

Ducting.
Complete range





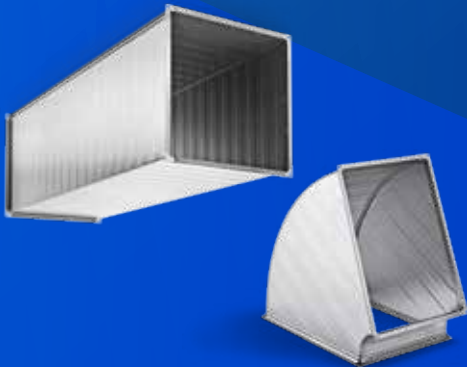
Contents

Product group

Ducting.

9

Ducting,
rectangular



38

Flexible connectors
(expansion joints)



47

Panels and
sandwich walls



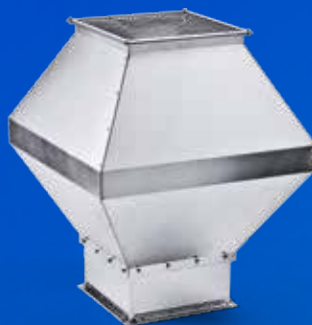
50

Ducting,
round



53

Fresh air
and exhaust air systems



107

Weatherproof
grilles



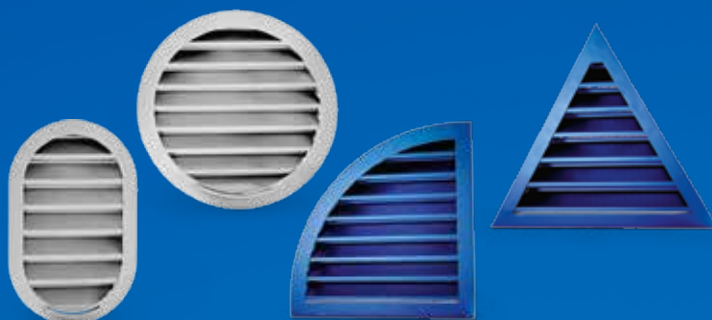
111

Weatherproof grille
combinations



115

Special
weatherproof grilles



119

Acoustic
weatherproof grilles



128

Weatherproof grilles
for pitched roofs



137

Ventilation towers
and steel chimneys



The BerlinerLuft. Group.
Your expert partners for versatile system solutions
in heating, ventilation and air conditioning.

Energy-efficient. Dynamic. Experienced.

FROM THE PRODUCT TO THE SYSTEM

With five branches around Germany, BerlinerLuft. Technik GmbH, along with BerlinerLuft. Klimatechnik GmbH and BerlinerLuft. Ventilatoren und Prozesslufttechnik GmbH, is the largest business unit in the group of companies. The wide range of products for air flow, distribution and regulation not only includes many different ducting systems and ventilation components, but also silencers and special acoustic structures. Smoke extraction systems and process air technology round off the product range available from the internationally active HVAC specialists.

FROM THE SYSTEM TO THE SERVICE

With our automated manufacturing systems and flexible management of production between five high-capacity sites, we offer our customers much more than the average competitor. When it comes to components and system technology, we are currently able to produce around 10,000 m² of the highest-quality ductwork and fittings every day. As Germany's leading manufacturer of ventilation ducting, we can take advantage of powerful and flexible logistics concepts to get it to the site as quickly as possible, either with our own fleet or using our reliable partners. For your project. For your benefit. Because we understand our customers.

To keep our customers satisfied, we combine expertise with continuity, team spirit and innovation to create energy-efficient solutions that retain their value.



Air duct

FROM QUALITY TO CONTINUITY

Quality, flexibility and customer satisfaction are not just our goal – they are our mission. With this in mind, and monitored by our internal and external quality management system, we develop air conditioning and ventilation solutions with impressive and lasting efficiency and performance. To guarantee functionality, stability and leaktightness in line with the latest standards, directives and accepted technical parameters, we combine tried-and-tested craftsmanship with forward-looking technology to create perfect products. We offer expertise and advice on site – to the benefit of your individual building project.

FROM THE SYSTEM TO THE PROCESS

Whether at airports, in industry, in administrative buildings or in hospitals – with our high standards of durability, efficiency and quality, BerlinerLuft. Technik GmbH, with branches spread around Germany and abroad, is a reliable partner in modern ventilation, air conditioning and process air technology. As specialists with decades of experience, we create tailor-made systems for powerful, ambient and process-related air conditioning zones that not only comply with the most stringent quality criteria, but also meet the highest functional, hygienic and individual standards. And we are sure that they will meet yours too.

Ducting

Every HVAC system requires many different parts and components for efficiently transporting air.

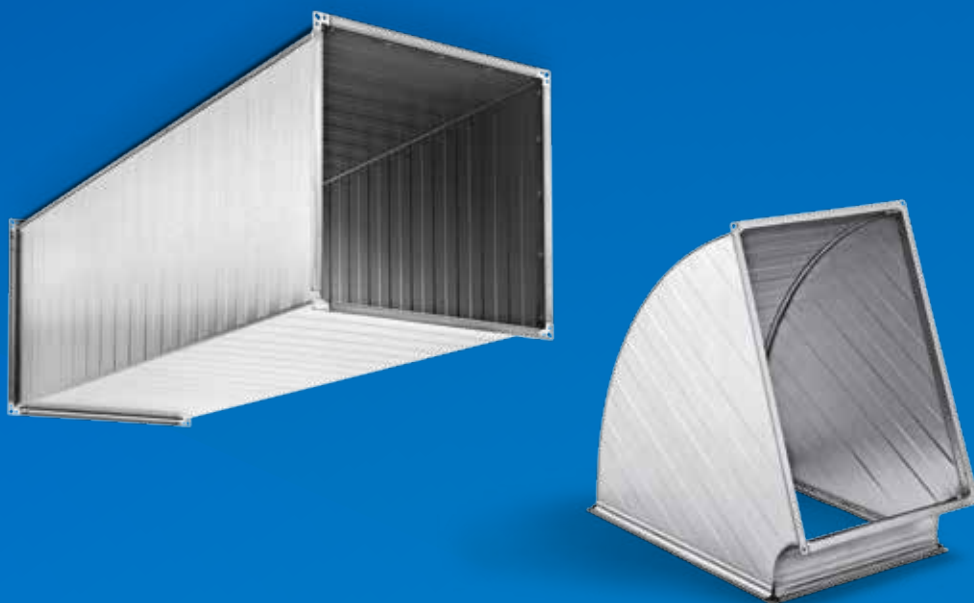
In its ducting range, BerlinerLuft. offers products and components for designing complete round or rectangular ducting systems.

Tailor-made solutions

Sturdy and safe

Compliant with standards

Rectangular ducting



Folded ducting components

FOLDED DUCTING COMPONENTS – GALVANISED STEEL

Folded sheet metal ducts and fittings with rectangular cross section as per DIN EN 1505, 1507 and DIN 18379

Material: Sendzimir galvanised sheet steel

Grade: DX51D + Z275MA-C (DIN EN 10346 and DIN EN 10143)

Sheet thickness: for pressure rating L, M, HR

Tightness classes: A, B and C as per DIN EN 1507

Turning vanes as per DIN EN 1505

Longitudinal seams folded, end connection with frame or slip joint,

walls reinforced with trapezoidal corrugation

Additional reinforcement for pressure ratings M and HR as per BerlinerLuft. Technik GmbH (BLKS) company standard

Standard duct section length 1500 mm (also with frame)

Width of frame sections for pressure rating L

Frame width 20 mm: up to edge length 1000 mm

Frame width 30 mm: > edge length 1000 to 2000

Frame width 40 mm: > edge length 2000 mm



FOLDED DUCTING COMPONENTS – STAINLESS STEEL 1.4301 FOLDED DUCTING COMPONENTS – STAINLESS STEEL 1.4571

Sheet metal ducts and fittings with rectangular cross section similar to EN 1505, 1507 and DIN 18379

Folded sheet metal ducts and fittings made of stainless steel 1.4301 or 1.4571 (surface 2B as per DIN EN 10088)

Sheet thickness 0.8 mm and 1.0 mm. Corners sealed or whole joint sealed (corners, frame and seams)

Longitudinal seams folded, end connection with frame, turning vanes as per DIN EN 1505, walls reinforced with corrugations, additional reinforcement as per BerlinerLuft. company standard. Spot welds treated

Standard duct section length 1500 mm

Width of frame sections for pressure rating L

Frame width 20 mm: up to edge length 1000 mm

Frame width 30 mm: > edge length 1000 to 2000 mm



FOLDED DUCTING COMPONENTS – ALUMINIUM

Sheet metal ducts and fittings with rectangular cross section similar to EN 1505, 1507 and DIN 18379

Folded sheet metal ducts and fittings made of aluminium AlMg3

Sheet thickness 1.0 mm and 1.2 mm. Corners sealed or whole joint sealed (corners, frame and seams)

Longitudinal seams folded, end connection with frame, turning vanes as per DIN EN 1505, walls reinforced with corrugations, additional reinforcement as per BerlinerLuft company standard. Standard duct section length 1500 mm

Width of frame sections for pressure rating L

Frame width 20 mm: up to edge length 700 mm

Frame width 30 mm: > edge length 700 to 2000 mm



FOLDED DUCTING COMPONENTS – GALVANISED STEEL INDUSTRIAL DUCTING

Sheet metal ducts and fittings with rectangular cross section for harsher conditions

Folded sheet metal ducts and fittings made of Sendzimir galvanised sheet steel grade DX51D + Z275MA-C (DIN EN 10346 and DIN EN 10143). Sheet thickness up to 1000 mm, edge length 1.0 mm, from 1001 mm edge length 1.25 mm. Tightness class A or B as per DIN EN 1507. Longitudinal seams folded, end connection with frame

Turning vanes as per DIN EN 1505

Walls corrugated, additional reinforcement with 30 mm standing seam and U-section support 30 x 50 x 30

Suitable for pressure of -1500 Pa to +3000 Pa and high air velocities. Standard duct section length 1000 mm

Width of frame sections for pressure rating HR

Frame width 30 mm: up to edge length 1000 mm

Frame width 40 mm: > edge length 1000 mm



Overview of ducting components: folded, welded

FOLDED DUCTING COMPONENTS – GALVANISED STEEL, INSULATED

Sheet metal ducts and fittings with rectangular cross section, galvanised, folded and insulated

Sheet metal ducts and fittings made of Sendzimir galvanised fine sheet steel grade DX51D + Z275MA-C (DIN EN 10346 and DIN EN 10143)

Sheet thickness depending on pressure rating L or M

Tightness class A or B as per DIN EN 1507

Longitudinal seams folded, end connection with frame

Turning vanes as per DIN EN 1505. Walls reinforced with corrugations, additional reinforcement as per BerlinerLuft. company standard. Standard duct section length 1500 mm

Width of frame sections for pressure rating L

Frame width 20 mm:	up to edge length 1000 mm
Frame width 30 mm:	> edge length 1000 to 2000 mm

WELDED DUCTING COMPONENTS – SHEET STEEL

Welded sheet metal ducts and fittings with rectangular cross section as per DIN EN 1505, 1507 and VDI 3803

Welded sheet metal ducts and fittings made of Sendzimir galvanised fine sheet steel grade DX51D + Z275MA-C (DIN EN 10346 and DIN EN 10143) and black sheet S 235 JRG2 as per DIN EN 10025

Sheet thickness for pressure rating H^R

Tightness class C and D as per DIN EN 1507

End connection with angle frame or formed frame. Perforated as per factory standard (hole spacing 125 mm), turning vanes as per DIN EN 1505. Fixed duct length according to frame connection

Fixed duct length with flush angle frame: 1500 mm

Recessed angle frame: 1480 mm

30 mm formed frame 30/15: 1350 mm

40 mm formed frame 40/20: 1350 mm

60 mm formed frame 60/30: 1300 mm

Larger formed frames available on request (individual assessment)



WELDED DUCTING COMPONENTS – MATT OR POLISHED STAINLESS STEEL

Sheet metal ducts and fittings with rectangular cross section similar to DIN EN 1505, 1507 and VDI 3803

Welded sheet metal ducts and fittings made of stainless steel 1.4301 and 1.4571, matt or polished finish

Sheet thickness as required for tightness class C or D as per DIN EN 1507. Stricter requirements such as nekal tightness as per DIN on request

End connection with angle frame or formed frame. Perforated as per factory standard (hole spacing 125 mm), turning vanes as per DIN EN 1505. Fixed duct length according to joint type

Fixed duct length with flush angle frame: 1500 mm

Recessed angle frame: 1480 mm

30 mm formed frame 30/15: 1350 mm

40 mm formed frame 40/20: 1350 mm

60 mm formed frame 60/30: 1300 mm

Larger formed frames available on request (individual assessment)



WELDED DUCTING COMPONENTS – ALUMINIUM

Sheet metal ducts and fittings with rectangular cross section similar to DIN EN 1505, 1507 and VDI 3803

Welded sheet metal ducts and fittings made of aluminium AL 99.5 hh and AlMg3, sheet thickness 2.0 mm and 3.0 mm

Tightness class C and D as per DIN EN 1507. Stricter requirements such as nekal tightness as per DIN on request

End connection with perforated angle frame as per company standard (hole spacing 125 mm), turning vanes as per DIN EN 1505

Fixed duct length with flush angle frame: 1500 mm

Recessed angle frame: 1480 mm

30 mm formed frame 30/15: 1350 mm

40 mm formed frame 40/20: 1350 mm

60 mm formed frame 60/30: 1300 mm

Larger formed frames available on request (individual assessment)



Design of ducting components – frames

PLANNING REQUIREMENTS

Ducting components are part of the ducting system in central ventilation systems. When planning the ducting system, various requirements have to be met:

Optimised air flow

Ability to withstand pressure (VDI 3803)

Tightness class (DIN EN 1507)

Hygiene requirements (VDI 6022)

Type specification (folded or welded)

Selection of material according to the type of air carried, e.g.:
normal room air, dusty process air, chemically polluted air

DESIGN OF RECTANGULAR DUCTING COMPONENTS

Welded air duct with folded frame (3)

Mandatory for the strictest requirements of tightness class D (e.g. decontaminable design)

Welded air duct with angle frame (4)

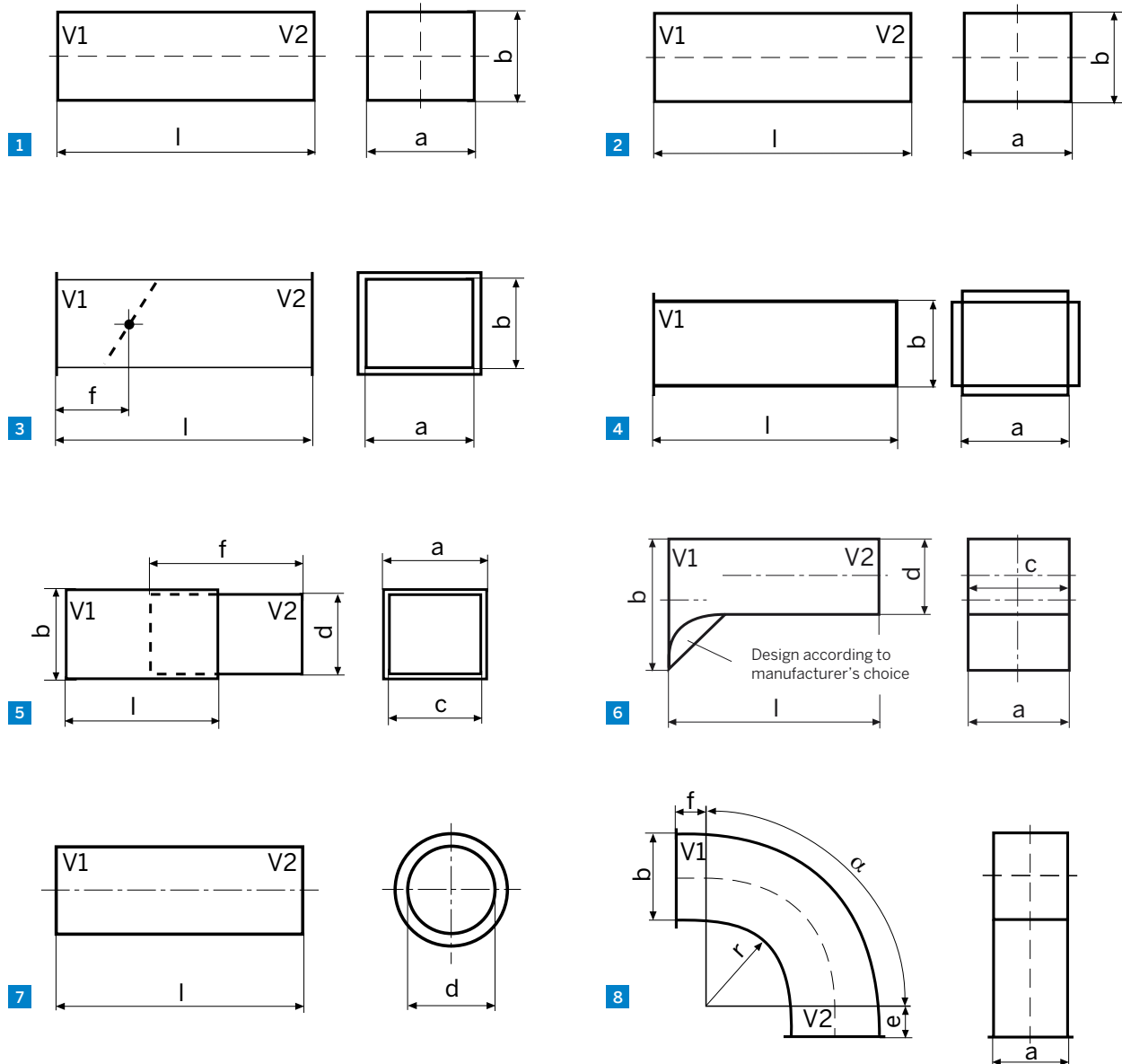
Can be used for special requirements of tightness class D

- 1 | Folded air duct with formed frame
- 2 | Folded air duct with attached frame
- 3 | Welded air duct with folded frame
- 4 | Welded air duct with angle frame



Sheet metal ducts and fittings

AS PER DIN EN 1505, 1507 AND DIN 18379

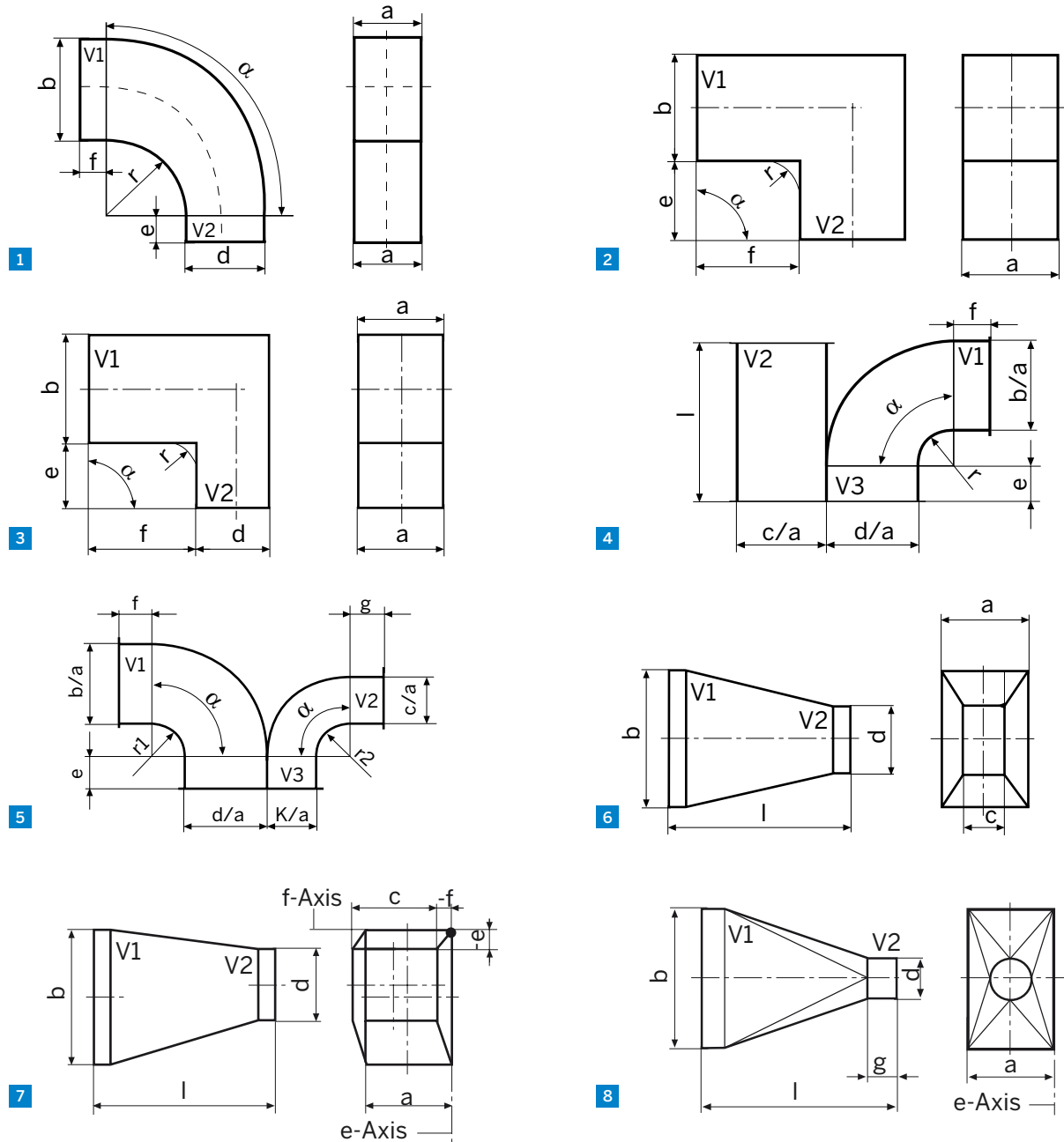


- 1 | K – Duct $l > 900$
- 2 | KT – Duct section $l \leq 900$
- 3 | KD – Duct with damper
- 4 | KS – Duct connector

- 5 | SS – Sliding connector
- 6 | SU – Transition connector
- 7 | SR – Round connector
- 8 | BS – Bend

Sheet metal ducts and fittings

AS PER DIN EN 1505, 1507 AND DIN 18379



1 | BA – Transition bend

2 | WS – Symmetrical square bend

3 | WA – Square transition bend

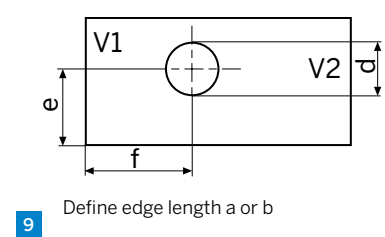
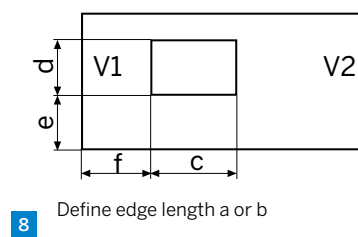
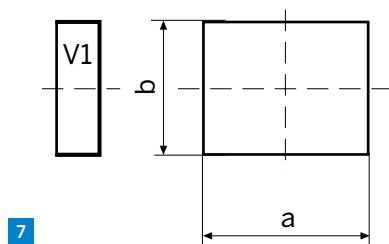
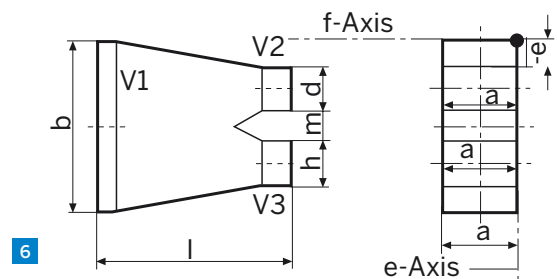
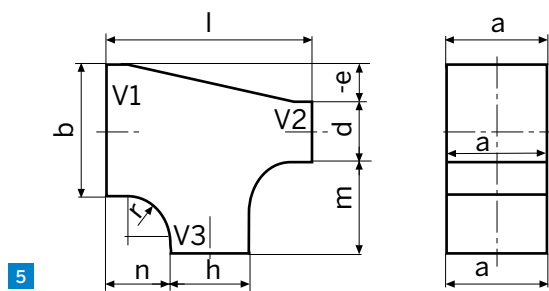
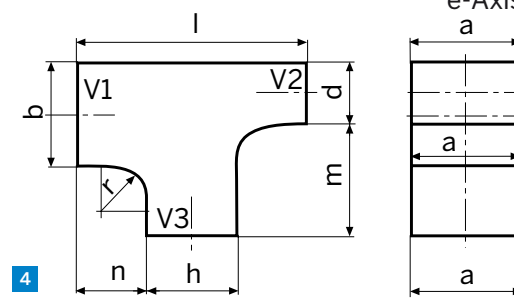
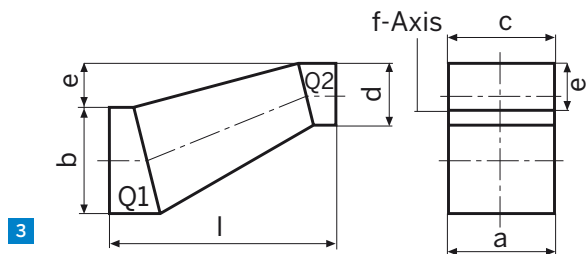
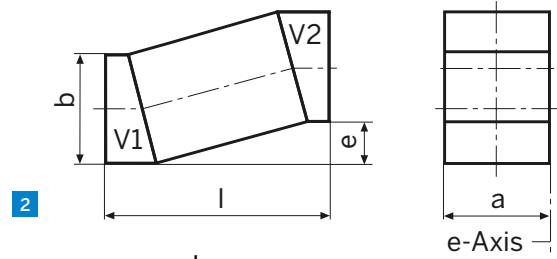
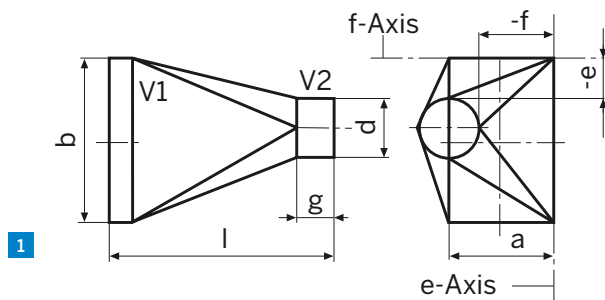
4 | KOM Combined bend/duct

5 | KOM 3 combined bend/bend

6 | US – Symmetrical transition

7 | UA – Asymmetrical transition

8 | RS – Symmetrical square to round transition



- 1 | RA - Asymmetrical square to round transition
- 2 | ES - Symmetrical offset
- 3 | EA - Asymmetrical offset
- 4 | TG - Straight T-piece
- 5 | TA - Diagonal T-piece

- 6 | HS - Y-piece
- 7 | BO - Base
- 8 | AE - Rectangular cut-out
- 9 | AR - Round cut-out

Table of ducting components

Technical requirement	Material					
	Galvanised steel	Black steel	Stainless steel	FAL	Aluminium	Platal
Version						
Folded	•		•		•	•
Welded	•	•	•	•	•	
Connection						
Frame	•		•		•	•
Slip joint	•	•	•	•	•	
Screw connection	•	•	•	•	•	
Welded butt joint		•	•	•		
Tightness						
Tightness class B	•		•		•	
Tightness class C	•		•		•	
Tightness class D	•	•	•	•	•	•
Aerosol-tight	•		•		•	•
Surface						
Hot-dip galvanised		•				
Primed/painted	•	•			•	
Chlorine-resistant paint	•	•				
Fatty acid-resistant paint	•	•				
Powder coated	•	•	•		•	
Insulation						
Double wall	•		•		•	•
Mineral wool/perforated plate, inside	•		•		•	
Cellular rubber inside/outside	•	•	•	•	•	•
Anti-drone coating	•		•		•	

Standards and guidelines

STANDARDS AND GUIDELINES

HVAC is undergoing a period of upheaval in terms of standards and regulations. Some of the DIN standards have been withdrawn and replaced by EN standards. Although fundamental contractual freedom exists, withdrawn DIN standards may no longer be used.

In a legal dispute, only the EN standards apply.

This means that there always an obligation to check that the standards are up to date.

Here is a list of standards which must always be observed for ducting:

DIN EN 1505	Sheet metal air ducts and fittings with rectangular cross section - Dimensions
DIN EN 1507	Sheet metal air ducts with rectangular section - Requirements for strength and leakage
DIN EN 12097	Requirements for ducting components to facilitate maintenance of ducting systems
DIN EN 12236	Ductwork hangers and supports
DIN EN 12599	Test procedures and measurement methods to hand over air conditioning and ventilation systems
DIN EN 13779	Ventilation of non-residential buildings
DIN 18379	VOB Part C - General technical specifications in construction contracts
DIN 18869-4	Equipment for commercial kitchens - Components for ventilation
DIN 24193-1*	Ducting for ventilation equipment; flanges; series 1 angle flanges
DIN 24193-2*	Ducting for ventilation equipment; flanges; series 2 angle flanges
DIN 1946-4	Ventilation systems in hospitals
VDI 2052	Air-conditioning - Kitchens (VDI Ventilation Code of Practice)
VDI 2087	Air ducts - Operating and construction fundamentals
VDI 2089	Building services in swimming baths
VDI 3803	Central air-conditioning systems - Structural and technical principles
VDI 6022	Hygiene requirements for ventilation and air-conditioning systems and units

* DIN 24193 Parts 1 and 2 have been withdrawn. However, their use can be agreed upon, as no equivalent EN standard exists.

CERTIFICATE OF CONFORMITY WITH VDI 6022

The sheet metal ductwork made by BerlinerLuft. Technik GmbH (BLKS) is certified as compliant with VDI 6022 and is listed by the Institut für Lufthygiene Berlin with the registration number: **HKP 09/13 -10.**

Materials

METALLIC MATERIALS

Depending on the application, ducting can be manufactured from different metallic materials

FOLDED AND WELDED VERSION

Material type	Grade	Standard	tmax (°C)
Galvanised steel (Sendzimir galvanised fine sheet steel)	DX51D + Z275 MA-C	DIN EN 10346 DIN EN 10143	+ 250 °C
Stainless sheet steel (surface 2 B)	1.4301 (V2A) 1.4571 (V4A)	DIN EN 10088	+ 500 °C
Aluminium	ALMg3	DIN EN 485 DIN EN 573-3	+ 350 °C
FAL (hot-dip aluminised sheet steel)		DIN EN 1396	+ 700 °C
Platal (folded ducting only)	DX51D + ZA255 OS: 200 µm PVC st.no.... US: 5 µm + K-	DIN EN 10346 DIN EN 143	- 20 °C/+ 80 °C
Black sheet steel (welded ducting only)	S 235 JRG 2	DIN 10130	+ 250 °C
Sealants ¹² Single-component sealant Basis:	Silicone-free Butyl rubber Acrylic Silyl modified polymer (SMP) Resistant to fatty acids Permanently elastic and UV-resistant	VDI 6022	+ 80 °C Certified

¹ For all seals, only silicon-free materials are used

² Special seals for specific applications are available on request

SURFACE FINISH

Ducting can be made from different metallic materials, depending on the application. The surface finish and corrosion protection depend on the requirements.

The necessary coating thicknesses depend on the application, and must be specified by the user in line with the relevant corrosion protection guidelines. With sheet steel, the surface is either black or galvanised.

Black and galvanised sheet steel

Surface preparation / washing and passivation

Undercoat or primer

Painting

Powder coating

KTL coating

Stainless steel

Pickling and neutralisation

Blasting

Grinding

Brushing

Sheet thicknesses and pressure ratings as per VDI 3803

Nominal dimensions (edge lengths) ¹² as per EN 1505		Wall thickness s [mm] ³							
		Folded ducting						Welded ducting	
		Low pressure L		Medium pressure M		High pressure H ^R		High pressure H	
		Max. pressure		Max. pressure		Max. pressure		Max. pressure	
a	b	Pa +1000	Pa -500	Pa +2000	Pa -750	Pa +3000	Pa -1500	Pa +6000	Pa -2500
100	100	0.6		0.7		1.0		1.5	
150	150							2.0	
200	200								
250	250								
300	300								
400	400								
500	500	0.8		0.9		1.2		3.0	
600	600								
800	800								
1000	1000								
1200	1200	1.0		1.1		1.2		3.0	
1400	1400								
1600	1600								
1800	1800								
2000	2000	1.0		1.1		1.2		3.0	
Nominal dimensions outside DIN EN 1505 > 2000 to 3000		Special non-standard components are manufactured on request. For the tender specification, the customer must state specific requirements for the sheet thickness and frame connection. They are charged for as special components.							

¹ Edge lengths a and b can be combined in any way

² For intermediate sizes, the sheet thickness is the one stated for the next higher edge length

³ The wall thicknesses are nominal thicknesses as per DIN 10143

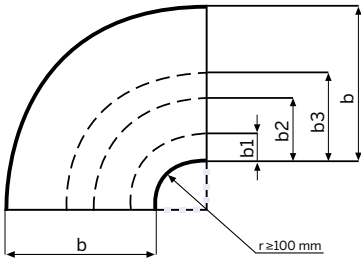
H^R Folded industrial ducting for restricted high pressure with increased sheet thickness
and additional reinforcement (available in tightness class B), max. duct length 1000 mm

Turning vanes

ARRANGEMENT OF TURNING VANES IN 90° BENDS AS PER DIN EN 1505 ¹

Width of ducting [mm]	Number of turning vanes	Space between turning vanes (approximate) [mm]		
		b1	b2	b3
400 < b ≤ 800	1	b/3	-	-
800 < b ≤ 1600	2	b/4	b/2	-
1600 < b ≤ 2000	3	b/8	b/3	b/2

Note: Bends up to 45° do not contain turning vanes



As standard, the turning vanes are fastened with sealed studs.

¹ Turning vanes as per DIN EN 1505
Edge length b as per DIN 18379 (VOB Part C)

Tightness

TIGHTNESS

To ensure that the air conditioning system operates reliably and energy-efficiently, the ducting must meet specific leak-tightness requirements. DIN EN 1507 defines the permissible leakage rate per m² of ducting surface, depending on the static internal pressure.

Diagram 1 can be used to estimate the expected leak loss for a ducting system or a section of it. To do this, starting with the average internal pressure¹, the leakage rate is read off of

the diagram and multiplied by the duct surface area. The table below shows the tightness requirements in DIN EN 1507 and the recommendations for use in DIN 13779 and VDI 3803.

