Grilles
Linear Grilles

TROX® TECHNIK

Contents · Description

Grilles and linear grilles are suitable for duct, wall and floor installation. They may be fitted straight into the duct section, or alternatively, an installation subframe may be used, e.g. for installation into builders work.

To optimise air distribution, it is possible to choose from different types of rear assemblies, see pages 14 and 15.

Construction

Type ASL

Supply or return air grille. The front border has a diffuser-type section, with individually adjustable horizontal front blades and a concealed fixing. Available on request with spring clip fixing.

Type AT

Supply or return air grille with individually adjustable horizontal aerofoil blades. Front border either 27 or 23 mm wide, concealed fixing. Available on request with spring clip fixing or visible screw fixing.

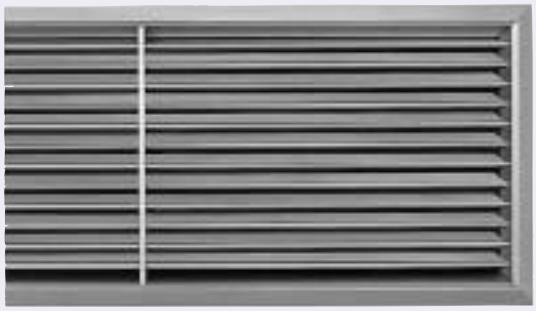
Type VAT

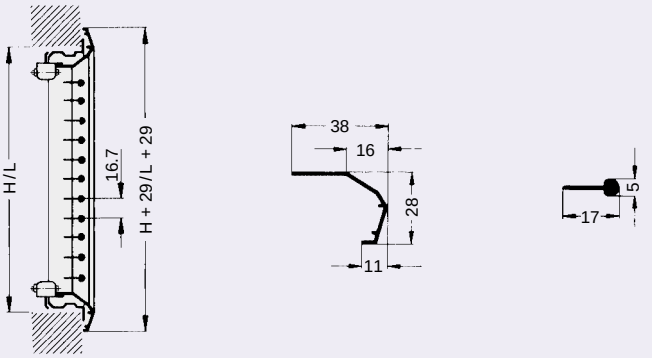
Supply or return air grille with individually adjustable vertical aerofoil blades. Front border either 27 or 23 mm wide concealed fixing. Available on request with spring clip fixing or – only for front border 27 mm – visible screw fixing (border counter punched).

Materials

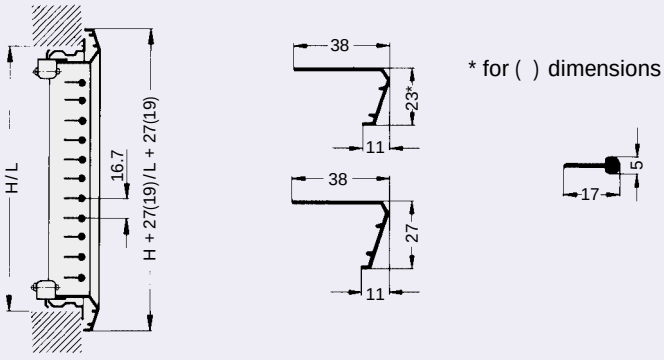
The grilles are made from extruded aluminium sections, with a natural anodised finish E6-C-0.

Type ASL

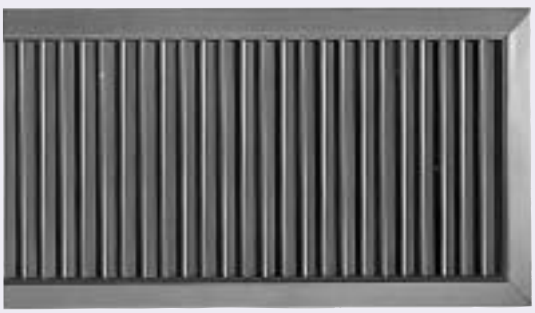


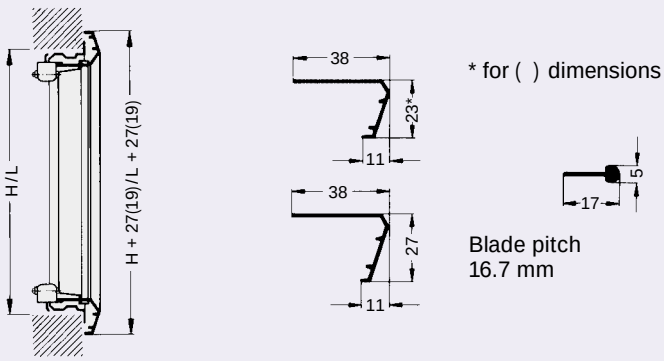


Type AT



Type VAT





Aluminium Grilles and Grille Cores

Construction · Dimensions

Type AH

Supply or return air grille with fixed horizontal profiled blades. Front border either 28 or 20 mm wide, concealed fixing, blades with either 0° or 15° deflection, types AH-0-… and AH-15-… respectively. Available on request with spring clip fixing or visible screw fixing (border counter punched).

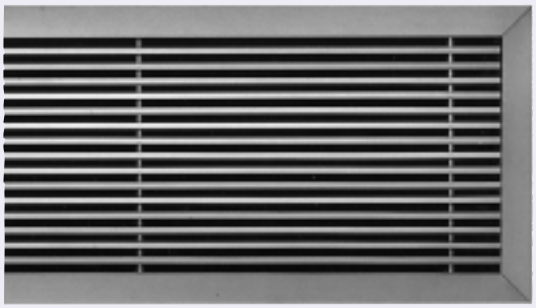
Type AF

Supply or return air grille for floor or wall mounting with fixed horizontal profiled blades, blades with either 0° or 15° deflection, types AF-0-… and AF-15-… respectively. The grille core can be removed by releasing the W clips. The grille can be fitted in masonry by means of builders work cleats.

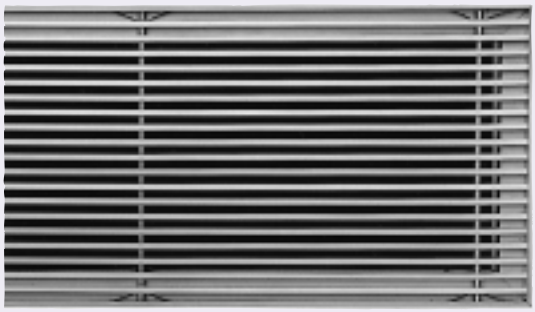
Types EH · EF · EHG · EFG

Grille cores for supply or return air for wall or cill mounting with fixed horizontal profiled blades, blade pitch either 12.5 mm – types EH-0, EH-15, EF-0, and EF-15, or 16.7 mm types EHG-0, EHG-15, EFG-0, and EFG-15. Blades with either 0° or 15° deflection, types …0 and …15. The construction and dimensions are the same as for the cores of types AH and AF.

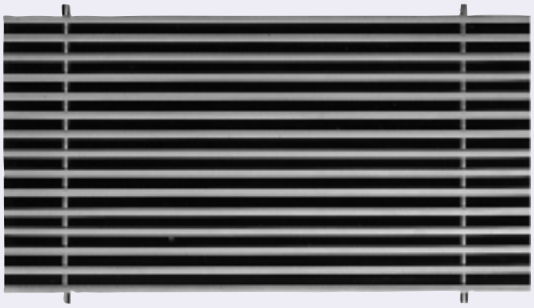
Type AH



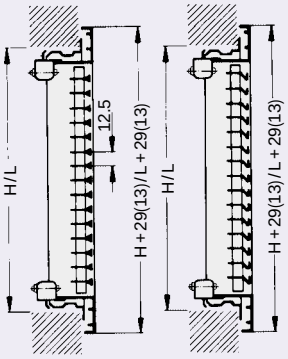
Type AF



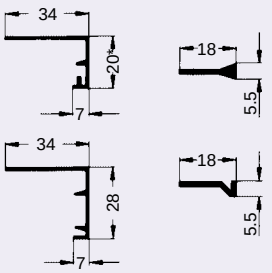
Types EH · EF · EHG · EFG

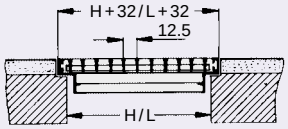


* for ( ) dimensions

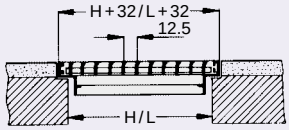


AH-0 AH-15

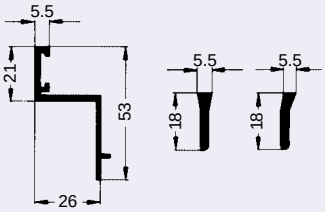


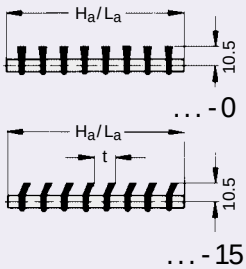


AF-0



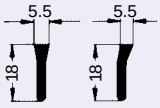
AF-15





…-0

…-15



Type AWT

Grille for installation in gymnasia and sports halls has a ball impact resistance according to DIN 18 032 Part 3.

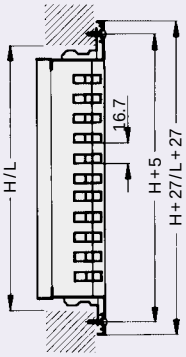
Robustly constructed supply or return air grille with fixed horizontal profiled blades with visible screw fixing (border counter punched).

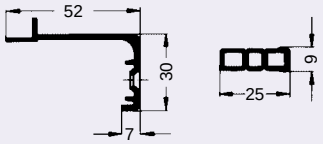
Type AGS

Non vision grille for supply or return air with fixed inverted vee blades with visible screw fixing (border counter punched). The non vision grille is also available with a light baffle plate – type AGS-L with a matching rear frame – type AGS-T or with both baffle and rear frame – type AGS-TL, see page 18.

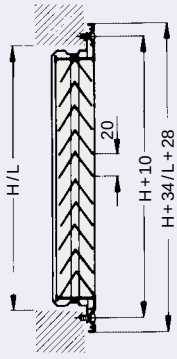
Types AGS-L and AGS-TL are completely painted black to prevent light reflection.

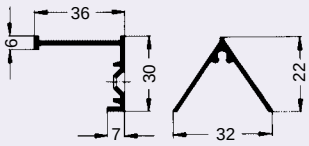
Type AWT





Type AGS





Steel Grilles

Construction · Dimensions · Materials

Construction

Type SL

Supply or return air grille. The front border has a diffuser-type section (L side 28 mm wide, H side 20 mm wide) with individually adjustable horizontal front blades and a concealed fixing.

Type TR

Supply or return air grille with individually adjustable horizontal front blades with visible screw fixing (border counter punched). Available on request with galvanised finish and concealed fixing.

Type TRS

Supply or return air grille with individually adjustable vertical front blades with visible screw fixing (border counter punched). Available on request with concealed fixing.

Materials

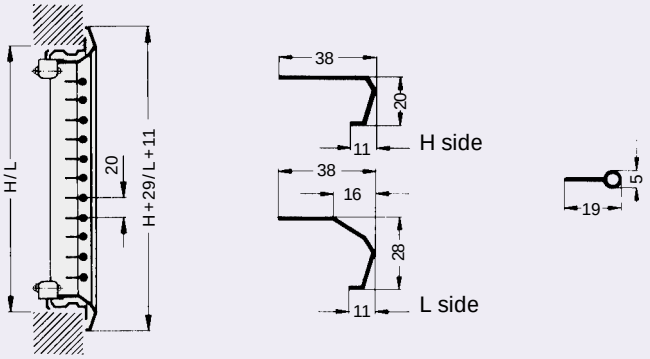
Type SL · TR · TRS

The grille face is made from formed sheet steel. The surfaces are pre-treated and powder coated white (RAL 9010).

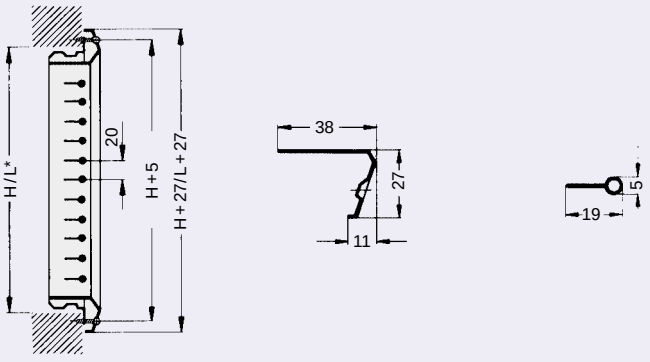
Type TR – galvanised

The grille face is made from formed, galvanised sheet steel.

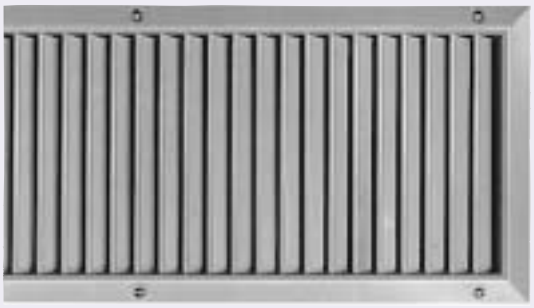
Type SL

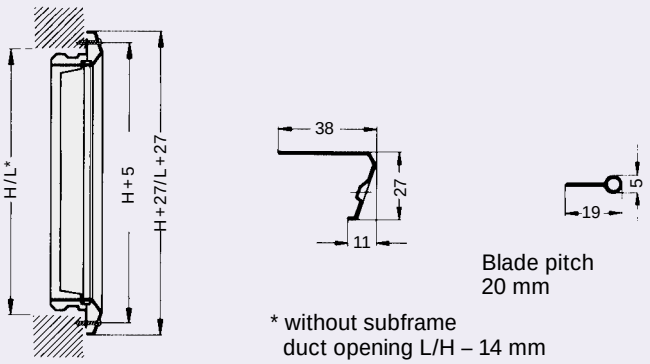


Type TR



Type TRS





Blade pitch
20 mm

* without subframe
duct opening L/H – 14 mm

Stainless Steel Grilles · Flow Rate Control Dampers

Construction · Dimensions · Materials

Construction

Type TRE

Supply or return air grilles with individually adjustable horizontal front blades with visible screw fixing (border counter punched).

