



Round Duct System

Model RR-Complete



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Round Duct System RR-Complete

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Description

In modern architecture, sheet metal and spiral ducts of air-conditioning systems are often incorporated in the design of the room. Parts of the supply system are often intentionally placed at the front. In this visible installation of the ventilation ducts, a logical option is to integrate the fire dampers, volumetric flow controllers, duct silencers and air diffusers into the ducts.

In order to be able to offer planners a technically outstanding system, which can also be well integrated into modern architectural concepts, we have developed the **round duct system type RR-Complete**.

Its modular design allows architects and planners to construct freely visible ventilation systems on the highest esthetic level. They thus provide a room with visual highlights.

The system can be used in laboratories, schools, kindergartens, swimming pools, offices, showrooms, seminar rooms, restaurants, gymnasiums, multi-purpose halls and even in residential buildings, in theory almost anywhere.

Apart from its versatile geometric options, the round duct system harmonises with its environment also in terms of colour, whether painted to a RAL colour or as special eye-catcher as stainless model. The latter is also highly suitable for humid rooms or mounting situations with aggressive environment.

The technical aspects of the round duct system impress with their wide range of components. Fire dampers, volumetric flow controllers, measuring cross/damper combinations and not least supply air and return air diffusers - vertical or horizontal mounting possible - can be combined to give a complete ventilation system. All components can be manufactured to the **same diameters** and to a uniform duct design.

In addition to electric volumetric flow controllers, as an alternative, a manually operated combination of measuring cross and damper for regulation the volumetric flow can also be used.

The round duct system is already designed in the planning stage at SCHAKO and supplied to the customer as CAD drawing. This guarantees that all components are optimally tuned to one another.

In on-site mounting, the round duct system excels with its pre-mounted suspension devices such as the rivet nuts for the threaded bars.

For maintenance, service, retrofitting, etc., inspection openings in sufficient number and size must be provided on-site.

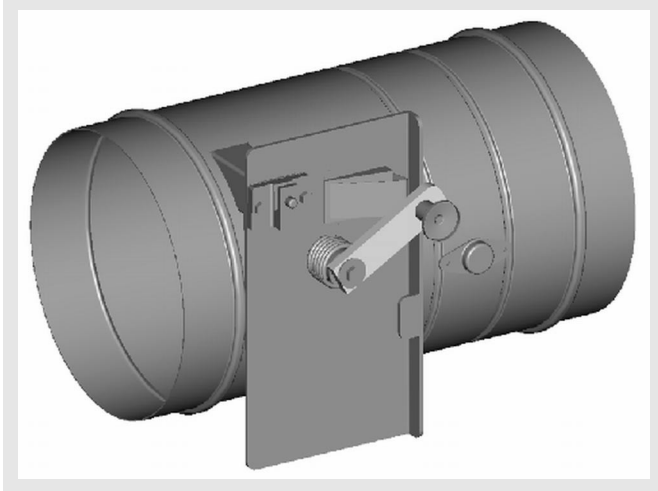
Advantages:

- **Complete:** implementation of a complete and adjustable system: integrated supply air and return air diffusers, controllable volumes, protection by means of fire dampers
- **Aesthetic:** All components can be manufactured to the same diameters and to a uniform duct design.
- **Flexible:** any geometry is possible thanks to the combination of dummy pipes, bends, arc segments and connecting pieces
- **Adaptable:** The galvanised sheet steel model is available in all RAL colours, and the stainless steel model is suitable for aggressive environments
- **Easy to mount:** pre-mounted suspension devices reduce the assembly time
- **CAD-supported:** technical design by SCHAKO, the customers gets finished CAD drawings
- **Design:** The technical design of the duct system is only possible by means of the SCHAKO layout program

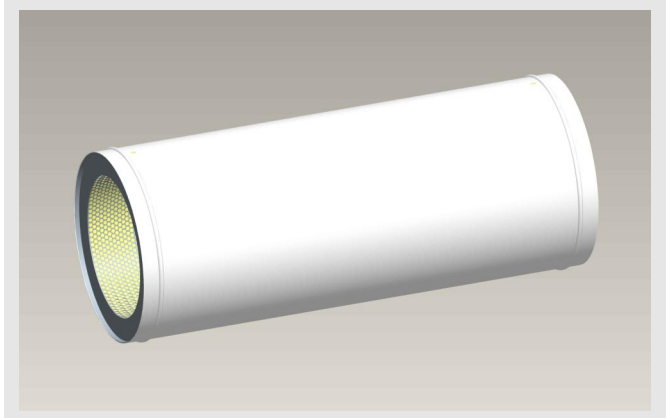
Round Duct System RR-Complete

Components

Fire damper BSK-RB-S (page 7)



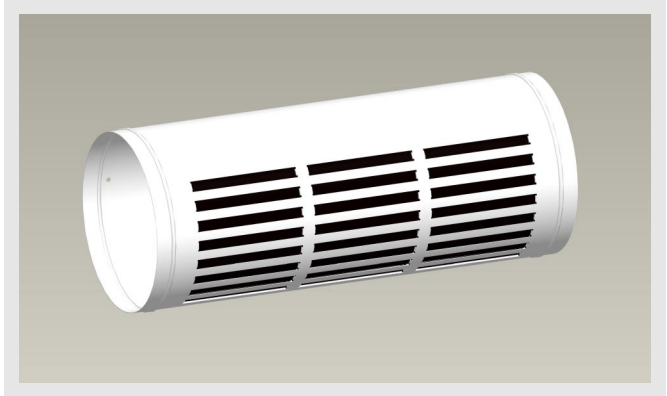
Duct silencer RS-RR (page 30)



Volumetric flow controller VRA-RR-E (page 16)



Round duct diffuser DBB-RR (page 33)



Volumetric flow restrictor DKG-MKA (page 26)