¹ Static pressure difference between the internal duct pressure and the ambient pressure (both positive and negative pressure)

Airtightness class as per DIN EN 1507	Maximum air leakage m ³ x s ⁻¹ x m ⁻²	Use recommendation as per VDI 3803
A	$0.027 \times p^{0.65} \times 10^{-3}$	Not recommended
B	$0.009 \times p^{0.65} \times 10^{-3}$	Minimum requirement
C	$0.003 \times p^{0.65} \times 10^{-3}$	Standard requirement
D	$0.001 \times p^{0.65} \times 10^{-3}$	Maximum requirement

p = static interior pressure

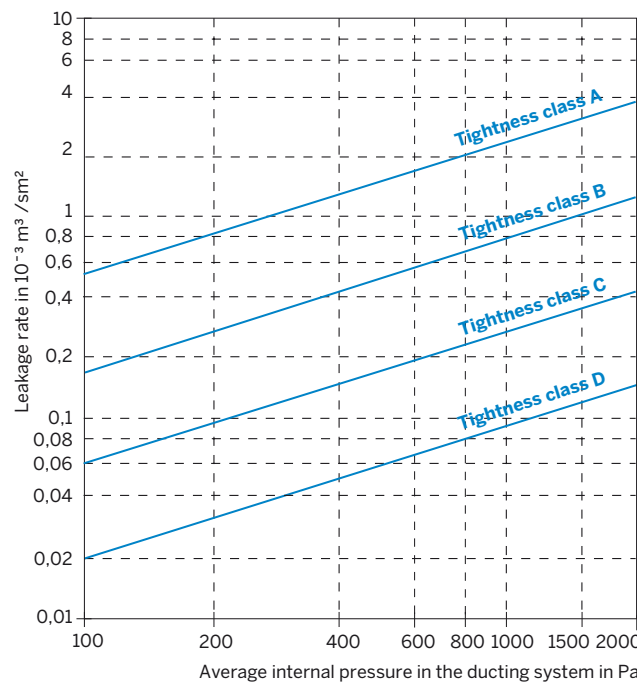


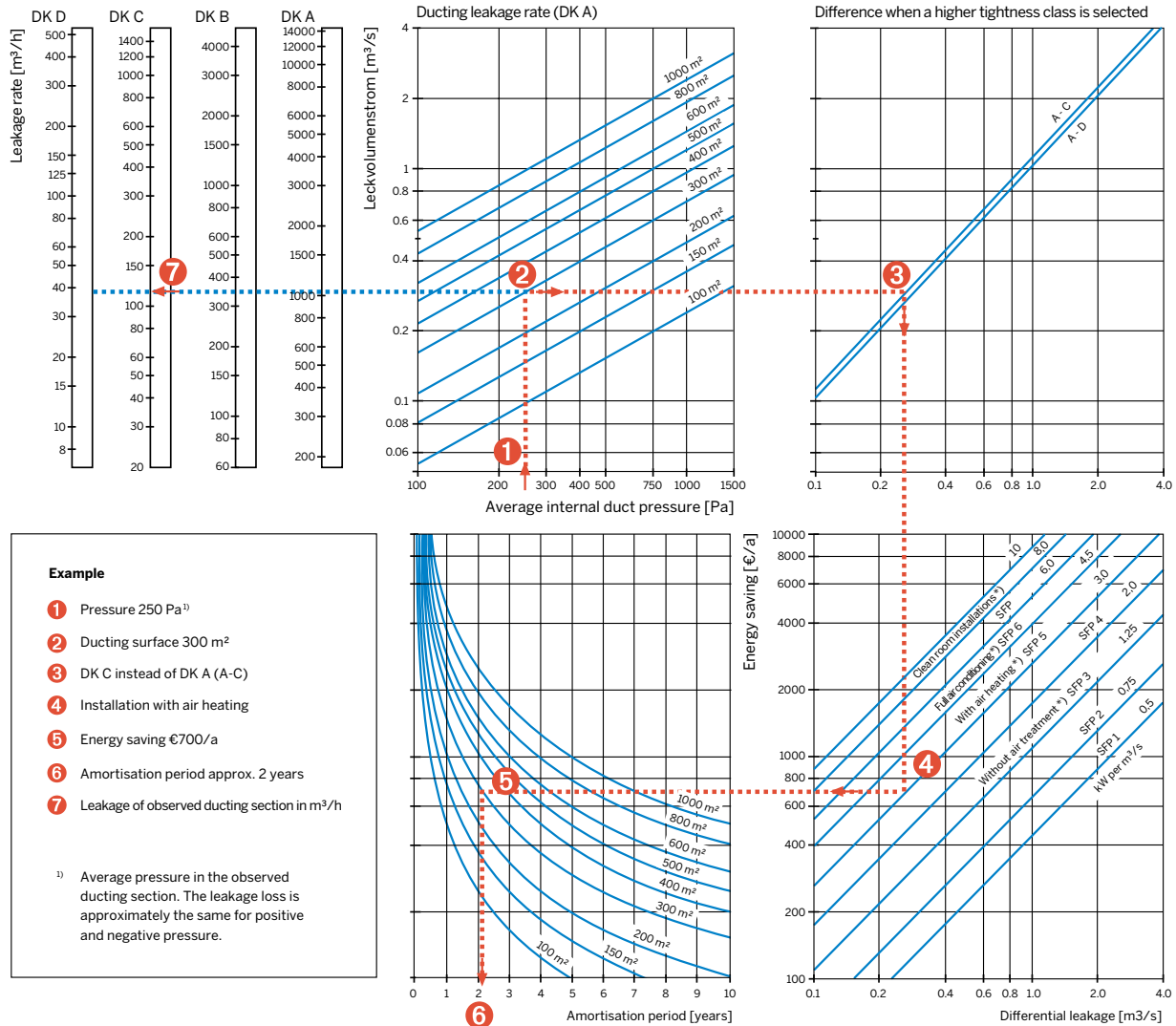
Diagram 1

PROOF OF TIGHTNESS

The tightness class must be certified on an installed section of the ductwork containing a representative number of ducts and fittings and a surface area of at least 10 m² (see DIN EN 1507, measuring procedure in DIN EN 12599).

The quality of installation has a significant effect on the leak-tightness of the ducting. In order to achieve a particular tightness class, all the components must have been designed for the respective class at the least, and must be correctly installed. To monitor the quality of installation, it is advisable to carry out a sample test of the leak rate in accordance with DIN EN 15599 during the assembly phase.

Energy savings from use of tightness class C



* The assignment of SFP classes to the type of system only includes the cost of ducting (as a rough guide)

Comparison: advantages of using tightness class C instead of class A, which has been usual up to now

The diagram is based on the following assumptions:

Energy costs 10 cents/kWh

System operated 24 hours a day

Additional cost of ducting €5.00/m²

The amortisation period is calculated using the following formula, taking account of current cost developments and the operating time:

$$A [\text{years}] = \frac{10 \text{ ct.}}{E_k [\text{ct.}]} \times \frac{B_d}{[h]} \times \frac{M_k [\text{€}]}{\text{€5}}$$

A: Amortisation period

E_k: Actual energy costs per kWh

B_d: Average operating time

M_k: Additional cost of the ducting system per m²

Component joints – maximum and minimum dimensions

Pressure rating	Profile connection				Folded flange	Angle flange	Straight flange
	LP C+ ¹		LP ²		H	H	H
	L	M	L	M			
Edge length	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
00 to 500	20	20	20	20	40	30 x 3	30 x 5
501 to 1000							40 x 5
1001 to 1250	30	30	30	30	40	40 x 4	60 x 6
1251 to 2000							
> 2000 ³			40	40	40	50 x 5	60 x 10

¹ LP C+ formed frame on duct and fitting (except US, UA, HS, BE, BD)

² LP Attached frame for the above fittings and special parts

³ Components with edge lengths greater than 2000 mm are non-standard and are manufactured as special parts.

The type of component joint must be specified by the user according to the requirements of use.

COMPONENT REINFORCEMENTS

The reinforcements on duct walls are based on the component requirements in DIN EN 1507 specifying limits for rigidity and stability of form.

The specific requirements are compiled in an internal company standard.

Generally, the following types of reinforcement are used. Walls of duct and fittings up to a sheet thickness of 1.25 mm always have a trapezoidal corrugated profile.

BLKS trapezoidal corrugations have profile depths and flank angles that optimise flow and are classified as smooth-walled as regards VDI 6022.



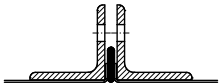
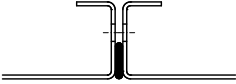
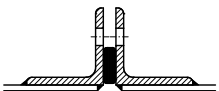
For certain pressure ratings and component dimensions, additional side wall reinforcements are required. These take the form of

Internal tubular supports

Internal or external sheet metal rails

Internal ribs (only on welded ductwork when necessary)

Flange connections

Folded components					
Flange designation		Code	Diagram	Connection ¹ with	Standard component length Duct [mm]
Folded components	Profile connection formed	LP C		4-hole corner joint plus duct clamps	1500
	Profile connection attached	LP		4-hole corner joint plus duct clamps	1500
	Angle flange, recessed	W 1		Bolted joint Hole spacing 125 mm or special hole spacing	1480
Welded components	Welded components Folded flange	WA		Bolted joint Hole spacing 125 mm or special hole spacing	1350 at 40/20 mm forward/backward fold
	Angle flange, welded flush	W 2		Bolted joint Hole spacing 125 mm or special hole spacing	1500

¹ Observe the assembly recommendation

Assembly recommendation

FOR JOINTS (FLANGES) OF DUCT COMPONENTS

Pressure range Pa	Pressure rating	Tightness class	Sealing material for flange	Spacing of duct brackets or bolted joints
+ 1000 / - 500	L	A	Duct tape 12 x 6	for a or b > 750 max. 400 mm
		B	Duct tape 12 x 6	for a or b > 750 max. 400 mm
		C	Duct tape 12 x 6	for a or b > 400 max. 200 mm
+ 2000 / - 750	M	B	Duct tape 12 x 6	for a or b > 750 max. 400 mm
		C	Duct tape 12 x 6	for a or b > 400 max. 200 mm
+ 3000 / - 1500 (Folded industrial ducting)	HR	B	Duct tape 12 x 6	for a or b > 550 max. 300 mm
+ 6000 / - 2500	H	C	Duct tape 12 x 6	Hole spacing 125 mm
		D	Duct tape 12 x 6	Hole spacing 125 mm

HR^R Folded industrial ducting for restricted high pressure level with increased sheet thickness
and additional reinforcement (available in tightness class B), maximum duct length 1000 mm

TOLERANCE RANGES

Sheet metal ducts

Edge length [mm]	Max. deviation [mm]
a or b	
100 - 1000	0 -3
1001 - 2000	0 -4
> 2000	0 -5
Component length [mm]	0.005 x L

Sheet metal fittings

Component dimensions	Max. deviation [mm]
a, b, c, d, e, f	0 -4
l, l_p, r	0 -5
> 15 / < 100 mm	
> 100	0 -4
> 2000	0 -10
Angle tolerance	+/- 1°

Transport and storage

CLEANLINESS OF DUCTWORK (VDI 6022)

Depending on the hygienic requirements, ducts and fittings may have to be protected from dirt during transport and storage on the site or cleaned before assembly. In accordance with VDI 6022, requirements for the cleanliness of components are divided into three levels.

The standard option offered by the manufacturer is visibly clean, non-packaged components.

Other requirements (such as cleaning, closing ends, complete single or multiple packaging) must be specified at the planning stage.

Level	Packaging ex works	Protection during transport	Protection during storage	Cleaning on site	Sealing openings on site
Basic level	No	No	No	No	Only rising ducts
Medium level	No	No	Yes	Yes	Yes
Higher level	Yes	Yes	Yes	Yes	Yes

COST CALCULATION UNITS

The cost of ducts and fittings is standardised and is based on the surface area in m².

The basis for this is: **DIN 18379**

German construction contract procedures (VOB)

Part C: General technical specifications in construction contracts (ATV)

Installation of air conditioning systems

The price is calculated by m² of component surface area. The calculation formulae are standardised for each component. The costs are calculated in price groups.

Straight ducts up to a component length of 900 mm are priced as fittings. The minimum size for price calculation is 1 m² per component.

Price calculation group		Maximum edge length [mm]
Ducts	Fittings	
L1	F1	up to 500
L2	F2	> 500 to 1000
L3	F3	>1000 to 1500
L4	F4	> 1500 to 2000
L5	F5	> 2000 (outside standard)

Special ducting

KITCHEN EXHAUST AIR DUCTING

Ducting for kitchens is subject to special hygiene and safety requirements. The basis for this is DIN 18869 Part 4 and VDI 2052.

Exhaust air ducting in kitchens must be greaseproof and aerosol-proof. The materials used are galvanised sheet steel and stainless steel (V2A 1.4301).

RECOMMENDATIONS FOR USE

Ducting type	Galvanised steel	Stainless steel	Tightness class	Seal	Notes
Fresh air	x	x	C	Grease-resistant Permanently elastic	Folded ducting with additional seal
Exhaust air	x	x	C	Folded and sealed	Not always suitable, due to complex sealing during production and assembly
	x	x	D	Welded	Components are greaseproof and aerosol-proof, high quality of assembly required

Galvanised ducting through which aerosols might enter food processing areas must be coated with paint.

DUCTING FOR SWIMMING BATHS

Requirements for building services in swimming baths are specified in VDI 2089.

There are no special requirements for metal ventilation ducting in swimming baths. Some references are made to the requirements for ducting in kitchens.

We also offer sheet steel ducting components with painted surfaces. Depending on the application, the interior or exterior surfaces should be protected.

Thermal and acoustic insulation

INSULATION REQUIREMENTS FOR DUCTING

Reduced heat loss

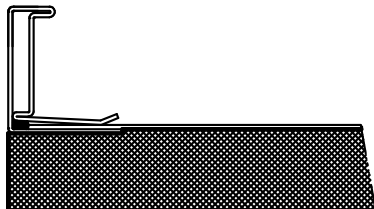
Temperature dropping below dew point

Reduced sound emissions

Note

The customer must always check that type and structure of the insulation is suitable for the application.

Interior thermal insulation (self-adhesive cellular rubber)



Insulation thickness [mm]	Weight kg/m ²	U-value W/m ² C
19 mm		1,736
up to EL 1000	8.4	
> EL 1000	9.5	

Exterior thermal insulation (self-adhesive cellular rubber)

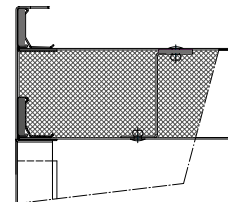


Insulated components for outdoor assembly, cold insulation or special applications on request

As well as insulation after complete assembly of the ducting, there is also the option of using ready-insulated components. This option is used indoors when insulation after installation is not possible due to lack of space.

Double-wall thermal insulation

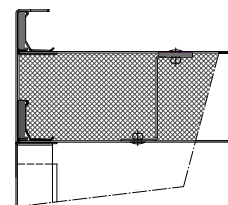
Mineral wool with sheet metal shell



Insulation thickness [mm]	Weight kg/m ²	U-value W/m ² C
50		0.9
up to EL 1000	16	
> EL 1000	19	
100		0.45
up to EL 1000	17.5	
> EL 1000	20.5	

Acoustic insulation

Mineral wool with perforated sheet metal shell



Insulation thickness [mm]	Weight kg/m ²
50	
up to EL 1000	12.5
> EL 1000	14
100	
up to EL 1000	15
> EL 1000	16.5

Smoke extraction – XDuct® smoke extraction ducting

XDuct® is a smoke extraction ducting system made of galvanised sheet steel with the general approval certificate P-TUM-428, tested at the research and test laboratory of the Institute for Air Conditioning and Building Services of the Technical University of Munich. The test took place with 1500 Pa negative pressure at room temperature and 500 Pa negative pressure at 600 °C over a period of 120 minutes as required by DIN 18232-6 and DIN EN 1366-8.

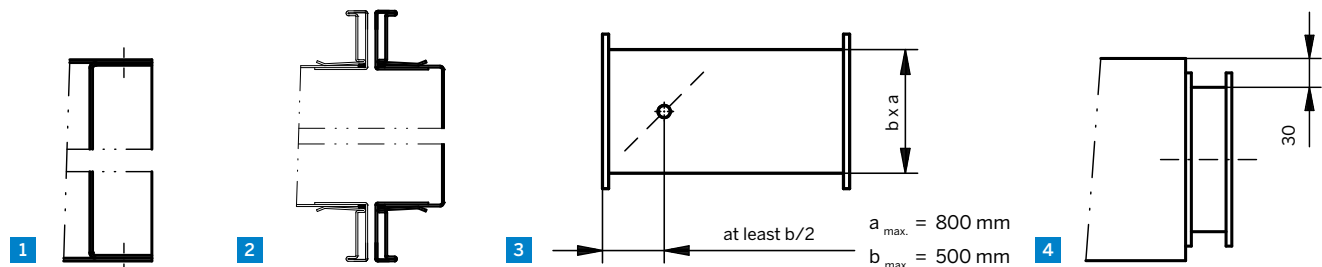
The smoke extraction ducting is a complete system of ducts and fittings made of folded galvanized sheet steel, and complies with Building Code A part 2 no. 2.36. The tested system has a much reduced pressure drop, less risk of transit damage, and is more lightweight and therefore easier to install than other solutions made of calcium silicate plates. The ducts and fittings are made of 1 mm galvanised sheet steel with additional reinforcements and a 30 mm lightweight section frame.

Smoke extraction ducting up to a cross section of $W \times H = 1250 \times 1000$ mm is used. The installation material required for the XDuct® system (wall anchors, duct crossbeams, duct tape, putty) is also subject to certification for fire safety and is also supplied on request.

XDuct® smoke extraction ducting with general approval certificate P-TUM-428 with Ü and CE label.



Duct accessories



- 1 | Pre-fitted duct base
- 2 | Separate duct base
- 3 | Duct with damper
(Damper adjuster with setting mark)
- 4 | Duct base with rectangular or round connector

OVAL INSPECTION PANEL WITH 2 STAR KNOBS

Nominal size	Dimensions				
Type		RD	RD-SKK	RD-HT	IRD
Tightness class		B	C		
Range of application		-70 °C/+70 °C	-70 °C/+100 °C	up to 400 °C	up to l thickness 50 mm
21	200 x 100	All listed types and dimensions are available in the following materials: galvanised steel, corrosion-resistant steel (V2A and V4A), aluminium			
32	300 x 200				
43	400 x 300				
54	500 x 400				
65	600 x 500				

- RD = Inspection panel
- RD-SKK = Inspection panel with self-adhesive edge guard
- RD-HT = Inspection panel for high temperatures
- IRD = Insulated inspection panel

Drain outlets	1/2 " 3/4 " 1.0 " 1 1/2 "
Angle frame for equipment connection Hole spacing 125 mm or special hole spacing	30 x 30 x 3 40 x 40 x 4 50 x 50 x 5
Installation material	Hex bolts M 8 x 25 Hex nuts M 8 Washers DN 9 Duct clamps C clamp (100 mm long) Self-adhesive installation tape (only for tightness class A) Butyl rubber sealing putty (for tightness class B, C, D)

Other accessories are available on request.

Tender specification texts

FOLDED GALVANISED STEEL DUCTS AND FITTINGS

Folded galvanised steel ducts and fittings as per DIN EN 1505, DIN EN 1507 and VDI 3803

Pressure rating L (low pressure); +1000/-500 Pa

Pressure rating M (medium pressure); +2000/-750 Pa

Sheet thickness depending on the above pressure rating

Components suitable for assembly ducting in

tightness class B as per DIN EN 1507

BLKS B-Duct ducting system or

Tightness class C as per DIN EN 1507

BLKS C+Duct ducting system

Duct flange joint with 4-hole corner fixing, mainly with touching duct profile.

The additional seal on the seams and corners must be permanently elastic, water-insoluble, chemical-resistant and silicon-free.

Duct walls reinforced with BLKS trapezoidal corrugated profile, with optimum pipe friction coefficients.

Additional (internal) reinforcements for optimised acoustic properties depend on the operating pressure, sheet thickness and component dimensions according to the factory standard.

Additional requirements (as necessary)

To ensure that the ducting is clean as per DIN EN 12097 or VDI 6022

Basic level:

Delivery without packing or transport protection, assembly with only rising ducts sealed

Medium level:

Delivery without packaging or transport protection, protection during storage, cleaning before assembly, openings sealed

Higher level:

Delivery with packaging and transport protection (e.g. ends closed), protection during storage, cleaning before assembly, openings sealed

KITCHEN EXHAUST AIR DUCTING

(Text as above) The additional seal on the seams and corners must be permanently elastic, water-insoluble, chemical-resistant and silicon-free.

All components must be coated on the outside and/or inside with chemically resistant paint, RAL colour

DUCTING FOR SWIMMING BATHS

(Text as above) The additional seal on the seams and corners must be permanently elastic, water-insoluble, chemical-resistant and silicon-free.

All components must be coated on the outside and/or inside with chemically resistant paint, RAL colour

Tender specification texts

FOLDED STAINLESS STEEL DUCTS AND FITTINGS (1.4301 OR 1.4571)

Folded stainless steel ducts and fittings 1.4301 (1.4571)

Pressure rating L (low pressure); +1000/-500 Pa

Pressure rating M (medium pressure); +2000/-750 Pa

Sheet thickness min. 0.8 mm; max. 1.0 mm

Components suitable for assembling ducting

In tightness class B according to DIN EN 1507
BLKS BDuct ducting system or

Tightness class C according to DIN EN 1507 BLKS C+Duct ducting system

Duct flange joint with 4-hole corner fixing, with attached duct profile

The additional seal on the seams and corners must be permanently elastic, water-insoluble, chemical-resistant and silicon-free.

Duct walls reinforced with BLKS trapezoidal corrugated profile, with optimum pipe friction coefficients.

Additional (internal) reinforcements for optimised acoustic properties depend on the operating pressure, sheet thickness and component dimensions according to the factory standard.

Additional requirements (as necessary)

To ensure that the ducting is clean as per DIN EN 12097 or VDI 6022

Basic level:

Delivery without packaging or transport protection, assembly with only rising ducts sealed

Medium level:

Delivery without packaging or transport protection, protection during storage, cleaning before assembly, openings sealed

Higher level:

Delivery with packaging and transport protection (e.g. ends closed)

Protection during storage, cleaning before assembly, openings sealed

KITCHEN EXHAUST AIR DUCTING

(Text as above) The additional seal on the seams and corners must be permanently elastic, water-insoluble, fatty-acid-resistant, aerosol-tight and silicon-free.

INDUSTRIAL FOLDED GALVANISED STEEL DUCTS AND FITTINGS

Folded galvanised steel ducts and fittings

Pressure rating H^R (high pressure restricted); +3000/-1500 Pa

Sheet thickness min. 1.0 mm; max. 1.2 mm

Components suitable for assembling ducting

In tightness class B according to DIN EN 1507 BLKS BDuct ducting system

Duct flange joint with 4-hole corner fixing, with attached duct profile

The additional seal on the seams and corners must be permanently elastic, water-insoluble, chemical-resistant and silicon-free.

Duct walls reinforced with BLKS trapezoidal corrugated profile, with optimum pipe friction coefficients.

Additional (internal) reinforcements for optimised acoustic properties depend on the operating pressure, sheet thickness and component dimensions according to the factory standard.

Additional requirements (as necessary)

To ensure that the ducting is clean as per DIN EN 12097 or VDI 6022

Basic level:

Delivery without packing or transport protection, assembly with only rising ducts sealed

Medium level:

Delivery without packaging or transport protection, protection during storage, cleaning before assembly, openings sealed

Higher level:

Delivery with packaging and transport protection (e.g. ends closed), protection during storage, cleaning before assembly, openings sealed

Tender specification texts

WELDED DUCTS AND FITTINGS

Welded ducts and fittings as per DIN EN 1505, DIN EN 1507 and VDI 3803 made of

galvanised steel with cold galvanised welds

Stainless steel 1.4301 (1.4571), brushed welds

Aluminium AlMg3

Welds may not be ground

Pressure rating H (high pressure); +6000/-2500 Pa

Sheet thickness appropriate for the above pressure rating and component cross sections (see BLKS documentation), but at least 1.5 mm

Components suitable for assembly ducting in

Tightness class D according to DIN EN 1507

BLKS DDuct ducting system

Duct flange connections W1, W2, WA, F2 with 125 mm hole spacing as standard or special hole spacing.

External duct wall reinforcement depending on pressures stated in factory standard

Additional requirements (as necessary)

All components must be coated on the outside and/or inside with chemically resistant paint, RAL colour, coating thickness µm

To ensure that the **ducting is clean** as per DIN EN 12097 or VDI 6022

Basic level:

Delivery without packing or transport protection, assembly with only rising ducts sealed

Medium level:

Delivery without packaging or transport protection, protection during storage, cleaning before assembly, openings sealed

Higher level:

Delivery with packaging and transport protection (e.g. ends closed), protection during storage, cleaning before assembly, openings sealed

Assembly information

FOR DUCTING REQUIRING TIGHTNESS CLASS C ACCORDING TO DIN EN 1507

Several factors determine whether the tightness class can be ensured. The fundamental requirement is that the components are carefully manufactured. The order must state which tightness class is needed. Assembly on site is equally important in this respect.

As the manufacturer, we would like to provide you with the necessary information.

Unloading and transporting components

Visually check all components for external damage.

Check that tightness class C is correctly shown on the labels.

Unload the components with care to avoid any damage.

Use suitable equipment to transport the components (do not pull on the frame joint).

Store them in a proper manner on the site.

Assembly

Visually check the components again for external damage.

Make sure that the frame joint is clean.

Attach the duct tape flush with the inside edge of the duct profile.

Attach the duct tape crosswise in the corner area of the profile.

Make sure the bolt connections on the corners are tight.

Use duct brackets for edge lengths above 400 mm, with a maximum spacing of 200 mm.

About 2 days later, check that the bolt connections on the frame are tight (duct tape has settled).

Only use mating parts with the specially supplied frames (with internal sealant).

Fasten the frame using tightly closing blind rivets, so that it is positively seated on the component (do not use self-tapping screws).

Afterwards, seal the corner area of the profile frame on the inside.

Do not fasten any additional attachments with self-tapping screws (only blind rivets).

Seal attachments afterwards using a suitable sealant (compliant with VDI 6022).

Flexible connectors, louvres, silencers etc. must be shown to meet the requirements of tightness class C.

Leakage tests

On-site leakage tests in accordance with DIN EN 12599 are offered by external, independent contractors.

The tests should already be defined at the planning stage and carried out during the assembly stage. See the information sheet "Measuring leaktightness on ducting systems" (www.BerlinerLuft.de/de/luftfuehrung)

Flexible connectors (compensators)



Flexible connectors

APPLICATION

Flexible connectors (expansion joints) are used in HVAC systems for

Isolating structure-borne noise

Absorbing expansion

Fire damper connections (for smoke extraction ducts as per DIN V 18232-6, see catalogue section 7.3 XDuct® smoke extraction duct, accessories, non-metallic expansion joints)

STANDARDS AND GUIDELINES

DIN EN 13501

Classification of construction products

DIN EN 4102

Fire behaviour of building materials and building components

DIN 75200

Determination of burning behaviour of interior materials

DIN 53359 A

Flex cracking test

VDI 6022

Hygiene requirements for ventilation and air-conditioning systems and units

Loba guideline (NRW regional mining inspectorate)

ATEX directive 94/9/EC

Design and testing principles of the DiBt (German Institute for Structural Engineering)

DESIGN DETAILS

Depending on the application, various types of coated types of fabric are used, either as prefabricated strips sandwiched in sheet steel, or without a sheet steel surround. The strips are cut to size and shaped to form rectangular or round cross sections and fitted with frames for the components to be connected. The joints of the flexible part are glued, sewn or welded depending on the type of backing material.

For the approved ATEX version, a special material with a fixed composition is used. The maximum circumference of a flexible duct connector is 6500 mm. For instructions on use, see the enclosed type examination certificate.

DECLARATION OF CONFORMITY

Flexible connectors of the type EK / P600S are certified according to VDI 6022

ILH reg. no.: HBMP / D / 0057 / 8BL / ...

Flexible connectors of the type EK / ATEX are type tested:

Reg. no.: IBExU 09ATEXB003 X



1



2



3

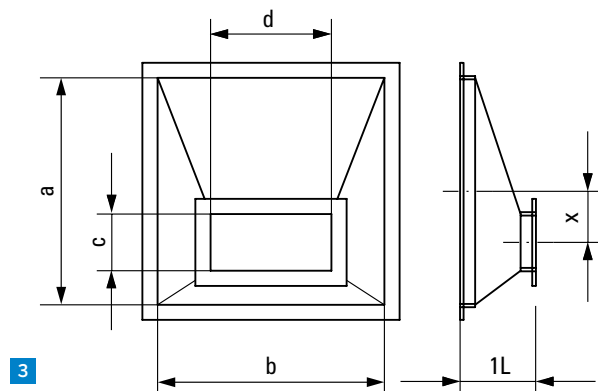
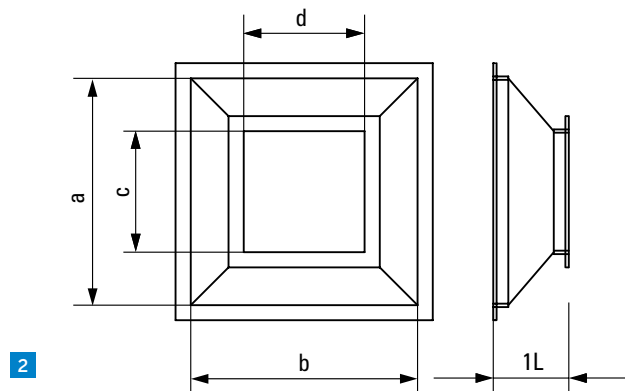
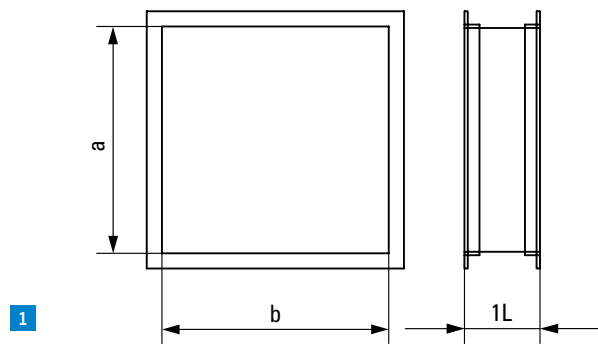
1 | PVC flexible duct connector

2 | Glass wool duct connector

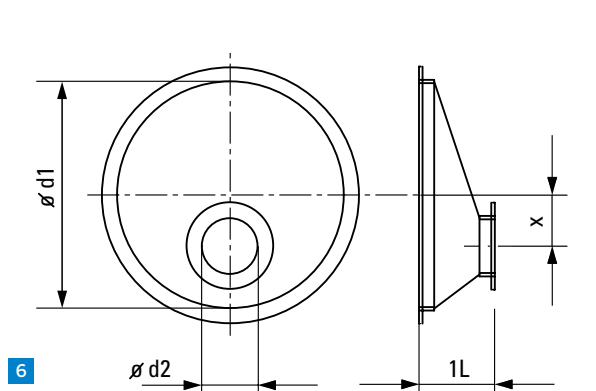
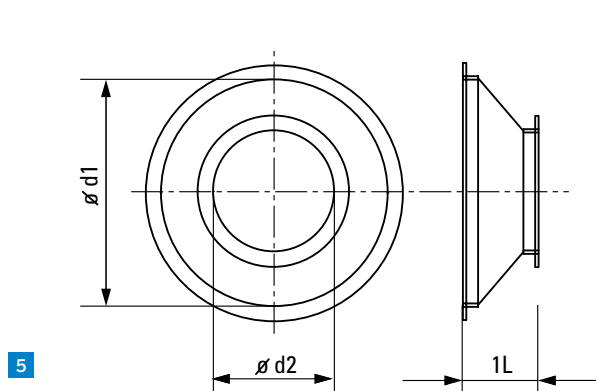
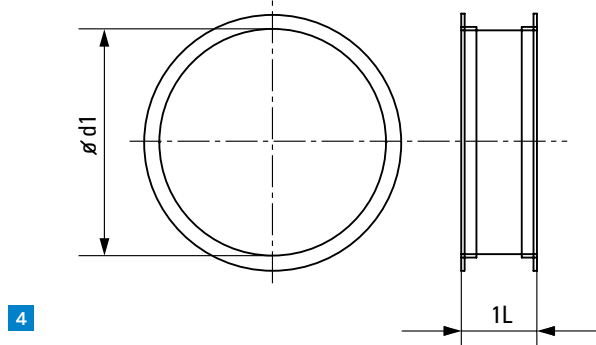
3 | PVC flexible tube connector

Designs

FLEXIBLE DUCT CONNECTORS



FLEXIBLE TUBE CONNECTORS



- 1 | EK Flexible duct connector
- 2 | EÜK-s Flexible symmetrical transition duct connector
- 3 | EÜK-as Flexible asymmetrical transition duct connector

- 4 | ER Flexible tube connector
- 5 | EÜR-s Flexible symmetrical transition tube connector
- 6 | EÜR-as Flexible asymmetrical transition tube connector

TYPES OF CONNECTING FRAME

Flexible duct connectors with sheet steel surround	Flexible duct connectors without sheet steel surround	Flexible tube connectors with sheet steel surround	Flexible tube connectors without sheet steel surround
With duct profile 20 / 30 / 40	With duct profile 20 / 30 / 40	Sheet steel surround with flange for clamp ring	Only as sleeve with tape
With recessed straight frame		With METU flange / clamp ring	
With recessed angle frame		With recessed straight flange (DIN 24154)	
Corners sealed		With recessed angle flange (DIN 24150)	

MATERIALS

Type	Backing material	Coating	Temperature		Fire resistance
			Min.	Max.	
PVC	Polyester	PVC	- 25° C	+70° C	<100 mm / min (DIN 75200)
P 600 S	Polyester	PVC	- 25° C	+70° C	Flame retardant as per DIN 4102 B1 / B2
PVC-ATEX	Polyester	PVC	- 25° C	+70° C	Flame retardant as per DIN 4102 B1 / B2
Glass / aluminium	Glass fabric	Aluminium / polyester foil on one side	- 40° C	+200° C (coating) +500° C (glass fabric)	Flame retardant as per DIN 4102 B1 / B2
Neoprene	Polyester	Synthetic rubber	- 40° C	+100° C (+130° C briefly)	

All materials are free of silicone.

PRESSURE RATINGS AND TIGHTNESS CLASSES

Flexible connectors can be used
up to pressure rating M (+2000 Pa/ -1000 Pa)
for tightness class C as per EN 1507

Special designs are available for higher requirements if specified in detail.

