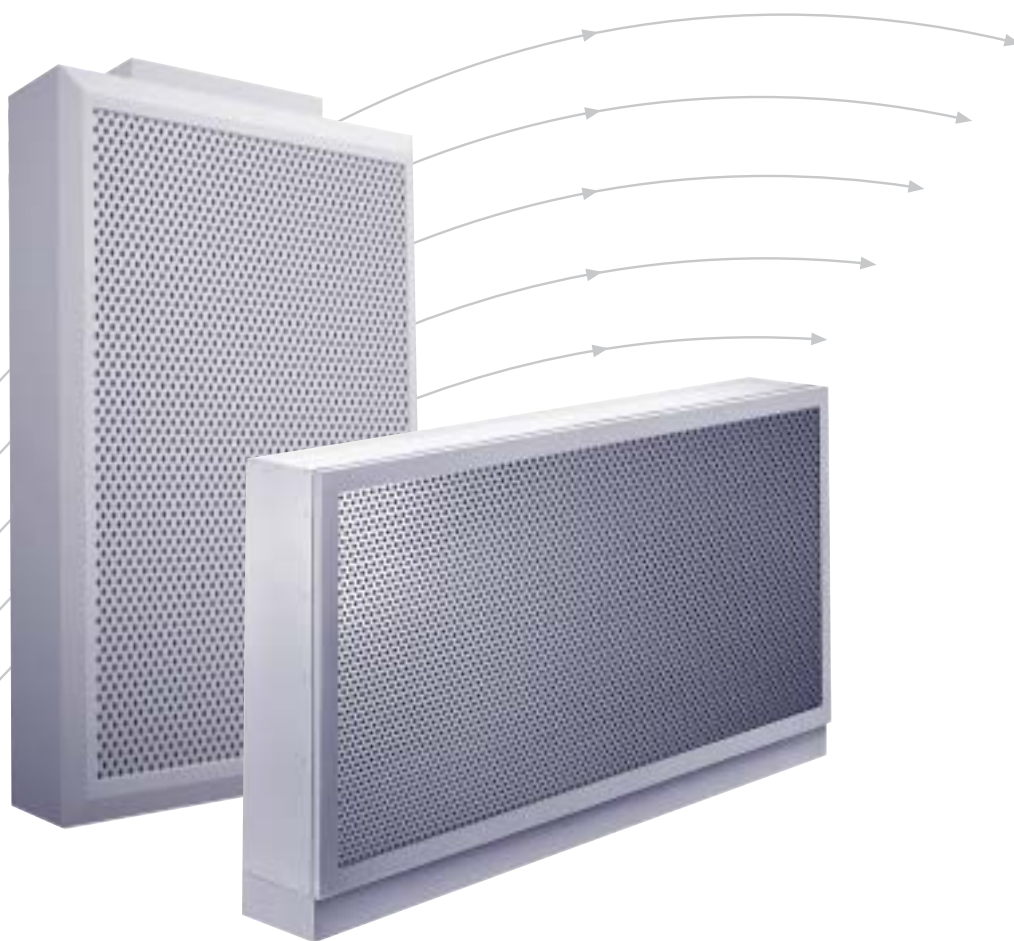


# Displacement Flow Diffusers

- Types QLE · QLF
- for low turbulence air supply



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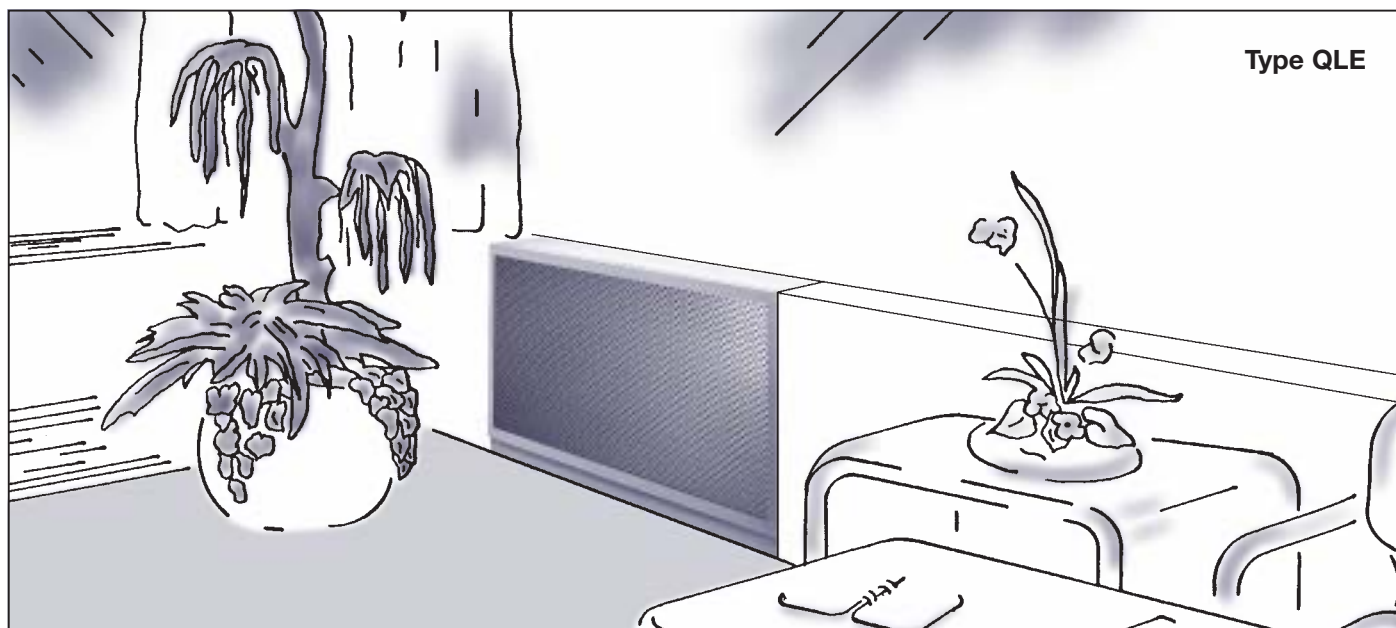
The displacement flow units types QLE and QLF are primarily employed in comfort conditioning.

As opposed to the familiar principle of mixed air flow through ceiling or wall diffusers, displacement flow units guarantee low-turbulence air supply. The discharge velocity is very low. While with mixed flows it is preferable to achieve as high an induction as possible (by mixing room air with the supply air stream), the principle of displacement flow ventilation is to achieve an induction rate as low as possible.

Depending on the degree of activity of the persons in the occupied zone, the supply air can enter the space with a temperature difference of -1K to -6K in relation to the room air. The air spreads out on the floor and is lifted up by convection currents from heat sources (machines, electrical equipment, people, etc.). The fresh air, therefore, finds its own path to the heat source from which the heat load must be removed. Should the heat source be people, this provides them also with fresh air.

With the principle of displacement ventilation, the exhaust air locations should be arranged at high room level.

With an even distribution of displacement flow diffusers, even large halls (e. g. auditoria, industrial factories) can be air-conditioned without draughts in an economical manner.



# Construction · Dimensions · Materials

## Construction

The displacement flow diffusers types QLE and QLF are manufactured with rectangular spigots optionally located at the top or at the bottom. An inserted perforated sheet steel basket is fitted to ensure even air distribution.

### Special features of the type QLE:

The perforated metal face plate is hooked onto the casing. This enables easy removal.

### Special features of the type QLF:

These units can be supplied on request with a single direction of discharge (face area) or a three way discharge (face and side areas).

## Materials

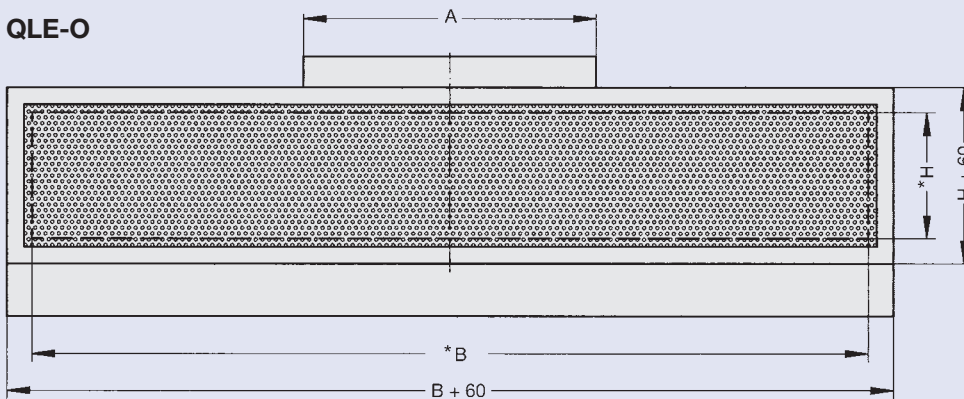
Casing, perforated face plate and perforated sheet steel basket are made of galvanised sheet steel. Casing and perforated face plate are pre-treated and powder-coated white RAL 9010, gloss level 50 %. The rear surface of the casing and the perforated sheet steel basket are coated black RAL 9005.

Standard sizes QLE · QLF							
H* in mm	B* in mm						
	300	450	600	750	1000	1250	1500
150					QLE	QLE	QLE
300					QLE	QLE	QLE
450	QLF	QLF			QLE	QLE	QLE
600	QLF	QLF	QLF		QLE	QLE	QLE
750		QLF	QLF	QLF	QLE	QLE	QLE
1000			QLF	QLF			
1250			QLF	QLF			
1500				QLF	QLF		
1750				QLF	QLF	QLF	
2000					QLF	QLF	

\*H x B = Dimensions of perforated area of the face plate (QLF)  
= Discharge opening in the casing (QLE)

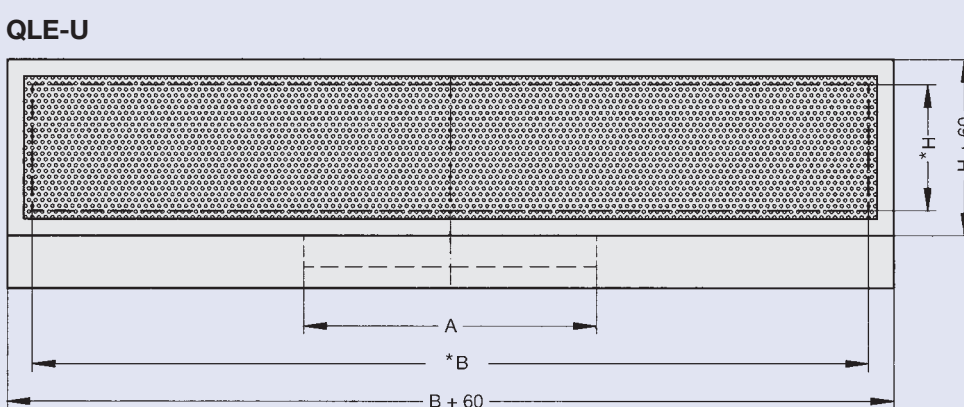
## Construction types QLE

### QLE-O



\* B x H (mm) = Discharge opening in the casing

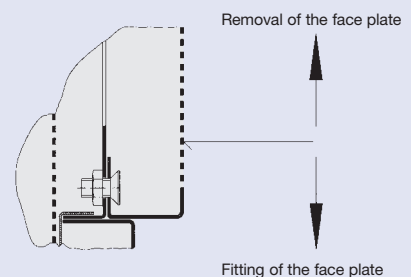
### QLE-U



## Dimensions QLE

Size	A	H
150	350	150
300	350	300
450	485	450
600	700	600
750	770	750

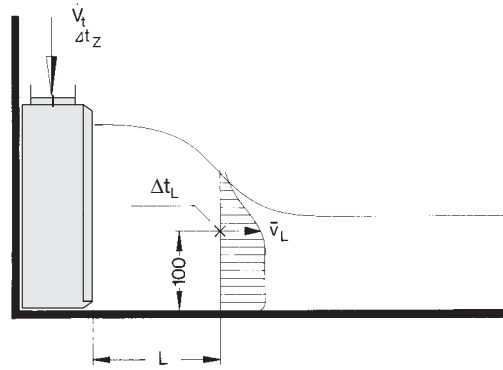
applicable for all widths (1000 / 1250 / 1500)