Round Duct System RR-Complete

Quick selection of components and sizes

Size	Air supply grille		Return air grille		Fire damper		Volumetric flow controller			
	DBB-RR	Length mm	DBB-RR	Length mm	BSK-RB-S	Length mm	VRA-RR-E	Length mm		
200	x	500 750 1000 1500 1750 2000	x	500 750 1000 1500 1750 2000	x	475 600	x	450		
224	x		x		x		x	x	475	
250	x		x		x		x	x	500	
280	x		x		x		x	x	550	
315	x		x		x		x	x	600	
355	x		x		x		x	x	650	
400	x		x		x		x	x	700	
450	x		x		x		x	x	-	-
500	x		x		x		x	x	x	850

Size	Volumetric flow meter		Duct silencer		
	DKG-MKA	Length mm	RS-RR	Packing mm	Length mm
200	x	450	x	20	1-part 500 750 1000
224	x	475	x	20	
250	x	500	x	40	
280	x	550	x	40	
315	x	600	x	40	2-part 1500 1750 2000
355	x	650	x	50	
400	x	700	x	50	
450	-	-	x	50	
500	x	850	x	50	

Installation

Suspension

- prepared for suspended installation by using an M8 threaded rod to be provided by the customer.
- For fire dampers, see BSK-RB (page 10 - Installation) or Installation and Maintenance

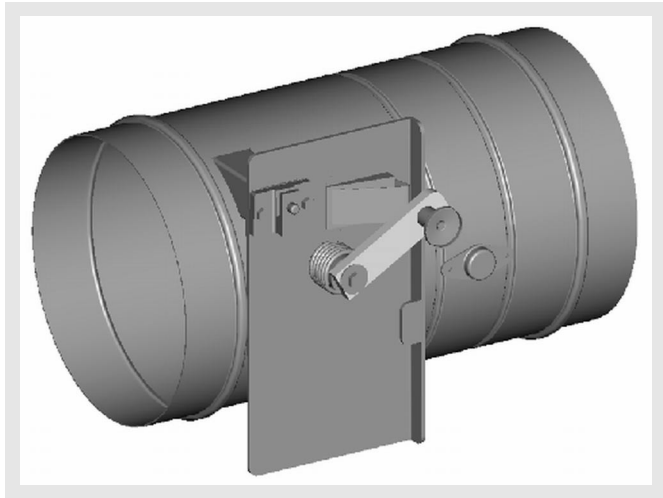
Attention!

We would like to point out that for cleaning stainless steel models, only suitable cleaning materials may be used!

Round duct components should be sealed on site with sealing tape, before attaching the connection sleeve.
For rubber lip seals, no sealing tape is required.

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Fire damper BSK-RB



Description

The fire damper type BSK-RB serves as a shut-off device of fire lobbies in ventilation and air-conditioning installations. In connection with non-flammable ventilation ducts connected on both sides, the fire damper BSK-RB has resistance class K90. The fire test was carried out according to DIN 4102 Part 6 and the approval requirements for shut-off devices against fire and smoke in ventilation ducts. The fire damper BSK-RB has the approval certificate number Z-41.3-628. The fire damper is triggered by an integrated thermal trigger device at temperatures $\geq 72^{\circ}\text{C}$. Useable up to a pressure of 1000 Pa at a duct speed of 10 m/s. The fire damper BSK-RB can be installed in walls and ceilings or light partition walls. Assembly can take place with vertical or horizontal axle and independently of the air flow direction. The suitability of the fire damper in ventilation ducts, which are particularly expect a mass of internal pollution through fats (i.e. return air ducts of commercial kitchens) is not proven.

The housing consists of galvanised sheet steel (stainless steel 1.4301 (V2A) or 1.4571 (V4A) available as an option at an extra charge). The metal damper leaf is absolutely abrasion-proof and housed with its continuous axle in in maintenance-free bushes. In the damper area, a seal which starts foaming from a temperature of 140°C provides an air-tight seal of the fire damper against smoke transmission.

The outside damper adjusting lever serves also as position indicator of the damper blade. The damper adjusting lever is fitted on the right as standard.

For maintenance, servicing, retrofitting, etc., it may be necessary to provide on-site inspection openings in suspended ceilings, shaft walls, etc. They must be built in in sufficient numbers and size.

Quality assurance

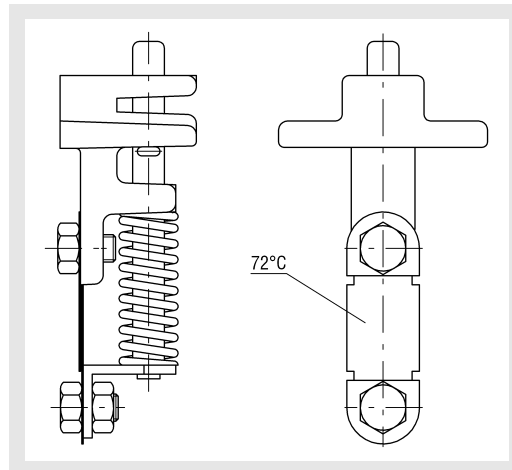
Constant self-control and external monitoring by the FMFA Baden-Württemberg guarantee a high quality production. Manufactured to QM processes, certified to DIN ISO 9001.

Attention!

Each builder and designer is required, according to the Model Industrial Construction Guidelines (MINDBAURL) and DIN 18232-2, to build in such a way that the formation and spreading of smoke and fire is prevented and that in case of fire no-one is injured. Spreading of smoke through the ventilation and air-conditioning systems can only be prevented effectively by means of motorised fire dampers in connection with smoke detection triggers (smoke detectors type RMS). We therefore recommend fitting the fire damper with actuators that can be triggered by the smoke detector.

A non-flammable round duct of **at least $1.5 \times D$ in length** (fire damper diameter) must be installed between the fire damper type BK-RB-S and the flammable round duct components.

Fusible link trigger



The fire dampers are supplied as standard with a thermal fusible link trigger with a trigger temperature of 72°C . When the fuse link breaks, the damper blade closes and can no longer be locked in the OPEN position until the fusible link is replaced.