Designs

DIMENSIONS – COMPONENT LENGTHS

Type	Sheet steel / flexible material / sheet steel	Straight length ¹ mm	Recommended fitted length mm	Remarks
PVC	45 / 60 / 45 35 / 100 / 35 45 / 120 / 45	150 170 210	110 -130 100 -150 130 -190	Use on fire dampers ²
P 600 S	45 / 60 / 45 45 / 120 / 45	150 210	110 -130 130 -190	Tested as per VDI 6022 ⁴
PVC-ATEX	45 / 60 / 45	150	110 -130	ATEX-approved ³ electrical surface resistance $< 1 \times 10^{8 \text{ ohm}}$
Glass / aluminium	35 / 100 / 35 45 / 120 / 45	170 210	100 -150 130 -190	
Neoprene	45 / 60 / 45	150	110 -130	

¹ Different straight lengths are produced without sheet steel surrounds on both sides

² According to the DiBt design and test guidelines, the flexible part must be at least 100 mm when used on fire dampers

³ ATEX approval no. IBExU09ATEXB003 X

⁴ ILH reg. no.: HBMP/D/0057/8 BL

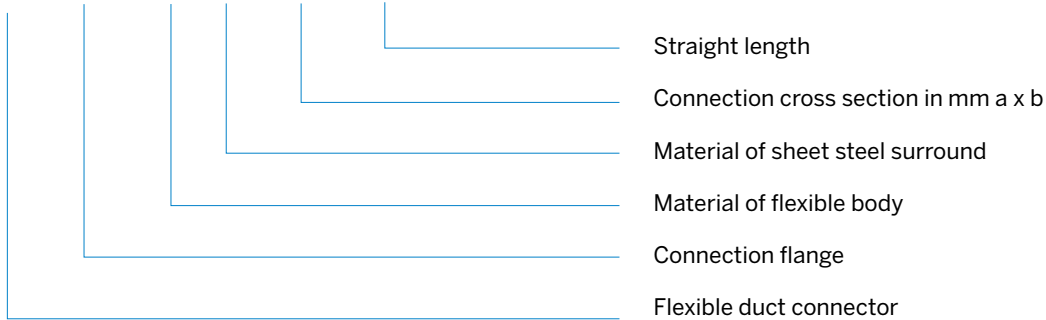
DIMENSIONS – CONNECTION CROSS SECTIONS

Type EK – Flexible duct connector		Edge length A max. 1250 mm Edge length B max. 2000 mm
Type EÜK – Flexible transition duct connector	Symmetrical transition	Flexible material without sheet steel surround Max. step in edge length 200 mm Straight length min. 200 mm
	Asymmetrical transition	Flexible material without sheet steel surround Max. step in edge length 100 mm Max. offset 100 mm Straight length min. 200 mm
Type ER – Flexible tube connector		DN 100 to DN 1250 Flanges R1 and R2
Type EÜR – Flexible transition tube connector	Symmetrical transition	Max. step in diameter 130 mm Straight length min. 200 mm
	Asymmetrical transition	Max. step in diameter 100 mm Max. offset 100 mm Straight length min. 200 mm

Type codes

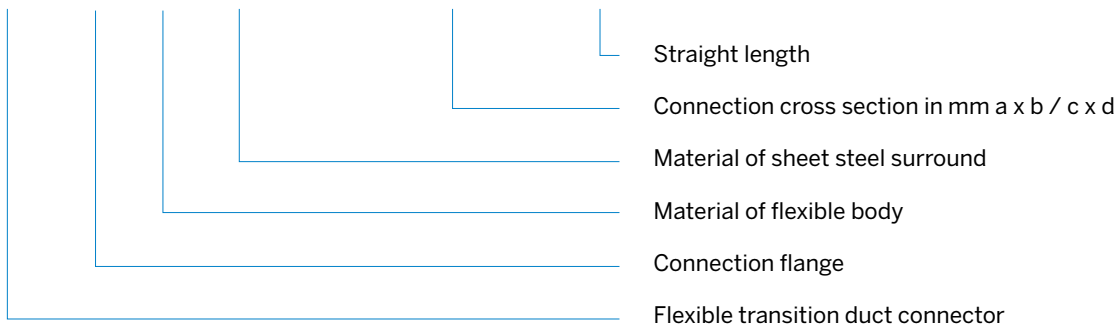
FLEXIBLE DUCT CONNECTOR (EK)

EK - P20/P20 - PVC - vz - 500x400 - 150



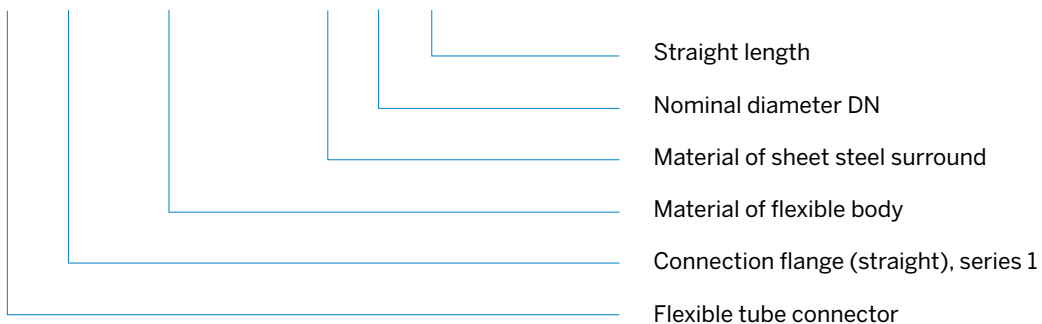
FLEXIBLE TRANSITION DUCT CONNECTOR (EÜK)

EÜK - P20/P30 - PVC - stainless steel - 1000 x1000 / 1120 x1120 - 200



FLEXIBLE TUBE CONNECTOR (ER)

ER - F1/F1 - glass / aluminium - vz - 400 - 170



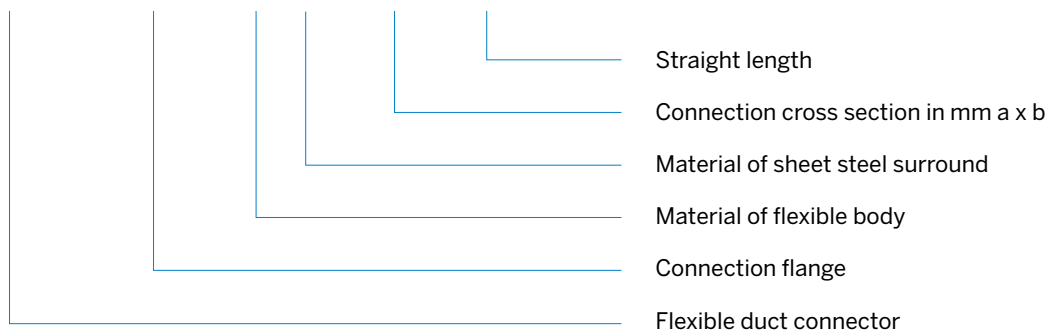
FLEXIBLE TRANSITION TUBE CONNECTOR (EÜR)

EÜR - W1/W1 - neoprene - stainless steel - 630 / 500 - 150



FLEXIBLE DUCT CONNECTOR WITH TYPE EXAMINATION CERTIFICATE (EK/ATEX)

EK / ATEX - P20 / P20 - PVC - vz - 500 x 400 - 150



Tender specification text

Flexible connector (expansion joint) for isolating structure-borne noise and absorbing expansion in HVAC systems, consisting of flexible material connected enclosed in sheet steel strips

Made of ...	Complete as appropriate:
	PVC
	P 600 S (with hygiene test certificate no.: ILH reg. no.: HBMP / D / 0057 / 8 BL ...)
	PVC-ATEX (with ATEX test certificate no. IBExU09ATEXB003 X)
	Glass / aluminium
Type ...	Neoprene:
	Complete as appropriate:
	Flexible duct connector (EK)
	Flexible transition duct connector (EÜK)
	Flexible tube connector (ER)
	Flexible transition tube connector (EÜR)
Straight length ...	Type-tested flexible duct connector (EK/ATEX)
	Complete as appropriate:
	150
	170
Connection frame ...	210
	Complete as appropriate:
	Duct profile 20 (30 ; 40)
	Straight frame or flange
Connection frame material ...	Angle frame or flange
	Complete as appropriate:
	Galvanised steel
Type code:	Stainless steel (1.4301)
	Flexible connectors (expansion joints)
Manufacturer:	BerlinerLuft. Technik GmbH

Panels and sandwich walls



Panels and sandwich walls

PRODUCT DESCRIPTION

BerlinerLuft. Sandwich walls consist of a 60 mm thick layer of mineral wool insulation in a sheet steel shell. They can be used to make roofs, interior walls and partitions. They are suitable for constructing housings and chambers for ventilation, machinery and soundproofing. The panels are joined together with connecting elements to make walls. Standard version without coating

Dimensions

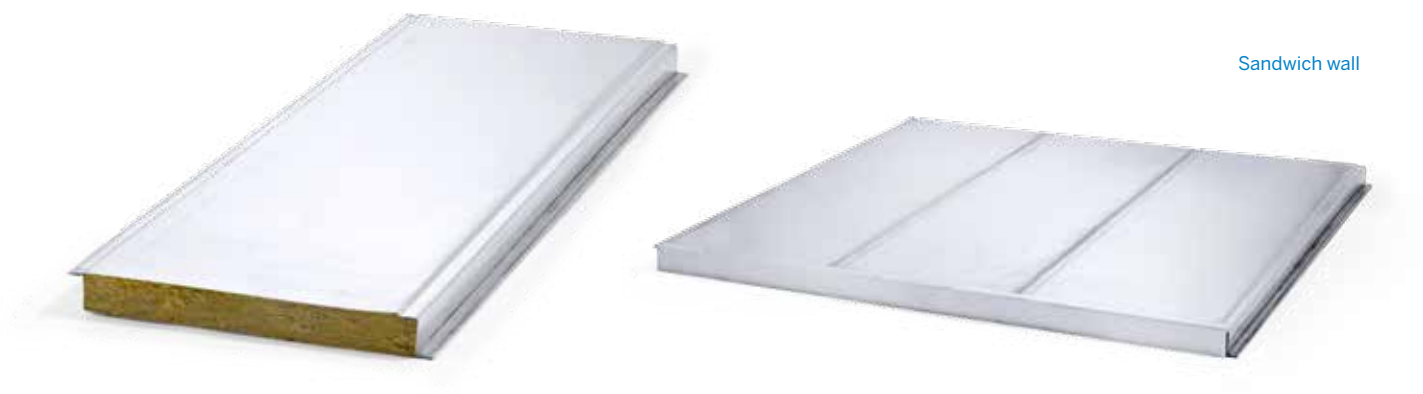
Width up to 500 mm
Length up to 5000 mm, total wall thickness 65 mm
including 2 x 1.0 mm sheet steel thickness

Material



Galvanised 1.0 mm-gauge sheet steel
DX51D+Z275MA chemically passivated, de-oiled

Insulation

For walk-on floors or ceilings 60 mm: RPF-100 fireproof panels; minimum density 100 kg/m³.
For other walls 60 mm: RPF-50 fireproof panels; minimum density 50 kg/m³.
Non-combustible as per DIN 4102/A1



Sandwich wall

Version	Designation
	SW60 straight galvanised sandwich wall, ISO 60/RPF – 100 Width 500 mm, insulation weight 100 kg/m³, walk-on, mounting profiles supplied
	SW60 straight galvanised sandwich wall, ISO 60/RPF – 50 Width 500 mm, insulation weight 50 kg/m³, mounting profiles supplied

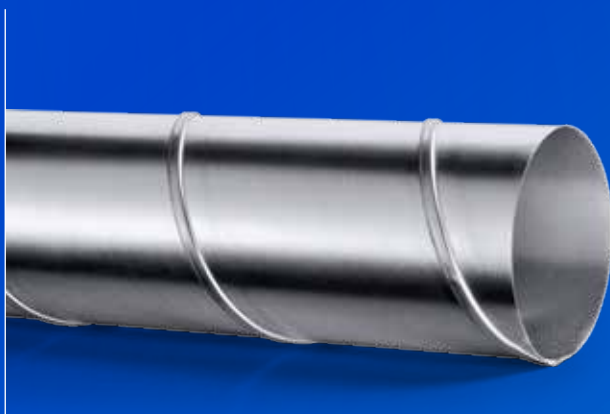
ACCESSORIES

Painted in RAL colour on one side	
Cut-outs with surround	
2000 x 1000 mm galvanised door with 3 levers 1800 x 0800 mm galvanised door with 3 levers 1800 x 0600 mm galvanised door with 2 levers 1200 x 0800 mm galvanised door with 2 levers 1200 x 0600 mm galvanised door with 2 levers 0800 x 0600 mm galvanised door with 2 levers 0600 x 0600 mm galvanised door with 1 lever	Not including assembly
Lock	

Performance: Delivered without assembly

Fasteners, framework elements, doors and wall openings
are supplied on request.

Round ducting



Round ducting

Pressed, folded

PRODUCT RANGE

Round ducting components are part of the ducting system in central ventilation systems and are suitable for optimised air flow. The BerlinerLuft. round duct and fitting system is available with or without lip seals, in a complete range of galvanised steel, stainless steel or aluminium.

Technical features

The round ducts and fittings comply with DIN EN 12237 and DIN EN 1506. The slip joint system with sealing lips is suitable for achieving tightness class D. This means that the hygiene requirements of VDI 6022 can be met in full. The static pressure limit is +2000 Pa, -750 Pa.

Design

Round fittings up to DN 250 are generally pressed parts. Nominal diameters above this are folded.

Material

The choice of material depends on the type of air carried (e.g. normal room air, dusty process air or air polluted with chemicals). The following are available:

Galvanised steel

Stainless steel

Aluminium

Sheet thicknesses

Depending on whether the components are pressed or folded, sheet thicknesses between 0.5 and 1.25 mm are available.

Connection systems

The standard type of connection is the slip joint. This type of connection should be preferably used for nominal diameters up to 630. Nominal diameters above this usually have METU flanges with clamp rings. In special cases, a recessed flange connection can be used. The flanges correspond to DIN 24154 series 1 or 2.

PRODUCT RANGE

Our complete range of ducting in all sizes and dimensions can be found in the latest BerlinerLuft. price list.*

Galvanised spiral tubes

Galvanised longitudinal seam-welded ducts

Galvanised fittings with and without lip seals

Stainless steel spiral tubes

Stainless steel longitudinal seam-welded ducts

Stainless steel fittings with and without lip seals

Flexible tubes made of aluminium, stainless steel, galvanised steel and plastic

Soundproofing systems - flexible aluminium silencers

Assembly / pre-assembly

Round fresh air and exhaust air systems

Round galvanised cowls

Galvanised intake and discharge bends

Galvanised roof collars and flashing

Round stainless steel cowls

Stainless steel roof collars and flashing

Galvanised insulated tubes

Galvanised insulated spiral tubes and fittings 25/50 mm

Installation material and accessories

* The price list is available on the internet at www.berlinerluft.de/luftfuehrung or as a printed version.

Round ducting

Pressed, folded



1



2



3



4



5



6



7



8



9



10



11

- 1 | Spiral tubes
- 2 | Bends
- 3 | Reducers
- 4 | Branches
- 5 | Connectors
- 6 | Dampers
- 7 | Discharge outlets
- 8 | Flexible tubes
- 9 | Flexible silencers
- 10 | Jet caps
- 11 | Louvred cowls

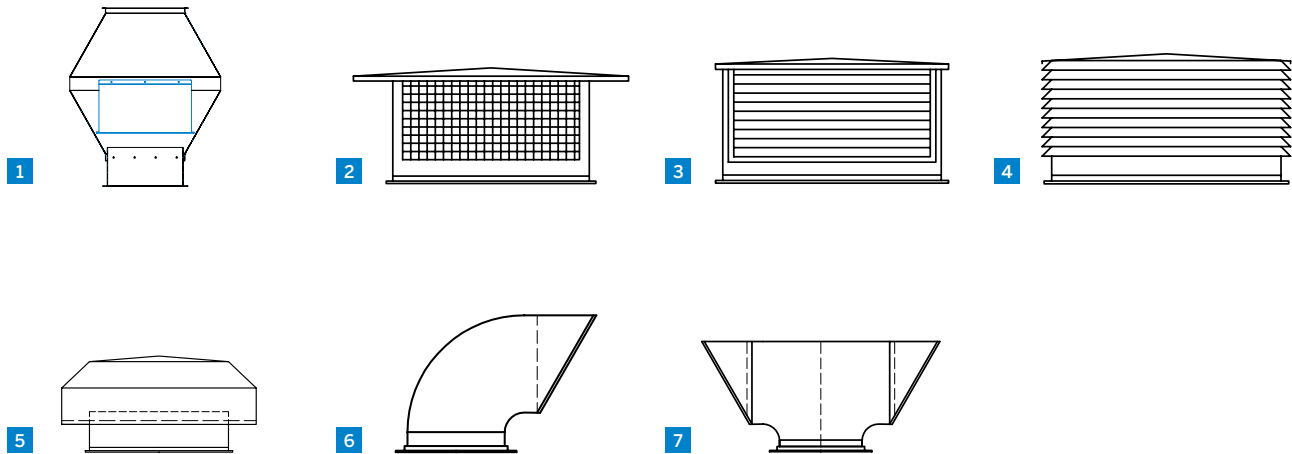
BerlinerLuft. manufactures its products using the high-quality Spiro® System. Detailed information on each product and the system certifications can be found in the technical information from Spiro. It can be downloaded from www.berlinerluft.de/luftfuehrung

Fresh air and exhaust air systems



Fresh air and exhaust air systems – Overview

RECTANGULAR ROOF COWLS

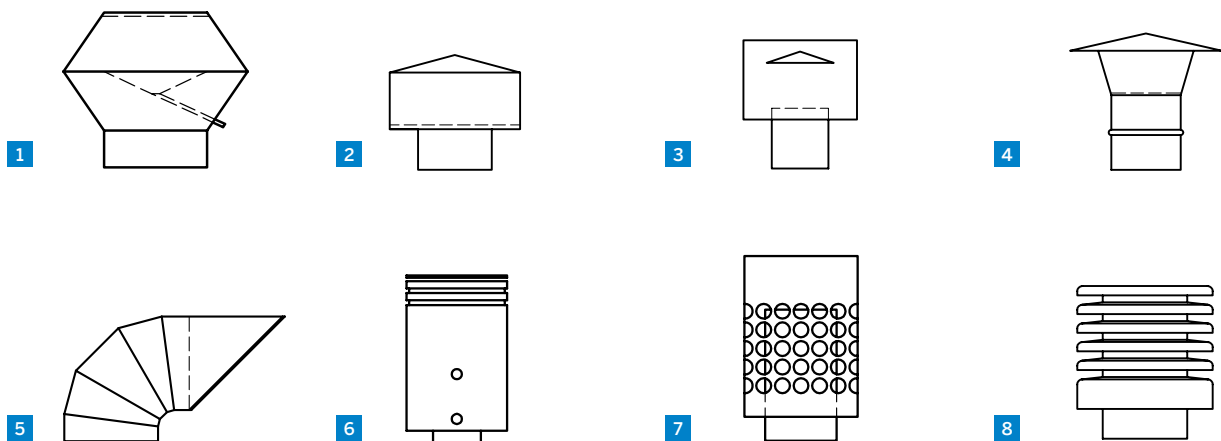


Special versions on request

- 1 | Jet cap DFH-E-Eco
- 2 | Roof cowl DH
- 3 | Roof vent cover DLA
- 4 | Louvred cowl LH

- 5 | Fresh air cowl ALH
- 6 | Discharge bend 90°/135° AB
- 7 | Twin discharge bend D-AB

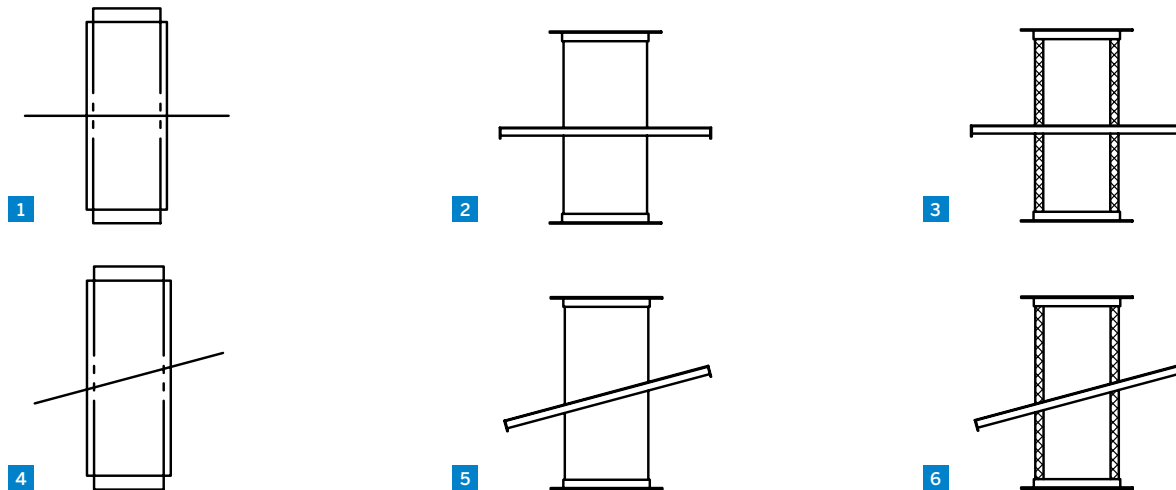
ROUND ROOF COWLS



- 1 | Jet cap HN/HF
- 2 | Roof cowl VH
- 3 | Outlet head ALK
- 4 | Rain cowl RHF

- 5 | Discharge bend 90°/135° AB
- 6 | Outlet cowl VHA
- 7 | Inlet and outlet cowl VHP
- 8 | Louvred cowl VHL

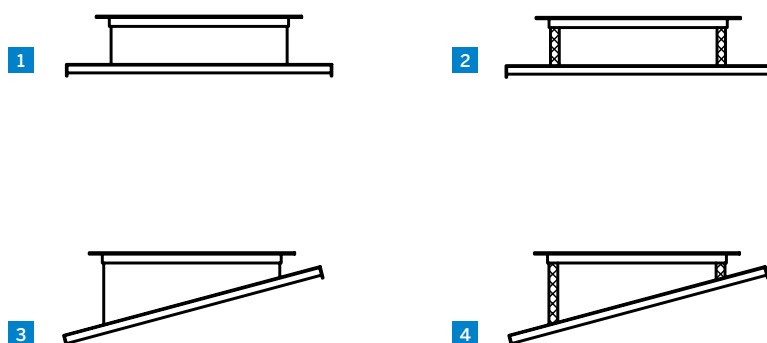
RECTANGULAR AND ROUND ROOF COLLARS



Special versions available on request

- 1 | Non-load-bearing collar for flat roof
- 2 | Load-bearing collar for flat roof
- 3 | Insulated load-bearing collar for flat roof
- 4 | Non-load-bearing collar for pitched roof
- 5 | Load-bearing collar for pitched roof
- 6 | Insulated load-bearing collar for pitched roof

RECTANGULAR AND ROUND ROOF BOOTS



- 1 | Load-bearing boot for flat roof
- 2 | Insulated load-bearing boot for flat roof
- 3 | Load-bearing boot for pitched roof
- 4 | Insulated load-bearing boot for pitched roof

Fresh air and exhaust air systems

GENERAL INFORMATION

Along with the façade and the outdoor area, the roofs of buildings are the place where fresh air enters and exhaust air exits HVAC systems. Depending on the application, various types of roof cowl are available.

Various factors must be taken into account when selecting roof cowls:

Application

Air flow

Intake and discharge velocity

Pressure drop

Generated noise

Aesthetic aspects

Weight

Roof cowls protect buildings and equipment from rainwater ingress. This requirement is met by means of structural design, careful selection and appropriate use. To prevent secondary measures causing water ingress, precautions must be taken during the planning stage.

Note

Not all roof cowls are explosion-proof!

The following sections on specific products contain information on uses, designs, nominal diameters, dimensions and weight.

TYPES

Roof ventilation cowls are normally made of a sturdy sheet metal structure. The basic designs are usually made from folded or spot-welded sheet metal. A UV-resistant, silicone-free sealant is applied to the necessary positions on the folded joints or overlaps.

For more stringent requirements, welded roof cowls can be manufactured. This should be decided at the planning stage. The cowls are normally fastened onto roof collars or boots. Information can be found in one of the following sections of the catalogue.

Material type	Grade	Standard
Galvanised sheet steel	DX51D + Z275 MA-C	DIN 10327
Black sheet steel (painted)	S 235 JRG 2	DIN 10130
Stainless sheet steel (surface III C)	1.4301 (V2A)	DIN 17440
Aluminium	AlMg3 (3.3535)	EN 485-2

Other metallic materials and special paint are available on request



Roof vent cover DLA

APPLICATION

Roof vent covers act in the same way as weatherproof grilles. When calculating the air passage, in order to ensure relatively good protection from rainwater penetration, the average intake velocity in the free cross section should not be more than 2 m/s.

The roof vent cover DLA is a universally usable roof attachment for the air intake and discharge of HVAC systems.

Its main uses are:

Exhaust air discharge

Fresh air intake

Natural ventilation (e.g. underground car parks, hot working areas)

Ventilation of lift shafts

Combined covers for multiple small HVAC systems, with separate intake and discharge.

Note

At high air humidity and temperatures below 0 °C, there is a risk of the grilles icing up. Roof vent covers are not explosion-proof.

DESIGN DETAILS

Depending on the size, the roof vent cover has a sturdy housing structure made of profile or rectangular tube sections. This housing structure is fitted with the detachable weatherproof grilles and bird mesh, depending on the design. The attached roof with drip edge is slightly inclined so that rainwater can safely run off. For special applications, the roof can be removable or hinged.

The base of the roof vent cover is designed according to the requirements at the site. The basic version has a perforated L profile all the way around so that the roof vent cover can be securely fastened to the roof attachment (see the section on roof collars and boots)

MATERIALS

Material type	Grade	Standard
Galvanised sheet steel	DX51D + Z275 MA-C	DIN 10327
Stainless sheet steel (surface III C)	1.4301 (V2A)	DIN 17440
Aluminium	AlMg3 (3.3535)	EN 485-2

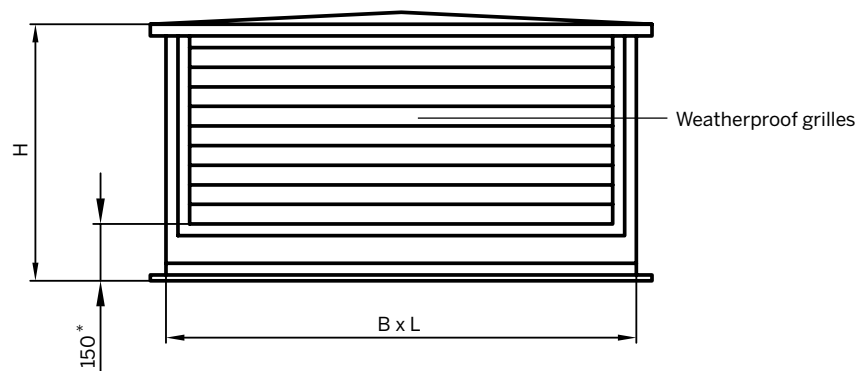
Special paint available on request



Roof vent cover DLA

Roof vent cover DLA

DIAGRAM

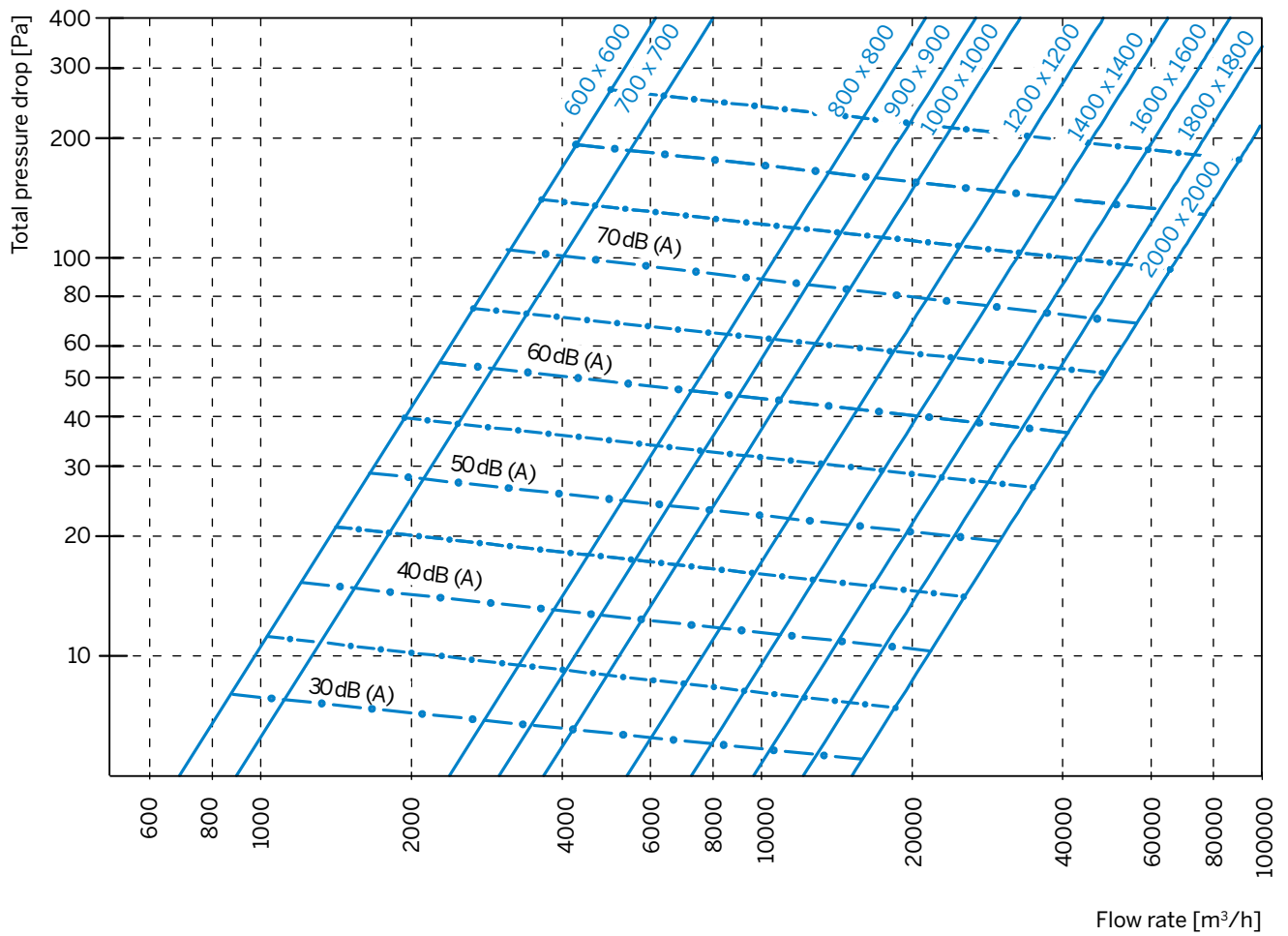


* Standard size - other dimensions available

DESIGNS

A	B	C	D
	B1	C1	D1
		C2	

PRESSURE DROP / FLOW NOISE
[diagram 1]

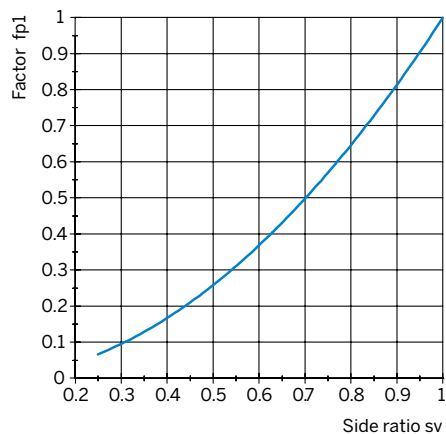


Pressure drop and flow noise of the DLA / WSG with square connection cross section.
Diagram refers to fresh air; for exhaust air, a 20% lower pressure drop and 3dB(A)
lower sound power level should be assumed.

Roof vent cover DLA

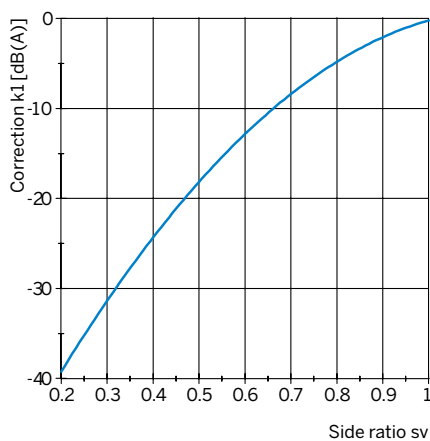
PRESSURE DROP

Conversion from square to rectangular
[diagram 2]



CONVERSION OF SOUND POWER LEVEL

Square to rectangular
[diagram 3]



CONVERSION TO NON-SQUARE ROOF VENT COVERS (APPROXIMATION)

Conversion

$$\Delta p_{\square} = \Delta p_{\square} \times fp1$$

Example

$V = 10000 \text{ m}^3/\text{h}$
 Size \square 800 x 800 mm
 $\Delta p_{\square} = 90 \text{ Pa}$ (diagram 1)
 Size 800 x 1000 mm (side ratio 0.8)
 Factor fp1 = 0.65 (diagram 2)
 $\Delta p_{\square} = 90 \text{ Pa} \times 0.65 = 59 \text{ Pa}$

$$L_{wA\square} = L_{wA\square} + k1$$

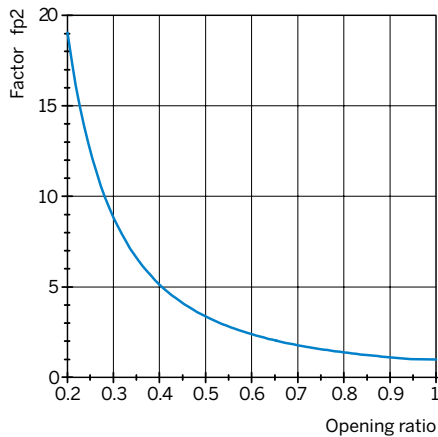
Example

$V = 10000 \text{ m}^3/\text{h}$
 Size \square 800 x 800 mm
 $L_{wA\square} = 70 \text{ dB(A)}$ (from top diagram)
 Size 800 x 1000 mm (side ratio 0.8)
 Correction k1 = -5 dB(A) (diagram 3)
 $L_{wA\square} = 70 \text{ dB(A)} - 5 \text{ dB(A)} = 65 \text{ dB(A)}$

OTHER DESIGNS

Conversion factor fp2

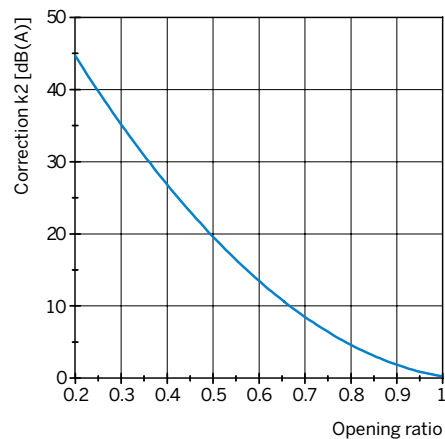
[diagram 4]



OTHER DESIGNS

Conversion factor K2

[diagram 5]



Conversion

$$\Delta p_{\square} = \Delta p_{\square} \times fp1 \times fp2$$

Example

V =	10000 m³/h
Size □	800 x 800 mm
Δp_{\square} =	90 Pa (diagram 1)
Size	800 x 1000 mm (side ratio 0.8)
Factor fp1 =	0.65 (diagram 2)
Factor fp2 =	2 (opening ratio 0.72, diagram 4)
Δp_{\square} =	90 Pa x 0.65 x 2 = 117 Pa

$$L_{WA\square} = L_{WA\square} + k1 \times k2$$

Example

V =	10000 m³/h
Size □	800 x 800 mm
$L_{WA\square}$ =	70 dB(A) (from top diagram)
Size	800 x 1000 mm (side ratio 0.8)
Correction k1 =	-5 dB(A) (diagram 3)
Correction k2 =	+8 dB(A) (diagram 5)
$L_{WA\square}$ =	70 dB(A) - 5 dB(A) + 8 dB(A) = 73 dB(A)

Estimation of pressure drop for other designs with partially closed sides
(see diagrams 4 and 5)

Example

800 x 1000 mm, one 100 side closed
Opening ratio: open side [m]/ all sides [m]
(2 x 0.8 m) + (1 x 1 m)/(2 x 0.8 m) + (2 x 1 m)
= 2.6 m/3.6 m = 0.72

Roof vent cover DLA

DIMENSIONS AND WEIGHTS [1]

Width B [mm]		Length L [mm]								
		600	700	800	900	1000	1100	1200	1300	1400
600	Height [mm]	450	450	450	450	750	750	750	750	750
	Free cross section [m²]	0.11	0.13	0.14	0.16	0.51	0.55	0.59	0.63	0.67
	Steel weight [kg]	36	40	43	46	70	74	79	83	88
	Aluminium weight [kg]	14	15	17	18	28	30	32	34	36
700	Height [mm]		450	450	750	750	750	750	750	750
	Free cross section [m²]		0.14	0.16	0.51	0.55	0.59	0.63	0.67	0.71
	Steel weight [kg]		43	46	70	75	79	84	89	93
	Aluminium weight [kg]		17	18	28	30	32	34	36	38
800	Height [mm]			750	750	750	750	750	750	750
	Free cross section [m²]			0.51	0.55	0.59	0.63	0.67	0.71	0.75
	Steel weight [kg]			70	75	80	84	89	94	99
	Aluminium weight [kg]			28	30	32	34	36	38	40
900	Height [mm]				750	750	750	750	750	750
	Free cross section [m²]				0.59	0.63	0.67	0.71	0.75	0.79
	Steel weight [kg]				80	84	89	94	99	104
	Aluminium weight [kg]				32	34	36	38	40	42
1000	Height [mm]					750	750	750	750	950
	Free cross section [m²]					0.77	0.71	0.75	0.79	0.83
	Steel weight [kg]					89	94	99	104	130
	Aluminium weight [kg]					36	38	40	42	54
1100	Height [mm]						750	750	950	950
	Free cross section [m²]						0.75	0.79	1.25	1.31
	Steel weight [kg]						99	105	130	136
	Aluminium weight [kg]						40	42	53	56
1200	Height [mm]							950	950	950
	Free cross section [m²]							1.25	1.31	1.37
	Steel weight [kg]							130	136	142
	Aluminium weight [kg]							53	56	58
1300	Height [mm]								950	950
	Free cross section [m²]								1.37	1.43
	Steel weight [kg]								142	148
	Aluminium weight [kg]								58	61
1400	Height [mm]									950
	Free cross section [m²]									1.49
	Steel weight [kg]									154
	Aluminium weight [kg]									63

B x L Connection cross section

B Short side

L Long side

Depending on the design, the smallest size is a nominal edge length of 600 mm. For reasons of structural strength and transport, the largest nominal dimensions of a unit are 2000 x 2400 mm.

