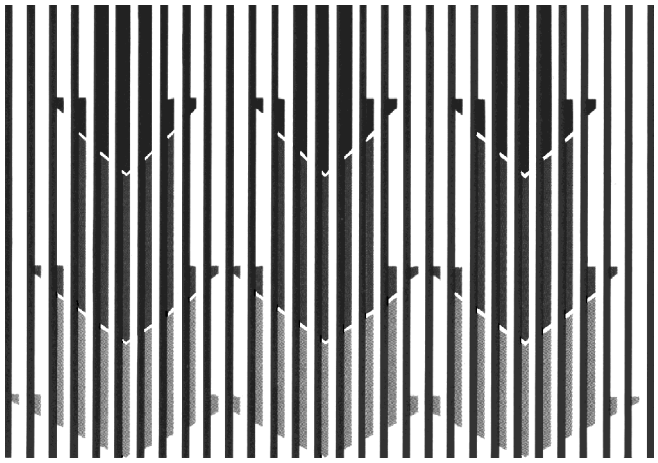
LTG Aktiengesellschaft

Tubular Diffuser Type RLB



LTG Aktiengesellschaft
D - 70435 Stuttgart, Grenzstraße 7
☎ +49 (0711) 82 01-180 Fax +49 (0711) 82 01-720
Internet: http://www.LTG-AG.de
E-Mail: info@LTG-AG.de

LTG Incorporated
101 Corporate Drive, Suite D
Spartanburg S.C. 29303 USA
☎ (864) 59-6340 Fax (864) 599-6344
Internet: http://www.LTG-INC.net
E-Mail: info@LTG-INC.net

LTG S.r.l.
Via G. Leopardi 10
I-20066 Melzo
☎ 02 9 55 05 35 Fax 02 9 55 08 28
E-Mail:ltgcomponenti@tiscalinet.it

*RLB-E-TP-**01** (10/00) 419-136*

Components for room air technology

Germany

Central Office (Frankfurt)
Sontraer Str. 27, D-60386 Frankfurt
☎ (069) 94 20 19-0, Fax -10
E-mail: Schilling@LTG-AG.de
Central Office (Herborn)
Sperberweg 16, D-35745 Herborn
☎ (02772) 570-725, Fax -727
E-mail: Hartmann@LTG-AG.de
Northern Office
Meessen 5, D-22113 Oststeinbek
☎ (040) 7 13 84 85, Fax 7 13 82 55
E-mail: Heinsch@LTG-AG.de
Eastern Office (Berlin)
Eisenhutweg 51a, D-12487 Berlin
☎ (030) 63 22 87-74, Fax -75
E-mail: Linke@LTG-AG.de
Eastern Office (Chemnitz)
Johannes-Ebert-Straße 20,
D-09128 Chemnitz
☎ (0371) 7711-801, Fax -802
E-mail: Schenfeld@LTG-AG.de
Southern Office
Grenzstraße 7, D-70435 Stuttgart
☎ (0711) 8201-180, Fax -720
E-mail: Gau@LTG-AG.de
Western Office
Demagstr. 47a, D-40597 Düsseldorf
☎ (0211) 71866-13, Fax -39
E-mail: Joswig@LTG-AG.de

Austria

KTG Klimatechnische Gesellschaft mbH

Autokaderstraße 31, A-1210 Wien
☎ (01) (in A: 0222) 2 70 25 90
Fax (01) (in A: 0222) 2 70 25 90 20
E-Mail: info@ktg-wien.com

France

INNTEK

18, Avenue Gabriel Péri
F-78360 Montesson
☎ (01) 30 15 16 16, Fax (01) 30 15 16 17
E-Mail: INNTEC.AC@wanadoo.fr

Great Britain

MAP
Motorised Air Products Ltd.

Unit 5A, Sopwith Crescent
Wickford Business Park Wickford
GB-Essex SS11 8YU
☎ (01268) 57 44 42, Fax (01268) 57 44 43
E-Mail: info@mapuk.com

Poland

HTK Went Sp.z.o.o.

ul. Chopina 13/3, Pl-30047 Krakow
☎ (012) 632 31 32, Fax (012) 632 81 93
E-Mail: info@htk-went.pl

Portugal

ArGelo S. A.

R. Luis Pastor de Macedo, Lote 28 B,
P-1750-158 Lisboa
☎ (21) 752 01 20, Fax (21) 752 01 29
E-Mail: info@argelo.pt

Slovenia

Energo Plus

Koprska 108 d
SLO- 1000 Ljubljana
☎ (01) 200 73 67, Fax (01) 42 33 346
E-Mail: info@energoplus.si

Turkey

Step Müh. Yapi Ltd.

Yali Yolu Sokak.
Turanli Apt. No: 24 D.1
TR- 81110 Bostanci-Istanbul
☎ (0216) 445 2931, Fax (0216) 445 2505
E-Mail: info@stepyapi.com.tr

Components for process air technology

Japan

Toho Engineering Co. Ltd.

14-11, Shimizu 3-Chome, Kita Ku
Japan 462 Nagoya
☎ (052) 9 91-10 40, Fax (052) 9 14-98 22
E-Mail: main@tohoeng.com

The Program for room air technology

Components

Air diffusers for walls, floors and ceilings · "LTG System clean®" · Coandatrol® and Coandavent® air diffusers · LTG cool wave® chilling fans · Klimavent® induction units · Raumluft® fan coil units · Facade fan coil units · Airflow control units · labair® system

Engineering services

Technical services for investors, architects, engineers and plant builders during design, construction and operation of buildings. Reliable and precise data relating to the ventilation of air conditioning system are given already before realization of the project, determined by measurements, calculations, building simulations and experiments.

The Program for process air technology

Components

Axial-flow, centrifugal and tangential fans · Collector system for: coarse and fine particle filtration, separating and compacting, compressing and humidifying.

Engineering services

Technical services for construction engineers and plant designers during development and operation of assembly groups, machines and plants.

Tubular Diffuser Type RLB

In many areas to be air conditioned diffusers are used as decorative elements and installed directly into the visible duct system. The RLB meets this need.

Apart from offering an excellent performance, e.g. draft-free, uniform distribution of the air to remove thermal and pollution loads, an economical solution of high-quality design is also provided.

Versions

Diffusers made of :

- stainless steel (V2A)
- galvanized steel
- galvanized steel, powder coated similar to RAL

Duct diameters for length 1500 mm :
DN 200, DN 250, DN 315, DN 400, DN 500, DN 630

Duct diameters for length 2000 mm :
DN 200, DN 250, DN 315, DN 400

Connection:

- with standard internal plug connectors
- as an option, with Metu system AF

Other features :

- Interior duct reinforcing maintains the duct shape.
- The reinforcement may also be used for easy and safe suspension of the diffuser using holes for threaded rods M10.
- Interior flow restrictor with pressure balancing.

Advantages

- Complete air duct system with integrated diffusers of up to 20 m.
- Factory-preset for a uniform distribution of the air over the entire duct run length, (by inherent balance).
- No plastic elements. Non-inflammable. Building materials class A1.
- Easy and safe connection of the ducts through standard interior plug connectors (no visible beadings).
- Interior duct reinforcement with integrated suspension.
- Smooth air distribution duct run over the entire length. Therefore, easy cleaning, e.g. in labs.
- As an option, the Metu system AF may be used for connection.

Tubular Diffuser Type RLB

Tubular Diffuser Type RLB - Example

The following selection diagrams give recommendations regarding the duct diameter, depending on the required total flow rate and the air speed at the duct run inlet c_e.

These recommendations are based on the selection of an air inlet speed c_e into the air distribution duct run of 3 to 4.5 m/s, depending on the application, to minimize throttling and air flow noises.

Example:

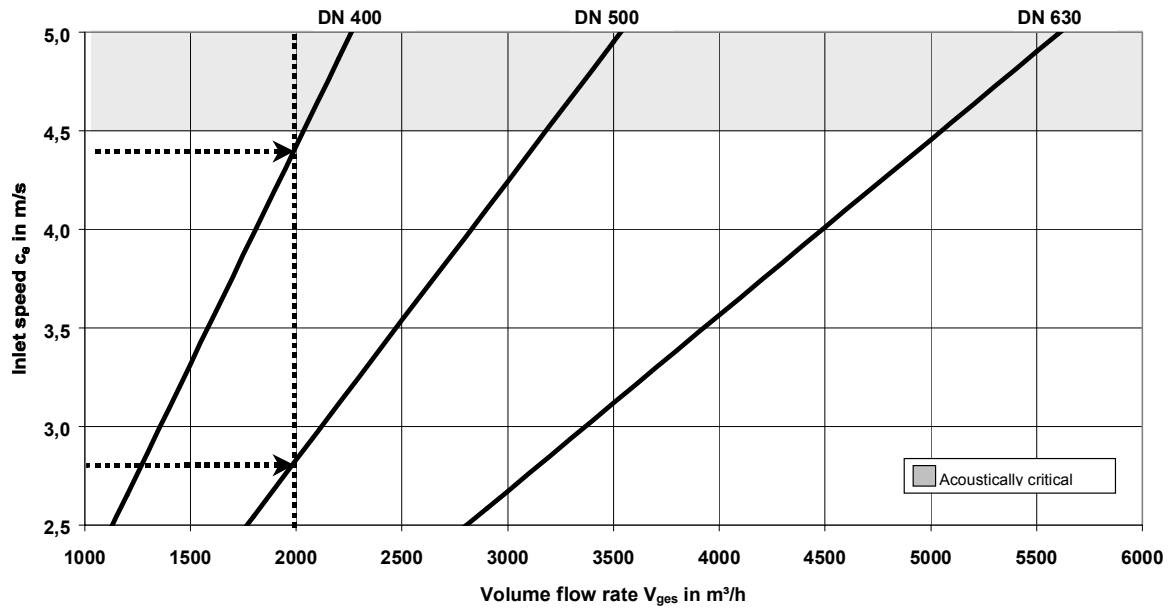
given : V_{ges} = 2000 m^3/h

required : appropriate diameter DN of the tubular diffuser.