Type AGW

Flow rate control damper for duct installation, opposed blade action adjustable from the face, angle border. Standard sizes as for type VAT (see page 10) L_{max} = 1225 mm.

Type DGW

Flow rate control damper for duct installation, opposed blade action adjustable from the face, plus a set of individually adjustable vertical air pattern control blades, angle border. Standard sizes as for type VAT (see page 10)
L_{max} = 1225 mm.

Materials

Type TRE

The grille face is made from formed, stainless sheet steel (DIN ref. 1.4301 or higher). The material has a dull, pickled surface.

A bright surface is available on request.

Type AGW · DGW

The damper is made from formed sheet steel. The surface is phosphate treated and stove enamelled black (RAL 9005) using electro-dipcoat process.

Type TRE

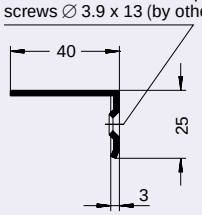
L in mm	F in mm
225	–
325	–
425	–
525	–
625	283.5
775*	358.5

* L = 775 Face blades sub-divided by separating bar!

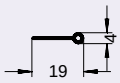
Type AGW · DGW

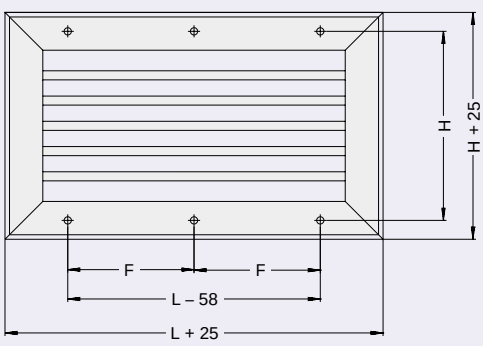
Border section

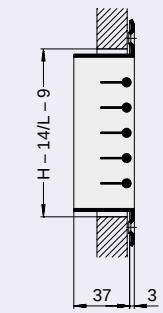
Counterpunched holes
∅ 4.8 x 90° raised countersunk head self-tapping screws ∅ 3.9 x 13 (by others)



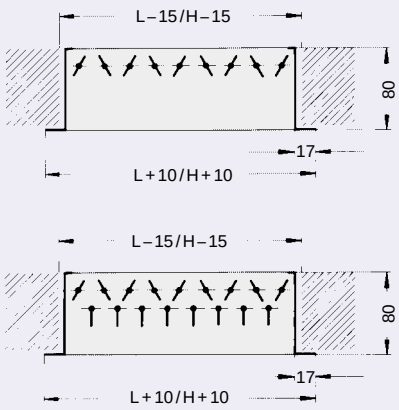
Horizontal front blade







Blade pitch 16.7 mm



Plastic Grilles

Construction · Dimensions · Materials

Construction

Type KS

Type KS grilles suitable for supply and extract use. The grille has an injection moulded border with holes (∅ 4.5 mm) for site fixing with suitable screws.

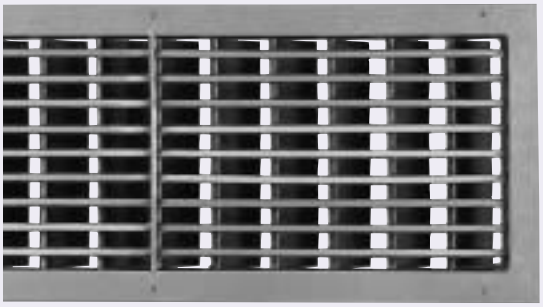
Type KS-A with horizontal face blades which are individually adjustable.

Type KS-C as Type KS-A but with additional individually adjustable vertical curved blades at rear for volume control.

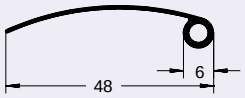
Materials

Grille face and rear assemblies made from plastic extrusions (hard PVC) with good anti-corrosive properties, temperature resistant up to 50 °C. Dark grey grille face (similar to RAL 7011) curved blades for volume control in black or dark grey.

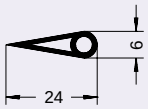
Type KS



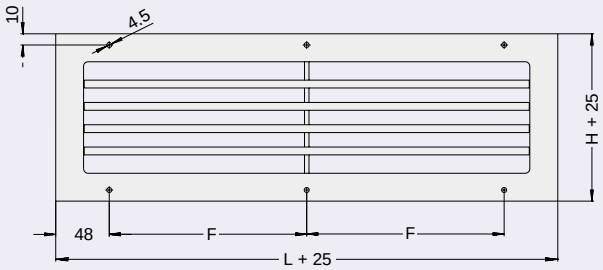
Vertical curved blade C

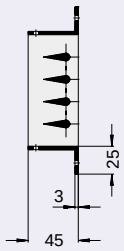


Horizontal face blade



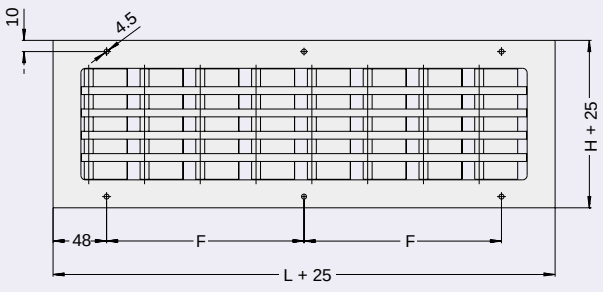
Type KS-A

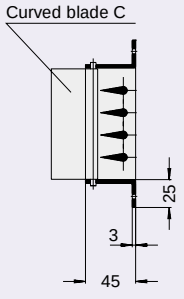




Blade pitch 20 mm

Type KS-C





Blade pitch 20 mm

L in mm	F in mm
325	–
425	–
625	277
825	377

L = 625 face blades subdivided by separating bar!
L = 825 face blades subdivided twice by separating bar!

Special Filter Frame

Construction · Dimensions · Materials

Construction

Type ...-EF

For wall installation, the standard ...-A construction in the types AT, VAT, AH, SL, TR and TRS grilles are available with the ...A-EF special frame with filter pad or, alternatively, with an additional special hit and miss damper, type ...-AS-EF (construction on page 15).

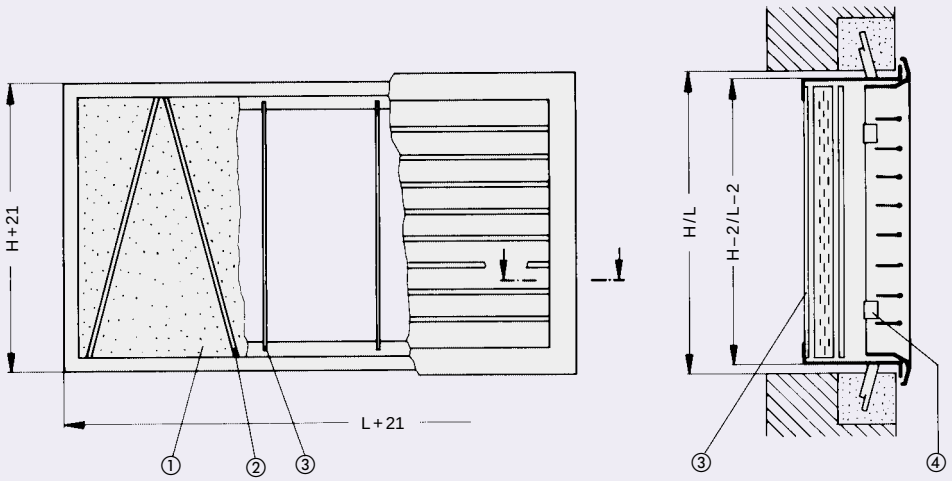
The grille and special frame with filter pad are connected by spring clip fastening. The special frame with filter pad is available with H = 125 mm to H = 525 mm.

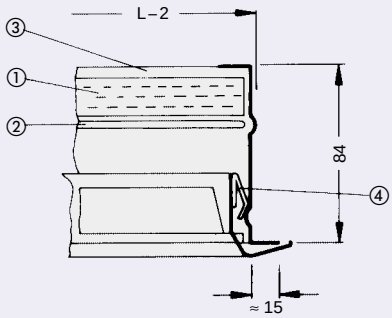
Spare E-EF filter media is available on request.

Materials

The special filter frame is made from formed sheet steel. The surface is phosphate treated and stove enamelled black (RAL 9005) using electro-dipcoat process. The filter pad consists of synthetic chemical fibres, quality grade EU 4.

Type ...-EF





① Filter pad
② Support wire,
removable for filter pad change, support wire only required on ...-A-EF... grilles
③ "Rear" support wire not removable
④ Spring clip fastening

(The filter pad can only be changed after the grille has been removed)

Grilles and Linear Grille Cores

Dimensions

Standard sizes

L x H in mm	Aluminium					Steel			Stainless steel	Plastic
	ASL AT	VAT	AH AF	AWT	AGS	SL	TR	TRS	TRE	KS
225 x 75										
325										
425										
525										
625										
825										
1025										
1225										
1425										
1625										
1825										
2025										
225 x 125										
325										
425										
525										
625										
775										
825										
1025										
1225										
1425										
1625										
1825										
2025										
225 x 225										
325										
425										
525										
625										
775										
825										
1025										
1225										
1425										
1625										
1825										
2025										
325 x 325										
425										
525										
625										
775										
825										
1025										
1225										
1425										
1625										
1825										
2025										
625 x 425										
825										
1025										
1225										
1025 x 525										
1225										

Aluminium Grille Cores

L_a x H_a in mm	
EH · EHG	EF · EFG
196 x 46	245 x 95
296	345
396	445
496	545
596	645
796	845
996	1045
1196	1245
196 x 96	245 x 145
296	345
396	445
496	545
596	645
796	845
996	1045
1196	1245
296 x 196	345 x 245
396	445
496	545
596	645
796	845
996	1045
1196	1245
396 x 296	445 x 345
496	545
596	645
796	845
996	1045
1196	1245
596 x 396	645 x 445
796	845
996	1045
1196	1245

Aluminium and Steel Linear Grilles

Construction · Dimensions · Materials

Construction

Type AH *
Supply or return air linear grille with fixed horizontal profiled blades. Front border either 28 or 20 mm wide, concealed fixing, blades with either 0° or 15° deflection, types AH-0-… and AH-15-… respectively. Available on request with visible screw fixing (border counter punched).

Type AF *
Supply or return air linear grille for floor or wall mounting with fixed horizontal profiled blades, blades either 0° or 15° deflection, types AF-0-… and AF-15-… respectively. The grille core can be removed by releasing the W clips. The grille can be fitted in masonry by means of builders work cleats. Additionally, 90° mitre also available.

Type SL
Supply or return air linear grille. The front border has a diffuser-type section (L side 28 mm wide, H side 20 mm wide) with individually adjustable horizontal front blades and a concealed fixing.

* For type AH for example.
The AF air exit can be 0° vertical to the grille and also 15° below if deflection occurs.

Standard Heights

Type \ H	75	125	225	325
AH	●	●	●	●
AF	●	●	●	●
SL		●	●	●

Standard Intermediate Sections

Intermediate Section M in mm
2000

Standard End Sections

End Section E in mm					
950	1130	1310	1490	1670	1850
1010	1190	1370	1550	1730	1910
1070	1250	1430	1610	1790	1970

Number of end and intermediate sections based on the opening size “L”

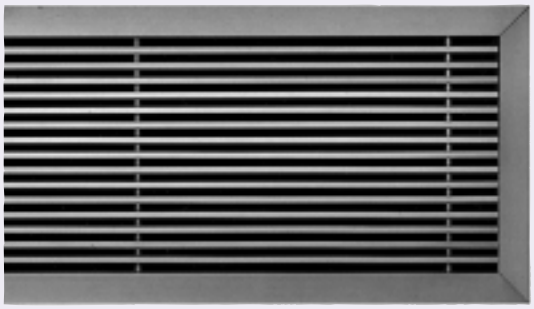
Material Type AH · AF

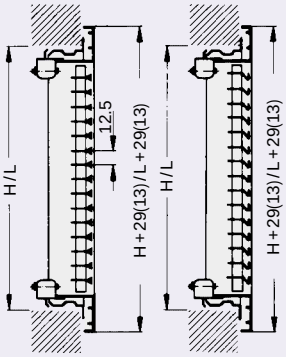
Linear grilles are made from extruded aluminium sections, with a natural anodised finish E6-C-0.

Material Type SL

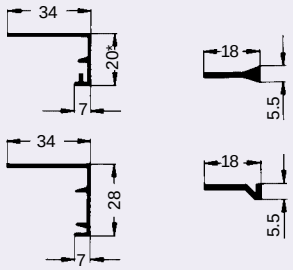
The grille face is made from formed sheet steel. The surfaces are pre-treated and powder coated white (RAL 9010).