# Construction · Dimensions · Nomenclature

## Nomenclature:

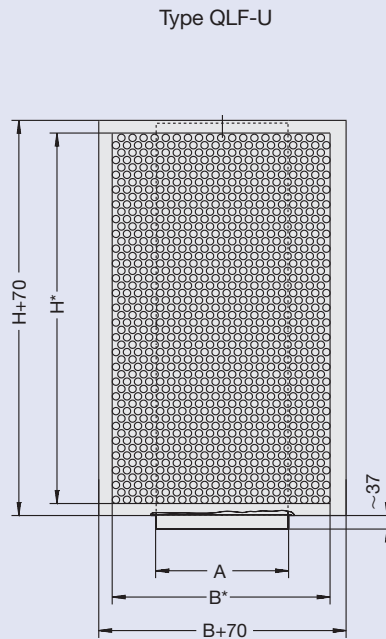
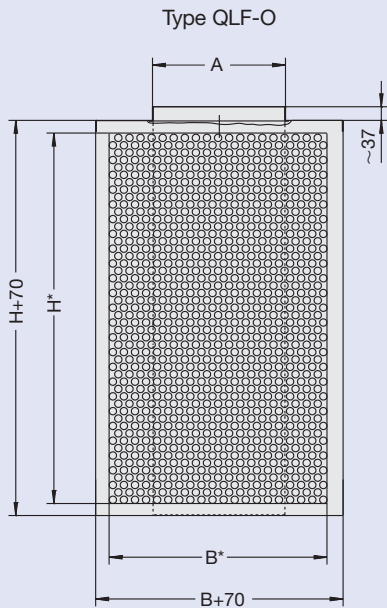
- $\dot{V}$  in l/s · m; m<sup>3</sup>/h · m: Volume flow rate per meter (width)  
 $\dot{V}_t$  in l/s; m<sup>3</sup>/h Total volume flow rate per diffuser  
 $L$  in m: Distance from diffuser to calculate  $\bar{v}_L$  and  $\Delta t_L$   
 $\bar{v}_L$  in m/s: Maximum flow velocity at distance  $L$  from diffuser and distance 0.1 m above floor  
 $t_z$  in °C: Supply air temperature  
 $t_{1,1}$  in °C: Temperature at 1.1 m room height  
 $t_{0,1}$  in °C: Temperature at 0.1 m above floor  
 $\Delta t_z$  in K: Temperature difference  $t_{1,1} - t_z$   
 $\Delta t_{0,1}$  in K: Temperature difference  $t_{0,1} - t$   
 $\Delta p_{t1}$  in Pa: Pressure drop for discharge in one direction  
 $\Delta p_{t3}$  in Pa: Pressure drop for discharge in three directions (~ 0.9 x  $\Delta p_{t1}$ )  
 $L_{WA}$  in dB(A): A-weighted sound power level  
 $\Delta t_L$  in K: Temperature difference at distance  $L$  between room and core temperature



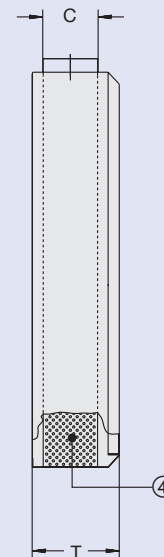
$$v_{tot\min} = 0.1 \text{ m/s}$$

$$v_{tot\max} = 0.3 \text{ m/s}$$

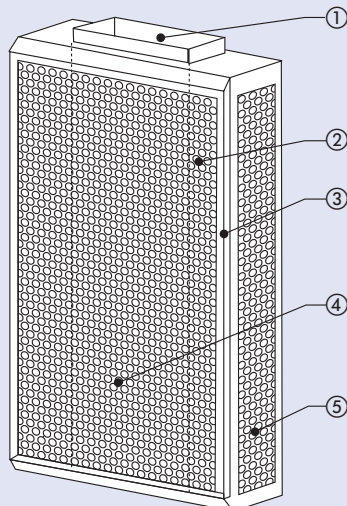
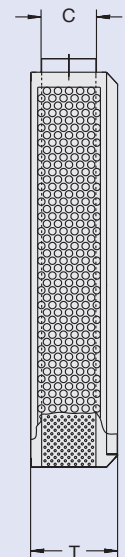
## Construction QLF



1-directional discharge



3-directional discharge



- ① Rectangular air connection spigot, either on top or bottom
- ② Perforated face plate
- ③ Casing
- ④ Integral perforated sheet steel basket
- ⑤ Perforated side plates right and left for 3-directional discharge

## Dimensions QLF

Size H* x B*	Dimensions in mm		
	A	C	T
450 x 300	160	80	185
450	300	80	185
600 x 300	160	80	185
450	300	80	185
600	360	150	235
750 x 450	300	80	185
600	360	150	235
750	625	150	235
1000 x 600	360	150	235
750	625	150	235
1250 x 600	360	150	235
750	625	150	235
1500 x 750	625	150	235
1000	715	200	287
1250	890	200	287
2000 x 1000	715	200	287
1250	890	200	287



# Quick Selection · Examples

## Quick Selection QLE

H x B	$\dot{V}_t$ min l/s	$\dot{V}_t$ max l/s	$\dot{V}_t$ min m <sup>3</sup> /h	$\dot{V}_t$ max m <sup>3</sup> /h	$\dot{V}_t$ min l/s · m	$\dot{V}_t$ max l/s · m
150 x 1000	10	40	36	144	10	40
150 x 1250	12.5	50	45	180	10	40
150 x 1500	15	60	54	216	10	40
300 x 1000	15	60	54	216	15	60
300 x 1250	19	75	68	272	15	60
300 x 1500	22.5	90	81	324	15	60
450 x 1000	20	80	72	288	20	80
450 x 1250	25	100	90	360	20	80
450 x 1500	30	120	108	432	20	80
600 x 1000	25	100	90	360	25	100
600 x 1250	31	125	113	452	25	100
600 x 1500	37.5	150	135	540	25	100
750 x 1000	30	120	108	432	30	120
750 x 1250	37.5	150	135	540	30	120
750 x 1500	45	180	162	648	30	120

## Quick Selection QLF - 1

H x B	$\dot{V}_t$ min l/s	$\dot{V}_t$ max l/s	$\dot{V}_t$ min m <sup>3</sup> /h	$\dot{V}_t$ max m <sup>3</sup> /h	L <sub>WA</sub> min dB(A)	L <sub>WA</sub> max dB(A)
450 x 300	13	40	48	145	<15	26
450 x 450	20	60	73	218	<15	27
600 x 300	18	54	64	193	<15	27
600 x 450	27	81	97	290	<15	29
600 x 600	36	108	129	388	<15	28
750 x 450	34	101	121	363	<15	30
750 x 600	45	135	162	485	<15	27
750 x 750	56	168	202	606	<15	24
1000 x 600	60	180	215	646	<15	28
1000 x 750	75	224	269	808	<15	25
1250 x 600	75	224	269	808	<15	28
1250 x 750	94	281	337	1010	<15	26
1500 x 750	112	337	404	1213	<15	26
1500 x 1000	150	449	539	1617	<15	29
1750 x 750	131	393	472	1415	<15	26
1750 x 1000	175	524	629	1887	<15	30
1750 x 1250	218	655	786	2359	<15	32
2000 x 1000	200	599	719	2157	<15	30
2000 x 1250	250	749	899	2696	<15	33

## Quick Selection QLF - 3

H x B	$\dot{V}_t$ min l/s	$\dot{V}_t$ max l/s	$\dot{V}_t$ min m <sup>3</sup> /h	$\dot{V}_t$ max m <sup>3</sup> /h	L <sub>WA</sub> min dB(A)	L <sub>WA</sub> max dB(A)
450 x 300	25	75	90	269	<15	45
450 x 450	32	95	114	342	<15	42
600 x 300	33	99	119	356	<15	47
600 x 450	42	126	151	453	<15	45
600 x 600	55	164	197	591	<15	40
750 x 450	52	157	188	564	<15	45
750 x 600	68	204	245	736	<15	42
750 x 750	79	238	286	857	<15	36
1000 x 600	92	276	331	993	<15	43
1000 x 750	107	321	385	1155	<15	37
1250 x 600	115	344	413	1239	<15	46
1250 x 750	133	400	480	1441	<15	38
1500 x 750	160	480	576	1727	<15	39
1500 x 1000	216	649	779	2338	<15	42
1750 x 750	186	559	671	2013	<15	39
1750 x 1000	252	757	908	2725	<15	42
1750 x 1250	296	888	1066	3197	<15	43
2000 x 1000	290	869	1043	3129	<15	43
2000 x 1250	340	1019	1223	3669	<15	43

## Selection example QLE

Data given:

Volume flow rate per meter  $\dot{V} = 80 \text{ l/s} \cdot \text{m}$

Distance from diffuser:  $L = 2 \text{ m}$

Supply air temperature

difference:

$$\Delta t_z = -4 \text{ K}$$

Max. allowed air velocity

on the floor:

$$\bar{v}_{L \max} = 0.3 \text{ m/s}$$

Size and width of the displacement flow diffuser have to be determined.