Depending on the required inlet speed c_e there are several possibilities (see diagram):

1. Duct diameter DN 400 with an inlet speed c_e of 4.4 m/s.
2. Duct diameter DN 500 with an inlet speed c_e of 2.8 m/s.

Selection diagram



for smaller diameters, refer to page 11

Legend

V_{ges}	=	Total volume flow rate	[m^3/h]
c_e	=	Inlet speed into RLB duct run	[m/s]
DN	=	Inner duct diameter	[mm]

Tubular Diffuser Type RLB - Example

Optimising flow rate per metre run is important With the total flow rate V_{ges} known, the length of active diffusers in meters, i.e. the duct run, can be calculated.

Values can be taken from the diagram below for all diameters.

In order to avoid excessive air speeds in the room, a minimum installation height of 3.7 m to the lower edge of the tubular diffuser is recommended.

To avoid extreme air speeds and maintain comfortable conditions, flow rates exceeding 300 m^3/(hm) and, in the cooling mode, temperatures by more than -9K lower should not be used for occupied spaces.

In the cooling mode with variable flow rate systems, care must be taken not to use temperatures lower than -6K, particularly if flow rates are below 100 m^3/(hm) since the resultant jets could produce higher room air speeds than required.

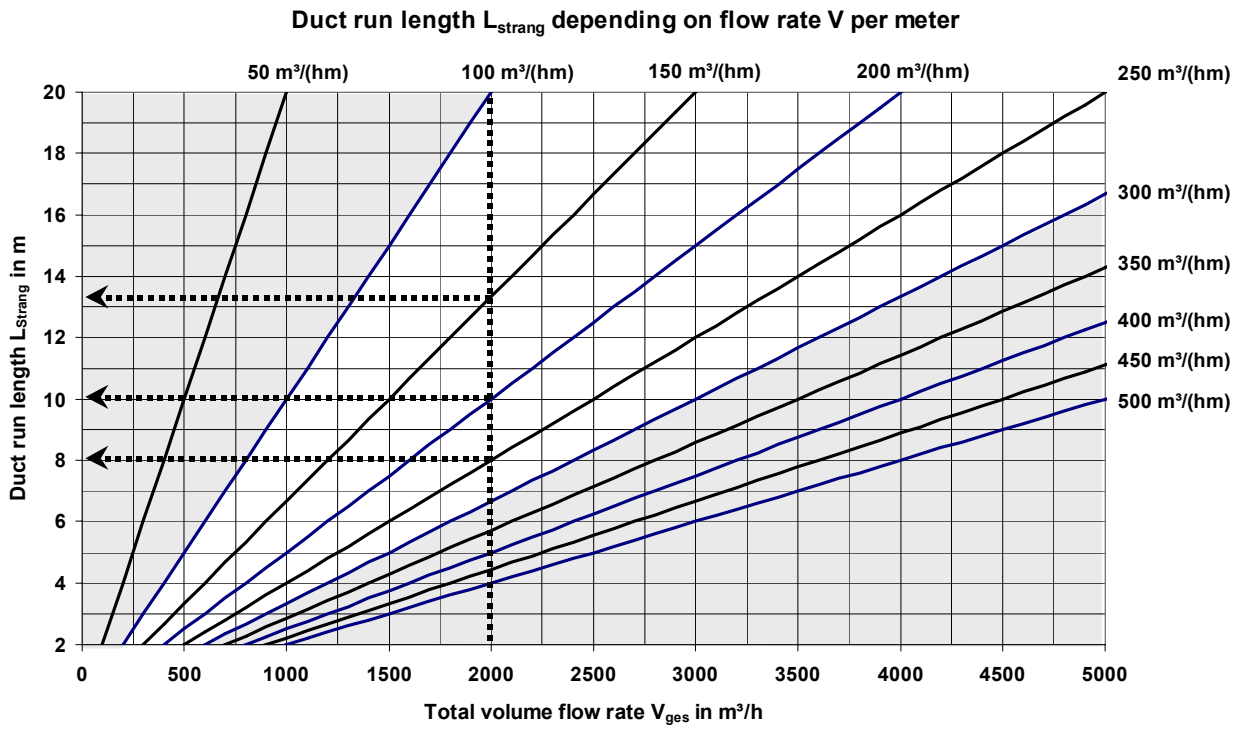
Example:

given : V_{ges} = 2000 m^3/h
DN = 400 mm
c_e = 4.4 m/s

required : suitable volume flow rate V per meter and duct run length L_{Strang}

Depending on the required volume flow rate per meter, the following possibilities result from the dimensioning diagram:

1. About 3 m duct run length at a flow rate of 150 m^3/h per meter diffuser.
2. 10 m duct run length at a flow rate of 200 m^3/h per meter diffuser.
3. 8 m duct run length at a flow rate of 250 m^3/h per meter diffuser.



Legend

V_{ges}	=	Total volume flow rate	[m^3/h]
V	=	Volume flow rate per meter RLB	[m^3/(hm)]
L_{Strang}	=	Duct run length	[m]

Tubular Diffuser Type RLB - Example

Based on the above values the pressure loss Δp of the duct run and the acoustic power L_{WA} for each 1m module are obtained.

The diagram below illustrates the values obtained for DN 400:

Example:

Given :

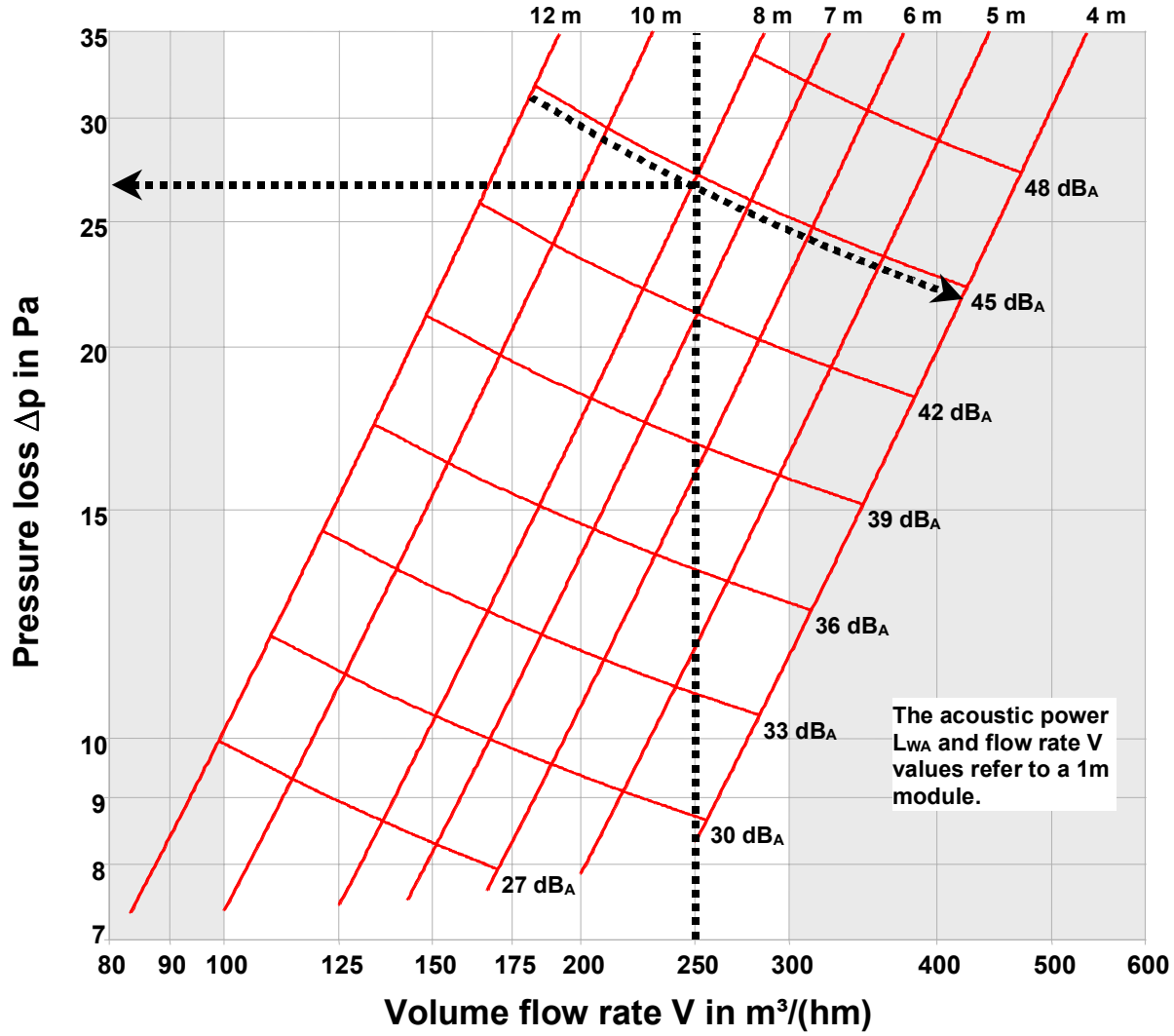
V_{ges}	=	2000	m^3/h
DN	=	400	mm
c_e	=	4.4	m/s
V	=	250	$m^3/(hm)$
L_{Strang}	=	8	m

Required : pressure loss Δp in Pa in the duct run.

acoustic power L_{WA} in dB_A eines einzelnen 1 Meter Moduls.

Resulting in :

1. Total pressure loss Δp of 27 Pa in the duct run.
2. Acoustic power L_{WA} of abt. 45 dB_A for each individual 1 m module.



Legend

V	=	Volume flow rate per meter RLB	$[m^3/(hm)]$
Δp	=	pressure loss in the RLB duct run	[Pa]
L_{Strang}	=	Length of the RLB duct run	[m]
L_{WA}	=	Acoustic power per m RLB	$[dB_A]$

Tubular Diffuser Type RLB - Example

Based on the acoustic power of a 1m module and the number n of active 1 m modules, the total acoustic power $L_{WA,Strang}$ of the entire duct run can easily be found in the table below.