Type AH

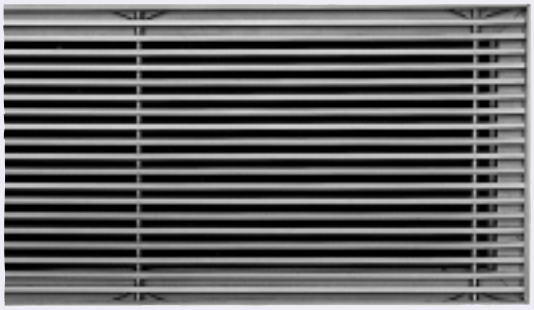


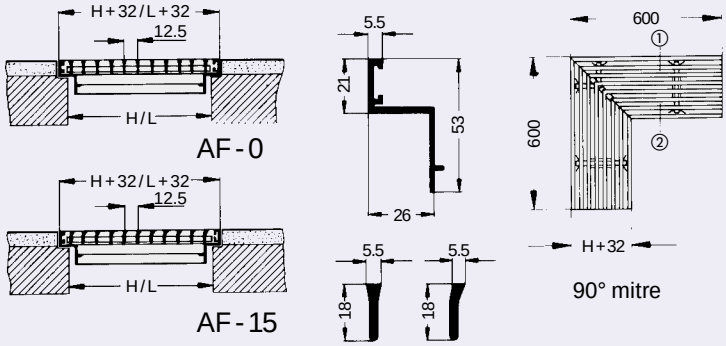


* for ( ) dimensions

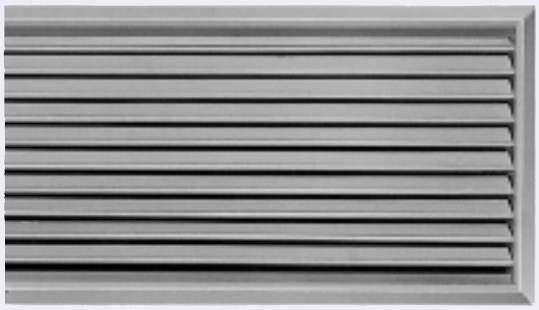


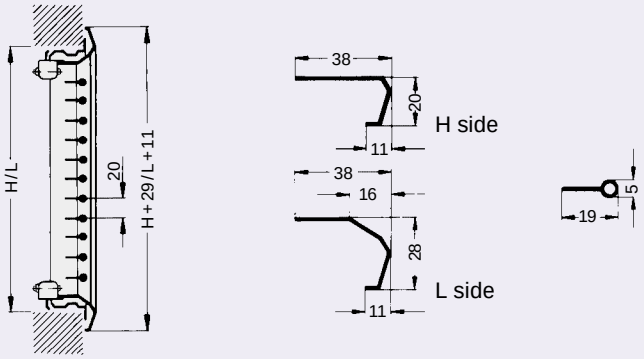
Type AF





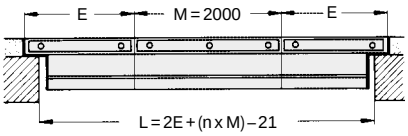
Type SL





Selection Tables for Linear Grille Lengths

Type AF



L = inside dimension of opening
n = number of M sections

Example

Data given:
Type AF
L = 18910 mm

From the table:
Select next size down
L = 18899 mm (opening size plastered surface)

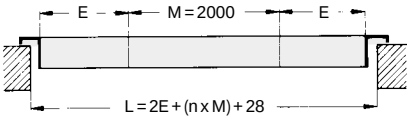
Number of intermediate and end sections:
8 intermediate sections M = 2000 mm
1 end section E = 1430 mm
1 end section E = 1490 mm

The opening size “L” and associated number of end sections “E” and intermediate sections “M” can be directly determined from the section table below.

E	E	L = 2E – 21	L = 2E + (n x M) – 21									
			1 x M	2 x M	3 x M	4 x M	5 x M	6 x M	7 x M	8 x M	9 x M	10 x M
			2000	4000	6000	8000	10000	12000	14000	16000	18000	20000
950	950	1879	3879	5879	7879	9879	11879	13879	15879	17879	19879	21879
950	1010	1939	3939	5939	7939	9939	11939	13939	15939	17939	19939	21939
1010	1010	1999	3999	5999	7999	9999	11999	13999	15999	17999	19999	21999
1010	1070	2059	4059	6059	8059	10059	12059	14059	16059	18059	20059	22059
1070	1070	2119	4119	6119	8119	10119	12119	14119	16119	18119	20119	22119
1070	1130	2179	4179	6179	8179	10179	12179	14179	16179	18179	20179	22179
1130	1130	2239	4239	6239	8239	10239	12239	14239	16239	18239	20239	22239
1130	1190	2299	4299	6299	8299	10299	12299	14299	16299	18299	20299	22299
1190	1190	2359	4359	6359	8359	10359	12359	14359	16359	18359	20359	22359
1190	1250	2419	4419	6419	8419	10419	12419	14419	16419	18419	20419	22419
1250	1250	2479	4479	6479	8479	10479	12479	14479	16479	18479	20479	22479
1250	1310	2539	4539	6539	8539	10539	12539	14539	16539	18539	20539	22539
1310	1310	2599	4599	6599	8599	10599	12599	14599	16599	18599	20599	22599
1310	1370	2659	4659	6659	8659	10659	12659	14659	16659	18659	20659	22659
1370	1370	2719	4719	6719	8719	10719	12719	14719	16719	18719	20719	22719
1370	1430	2779	4779	6779	8779	10779	12779	14779	16779	18779	20779	22779
1430	1430	2839	4839	6839	8839	10839	12839	14839	16839	18839	20839	22839
1430	1490	2899	4899	6899	8899	10899	12899	14899	16899	18899	20899	22899
1490	1490	2959	4959	6959	8959	10959	12959	14959	16959	18959	20959	22959
1490	1550	3019	5019	7019	9019	11019	13019	15019	17019	19019	21019	23019
1550	1550	3079	5079	7079	9079	11079	13079	15079	17079	19079	21079	23079
1550	1610	3139	5139	7139	9139	11139	13139	15139	17139	19139	21139	23139
1610	1610	3199	5199	7199	9199	11199	13199	15199	17199	19199	21199	23199
1610	1670	3259	5259	7259	9259	11259	13259	15259	17259	19259	21259	23259
1670	1670	3319	5319	7319	9319	11319	13319	15319	17319	19319	21319	23319
1670	1730	3379	5379	7379	9379	11379	13379	15379	17379	19379	21379	23379
1730	1730	3439	5439	7439	9439	11439	13439	15439	17439	19439	21439	23439
1730	1790	3499	5499	7499	9499	11499	13499	15499	17499	19499	21499	23499
1790	1790	3559	5559	7559	9559	11559	13559	15559	17559	19559	21559	23559
1790	1850	3619	5619	7619	9619	11619	13619	15619	17619	19619	21619	23619
1850	1850	3679	5679	7679	9679	11679	13679	15679	17679	19679	21679	23679
1850	1910	3739	5739	7739	9739	11739	13739	15739	17739	19739	21739	23739
1910	1910	3799	5799	7799	9799	11799	13799	15799	17799	19799	21799	23799
1910	1970	3859	5859	7859	9859	11859	13859	15859	17859	19859	21859	23859
1970	1970	3919	5919	7919	9919	11919	13919	15919	17919	19919	21919	23919

Selection Tables for Linear Grille Lengths

Types AH · SL



L = inside dimension of opening
n = number of M sections

Installation without installation subframe
L = 2E + (n x M) + 14

Example

Data given:
Type SL
L = 18910 mm

From the table:
Select next size down
L = 18888 mm (opening size plastered surface)

Number of intermediate and end sections:
8 intermediate sections M = 2000 mm
2 end sections E = 1430 mm

The opening size “L” and associated number of end sections “E” and intermediate sections “M” can be directly determined from the selection table below.

E	E	L = 2E +28	L = 2E + (n x M) +28									
			1 x M	2 x M	3 x M	4 x M	5 x M	6 x M	7 x M	8 x M	9 x M	10 x M
			2000	4000	6000	8000	10000	12000	14000	16000	18000	20000
950	950	1928	3928	5928	7928	9928	11928	13928	15928	17928	19928	21928
950	1010	1988	3988	5988	7988	9988	11988	13988	15988	17988	19988	21988
1010	1010	2048	4048	6048	8048	10048	12048	14048	16048	18048	20048	22048
1010	1070	2108	4108	6108	8108	10108	12108	14108	16108	18108	20108	22108
1070	1070	2168	4168	6168	8168	10168	12168	14168	16168	18168	20168	22168
1070	1130	2228	4228	6228	8228	10228	12228	14228	16228	18228	20228	22228
1130	1130	2288	4288	6288	8288	10288	12288	14288	16288	18288	20288	22288
1130	1190	2348	4348	6348	8348	10348	12348	14348	16348	18348	20348	22348
1190	1190	2408	4408	6408	8408	10408	12408	14408	16408	18408	20408	22408
1190	1250	2468	4468	6468	8468	10468	12468	14468	16468	18468	20468	22468
1250	1250	2528	4528	6528	8528	10528	12528	14528	16528	18528	20528	22528
1250	1310	2588	4588	6588	8588	10588	12588	14588	16588	18588	20588	22588
1310	1310	2648	4648	6648	8648	10648	12648	14648	16648	18648	20648	22648
1310	1370	2708	4708	6708	8708	10708	12708	14708	16708	18708	20708	22708
1370	1370	2768	4768	6768	8768	10768	12768	14768	16768	18768	20768	22768
1370	1430	2828	4828	6828	8828	10828	12828	14828	16828	18828	20828	22828
1430	1430	2888	4888	6888	8888	10888	12888	14888	16888	18888	20888	22888
1430	1490	2948	4948	6948	8948	10948	12948	14948	16948	18948	20948	22948
1490	1490	3008	5008	7008	9008	11008	13008	15008	17008	19008	21008	23008
1490	1550	3068	5068	7068	9068	11068	13068	15068	17068	19068	21068	23068
1550	1550	3128	5128	7128	9128	11128	13128	15128	17128	19128	21128	23128
1550	1610	3188	5188	7188	9188	11188	13188	15188	17188	19188	21188	23188
1610	1610	3248	5248	7248	9248	11248	13248	15248	17248	19248	21248	23248
1610	1670	3308	5308	7308	9308	11308	13308	15308	17308	19308	21308	23308
1670	1670	3368	5368	7368	9368	11368	13368	15368	17368	19368	21368	23368
1670	1730	3428	5428	7428	9428	11428	13428	15428	17428	19428	21428	23428
1730	1730	3488	5488	7488	9488	11488	13488	15488	17488	19488	21488	23488
1730	1790	3548	5548	7548	9548	11548	13548	15548	17548	19548	21548	23548
1790	1790	3608	5608	7608	9608	11608	13608	15608	17608	19608	21608	23608
1790	1850	3668	5668	7668	9668	11668	13668	15668	17668	19668	21668	23668
1850	1850	3728	5728	7728	9728	11728	13728	15728	17728	19728	21728	23728
1850	1910	3788	5788	7788	9788	11788	13788	15788	17788	19788	21788	23788
1910	1910	3848	5848	7848	9848	11848	13848	15848	17848	19848	21848	23848
1910	1970	3908	5908	7908	9908	11908	13908	15908	17908	19908	21908	23908
1970	1970	3968	5968	7968	9968	11968	13968	15968	17968	19968	21968	23968

Rear Assemblies

The rear assemblies are permanently fitted at the factory to the various types of grille face. The possible combinations – grille plus rear assemblies – are shown in the table on page 15.

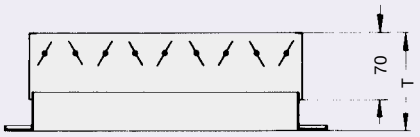
Materials

The rear assemblies are made from formed sheet steel. The surface is phosphate treated and stove enamelled black (RAL 9005) using electro-dipcoat process.

Type TRE

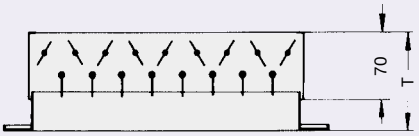
The rear assemblies are made from formed stainless steel (material ref. 1.4301 or higher). The material has a dull, pickled surface.

Rear assemblies	Installation depth dimension T			
	ASL · AT · VAT SL · TR · TRS	AH TRE	AWT	AF
…-AG	108	105	123	123
…-D	70	67	85	85
…-AS	80	77	–	–
…-Z	70…238	65…235	80…250	80…250
…-DG	108	105	123	123
…-DL	72	–	–	–
…-AL	40	–	–	–
…-C	70…238	65…235	–	–



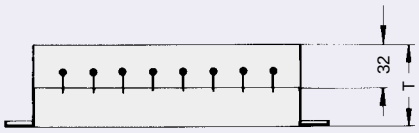
…-AG

Opposed blade action volume control damper, adjustable from the front face.



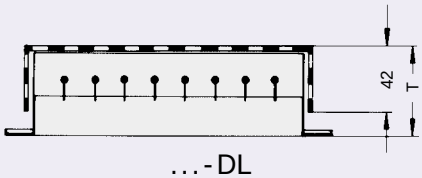
…-DG

Volume control damper as …-AG plus a set of individually adjustable vertical air pattern control blades. For types VAT and TRS these blades are horizontal (Type TR with stamped pattern blades).



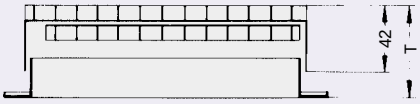
…-D

A set of individually adjustable vertical air pattern control blades.
For types VAT and TRS, these blades are horizontal (Type TR with stamped pattern blades).



…-DL

Rear deflection blades, as …-D, also with perforated plate baffle, as …-AL.

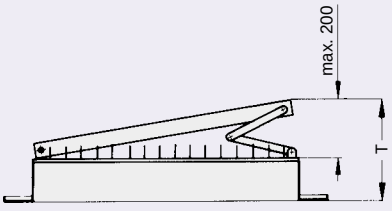


…-AS

Volume control of hit and miss construction with stamped vertical blades, adjustable from the front face (H_{max} = 325 mm).

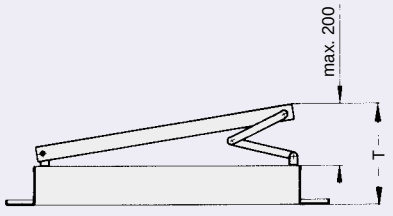
…-AL

Perforated plate baffle with 35 % free cross-section.



…-Z

Flap type volume control with stamped pattern air straightening blades, adjustable from front face.



…-C

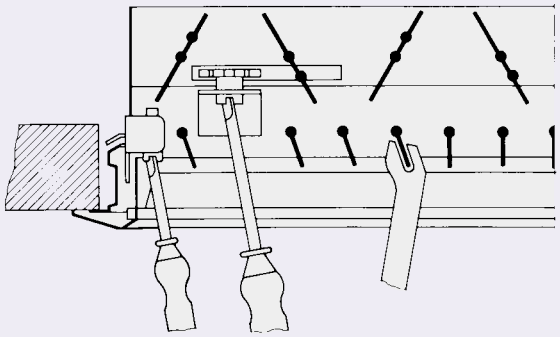
Volume controller of flap construction which can be adjusted from the front face.