DIMENSIONS AND WEIGHTS [2]

Width B [mm]		Length L [mm]									
		1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
600	Height [mm]	750	750	750	950						
	Free cross section [m²]	0.71	0.75	0.79	1.25						
	Steel weight [kg]	93	97	102	127						
	Aluminium weight [kg]	37	39	41	52						
700	Height [mm]	750	750	950	950	950					
	Free cross section [m²]	0.75	0.79	1.25	1.31	1.37					
	Steel weight [kg]	98	103	128	133	139					
	Aluminium weight [kg]	40	42	58	55	57					
800	Height [mm]	750	950	950	950	950	950				
	Free cross section [m²]	0.79	1.25	1.31	1.37	1.43	1.49				
	Steel weight [kg]	103	129	134	140	145	151				
	Aluminium weight [kg]	42	53	55	57	60	62				
900	Height [mm]	950	950	950	950	950	950	950			
	Free cross section [m²]	1.25	1.31	1.37	1.43	1.49	1.55	1.62			
	Steel weight [kg]	129	135	141	146	152	158	164			
	Aluminium weight [kg]	53	55	58	60	62	65	67			
1000	Height [mm]	950	950	950	950	950	950	950	1150		
	Free cross section [m²]	1.31	1.37	1.43	1.49	1.55	1.62	1.68	2.32		
	Steel weight [kg]	135	141	147	153	159	165	170	203		
	Aluminium weight [kg]	55	58	60	63	65	67	70	84		
1100	Height [mm]	950	950	950	950	950	950	1150	1150	1150	
	Free cross section [m²]	1.37	1.43	1.49	1.55	1.62	1.68	2.32	2.40	2.48	
	Steel weight [kg]	142	148	154	159	165	171	204	211	218	
	Aluminium weight [kg]	58	60	63	65	68	70	84	87	90	
1200	Height [mm]	950	950	950	950	950	1150	1150	1150	1150	1150
	Free cross section [m²]	1.43	1.49	1.55	1.62	1.68	2.32	2.40	2.48	2.56	2.64
	Steel weight [kg]	148	154	160	166	172	205	212	219	226	233
	Aluminium weight [kg]	61	63	65	68	70	85	88	90	93	96
1300	Height [mm]	950	950	950	950	1150	1150	1150	1150	1150	1150
	Free cross section [m²]	1.49	1.55	1.62	1.68	2.32	2.40	2.48	2.56	2.64	2.73
	Steel weight [kg]	154	160	166	173	206	213	220	227	234	241
	Aluminium weight [kg]	63	66	68	71	85	88	91	94	97	99
1400	Height [mm]	950	950	950	1150	1150	1150	1150	1150	1150	1550
	Free cross section [m²]	1.55	1.62	1.68	2.32	2.40	2.48	2.56	2.64	2.73	4.21
	Steel weight [kg]	160	167	173	206	213	220	227	234	241	313
	Aluminium weight [kg]	66	68	71	85	88	91	94	97	100	131

B x L Connection cross section

B Short side

L Long side

Roof vent cover DLA

DIMENSIONS AND WEIGHTS [3]

Width B [mm]		Length L [mm]									
		1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
1500	Height [mm]	950	950	1150	1150	1150	1150	1150	1150	1550	1550
	Free cross section [m²]	1.62	1.68	2.32	2.40	2.48	2.56	2.64	2.73	4.21	4.33
	Steel weight [kg]	167	173	206	214	221	228	235	242	314	323
	Aluminium weight [kg]	68	71	85	88	91	94	97	100	131	135
1600	Height [mm]		1150	1150	1150	1150	1150	1150	1550	1550	1550
	Free cross section [m²]		2.32	2.40	2.48	2.56	2.64	2.73	4.21	4.33	4.46
	Steel weight [kg]		207	214	221	228	235	243	315	324	333
	Aluminium weight [kg]		85	88	91	94	97	100	132	135	139
1700	Height [mm]			1150	1150	1150	1150	1550	1550	1550	1550
	Free cross section [m²]			2.48	2.56	2.64	2.73	4.21	4.33	4.46	4.58
	Steel weight [kg]			221	228	236	243	315	324	333	342
	Aluminium weight [kg]			91	94	97	100	132	136	139	143
1800	Height [mm]				1150	1150	1550	1550	1550	1550	1550
	Free cross section [m²]				2.64	2.73	4.21	4.33	4.46	4.58	4.70
	Steel weight [kg]				235	243	315	324	334	343	352
	Aluminium weight [kg]				97	100	132	136	140	143	147
1900	Height [mm]					1550	1550	1550	1550	1550	1550
	Free cross section [m²]					4.21	4.33	4.46	4.58	4.70	4.82
	Steel weight [kg]					315	325	334	343	352	361
	Aluminium weight [kg]					132	136	140	143	147	151
2000	Height [mm]						1550	1550	1550	1550	1550
	Free cross section [m²]						4.46	4.58	4.70	4.82	4.49
	Steel weight [kg]						334	343	353	362	371
	Aluminium weight [kg]						140	144	147	151	155

B x L Connection cross section

B Short side

L Long side

TENDER SPECIFICATION TEXT

Rectangular roof cowl as roof vent cover (DLA) with integrated weatherproof grilles made of

Galvanised steel

Stainless steel (1.4301)

Aluminium (3.3535)

Consisting of

Sturdy housing structure with profile or rectangular tube sections, overhanging housing roof, pitched with drip edge to safely allow rain water to run off.

Base designed for secure connection to the roof attachment.

Split rain collar supplied separately and attached after the roof vent cover is mounted.

Weatherproof grille backed with bird mesh.

Eye bolts must be provided on request for safe on-site transport.

Additional requirement

Exterior of DLA completely painted in RAL

Type: DLA

Dimensions: /

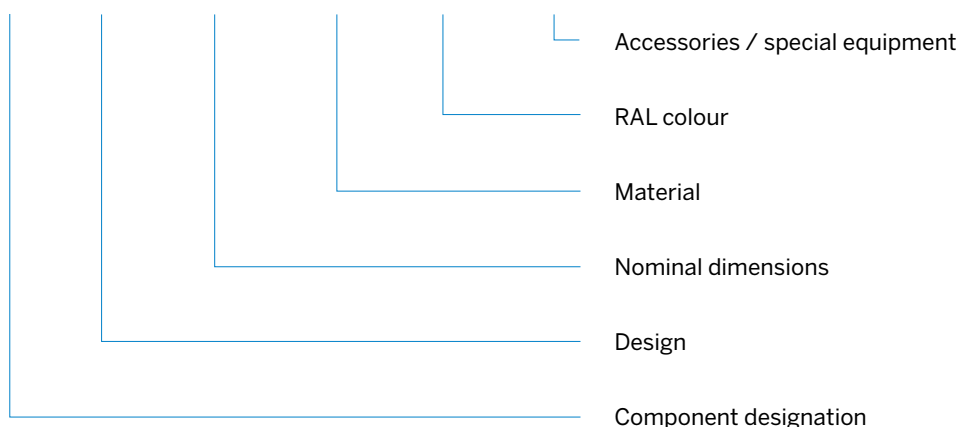
Height:

(Only specify when not standard height)

Manufacturer: BerlinerLuft.
Technik GmbH

TYPE CODE / EXAMPLE ORDER

DHE/DLA - A - 1000 x 1200 - Sv - RAL 8004 - W40



Louvred cowl LH

APPLICATION

The louvred cowl LH is a square roof cowl for air intake and discharge in HVAC systems.

Its main uses are:

Fresh air intake

Exhaust air discharge

Natural ventilation (e.g underground car parks, hot working areas)

Ventilation of lift shafts

Combined covers for multiple small HVAC systems, with separate intake and discharge.

To prevent water being sucked into the fresh air intake, the average velocity in the free cross section should not exceed 2 m/s.

Note

Louvred cowls are not explosion-proof. At high air humidity and temperatures below 0 °C, there is a risk of the grilles icing up.

DESIGN DETAILS

The louvred cowl consists of a substructure, which conceals the mitre-cut louvres fastened on all sides.

The attached roof with drip edge is slightly inclined on all sides so that rainwater can safely run off. The louvres are backed with bird mesh.

The louvres project 50 mm beyond the connection cross section on all sides.

As standard, the base of the louvred cowl, depending on the cross section, has a duct connection flange for secure fastening to the roof attachment. Alternatively, the louvred cowl can be fastened with a shoe.

In this case, the connection cross section is equal to the maximum outer dimensions of the louvred cowl. The louvred cowl with shoe should only be used if it can be mounted on a roof attachment to absorb wind force. Because of the connection cross section and the shoe, an additional rain collar is not required.

Standard louvred cowls are manufactured in sizes from 300 x 300 to 1500 x 1500 mm. Rectangular cross sections within this range of sizes are available on request.

MATERIALS

Galvanised sheet steel

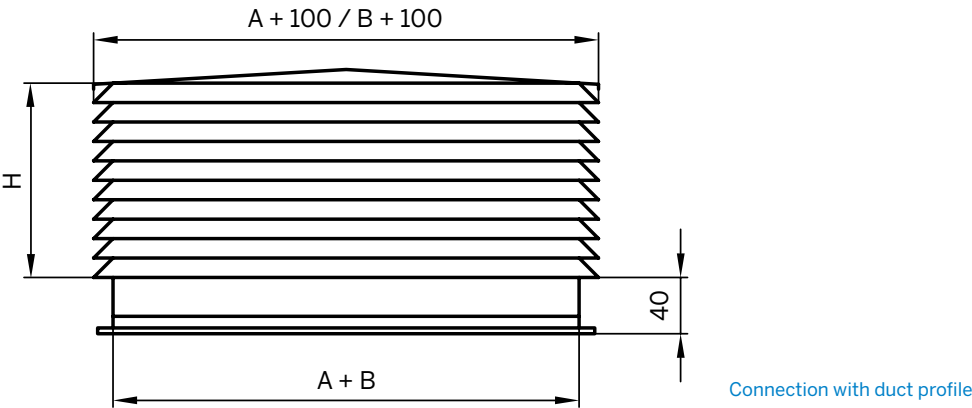
Special paint on request

Louvred cowl LH

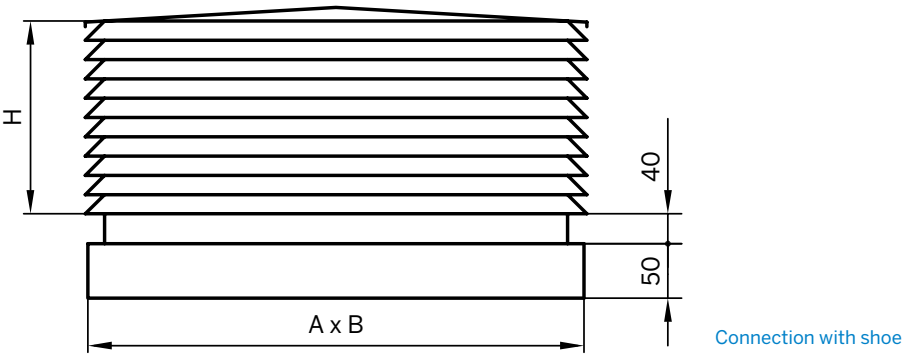


DIAGRAMS AND DESIGNS

Design LH-1



Design LH-2



Note

	Connection dimension	External cowl dimension
With LH-1	$A \times B$	$A \times B + 100$
With LH-2	$A \times B$	$A \times B$

Louvred cowl LH

DIMENSIONS AND WEIGHTS

The following table contains standard dimensions for the square cowls with information on installed heights, free cross sections and weights. Other dimensions can be approximately interpolated or calculated using the formulae below.

DESIGN LH-1

Connection cross section		Number of louvres	Height	Free cross section	Weight
A mm	B mm	n pcs	mm	FA m ²	kg
300	300	5	300	0.18	5.4
400	400	6	360	0.32	8.7
500	500	7	420	0.50	12.6
600	600	7	420	0.60	15.1
700	700	8	480	0.84	20.2
800	800	9	540	1.12	25.9
900	900	10	600	1.44	32.4
1000	1000	11	660	1.80	47.4
1100	1100	12	720	2.20	56.9
1200	1200	12	720	2.40	62.1
1300	1300	13	780	2.86	72.1
1400	1400	14	840	3.36	84.5
1500	1500	15	900	3.90	97.0

CALCULATION OF THE FREE CROSS SECTION (FA) IN M² FOR DESIGN

LH-1 $F_A = 2 \times (A + B) \times (n-2) \times 0.05$

LH-2 $F_A = 2 \times (A + B - 0.2) \times (n-2) \times 0.05$

A/B Connection cross sections in mm

n Number of louvres

EXHAUST AIR PRESSURE DROP / FLOW NOISE

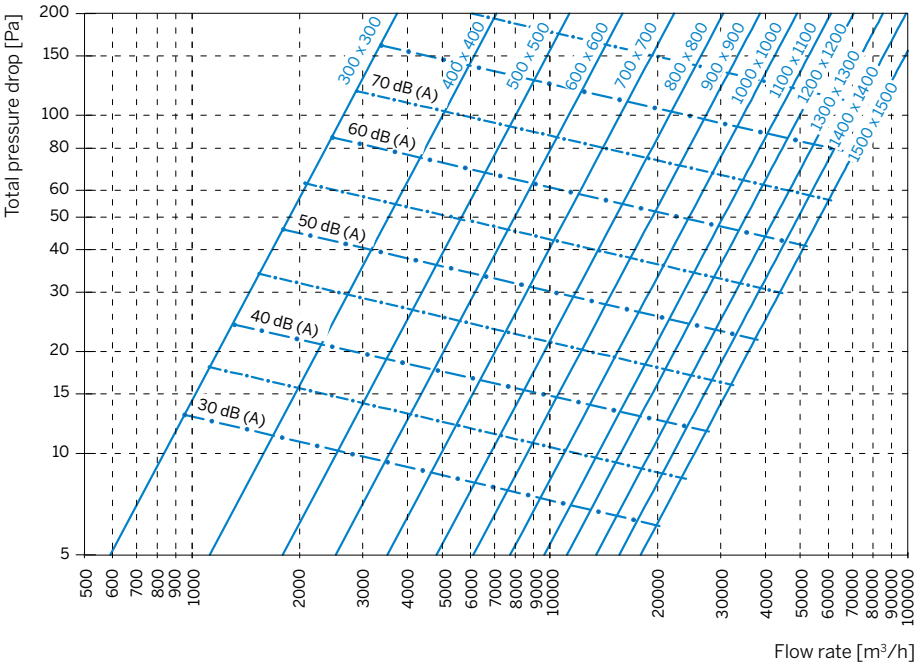


Diagram 1: Exhaust air pressure drop and flow noise of LH1 with square connection cross section.

FRESH AIR PRESSURE DROP / FLOW NOISE

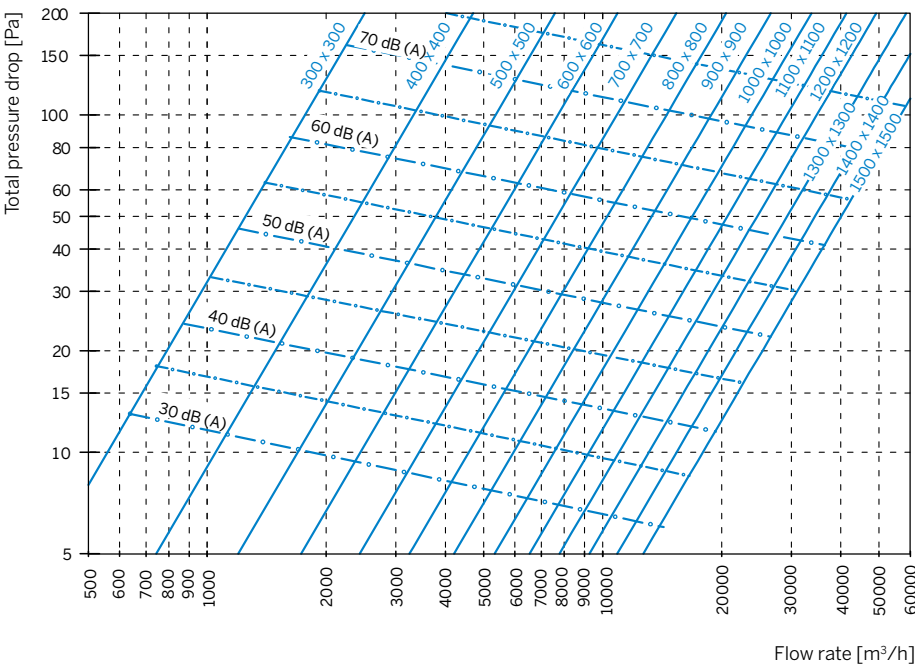
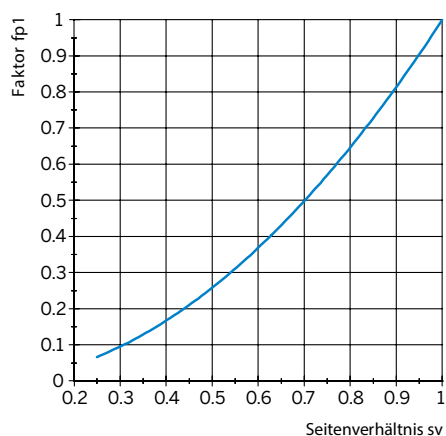


Diagram 2: Fresh air pressure drop and flow noise of LH1 with square connection cross section.

Louvred cowl LH

PRESSURE DROP

Conversion from square to rectangular
[diagram 3]



Conversion to non-square
louvred cowls (approximation)

Conversion

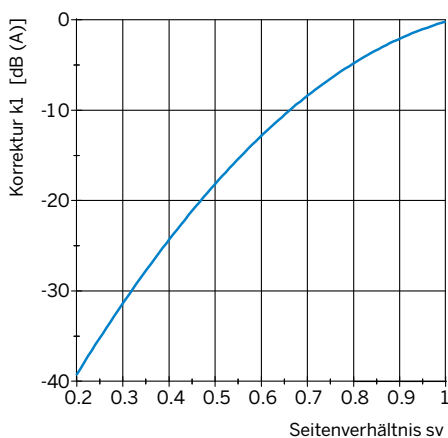
$$\Delta p_{\square} = \Delta p_{\square} \times fp1$$

Example (exhaust air)

$V = 7000 \text{ m}^3/\text{h}$
 Size $\square = 500 \times 500 \text{ mm}$
 $\Delta p_{\square} = 80 \text{ Pa}$ (diagram 1)
 Size $500 \times 800 \text{ mm}$ (side ratio 0.625)
 Factor $fp1 = 0.4$ (diagram 3)
 $\Delta p_{\square} = 80 \text{ Pa} \times 0.4 = 32 \text{ Pa}$

PRESSURE DROP

Conversion from square to rectangular
[diagram 4]



$$L_{wA\square} = L_{wA\square} + k1$$

Example (exhaust air)

$V = 7000 \text{ m}^3/\text{h}$
 Size $\square = 500 \times 500 \text{ mm}$
 $L_{wA\square} = 62 \text{ dB(A)}$ (from diagram 1)
 Size $500 \times 800 \text{ mm}$ (side ratio 0.625)
 Correction $k1 = -12 \text{ dB(A)}$ (diagram 4)
 $L_{wA\square} = 62 \text{ dB(A)} - 12 \text{ dB(A)} = 50 \text{ dB(A)}$

On non-square louvred cowls, the number of louvres is based on the larger dimension.

TENDER SPECIFICATION TEXT

Rectangular roof cowl, as louvred cowl LH-1 made of
Galvanised steel

Black powder-coated galvanised steel

Consisting of a sturdy substructure, which conceals the mitre-cut louvres fastened on all sides, backed with bird mesh. Base equipped with duct connection flange for the following cross section, alternatively type LH-2 base with shoe.

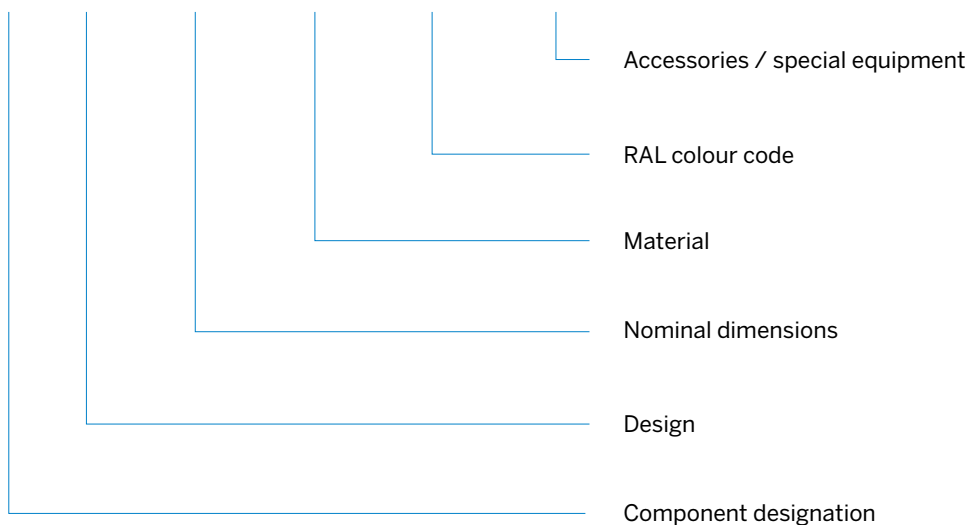
Connection dimension A and B equal to maximum outer dimension of LH

Manufacturer

BerlinerLuft. Technik GmbH

TYPE CODE / EXAMPLE ORDER

DHE/LH- 1 - 800 x 800 - Sv - RAL 9008 - LP30



Jet cap for optimised flow

DFH-E-Eco

PRODUCT DESCRIPTION

The jet cap is the most commonly used roof cowl for discharging used air on roofs. The air is discharged vertically upwards with a large throw range. This keeps polluted or bad-smelling exhaust air away from the building and the fresh air intake points. To achieve a sufficient throw range, flow velocities of 6 – 8 m/s are recommended, depending on the flow cross section.

The new DFH-E-Eco jet cap is attractive, and reduces operating costs and flow noise.

DESIGN DETAILS

Unlike conventional jet caps, the flow-optimised DFH-E-Eco does not deflect the air from the rain catcher in four directions as lateral flow, but conducts it along the side through almost parallel shafts. Instead of a flat funnel, there is a V-shaped channel which reaches down to the inside of the housing. Inside the housing, the rainwater runs off through a gap that goes all the way round. This means there is no need for a drainpipe, which might become dirty.

Note

No roof cowl can guarantee absolute protection from rainwater entering the air duct in extreme weather. To safely catch the rainwater, it is advisable to take precautions with the construction of the building. The DFH-E-Eco jet cap essentially consists of a housing in the form of two opposing frustums, the base and the rainwater collector. The rainwater collector completely covers the flow cross section and thus allows hardly any rainwater to enter.

The base is fitted with a connection frame for secure fastening to the roof attachment (see the section on roof collars and boots). The flange connection and optional thermal insulation jacket must be protected with a rain collar.

Eye bolts are optionally available for crane assembly. Structural engineering requirements (e.g. wind loads) can also be analysed on request.

MATERIALS

Material type	Grade	Standard
Galvanised sheet steel	DX51D + Z275 MA-C	DIN 10327
Stainless sheet steel (surface III C)	1.4301 (V2A)	DIN 17440
Aluminium	AlMg3	EN 485-2

RAL painting available on request - colour table on request

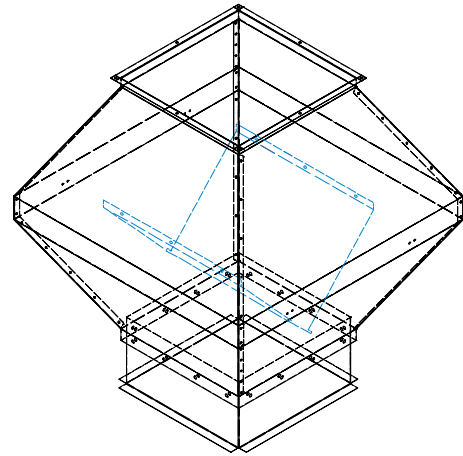
Flow-optimised
jet cap DFH-E-Eco



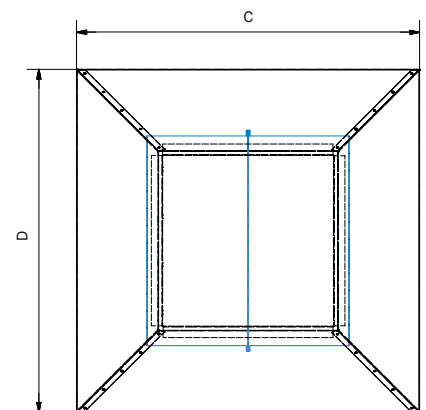
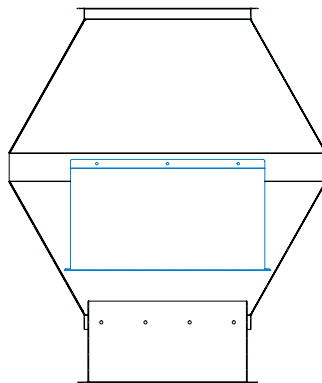
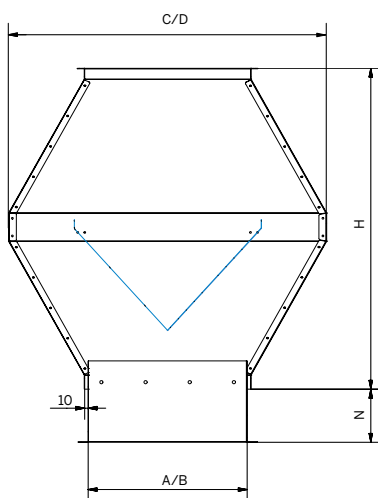
AVAILABLE SIZES

Standard square and rectangular jet caps are manufactured fully assembled up to a connection dimensions of 1500 x 1500 mm. Any required square or rectangular cross section can be manufactured within this range of sizes. For connection dimensions larger than 750 x 750 mm, the two frustums are split, with a flange connection.

Larger caps are special designs that require reinforcements and divisions into different sections. For reasons of transport, these are normally delivered as separate parts.



DIAGRAM

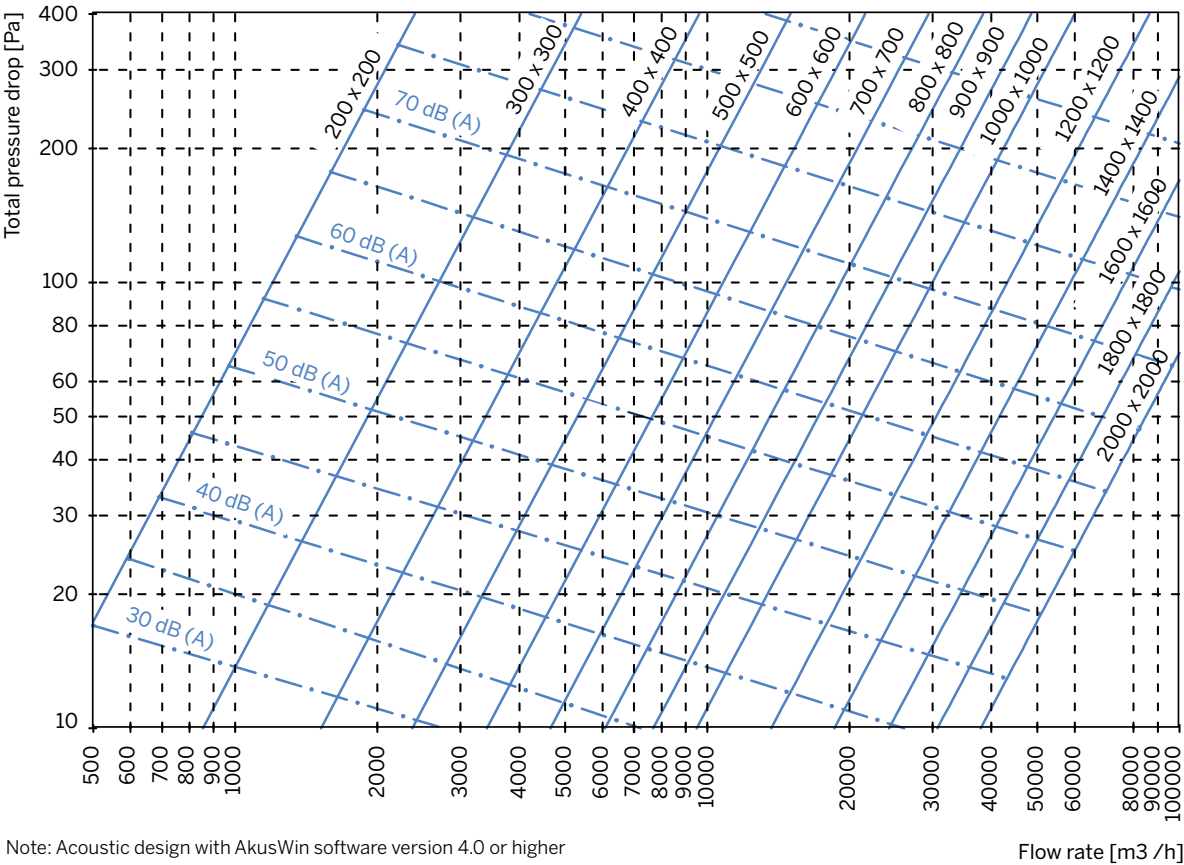


- A = Small connection dimension
- B = Large connection dimension
- N = 150 mm (standard base height - other height optionally available)
- C = $2 \times A$
- D = $A + B$
- H = $2 \times A$

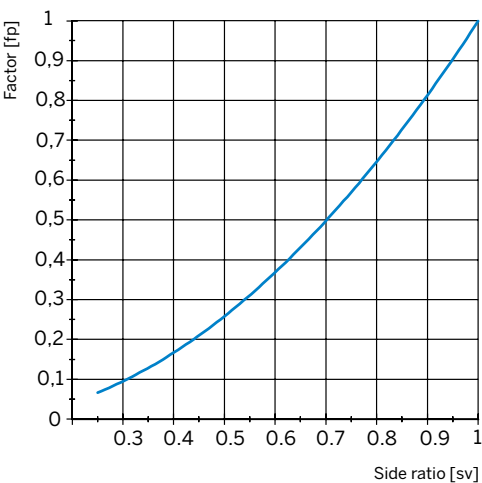
Jet cap for optimised flow

DFH-E-Eco

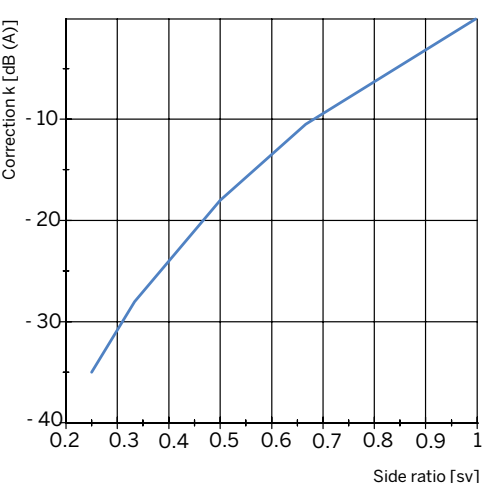
PRESSURE DROP / FLOW NOISE
[Diagram 1]



PRESSURE DROP
[Diagram 2]



SOUND POWER LEVEL
[Diagram 3]



CONVERSION TO NON-SQUARE JET CAPS

Pressure drop

$$\Delta p_{\square} = \Delta p_{\square} \times fp1$$

Example conversion

$V =$ 10,000 m³/h
 $\text{Size } \square:$ 600 x 600 mm
 $\Delta p_{\square} =$ 85 Pa (see diagram 1)
 Size: 600 x 800 mm (side ratio 1 : 1.5 = 0.75)
 $\text{Factor } fp =$ 0.58 (see diagram 2)
 $\Delta p_{\square} =$ 85 Pa x 0.58 = 49 Pa

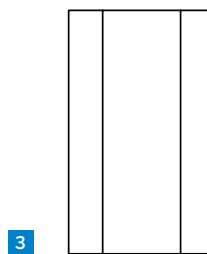
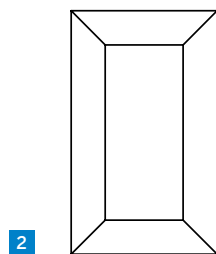
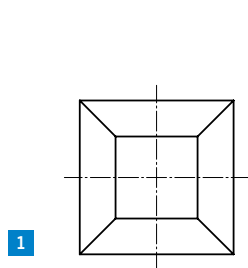
Sound power level

$$L_{WA\square} = L_{WA\square} + k$$

Example conversion

$V =$ 10,000 m³/h
 $\text{Size } \square:$ 600 x 600 mm
 $L_{WA\square} =$ 64 dB(A) (see diagram 1)
 Size: 600 x 800 mm (side ratio 1 : 1.5 = 0.75)
 $\text{Correction } k =$ -8dB (A) (see diagram 3)
 $L_{WA\square} =$ 64dB (A) - 8 dB (A) = 56 dB (A)

DESIGNS



- 1 | E1 standard square
- 2 | E2 standard rectangular
- 3 | E3 rectangular; inclined on both sides

Jet cap for optimised flow

DFH-E-Eco

DIMENSIONS AND WEIGHTS

Widths [mm]		B	Length [mm]					
A	C		500	600	700	800	900	1000
500	1000	D [mm]	1000	1100	1200	1300	1400	1500
		Total height [mm]	1000	1000	1000	1000	1000	1000
		Steel weight [kg]	53	59	68	75	84	93
		Aluminium weight [kg]	20	22	25	28	31	34
600	1200	D [mm]		1200	1300	1400	1500	1600
		Total height [mm]		1200	1200	1200	1200	1200
		Steel weight [kg]		69	79	89	100	112
		Aluminium weight [kg]		26	29	33	37	41
700	1400	D [mm]			1400	1500	1600	1700
		Total height [mm]			1400	1400	1400	1400
		Steel weight [kg]			91	104	118	132
		Aluminium weight [kg]			33	38	43	49
800	1600	D [mm]				1600	1700	1800
		Total height [mm]				1600	1600	1600
		Steel weight [kg]				120	137	154
		Aluminium weight [kg]				44	50	56
900	1800	D [mm]					1800	1900
		Total height [mm]					1800	1800
		Steel weight [kg]					155	174
		Aluminium weight [kg]					57	64
1000	2000	D [mm]						2000
		Total height [mm]						2000
		Steel weight [kg]						193
		Aluminium weight [kg]						71
1100	2200	D [mm]						
		Total height [mm]						
		Steel weight [kg]						
		Aluminium weight [kg]						
1200	2400	D [mm]						
		Total height [mm]						
		Steel weight [kg]						
		Aluminium weight [kg]						
1300	2600	D [mm]						
		Total height [mm]						
		Steel weight [kg]						
		Aluminium weight [kg]						
1400	2800	D [mm]						
		Total height [mm]						
		Steel weight [kg]						
		Aluminium weight [kg]						
1500	2800	D [mm]						
		Total height [mm]						
		Steel weight [kg]						
		Aluminium weight [kg]						

A x B Connection cross section

C x D Largest dimension

Length [mm]									
1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
1600	1700	1800	1900	2000					
1000 102 38	1000 112 41	1000 122 45	1000 132 49	1000 143 52					
1700	1800	1900	2000	2100	2200				
1200 124 46	1200 137 50	1200 149 55	200 162 60	1200 174 64	1200 185 68				
1800	1900	2000	2100	2200	2300	2400			
1400 147 54	1400 161 59	1400 176 64	1400 189 69	1400 202 74	1400 213 78	1400 224 82			
1900	2000	2100	2200	2300	2400	2500	2600		
1600 170 62	1600 185 68	1600 200 73	1600 213 78	1600 225 82	1600 235 86	1600 244 89	1600 251 92		
2000	2100	2200	2300	2400	2500	2600	2700	2800	
1800 191 70	1800 270 76	1800 221 81	1800 233 85	1800 243 89	1800 251 92	1800 258 95	1800 264 97	1800 313 115	
2100	2200	2300	2400	2500	2600	2700	2800	2900	3000
2000 210 77	2000 224 82	2000 237 87	2000 248 91	2000 256 94	2000 263 96	2000 269 99	2000 328 120	2000 346 126	2000 365 132
2200	2300	2400	2500	2600	2700	2800	2900	3000	
2200 226 83	2200 240 88	2200 250 92	2200 259 95	2200 265 98	2200 270 100	2200 341 124	2200 360 131	2200 381 139	
	2400	2500	2600	2700	2800	2900	3000		
	2400 252 92	2400 260 95	2400 267 99	2400 312 100	2400 350 127	2400 372 135	2400 393 143		
		2600	2700	2800	2900	3000			
		2600 267 98	2600 274 100	2600 355 130	2600 379 139	2600 403 146			
			2800	2900	3000				
			2800 358 130	2800 383 140	2800 408 149				
				3000					
				300 383 140					

Jet cap for optimised flow

DFH-E-Eco

DIMENSIONS AND WEIGHTS [2]

Square / rectangular jet cap made of

- ☐ Galvanised steel
- ☐ Stainless steel (1.4301)
- ☐ Aluminium (AlMg3)
- ☐ folded
- ☐ welded

Housing consisting of:

Two opposing frustums

Steeply angled rain channel inside, with outer sides forming flow ducts roughly parallel with the housing wall and water running off a gap all the way round

Bird mesh on the air outlet

Base with flange for securely fastening the jet cap to the roof attachment

Rain collar supplied separately for subsequent assembly at the site

Additional requirement

Exterior completely painted in RAL colour

Type: DFH-E-Eco /

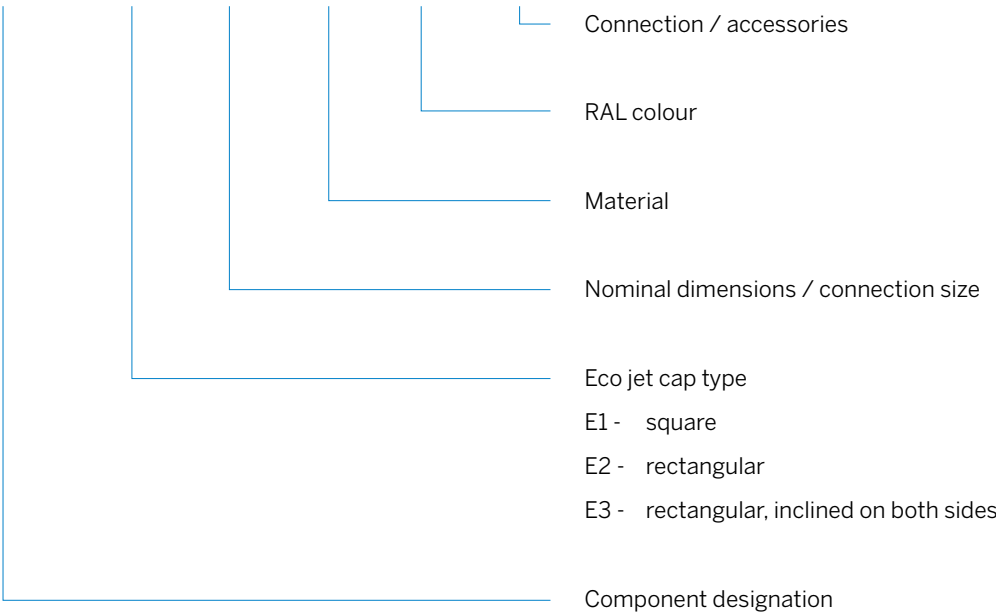
(Connection cross section A x B)

Manufacturer: BerlinerLuft.