This value results from the acoustic power of a 1m module plus ten times the logarithm of the number n of all active 1m modules:

$L_{WA,Strang} = L_{WA} + 10 * \log (n)$ in dB_A

Example:

given : $L_{WA} = 44.8\ dB_A$

$L_{Strang} = 8\ m$

$n = 8$

required : total acoustic power $L_{WA,Strang}$ of the entire duct run in dB_A

A total acoustic power $L_{WA,Strang}$ of 54 dB_A is obtained for the entire duct run.

$L_{WA,Strang} = 44.8\ dB_A + 10 * \log (8)$
$L_{WA,Strang} = 44.8\ dB_A + 9\ dB = 53.8\ dB_A$

Acoustic power L_{WA} of a 1 m module in dB_A	Number n of sound sources																		
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0	3,0	4,8	6,0	7,0	7,8	8,5	9,0	9,5	10,0	10,4	10,8	11,1	11,5	11,8	12,0	12,3	12,6	12,8	13,0
18	21,0	22,8	24,0	25,0	25,8	26,5	27,0	27,5	28,0	28,4	28,8	29,1	29,5	29,8	30,0	30,3	30,6	30,8	31,0
19	22,0	23,8	25,0	26,0	26,8	27,5	28,0	28,5	29,0	29,4	29,8	30,1	30,5	30,8	31,0	31,3	31,6	31,8	32,0
20	23,0	24,8	26,0	27,0	27,8	28,5	29,0	29,5	30,0	30,4	30,8	31,1	31,5	31,8	32,0	32,3	32,6	32,8	33,0
21	24,0	25,8	27,0	28,0	28,8	29,5	30,0	30,5	31,0	31,4	31,8	32,1	32,5	32,8	33,0	33,3	33,6	33,8	34,0
22	25,0	26,8	28,0	29,0	29,8	30,5	31,0	31,5	32,0	32,4	32,8	33,1	33,5	33,8	34,0	34,3	34,6	34,8	35,0
23	26,0	27,8	29,0	30,0	30,8	31,5	32,0	32,5	33,0	33,4	33,8	34,1	34,5	34,8	35,0	35,3	35,6	35,8	36,0
24	27,0	28,8	30,0	31,0	31,8	32,5	33,0	33,5	34,0	34,4	34,8	35,1	35,5	35,8	36,0	36,3	36,6	36,8	37,0
25	28,0	29,8	31,0	32,0	32,8	33,5	34,0	34,5	35,0	35,4	35,8	36,1	36,5	36,8	37,0	37,3	37,6	37,8	38,0
26	29,0	30,8	32,0	33,0	33,8	34,5	35,0	35,5	36,0	36,4	36,8	37,1	37,5	37,8	38,0	38,3	38,6	38,8	39,0
27	30,0	31,8	33,0	34,0	34,8	35,5	36,0	36,5	37,0	37,4	37,8	38,1	38,5	38,8	39,0	39,3	39,6	39,8	40,0
28	31,0	32,8	34,0	35,0	35,8	36,5	37,0	37,5	38,0	38,4	38,8	39,1	39,5	39,8	40,0	40,3	40,6	40,8	41,0
29	32,0	33,8	35,0	36,0	36,8	37,5	38,0	38,5	39,0	39,4	39,8	40,1	40,5	40,8	41,0	41,3	41,6	41,8	42,0
30	33,0	34,8	36,0	37,0	37,8	38,5	39,0	39,5	40,0	40,4	40,8	41,1	41,5	41,8	42,0	42,3	42,6	42,8	43,0
31	34,0	35,8	37,0	38,0	38,8	39,5	40,0	40,5	41,0	41,4	41,8	42,1	42,5	42,8	43,0	43,3	43,6	43,8	44,0
32	35,0	36,8	38,0	39,0	39,8	40,5	41,0	41,5	42,0	42,4	42,8	43,1	43,5	43,8	44,0	44,3	44,6	44,8	45,0
33	36,0	37,8	39,0	40,0	40,8	41,5	42,0	42,5	43,0	43,4	43,8	44,1	44,5	44,8	45,0	45,3	45,6	45,8	46,0
34	37,0	38,8	40,0	41,0	41,8	42,5	43,0	43,5	44,0	44,4	44,8	45,1	45,5	45,8	46,0	46,3	46,6	46,8	47,0
35	38,0	39,8	41,0	42,0	42,8	43,5	44,0	44,5	45,0	45,4	45,8	46,1	46,5	46,8	47,0	47,3	47,6	47,8	48,0
36	39,0	40,8	42,0	43,0	43,8	44,5	45,0	45,5	46,0	46,4	46,8	47,1	47,5	47,8	48,0	48,3	48,6	48,8	49,0
37	40,0	41,8	43,0	44,0	44,8	45,5	46,0	46,5	47,0	47,4	47,8	48,1	48,5	48,8	49,0	49,3	49,6	49,8	50,0
38	41,0	42,8	44,0	45,0	45,8	46,5	47,0	47,5	48,0	48,4	48,8	49,1	49,5	49,8	50,0	50,3	50,6	50,8	51,0
39	42,0	43,8	45,0	46,0	46,8	47,5	48,0	48,5	49,0	49,4	49,8	50,1	50,5	50,8	51,0	51,3	51,6	51,8	52,0
40	43,0	44,8	46,0	47,0	47,8	48,5	49,0	49,5	50,0	50,4	50,8	51,1	51,5	51,8	52,0	52,3	52,6	52,8	53,0
41	44,0	45,8	47,0	48,0	48,8	49,5	50,0	50,5	51,0	51,4	51,8	52,1	52,5	52,8	53,0	53,3	53,6	53,8	54,0
42	45,0	46,8	48,0	49,0	49,8	50,5	51,0	51,5	52,0	52,4	52,8	53,1	53,5	53,8	54,0	54,3	54,6	54,8	55,0
43	46,0	47,8	49,0	50,0	50,8	51,5	52,0	52,5	53,0	53,4	53,8	54,1	54,5	54,8	55,0	55,3	55,6	55,8	56,0
44	47,0	48,8	50,0	51,0	51,8	52,5	53,0	53,5	54,0	54,4	54,8	55,1	55,5	55,8	56,0	56,3	56,6	56,8	57,0
45	48,0	49,8	51,0	52,0	52,8	53,5	**54,0**	54,5	55,0	55,4	55,8	56,1	56,5	56,8	57,0	57,3	57,6	57,8	58,0
46	49,0	50,8	52,0	53,0	53,8	54,5	55,0	55,5	56,0	56,4	56,8	57,1	57,5	57,8	58,0	58,3	58,6	58,8	59,0
47	50,0	51,8	53,0	54,0	54,8	55,5	56,0	56,5	57,0	57,4	57,8	58,1	58,5	58,8	59,0	59,3	59,6	59,8	60,0
48	51,0	52,8	54,0	55,0	55,8	56,5	57,0	57,5	58,0	58,4	58,8	59,1	59,5	59,8	60,0	60,3	60,6	60,8	61,0
49	52,0	53,8	55,0	56,0	56,8	57,5	58,0	58,5	59,0	59,4	59,8	60,1	60,5	60,8	61,0	61,3	61,6	61,8	62,0
50	53,0	54,8	56,0	57,0	57,8	58,5	59,0	59,5	60,0	60,4	60,8	61,1	61,5	61,8	62,0	62,3	62,6	62,8	63,0
51	54,0	55,8	57,0	58,0	58,8	59,5	60,0	60,5	61,0	61,4	61,8	62,1	62,5	62,8	63,0	63,3	63,6	63,8	64,0
52	55,0	56,8	58,0	59,0	59,8	60,5	61,0	61,5	62,0	62,4	62,8	63,1	63,5	63,8	64,0	64,3	64,6	64,8	65,0
53	56,0	57,8	59,0	60,0	60,8	61,5	62,0	62,5	63,0	63,4	63,8	64,1	64,5	64,8	65,0	65,3	65,6	65,8	66,0
54	57,0	58,8	60,0	61,0	61,8	62,5	63,0	63,5	64,0	64,4	64,8	65,1	65,5	65,8	66,0	66,3	66,6	66,8	67,0
55	58,0	59,8	61,0	62,0	62,8	63,5	64,0	64,5	65,0	65,4	65,8	66,1	66,5	66,8	67,0	67,3	67,6	67,8	68,0

Tubular Diffuser Type RLB - Example

Based on the room data, the sound pressure level L_{PA} in the reverberation field can be estimated.

The sound pressure level L_{PA} in the reverberation field results from the acoustic power $L_{WA,Strang}$ of the entire duct run minus the room absorption ΔL.

Using the diagram below, ΔL can easily be estimated based on the room volume V_{Raum} and the rooms sound absorption characteristics.

For more precise calculations in the reverberation field, calculations must be made in octaves considering the tubular diffuser in terms of a linear sound source.

As an alternative, an individual element and the corresponding room section may be considered as a punctual sound source for calculation. In that case, however, the reduced room sound insulation will have to be considered as well.