Construction

- | | |
|---------|--|
| Housing | - Galvanised sheet steel, painted to RAL 9010 white (standard) |
| | - Stainless steel material no. 1.4301 or 1.4571 |
| | - Painted to a RAL colour of your choice |

Model

- | | |
|----------|------------------|
| BSK-RB-S | - without flange |
|----------|------------------|

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Accessories

electric spring return actuator (-E)

- Type ELD-BLF-B 24 V AC / 24 V DC / 230 V AC, to open and close the shut-off damper (up to NW 560)
- Type ELD-BF 24 V AC / 24 V DC / 230 V AC, to open and close the shut-off damper (up to NW 630)

Limit switch (-ES)

- with/without KESS, protection type IP 66

Flexible connection piece (-FS-RF / -FS-RS)

- PVC, connection profile galvanised sheet steel

Anticorrosive paint (-DD)

- DD varnish, inside and/or outside, two-component varnish based on polyurethane, colour light grey

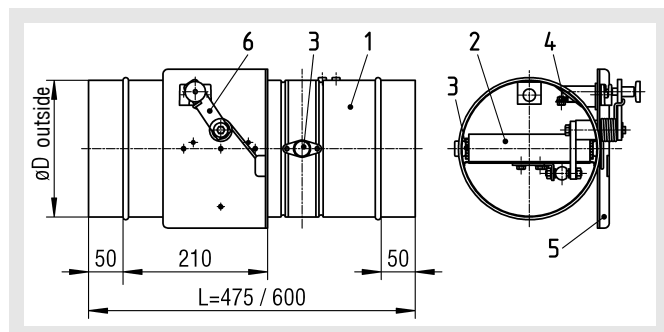
Smoke trigger (-RMS)

- for smoke detection

Models and dimensions

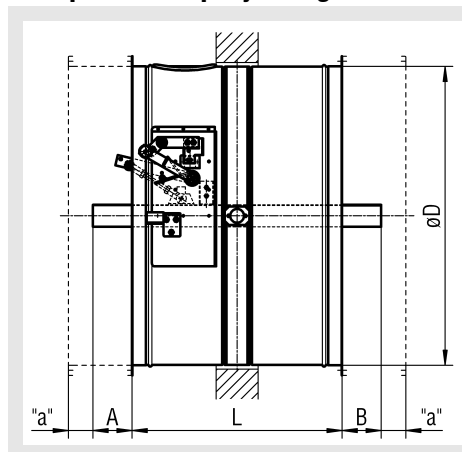
Dimensions

BSK-RB-S



- 1 = Housing
- 2 = Shut-off damper
- 3 = Shut-off damper housing
- 4 = Trigger device
- 5 = Fitted console
- 6 = Damper adjusting lever

Damper blade projecting ends



"a" = 50 mm: Minimum distance between the front edge of the open damper blade and the finishing protective grating (ASG) or the flexible connection piece (FS).

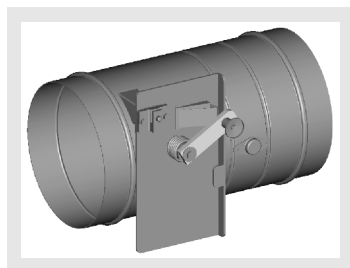
NW	øD	BSK-RB-S	
		A	B
			L=475 L=600
200	198	-	-
224	222	-	-
250	248	-	8*
280	278	-	23*
315	313	-	40*
355	353	-	60*
400	398	-	83*
450	448	-	108*
500	498	-	133*

* Extension piece (VT) necessary

Picture showing the fitted console

Available sizes

NW	øD	Length mm
200	198	475 600
224	222	
250	248	
280	278	
315	313	
355	353	
400	398	
450	448	
500	498	

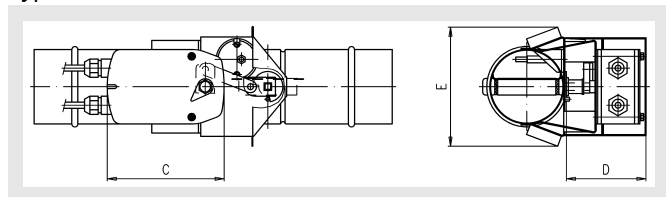


Round Duct System RR-Complete

Dimensions of accessories

with electric spring return actuator (-E)

Type ELD-BLF-B or ELD-BF 24 V AC / 24 V DC / 230 V AC

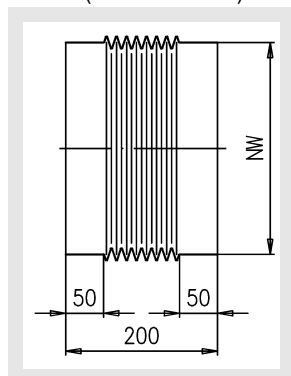


Available sizes (-E)

NW	C	D	E
200	155	84	230
224	155	84	230
250	155	84	230
280	155	84	230
315	155	84	230
355	155	84	230
400	155	84	230
450	155	84	230
500	155	84	230

Flexible connection piece (FS-RS)

FS-RS (for BSK-RB-S)



The equipotential bonding must be carried out according to the VDE regulations by authorised skilled personnel. In case of a fire (breakdown) no mechanical stress from the equipotential bonding must operate on the fire damper and the fire damper must not be impaired in their function.