Quick selection table:

Rough estimate:

Size 450, 600 or 750  
at B = 1000, 1250  
or 1500

selected:  
Size 600  
Width 1250

Diagramme 2:

Total pressure drop

$$\dot{V}_t = (80 \text{ l/s} \cdot \text{m}) \cdot 1.25 = 100 \text{ l/s}$$

$$\Delta p_{t1} = 1.5 \text{ Pa}$$

Diagramme 18:

Air flow velocity

$$\bar{v}_L = 0.26 \text{ m/s}$$

Diagramme 19:

Temperature difference

at  $\Delta t_z = -4 \text{ K}$  results in a  $\Delta t_L = -2 \text{ K}$

## Selection example QLF

Data given:

Total volume flow rate:  $\dot{V}_t = 500 \text{ m}^3/\text{h}$

Distance from diffuser:  $L = 1.5 \text{ m}$

Supply air temperature

difference:

$$\Delta t_z = -4 \text{ K}$$

Quick selection table QLF-1:

Size selected:

Height 1250

Width 750

Diagramme 8:

$$L_{WA} < 15 \text{ dB(A)}; \Delta p_{t1} < 5 \text{ Pa}$$

Diagramme 44:

$$\bar{v}_L = 0.21 \text{ m/s}$$

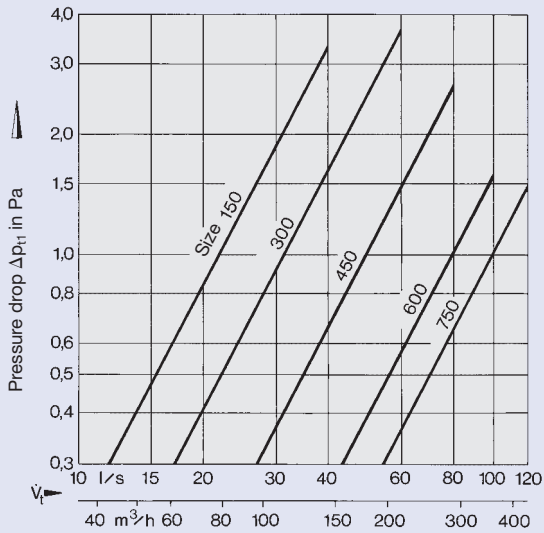
Diagramme 45:

$$\Delta t_L = 1.9 \text{ K}$$

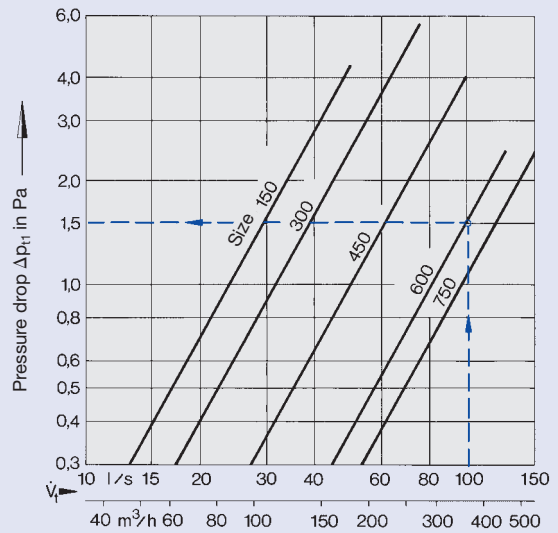
# Pressure Drop · Acoustic Data

## Type QLE

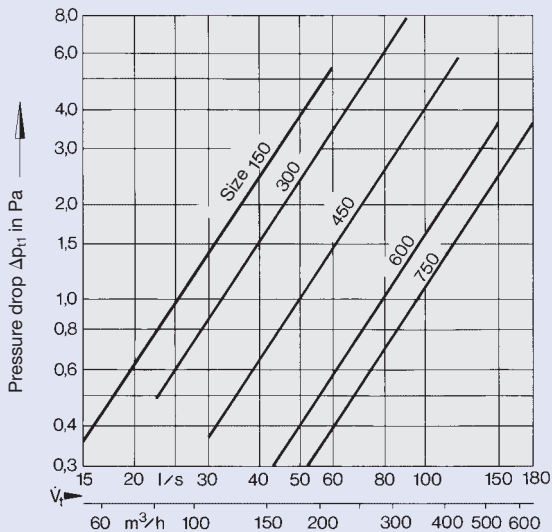
1 Pressure drop QLE B = 1000 mm



2 Pressure drop QLE B = 1250 mm



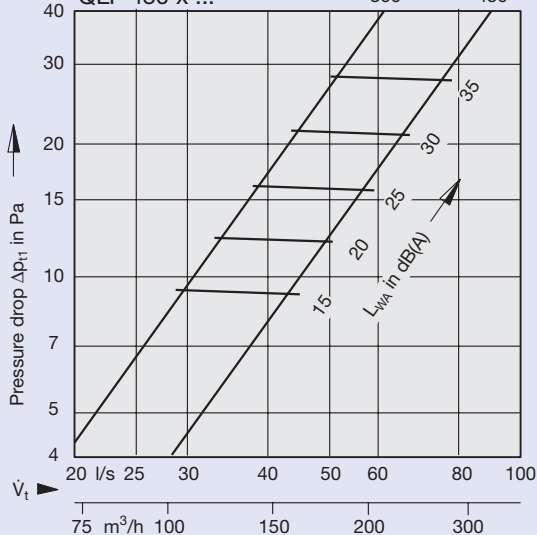
3 Pressure drop QLE B = 1500 mm



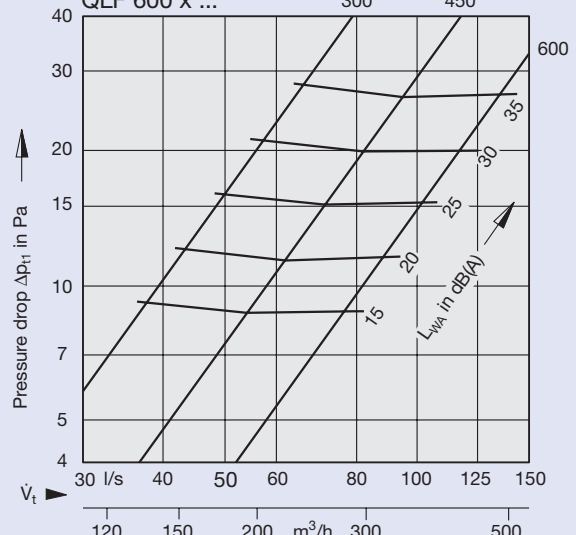
Note:  
Applicable for all QLE sizes:  $L_{WA} < 20 \text{ dB(A)}$

## Type QLF ( $\Delta p_{t3} = 0,9 \times \Delta p_{t1}$ )

4 Sound power level and pressure drop QLF 450 x ...

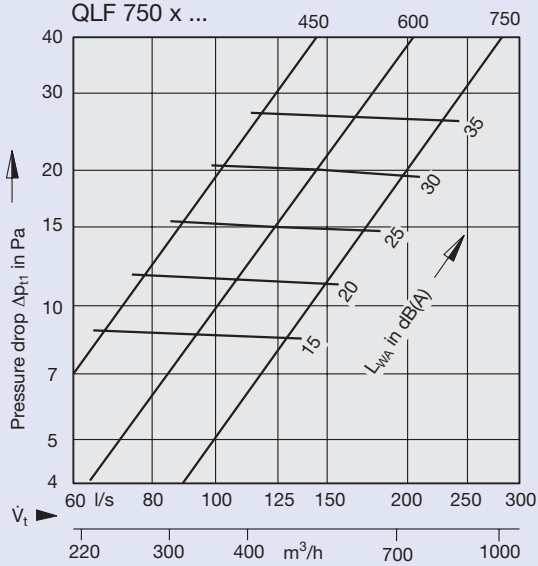


5 Sound power level and pressure drop QLF 600 x ...

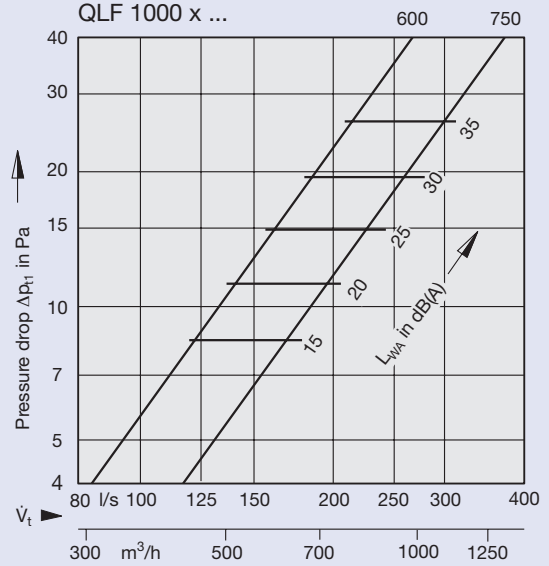


# Pressure Drop · Acoustic Data

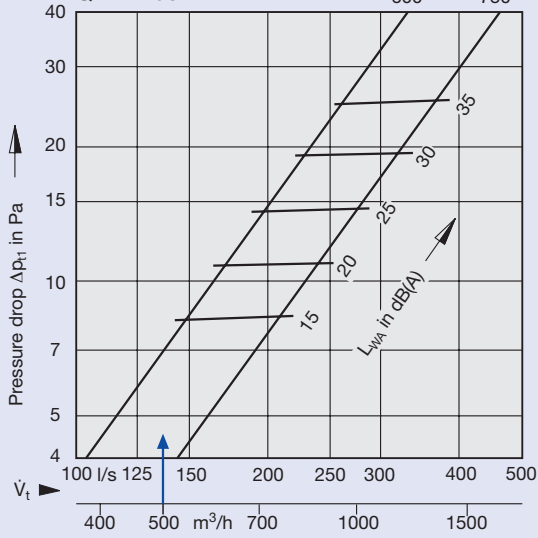
**6** Sound power level and pressure drop  
QLF 750 x ...



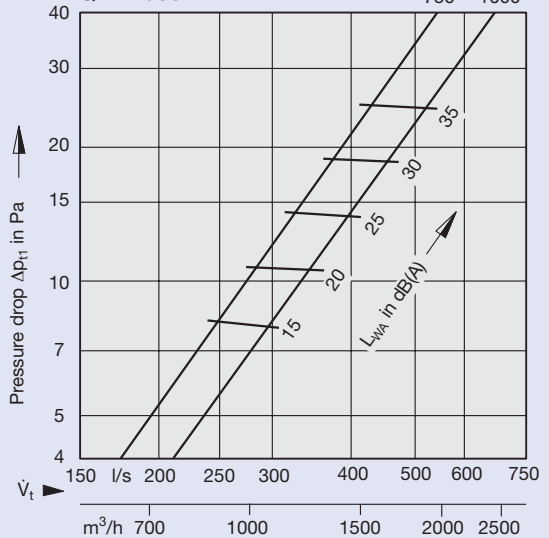
**7** Sound power level and pressure drop  
QLF 1000 x ...



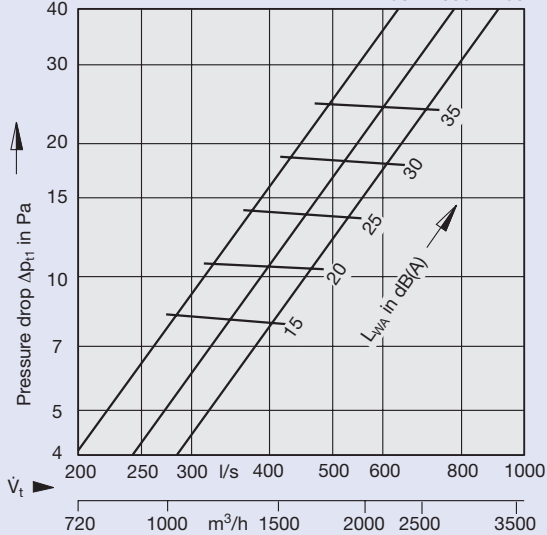
**8** Sound power level and pressure drop  
QLF 1250 x ...