Example:

Given : V_{Raum} = 200 m^3

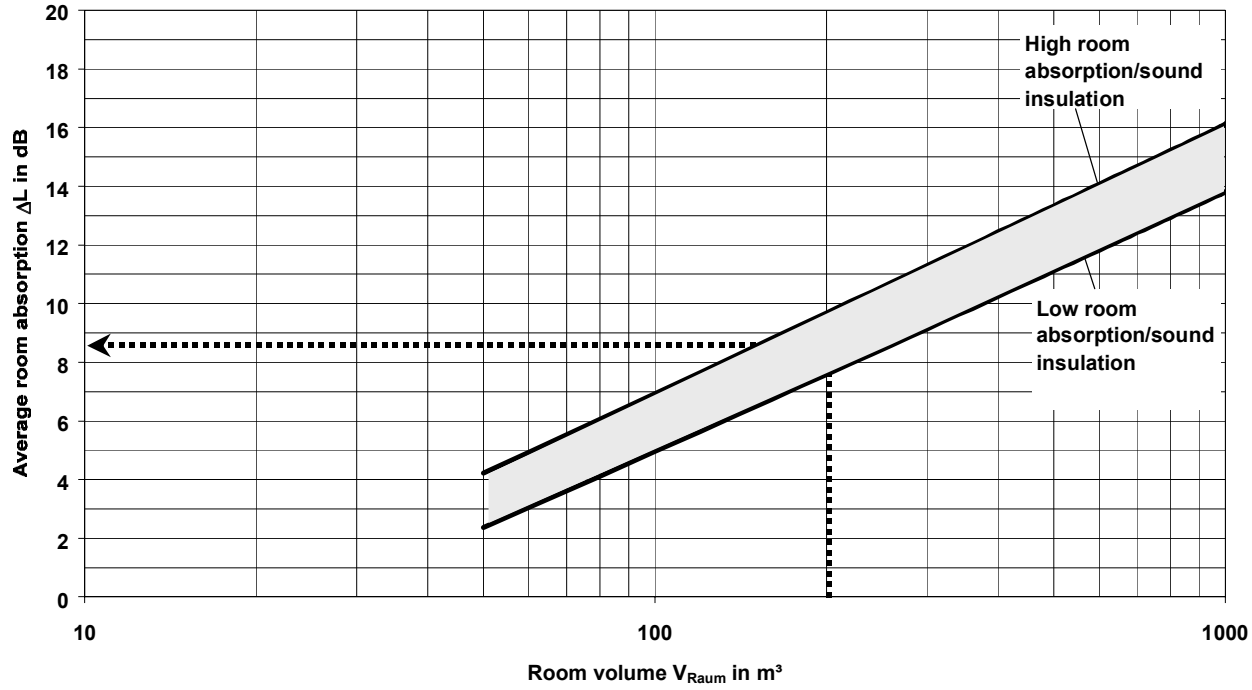
Required : room absorption ΔL in dB.

sound pressure level L_{PA} in the reverberation field, in dB_A

Result :

1. a room absorption ΔL of abt. 8.5 dB.
2. $L_{PA} \approx 53.8\ dB_A - 8.5\ dB \approx 45.3\ dB_A$ and thus a sound pressure level L_{PA} LPA in the reverberation field of the room of abt. 45 dB_A

Room absorption ΔL depending on the room volume and the room insulation



Legend

V_{Raum} = Room volume [m^3]

ΔL = Average room absorption [dB]

Tubular Diffuser Type RLB - Example

The sound pressure level L_{PA} in the reverberation field is calculated from the acoustic power $L_{WA,Strang}$ of the entire duct run minus the room absorption ΔL.

From the table below, the L_{PA} value can easily be read based on the total acoustic power $L_{WA,Strang}$ and the room absorption ΔL .

Example:

Given : $L_{WA,Strang}$ = 53.8 dB_A

ΔL = 8.5 dB

required : sound pressure level L_{PA} in the reverberation field, in dB_A

Result :

$L_{PA} \approx 53.8\ dB_A - 8.5\ dB \approx 45.3\ dB_A$

and thus a sound pressure level in the reverberation field of abt. 45 dB_A

Sound pressure level L_{PA} in the reverberation field of the room in dB_A

Total acoustic power $L_{WA,Strang}$ in dB_A	Room absorption ΔL in dB																		
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
22	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
23	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3
24	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4
25	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5
26	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6
27	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7
28	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8
29	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9
30	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10
31	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11
32	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12
33	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13
34	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14
35	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15
36	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
37	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
38	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18
39	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19
40	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20
41	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21
42	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22
43	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23
44	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24
45	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25
46	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26
47	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27
48	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28
49	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29
50	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30
51	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31
52	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32
53	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
54	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34
55	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35
56	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36
57	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37
58	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38
59	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39
60	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40

Tubular Diffuser Type RLB - Example

V	Power Q in W/m		
m³/h	ΔT=+/-3K*	ΔT=-6K	ΔT=-9K
30	29	58	86
40	38	77	115
50	48	96	144
60	58	115	173
70	67	134	201
80	77	153	230
90	86	173	259
100	96	192	288
125	120	240	359
150	144	288	431
175	168	335	503
200	192	383	575
250	240	**479**	719
300	288	575	863
400	383	767	1150
500	479	958	1438
600	575	1150	1725
700	671	1342	2013
800	767	1533	2300
900	863	1725	2588
1000	958	1917	2875
1500	1438	2875	4313
2000	1917	**3833**	5750
2500	2396	4792	7188
3000	2875	5750	8625
3500	3354	6708	10063
4000	3833	7667	11500
4500	4313	8625	12938
5000	4792	9583	14375
5500	5271	10542	15813
6000	5750	11500	17250

Values for the heating or cooling capacity Q can be taken from the table on the left for various tempera-tures, above or below ambient temperature.

It results from the capacity Q of a 1m module times the number n of all active 1m modules :

$Q_{Strang} = Q * n$ in Watt

Example:

Given :

V_{ges}	=	2000	m^3/h
DN	=	400	mm
c_e	=	4.4	m/s
V	=	250	$m^3/(hm)$
L_{Strang}	=	8	m
ΔT	=	-6	K

required : cooling capacity Q_K fof a 1m module.

cooling capacity $Q_{K,Strang}$ in Watt of the entire duct run.

Result :

1. A cooling capacity Q_K of 479 Watt per meter.
2. $Q_{K,Strang}$ = 479 Watt • 8 = 3832 Watt

   A total cooling capacity $Q_{K,Strang}$ of 3832 Watt for the entire duct run.

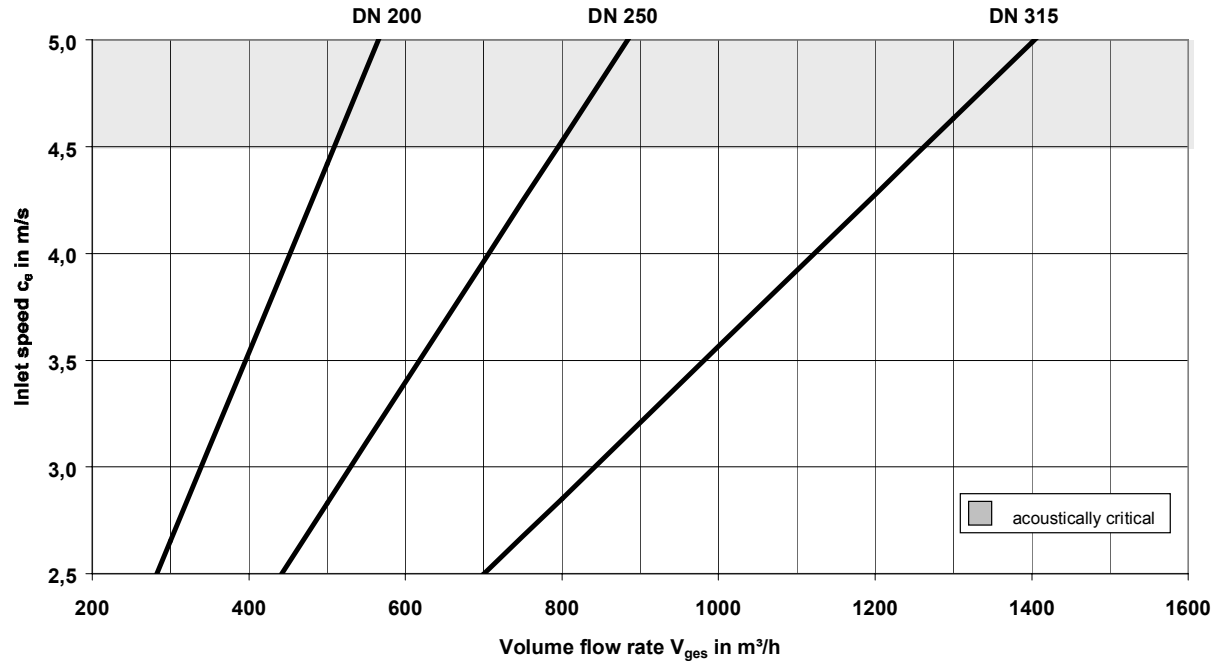
---

* In the heating mode ΔT up to +3 K is recommended in order to keep the formation of temperature layers low.

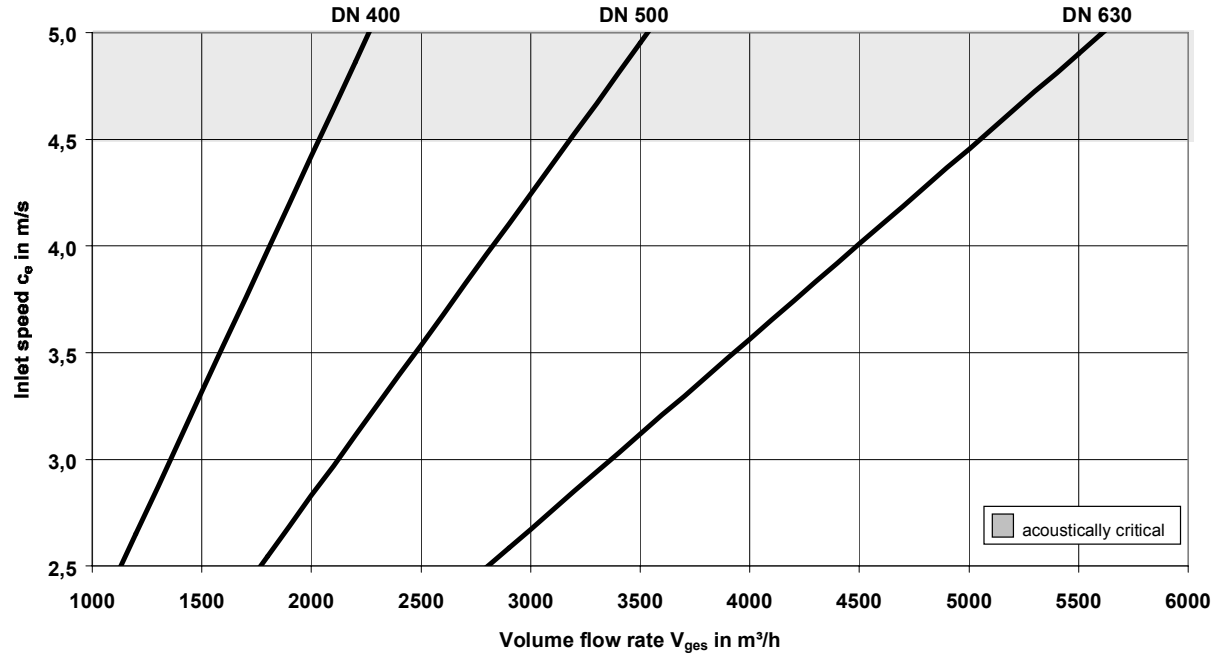
Tubular Diffuser Type RLB - Dimensioning

Based on the flow rate V_{ges} and a reasonable inlet speed c_e of about. 3-4.5 m/s, the required duct diameter DN can easily be estimated.