Technik GmbH

TYPE CODE / EXAMPLE ORDER

DHE/DFH-E-Eco - E2 - 1000 x 1200 - Sv - RAL 9006 - W40



Roof cowl DH

APPLICATION

The roof cowl (DH) is a simple rooftop structure for fresh air intake and exhaust air discharge. Because of its simple design, the roof cowl can only be used for fairly straightforward requirements. The air intake or outlet vents are relatively unprotected from rainwater ingress. The cowl roof which protrudes over the intake cross section can deflect rainwater falling at an angle of around 35° when the winds are not extreme. The air intake velocity in the free passage should not exceed 5.0 m/s.

Note:

Roof cowls are not explosion-proof.

At high air humidity and temperatures below 0°C, there is a risk of the grilles icing up.

DESIGN DETAILS

The roof cowl essentially consists of a sheet metal housing without any additional substructure. The top section of this housing has open sections on each side, backed with bird mesh. The attached roof with drip edge is slightly inclined on all sides to allow water to run off. The base of the roof cowl depends on the fastening options available at the site (roof boot). A rain collar is supplied separately to be attached over the fastening point after assembly.

MATERIALS

Material type	Grade	Standard
Galvanised sheet steel	DX51D + Z275 MA-C	DIN 10327
Stainless sheet steel (surface III C)	1.4301 (V2A)	DIN 17440
Aluminium	AlMg3 (3.3535)	EN 485-2

Other metallic materials and special paint are available on request

AVAILABLE SIZES

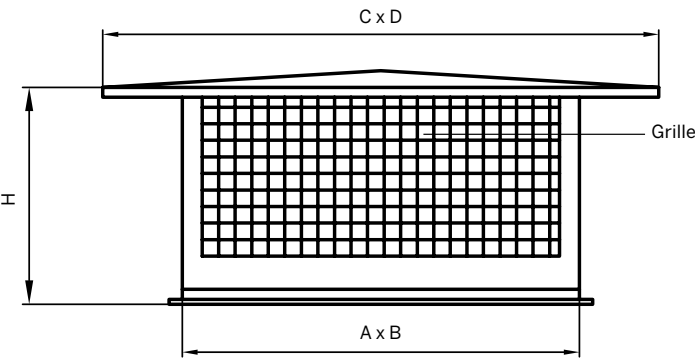
Standard rectangular roof cowls are available from a nominal dimension (connection cross section) from 200 x 200 mm to 1200 x 1200 mm. All square and rectangular dimensions are available within this range of sizes. Larger sizes can be specifically manufactured to a detailed description of the requirements.



Roof cowl DH

Roof cowl DH

DIAGRAM



* Standard size - other dimensions available

DESIGNS

The standard version has an air passage section on all four sides. Other versions are available with it on three sides, on two sides or on one.

A	B	C	D
	B1	C1	D1
		C2	

DIMENSIONS AND WEIGHTS [1]

Widths [mm]		B	Length [mm]										
A	C		200	300	400	500	600	700	800	900	1000	1100	1200
200	400	D [mm]	400	500	600	700	800	900	1000	1100	1200	1300	1400
		Free cross section [m ²]*	0.072	0.096	0.12	0.144	0.168	0.192	0.216	0.24	0.264	0.288	0.312
		Total height [mm]	400	400	400	400	400	400	400	400	400	400	400
		Steel weight [kg]	4	5	6	7	8	9	10	11	12	12.5	13
		Aluminium weight [kg]	2	3	3.5	4	4.5	5	5.5	6	6.5	7	8
300	600	D [mm]		600	700	800	900	1000	1100	1200	1300	1400	1500
		Free cross section [m ²]*		0.14	0.17	0.20	0.24	0.27	0.3	0.33	0.36	0.4	0.43
		Total height [mm]		450	450	450	450	450	450	450	450	450	450
		Steel weight [kg]		7	8	10	11	12	13	14	16	17	18
		Aluminium weight [kg]		4	5	5.5	6	7	7.5	8	9	9.5	10
400	800	D [mm]			800	900	1000	1100	1200	1300	1400	1500	1600
		Free cross section [m ²]*			0.24	0.28	0.32	0.36	0.4	0.44	0.48	0.52	0.56
		Total height [mm]			500	500	500	500	500	500	500	500	500
		Steel weight [kg]			12	13	14	16	17	19	20	22	23
		Aluminium weight [kg]			6	7	8	9	10	11	11.5	12	13
500	1000	D [mm]				1000	1100	1200	1300	1400	1500	1600	1700
		Free cross section [m ²]*				0.38	0.43	0.48	0.53	0.58	0.62	0.67	0.72
		Total height [mm]				550	550	550	550	550	550	550	550
		Steel weight [kg]				17	18	20	22	24	25	27	29
		Aluminium weight [kg]				9	10	11	12	13	14	15	16
600	1200	D [mm]					1200	1300	1400	1500	1600	1700	1800
		Free cross section [m ²]*					0.56	0.62	0.67	0.73	0.78	0.84	0.9
		Total height [mm]					600	600	600	600	600	600	600
		Steel weight [kg]					23	25	27	29	31	33	35
		Aluminium weight [kg]					13	14	15	16	17	18	19
700	1400	D [mm]						1400	1500	1600	1700	1800	1900
		Free cross section [m ²]*						0.77	0.83	0.9	0.96	1.02	1.09
		Total height [mm]						650	650	650	650	650	650
		Steel weight [kg]						30	32	35	37	39	41
		Aluminium weight [kg]						17	18	19	21	22	23

A x B Connection cross section

C x D Largest dimension of roof cowl

* Free cross section with air intake on 4 sides

Roof cowl DH

DIMENSIONS AND WEIGHTS [2]

Widths [mm]		B	Length [mm]										
A	C		200	300	400	500	600	700	800	900	1000	1100	1200
800	1600	D [mm]							1600	1700	1800	1900	2000
		Free cross section [m ²]*							1.01	1.08	1.15	1.22	1.3
		Total height [mm]							700	700	700	700	700
		Steel weight [kg]							38	41	43	46	48
		Aluminium weight [kg]							22	23	24	26	27
900	1800	D [mm]								1800	1900	2000	2100
		Free cross section [m ²]*								1.28	1.36	1.44	1.52
		Total height [mm]								750	750	750	750
		Steel weight [kg]								48	50	53	55
		Aluminium weight [kg]								27	28	30	31
1000	2000	D [mm]									2000	2100	2200
		Free cross section [m ²]*									1.58	1.67	1.76
		Total height [mm]									800	800	800
		Steel weight [kg]									58	60	63
		Aluminium weight [kg]									32	34	36
1100	2200	D [mm]										2200	2300
		Free cross section [m ²]*										1.92	2.02
		Total height [mm]										850	850
		Steel weight [kg]										69	72
		Aluminium weight [kg]										39	40
1200	2400	D [mm]											2400
		Free cross section [m ²]*											2.29
		Total height [mm]											900
		Steel weight [kg]											81
		Aluminium weight [kg]											45

A x B Connection cross section

C x D Largest dimension of roof cowl

* Free cross section with air intake on 4 sides

TENDER SPECIFICATION TEXT

Rectangular roof cowl (DH) consisting of a sheet metal housing made of

Galvanised steel

Stainless steel (1.4301)

Aluminium (AlMg3 - 3.3535)

With open sections on 4 (3, 2, 1) the sides, backed with fixed bird mesh

Roof with drip edge directly and permanently fastened to the housing

Base designed for secure fastening to roof attachment

Fastening between base and roof attachment covered by rain collar

Additional requirements:

Exterior of DLA completely painted in RAL

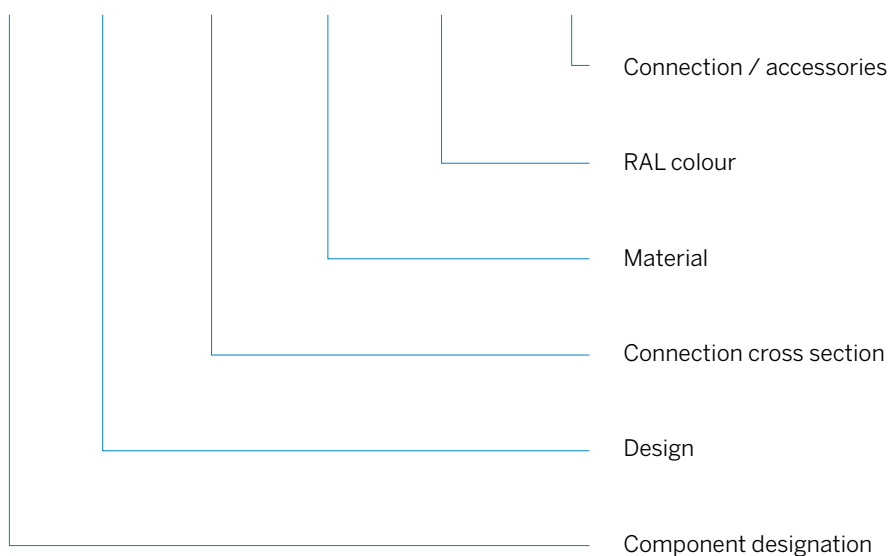
Type: DH

Nominal size: /

Manufacturer: BerlinerLuft.
Technik GmbH

TYPE CODE / EXAMPLE ORDER

DHE/DH - A - 500 x 800 - Sv - RAL 9006 - LP 30



Fresh air cowl ALH

APPLICATION

The fresh air cowl (ALH) is a special type of roof cowl designed solely for fresh air intake. This roof cowl is mainly used for drawing large quantities of fresh air into industrial ventilation systems. The cowl is specially designed to provide excellent protection from driving rain.

The fresh air cowl should be positioned far enough from the roof surface to prevent snow being sucked in during winter.

DESIGN DETAILS

Because of its shape and its function as a rooftop air intake, the fresh air cowl requires a sturdy substructure, whose design depends on to the nominal dimension. The dimensions and wind forces on the relatively large cowl surface area must be safely diverted to the substructure. The connector has a sturdy fastening flange for assembly on the roof attachment. The air is drawn in through horizontally arranged grilles fastened under the cowl structure. Hinged grilles are available on request.

Material type	Grade	Standard
Galvanised sheet steel	DX51D + Z275 MA-C	DIN 10327
Stainless sheet steel (surface III C)	1.4301 (V2A)	DIN 17440
Aluminium with steel substructure	AlMg3 (3.3535)	EN 485-2

Other metallic materials and special paint are available on request

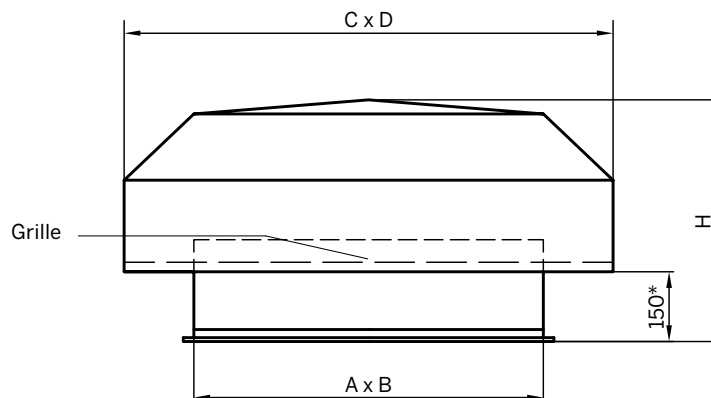


AVAILABLE SIZES

Standard rectangular fresh air cowls are available in nominal dimensions (connection dimension) from 500 x 500 mm to 2000 x 2000 mm. Within these dimensions, all square and rectangular cross sections are possible in 100 mm steps.

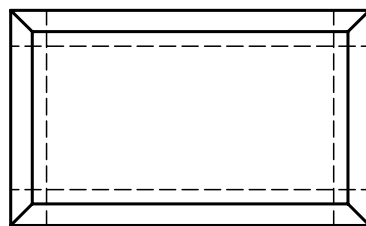
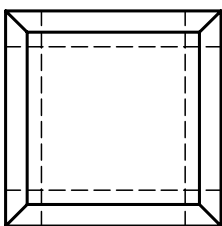
Larger sizes up to 2000 x 4000 mm are available as special solutions after consultation with the manufacturer. The design, assembly and transport requirements must be included in the specifications.

DIAGRAM



* Standard base height - other heights available

DESIGNS



- 1 | E1 square
- 2 | E2 rectangular

Fresh air cowl ALH

DIMENSIONS AND WEIGHTS [1]

Widths [mm]		B	Length [mm]															
A	C		500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
500		D [mm]	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900					
		Free cross section [m²]	0.32	0.35	0.38	0.42	0.45	0.48	0.51	0.54	0.58	0.61	0.64					
		Total height [mm]	880	880	880	980	980	980	980	1080	1080	1080	1080					
		Steel weight [kg]	74	81	87	95	101	108	114	131	138	145	151					
		Aluminium weight [kg]	59	64	69	73	78	83	88	101	107	112	117					
600		D [mm]		1080	1180	1280	1380	1480	1580	1680	1780	1880	1980	2080				
		Free cross section [m²]		0.46	0.50	0.54	0.58	0.61	0.65	0.69	0.73	0.77	0.81	0.84				
		Total height [mm]		880	980	980	980	980	1080	1080	1080	1080	1230	1230				
		Steel weight [kg]		94	102	109	116	122	141	148	155	162	198	206				
		Aluminium weight [kg]		74	79	84	89	95	109	114	120	125	155	161				
700		D [mm]			1260	1360	1460	1560	1660	1760	1860	1960	2060	2160	2260			
		Free cross section [m²]			0.63	0.67	0.72	0.76	0.81	0.85	0.90	0.94	0.99	1.03	1.08			
		Total height [mm]			980	980	980	1080	1080	1080	1080	1230	1230	1230	1230			
		Steel weight [kg]			116	124	131	150	158	165	173	211	219	228	236			
		Aluminium weight [kg]			90	95	101	116	122	128	133	165	172	178	185			
800		D [mm]				1440	1540	1640	1740	1840	1940	2040	2140	2240	2340	2440		
		Free cross section [m²]				0.82	0.87	0.92	0.97	1.02	1.08	1.13	1.18	1.23	1.28	1.33		
		Total height [mm]				980	1080	1080	1080	1080	1230	1230	1230	1230	1230	1230		
		Steel weight [kg]				139	159	167	175	183	223	232	241	250	259	268		
		Aluminium weight [kg]				107	123	129	135	142	175	182	189	196	203	210		
900		D [mm]					1620	1720	1820	1920	2020	2120	2220	2320	2420	2520	2620	
		Free cross section [m²]					1.04	1.09	1.15	1.21	1.27	1.32	1.38	1.44	1.50	1.56	1.61	
		Total height [mm]					1080	1080	1080	1230	1230	1230	1230	1230	1330	1330	1330	
		Steel weight [kg]					177	185	193	235	245	254	264	273	282	311	321	
		Aluminium weight [kg]					137	143	150	184	192	199	206	214	221	243	251	
1000		D [mm]						1800	1900	2000	2100	2200	2300	2400	2500	2600	2700	2800
		Free cross section [m²]						1.28	1.34	1.41	1.47	1.54	1.60	1.66	1.73	1.79	1.86	1.92
		Total height [mm]						1080	1230	1230	1230	1230	1230	1230	1330	1330	1330	1330
		Steel weight [kg]						204	248	257	267	277	287	297	326	336	347	357
		Aluminium weight [kg]						157	194	201	209	217	224	232	255	263	271	279
1100		D [mm]							1980	2080	2180	2280	2380	2480	2580	2680	2780	2880
		Free cross section [m²]							1.55	1.62	1.69	1.76	1.83	1.9	1.97	2.04	2.11	2.18
		Total height [mm]							1230	1230	1230	1230	1230	1330	1330	1330	1330	1480
		Steel weight [kg]							270	280	290	300	311	341	352	363	373	436
		Aluminium weight [kg]							211	219	227	235	243	267	275	284	292	345
1200		D [mm]								2160	2260	2360	2460	2560	2660	2760	2860	2960
		Free cross section [m²]								1.84	1.92	2.00	2.07	2.15	2.23	2.30	2.38	2.46
		Total height [mm]								1230	1230	1230	1330	1330	1330	1480	1480	
		Steel weight [kg]								303	314	324	356	367	378	390	454	466
		Aluminium weight [kg]								237	246	254	279	288	296	305	360	369

A x B Connection cross section
C x D Largest dimension of ALH head

DIMENSIONS AND WEIGHTS [2]

Widths [mm]		B	Length [mm]							
A	C		1300	1400	1500	1600	1700	1800	1900	2000
1300		D [mm]	2340	2440	2540	2640	2740	2840	2940	3040
		Free cross section [m²]	2.16	2.25	2.33	2.41	2.50	2.58	2.66	2.75
		Total height [mm]	1230	1330	1330	1330	1330	1480	1480	1480
		Steel weight [kg]	338	371	383	394	406	473	485	489
		Aluminium weight [kg]	265	290	299	308	317	374	384	394
1400		D [mm]		2520	2620	2720	2820	2920	3020	3120
		Free cross section [m²]		2.51	2.60	2.69	2.78	2.87	2.96	3.05
		Total height [mm]		1330	1330	1330	1480	1480	1480	1480
		Steel weight [kg]		398	410	422	491	504	517	530
		Aluminium weight [kg]		311	321	330	389	399	409	409
1500		D [mm]			2700	2800	2900	3000	3100	3200
		Free cross section [m²]			2.88	2.98	3.07	3.17	3.26	3.36
		Total height [mm]			1330	1480	1480	1480	1480	1480
		Steel weight [kg]			437	509	522	536	550	563
		Aluminium weight [kg]			342	403	414	424	435	446
1600		D [mm]				2880	2980	3080	3180	3280
		Free cross section [m²]				3.28	3.38	3.48	3.58	3.69
		Total height [mm]				1480	1480	1480	1480	1480
		Steel weight [kg]				541	555	569	583	597
		Aluminium weight [kg]				428	439	450	461	472
1700		D [mm]					3060	3160	3260	3360
		Free cross section [m²]					3.70	3.81	3.92	4.03
		Total height [mm]					1480	1480	1480	1730
		Steel weight [kg]					588	602	617	708
		Aluminium weight [kg]					465	477	488	561
1800		D [mm]						3240	3340	3440
		Free cross section [m²]						4.15	4.26	4.38
		Total height [mm]						1480	1730	1730
		Steel weight [kg]						636	730	746
		Aluminium weight [kg]						504	578	591
1900		D [mm]							3420	3520
		Free cross section [m²]							4.62	4.74
		Total height [mm]							1730	1730
		Steel weight [kg]							768	785
		Aluminium weight [kg]							608	621
2000		D [mm]								3600
		Free cross section [m²]								5.12
		Total height [mm]								1730
		Steel weight [kg]								824
		Aluminium weight [kg]								653

A x B Connection cross section
C x D Largest dimension of ALH head

Fresh air cowl ALH

TENDER SPECIFICATION TEXT

Sturdy, self-supporting fresh air cowl (ALH). Substructure made of welded, hot-dip galvanised steel sections. Cowl clad with sheets made of

Galvanised steel

Stainless steel (1.4301)

Aluminium (AlMg3 - 3.3535)

Watertight design. Sealed with silicone-free, UV resistant sealant.

Fixed bird mesh on intake openings.

Base of fresh air cowl with sturdy flange to fit the roof attachment. Split rain collar supplied separately for subsequent fitting to the fresh air cowl. With suitable number of eye bolts for transport according to size.

Additional requirement

Hinged grille

Outside air hood completely painted in RAL

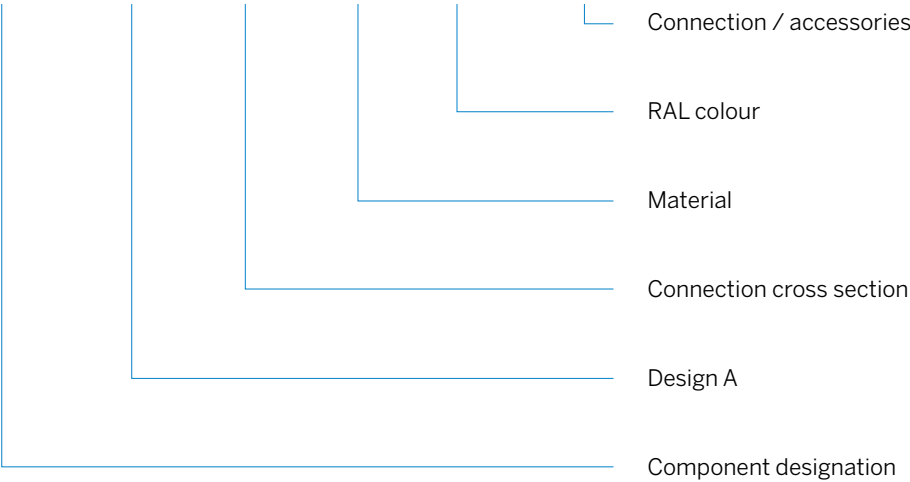
Type: ALH

Nominal size: /

Manufacturer: BerlinerLuft.
Technik GmbH

TYPE CODE / EXAMPLE ORDER

DHE/ALH - E1 - 1000 x 1200 - Sv - RAL 9006 - W 40



Intake and discharge bend AB 135°/90°

APPLICATION

Intake or discharge bends (ASB or ABB) are a simple alternative to roof cowls for fresh air intake or exhaust air discharge. Depending on the application, single- or double-sided bends are used. 135° bends are mainly used for fresh air intake, and 90° bends for exhaust air discharge. The air intake velocity in the free passage should not exceed 5.0 m/s.

Note

Discharge bends are not fully explosion-proof. At high air humidity and temperatures below 0 °C, there is a risk of the grilles icing up.

DESIGN DETAILS

Intake or discharge bends essentially consist of a sturdy, folded sheet metal housing which, depending on the size, has additional reinforcements according to the manufacturer's design specifications. To prevent rain from directly falling in, the ABB 90° arches over by 30°. To prevent contamination, all discharge bends have a detachable bird mesh. Discharge bends have turning vanes, as described in DIN EN 1505.

The inside radius is 100 mm, and on the standard version the connection side is extended by 200 mm. The base of the ABB/ASB depends on the fastening options available at the site (roof attachment). A rain collar is supplied separately to be attached over the fastening point after assembly. All folds have UV-resistant seals. Depending on the site and requirements, the intake and discharge bends have reinforced load attachment points with eye bolts.

MATERIALS

Material type	Grade	Standard
Galvanised sheet steel	DX51D + Z275 MA-C	DIN 10327
Stainless sheet steel (surface III C)	1.4301 (V2A)	DIN 17440
Aluminium	AlMg3 (3.3535)	EN 485-2

Other metallic materials and special paint are available on request

AVAILABLE SIZES

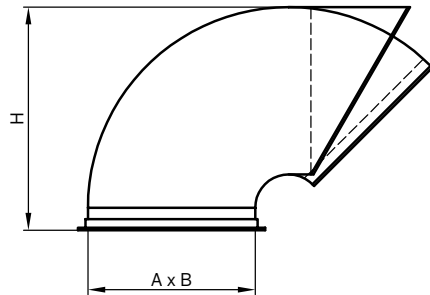
Standard intake and discharge bends are available in nominal dimensions (connection cross section) from 200 x 200 mm to 2000 x 2000 mm. All square and rectangular dimensions are available within this range of sizes. Larger sizes can be specially manufactured with a detailed description of the requirements.



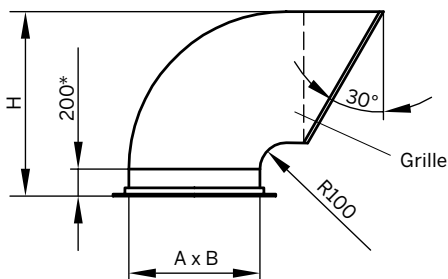
Intake bend AB 135°

Intake and discharge bend AB 135°/90°

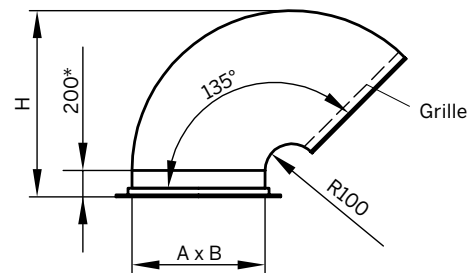
DIAGRAM



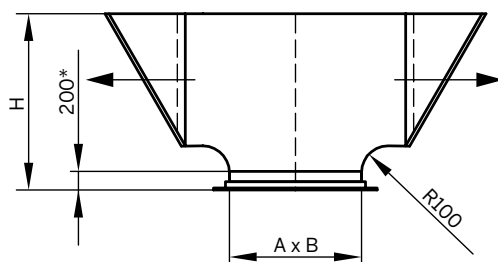
DESIGNS



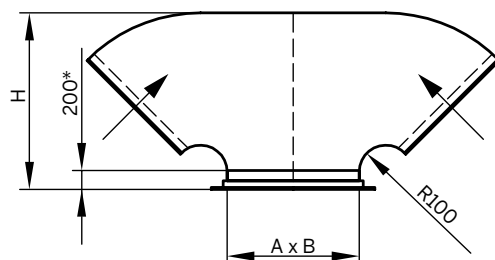
1



2



3



4

* Standard base height - other heights available

- 1 | Discharge bend AB-90°
- 2 | Intake bend AB-135°
- 3 | Double discharge bend AB-D 90°
- 4 | Double intake bend AB-D 135°

DIMENSIONS AND WEIGHTS [1]

A [mm]	B [mm]											
		200	300	400	500	600	700	800	900	1000	1100	1200
200	Height [mm]	500	500	700								
	Free cross section [m ²]	0.008	0.018	0.028								
	Weight 90° [kg]	11	14	19								
	Weight 135° [kg]	12	17	23								
300	Height [mm]	500	600	700	800							
	Free cross section [m ²]	0.018	0.036	0.054	0.072							
	Weight 90° [kg]	13	17	22	27							
	Weight 135° [kg]	15	20	26	33							
400	Height [mm]	500	600	700	800	900						
	Free cross section [m ²]	0.028	0.054	0.08	0.106	0.132						
	Weight 90° [kg]	16	20	25	31	37						
	Weight 135° [kg]	18	24	30	38	46						
500	Height [mm]	500	600	700	800	900	1000					
	Free cross section [m ²]	0.038	0.072	0.106	0.14	0.174	0.208					
	Weight 90° [kg]	19	23	28	34	40	47					
	Weight 135° [kg]	21	27	34	42	50	59					
600	Height [mm]	500	600	700	800	900	1000	1100				
	Free cross section [m ²]	0.048	0.09	0.132	0.174	0.216	0.258	0.3				
	Weight 90° [kg]	21	26	32	38	44	51	59				
	Weight 135° [kg]	24	31	38	46	55	64	74				
700	Height [mm]		600	700	800	900	1000	1100	1200			
	Free cross section [m ²]		0.108	0.158	0.208	0.258	0.308	0.358	0.408			
	Weight 90° [kg]		29	35	41	48	55	63	71			
	Weight 135° [kg]		34	42	50	59	69	80	91			
800	Height [mm]			700	800	900	1000	1100	1200	1300		
	Free cross section [m ²]			0.184	0.242	0.3	0.358	0.416	0.474	0.532		
	Weight 90° [kg]			38	45	52	59	67	76	85		
	Weight 135° [kg]			46	54	64	73	85	97	110		
900	Height [mm]				800	900	1000	1100	1200	1300	1400	
	Free cross section [m ²]				0.276	0.342	0.408	0.474	0.54	0.606	0.672	
	Weight 90° [kg]				48	55	63	71	80	90	99	
	Weight 135° [kg]				59	69	79	91	103	116	129	
1000	Height [mm]					900	1000	1100	1200	1300	1400	1500
	Free cross section [m ²]					0.384	0.458	0.532	0.606	0.68	0.754	0.828
	Weight 90° [kg]					54	67	76	85	94	104	115
	Weight 135° [kg]					73	84	96	109	122	136	151

Dimensions and weights for galvanised folded steel cowls

Types: One-sided symmetrical AB 90° and ASB 135°

Double-sided versions must be calculated individually due to the wide variety of designs

Intake and discharge bend AB 135°/90°

A [mm]		B [mm]														
			700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
1100	Height [mm]	1000	1100	1200	1300	1400	1500	1600								
	Free cross section [m²]	0.508	0.59	0.672	0.754	0.836	0.918	1.00								
	Weight 90° [kg]	71	80	89	99	109	120	132								
	Weight 135° [kg]	89	101	114	128	143	158	174								
1200	Height [mm]		1100	1200	1300	1400	1500	1600	1700							
	Free cross section [m²]		0.648	0.738	0.828	0.918	1.008	1.098	1.188							
	Weight 90° [kg]		84	94	104	115	126	137	149							
	Weight 135° [kg]		107	120	134	149	165	181	198							
1300	Height [mm]			1200	1300	1400	1500	1600	1700	1800						
	Free cross section [m²]			0.804	0.902	1.00	1.098	1.196	1.294	1.392						
	Weight 90° [kg]			98	109	120	131	143	155	168						
	Weight 135° [kg]			126	141	156	172	189	206	224						
1400	Height [mm]				1300	1400	1500	1600	1700	1800	1900					
	Free cross section [m²]				0.976	1.082	1.188	1.294	1.40	1.506	1.612					
	Weight 90° [kg]				114	125	136	148	161	174	188					
	Weight 135° [kg]				147	162	179	196	214	233	252					
1500	Height [mm]					1400	1500	1600	1700	1800	1900	2000				
	Free cross section [m²]					1.164	1.278	1.392	1.506	1.62	1.734	1.848				
	Weight 90° [kg]					130	142	154	167	180	194	209				
	Weight 135° [kg]					169	186	203	222	241	261	281				
1600	Height [mm]						1500	1600	1700	1800	1900	2000	2100			
	Free cross section [m²]						1.368	1.49	1.612	1.734	1.856	1.978	2.10			
	Weight 90° [kg]						147	160	173	187	201	215	231			
	Weight 135° [kg]						193	211	229	249	269	290	312			
1700	Height [mm]							1600	1700	1800	1900	2000	2100	2200		
	Free cross section [m²]							1.588	1.718	1.848	1.978	2.108	2.238	2.368		
	Weight 90° [kg]							165	179	193	207	222	238	253		
	Weight 135° [kg]							218	237	257	278	299	321	344		
1800	Height [mm]								1700	1800	1900	2000	2100	2200	2300	
	Free cross section [m²]								1.824	1.962	2.10	2.238	2.376	2.514	2.652	
	Weight 90° [kg]								185	199	214	229	244	261	277	
	Weight 135° [kg]								245	265	286	308	330	354	378	
1900	Height [mm]									1800	1900	2000	2100	2200	2300	
	Free cross section [m²]									2.076	2.222	2.368	2.514	2.66	2.806	
	Weight 135° [kg]									205	220	235	251	268	285	
	Weight 90° [kg]									273	295	317	340	363	388	
2000	Height [mm]										1900	2000	2100	2200	2300	
	Free cross section [m²]										2.344	2.498	2.652	2.806	2.96	
	Weight 90° [kg]										226	242	258	275	292	
	Weight 135° [kg]										303	326	349	373	398	

TENDER SPECIFICATION TEXT

Rectangular roof cowl as 135° intake bend consisting of a sturdy sheet metal housing made of

(90° discharge bend, consisting of a sturdy sheet metal housing with 30° overhang) made of

Galvanised steel

(Stainless steel 1.4301)

(Aluminium AlMg3 - 3.3535)

Detachable bird mesh fastened to housing.

Intake with rain drip edge directly and permanently fastened to the housing.

Base designed for secure fastening to roof attachment.

Fastening between base and roof attachment covered by rain collar

Fold with UV-resistant seal.

Additional requirement

Bend completely painted in RAL

Type:	AB 90°	Symmetrical single-sided 90°
	AB 135°	Symmetrical single-sided 135°
	AB -D 90°	Double-sided 90°
		According to drawing
	AB -D 135°	Double-sided 135°
		According to drawing

Nominal size: /

Manufacturer: BerlinerLuft.
Technik GmbH

TYPE CODE / EXAMPLE ORDER

DHE/AB - 90 - 1000 x 1200 - Sv - RAL 9006 - LP 30

	Connection / accessories
	RAL colour
	Material
	Connection cross section
	Design of 90° discharge bend
	Component designation

Custom units

APPLICATION

A wide range of rectangular and round rooftop intake and discharge units are available as custom solutions for special requirements.

Special solutions for:

High air flows

Restricted heights

Flat air inlets and outlets integrated in the roof

Special aesthetic requirements

Combined air inlets and outlets

High safety requirements as regards water ingress

Increased security requirements (break-ins)

DESIGN DETAILS

Custom air intake or discharge components are usually sturdy, welded structures. If necessary, a support substructure is used, with sheet metal and air passage elements. Depending on the design, the rainwater from some solutions is drained to the building.

Galvanised sheet steel is used to ensure protection from corrosion.

All welds are suitably treated to prevent corrosion. On request, each assembly can be completely painted. Alternative materials are stainless steel or aluminium.

MATERIALS

Material type	Grade	Standard
Galvanised sheet steel	DX51D + Z275 MA-C	DIN 10327
Stainless sheet steel (surface III C)	1.4301 (V2A)	DIN 17440
Aluminium	AlMg3 (3.3535)	EN 485-2

Additional painting on request

INTAKE UNIT DESIGNS

Louvred intake unit

The louvred intake unit is a sturdy housing structure with electrically controlled multi-section louvres to prevent cold air entering installed behind weatherproof grilles.

Possible additional requirements:

Walk-on access

Insulated roof zone

Multi-chamber system

Earthing clamp

Lifting eye bolts

Intake unit with droplet separator

The intake unit with droplet separator has a sturdy housing and provides increased protection from moisture with its integrated droplet separator and 30° overhanging intake port.