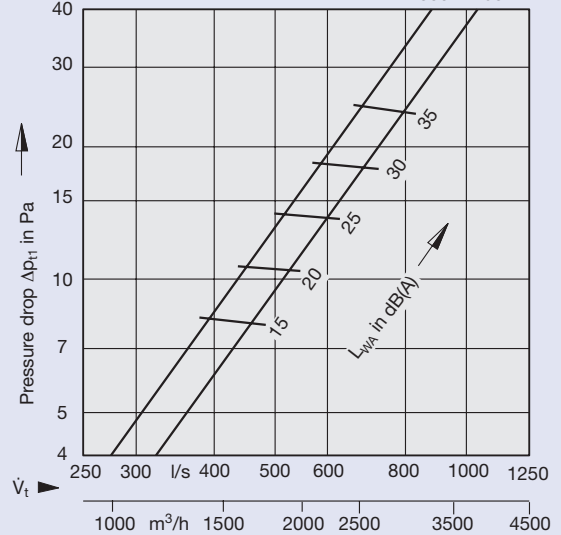
**9** Sound power level and pressure drop  
QLF 1500 x ...



**10** Sound power level and pressure drop  
QLF 1750 x ...



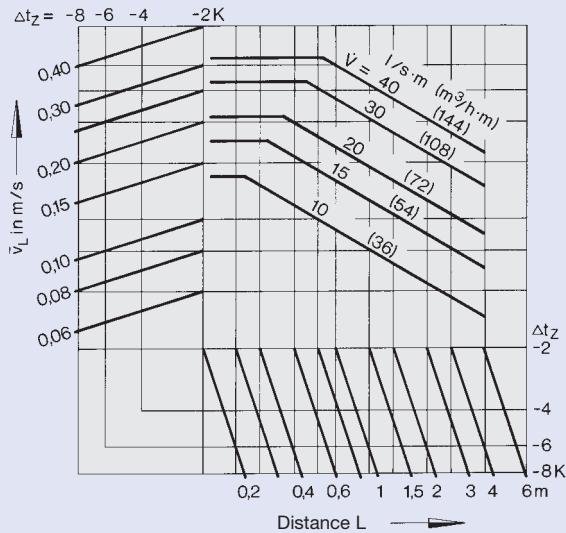
**11** Sound power level and pressure drop  
QLF 2000 x ...