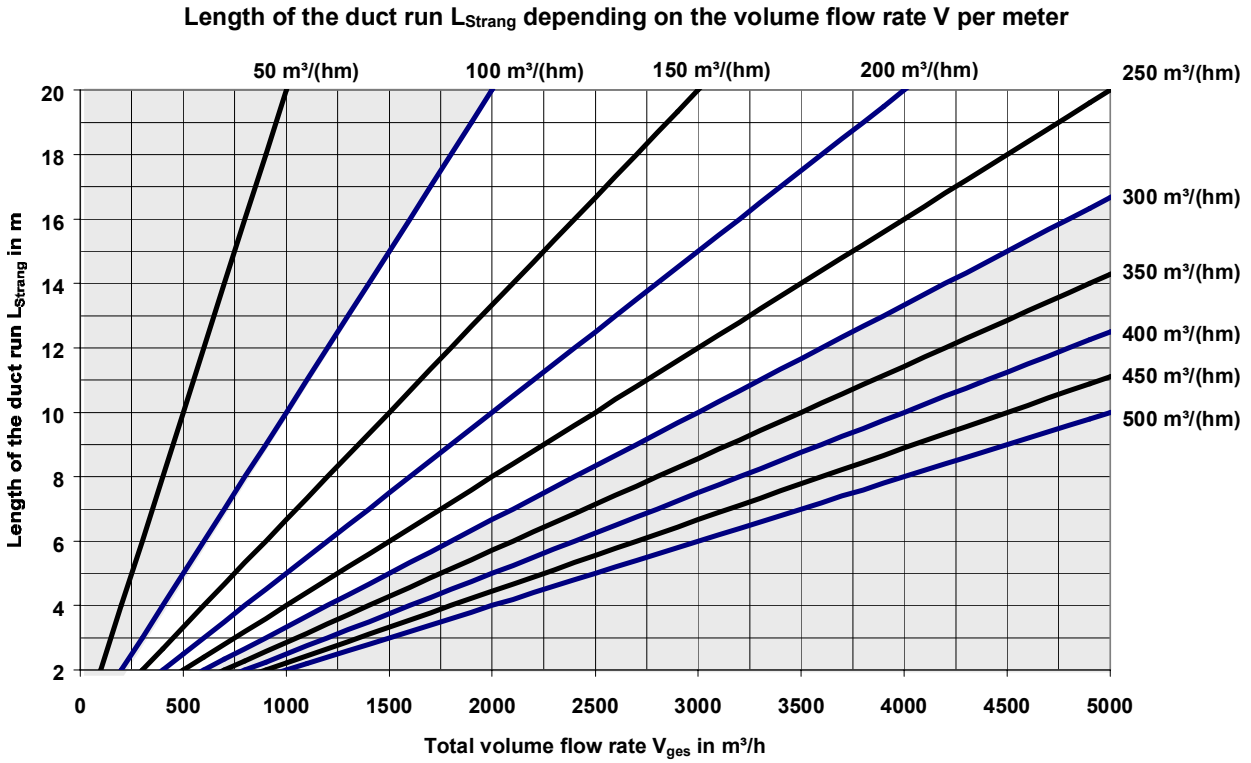
Selection diagram of duct diameter



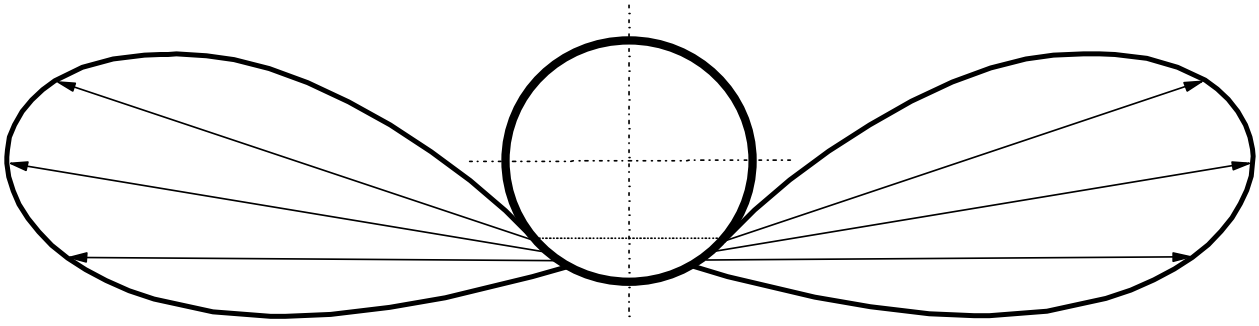
Selection diagram of duct diameter



Tubular Diffuser Type RLB - Dimensioning

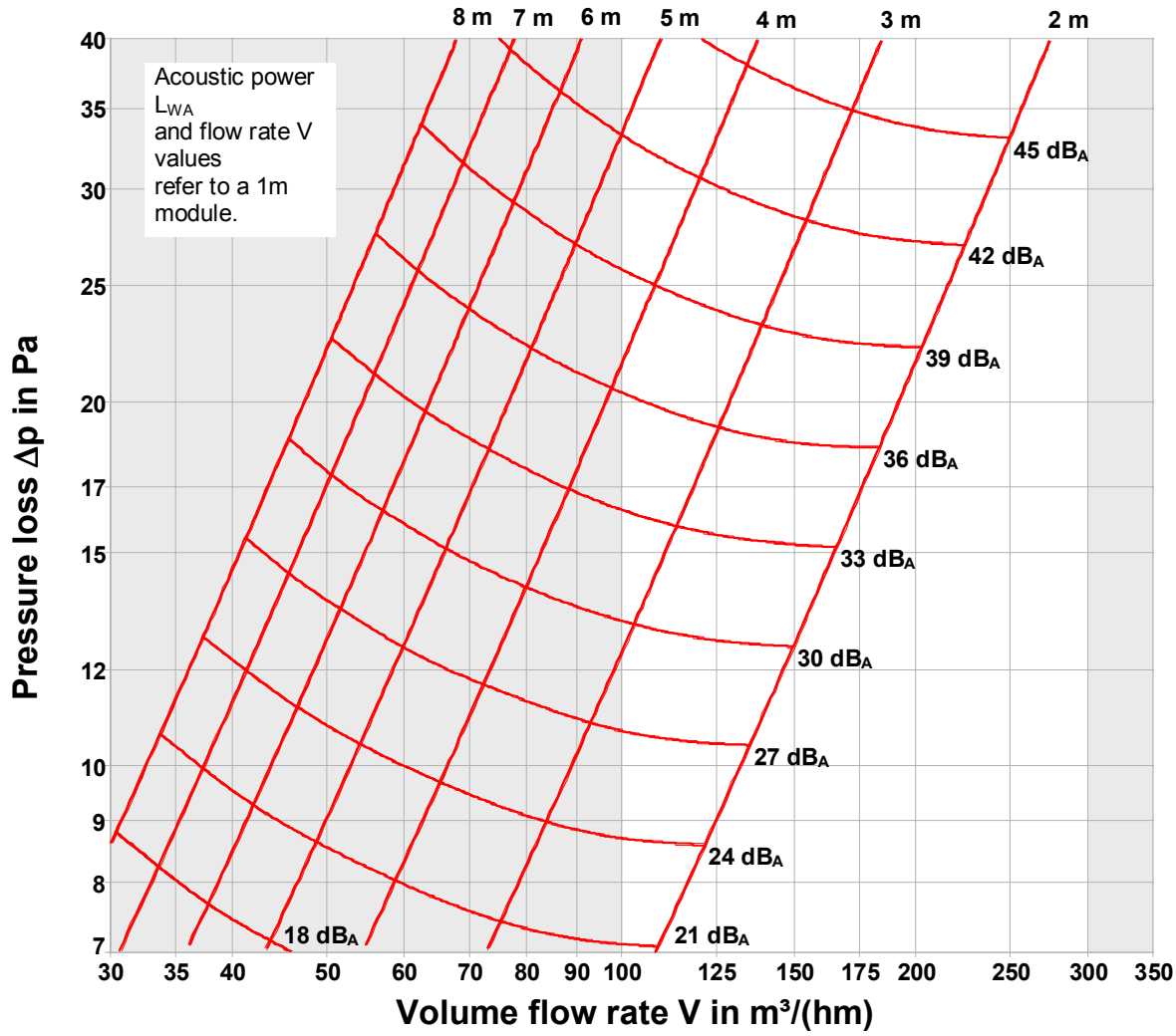


Flow pattern



Tubular Diffuser Type RLB - DN 200

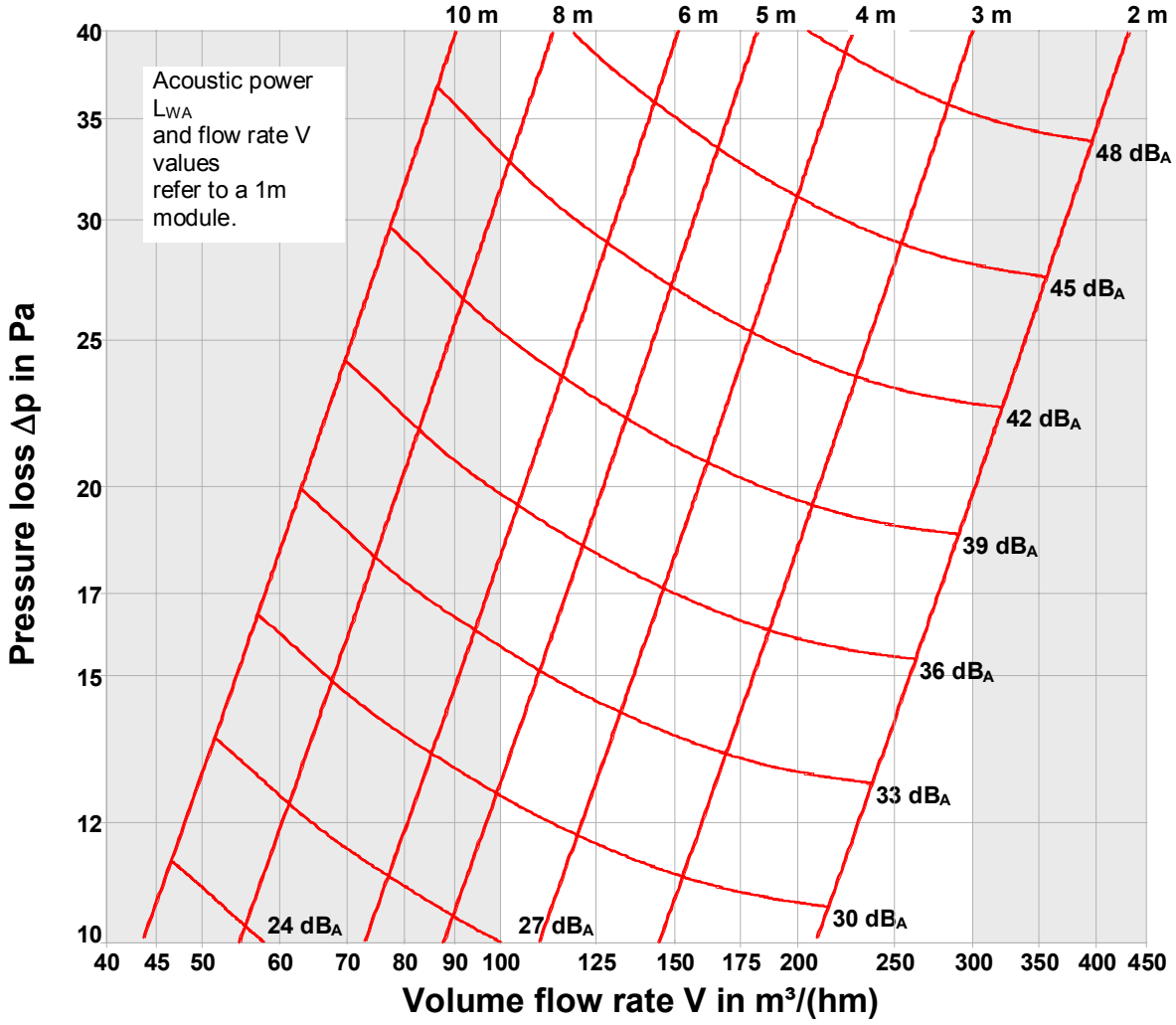
Duct runs of 2 - 8 m



V	K.- / H.-Leistung in W/m		
m³/(hm)	+/-3K	ΔT=-6K	ΔT=-9K
30	29	58	86
40	38	77	115
50	48	96	144
60	58	115	173
70	67	134	201
80	77	153	230
90	86	173	259
100	96	192	288