Mounting situation

Mounting into walls to DIN 1053, thickness < 100 mm:

- FS-RF / FS-RS on both sides

Installation in front of walls and ceilings:

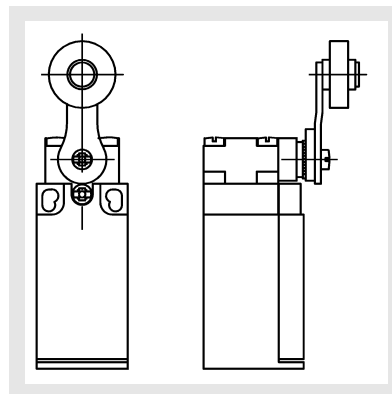
- FS-RF / FS-RS on the side pointing away from the fire-resistant duct on the shut-off device

Installation in light-weight partition walls:

- FS-RF / FS-RS on both sides

Electric limit switch type ES

with / without KESS



Switching elements include 1 NC contact and 1 NO contact each, with jump feed, 4 connections, screw clamp M 3.5 for max. 2 mm². Operating temperature: -20°C to +70°C
Protection type: IP 66 using suitable screwed joints le 6 A 250 V AC (wiring on-site).

Electric limit switches can be installed to indicate position or to perform switching functions

Mounting options:

- for damper position "CLOSED" 1 limit switch type ES 1 Z
- for damper position "OPEN" 1 limit switch type ES 1 A
- for damper position "CLOSED" / "OPEN" 2 switches type ES 2

Special limit switch in Ex design (on request) type ES 1 Ex

The limit switches are fitted during manufacture.

The analogue limit switches ES1 and ES2 can be connected to the communicative signalling and switching bus system KOMES via the compatible KESS limit switch modules.

The BSK-RB equipped with a 24 V actuator can be integrated into the communicative signalling and switching bus system KOMES via an SMB module.

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Installation

Installation in walls and ceilings

The round fire damper type BSK-RB can be fitted as shown in the following tables.

Fire resistance classification

Installation in walls and ceilings

- One side duct, opposite side protective grating K90
- both sides with non-flammable ventilation duct at least 1.5 x size K90

Lightweight partition wall:

- both sides with non-flammable ventilation duct at least 1.5 x size K90

Minimum thickness (mm) for installation in walls and ceilings

The classification of the fire dampers into the individual fire resistance classes can be seen from the table below.

Fire resistance class:

in walls:	K30	K60	K90
Gas concrete and lightweight concrete	≥75 2.)	≥75 2.)	≥100
other types of concrete	≥80 2.)	≥80 2.)	≥100
other types of masonry	≥71 1.) 2.)	≥71 1.) 2.)	≥115
Gypsum wall boards	≥60 2.)	≥80 2.)	≥100
in ceilings:			
Concrete, including lightweight concrete and gas concrete	(≥100)	(≥100)	≥100

- 1.) Additional plaster on both sides (2 x 15 mm thick) masonry to DIN 1053 must be provided.
- 2.) Fire dampers in solid walls of less than 100 mm in thickness must be connected on both sides to the ventilation ducts by means of flexible connection pieces type FS-RF or FS-RS.

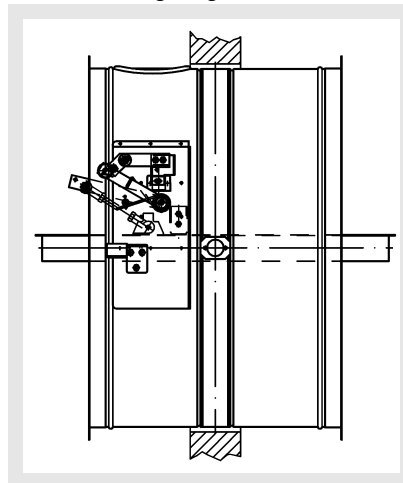
Assembly instructions for walls and ceilings

Assembly can also take place immediately during masonry construction or cementing (in this case, the circumferential mortar gaps can be omitted). The cement must **not** be compacted.

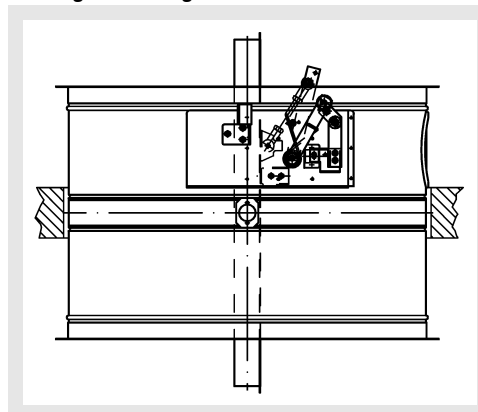
Installation positions

Assembly instructions for walls and ceilings

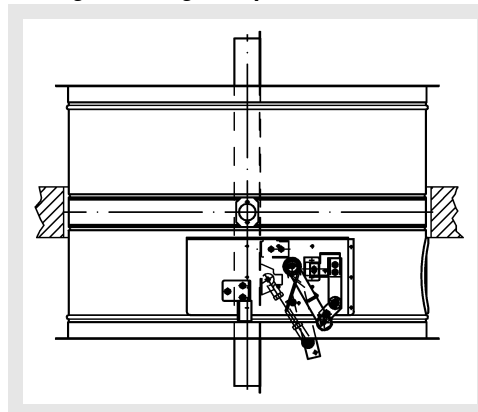
Installation position: Wall mounting - right



Ceiling mounting - vertical

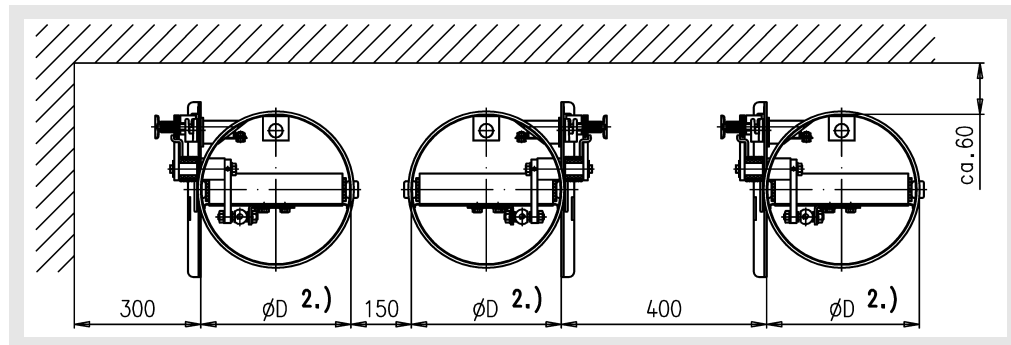


Ceiling mounting - suspended



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Minimum distances for installation in walls and ceilings