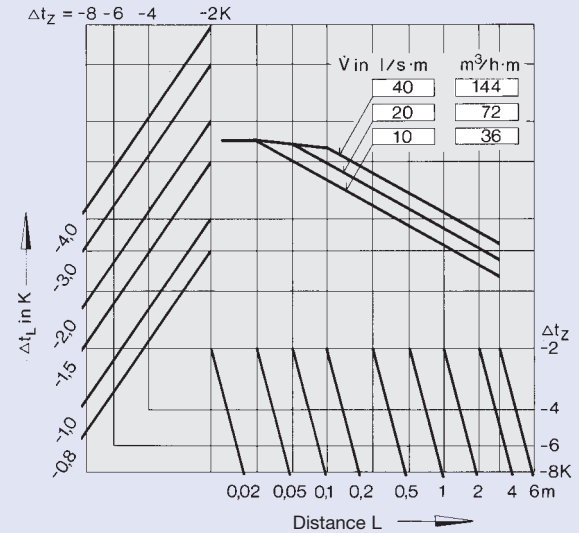
# Aerodynamic Data QLE

## Type QLE (Diagramme values referring to m)

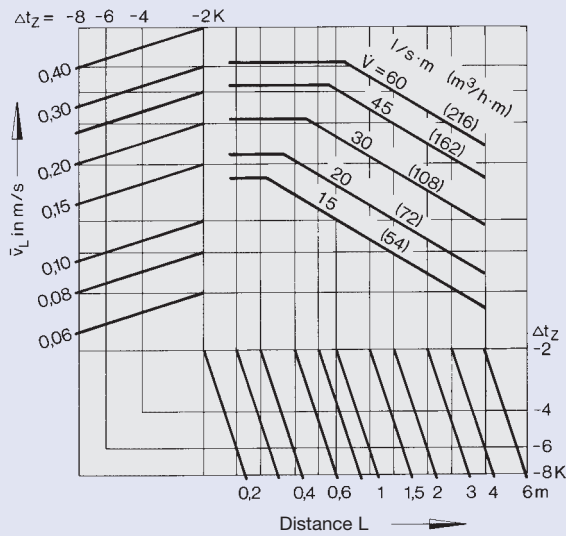
**12** Air flow velocity size 150



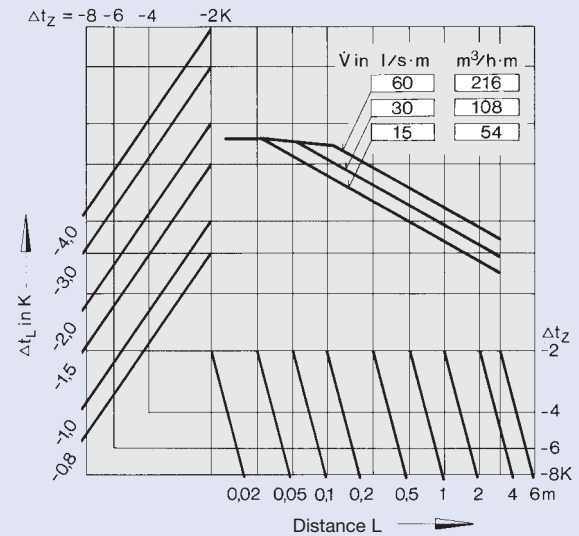
**13** Temperature difference size 150



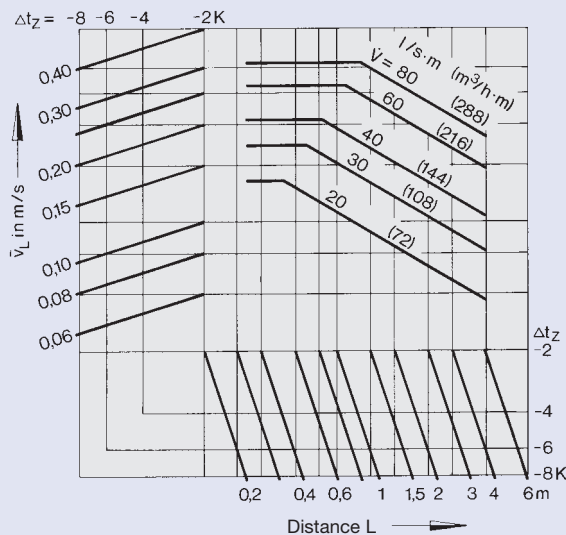
**14** Air flow velocity size 300



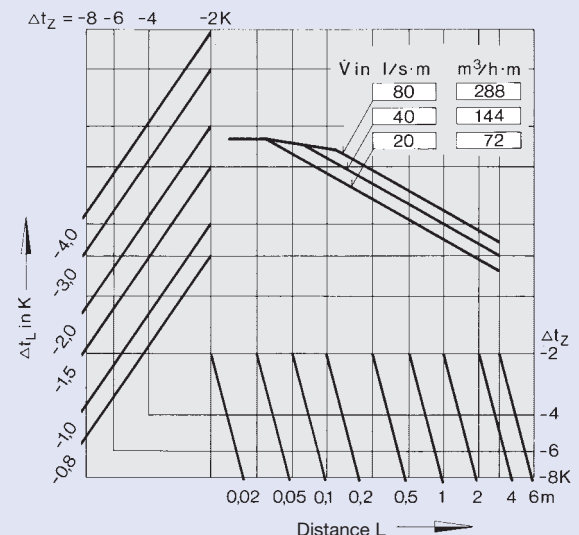
**15** Temperature difference size 300



**16** Air flow velocity size 450

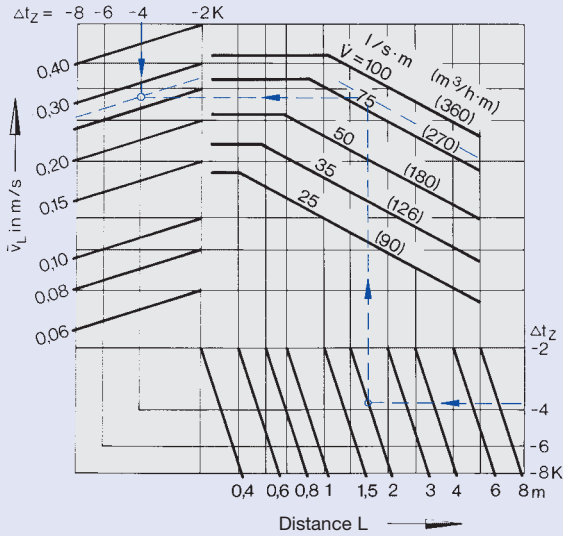


**17** Temperature difference size 450

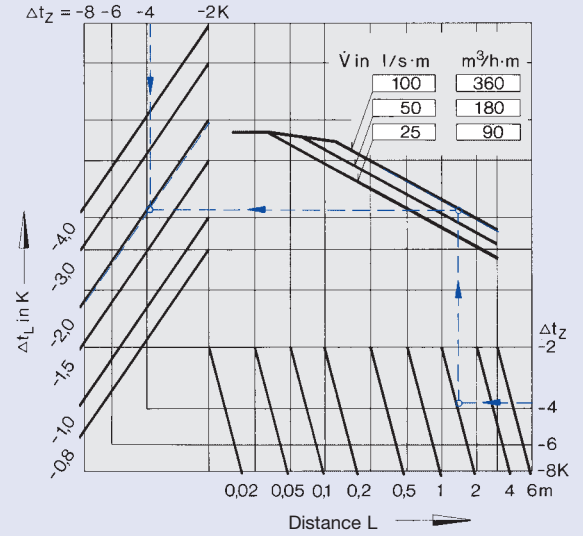




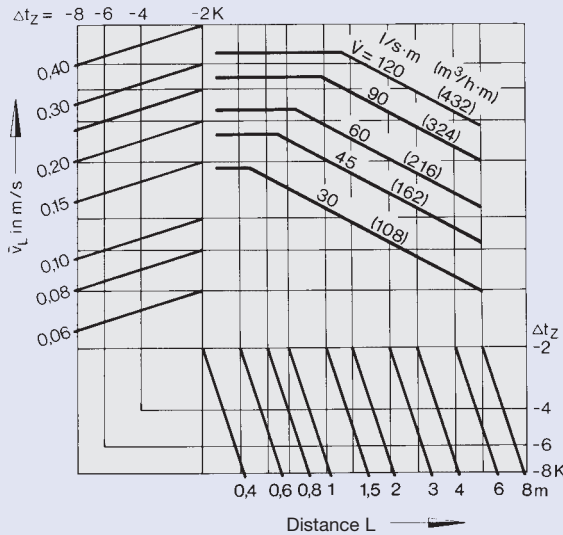
**18** Air flow velocity size 600



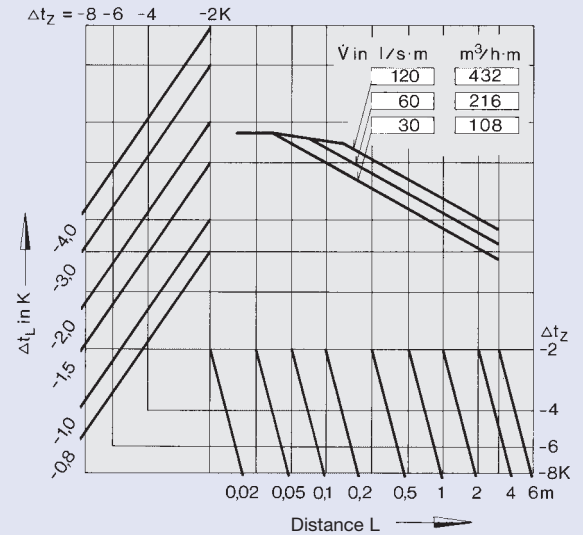
**19** Temperature difference size 600



**20** Air flow velocity size 750

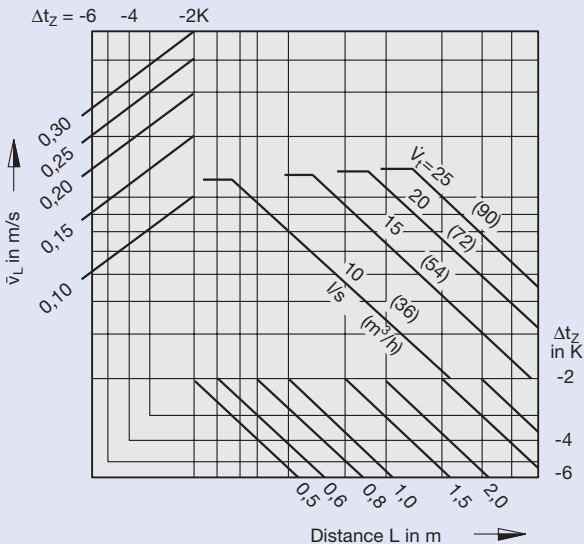


**21** Temperature difference size 750

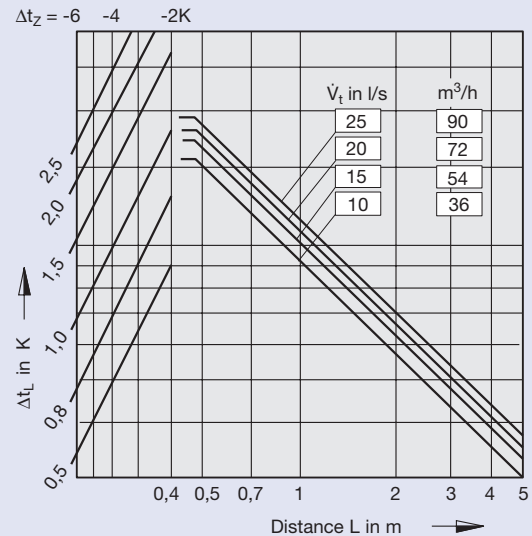


**Type QLF**

**22** Air flow velocity size 450 x 300

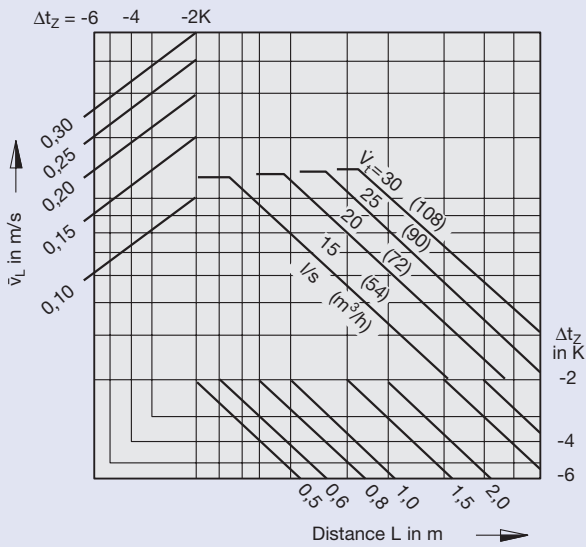


**23** Temperature difference size 450 x 300

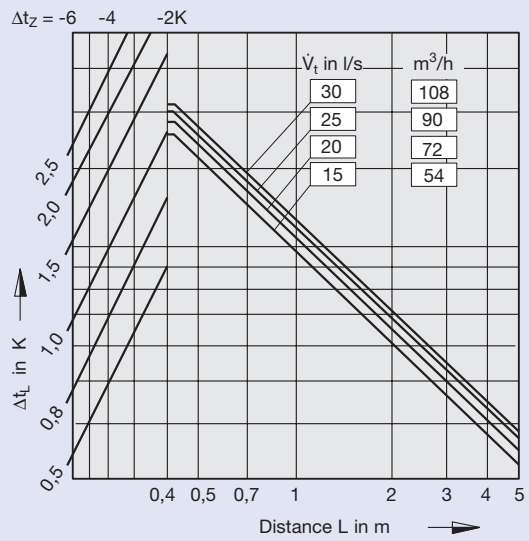


# Aerodynamic Data QLF

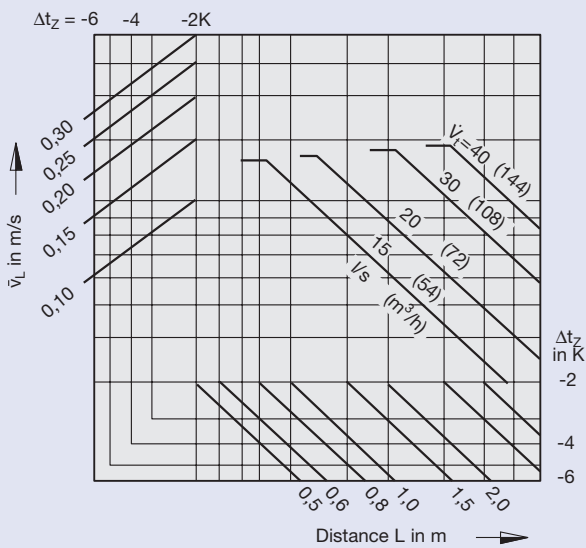
**24** Air flow velocities size 450 x 450



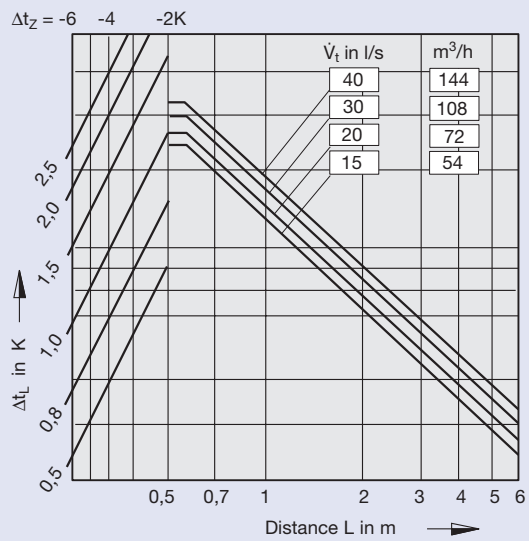
**25** Temperature difference size 450 x 450



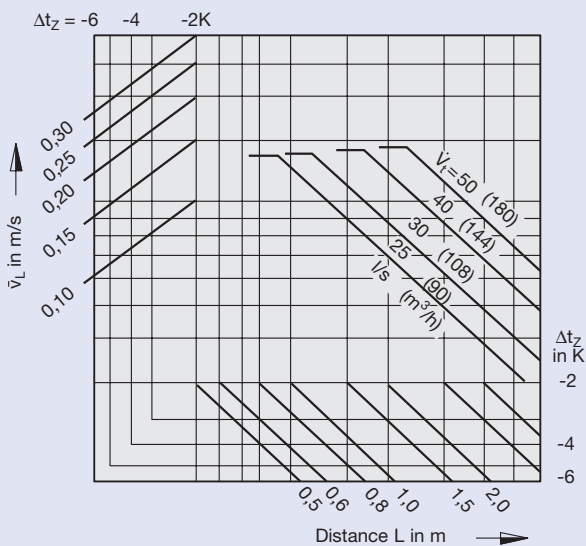
**26** Air flow velocities size 600 x 300



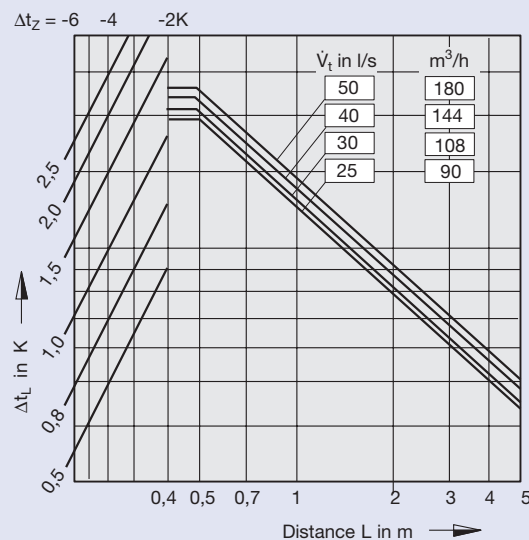
**27** Temperature difference size 600 x 300



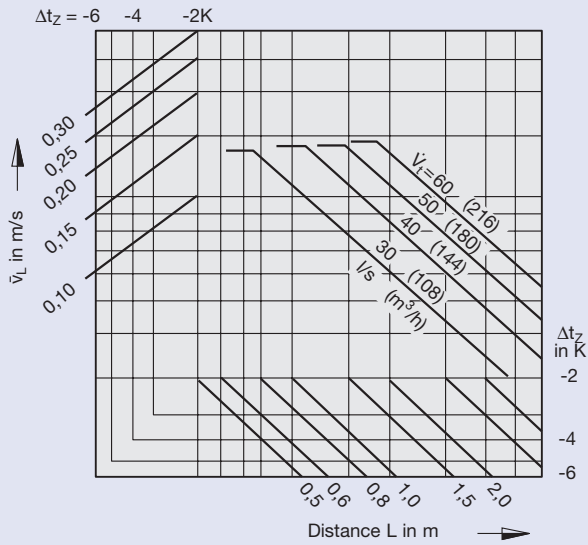
**28** Air flow velocities size 600 x 450



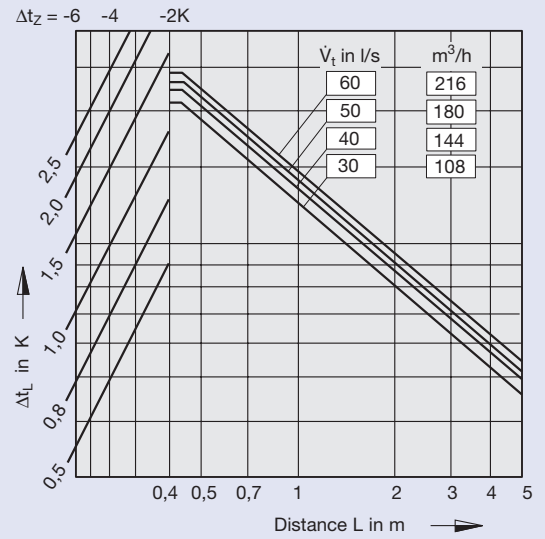
**29** Temperature difference size 600 x 450