Possible additional requirements:

Multi-chamber system

Earthing clamp

Lifting eye bolts

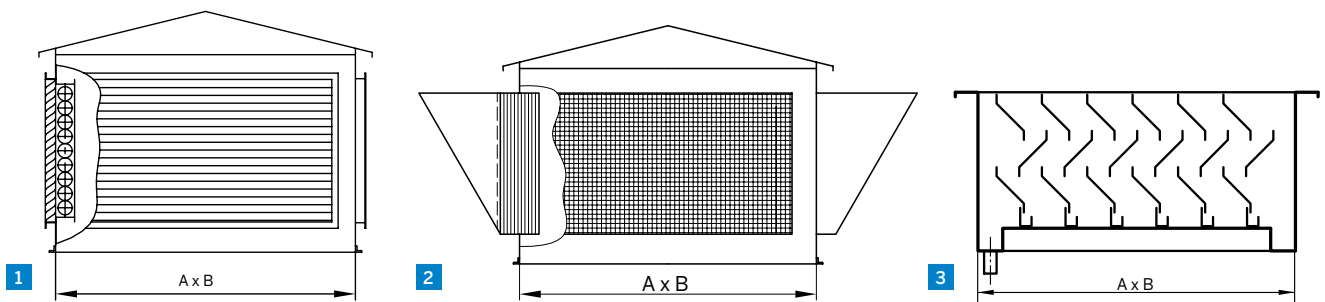
Intake or discharge unit with rainwater cascade

The intake unit is a welded housing structure with a horizontal, multi-step rainwater cascade and water outflow to the building. Especially suitable for flat roofs where an inconspicuous air intake is required.

Possible additional requirements:

Earthing clamp

Lifting eye bolts



Custom units

DESIGNS - DISCHARGE UNITS

Multiple-port discharge unit

The multiple discharge unit has a sturdy housing with an all-round support frame, round or square duct ports on the side, and a symmetrical or asymmetrical rainwater funnel that drains water to the building. Protected by grilles.

Possible additional requirements:

Inspection panel

Earthing clamp

Lifting eye bolts

Discharge diffuser

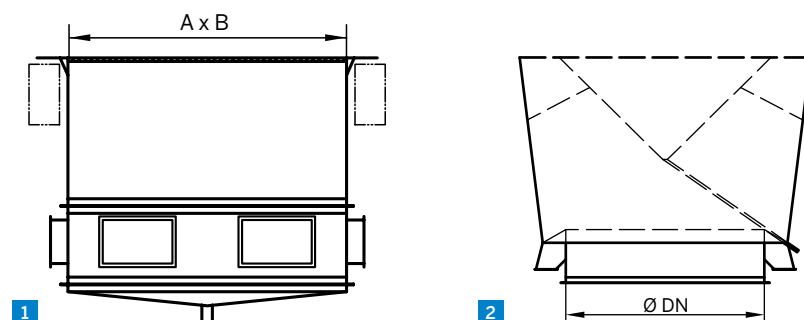
The discharge diffuser works in a similar way to a jet cap. However, instead of the exhaust air emerging as a compact upwards jet, it is ejected in a ring shape. The advantage of this design is that it is not as tall as a jet cap, but has the same effect as a jet of air directed upwards. Resistance is minimised in the diffuser by avoiding an opening angle greater than 8°.

In unfavourable wind conditions, rainwater may enter the connected ducting. The annular opening is protected by a grille.

AVAILABLE SIZES

The units described above are all custom products. The dimensions can be specified individually during planning.

Recommended intake velocity for intake units: 2 – 3 m/s onto the planned intake area.



- 1 | Multiple-port discharge unit
- 2 | Discharge diffuser

TENDER SPECIFICATION TEXTS

Louvred intake unit

Sturdy galvanised sheet steel housing with electrically operated louvres to prevent cold air entering, with multiple weatherproof grilles in front. Inclined roof with drip edge for rainwater to run off. Base designed for secure connection to the roof attachment. Split rain collar supplied unattached. Eye bolts must be provided for secure transport on site.

Connection cross section: mm / mm
Height: mm
Air flow: m³/h

Additional requirements such as walk-on access, multiple chambers, insulated zones and earthing clamp must be individually specified.

Manufacturer: BerlinerLuft.
Technik GmbH

Intake unit with droplet separator

Sturdy galvanised sheet steel housing with built-in droplet separator and intake port with 30° overhang for extra protection from moisture. Inclined roof with drip edge for rainwater to run off. Base designed for secure connection to the roof attachment. Split rain collar supplied unattached. Eye bolts must be provided for secure transport on site.

Connection cross section: mm / mm
Height: mm
Air flow: m³/h

Manufacturer: BerlinerLuft.
Technik GmbH

Intake or discharge unit with rainwater cascade

Sturdy galvanised sheet steel housing with a horizontal, multi-step rainwater cascade that drains water to the building.

Vertical duct connection

Dimensions mm / mm

Walk-on grilles as cover. All-round support frame for secure fastening to the roof structure. Eye bolts must be provided for secure transport on site.

Connection cross section: mm / mm
Height: mm
Air flow: m³/h

Manufacturer: BerlinerLuft.
Technik GmbH

Custom units

TENDER SPECIFICATION TEXTS

Multiple-port discharge unit

Sturdy galvanised sheet steel housing for connecting multiple horizontal square or round ducts (position and dimensions according to sketch supplied). Symmetrical (asymmetrical) rainwater funnel with drain port. Walk-on grille as cover. All-round support frame for secure fastening to the roof structure. Eye bolts must be provided for secure transport on site.

Discharge cross section: mm / mm
Height: mm
Air flow: m³/h

Manufacturer: BerlinerLuft.
Technik GmbH

Discharge diffuser

Round galvanised sheet steel discharge element that functions in a similar way to a jet cap, consisting of a sturdy cylindrical pipe with the connection/nominal cross section and with a diffuser attached to it. The diffuser contains a rainwater funnel that covers the connection cross section. The air exits through the annular gap between the funnel and diffuser, which must be protected with a grille. The base of the discharge element must provide a secure connection to the roof attachment. There must be sufficient eyelets for transport.

Nominal diameter DN: mm / mm
Air flow: m³/h

Manufacturer: BerlinerLuft.
Technik GmbH

Roof collar and boot

Roof collar

- Non-load-bearing for flat roof
- Load-bearing for flat roof
- Load-bearing for flat roof, insulated
- Non-load-bearing for pitched roof
- Load-bearing for pitched roof
- Load-bearing for pitched roof, insulated
- Custom design

Roof boot

- Load-bearing for flat roof
- Load-bearing for flat roof, insulated
- Load-bearing for pitched roof
- Load-bearing for pitched roof, insulated
- Custom design



Roof collar and boot

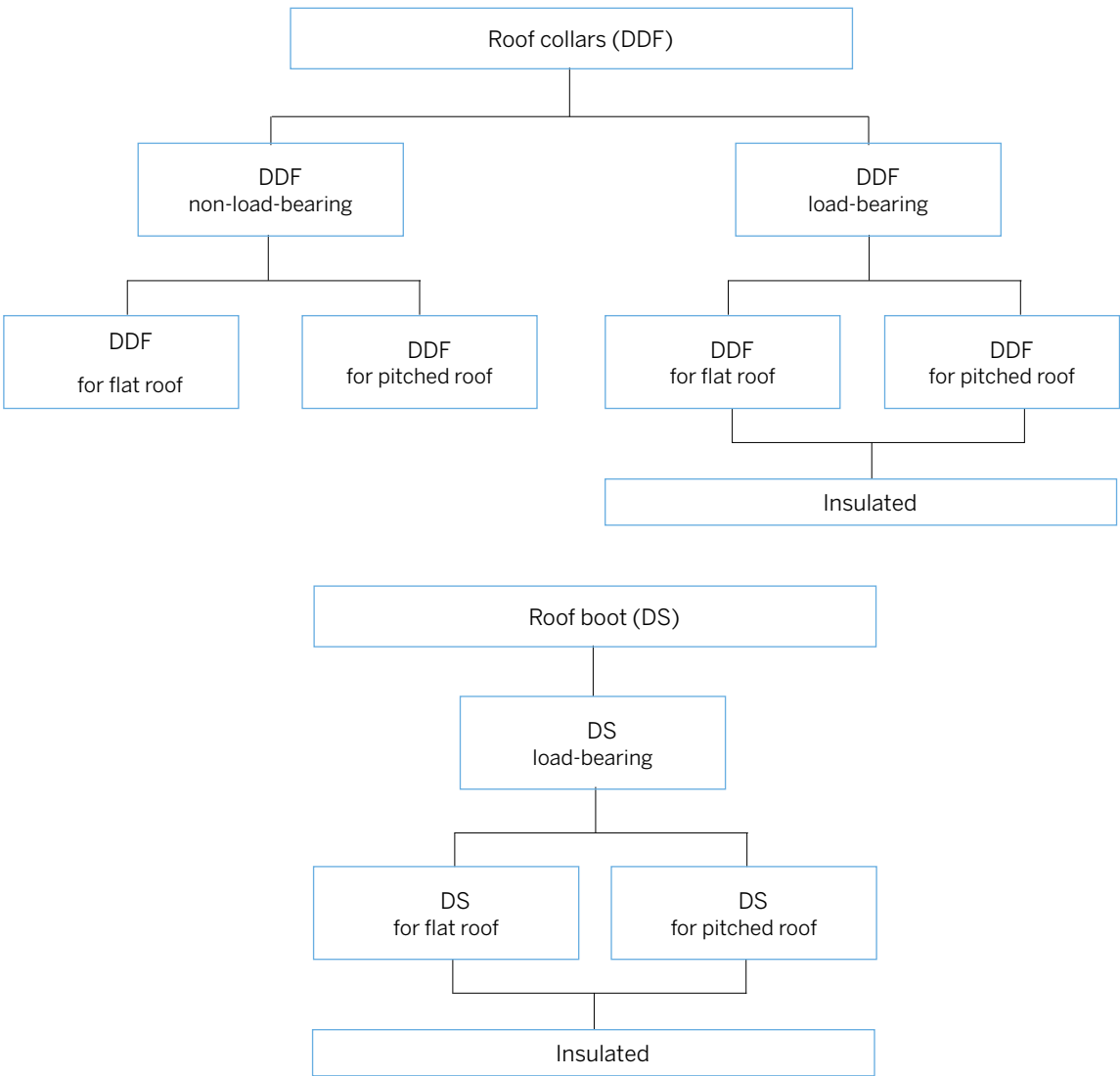
PRODUCT DESCRIPTION

Roof collars and boots are used for securely fastening roof cowls of HVAC systems to the building structure. They are designed for attachment on flat roofs or pitched roofs up to 45°. Local snowfall levels and wind conditions must be taken into account when dimensioning and specifying the components.

STANDARDS AND REGULATIONS

DIN 1055-4	Wind loads
(DIN EN 1991-1-4)	Actions on structures
DIN 1055-5	Snow loads
(DIN EN 03/01/1991)	Actions on structures
DIN 18234-3	Fire safety of large roofs for buildings Requirements for roof penetrations
DIN 18234-4	Fire safety of large roofs for buildings List of roof penetrations

OVERVIEW



LOAD-BEARING ROOF COLLARS

This type of roof collar is designed to safely absorb vibrations and wind loads. It is securely fastened to the roof structure by means of a circumferential flashing. The roof cowl and ducting can be directly connected to the roof collar.

Material and design: Load-bearing roof collars are always made from sturdy welded steel. The roof sealing strips can be directly stuck to the roof collar.

NON-LOAD-BEARING ROOF COLLARS

This type of roof collar needs to be supported by the ducting. This means its own weight and the wind loads are kept separate from the roof and must be absorbed by a sturdy air duct in the building.

Their sole purpose is to ensure that air duct passes through the roof by ensuring that the roof penetration is sealed with the roof collar.

The roof collar may not be subjected to loads or vibrations. The space between the roof collar and the air duct must be filled with insulating material on site after the individual elements have been installed. **Material and design:** Folded galvanised steel.

LOAD-BEARING ROOF BOOT

Roof boots are generally welded so that they can absorb the weight of the cowl and the wind load and divert it to the roof structure. The roof boot is fastened to the roof structure by an all-round support collar. The welded structure also ensures that the roof boot can be properly sealed. The penetration through the roof structure must be made in such a way that a smooth interior air flow surface is formed.

ADAPTATION TO THE ROOF TYPE

Roof collars and boots can be used for the following types of roof:

Flat roof

Pitched roof (shallow and steep roofs)

The exact pitch of the roof must be specified. The roof pitch is defined as follows:

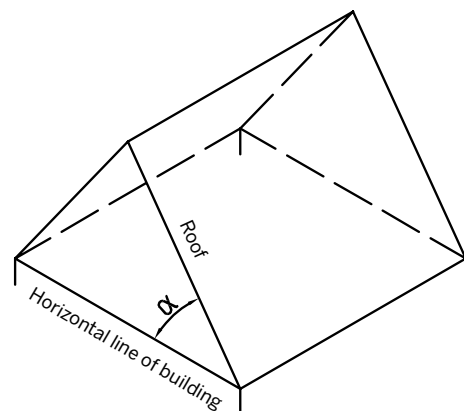
The roof pitch is the angle between the roof and the horizontal line of the building. It is given as an angle (alpha) in degrees (°).

The customer must convert pitches given as percentages to the roof pitch α° using the arctan function.

ROOF PITCH

Note about loads on roof collars and boots

Due to the wide range of possible conditions on site (weights, wind loads, snow depths, roof structure), the load-bearing capacity of roof collars and boots must always be calculated by the customer. All relevant information must be given to the manufacturer on placing the order.



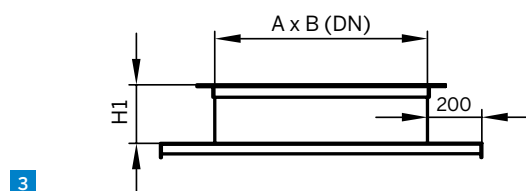
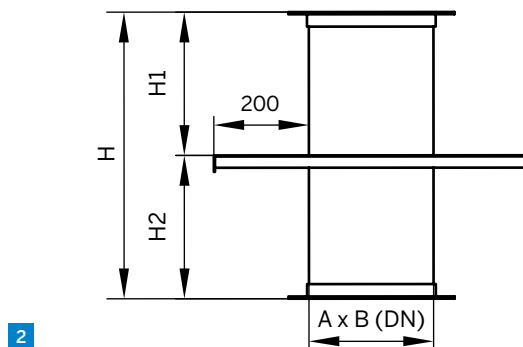
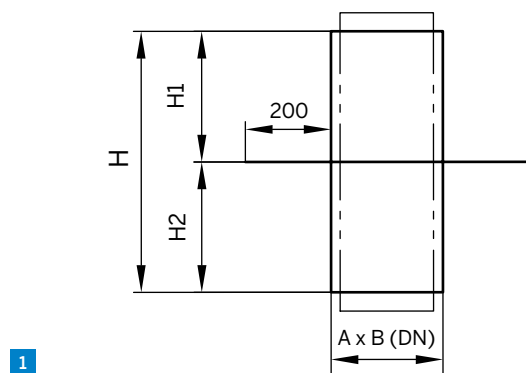
Roof collar and boot

INSTALLED HEIGHTS

The installed heights of BerlinerLuft. roof collars and boots are as follows for the standard versions. For H1 the standard height is 400 mm. Other requirements must be specified. In addition, the heights must be adapted to the typical local snow

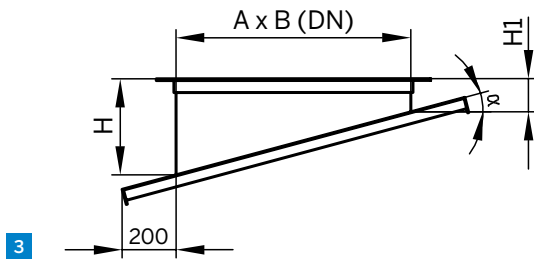
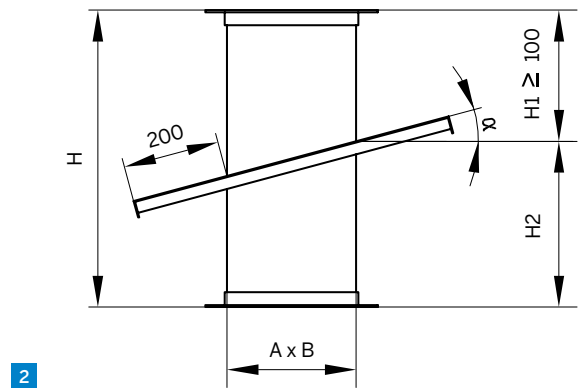
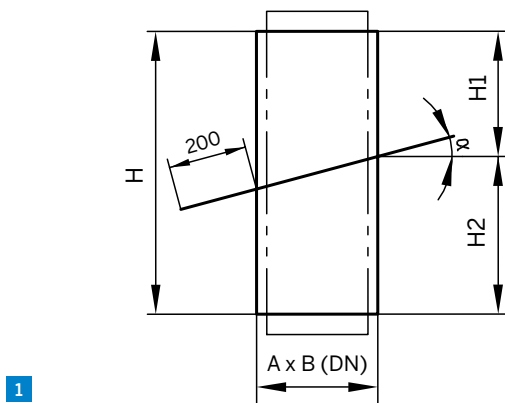
depth. The height of the components above the roof must be specified to ensure that no snow can be sucked into the system. This information must always be provided at the planning stage.

STANDARD VERSIONS FOR FLAT ROOF



- 1 | Non-load-bearing collar for flat roof
- 2 | Load-bearing collar for flat roof
- 3 | Load-bearing boot for flat roof

STANDARD VERSIONS FOR PITCHED ROOF



- 1 | Load-bearing collar for pitched roof
- 2 | Non-load-bearing collar for pitched roof
- 3 | Load-bearing boot for pitched roof

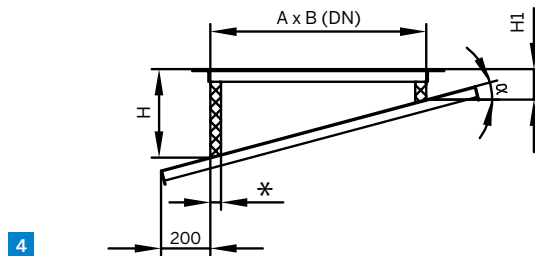
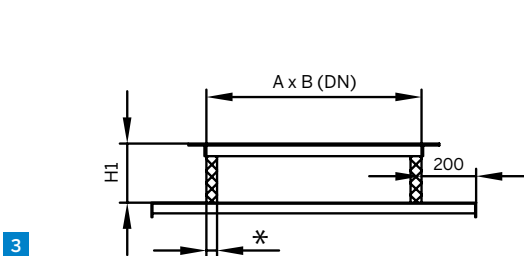
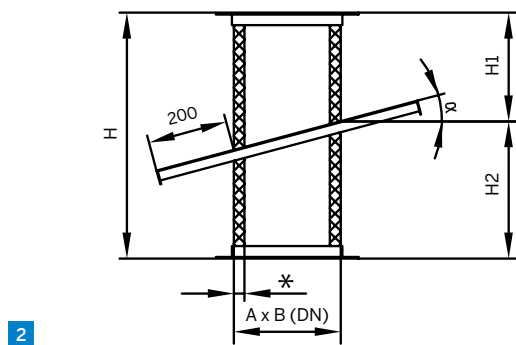
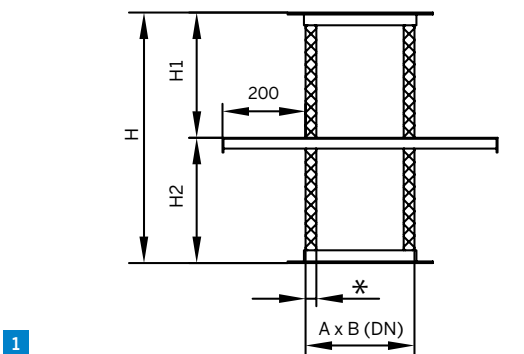
Roof collar and boot

INSULATION

The roof collars and boots from BerlinerLuft. can also be manufactured ex works with thermal insulation. Based on the structural design, the insulation is always on the inside. The standard insulation thickness is 50 mm and consists of mineral wool fibre.

This is covered by an internal sheet metal duct with profile sections on the joints. The reduction in diameter must be considered when determining the air flow velocity.

INSULATED LOAD-BEARING VERSION



* Insulation thickness 50 mm or as requested

- 1 | Flat roof collar
- 2 | Pitched roof collar
- 3 | Flat roof boot
- 4 | Pitched roof boot

SPECIAL VERSIONS

The roof collars and boots can also be supplied with silencers for special applications. The installed height depends on the technical conditions regarding the required soundproofing.

For the structural strength of the roof, the dimensions of the roof collar or boot, and of the silencer and roof cowl must be taken into account.

TENDER SPECIFICATION TEXT

Roof collar

Roof collar with all-round support collar 200 mm	Complete as appropriate: _____ Non-load-bearing _____ Load-bearing, welded version _____
Material	Complete as appropriate: _____ Galvanised steel _____ Stainless steel 1.4301 _____ Aluminium _____
Size	Complete as appropriate: _____ DN.....mm _____ A x B/.....mm _____
Height above roof	Complete as appropriate: _____ Standard H1 = 400 mm _____ H1 = mm _____
Total height	H _{tot} =mm _____
Roof type	Complete as appropriate: _____ Flat roof _____ Pitched roof - pitch° _____
Connection frame	Complete as appropriate: _____ Top _____ Bottom _____
Insulated	Insulation thicknessmm _____
Manufacturer	BerlinerLuft. Technik GmbH

Roof collar and boot

TENDER SPECIFICATION TEXT

Roof boot

Roof boot with all-round support collar version 200 mm	welded
Material	Complete as appropriate: _____ Galvanised steel _____ Stainless steel 1.4301 _____ Aluminium
Size	Complete as appropriate: _____ DN.....mm _____ A x B/.....mm
Height above roof	Complete as appropriate: _____ Standard H1 = 400 mm _____ H1 = mm
Total height	_____ $H_{tot} = \dots\dots\dots\text{mm}$
Roof type	Complete as appropriate: _____ Flat roof _____ Pitched roof - pitch°
Connection frame	Complete as appropriate: _____ Top _____ Bottom
Insulated	Insulation thicknessmm
Manufacturer	BerlinerLuft. Technik GmbH

Weatherproof grilles



Weatherproof grilles

APPLICATION

Weatherproof grilles prevent rainwater from entering inlets and outlets in building façades either as part of an HVAC system or for natural ventilation of building complexes.

DESIGN DETAILS

The weatherproof grille consists of specially shaped, rain-deflecting horizontal louvres fastened inside a frame. The louvres are spaced for an optimum balance between protection and pressure drop. The weatherproof grilles are backed with a bird mesh.

All standard weatherproof grilles have a non-perforated frame. Versions with a perforated frame must be specified when required.

Note:

Because weatherproof frames can never guarantee absolute protection from water ingress (see the permeability diagram), there must be an appropriate drainage facility in the connected ducting.

MATERIALS

Galvanised steel

Stainless steel 1.4301

Aluminium

Copper

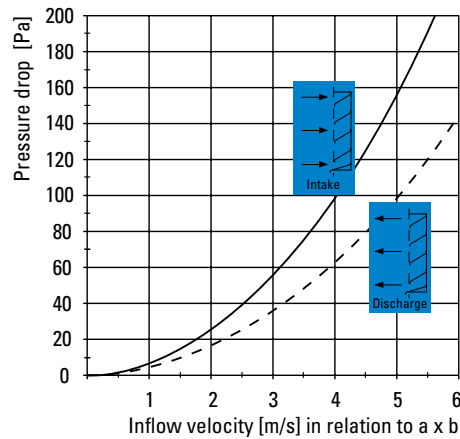
Additional colours possible

Galvanised steel weatherproof grille	WSG-S
Galvanised steel weatherproof grille with perforated frame	WSG-S1
Galvanised steel weatherproof grille, powder-coated	WSG-S RAL...
Extruded aluminium weatherproof grille	WSG-A
Aluminium weatherproof grille with perforated frame	WSG-A1
Stainless steel weatherproof grille	WSG-E
Stainless steel weatherproof grille with perforated frame	WSG-E1
Copper weatherproof grille	WSG-Cu
Copper steel weatherproof grille with perforated frame	WSG-Cu1

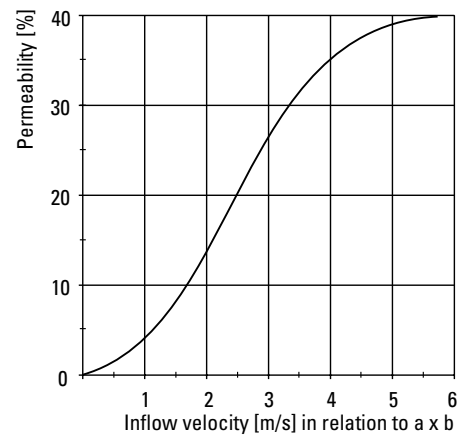


PERFORMANCE DATA

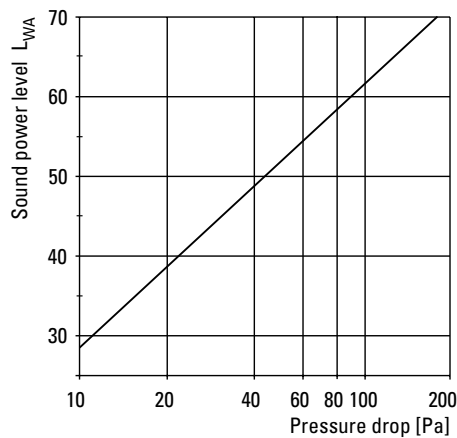
The recommended flow velocity in relation to $a \times b$ is 2–3 m/s, max. 5 m/s.



Pressure drop



Permeability



Flow noise

Correction K depending on the face area $a \times b$	
$a \times b$ in m^2	K in dB
0.04	-14
0.06	-12
0.1	-10
0.2	-7
0.4	-4
0.6	-2
1	0
2	3
4	6
8	9

Correction for sound power level

AVAILABLE SIZES

Width

All sizes > 200 mm to 2000 mm in one piece

Sizes > 2000 mm in multiple sections

Height

All sizes > 200 mm to 2,500 mm in one piece

Sizes > 2,500 mm in multiple sections

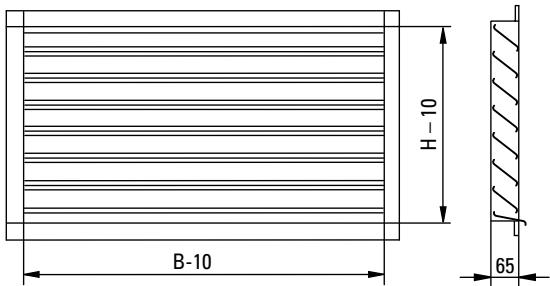
Note

Weatherproof grilles are always supplied in the nominal dimension minus 10 mm, so that they can be fitted directly in the duct.

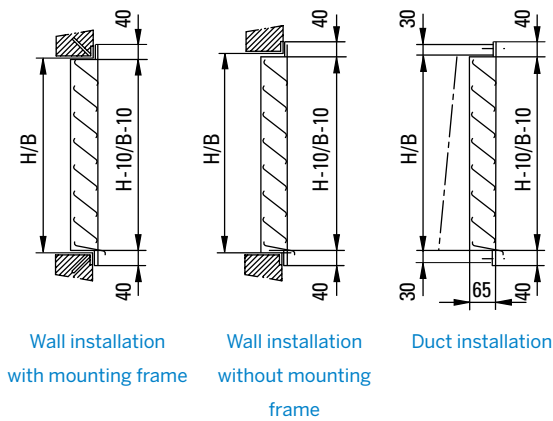
For wall installation, a mounting frame (ER) can be supplied to fit the weatherproof grille.

Weatherproof grilles

DIAGRAM

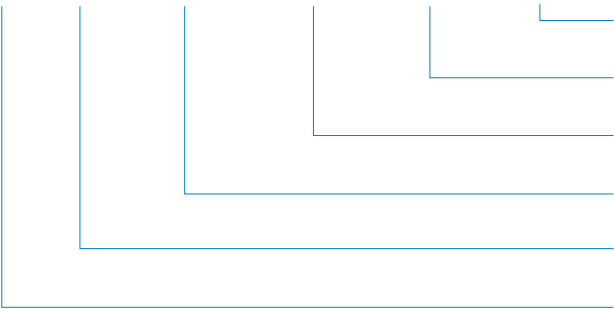


INSTALLED DIMENSIONS



TYPE CODES

WSG - E - 850 x 400 - Sv 1 - RAL 9006 - ER



- Accessories
- Colour code (as required)
- Material
- Nominal dimensions width x height
- Design
- Component designation

TENDER SPECIFICATION TEXT

Weatherproof grille to protect from ingress of rain and foreign objects in the air inlets and outlets of HVAC systems, consisting of a frame with special, rain-deflecting horizontal louvres, backed with bird mesh.

(Enter the design and material as in the above documentation, according to the technical requirements).

Manufacturer

Berliner Luft. Technik GmbH

EXAMPLE ORDER

Weatherproof grille, rectangular, size 850 x 400 mm, steel galvanised, perforated frame, RAL 9006, mounting frame

Order code

WSG-E- 850 x 400 - Sv 1 - RAL 9006 - ER

Weatherproof grille combinations



Weatherproof grille combinations

PRODUCT DESCRIPTION

Application

Weatherproof grilles with louvres or positive pressure dampers have a dual function in the inlets and outlets of HVAC systems. They prevent ingress of rainwater and foreign objects, and allow the air flow to be regulated or the vent to be closed when the system is not in operation.

Design details

Combined weatherproof grille with louvre

This assembly consists of a weatherproof grille from series WSG/K-E-Sv or WSG/K-E-Alu and a louvre from series JK-I-SS. The two components are fixed together using a specially shaped frame on the louvre.

Combined weatherproof grille with positive pressure damper

This assembly consists of a shared frame that contains the basic elements of the WSG-E-Sv or WSG-E-Alu series and the ÜDK series.

Materials

Galvanised steel, aluminium

The weatherproof grille is available in additional colours

DESIGNS AND DESIGNATIONS

Galvanised steel weatherproof grille / galvanised steel louvre	WSG/ K-E-Sv - JK100
Galvanised steel weatherproof grille / galvanised steel louvre	WSG/ K-E-Sv - JK165
Aluminium weatherproof grille / galvanised steel louvre	WSG/ K-E-Alu - JK100
Aluminium weatherproof grille / galvanised steel louvre	WSG/ K-E-Alu - JK165
Galvanised steel weatherproof grille / steel/aluminium positive pressure damper	WSG/K-E-Sv - ÜDK
Aluminium weatherproof grille / steel/aluminium positive pressure damper	WSG/K-E-Alu - ÜDK

PERFORMANCE DATA

The recommended flow velocity in relation to a x b is 2–3 m/s, max. 5 m/s.

For further details on the performance and design of the products, see the corresponding documentation:

Weatherproof grilles

Louvres

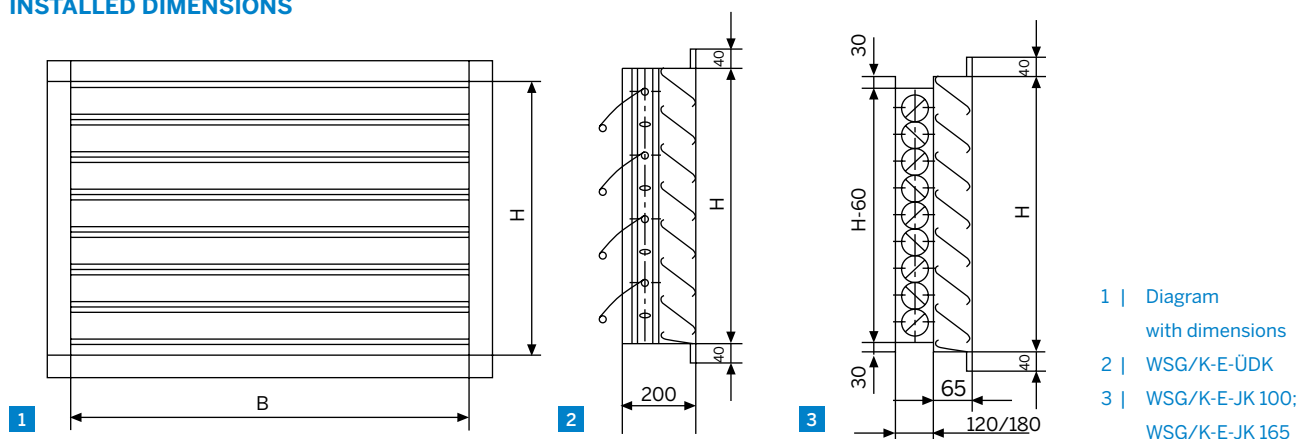
Positive pressure dampers



Weatherproof grille with louvre (left).
Weatherproof grille with positive pressure damper (right)

Weatherproof grilles

INSTALLED DIMENSIONS



AVAILABLE SIZES

Standard dimensions					
WSG/K-E-ÜDK		WSG/K-E-JK 100		WSG/K-E-JK 165	
Width	Height	Width	Height	Width	Height
200	160	200	270	300	240
300	240	300	370	400	405
400	320	400	470	500	570
600	480	500	570	600	730
700	560	600	670	700	900
800	640	700	770	800	1065
900	720	800	870	900	1230
1000	800	900	970	1000	1395
1100	880			1100	1560
1200	960			1200	1725
1300	1040			1300	1890
1400	1120			1400	2055
1500	1200			1500	
1600	1360			1600	
	1440				
	1520				
	1600				
	1680				
	1760				
	1840				
	1920				
	2000				

Note

The height always comes in increments depending on the louvre spacing.

JK 100 Spacing height 100 mm

JK 165 Spacing height 165 mm

ÜDK Spacing height 80 mm

The width comes in 100 mm steps, but other sizes up to the maximum stated width are possible. For wall installation, a galvanised steel mounting frame (ER) can be supplied to fit the weatherproof grille. A complete overview can be found in the latest BerlinerLuft price list.

Widths and heights can be combined.

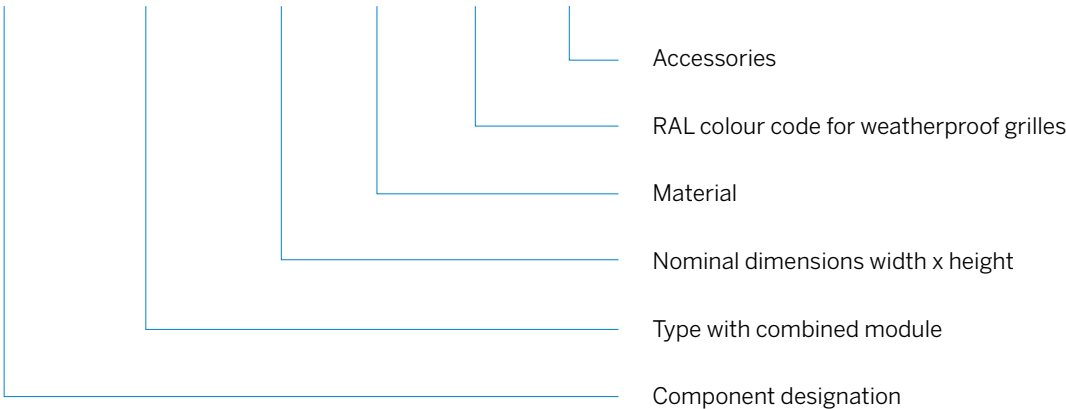
Do not exceed the maximum specified widths and heights.

A division may be necessary.

Weatherproof grilles

TYPE CODES

WSG/K - E-JK 100 - 600 x 670 - Sv - RAL 9006 - ER



TENDER SPECIFICATION TEXT

Combined weatherproof grille for protection from ingress of rain and foreign objects into the inlets and outlets of HVAC systems, with a louvre or positive pressure damper to regulate air flow rate or close the vent when the system is not in operation. (Enter the design and material as in the aforementioned documentation, according to the technical requirements).

Manufacturer

Berliner Luft. Technik GmbH

EXAMPLE ORDER

Combined weatherproof grille, louvre spacing 100, size 600 x 670 mm, galvanised steel, surface treated in RAL 9006, with mounting frame.

Order code

WSG/K-E-JK100-600 x 670-Sv-RAL 9006-ER

Special weatherproof grilles



Special weatherproof grilles

PRODUCT DESCRIPTION

Application

Special weatherproof grilles are used when specially shaped HVAC inlets and outlets are required on building façades for aesthetic reasons. They prevent rainwater and dirt from entering the connected ductwork.

Design details

The special weatherproof grille consists of specially shaped, rain-deflecting horizontal louvres fastened inside a frame.

The louvres are spaced for an optimum balance between protection and pressure drop. The special weatherproof grilles have a bird mesh on the back.

All standard weatherproof grilles have a non-perforated frame. Versions with a perforated frame must be specified when required.

Note

Because special weatherproof frames can never guarantee absolute protection from water ingress (see the permeability diagram in the WSG documentation), there must be an appropriate drainage option in the connected ducting.