Rear Assemblies

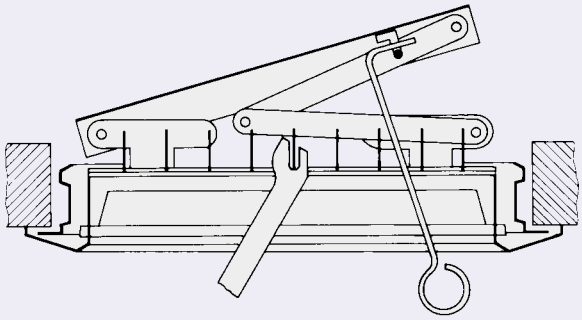
Type			Grilles														Linear Grilles		
			ASL	AT	VAT	AH-0 / AH-15	AF-0 / AF-15	EH-0, EF-0, EHG-0, EFG-0 / EH-15, EF-15, EHG-15, EFG-15	AWT	AGS	SL	TR	TRS	TRE	KS	AH-0 / AH-15	AF-0 / AF-15	SL
Standard Construction		– A	●	●	●	●	●		●	See page 18 for construction	●	●	●	●	●	●	●	●
Rear Assemblies		– AG[1]	●	●	●	●	●		●		●	●	●	●		●	●	●
		– D	●	●	●	●	●		●		●	●	●	●[4]		●	●	●
		– DG[1]	●	●	●	●	●		●		●	●	●			●	●	●
		– Z[2]	●	●		●	●		●		●	●		●[5]		●	●	●
		– AL										●	●					
		– DL										●	●					
		– AS[3]										●	●					
		– C			●							●	●	●[5]	●[4]			
With filter pad	Standard Construction	– A-EF		●	●	●					●	●	●					
	Rear Assemblies	– AS-EF		●	●	●					●	●	●					

1) For duct installation with angle frame (type AGW · DGW) supplied loose (see page 7)!
2) For duct installation (L_{max} = 1225) supplied loose!
3) Not available with concealed fixing!
4) Rear assemblies integral with the grille face section!
5) Not available in sizes 625 x 325 and 775 x 325!

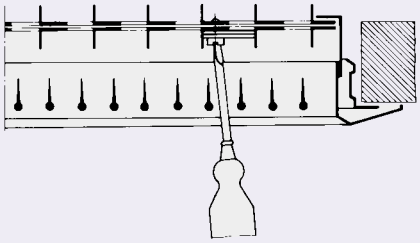
Component Adjustment



Rear assemblies …-D, …-AG, …-DG
concealed fixing



Rear assemblies …-Z, …-D, …-DG, …-C



Rear assemblies …-AS

Installation Subframes

The installation subframes are supplied as individual components, tied together with different coloured banding

Brown banding – Types AT, VAT
with 23 mm wide front border
Red banding – Type SL
White banding – All other types

and must be assembled into a complete subframe on site by others, using the tongue and spigot connections.

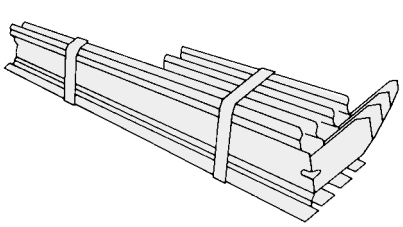
If necessary, the preformed builders work cleats can be bent, e. g. for wall installation.

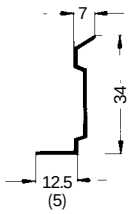
For grilles or linear grilles with concealed fixing, an installation subframe is essential.

Materials

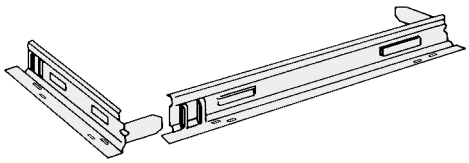
The installation subframes are made from formed, galvanised sheet steel.

Installation Subframe for Grilles



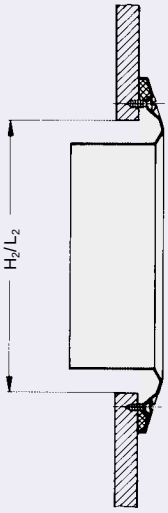


( ) Dimension for types AT, VAT, AH, front border 23 mm or 20 mm wide and SL/H side



Tongue and spigot connection

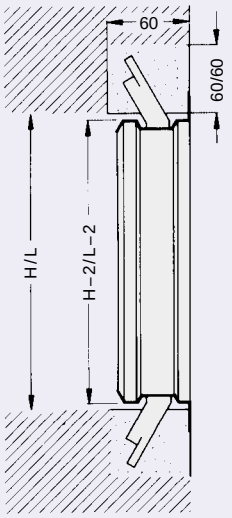
Opening Size without Installation Subframe



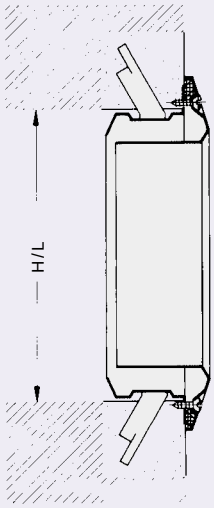
Inside dimension of opening
$L_2 = L - 14$
$H_2 = H - 14$

Counterpunched holes

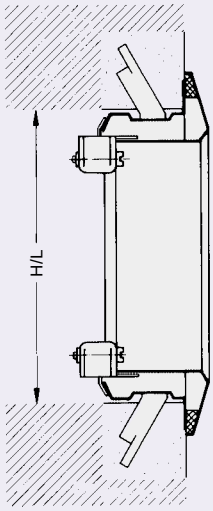
Wall Installation with Builders Work Cleats



for counter holes and concealed fixing

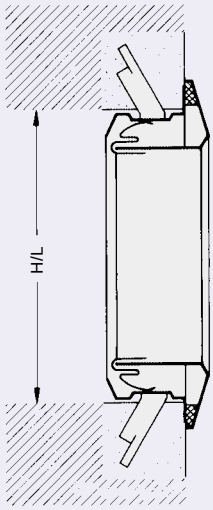


with counterpunched holes (for sheet metal raised countersunk head screws 4.2 x 16/DIN 7973)



with concealed fixing

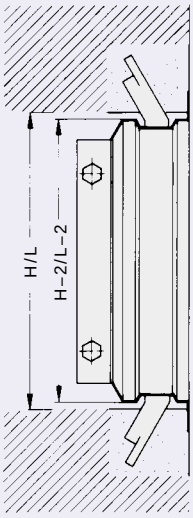
$L_{max} = 1225$
Mounting in a ceiling is not possible

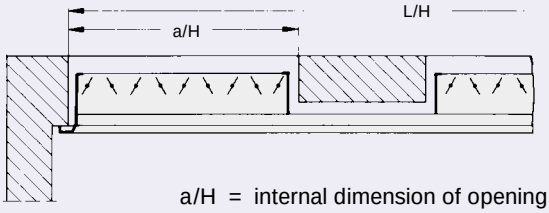


with spring clip fixing

Installation Subframes for Linear Grilles

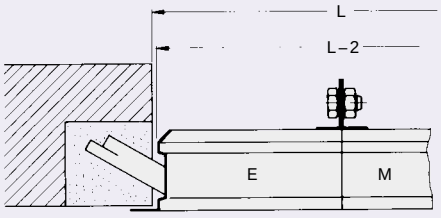
(for frame section see page 16)



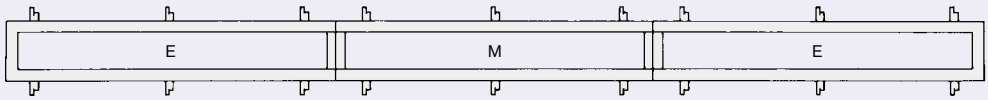


a/H = internal dimension of opening

When a linear grille is required with non-active sections, the rear sections are supplied loose for site assembly to meet the local requirements.

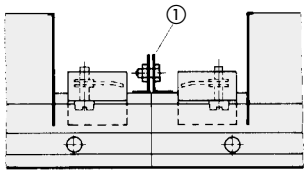


When fitting the subframes, great care should be taken in order to avoid distortion.

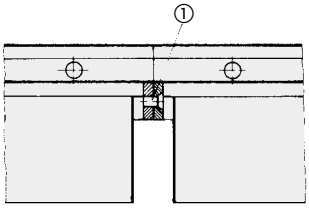


“E” and “M” sections corresponding to the face grille lengths.

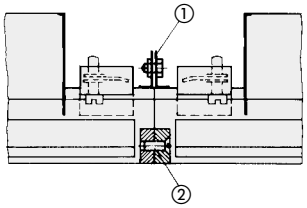
Jointing Details



Type AH
1 Bolt connection
of installation subframes

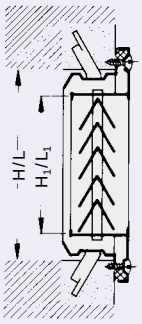


Type AF
1 Screw connection for the
grille face sections

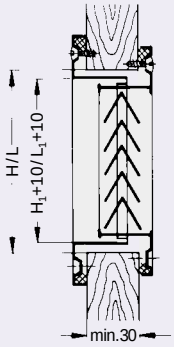


Type SL
1 Bolt connection
of installation subframes
2 Screw connections for the
grille face sections

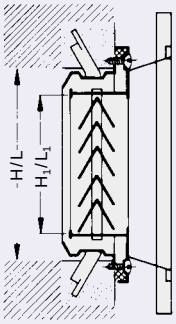
Type AGS



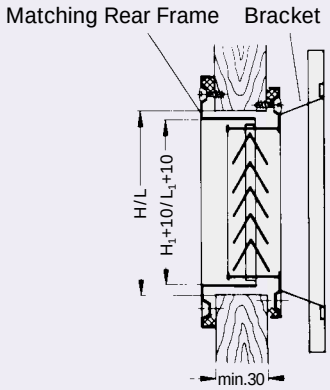
AGS



AGS-T



AGS-L

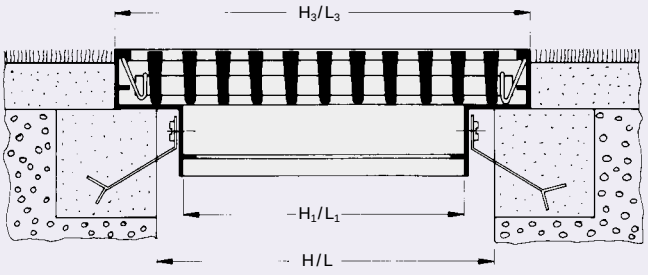


AGS-TL

For all constructions: $H_1 = H - 23$
$L_1 = L - 28$

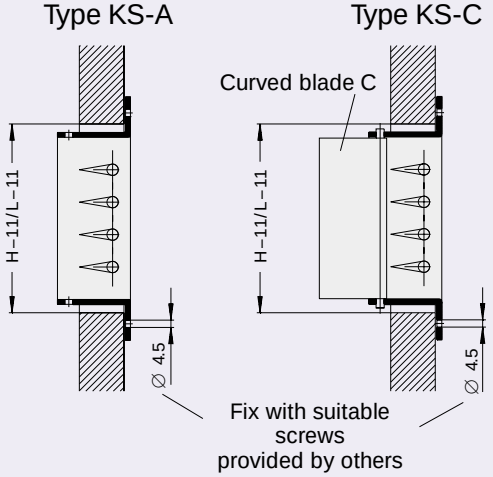
The light baffle plate and bracket for types AGS-L and AGS-TL are supplied loose and must be fitted on site by others.

Type AF



$H_1 = H - 20$ $\quad$ $H_3 = H + 32$
$L_1 = L - 20$ $\quad$ $L_3 = L + 32$

Type KS



Nomenclature · Acoustic Data

Nomenclature

$\dot{V}$ in l/s · m: Volume flow per metre
$\dot{V}$ in m³/h · m: Volume flow per metre

$\dot{V}_t$ in l/s: Total volume flow
$\dot{V}_t$ in m³/h: Total volume flow

L in m: Distance from the grille or linear grille (throw)

B in m: Spacing between two grilles

v_{geo} in m/s: Air velocity related to the geometric free area

v_k in m/s: Air velocity in the duct

$\bar{v}_L$ in m/s: Time average air velocity at distance L

$b_{0.2}$ in m: Distance from the centre of the airstream at which the velocity is a maximum of 0.2 m/s

y in m: Airstream drop or rise

i : Induction ratio = $\frac{\text{Total airstream volume flow}}{\text{Volume flow at grille discharge}}$

v_{eff} in m/s: Effective jet velocity

A_{eff} in m²: Effective outlet area

A_{geo} in m²: Geometric outlet area

h_{eff} in m: Effective outlet height ($A_{eff} = h_{eff} \times L_1/1000$)

α in °: Airstream discharge angle

β in °: Blade angle in the case of divergent setting

Δt_Z in K: Temperature difference between supply and room air

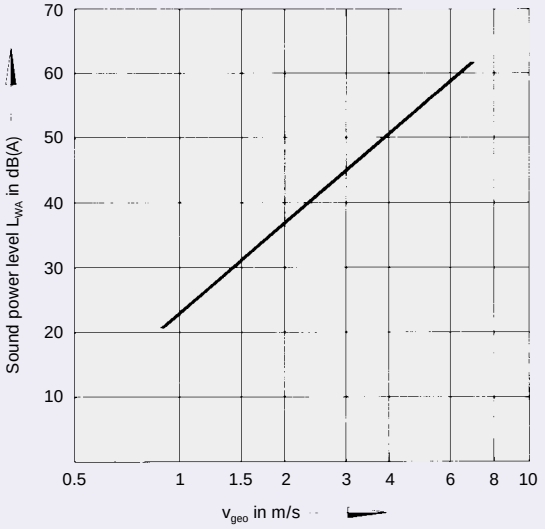
Δt_L in K: Difference between core and room temperature at distance L

L_1 in m: Grille core size (length)