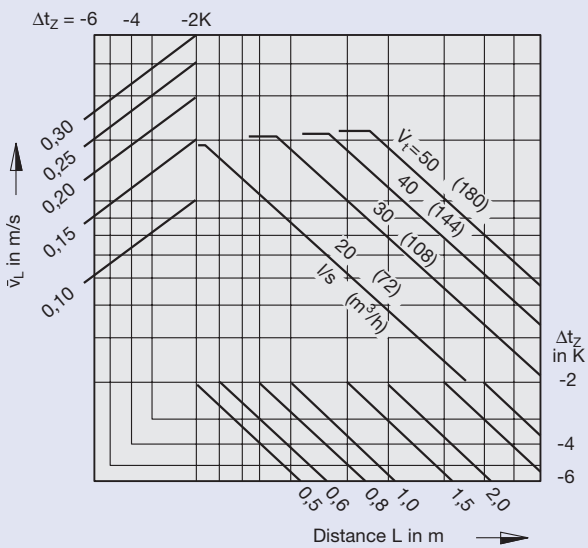
**30** Air flow velocities size 600 x 600



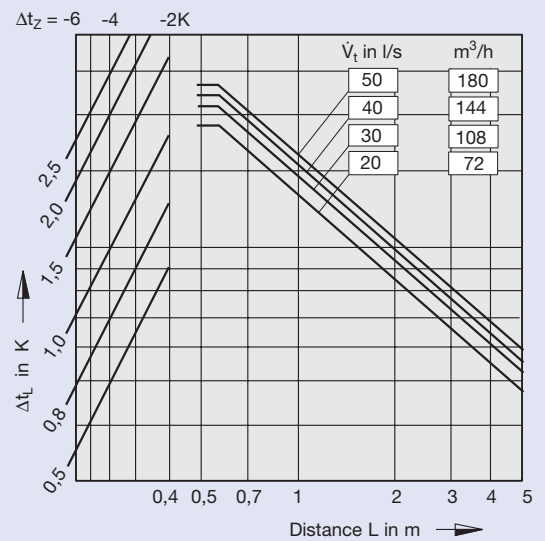
**31** Temperature difference size 600 x 600



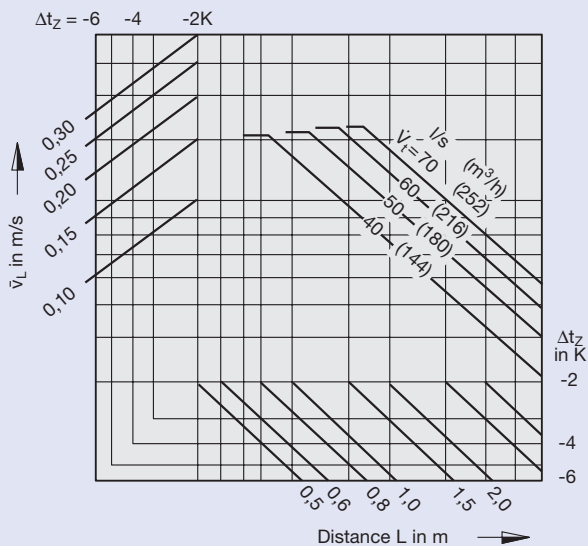
**32** Air flow velocities size 750 x 450



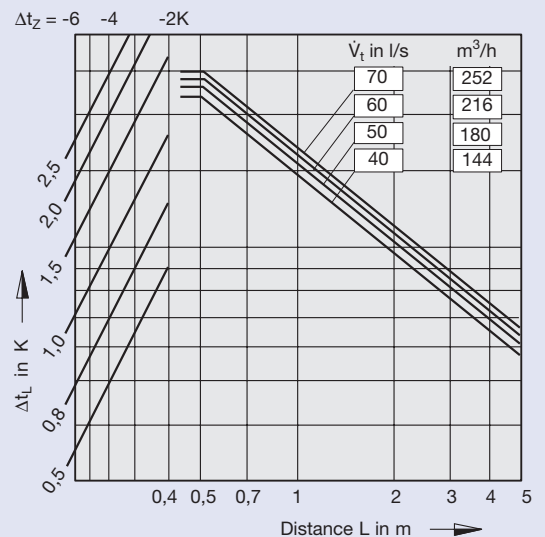
**33** Temperature difference size 750 x 450



**34** Air flow velocities size 750 x 600

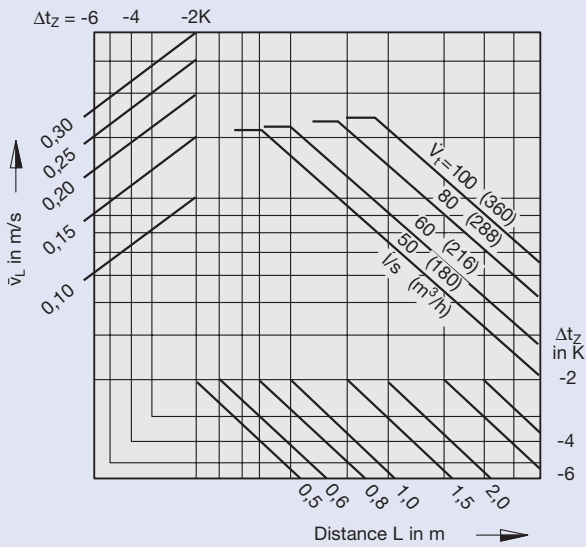


**35** Temperature difference size 750 x 600

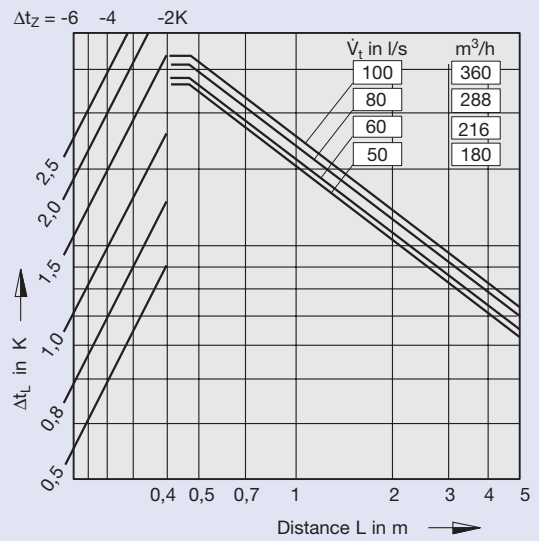


# Aerodynamic Data QLF

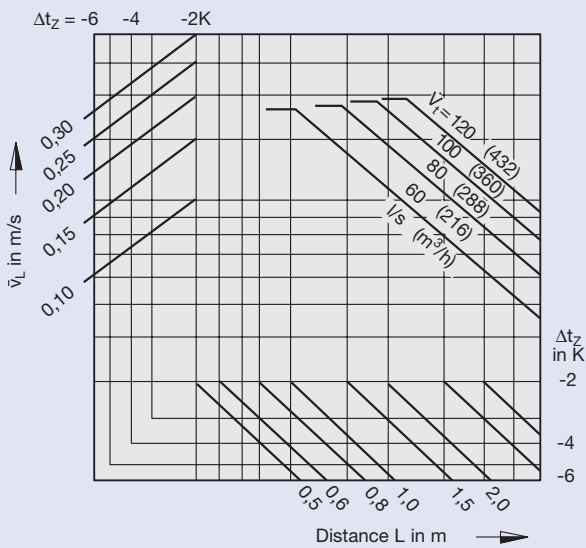
**36** Air flow velocities size 750 x 750



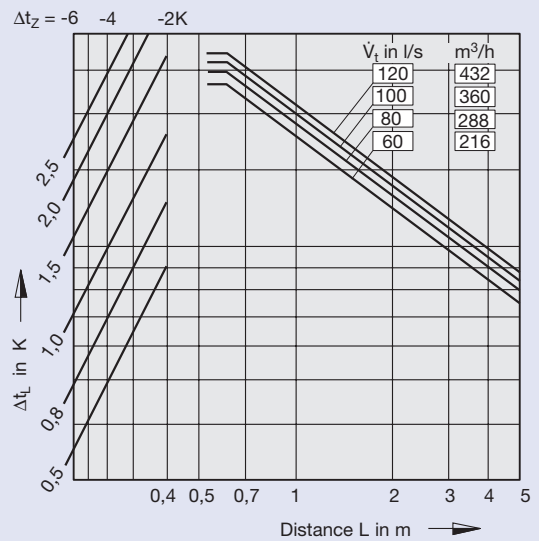
**37** Temperature difference size 750 x 750



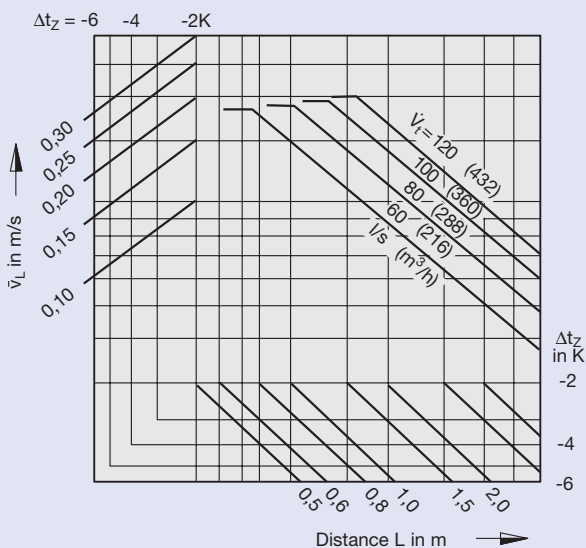
**38** Air flow velocities size 1000 x 600



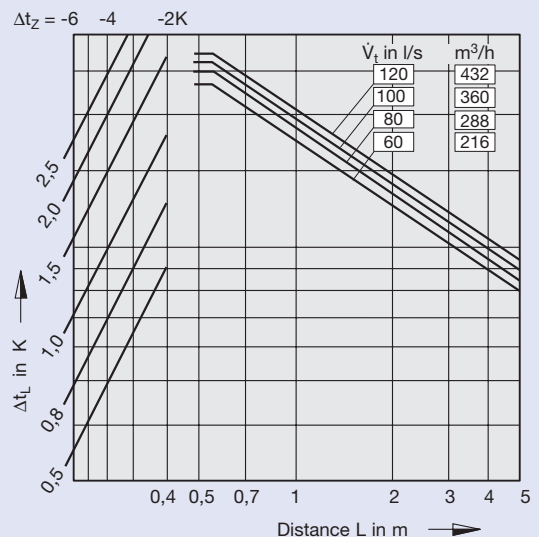
**39** Temperature difference size 1000 x 600