Materials

Galvanised steel, stainless steel 1.4301, aluminium, copper

Additional colours possible

Designations

Galvanised steel special weatherproof grille	WSG/F... – Sv
Galvanised steel special weatherproof grille, powder-coated	WSG/F... – Sv RAL.....
Extruded aluminium special weatherproof grille	WSG/F... – Alu
Stainless steel special weatherproof grille	WSG/F... – VA
Copper special weatherproof grille	WSG/F... – Cu

Performance data

The recommended flow velocity in relation to a x b is 2–3 m/s, max. 5 m/s.

For further details on the performance and design of the products, see the corresponding documentation:

Weatherproof grilles

Available sizes

Width (A) All sizes > 200 mm to 2000 mm in one piece

Height (B) All sizes > 200 mm to 2000 mm in one piece

Note

Weatherproof grilles are always supplied in the nominal dimension minus 10 mm. For wall installation, a galvanised steel mounting frame (ER) can be supplied to fit the special weatherproof grille.

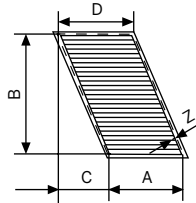


Special weatherproof grille WSG/F9

DESIGNS

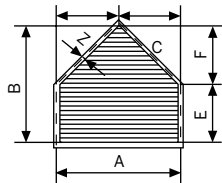
Rectangular type

WSG/F1



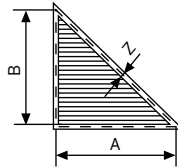
A
B
C
D
Z

WSG/F2



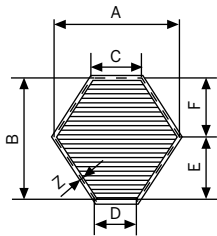
A
B
C
D
E
F
Z

WSG/F3



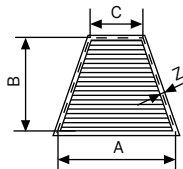
A
B
Z

WSG/F4



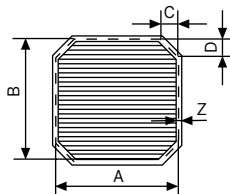
A
B
C
D
E
F
Z

WSG/F5



A
B
C
Z

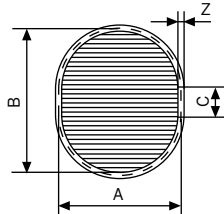
WSG/F6



A
B
C
D
Z

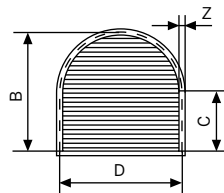
Round type

WSG/F7



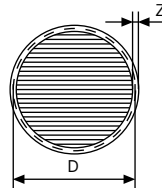
A
B
C
Z

WSG/F8



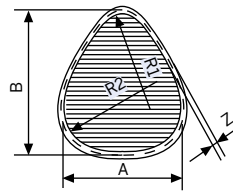
A
B
C
Z

WSG/F9



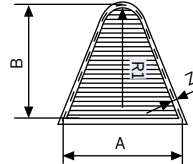
D
Z

WSG/F10



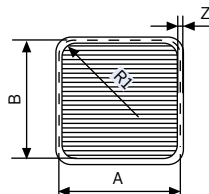
A
B
R1
R2
Z

WSG/F11



A
B
R1
Z

WSG/F12

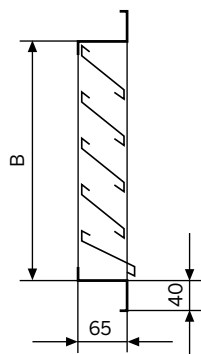


A
B
R1
Z

Other shapes are available on request
Standard dimension Z = 40 mm

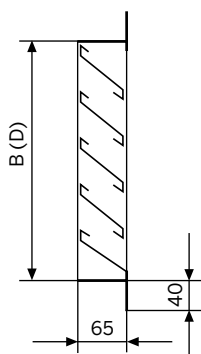
Special weatherproof grilles

INSTALLED DIMENSIONS



For all other dimensions see drawings F1 to F6

Rectangular type

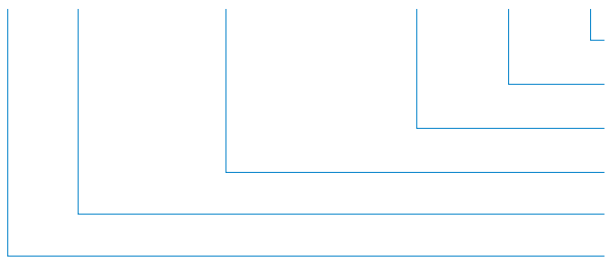


For all other dimensions see drawings F7 to F12

Round type

TYPE CODES

WSG/F - 1 - A, D400, B800, C100, Z40 - Sv - RAL 9006 - ER



- Accessories (as required)
- RAL colour code
- Material
- Nominal dimensions
- Design
- Component designation

TENDER SPECIFICATION TEXT

Special weatherproof grille to protect from ingress of rain and into the inlets and outlets of HVAC systems, consisting of a frame with special, rain-deflecting horizontal louvres, backed with bird mesh. (Specify designs F1 to F12 as required according to the above documentation). Use the above dimensional drawings and enter the correct dimensions.

Other designs must be documented.

Manufacturer

Berliner Luft. Technik GmbH

EXAMPLE ORDER

Special weatherproof grille, design 1, size (as specified on drawing), galvanised steel, RAL 9006, with mounting frame

Order code

WSG/F-1-A,D400,B800,C100,Z40-Sv-RAL 9006-ER

Acoustic weatherproof grilles



Acoustic weatherproof grilles

APPLICATION

Acoustic weatherproof grilles (WSG/AK) prevent penetration of rainwater and dirt and also reduce noise transmitted by the inlets and outlets in building façades, either as part of an HVAC system or for natural ventilation of building complexes.

They significantly reduce noise compared to standard weatherproof grilles (see diagram).

DESIGN DETAILS

The acoustic weatherproof grille (WSG/AK) consists of a sturdy housing with specially designed, rain-deflecting horizontal louvres. These louvres are filled with mineral wool, protected by a glass fibre fleece and a perforated sheet metal shell. There is a grille on the back of the WSG/AK to keep out larger objects such as leaves or small animals. The housing can be surface-mounted (type A) or recessed (type E). When there are very strict requirements for soundproofing, it is possible to increase the effect of the WSG/AK with a dual arrangement (type AD or ED).

To create lines of grilles along building façades, acoustically inactive dummy grilles (type AB or EB) with an identical appearance can be used.

When necessary, the WSG/AK can be equipped with an anti-icing system.

MATERIALS

Galvanised steel

Aluminium (AlMg3)

Stainless steel (1.4301)

Additional colours available on request

DESIGNS AND DESIGNATIONS

Design	Material	Designation
Single recessed grille (EE)	Galvanised steel	WSG/AK-EE-Sv
Single surface-mounted grille (AE)	Galvanised steel	WSG/AK-AE-Sv
Double recessed grille (ED)	Galvanised steel	WSG/AK-ED-Sv
Double surface-mounted grille (AD)	Galvanised steel	WSG/AK-AD-Sv
Recessed dummy grille (EB)	Galvanised steel	WSG/AK-EB-Sv
Surface-mounted dummy grille (AB)	Galvanised steel	WSG/AK-AB-Sv
Types as above	Aluminium	WSG/AK...-Alu
Types as above	Stainless steel	WSG/AK...-VA

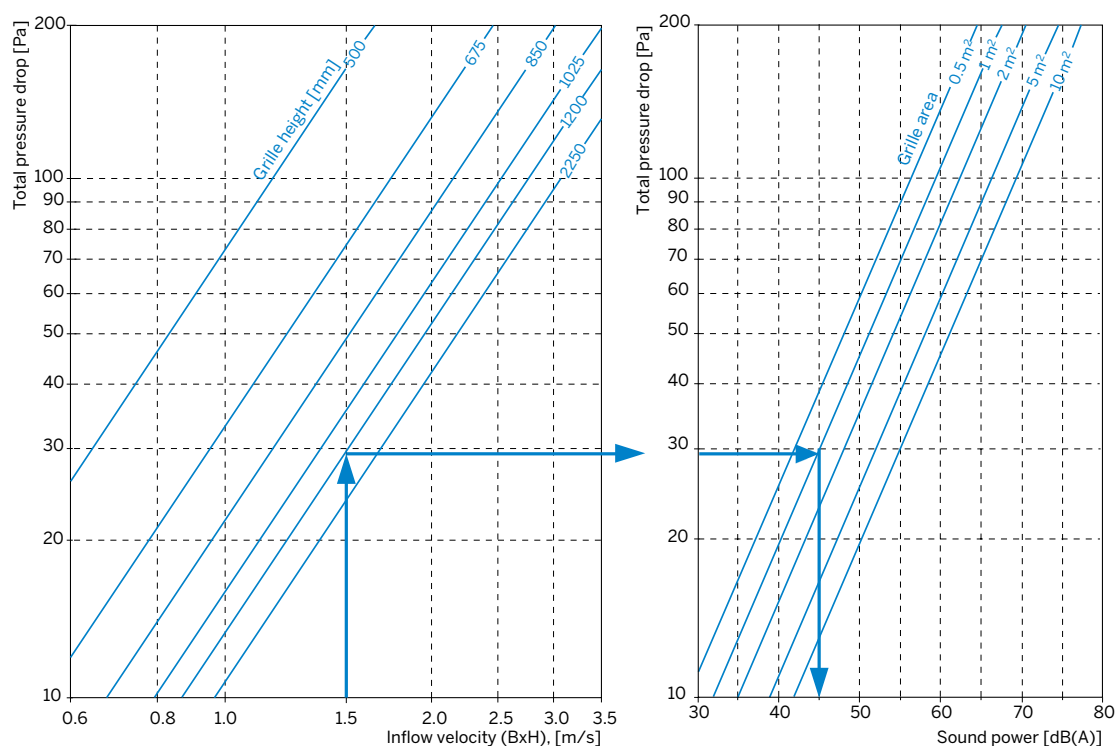


Acoustic weatherproof grilles

SINGLE GRILLES

Performance data

Octave frequency [Hz]	63	125	250	500	1k	2k	4k	8k
Insertion loss [dB]	2	5	6	9	14	15	14	13



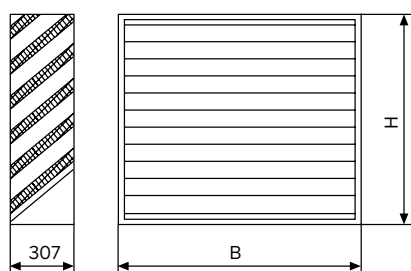
Dimensioning example

W = 800 mm, H = 1200 mm → face area approx. 1 m²

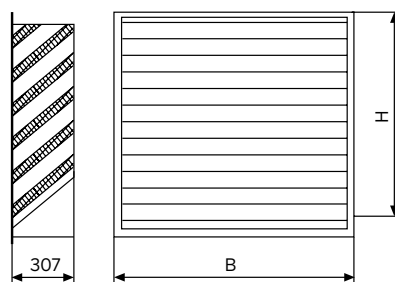
Inflow velocity: 1.5 m/s → Pressure drop 30 Pa

→ Sound power level 45 dB(A)

The OUTWIN design program can also be used for pressure drop and flow noise.



WSG/AK-EE – single recessed grille



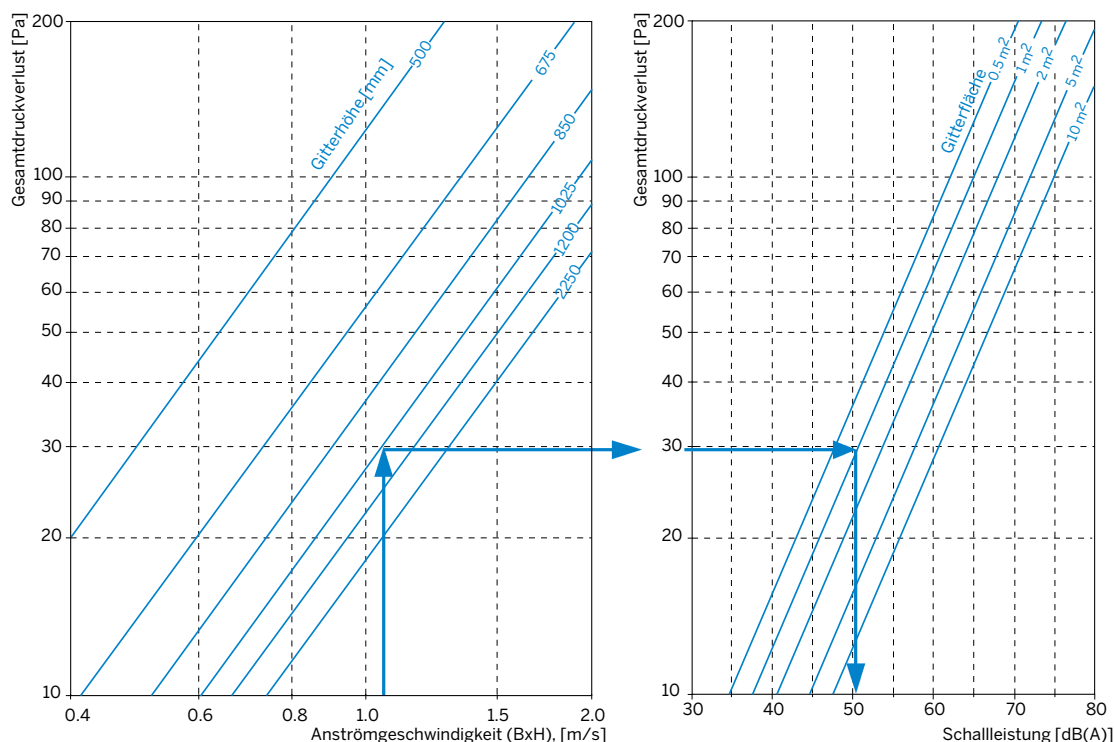
WSG/AK-EE – single surface-mounted grille

Acoustic weatherproof grilles

DOUBLE GRILLES

Performance data

Octave frequency [Hz]	63	125	250	500	1k	2k	4k	8k
Insertion loss [dB]	3	5	8	12	18	24	27	28



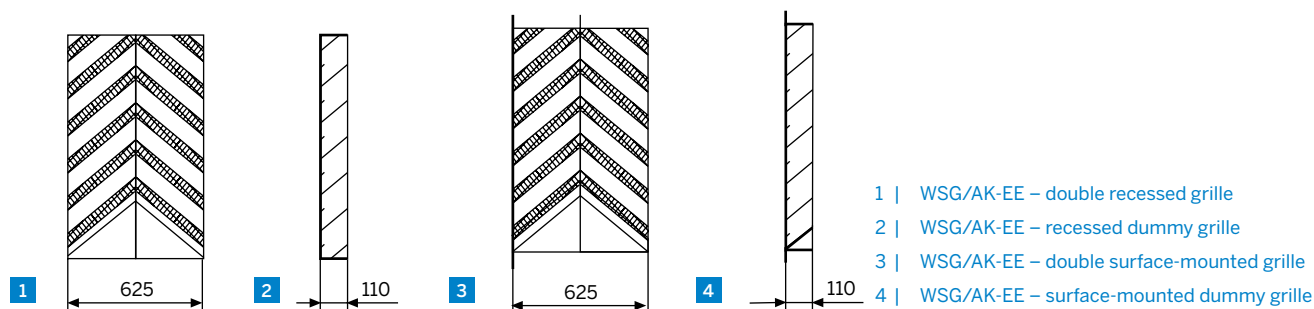
Dimensioning example

W = 1000 mm, H = 1025 mm → face area approx. 1 m²

Inflow velocity: 1.1 m/s → Pressure drop 30 Pa

→ Sound power level 50 dB(A)

The OUTWIN design program can also be used for pressure drop and flow noise.



AVAILABLE SIZES

The louvre spacing of the WSG/AK is 175 mm. The installed depth is 307 mm.

Width All sizes > 300 mm to 2500 mm
possible in one piece

Height min. height – 500 mm
max. height – 2250 mm

Note

The overall height of the acoustic weatherproof grille depends on the louvre spacing (175 mm).

The joints between WSG/AKs installed in a row must be covered by metal strips.

FREE CROSS SECTIONS AND WEIGHTS

The weights are reference values for the basic version.
(WSG/AK-EE)

Height H [mm]	Technical data Weights		Width B [mm]											
			300	500	700	900	1100	1300	1500	1700	1900	2100	2300	2500
500	Free cross section	m ²	0.018	0.030	0.043	0.055	0.067	0.079	0.091	0.103	0.115	0.128	0.140	0.152
	Flow rate ¹	m ³ /h	200	330	460	590	720	850	985	1115	1250	1380	1510	1640
	Steel weight	kg	12	16	20	24	28	31	35	39	43	47	51	55
675	Aluminium weight	kg	5	6	8	9	11	13	14	16	18	19	21	22
	Free cross section	m ²	0.036	0.061	0.085	0.109	0.134	0.158	0.182	0.207	0.231	0.255	0.279	0.304
	Flow rate ¹	m ³ /h	400	655	920	1180	1445	1700	1970	2230	2490	2750	3020	3280
300	Steel weight	kg	16	22	27	33	39	44	50	56	61	67	73	78
	Aluminium weight	kg	6	9	11	14	16	18	21	23	26	28	30	33
	Free cross section	m ²	0.055	0.091	0.128	0.164	0.200	0.237	0.273	0.310	0.346	0.383	0.419	0.456
1025	Flow rate ¹	m ³ /h	590	985	1380	1770	2165	2560	2950	3345	3740	4130	4530	4920
	Steel weight	kg	21	28	35	43	50	57	65	72	79	87	94	101
	Aluminium weight	kg	8	12	15	18	21	24	27	31	34	37	40	43
1200	Free cross section	m ²	0.073	0.122	0.170	0.219	0.267	0.316	0.365	0.413	0.462	0.510	0.559	0.608
	Flow rate ¹	m ³ /h	790	1310	1840	2360	2890	3410	3940	4460	4985	5510	6040	6560
	Steel weight	kg	25	34	43	52	61	70	79	88	97	106	115	124
1200	Aluminium weight	kg	10	14	18	22	26	30	34	38	42	46	50	54
	Free cross section	m ²	0.091	0.152	0.213	0.273	0.334	0.395	0.456	0.516	0.577	0.638	0.699	0.759
	Flow rate ¹	m ³ /h	985	1640	2300	2950	3610	4265	4920	5580	6230	6890	7545	8200
1200	Steel weight	kg	30	40	51	62	73	83	94	105	115	126	137	147
	Aluminium weight	kg	12	17	22	26	31	36	40	45	50	55	59	64

¹ Flow rate at intake velocity of 3 m/s in the free cross section

Acoustic weatherproof grilles

Height H [mm]	Technical data Weights		Width B [mm]											
			300	500	700	900	1100	1300	1500	1700	1900	2100	2300	2500
1375	Free cross section	m ²	0.109	0.182	0.255	0.328	0.401	0.474	0.547	0.620	0.693	0.765	0.838	0.911
	Flow rate ¹	m ³ /h	1180	1970	2760	3540	4330	5120	5900	6690	7840	8270	9050	9840
	Steel weight	kg	34	47	59	71	84	96	109	121	133	146	158	170
1550	Aluminium weight	kg	14	20	25	31	36	42	47	52	58	63	69	74
	Free cross section	m ²	0.128	0.213	0.298	0.383	0.468	0.553	0.638	0.723	0.808	0.893	0.978	1.063
	Flow rate ¹	m ³ /h	1380	2300	3215	4130	5050	5970	6890	7810	8730	9645	10560	11480
1725	Steel weight	kg	39	53	67	81	95	109	123	137	151	165	179	193
	Aluminium weight	kg	16	22	29	35	41	47	54	60	66	72	79	85
	Free cross section	m ²	0.146	0.243	0.340	0.437	0.535	0.632	0.729	0.826	0.923	1.021	1.118	1.215
1900	Flow rate ¹	m ³ /h	1575	2525	3675	4725	5775	6825	7875	8925	9975	11020	12070	13120
	Steel weight	kg	43	59	75	91	106	122	138	153	169	185	201	216
	Aluminium weight	kg	18	25	32	39	46	53	60	67	74	81	88	95
2075	Free cross section	m ²	0.164	0.273	0.383	0.492	0.601	0.711	0.820	0.929	1.039	1.148	1.258	1.367
	Flow rate ¹	m ³ /h	1770	2950	4130	5315	6495	7675	8860	10040	11220	12400	13580	14760
	Steel weight	kg	48	65	83	100	118	135	152	170	187	205	222	239
2250	Aluminium weight	kg	20	28	35	43	51	59	67	74	82	90	98	106
	Free cross section	m ²	0.182	0.304	0.425	0.547	0.668	0.790	0.911	1.033	1.154	1.276	1.397	1.519
	Flow rate ¹	m ³ /h	1970	3280	4590	5900	7220	8530	9845	11155	12460	13780	15090	16400
2500	Steel weight	kg	52	71	91	110	129	148	167	186	205	224	243	262
	Aluminium weight	kg	22	30	39	47	56	65	73	82	90	99	107	116
	Free cross section	m ²	0.200	0.334	0.468	0.601	0.735	0.869	1.002	1.136	1.270	1.403	1.537	1.671
	Flow rate ¹	m ³ /h	2165	3610	5050	6495	7940	9380	10830	12270	13710	15150	16600	18040
2750	Steel weight	kg	57	78	98	119	140	161	182	202	223	244	265	285
	Aluminium weight	kg	24	33	42	52	61	70	80	89	98	108	117	126
	Free cross section	m ²	0.218	0.366	0.514	0.662	0.810	0.958	1.106	1.254	1.402	1.550	1.698	1.846
	Flow rate ¹	m ³ /h	2340	3960	5480	7000	8520	10040	11560	13080	14600	16120	17640	19160
	Steel weight	kg	61	84	107	130	153	176	199	222	245	268	291	314
	Aluminium weight	kg	26	36	46	56	66	76	86	96	106	116	126	136

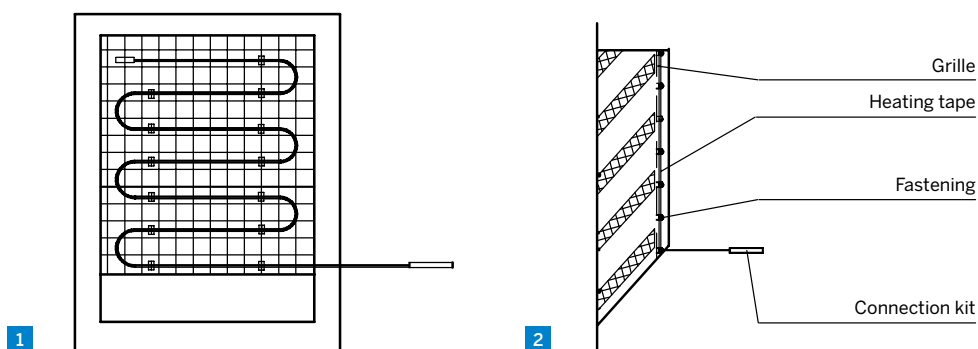
¹ Flow rate at intake velocity of 3 m/s in the free cross section

ANTI-ICING SYSTEM (ES)

At temperatures below + 2°C and an air humidity above 60% (for example in fog) there is a risk of the grille icing up. To ensure operation of the HVAC system, the soundproof weatherproof grille can be electrically heated. This is done using special temperature- and UV-resistant heating tape on the grille.

For fully automatic control of the anti-icing system, there must be an ice sensor or another combination of a thermostat and hygostat.

The control unit must be selected and installed by a specialist electrical contractor and is not supplied with the acoustic weatherproof grille.



1 | Rear view

2 | Side cross section

Acoustic weatherproof grilles

TECHNICAL DATA

65° anti-icing tape

Rated voltage:	230 V
Heating power:	11 W/m
Installed power:	approx. 110 W/m ²
Rated temperature:	65°
Earthed braiding:	Galvanised copper
Outer jacket:	Polyolefin
Watertight:	Yes
Width:	14 mm
Thickness:	6 mm
Minimum bending radius:	32 mm
CE label:	Yes
Required power switch fuse:	16 A

Connection kit

Connection kit for making a heating tape ready for connection, consisting of:

Heating tape plug	
Heating tape socket	
Connection cable	2 m
Watertight:	Yes
CE label:	Yes

MOUNTING FRAME / MASONRY ANCHORS

A suitable mounting frame and masonry anchors are supplied on request.

NOTES ON CONNECTION

The braiding of the heating tape must be earthed.

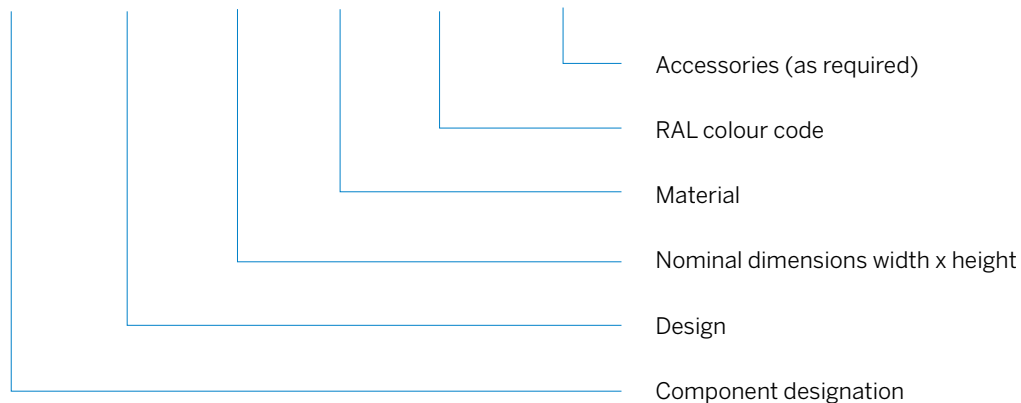
The WSG/AK must be included in this protection.

There must be a residual current device (RCD).

There must be protection from atmospheric discharge (general lightning protection requirement), VDE and EVU guidelines must be observed, and installation may only be carried out by a specialist electrical contractor.

TYPE CODES

WSG/AK - EE - 900 x 1200 - Sv - RAL 9006 - ES - ER



TENDER SPECIFICATION TEXT

Acoustic weatherproof grille to prevent ingress of rainwater and dirt and reduce noise into the inlets and outlets of HVAC systems, consisting of a sturdy frame with rain-deflecting, sound-absorbing horizontal louvres.

Material:

Design:

Colour: RAL

Dimensions:

(Select as required according to the above documentation)

As necessary

Grille with electric anti-icing system

Heating power: 11 W/m

Voltage: 230 V

Mounting frame ER, masonry anchors

Manufacturer

BerlinerLuft. Technik GmbH

EXAMPLE ORDER

Acoustic weatherproof grille, as single recessed grille, size 900 x 1200, galvanised steel, surface treated in RAL 9006, with anti-icing system and mounting frame.

Order code

WSG/AK-EE-900x1200-Sv-RAL 9006-ES-ER

Weatherproof grilles for pitched roofs



Weatherproof grilles for pitched roofs

APPLICATION

Weatherproof grilles for pitched roofs provide a visual separation and – in combination with a specially designed structure – discharge water from HVAC intakes and outlets on roofs.

DESIGN DETAILS

Inlet or outlet grilles for pitched roofs are a specially designed custom solution for individual applications. The visible grille surface and water trap form a functional unit. The water trap is a watertight assembly with a sturdy support frame for fastening to the rafters. Horizontal louvres are fitted in this frame, backed by a protective grille.

The angle of the weatherproof louvres is selected according to the roof pitch to minimise pressure drop and flow noise, and to maximise privacy.

For caulking on the roof, the support frame has water checks down both sides and a lead apron at the bottom. The design depends on the roof pitch (Dn) and the space available in the roof.

The connection of the ducting to the water trap can be individually designed and modified according to the space available. To drain off the water (type A), there is a 1.5" port with a male thread. When necessary, the WSG/SD can be equipped with an anti-icing system.

Note

Weatherproof grilles for pitched roofs provide protection from water ingress and must therefore always be fitted with a reliable water trap.



Weatherproof grille
for pitched roof

Weatherproof grilles for pitched roofs

MATERIALS

Base material:	Galvanised sheet steel Other materials on request
Welds:	Preserved with high-quality cold dip galvanisation
Front:	Painted as specified RAL 7015 slate grey RAL 8004 copper brown RAL 8012 red brown Special colours
Lead apron:	Natural (lead grey)
Or colour similar to	RAL 7021 black grey RAL 8004 copper brown RAL 8012 red brown (no special colours)

ROOF PITCH (A°)

To design the system, the exact roof pitch must be specified.

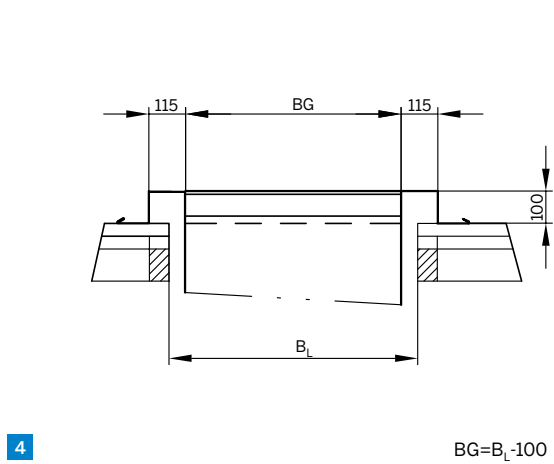
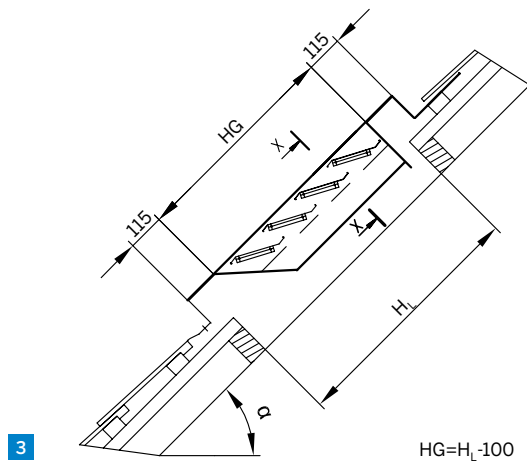
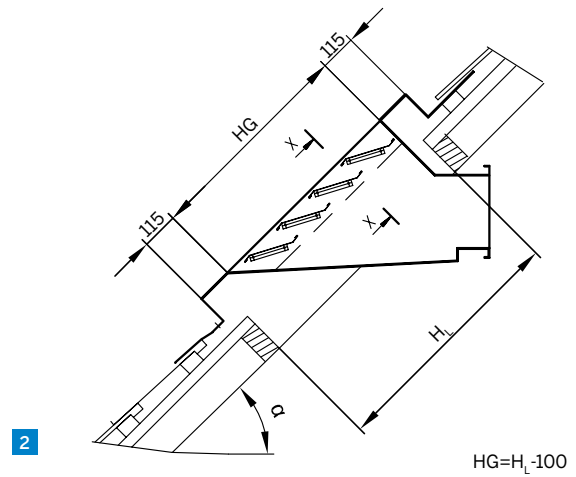
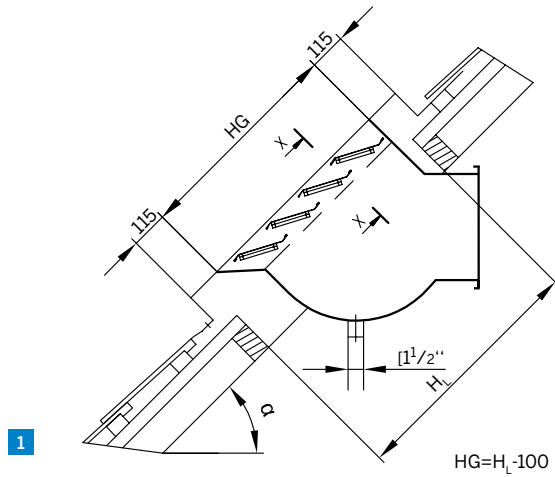
Definition

The roof pitch is the angle between the roof and the horizontal line of the building. It is stated as an angle in degrees (°).

DESIGNS AND DESIGNATIONS

Designation	Design	Notes on installation
WSG / SD – A	A	Required for roof pitches < 40° Water discharge via integrated water trap in the building
WSG / SD – B	B	Can be used for roof pitches > 40° Natural water run-off via roof surface Water trap with rainwater edge
WSG / SD – C	C	No protection against water ingress. Secondary measures must be taken by the customer.

INSTALLED DIMENSIONS



- 1 | Type A – with water trap and internal water run-off
- 2 | Type B – with water trap and external water run-off
- 3 | Type C – without water trap
- 4 | Sectional view X-X

KEY

- B_L = clear width (between rafters)
- H_L = clear height (between trimming)
- BG = BL-100 = clear width of WSG/SD
- HG = HL-100 = clear height of WSG/SD
- a = roof pitch in degrees

AVAILABLE DIMENSIONS (ONE-PIECE)

Grilles with clear width (BG) up to 2000 mm

Grilles with clear height (HG) up to 4000 mm

Special requirements such as undivided widths with partitioned water traps must be checked with our design department.

Weatherproof grilles for pitched roofs

FREE CROSS SECTIONS AND WEIGHTS

Specifications for free cross sections apply to a roof pitch of 46°- 55°. For other roof pitches, they have to be multiplied by a correction factor.

The stated weights are reference values only, with a water trap in idealised form included, and may have to be recalculated depending on the specific design of the water trap.