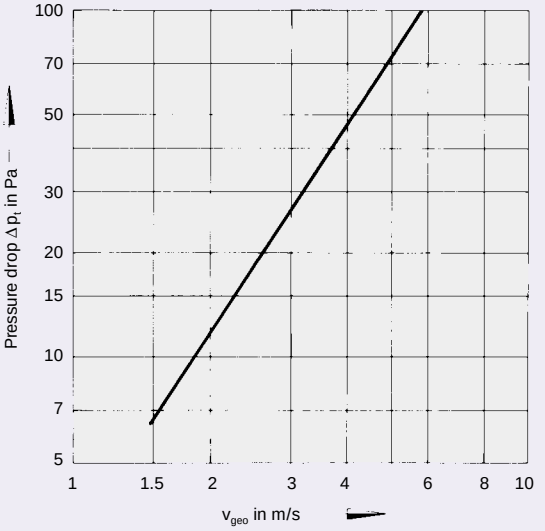
H_1 in m: Grille core size (height)

Δp_t in Pa: Total pressure drop

1 Sound power level and air velocity
Type AGS · Door installation



2 Pressure drop and air velocity
Type AGS · Door installation



Geometric outlet area A_{geo} in m²

L x H in mm	A_{geo} in m²
225 x 125	0.008
325	0.012
425	0.016
525	0.020
625	0.024
825	0.032
1025	0.040
1225	0.048
325 x 225	0.027
425	0.036
525	0.045
625	0.054
825	0.072
1025	0.090
1225	0.108
425 x 325	0.056
525	0.070
625	0.084
825	0.112
1025	0.140
1225	0.168
625 x 425	0.114
825	0.152
1025	0.190
1225	0.228
1025 x 525	0.240
1225	0.288

Correction values for A_{geo}

A_{geo} in m²	0.0075	0.015	0.03	0.06	0.12
L_{WA}	– 6	– 3	0	+ 3	+ 6

Nomenclature · Acoustic Data for Supply Air

Grilles · Linear Grilles

L_{WA} in dB(A): A-weighted sound power level, based on A_{eff} = 0.1 m² (see table for corrections)

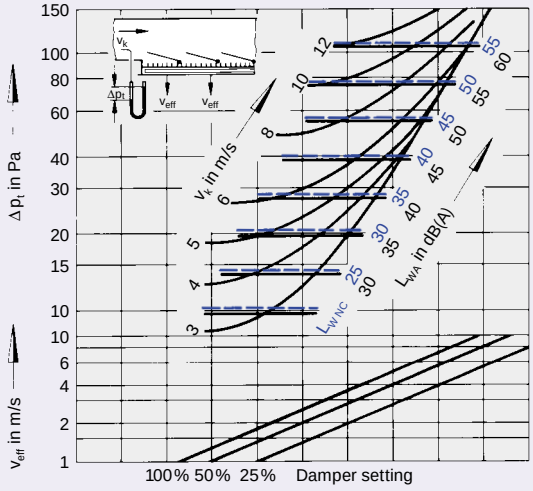
L_{WNC} : NC rating of sound power level

L_W in dB/Oct.: Octave sound power level of regenerated noise based on A_{eff} = 0.1 m² (see table for corrections)

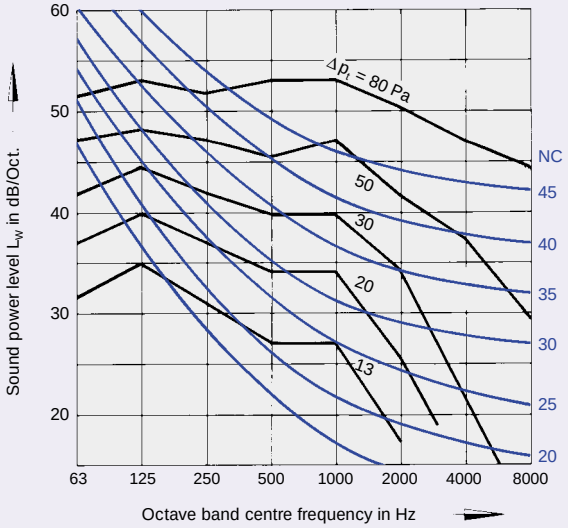
L_{pA}, L_{pNC} : A-weighting NC rating respectively of room sound pressure level
$L_{pA} \approx L_{WA} - 8$ dB
$L_{pNC} \approx L_{WNC} - 8$ dB

For grilles where L > 1225 mm, selection must be made using the technical data for linear grilles.

3 Sound power level and Pressure drop with flap damper …-Z



4 Octave band sound power levels with flap damper …-Z



Correction values for A_{eff}

A_{eff} in m²	0.005	0.01	0.02	0.05	0.1	0.2	0.4
L_{WA} / L_{WNC}	– 13	– 10	– 7	– 3	–	+ 3	+ 6

Diagram values based on A_{eff} = 0.1 m²
(zero blade divergence)

Correction values for h_{eff}

h_{eff} in m	Linear grille length L_1 in mm			
	2000	2500	3000	4000
0.030	– 2	– 1	–	+ 1
0.050	–	+ 1	+ 2	+ 3
0.075	+ 1	+ 2	+ 3	+ 4
0.100	+ 3	+ 4	+ 5	+ 6
0.150	+ 5	+ 6	+ 7	+ 8
0.200	+ 6	+ 7	+ 8	+ 9
0.250	+ 7	+ 8	+ 9	+ 10

Diagram values based on h_{eff} x L_1 = 0.1 m²
(zero blade divergence)

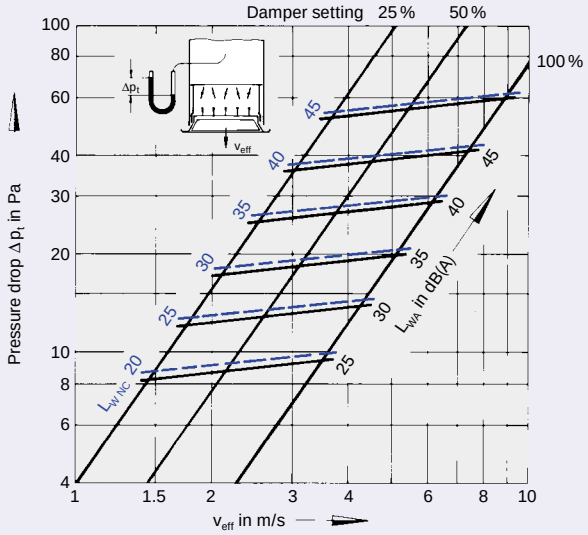
Correction values for other blade setting

Grille face	0°	45°	90°	45°	90°
Pattern cont. blades	0°	0°	0°	45°	90°
Δp_t	x 1.0	x 1.1	x 1.2	x 1.1	x 1.5
L_{WA} / L_{WNC}	–	+ 1	+ 3	+ 1	+ 6

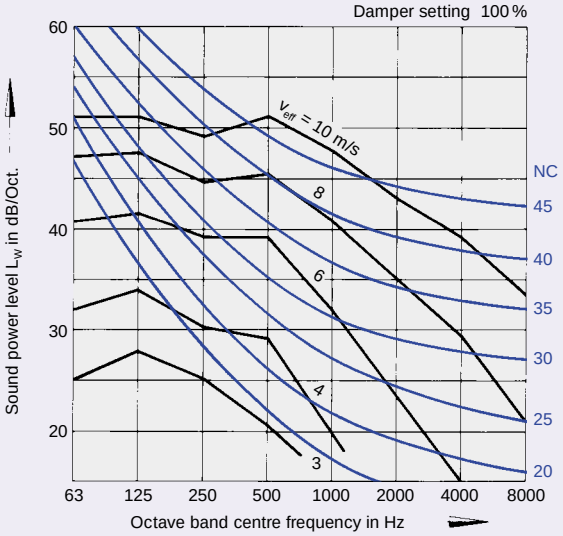
– Grilles can have horizontal/vertical divergence
– Linear grilles can only have vertical divergence

On diagram 5:
Diagram values for the 25 % damper setting are also valid for rear assemblies AL and DL.
Diagram values for the 100 % damper setting are also valid for grilles without rear assemblies.

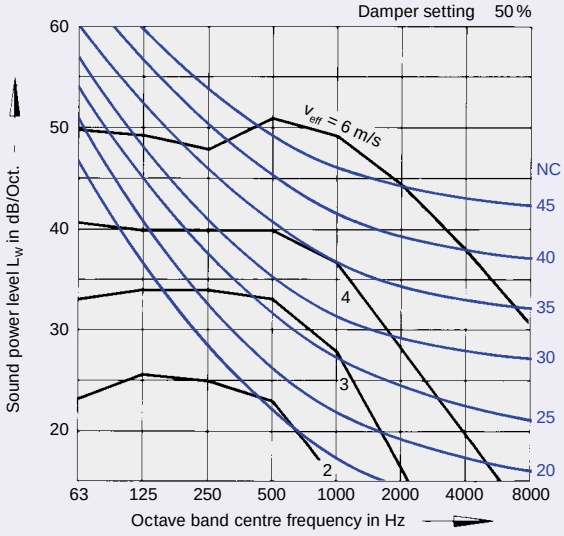
5 Sound power level and Pressure drop with opposed blade damper …-AG and …-DG



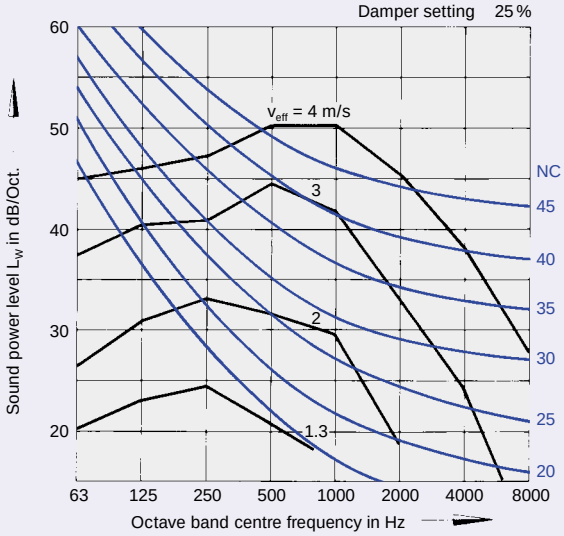
6 Octave band sound power levels with opposed blade damper …-AG and …-DG



7 Octave band sound power levels with opposed blade damper …-AG and …-DG



8 Octave band sound power levels with opposed blade damper …-AG and …-DG



Acoustic Data for Return Air

Grilles

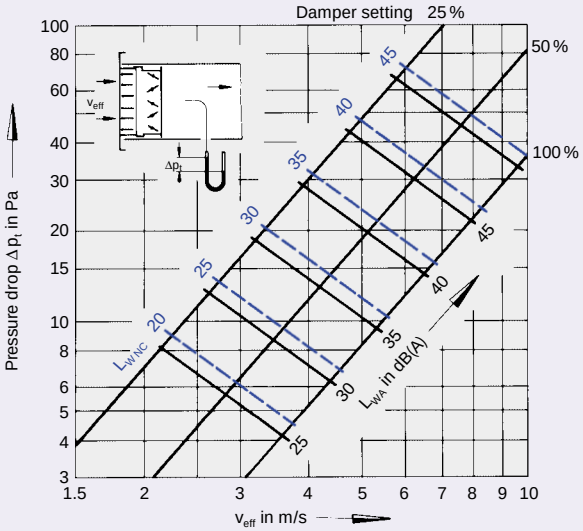
Correction values for A_{eff}

A_{eff} in m^2	0.005	0.01	0.02	0.05	0.1	0.2	0.4
L_{WA} / L_{WNC}	– 13	– 10	– 7	– 3	–	+ 3	+ 6

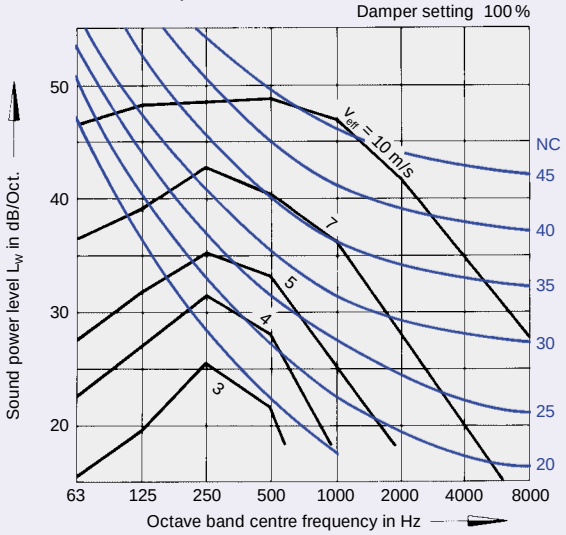
Diagram values based on A_{eff} = 0.1 m^2
(zero blade divergence)

On diagram 9:
Diagram values for the 100 % damper setting are also valid for grilles withour rear assemblies.