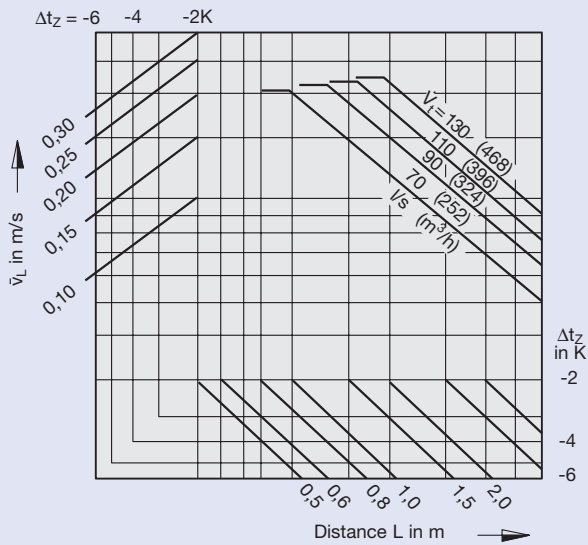
**40** Air flow velocities size 1000 x 750



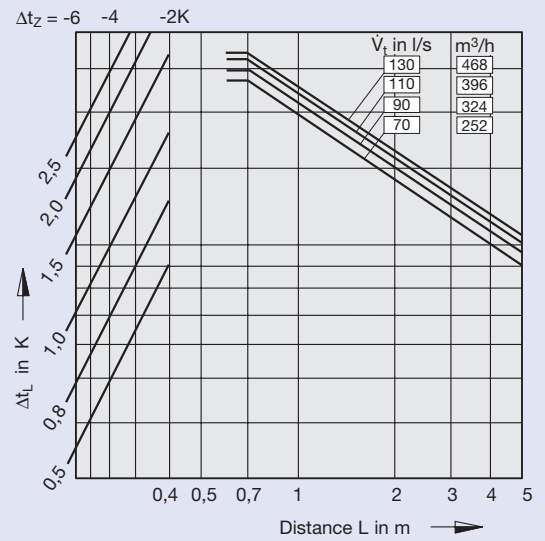
**41** Temperature difference size 1000 x 750



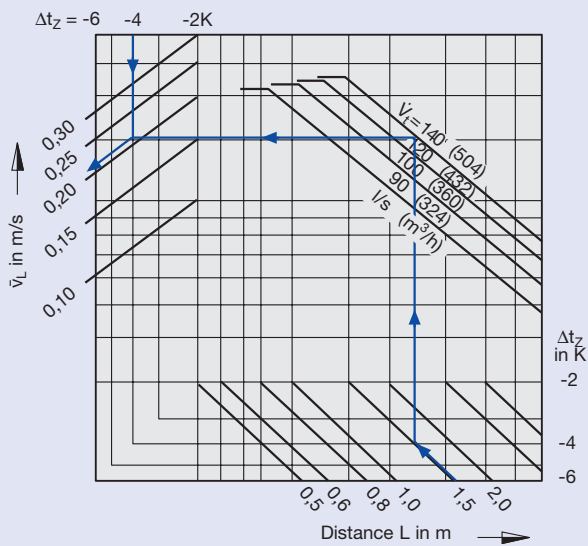
**42** Air flow velocities size 1250 x 600



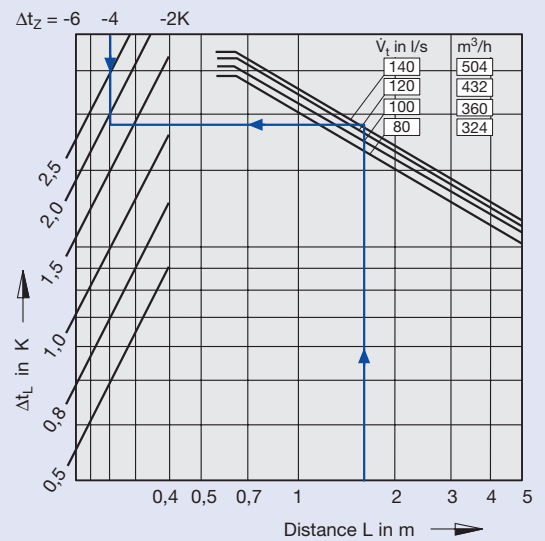
**43** Temperature difference size 1250 x 600



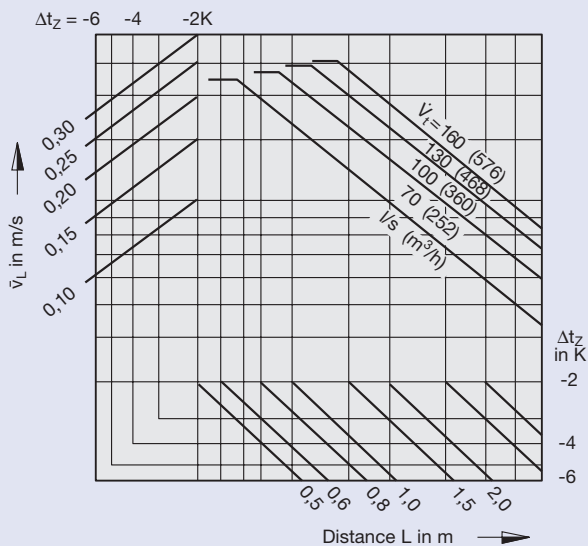
**44** Air flow velocities size 1250 x 750



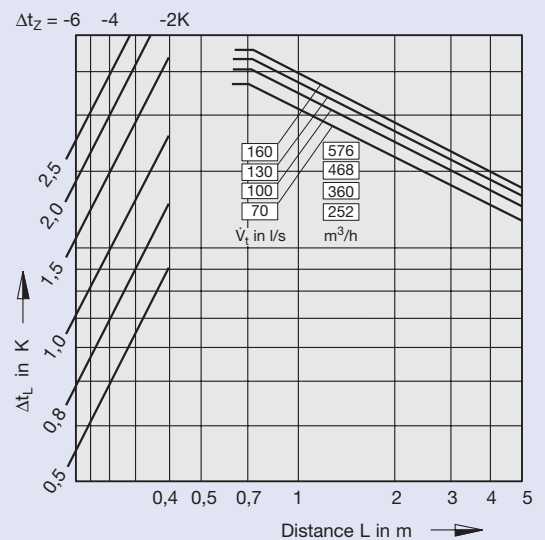
**45** Temperature difference size 1250 x 750



**46** Air flow velocities size 1500 x 750



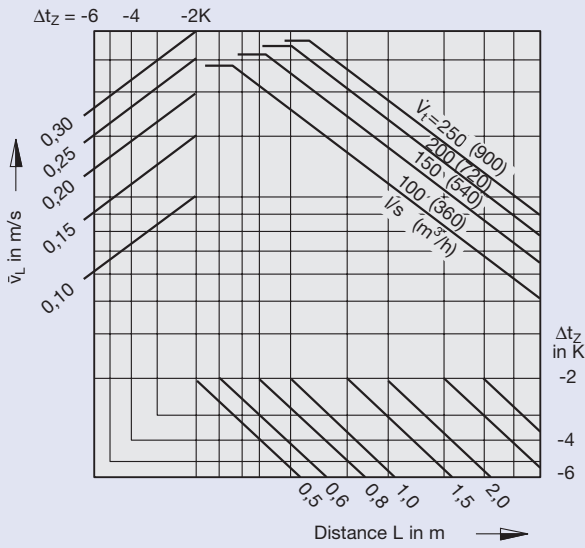
**47** Temperature difference size 1500 x 750



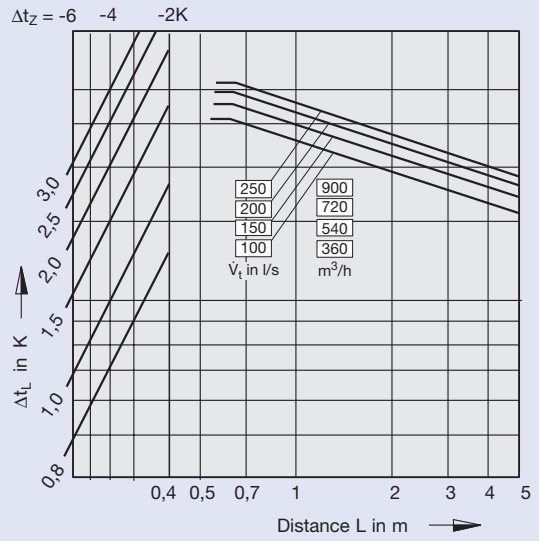


# Aerodynamic Data QLF

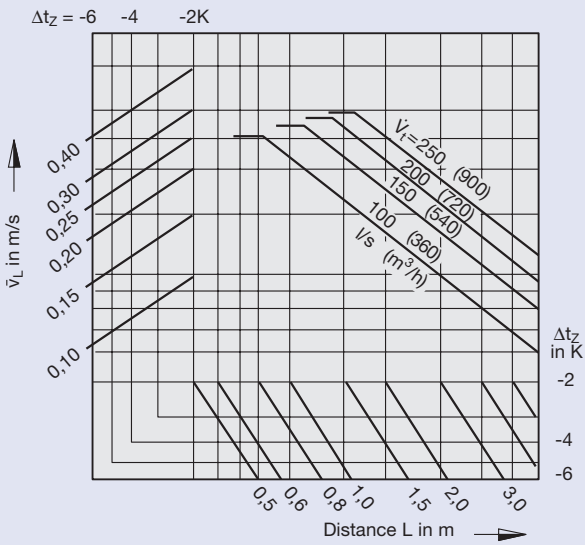
**48** Air flow velocities size 1500 x 1000



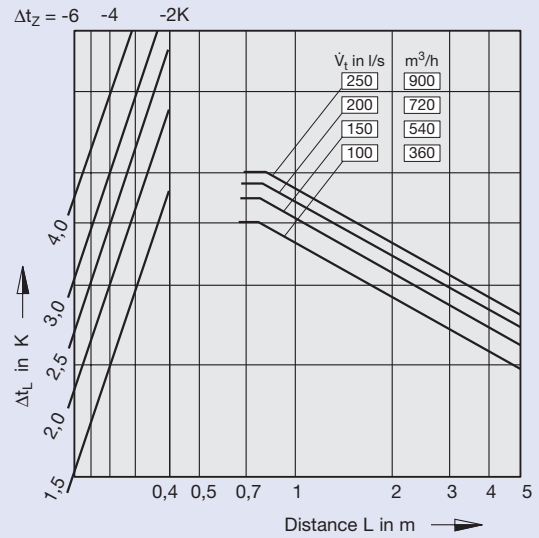
**49** Temperature difference size 1500 x 1000



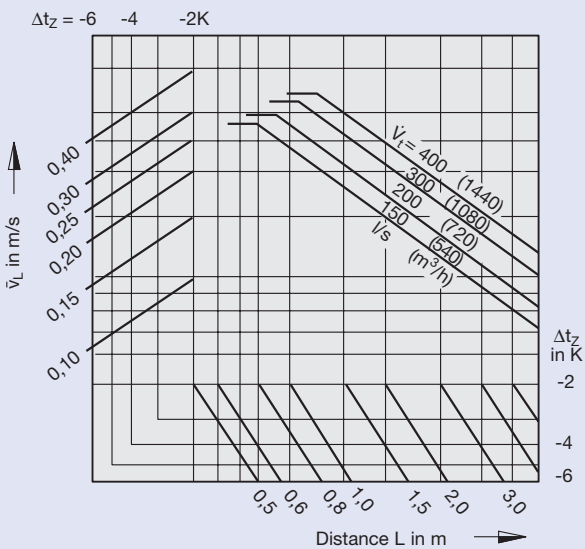
**50** Air flow velocities size 1750 x 750