Height HL [mm]	Values for Dn 46°-55°		Width BL [mm]									
			600	700	800	900	1000	1100	1200	1300	1400	1500
600	Free cross section ¹	m ²	0.14	0.17	0.20	0.22	0.25	0.28	0.31	0.34	0.36	0.39
	Flow rate ²	m ³ /h	1880	2265	2645	3020	3400	3775	4155	4530	4910	5285
	Steel weight ³	kg	51	54	58	61	65	69	72	76	79	83
800	Aluminium weight ³	kg	19	20	22	23	24	26	27	28	30	31
	Free cross section ¹	m ²	0.17	0.21	0.24	0.28	0.31	0.35	0.38	0.42	0.45	0.49
	Flow rate ²	m ³ /h	2360	2830	3300	3775	4275	4720	5190	5660	6135	6600
1000	Steel weight ³	kg	64	68	72	76	80	84	88	92	96	100
	Aluminium weight ³	kg	24	26	27	29	30	32	33	34	36	37
	Free cross section ¹	m ²	0.21	0.25	0.29	0.34	0.38	0.42	0.46	0.50	0.55	0.59
1200	Flow rate ²	m ³ /h	2830	3400	3960	4530	5100	5660	6230	6800	7360	7930
	Steel weight ³	kg	79	84	88	92	97	101	105	110	114	118
	Aluminium weight ³	kg	30	31	33	35	36	38	39	41	43	44
1400	Free cross section ¹	m ²	0.28	0.34	0.39	0.45	0.50	0.56	0.62	0.67	0.73	0.78
	Flow rate ²	m ³ /h	3775	4530	5285	6040	6800	7550	8300	9060	9820	10570
	Steel weight ³	kg	99	104	109	113	118	123	127	132	137	141
1600	Aluminium weight ³	kg	37	39	41	43	44	46	48	50	51	53
	Free cross section ¹	m ²	0.31	0.38	0.44	0.50	0.57	0.63	0.69	0.76	0.82	0.88
	Flow rate ²	m ³ /h	4250	5100	5950	6800	7645	8500	9350	10200	11050	11900
1800	Steel weight ³	kg	118	123	128	133	138	143	148	153	158	163
	Aluminium weight ³	kg	44	46	48	50	52	53	55	57	59	61

¹ Correction factors for free cross sections and volume flows with and without anti-icing system

² Flow rate for Dn = 46°- 55°

³ Weight (reference value) for standard sheet thickness in steel and aluminium versions (other materials on request)

Height HL [mm]	Values for Dn 46°-55°		Width BL [mm]									
			600	700	800	900	1000	1100	1200	1300	1400	1500
1600	Free cross section ¹	m ²	0.38	0.46	0.54	0.62	0.69	0.77	0.85	0.92	1.00	1.08
	Flow rate ²	m ³ /h	5200	6230	7270	8300	9350	10380	11420	12460	13500	14535
	Steel weight ³ Aluminium weight ³	kg kg	141 53	146 55	151 57	157 59	162 61	167 63	173 65	178 67	184 69	189 71
1800	Free cross section ¹	m ²	0.42	0.50	0.59	0.67	0.76	0.84	0.92	1.01	1.09	1.17
	Flow rate ²	m ³ /h	5660	6800	7930	9060	10200	11330	12460	13600	14720	15860
	Steel weight ³ Aluminium weight ³	kg kg	162 61	167 63	173 65	179 67	185 69	190 71	196 74	202 76	208 78	213 80
2000	Free cross section ¹	m ²	0.45	0.55	0.64	0.73	0.82	0.91	1.00	1.09	1.18	1.27
	Flow rate ²	m ³ /h	6135	7360	8590	9820	11040	12270	13500	14730	15950	17180
	Steel weight ³ Aluminium weight ³	kg kg	184 69	191 71	197 74	203 76	209 78	215 81	221 83	227 85	233 87	239 90

¹ Correction factors for free cross sections and volume flows with and without anti-icing system

² Flow rate for Dn = 46°- 55°

³ Weight (reference value) for standard sheet thickness in steel and aluminium versions (other materials on request)

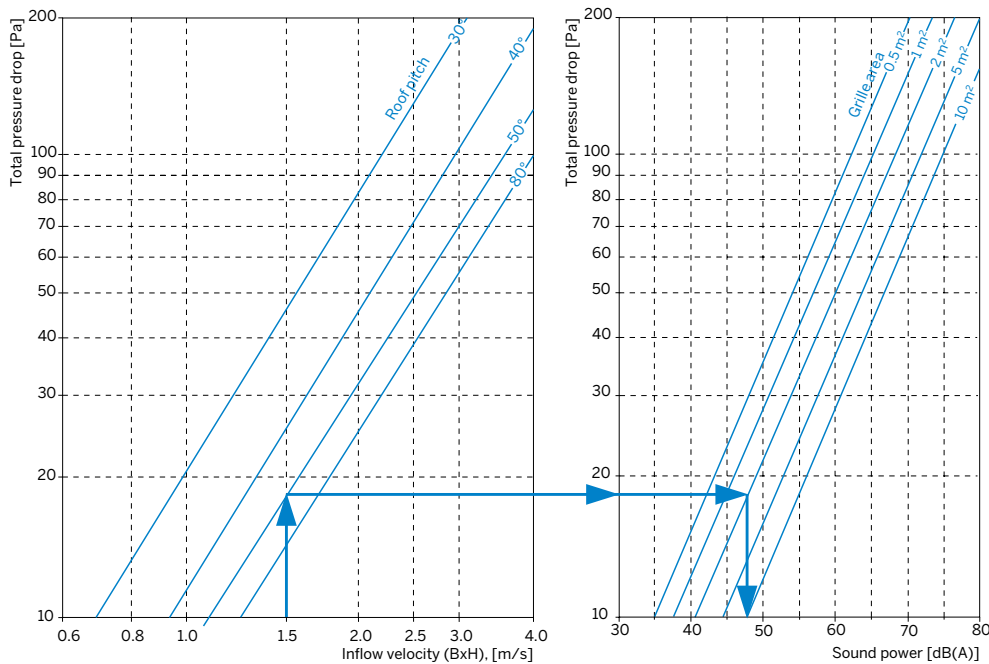
CORRECTION FACTORS FOR FREE CROSS SECTIONS AND FLOW RATE

The free cross sections and volume flows in the above table have to be multiplied with the appropriate correction factor for the roof pitch.

Roof pitch (a)	< 30°	30°-35°	36°-45°	46°-55°	56°-65°	66°-75°	76°-80°
Correction factor (k) without anti-icing system	On request	0.57	0.79	1	1.20	1.31	1.42
Correction factor (k) with anti-icing system	On request	0.48	0.67	0.85	1	1.11	1.21

Weatherproof grilles for pitched roofs

PRESSURE DROP AND FLOW NOISE



DIMENSIONING EXAMPLE

BL = 1000 mm, HL = 2000 mm, roof pitch 50°
Flow rate 11000 m³/h
Face area 2 m², inflow velocity 1.5 m/s

Diagram

1.5 m/s → Overall pressure drop 18 Pa
→ Sound power level 47 dB(A)

The OUTWIN design program can be used for dimensioning.

WATER SEPARATION EFFICIENCY

Weatherproof grilles for pitched roofs cannot completely trap all water. The most suitable design has to be chosen for the roof pitch and water drainage options (see the type table).

Type A grilles have a water drain outlet with a 1.5" male thread. The maximum possible rainfall must be calculated for the location. If necessary, the cross section of the drain outlet can be modified for the amount of rainfall.

When type B ($\alpha > 40^\circ$) is used, there is no need for an additional drain to discharge rainwater.

ACCESSORIES

Anti-icing system (ES)

On request, an electrically heated anti-icing system can be provided to prevent the grille becoming clogged by ice. (See the section on the anti-icing system)

Insulated water trap (iso.)

To prevent condensation when the temperature falls below dew point, the water trap can be insulated as necessary.

Inspection panel (RD)

Type A always has an inspection panel on the side of the water trap for removing dirt from the water inlet.

Duct connection

Connections on the sides for round or square ducts are available on request.

Lead apron

All weather grilles in the WSG/SD range have a soft lead apron (delivered unattached) on the bottom of the frame in the standard colour grey. (For other colours see page 4)

ANTI-ICING SYSTEM (ES)

At temperatures below + 2°C and an air humidity above 60% (for example in fog), there is a risk of the intake louvres and grille icing up. To ensure operation of the HVAC system, the grille can be electrically heated. This is done using special temperature- and UV-resistant heating tape on the grille.

For fully automatic control of the anti-icing system, there must be an ice sensor or another combination of a thermostat and hygrostat.

The control unit must be selected and installed by a specialist electrical contractor and is not supplied with the pitched roof weatherproof grille.

TECHNICAL DATA

65° anti-icing tape

Rated voltage:	230 V
Heating power:	27 W/m
Installed power:	approx. 270 W/m ²
Rated temperature:	65°
Earthed braiding:	Galvanised copper
Outer jacket:	Polyolefin
Watertight:	Yes
Width:	14 mm
Thickness:	6 mm
Minimum bending radius:	32 mm
Required power switch fuse:	16 A

Connection kit

Connection kit for making a heating tape ready for connection, consisting of:

Heating tape plug	
Heating tape socket	
Connection cable	2 m
Watertight:	Yes
CE label:	Yes

Notes on connection

The braiding of the heating tape must be earthed.

The WSG/SD must be included in this protection.

There must be a residual current device (RCD).

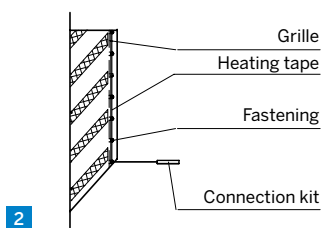
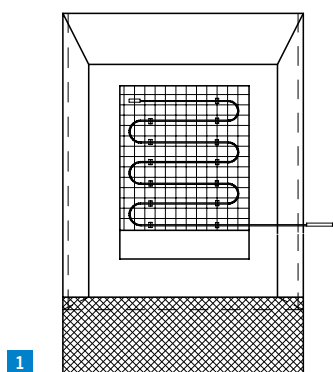
There must be protection from atmospheric discharge (general lightning protection requirements).

VDE and EVU guidelines must be observed.

Installation may only be carried out by a specialist electrical contractor.

DESIGN

The OUTWIN design program can be used for dimensioning.



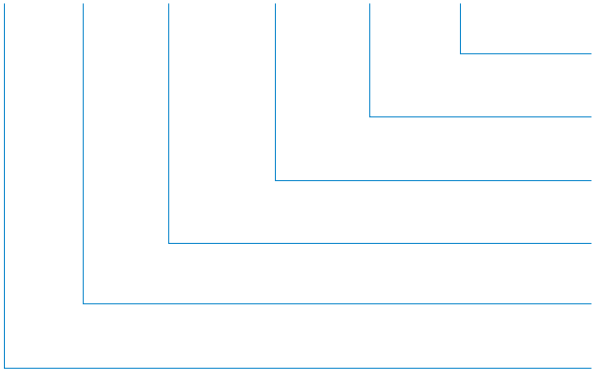
1 | Rear view

2 | Side cross section

Weatherproof grilles for pitched roofs

TYPE CODES

WSG/SD - A - 1000 x 1500 - 35° - RAL 8004 - ES - iso - RD



- Accessories (as required)
- RAL colour code
- Roof pitch
- Nominal dimensions width x height
- Design
- Component designation

TENDER SPECIFICATION TEXT

Weatherproof grille for pitched roof in design A (or B), consisting of a frame with horizontal louvres, backed with a grille, as well as an integrated water trap to collect and drain rainwater. Support frame designed so that the entire assembly can be fastened to the rafter. The frame has water checks down both sides and a lead apron at the bottom.

Additional requirements

Insulated trap, inspection panel, anti-icing system and front section colours must be added and formulated as required according to the technical documentation.

The customer must provide the manufacturer with the individual details of the roof in order to correctly dimension the WSG/SD. Before manufacturing begins, the design must be approved by the customer.

Manufacturer

BerlinerLuft. Technik GmbH

EXAMPLE ORDER

Weatherproof grille for inclined roof, type A (or B)
Nominal size 1000 x 1500, roof pitch 35°, front painted in RAL 8004, with anti-icing system, insulated water trap and inspection panel

Order code

WSG/SD-A-1000x1500-35-RAL 8004-ES-iso-RD

Ventilation towers and steel chimneys



Round design (free-standing)

PRODUCT DESCRIPTION

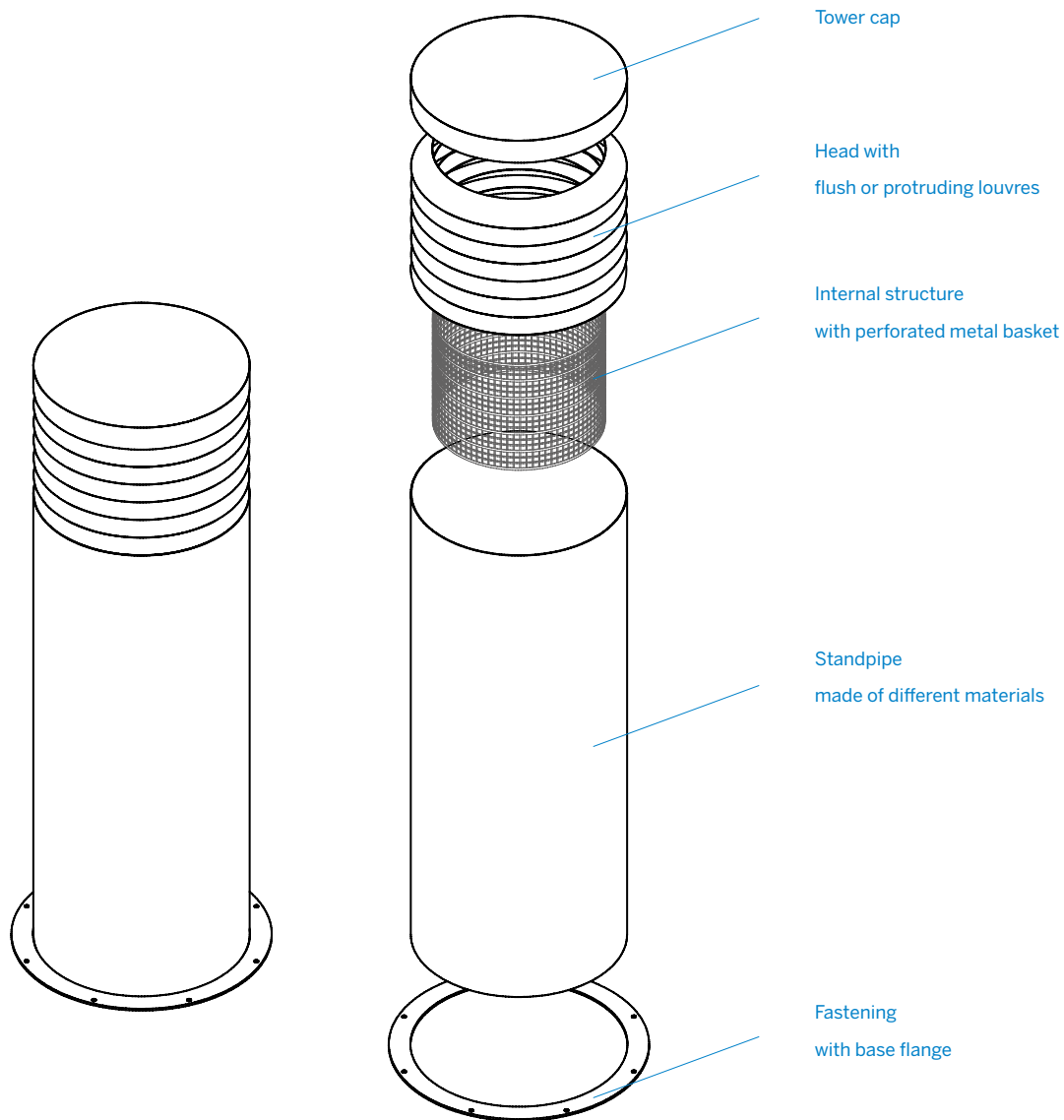
Ventilation towers are used for fresh air intake and exhaust air discharge. They are often installed in exposed locations outside buildings, in courtyards, or easily visible on flat roofs. As a part of the building concept, they are integral to modern architecture and should meet high aesthetic standards. BerlinerLuft ventilation towers are designed to meet these requirements in terms of both attractive appearance and technical design. The wide range of different designs mean they can be perfectly adapted to local conditions.

Flue gas chimneys carry off the flue gases that arise in controlled combustion processes (such as in thermal power stations). There should be harmony between functionality and aesthetics of flue gas chimneys as well. This is achieved by flawless workmanship and surface finish quality.

- 1 | Ventilation towers at BMW Research and Innovation Centre, Munich
- 2 | Exhaust air and smoke extraction chimneys at Munich airport terminal 2



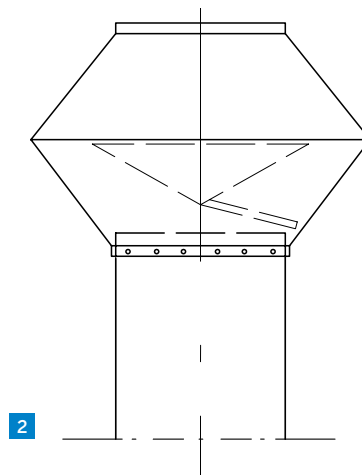
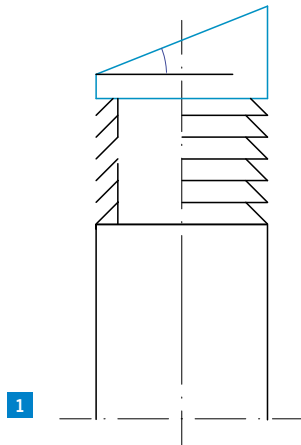
DESIGN AND STRUCTURE OF AN EXAMPLE LOUVRE TOWER



Round design (free-standing)

CAP DESIGNS

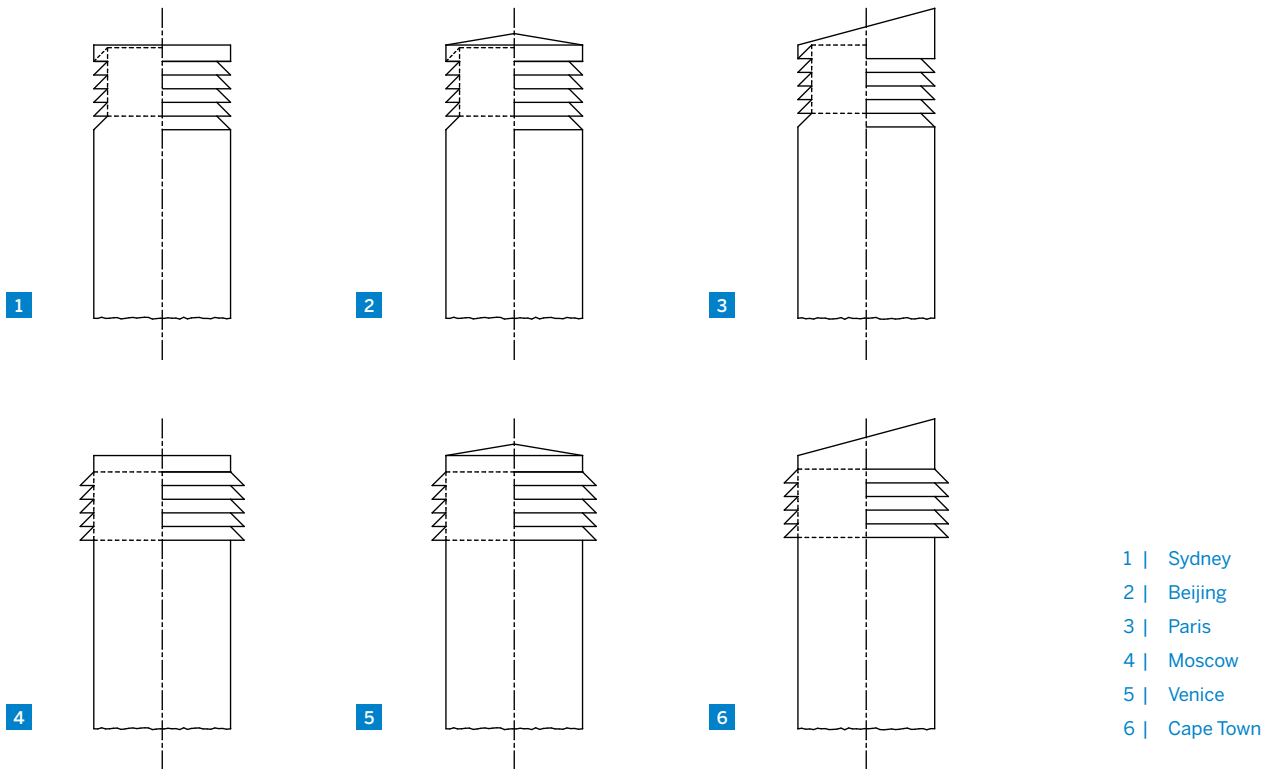
The top section always has a wire mesh to keep out small animals and coarse dirt. A flange on top of the head stabilizes the head and is also used to screw in handling lugs.



- 1 | Louvre tower with sloped cap
- 2 | Tower with deflector head
- 3 | Louvre tower with flat cap
- 4 | Tower with bend



CAP TYPES



OTHER TOWER DESIGNS

Towers for vertical air flow without louvres (cut straight or sloped)

This type of tower has no top cover plate. This means bad-smelling air can be discharged straight upwards. The throw range of the standpipe can be increased using a taper on the standpipe.

Tower with dummy louvres

Outlet towers for vertical air flow can be matched to the appearance of louver-type intake air towers by fitting them with dummy louvres (without a ventilation function).

Combination tower

Fresh air and exhaust air towers can be combined. For example, an internal pipe with a deflector head discharges air vertically upwards, while a large outer standpipe with louvres is used for fresh air intake.

Discharge towers with integrated silencers

The standpipe of these towers has a mineral wool packing in a perforated metal shell and, if necessary, a sound-absorbing inner core. This solution is ideal if a silencer is required, but cannot be located inside the building due to lack of space.

Round design (free-standing)

LOUVRE HEAD

The louvre head consists of a rounded perforated metal shell with brackets on the outside, to which the louvres are welded. The shape, spacing and angle of the louvres are designed to maximise protection from rainwater ingress.

Louvres can be flush with the standpipe (internal louvres) or protruding (external louvres).

The number of louvres depends on the permissible pressure drop and acoustic requirements (maximum flow noise). The air velocity at the louvres should not exceed 2.5 m/s.

For standpipe diameters below 500 mm, external louvres are recommended in order to optimise flow and minimise noise.

STANDPIPE

The diameter of the standpipe depends on the flow rate, pressure drop and soundproofing requirements. Dimensioning is based on the number of louvres (see above). The average flow rate in the pipe should not be more than 5.5 m/s.

Structural dimensioning is based on the DIN 4133 standard. The standpipe is a structurally self-supporting pipe. Its minimum wall thickness is 1.5 mm. All longitudinal welds are machine-welded using the plasma keyhole method. Transverse joints are manually welded by certified, qualified welders using TIG or MAG welding. As a manufacturer, we are qualified with the comprehensive welding suitability certificate according to DIN 18800-7 and DIN-EN 1090-2.

Accessories (optional)

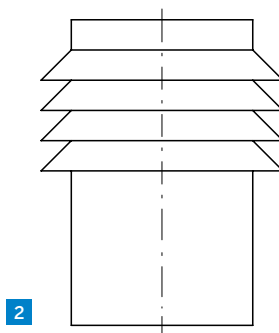
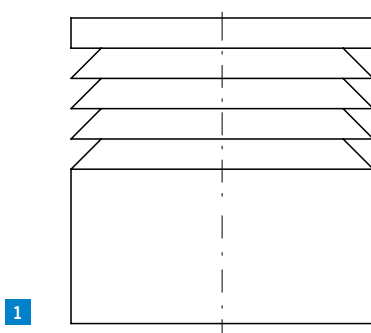
Thermally insulated design

Draining with run-off taper or double-stair separator

Fresh air filter

Integrated silencer

High temperature version



1 | Internal louvres

2 | External louvres

BASE AND FASTENING

Ventilation towers and steel chimneys are generally mounted on a concrete foundation or base.

Option 1:

Fastening with heavy-duty anchors

The ventilation tower is mounted on a suitably sized base flange or plate, which is directly fastened to the foundation provided by the customer using approved heavy-duty anchors. Irregularities on the foundation are compensated using shims and filled with non-shrink concrete by the customer if required.

Option 2:

Fastening with anchor basket

The tower is anchored in a basket that is set in concrete by the customer. The prefabricated anchor basket is sized according to the structural engineering requirements. The base of the tower is then aligned above the anchor rods protruding from the foundation, and is bolted to them. The gaps caused by the adjusting nuts are then filled with non-shrink concrete by the customer.

The anchor basket is delivered in advance, joined to the reinforcements and cast in concrete by the customer's concreting contractor. The concrete must be given time to cure before installing the tower.



Fresh air and exhaust air towers
with roof collar

Round design (free-standing)

DRAINAGE SYSTEMS

Rainwater that enters is discharged through a bottom drain. A water trap (double-stair separator) is can also be installed.

There are three options for draining chimneys:

Double-stair separator with outlet pipes on both sides

Run-off taper with outlet pipe

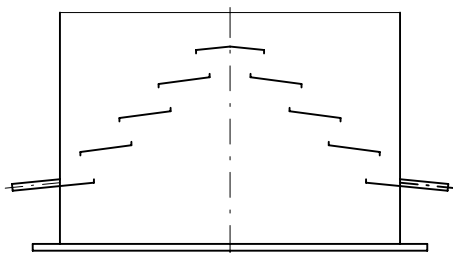
Run-off floor (welded with 3° slope) with outlet pipe

FOR VERTICAL CONNECTION FROM BELOW

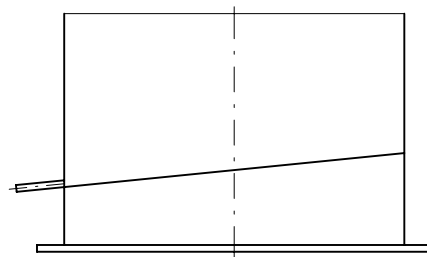
As another option, cascades and a run-off taper can also be combined at the customer's request. For louvre towers, the run-off taper can also be used as condensate barrier.

FOR HORIZONTAL CONNECTION

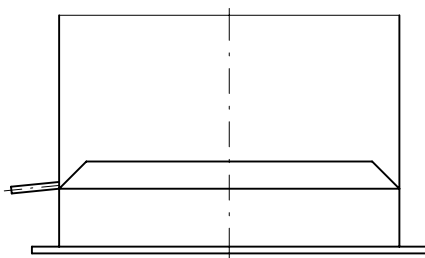
1



3



2



- 1 | Cascade or double-stair separator
- 2 | Run-off taper
- 3 | Run-off floor

MATERIALS

Material	Surface finish
Black sheet S235 JR	Outside liquid-coated as per DIN ISO 12944 in RAL colour
	Outside liquid-coated as per DIN ISO 12944 in RAL colour, inside primed
	Outside and inside liquid-coated as per DIN ISO 12944 in RAL colour
	Paint layers according to customer's specifications
Galvanised sheet / galvanised steel	Welds coated with anti-rust paint
	Outside liquid-coated as per DIN ISO 12944 in RAL colour, welds inside coated with anti-rust paint
Stainless steel 1.4301 (V 2 A)	All over matt-pickled and passivated, surface matt metallic III C
	Longitudinally brushed, welds brushed over
	Laterally brushed, with helical cylindrical grinding, welds brushed over
	Polished III D
	Bead-blasted
Stainless steel 1.4571 (V 4 A), pickled Stainless steel 1.4404 (V4A), brushed Stainless steel 1.4301 (V2A)	All over matt-pickled and passivated, surface matt metallic III C
	Longitudinally brushed (with brushed finish, 1.4404 is used instead of 1.4571 for optical reasons), welds brushed over
	Laterally brushed, with helical cylindrical grinding, welds brushed over
	Polished III D
	Bead-blasted

Other materials and finishes on request

REGULATIONS AND STANDARDS VDI 3803

Central air-conditioning systems - Structural and technical principles

DIN EN 13779 Ventilation in non-residential buildings

Round design (free-standing)

FLUE GAS CHIMNEYS DESIGN AND STRUCTURE

Flue gas chimneys are manufactured in compliance with the building rule list A issued by the Deutsches Institut für Bautechnik (DIBt). The “Ü” mark guarantees the compliance with the relevant standards and regulations and indicates long-term stability.

BerlinerLuft. flue gas chimneys are a pipe-in-pipe design consisting of a supporting pipe and flue gas pipe. Guide rollers allow thermal elongation.

Depending on the temperature and the type of air carried, resistant stainless steel alloys that meet the DIN EN 4133 standard (page 10, table 6) are used.

On request, chimney can be provided with dummy head or thermal insulation.

TRANSPORT AND INSTALLATION

BerlinerLuft. ventilation towers are transported, assembled and installed by trained personnel from specialised contractors in compliance with the installation instructions.

CONDITION MONITORING AS PER DIN 4133

Condition monitoring is always carried out by authorised specialists.

“Chimneys must be inspected by an expert on a regular basis of at least every two years. Shorter intervals for inspection and maintenance may be specified for vibration dampers and fall protection systems.

In the case of heavy chemical exposure and over-dimensioning to prevent corrosion, such inspections must be carried out at shorter intervals. Any passable space between the supporting and internal pipes must be included in the inspection. Such inspection must be documented.” DIN 4133 § 11.

ACCESSORIES

Side connection ports with reinforcements as required for structural stability

Inspection hatch with reinforcements as required for structural stability

Rain collar welded or as two clamped sections

Roof collar

Inner pipe(s)

Anchor basket

Sleeve for anchor basket (stay-in-place formwork)

Wall bracket

Clamping flange

Bird mesh (fixed or detachable)

Vertical ladder with fall arrester as per DIN EN 353-1

Earthing bracket

Transport brackets

Rectangular base plate

Head flange

Cascade or double-stair separator

Rain and condensate run-off floor

Run-off taper

Accelerator nozzle

REGULATIONS AND STANDARDS

DIN V 4133

Self-supporting steel chimneys

Guidelines issued by the Industrieverband Stahlschornsteine e.V.

CE marking

DIN EN 1090-2 –

Technical requirements for steel structures

DIN EN 13084-7 –

Free-standing chimneys - Product specifications

DIN 18800 Part 7 –

Comprehensive form of verification for welding with extension to DIN 4133 (steel chimneys and stainless steel)

DIN EN ISO 12944: Painting and coating systems

DIN 1055-4:

Effects on supporting frameworks – Wind pressures

Quality management: certified according to ISO 9001: 2000

PUBLISHING DETAILS

Ducting product catalogue - complete range

BerlinerLuft. Technik GmbH

February 2015 (2nd edition/06.2015)

© BerlinerLuft. Technik GmbH

For prices, see the current price list issued by
BerlinerLuft. Technik GmbH

Information on the scope of delivery, appearance, performance and
dimensions was up to date on going to press.

We reserve the right to make technical changes.

Our general terms and conditions apply, and can be found on the internet
at www.berlinerluft.de.

BerlinerLuft. Technik GmbH

Herzbergstrasse 87– 99

10365 Berlin

Tel. +49 (0)30 55 26 0

Fax +49 (0)30 55 26 22 11

www.berlinerluft.de

Production and sales sites

COMPONENTS AND SYSTEMS

1. BerlinerLuft. Komponenten und Systemtechnik GmbH | Northern Germany
Am Funkturm 16
29525 Uelzen
Tel. +49 581 170 88
Fax +49 581 172 07
E-mail blksnord@berlinerluft.de

2. BerlinerLuft. Komponenten und Systemtechnik GmbH | Eastern Germany
Herzbergstraße 87 – 99
10365 Berlin
Tel. +49 30 55 26 31 75
Fax +49 30 55 26 23 07
E-mail blksost@berlinerluft.de

3. BerlinerLuft. Komponenten und Systemtechnik GmbH | Western Germany
Waltherstraße 49 – 51, Halle 70
51069 Köln
Tel. +49 221 96 49 59 0
Fax +49 221 96 49 59 10
E-mail blkswest@berlinerluft.de

4. BerlinerLuft. Komponenten und Systemtechnik GmbH | Central Germany
Bergener Ring 11 – 13
01458 Ottendorf-Okrilla
Tel. +49 352 05 510 0
Fax +49 352 05 510 70
E-mail blksmitte@berlinerluft.de

5. BerlinerLuft. Komponenten und Systemtechnik GmbH | Southern Germany
Steinkirchen 7
84419 Obertaufkirchen
Tel. +49 80 82 890
Fax +49 80 82 58 32
E-mail blkssued@berlinerluft.de

AIR CONDITIONING SYSTEMS

6. BerlinerLuft. Ventilatoren und Prozesslufttechnik GmbH
Herzbergstraße 87 – 99
10365 Berlin
Tel. +49 30 55 26 23 59
Fax +49 30 55 26 22 43
E-mail infoblvp@berlinerluft.de

7. BerlinerLuft. Klimatechnik GmbH
In der Kolling
66450 Bexbach
Tel. +49 68 26 52 07 0
Fax +49 68 26 52 07 10
E-mail infoblkt@berlinerluft.de

OUTSIDE GERMANY

8. BerlinerLuft. Technik GmbH, Austria
Alte Landstraße 15
6130 Schwaz
Austria
Tel. +43 52 42 67 67 60
Fax +43 52 42 67 67 67
E-mail info@berlinerluft.at

9. BerlinerLuft. do Brasil Ltda.
Rua Visconde de Sao Leopoldo, 402
93025- 400 Sao Leopoldo
Brazil
Tel. +55 51 35 79 85 56
Fax +55 51 35 79 85 85
E-mail berlinerluft@berlinerluft.com.br
www.berlinerluft.com.br

10. BerlinerLuft. de México
Calle C No. 2a
Parque Industrial Puebla 2000
72226 Puebla, Pue.
Mexico
Tel. +52 222 282 88 43
Fax +52 222 282 98 79
E-mail mexico@berlinerluft.com
www.berlinerluft.com.mx

11. BerlinerLuft. Technik Sp. z o.o.
ul. Chocimska 13
78 – 200 Białogard
Poland
Tel. +48 94 311 24 62
Fax +48 94 311 36 67
E-mail bialogard@berlinerluft.pl
www.berlinerluft.pl

12. BerlinerLuft. Technik Sp. z o.o.
Northern Poland
ul. Lniana 13
75 – 213 Koszalin
Poland
Tel. +48 94 347 05 50
Fax +48 94 343 51 92
E-mail biuro@berlinerluft.pl

13. BerlinerLuft. Technik Sp. z o.o.
Southern Poland
ul. Gościewicka 4
49 – 100 Niemodlin
Poland
Tel. +48 77 402 36 00
Fax +48 77 402 36 09
E-mail niemodlin@berlinerluft.pl

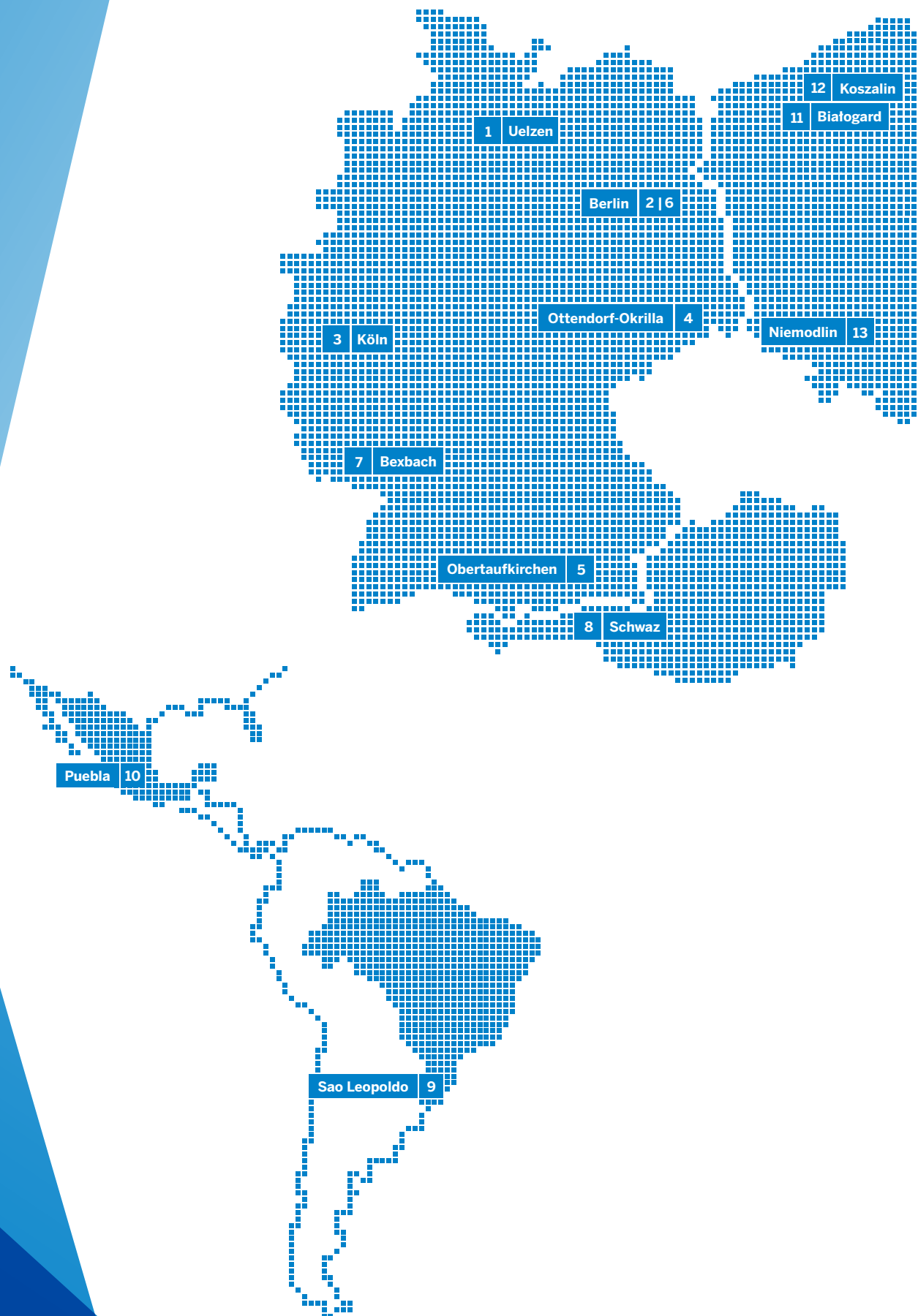
14. BerlinerLuft. Tehnika d.o.o. Croatia
Gornjostupnička 126
HR – 10255 Gornji Stupnik
Croatia
Tel. +38 51 65 89 244
Fax +38 51 65 89 243
E-mail info@berlinerluft.hr
www.berlinerluft.hr

SALES OFFICES

Hotline 0800 100 88 40

BerlinerLuft. ON THE INTERNET

www.berlinerluft.de



BerlinerLuft. Komponenten und Systemtechnik GmbH

Herzbergstraße 87 – 99
10365 Berlin

Tel. +49 (0)30 55 26 0
Fax +49 (0)30 55 26 22 11
E-mail blksost@berlinerluft.de

www.berlinerluft.de