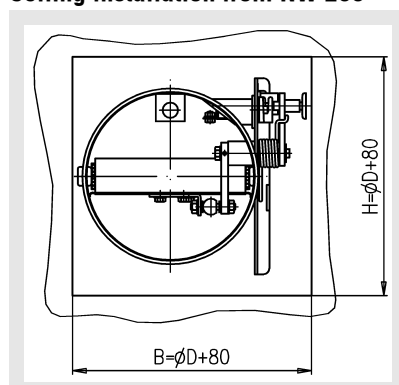


The distances given are those of the standard design. For additional installations, the projecting ends can be seen from the relevant column.

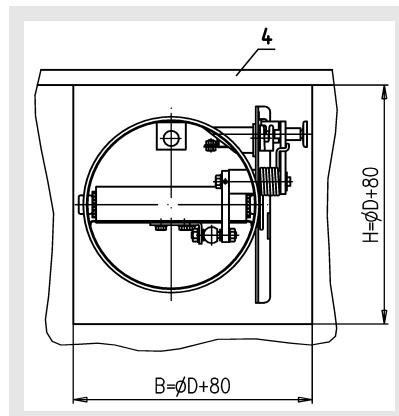
2.) = inside

Wall and ceiling installation

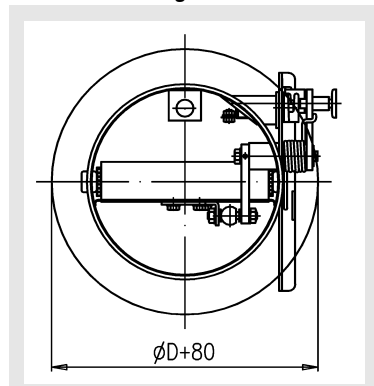
Ceiling installation from NW 200



Wall installation from NW 200



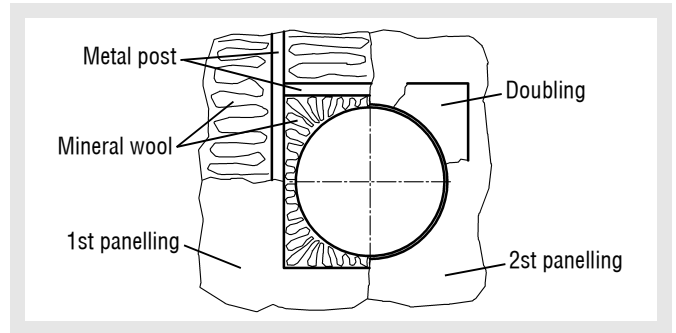
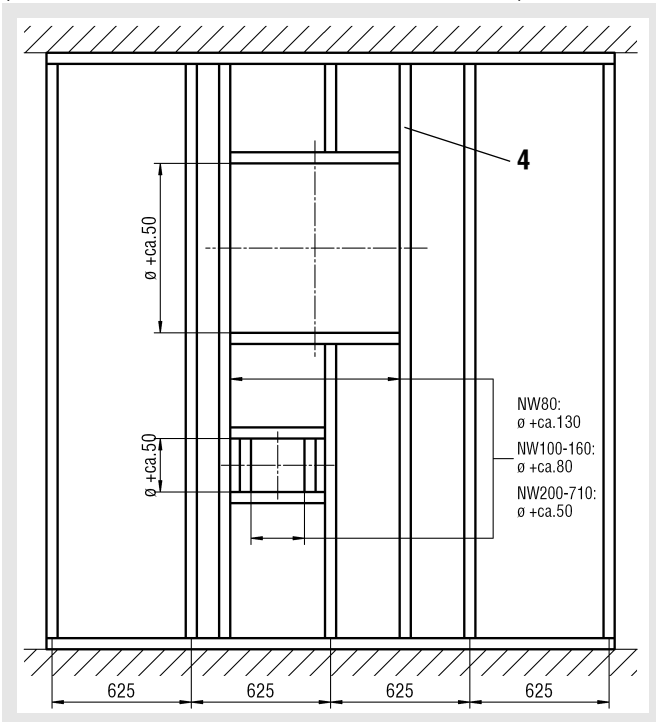
Wall and ceiling installation from NW 200



with mortar group II or III to DIN 1053 or cement.

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Installation in lightweight partition wall
according to Table 48 of DIN 4102 Part 4 (edition March 1994)
 (Drawn without showing the gypsum wall boards)



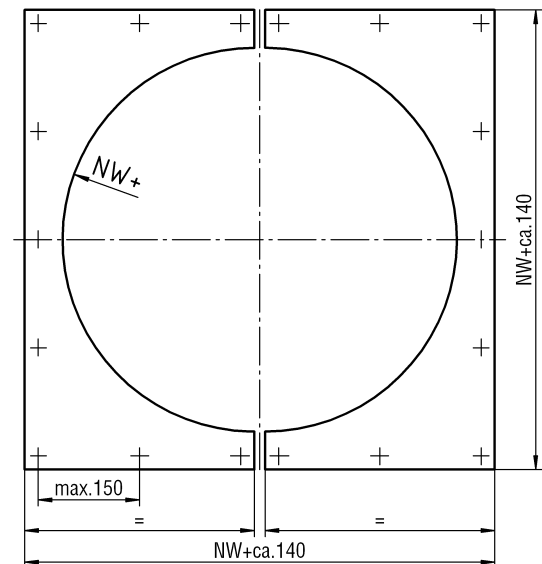
GKF doubling (plaster board t=12.5)

Fastening by means of drywall screws TN 3.5 x 55 to DIN 18182,
 $e \leq 150$ mm.