125	120	240	359
150	144	288	431
175	168	335	503
200	192	383	575
250	240	479	719
300	288	575	863
350	335	671	1006

Tubular Diffuser Type RLB - DN 250

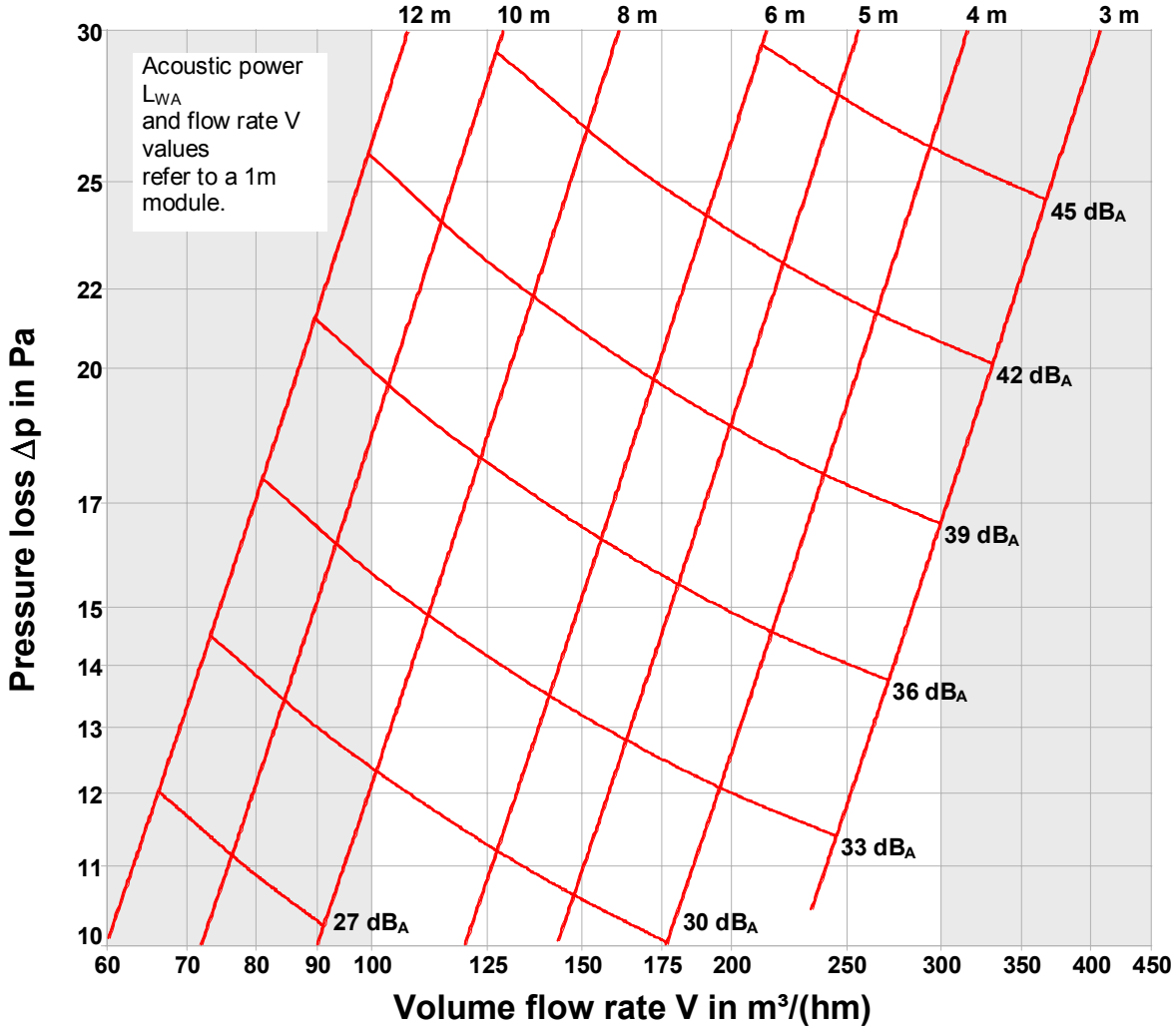
Duct runs of 2 - 10 m



V	K.- / H.-leistung in W/m		
m³/(hm)	+/-3K	ΔT=-6K	ΔT=-9K
40	38	77	115
50	48	96	144
60	58	115	173
70	67	134	201
80	77	153	230
90	86	173	259
100	96	192	288
125	120	240	359
150	144	288	431
175	168	335	503
200	192	383	575
250	240	479	719
300	288	575	863
350	335	671	1006
400	383	767	1150
450	431	863	1294