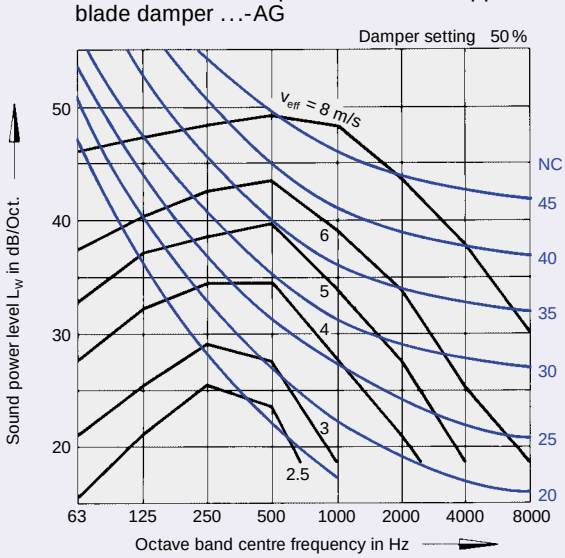
9 Sound power level and Pressure drop for opposed blade damper …-AG



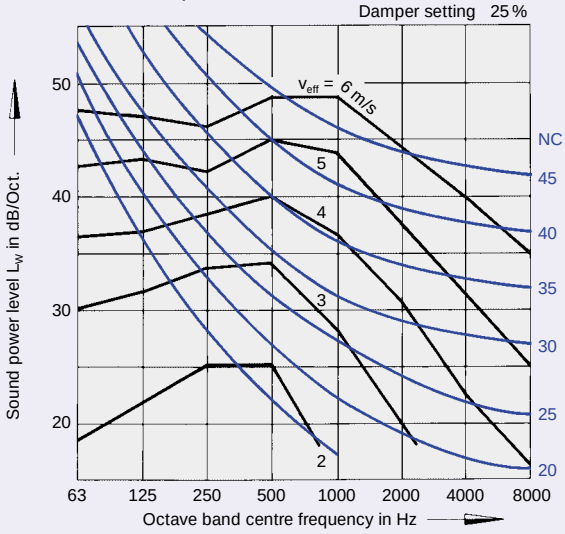
10 Octave band sound power levels with opposed blade damper …-AG



11 Octave band sound power levels with opposed blade damper …-AG



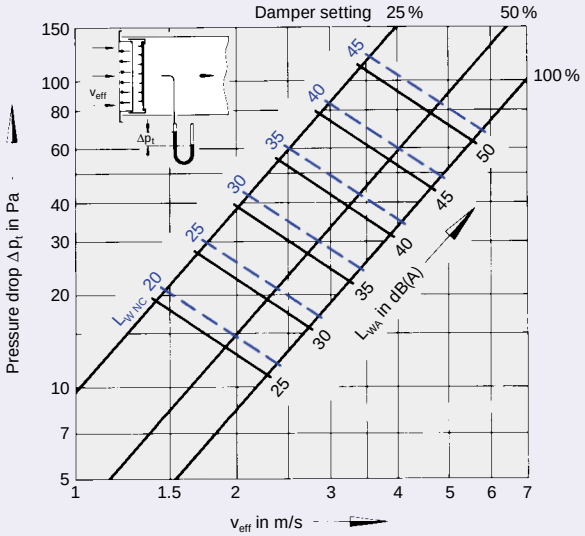
12 Octave band sound power levels with opposed blade damper …-AG



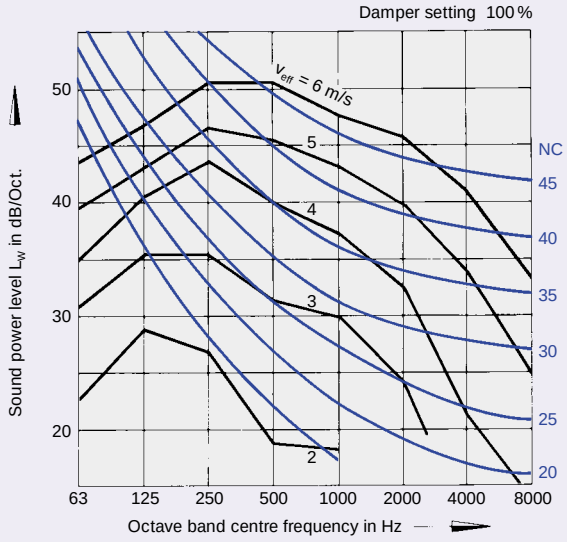
Acoustic Data for Return Air

Grilles

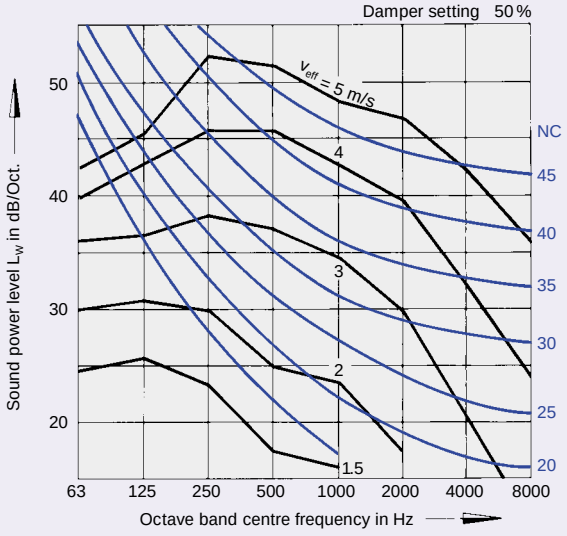
13 Sound power level and Pressure drop with hit and miss damper …-AS



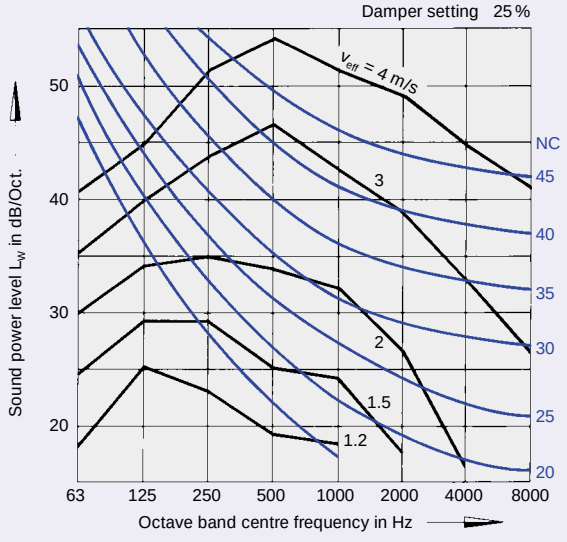
14 Octave band sound power levels with hit and miss damper …-AS



15 Octave band sound power levels with hit and miss damper …-AS



16 Octave band sound power levels with hit and miss damper …-AS



Aerodynamic Data for Supply Air

Grilles

Example

Data given:
Type AT-A, with ceiling effect

Total volume flow	$\dot{V}_t$ = 150 l/s
Maximum jet velocity	$\bar{v}_L$ = 0.5 m/s
Distance from the grille	L = 10 m
Temperature differential between supply and room air	Δt_Z = 4 K

Table on page 25:

A_{eff} = 0.041 m²
A_{eff} ≈ 0.043 m²
L x H = 625 x 125 or 325 x 225

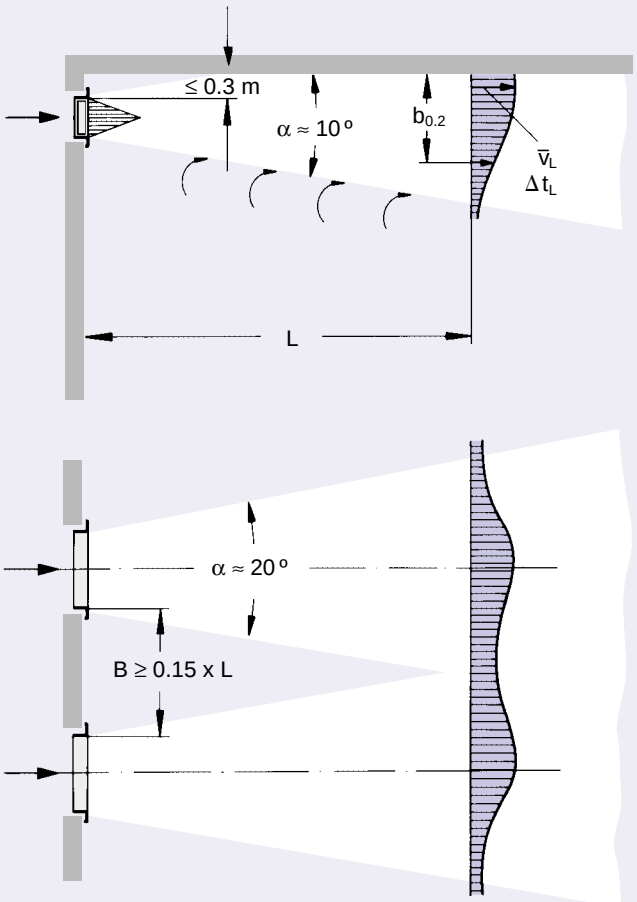
Diagram 17:

A_{eff} = 0.041 m²
v_{eff} = 3.8 m/s
$b_{0,2}$ = 1.2 m
i = 15
$\Delta t_L / \Delta t_Z$ = 0.13
Δt_L = 4 x 0.13 = 0.52 K
B ≧ 1.5 m

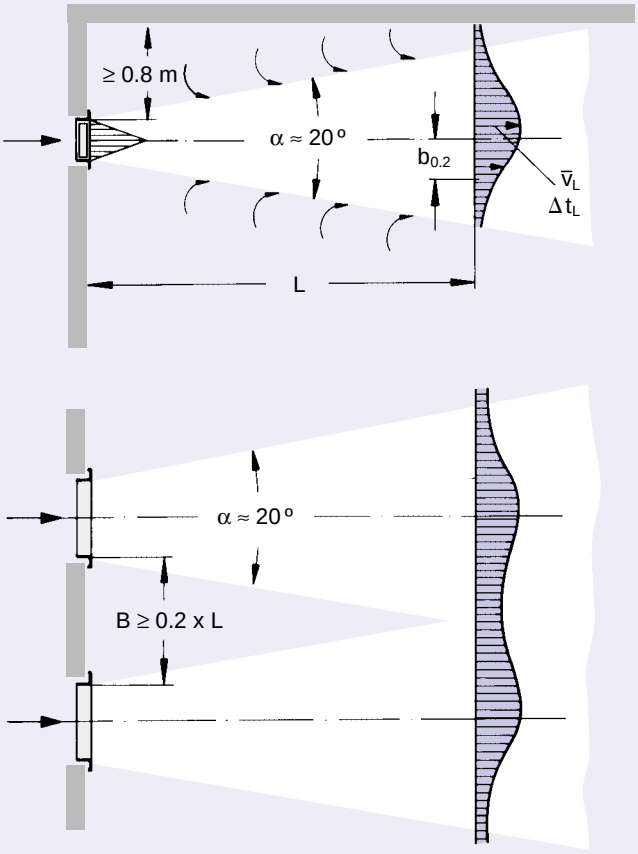
Correction factors for installation without ceiling effect

If the distance to the ceiling is ≥ 0.8 m, the diagram values $\bar{v}_L$, $b_{0.2}$, $\Delta t_L / \Delta t_Z$ should be multiplied by a factor of 0.71.

Installation with ceiling effect



Installation without ceiling effect

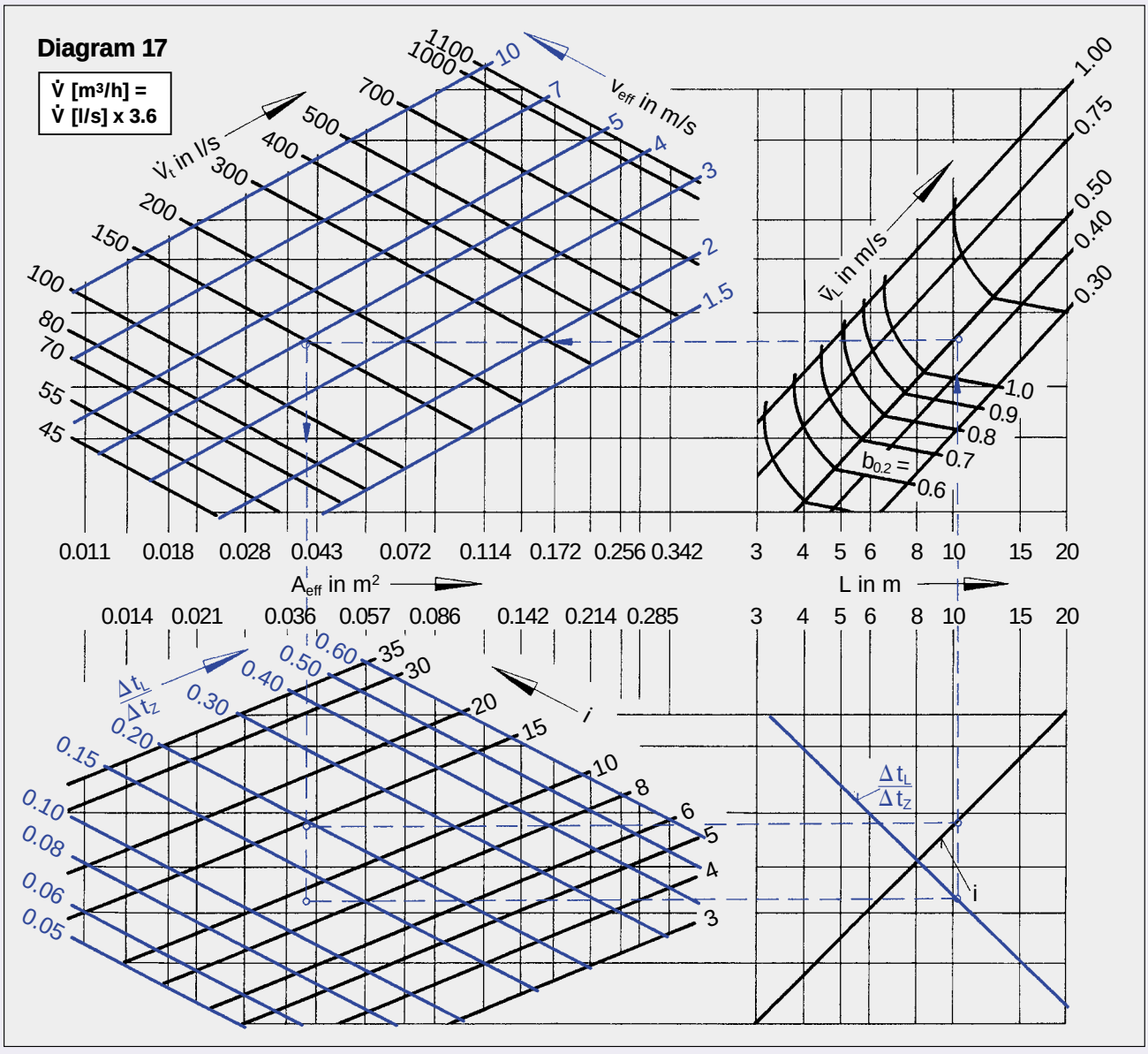


Aerodynamic Data for Supply Air

Grilles with ceiling effect

Effective outlet area A_{eff} in m²

H in mm	Type	L in mm								
		225	325	425	525	625	775	825	1025	1225
75	AH · AF	0.006	0.009	0.011	0.014	0.017		0.022	0.028	0.034
	VAT · TRS	0.007	0.011	0.014	0.018	0.021		0.029	0.036	0.043
125	AT · VAT · ASL · SL · TR · TRS · TRE · KS	0.014	0.021	0.029	0.036	0.043	0.054	0.057	0.072	0.086
	AH · AF	0.011	0.017	0.022	0.028	0.034		0.044	0.055	0.066
	AWT	0.010	0.015	0.020	0.025	0.031		0.040	0.050	0.060
225	AT · VAT · ASL · SL · TR · TRS · TRE · KS	0.029	0.043	0.057	0.072	0.086	0.107	0.114	0.142	0.172
	AH · AF		0.034	0.044	0.055	0.066		0.087	0.108	0.129
	AWT		0.031	0.040	0.050	0.060		0.078	0.097	0.116
325	AT · VAT · ASL · SL · TR · TRS · TRE		0.064	0.086	0.108	0.129	0.161	0.172	0.214	0.256
	AH · AF			0.066	0.081	0.096		0.129	0.169	0.193
	AWT			0.060	0.073	0.086		0.116	0.152	0.174
425	AT · VAT · ASL · SL · TR					0.172		0.228	0.285	0.342
	AH · AF					0.129		0.169	0.214	0.256
525	AT · VAT · SL · TR								0.355	0.427



Aerodynamic Data for Supply Air

Grilles

Determination of volume flow

The volume flow can be determined by measuring the air velocity with zero blade divergence using either a pitot tube or a rotating vane anemometer.