BSK-RB 200-500

1 each per drive side

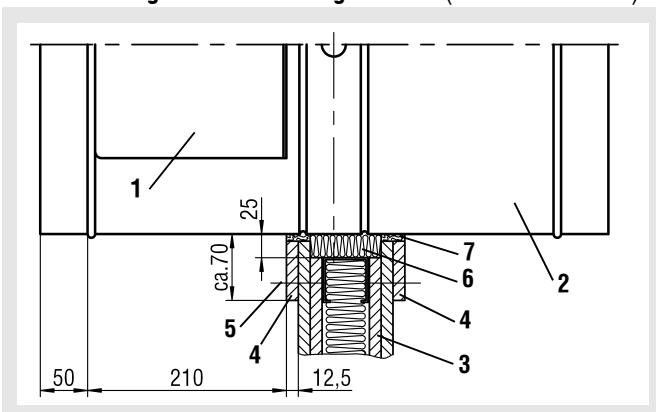
1 each per non-drive side



4.) = Profile

Minimum distance between two BSK-RB is 120 mm to each other
 In the overlap / connection area of the exchangeable profiles,
 they must be riveted, crimped or screwed once per connection
 point. The horizontal change profiles must be executed as UW
 50/40/0.6, the vertical change profiles as GW 50/50/0.6 to DIN
 18182.

Section through wall containing BSK-RB (drawn $NW \geq 200$)



- 1 = Fitted console
- 2 = Fire damper BSK-RB
- 3 = Lightweight partition wall according to Table 48 DIN 4102 Part 4
- 4 = Doubling (GKF board 12.5 mm to DIN 18180)
- 5 = Drywall screws TN 3.5 x 55 to DIN 18182
Bore distances 150 mm max.
- 6 = Mineral wool (DIN 4102)
Melting point $\geq 1000^\circ\text{C}$, apparent density approx. 100 kg/m^3
- 7 = Filled with plaster

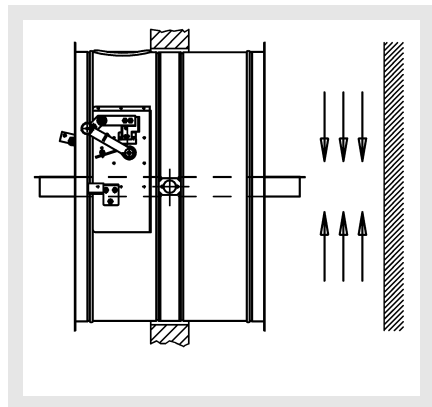
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Installation information

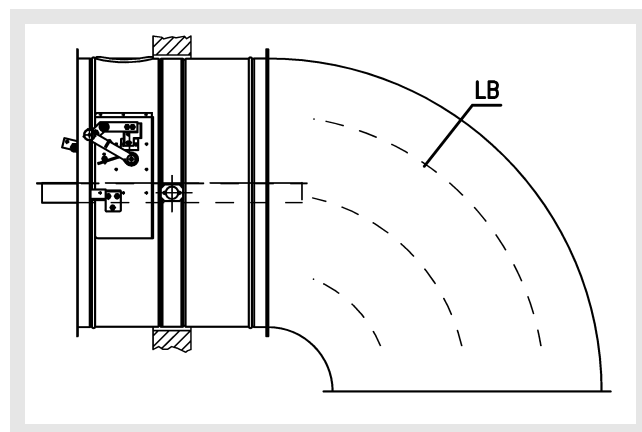
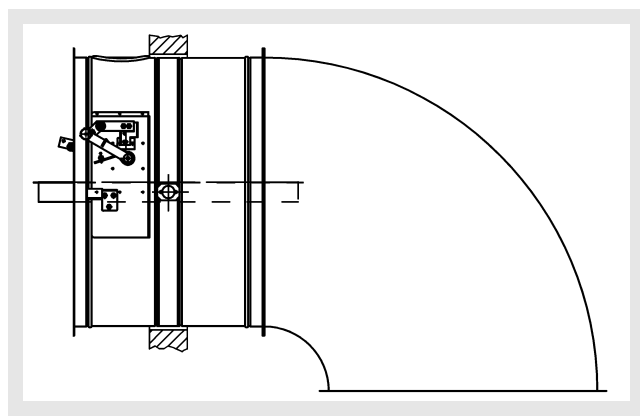
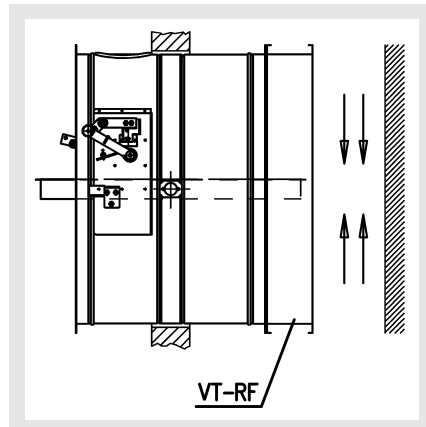
During installation make sure that the air inflow reaches the fire damper (damper leaf) uniformly. During installation, you must make sure that the air flow does not counteract the closing process of the shut-off damper.

LB = Guiding plate
VT-RF = Extension piece

Unfavourable installation



Favourable installation



The drawings show an unfavourable inflow of the fire damper. This should be avoided when air velocities in the duct are high.

Small structural alterations, such as air deflection plates, have a favourable effect on the air inflow.

Ensure free run of the damper leaf!

The suitability of the shut-off devices for ventilation ducts in which internal soiling through grease is to be expected to a particularly high degree (e.g. exhaust air ducts connected to commercial kitchens and for flammable ducts) has not been proven.

Connection to flammable ducts

A non-flammable duct of **at least 1.5 x D in length** (fire damper leaf diameter) must be installed between the fire damper type BSK-RB and the flammable duct.