Tubular Diffuser Type RLB - DN 315

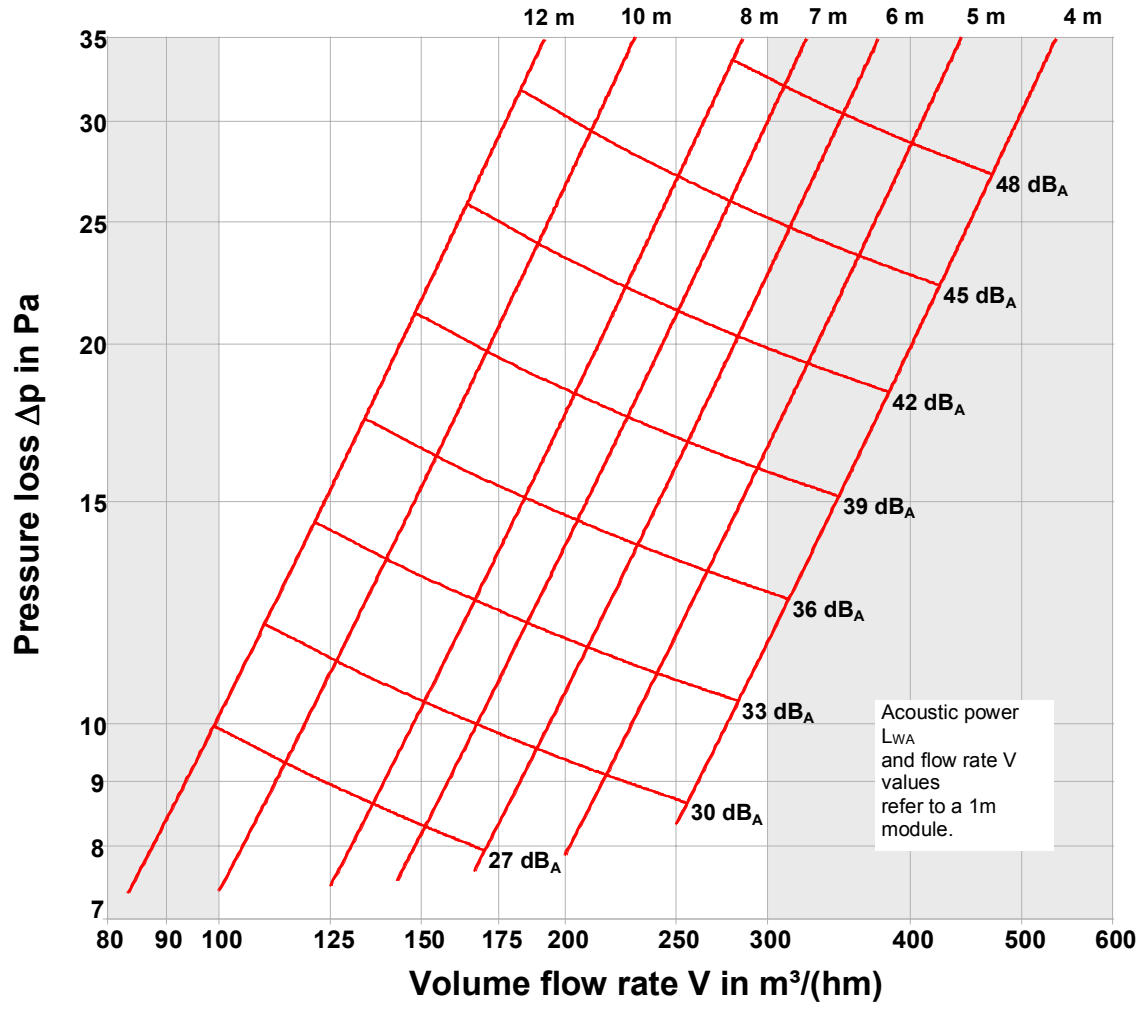
Duct runs of 3 - 12 m



V	K.- / H.-leistung in W/m		
m³/(hm)	+/-3K	ΔT=-6K	ΔT=-9K
60	58	115	173
70	67	134	201
80	77	153	230
90	86	173	259
100	96	192	288
125	120	240	359
150	144	288	431
175	168	335	503
200	192	383	575
250	240	479	719
300	288	575	863
350	335	671	1006
400	383	767	1150
450	431	863	1294

Tubular Diffuser Type RLB - DN 400

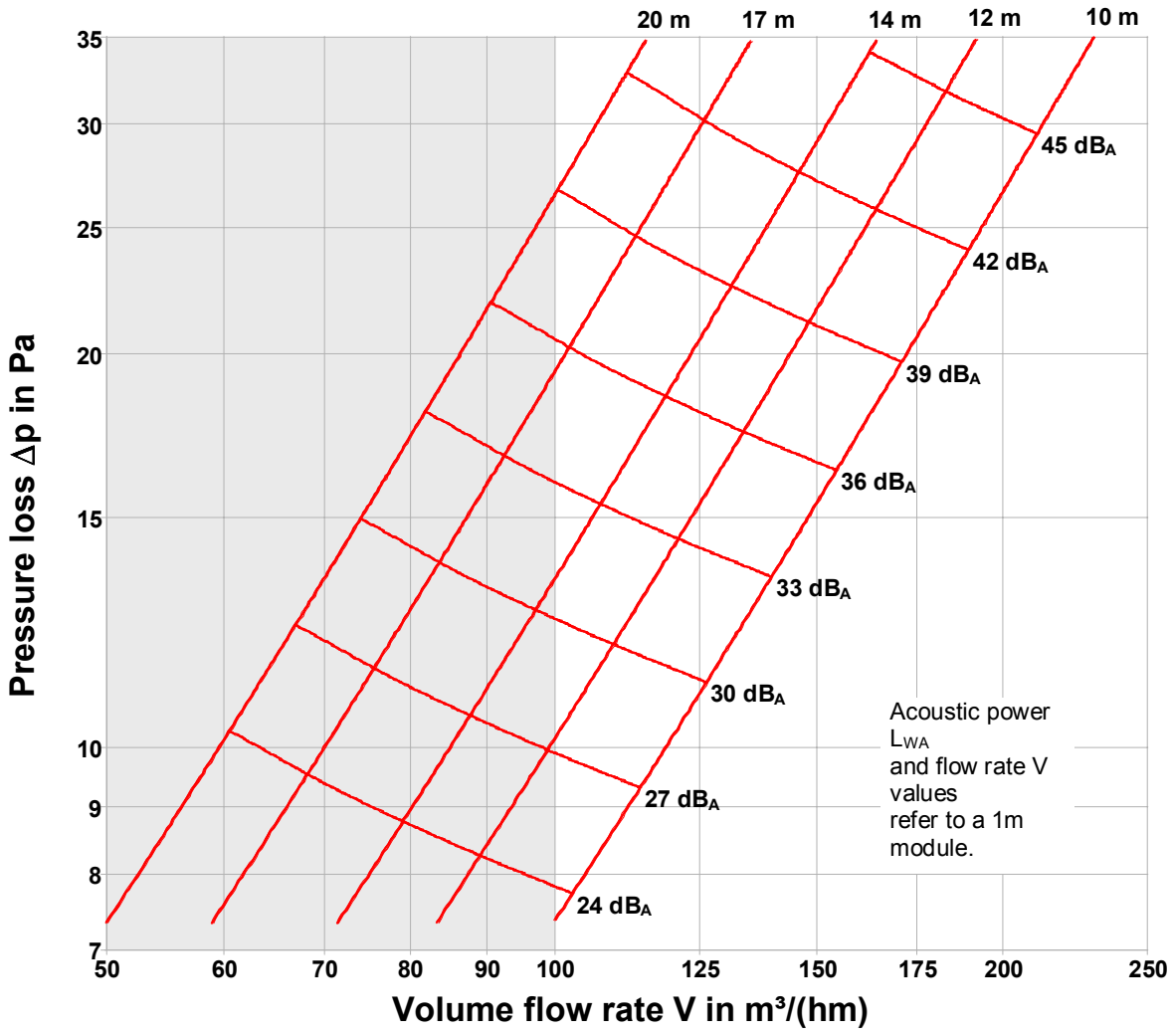
Duct runs of 4 - 12 m



V	K.- / H.-leistung in W/m		
m³/(hm)	+/-3K	ΔT=-6K	ΔT=-9K
80	77	153	230
90	86	173	259
100	96	192	288
125	120	240	359
150	144	288	431
175	168	335	503
200	192	383	575
250	240	479	719
300	288	575	863
400	383	767	1150
500	479	958	1438
600	575	1150	1725

Tubular Diffuser Type RLB - DN 400

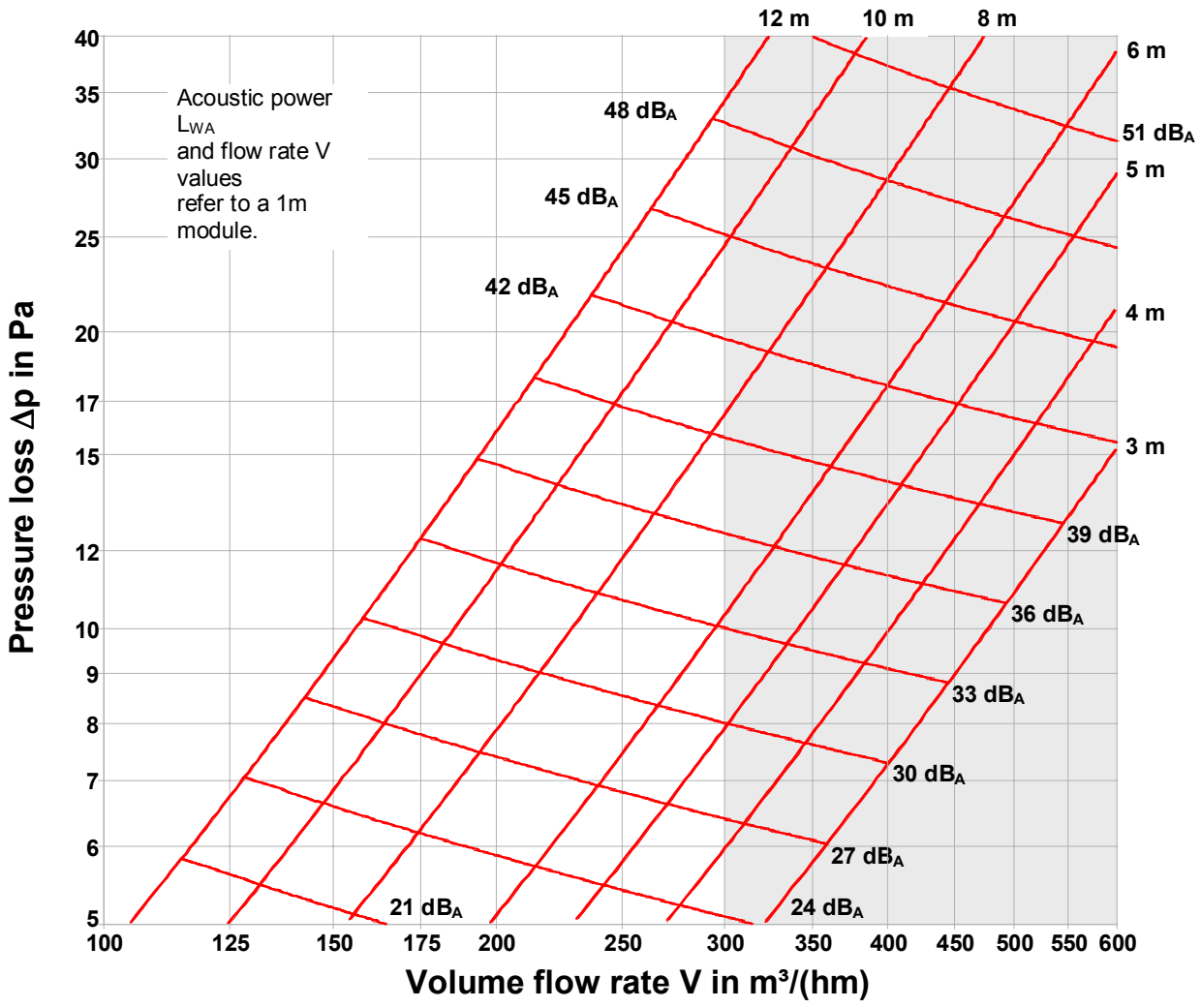
Duct runs of 10 - 20 m



V	K.- / H.-leistung in W/m		
m³/(hm)	+/-3K	ΔT=-6K	ΔT=-9K
50	48	96	144
60	58	115	173
70	67	134	201
80	77	153	230
90	86	173	259
100	96	192	288
110	105	211	316
120	115	230	345
130	125	249	374
140	134	268	403
150	144	288	431
160	153	307	460
170	163	326	489
180	173	345	518
190	182	364	546
200	192	383	575
225	216	431	647
250	240	479	719