Pitot tube (Figure 1):
Measurements of air velocity should be made between the blades at a number of positions to determine an arithmetic mean value $v_{eff.mean}$.
The volume flow is then calculated as follows:

$\dot{V}_t$ [l/s] = $v_{eff.mean}$ [m/s] x A_{eff} [m²] x 1000
$\dot{V}_t$ [m³/h] = $v_{eff.mean}$ [m/s] x A_{eff} [m²] x 3600

Rotating Vane Anemometer (Figure 2):
The measurement instrument should be evenly traversed across the entire grille face to determine a value of $v_{eff.mean}$. The volume flow is then:

$\dot{V}_t$ [l/s] = $v_{eff.mean}$ [m/s] x A_{eff} [m²] x 1.33 x 1000
$\dot{V}_t$ [m³/h] = $v_{eff.mean}$ [m/s] x A_{eff} [m²] x 1.33 x 3600

Volume Flow Measurement

Figure 1

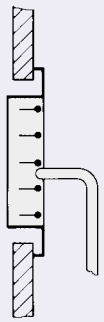
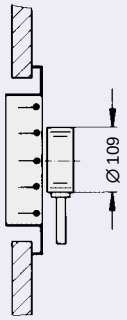
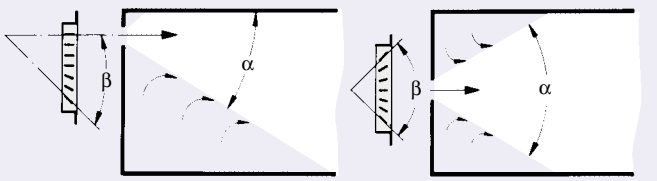


Figure 2



Correction Factors (where L = const.)

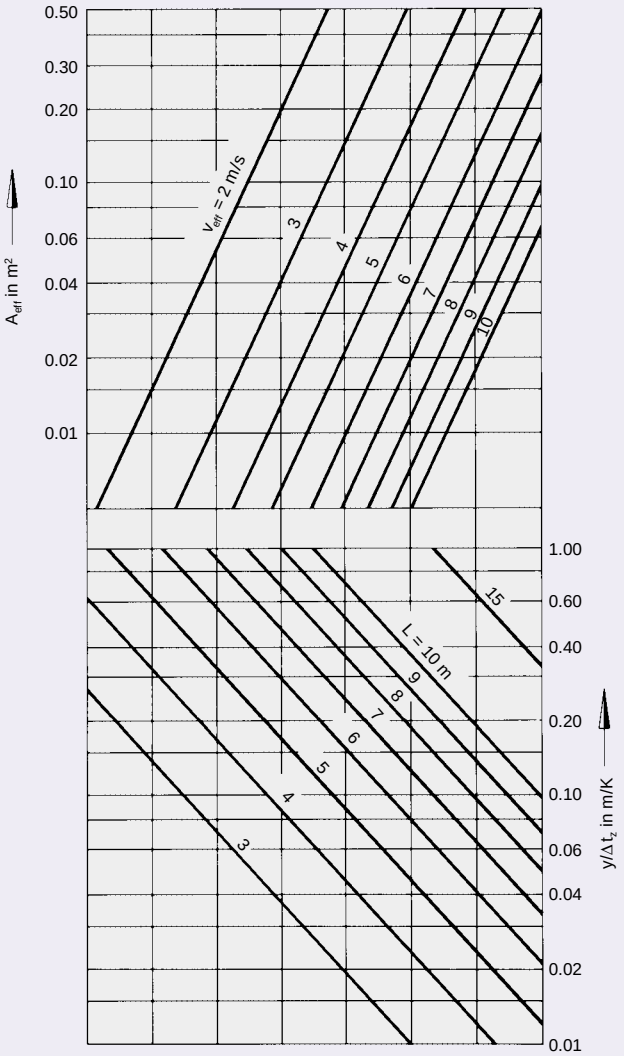
With ceiling effect **Without ceiling effect**



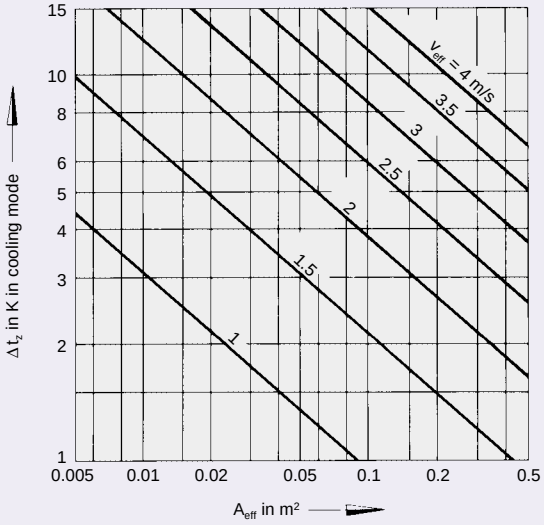
Correction for diagrams 18 and 19
(for setting of blade divergence)

β	45°	90°
α	35°	60°
$\bar{v}_L$	x 0.7	x 0.5
$\Delta t_L / \Delta t_Z$	x 0.7	x 0.5
i	x 1.4	x 2.0
y	x 1.4	x 2.0
With ceiling effect B ≥	L x 0.2	L x 0.3
Without ceiling effect B ≥	L x 0.25	L x 0.3

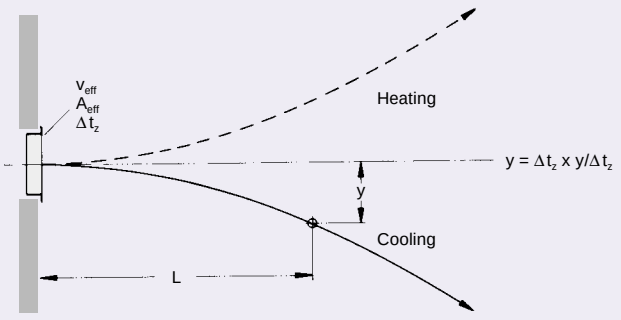
18 **Without ceiling effect**
Airstream drop or rise y
due to temperature difference



19 **With ceiling effect**
Maximum temperature difference Δ t_Z
in cooling mode



On diagram 19:
To prevent the airstream dropping into the occupied zone reference should be made to the graph above. This shows the maximum cooling differential which may be used related to the effective outlet area and effective outlet velocity.

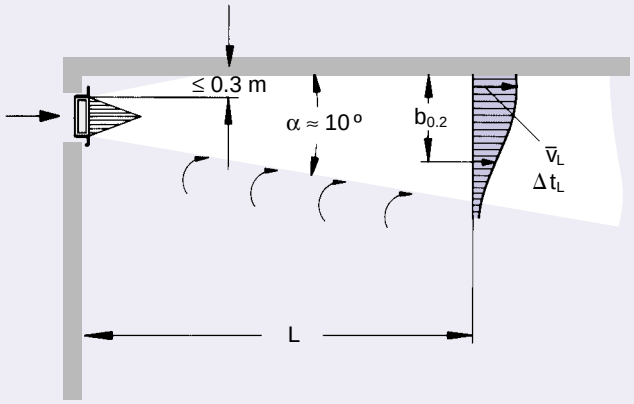


Aerodynamic Data for Supply Air

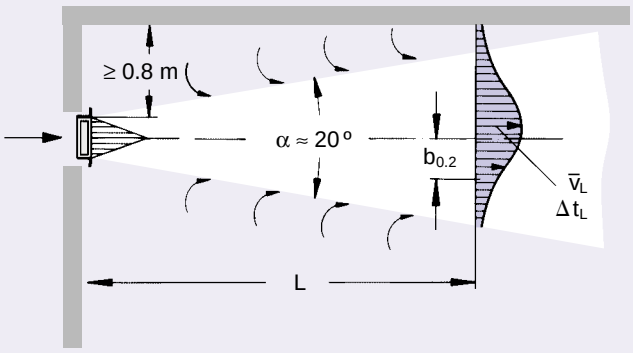
Grilles

Correction factors for installation without ceiling effect
If the distance to the ceiling is ≥ 0.8 m, the diagram values $\bar{v}_L$, $b_{0.2}$, $\Delta t_L / \Delta t_Z$ should be multiplied by a factor 0.71.

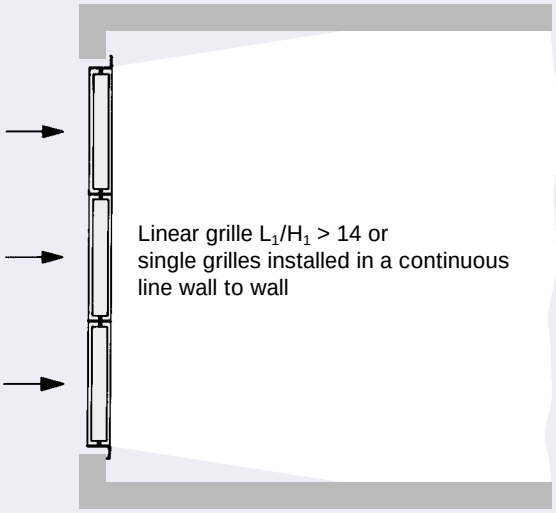
Installation with ceiling effect



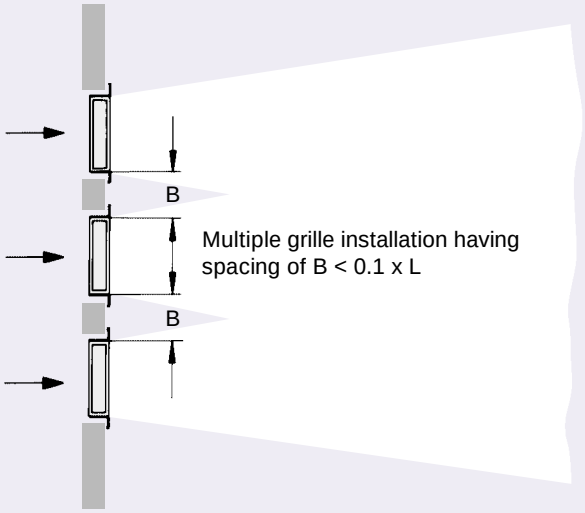
Installation without ceiling effect



Installation of Linear Grilles



Linear grille $L_1/H_1 > 14$ or single grilles installed in a continuous line wall to wall



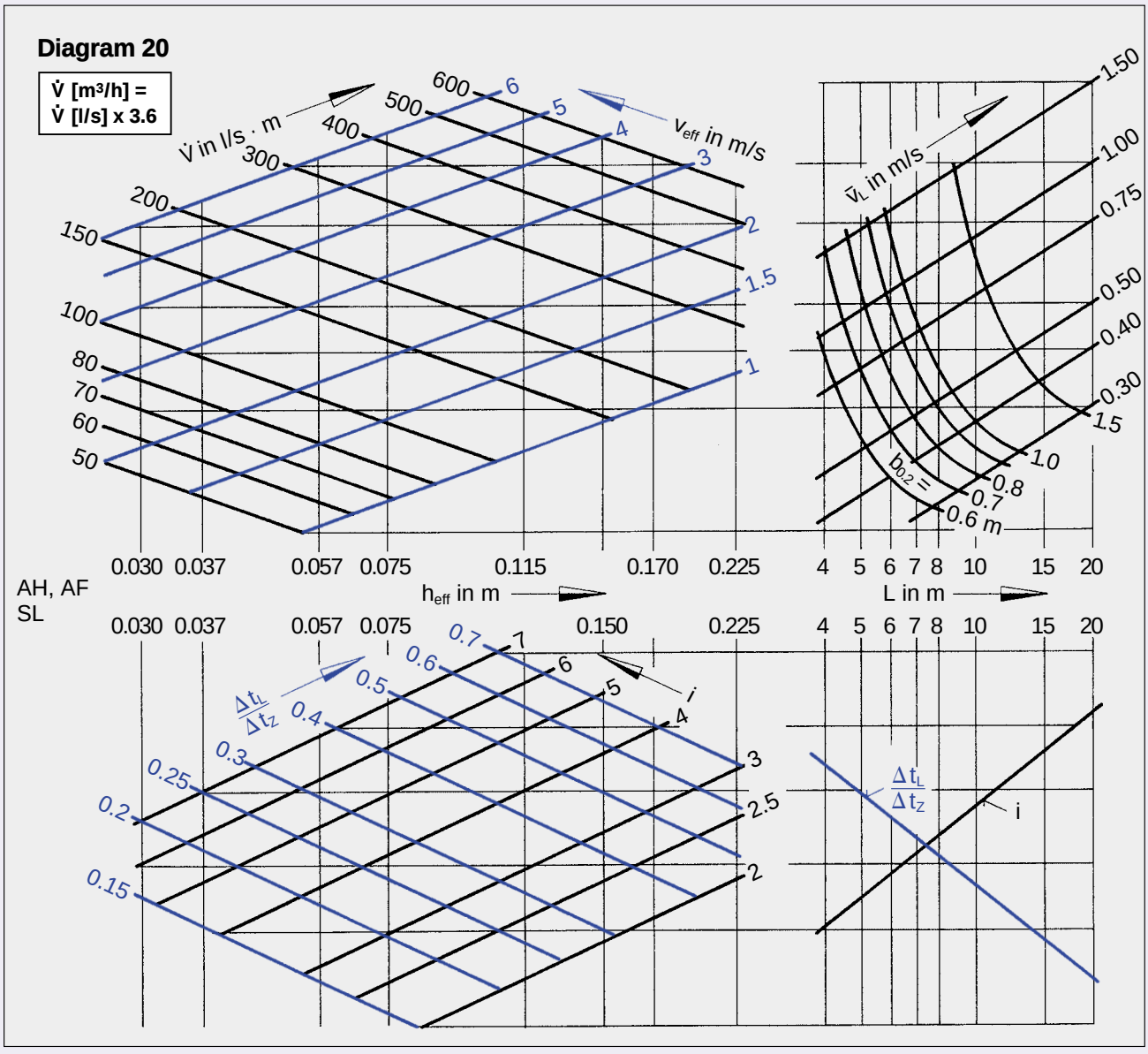
Multiple grille installation having spacing of B < 0.1 x L

Aerodynamic Data for Supply Air

Linear Grilles with ceiling effect

Effective outlet height

H in mm	h_{eff} in m	
	SL	AH · AF
75	–	0.030
125	0.075	0.057
225	0.150	0.115
325	0.225	0.170



Aerodynamic Data for Supply Air

Linear Grilles

Determination of Volume Flow

The volume flow can be determined by measuring the air velocity with zero blade divergence using either a pitot tube or a rotating vane anemometer.