The fire resistance class with this type of mounting is K90.

Mounting an end protective grille type ASG-RF resp. ASG-RS between the fire damper and the combustible duct is not allowed.

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Technical data

For the technical data, please refer to the SCHAKO layout program or the brochure Fire damper BSK-RB, register 09, catalogue 2.

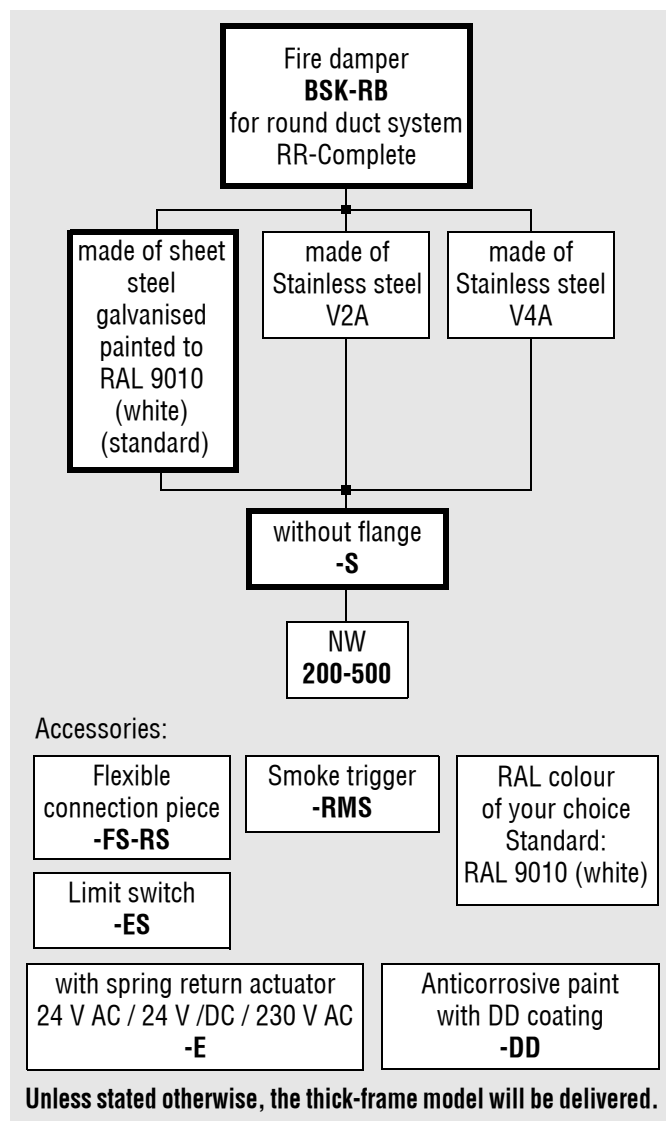
Quick selection chart

NW		L _{WA} [dB(A)]		
		35	40	45
200	V _{ZU} (m ³ /h)	426	518	630
	V _{ZU} [l/s]	118,3	143,9	175,1
	v _{stirn} (m/s)	3,8	4,7	5,7
	Δp _t (Pa)	8	12	18
224	V _{ZU} (m ³ /h)	718	859	1029
	V _{ZU} [l/s]	199,4	238,6	285,7
	v _{stirn} (m/s)	5,2	6,2	7,4
	Δp _t (Pa)	30	43	61
250	V _{ZU} (m ³ /h)	876	1048	1255
	V _{ZU} [l/s]	243,3	291,2	348,7
	v _{stirn} (m/s)	5,0	6,0	7,2
	Δp _t (Pa)	27	38	55
280	V _{ZU} (m ³ /h)	1089	1288	1542
	V _{ZU} [l/s]	302,5	357,7	428,3
	v _{stirn} (m/s)	5,0	5,9	7,1
	Δp _t (Pa)	24	35	50
315	V _{ZU} (m ³ /h)	1332	1595	1909
	V _{ZU} [l/s]	370,0	443,0	530,3
	v _{stirn} (m/s)	4,8	5,8	6,9
	Δp _t (Pa)	22	31	45
355	V _{ZU} (m ³ /h)	1655	1981	2372
	V _{ZU} [l/s]	459,7	550,3	658,8
	v _{stirn} (m/s)	4,7	5,6	6,7
	Δp _t (Pa)	24	35	50
400	V _{ZU} (m ³ /h)	2055	2460	2945
	V _{ZU} [l/s]	570,9	683,3	818,1
	v _{stirn} (m/s)	4,6	5,5	6,6
	Δp _t (Pa)	18	25	35
450	V _{ZU} (m ³ /h)	2545	3046	3647
	V _{ZU} [l/s]	706,9	846,1	1013,0
	v _{stirn} (m/s)	4,5	5,4	6,4
	Δp _t (Pa)	16	23	32
500	V _{ZU} (m ³ /h)	3081	3688	4416
	V _{ZU} [l/s]	855,9	1024,5	1226,7
	v _{stirn} (m/s)	4,4	5,3	6,3
	Δp _t (Pa)	14	21	29

Legend

V _{ZU} [l/s]	= Supply air volume
Δp _t (Pa)	= Pressure loss
v _{stirn} (m/s)	= Inflow velocity
L _{WA} [dB(A)]	= A-weighted sound power level
NW	= Nominal width

Order details



Round Duct System RR-Complete

Specification text

Round fire damper for round duct system RR-Complete for installation in walls and ceilings or in lightweight partition walls, of resistance class K 90 to DIN 4102, Part 6. Housing and installation components consisting of galvanised sheet steel (stainless steel 1.4301 (V2A) or 1.4571 (V4A) available as an option at an extra charge), with abrasion-resistant metal damper leaf housed in maintenance-free bushes with stable continuous damper axle. With inner thermal trigger device to 72°C. Installation position vertical, suspended or horizontal, any air jet direction. Operation side right.