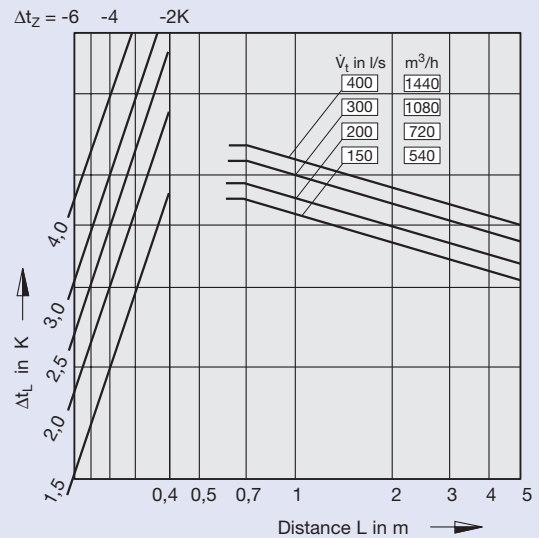
**51** Temperature difference size 1750 x 750



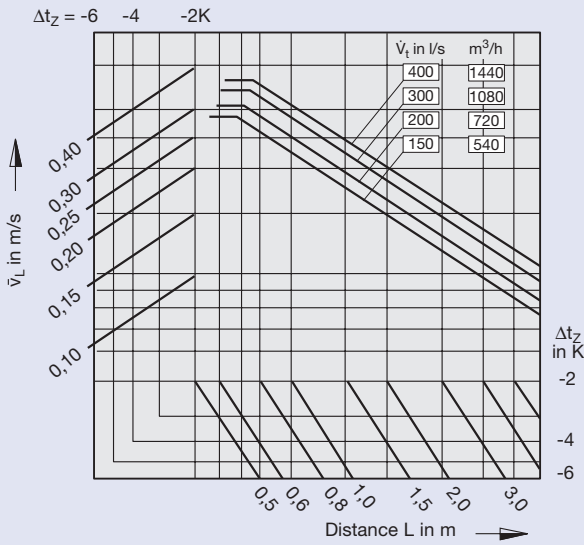
**52** Air flow velocities size 1750 x 1000



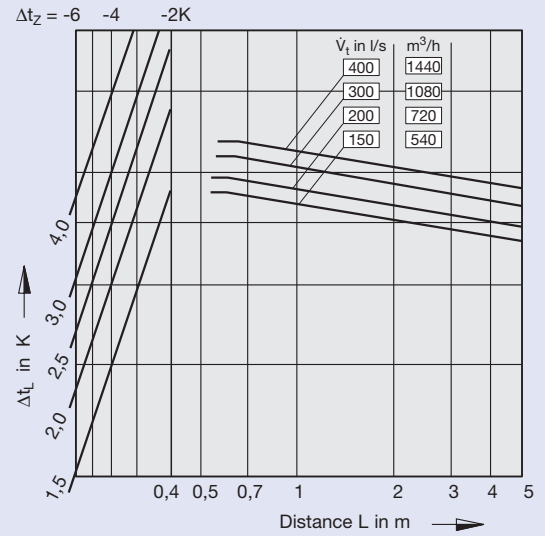
**53** Temperature difference size 1750 x 1000



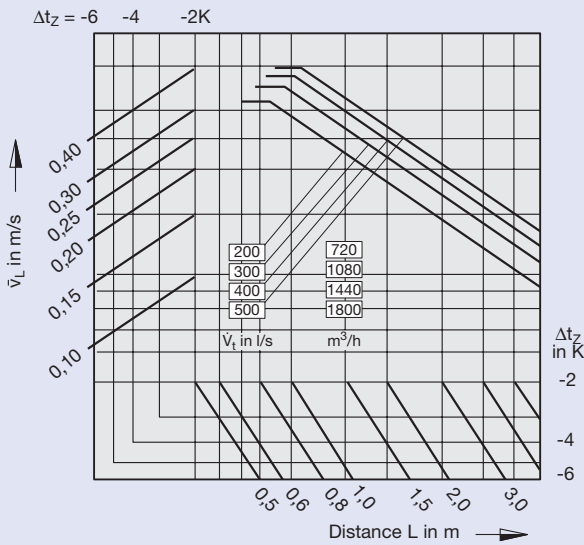
**54** Air flow velocities size 1750 x 1250



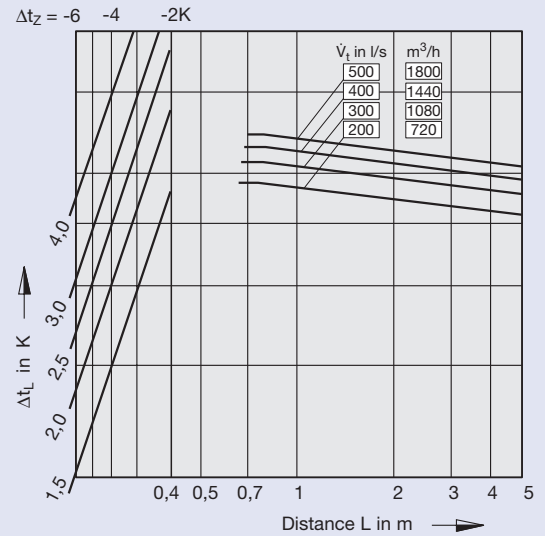
**55** Temperature difference size 1750 x 1250



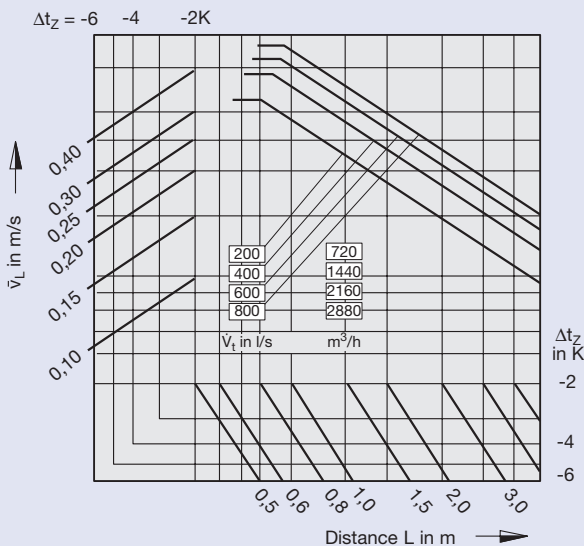
**56** Air flow velocities size 2000 x 1000



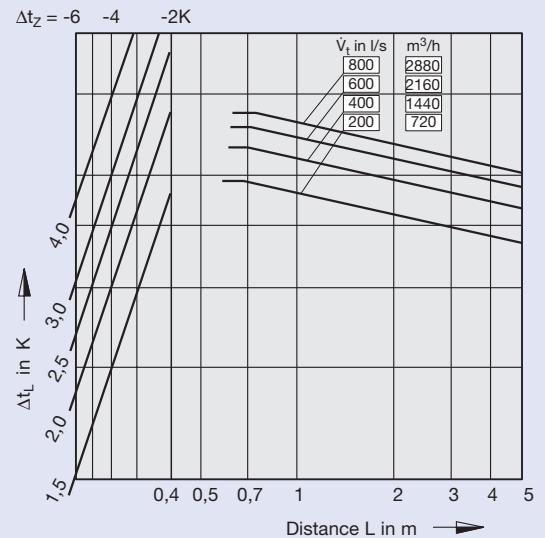
**57** Temperature difference size 2000 x 1000



**58** Air flow velocities size 2000 x 1250



**59** Temperature difference size 2000 x 1250



# Order Details

## Specification Text

The displacement flow units types QLE and QLF consist of a casing with a perforated metal face plate (for one-directional discharge) or additional perforated metal side plates (for three-directional discharge), a rectangular spigot located either on top or at the bottom of the unit as required, and an internal perforated plate basket for even air distribution.

## Materials

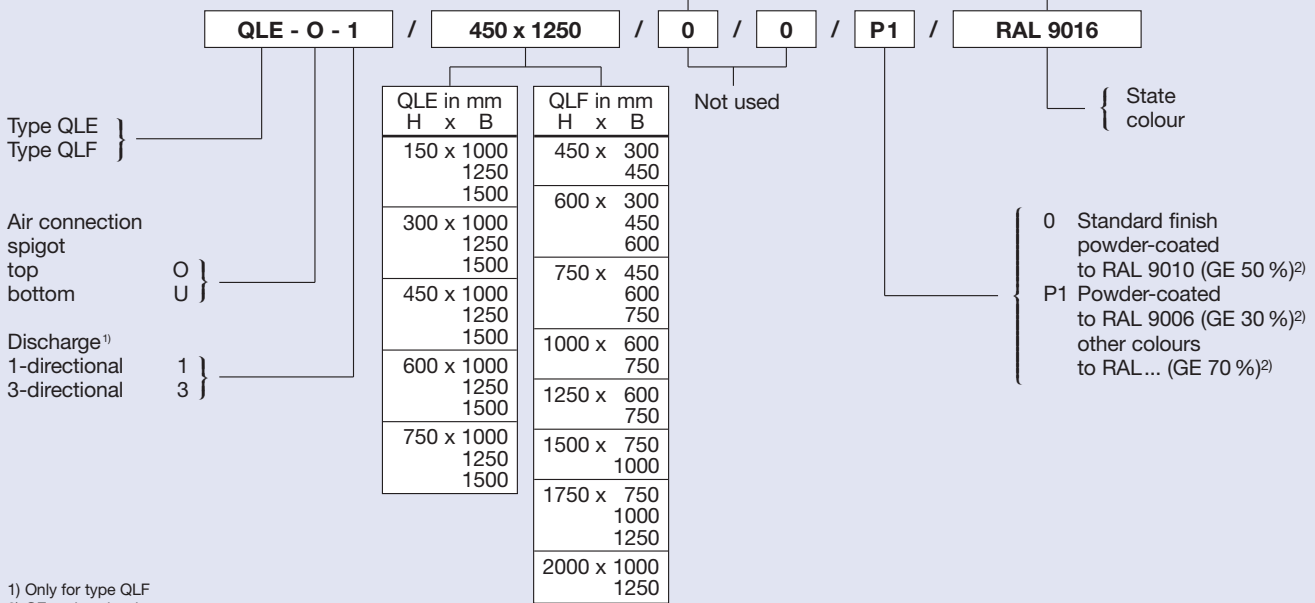
Casing, perforated face plate and perforated sheet steel basket are made of galvanised sheet steel.

Casing and perforated plates are pre-treated and powder-coated white RAL 9010, gloss level 50 %, any other RAL colour is optional.

The rear surface of the casing and the perforated sheet steel basket are coated black RAL 9005.

## Order code

These codes do not need to be completed for standard products



## Accessories

Fixing material  
 QLF-BM / P1 / RAL9016  
 (2 fixing angles, 4 self tapping screws)

## Order example

Make: TROX  
 Type: QLE - O / 450 x 1250

## Order example

Make: TROX  
 Type: QLF - O - 3 / 750 x 600 / P1 / RAL 9016