Pitot tube (Figure 1):
Measurement of air velocity should be made between the blades at a number of positions to determine an arithmetic mean value – $v_{eff.mean}$. The volume flow is then calculated as follows:

$\dot{V}$ [l/s] = $v_{eff.mean}$ [m/s] x h_{eff} [m] x L_1 [m] x 1000
$\dot{V}$ [m³/h] = $v_{eff.mean}$ [m/s] x h_{eff} [m] x L_1 [m] x 3600

Rotating Vane Anemometer (Figure 2):
The measurement instrument should be evenly traversed across the entire grille face to determine a value of $v_{eff.mean}$. The volume flow is then:

$\dot{V}$ [l/s] = $v_{eff.mean}$ [m/s] x h_{eff} [m] x L_1 [m] x 1.33 x 1000
$\dot{V}$ [m³/h] = $v_{eff.mean}$ [m/s] x h_{eff} [m] x L_1 [m] x 1.33 x 3600

Volume Flow Measurement

Figure 1

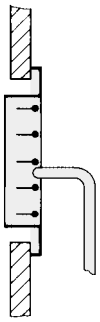
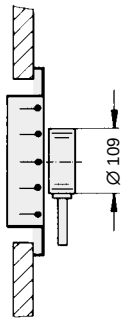
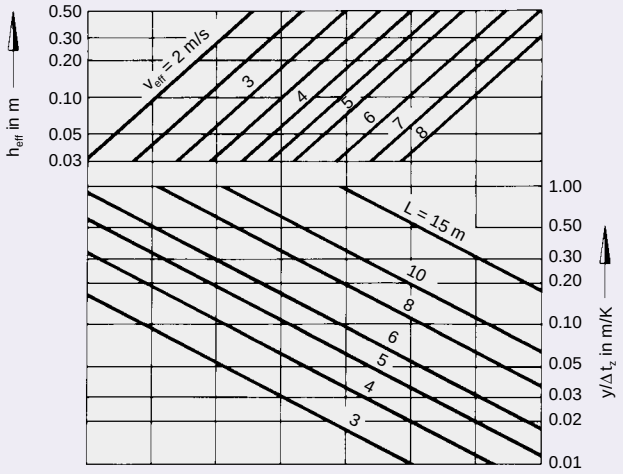


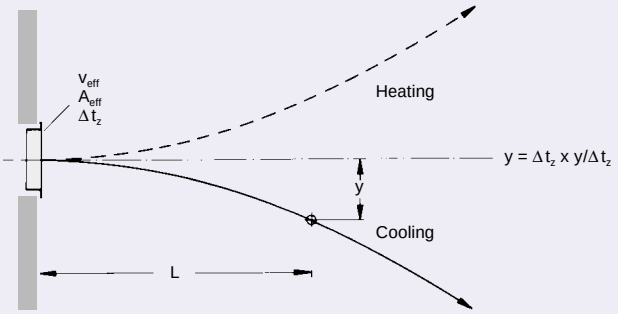
Figure 2



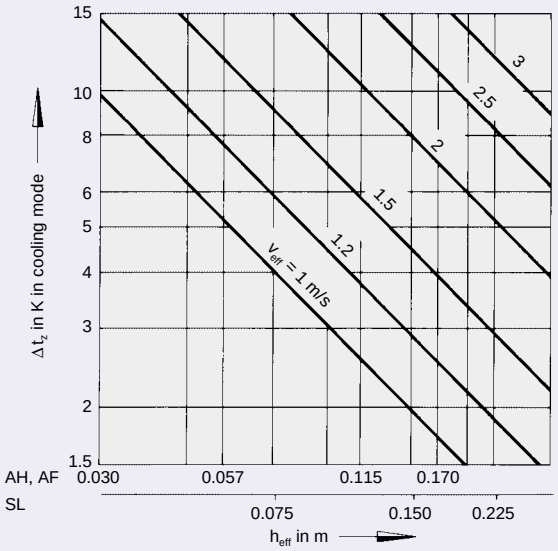
21 **Without ceiling effect**
airstream drop or rise y
due to temperature difference



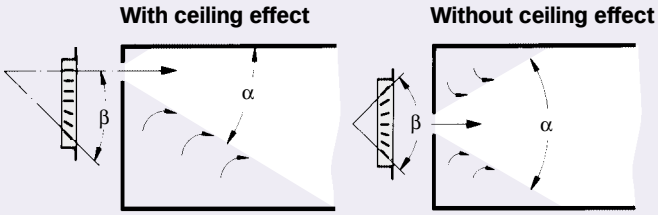
On diagram 22:
To prevent the airstream dropping into the occupied zone reference should be made to diagram 20. This shows the maximum cooling differential which may be used related to the effective outlet height and effective outlet velocity.



22 **With ceiling effect**
Maximum temperature difference Δt_z in cooling mode



Correction Factors (where L = const.)



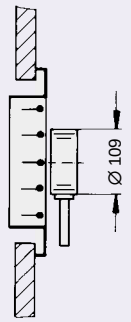
Correction for diagrams 21 and 22
(for setting of blade divergence)

β	45°	90°
α	35°	60°
$\bar{v}_L$	x 0.7	x 0.5
$\Delta t_L / \Delta t_z$	x 0.7	x 0.5
i	x 1.4	x 2.0

Aerodynamic Data for Return Air

Grilles

Volume Flow Measurement



Rotating Vane Anemometer:
The measurement instrument should be evenly traversed across the entire grille face to determine a value of $v_{eff.mean}$.
The volume flow is then:

$\dot{V}$ [l/s] = $v_{eff.mean}$ [m/s] x A_{eff} [m²] x f x 1000
$\dot{V}$ [m³/h] = $v_{eff.mean}$ [m/s] x A_{eff} [m²] x f x 3600

Correction Factor – f –

Type	f
ASL · AT · VAT · SL · TR · TRS	1.6
AH · AF · AWT	1.9

Effective outlet area

L x H in mm	A_{eff} in m²			
	AH · AF	AWT	AT · VAT TR · TRS TRE · KS	ASL · SL
225 x 75	0.004	0.003	0.006	
325	0.006	0.005	0.009	
425	0.009	0.008	0.011	
525	0.011	0.010	0.014	
625	0.013	0.011	0.016	
825	0.017	0.015	0.022	
1025	0.021	0.018	0.028	
1225	0.026	0.023	0.033	
225 x 125	0.009	0.008	0.011	0.013
325	0.013	0.011	0.016	0.019
425	0.017	0.015	0.022	0.026
525	0.021	0.018	0.028	0.033
625	0.026	0.023	0.033	0.040
825	0.033	0.029	0.044	0.053
1025	0.041	0.036	0.055	0.066
1225	0.049	0.043	0.066	0.080
325 x 225	0.026	0.023	0.033	0.040
425	0.033	0.029	0.044	0.053
525	0.041	0.036	0.055	0.066
625	0.049	0.043	0.066	0.080
825	0.066	0.057	0.090	0.105
1025	0.082	0.071	0.110	0.133
1225	0.090	0.078	0.134	0.160
425 x 325	0.049	0.043	0.066	0.080
525	0.060	0.052	0.083	0.100
625	0.072	0.063	0.100	0.120
825	0.095	0.083	0.134	0.160
1025	0.120	0.104	0.170	0.200
1225	0.140	0.122	0.200	0.240
625 x 425	0.095		0.134	0.160
825	0.122		0.180	0.220
1025	0.155		0.220	0.270
1225	0.185		0.270	0.320
1025 x 525			0.280	0.330
1225			0.340	0.400

A_{eff} for L = 775 mm can be interpolated with sufficient accuracy!

Order Details

Specification Text

Grilles, grille cores and linear grilles suitable for supply or return air for installation in walls, floors or cills. Borders (except for grille cores) with corner mitres and rear perimeter sealing strip – horizontal or vertical profiled front blades individually adjustable or fixed. Knock down installation subframes for assembly on site by others, installation by visible screw fixing (border counter punched) concealed fixing or spring clip fixing. For optimum air distribution, rear assemblies are fitted to grilles which can be adjusted directly at the grille face without demounting the face.

Materials:
Aluminium: Grille face made from extruded aluminium sections, natural anodised finish E6 - C - 0.
Steel: Grille face made from formed sheet steel. The surfaces are pre-treated and powder coated white (RAL 9010).
Galvanised steel: Grille face made from formed galvanised sheet steel.
Stainless steel: Grille face and rear assemblies made from formed, stainless sheet steel, materials ref. 1.4301 or higher, pickled matt surface or bright (face grille only).
Plastic: Grille face and rear assemblies made from plastic extrusions (hard PVC), dark grey (similar to RAL 7011), temperature resistant up to 50 °C. Curved blades for volume control in black or dark grey.

Order Code

These codes need not be completed for standard products

E - SL - AG / **1910 x 125** / **N 1** / **0** / **P1** / **RAL 9016**

End section E
Intermediate section M [1)]

Aluminium grilles and grill cores, see pages 3 to 5
Steel grilles, see page 6
Stainless steel grilles, see page 7
Plastic grilles, see page 8
Aluminium and steel linear grilles, see pages 11 to 13

1) only for linear grilles

Rear assemblies, see table on page 15

L x H see page 10
E x H
M x H
see pages 11 to 13

0 without installation subframe
... with installation subframe see table on page 33

0 for standard construction without fixing variant
... with fixing variant, see table on page 33

State colour

Aluminium:
- 0 Standard finish E6 - C - 0
- P 0 Powder coated (RAL 9010)
- P1 Powder coated to RAL ...
- S 2 Anodised according to Euro Standard E4 - C - 31 to C - 35

Steel:
- 0 Standard finish RAL 9010
- P1 Powder coated to RAL ...
- S 7 Galvanised base material (only type TR)

Stainless steel:
- 0 Standard finish dull-pickled
- S 8 Bright finish

Plastic:
- 0 Standard PVC finish similar to RAL 7011

Flow rate control dampers
AGW
DGW
Z

Please order separately indicating size

Rear Assemblies
E - EF spare filter media
AF - 90° mitre[1)]
ES - AF - 0 - A
ES - AF - 15 - A - 1
ES - AF - 15 - A - 2

1) Mitre: please order separately with indication of height!

Example: Grille Order

Make: TROX
Type: AT - AG / 825 x 225 / A 1

Example: Linear Grille Order

Make: TROX
Type: M - SL - AG / 2000 x 125 / E 1
E - SL - AG / 1910 x 125 / N 1
E - SL - AG / 1850 x 125 / N 1

Rear Assemblies for grilles made from aluminium, steel or galvanised steeel:
Rear assemblies made from formed sheet steel, phosphate treated, stove enamelled black (RAL 9005) using electro-dipcoat process, resistant to saturated environment for minimum of 100 hours without deterioration (DIN 50 017).

Type		Installation Subframe			Fixing variants						
		Front border width in mm			Front border width in mm						
					Concealed fixing			Counterpunched border	Spring clip fixing		
		27 (28)	23 (20)	28 / 20	27 (28)	23	20	27 (28) 25 (TRE und KS)	27 (28)	23	20
Grilles	ASL	A 1			0				B 11		
	AT	A 1	B 1		0	G 11		A 11	B 11	H 11	
	VAT	A 1	B 1		0	G 11		A 11	B 11	H 11	
	AH-0 / AH-15	A 1	B 1		0		E 11	A 11	B 11		F 11
	AF-0 / AF-15										
	EH-0, EF-0, EHG-0, EFG-0 EH-15, EF-15, EHG-15, EFG-15										
	AWT	A 1						0			
	AGS	A 1									
	SL			M 1	0						
	TR	A 1			C 11			0			
	TRS	A 1			C 11			0			
	TRE							0			
	KS							0			
Linear Grilles End section	E-AH-0 / AH-15	C 1	D 1		0		E 11	A 11			
	E-AF-0 / AF-15										
	E-SL			N 1	0						
Linear Grilles Intermediate section	M-AH-0 / AH-15	E 1	F 1		0		E 11	A 11			
	M-AF-0 / AF-15										
	M-SL			E 1	0						

0 = standard construction