Tubular Diffuser Type RLB - DN 500

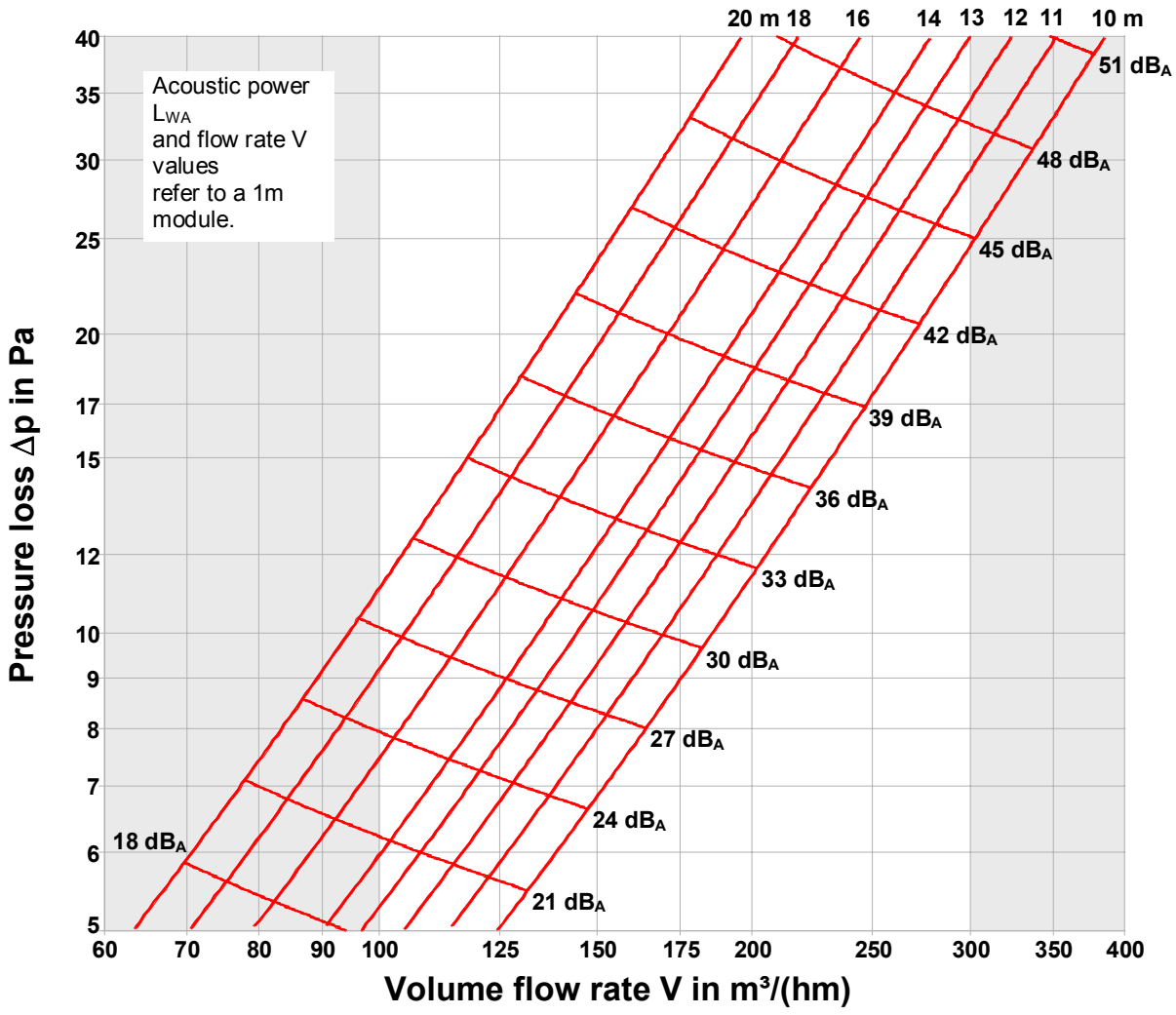
Duct runs of 3 - 12 m



V	K.- / H.-leistung in W/m		
m³/(hm)	+/–3K	ΔT=-6K	ΔT=-9K
100	96	192	288
125	120	240	359
150	144	288	431
175	168	335	503
200	192	383	575
250	240	479	719
300	288	575	863
350	335	671	1006
400	383	767	1150
450	431	863	1294
500	479	958	1438
550	527	1054	1581
600	575	1150	1725

Tubular Diffuser Type RLB - DN 500

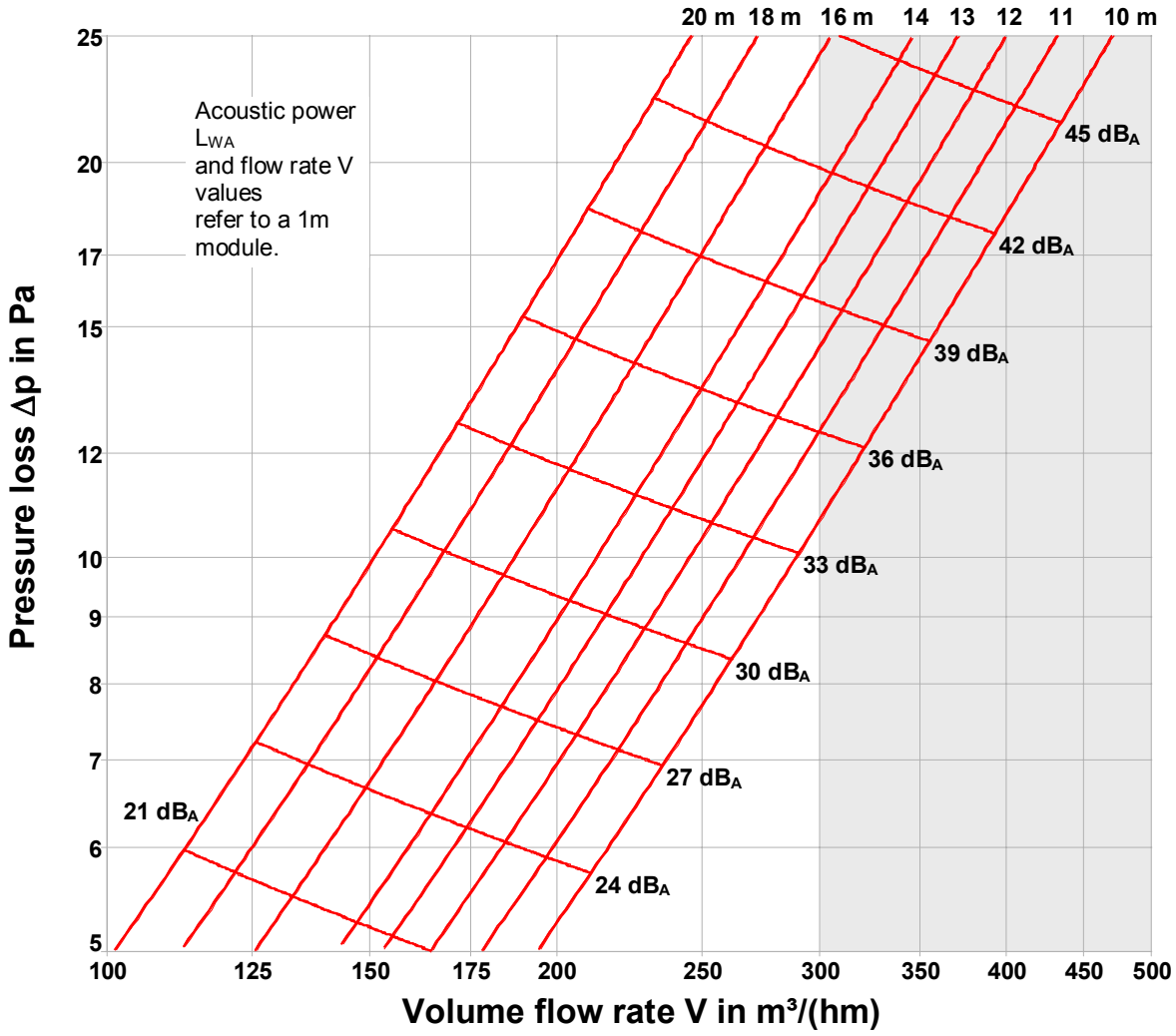
Duct runs of 10 - 20 m



V	K.- / H.-leistung in W/m		
m³/(hm)	+/–3K	ΔT=-6K	ΔT=-9K
60	58	115	173
70	67	134	201
80	77	153	230
90	86	173	259
100	96	192	288
125	120	240	359
150	144	288	431
175	168	335	503
200	192	383	575
250	240	479	719
300	288	575	863
350	335	671	1006
400	383	767	1150

Tubular Diffuser Typ RLB - DN 630

Duct runs of 10 - 20 m



V	K.- / H.-leistung in W/m		
m³/(hm)	+/-3K	ΔT=-6K	ΔT=-9K
100	96	192	288
125	120	240	359
150	144	288	431
175	168	335	503
200	192	383	575
225	216	431	647
250	240	479	719
275	264	527	791
300	288	575	863
325	311	623	934
350	335	671	1006
375	359	719	1078
400	383	767	1150
425	407	815	1222
450	431	863	1294
475	455	910	1366
500	479	958	1438