Approval certificate number: Z-41.3-628

- without flange

Product: SCHAKO type **BSK-RB-S**

- Length - 475 mm
- 600 mm

Accessories:

- Corrosion resistant paint (-DD), with DD varnish, inside and/or outside, two component varnish based on polyurethane, colour light grey.
- Electric spring return actuator (-E), 24 V DC / 230 V AC to open and close the locking damper (BSK-RB-F/-S 80 only available with electrical spring return actuator).
- Limit switch (-ES),
 - Protection type IP 66 (moisture-protected)
 - Equipped with 1 NO and 1 NC contact each:
 - Type ES 1 Z, for "CLOSED"
 - Type ES 1 A, for "OPEN"
 - Type ES 2 Z, for "CLOSED" / "OPEN"
 - Type ES 1, Ex design
 - With limit switch module KESS to connect to the communicative signalling system KOMES via looped bus line (-KESS)
- Flexible connection piece of PVC covered polyester material with stable connection profile made of galvanised sheet steel: Temperature-resistant from -20° to +70°C. Building material class at least B2 to DIN 4102.
 - without flange (FS-RS)
- Smoke trigger (RMS) for smoke detection
- painted to a RAL colour of your choice

Round Duct System RR-Complete

Volumetric flow controller VRA-RR-E



Description

A volumetric flow controller is used for pressure-independent volumetric flow regulation in ventilation and air-conditioning systems. It is used to keep the volumetric flow constant (CAV) within specified limits or to control it variably (VAV) as a function of a command variable, for example a room temperature controller, DDC or bus system. For constant volumetric flows, the operating stages CLOSED/ V_{min} / V_{ave} / V_{max} are available in stage operation, controlled via relays or switches. The housing, measuring sensor, control flap, PI controller with pressure sensor and actuator form a closed control loop with feedback, allowing demand-dependent, energy-saving air-conditioning of the single rooms or areas of air-conditioning systems. When suitable electrical controller types are used, room or duct pressure regulation can be achieved.

The first adjustment of the V_{min} , V_{max} and V_{nom} operating volumetric flows is done prior to delivery ex works in accordance with specific customer requirements, although it can easily be changed at any time with the controller already mounted by means of the handheld control device or the PC-Tool software. When these values are set, the functions of all volumetric flow controllers are also checked. The operating point V_{max} can be set in the range 30...100% of the nominal volumetric flow of the box, while the operating point V_{min} is set in the range 0...100%, relative to V_{max} or V_{nom} (depending on the controller types). The maximum deviation of the volumetric flows is +/- 5%, relative to the nominal volumetric flow V_{nom} .

For the calibration of the controllers, a curves with a flow rate of 12 m/sec is available. For constant-volume volumetric flow controllers, the V_{min} value will be set to the desired constant-volume value. In-factory the calibration curve will be selected such that the constant volume is about 80 - 85% of the nominal volume. If the changes in air volume are so large that the calibration curve must be changed, the controllers must either be recalibrated in-factory

or the calibration curve must be changed on-site by the customer service of Schako.

For the measurement of the effective pressure, Schako is using its measuring principle by means of a double measuring cross made of extruded aluminium profile, to which 12 measuring points have been attached on the pressure and suction side, respectively, by the median line method, in order to determine average values. In comparison with measuring rods or measuring orifices having fewer measuring points, this gives higher accuracy, allowing the inflow area required in front of the volumetric flow controller to be minimised (see page 18 - Installation Information).

When using the controllers in systems with heavy dust contamination, suitable filters must be used. For contaminated or aggressive or air containing fluffy material, only those controller types must be used that incorporate a differential pressure sensor. Since the membrane zero point must not be changed in static sensors, the mounting instructions documented by the manufacturer must be adhered to. The volumetric flow controllers type VRA are not suitable for air containing sticky and oily particles (e.g. kitchen exhaust air).

The volumetric flow controller VRA has been tested successfully by TÜV SÜD in accordance with the following regulations:

- **VDI 6022, Sheet 1:** Hygienic requirements of ventilation and air-conditioning systems
- **VDI 6022, Sheet 2:** Hygienic requirements of ventilation and air-conditioning systems - Measurement methods and investigations during hygienic controls and hygienic inspections
- **DIN 1946, Sheet 2:** Air-conditioning technology - Health requirements

For maintenance, service, retrofitting, etc., inspection openings in sufficient number and size must be provided on-site.

Round Duct System RR-Complete

Field of application

- for supply and return air systems
- for constant CAV or variable VAV installations.
- for positive control V_{\min} , V_{mid} , V_{\max} , "OPEN" or "CLOSED"
- For volumetric flow and linear pressure control
- in the differential pressure range 50 - 1,000 Pascal
- at ambient temperatures 0 ...+...50°C, requirement: measuring air 0...+ 50°C/5...95% rH, non-condensing
- with command signal 0...10V DC, 2...10V DC, via MP bus (Belimo) or digital LonWorks
- with supply voltage 24V AC (19.2..28.8V) or 24V DC (21.6..28.8V)
- with DD varnish coating for aggressive media
for regulating the air velocity in the duct in the range 2..12 m/s (electric) and 3..12 m/s (pneumatic)
- can also be used with vertical axis

When using volumetric flow controllers in roof central units, in extreme cases, condensation can build up in the measuring pipes of the volumetric flow controller as a result of the large temperature differences between the air flowing through the volumetric flow controller and the surrounding air. This condensation can affect or damage the sensor. This is why for this field of application care must be taken to insulate the housings of the volumetric flow controllers and the measuring hoses (to prevent condensation) and to mount the controllers in such a way that any condensate formed on the outside of the measuring hoses can run downward and be drained (without entering the sensor).

Before connecting SCHAKO components to customer installations, any compatibility problems must be solved on-site and are not our area of responsibility.

Attention: We would like to point out that only suitable cleaning materials may be used for cleaning the stainless steel housings and damper leaves.

Round Duct System RR-Complete

Installation

Installation information

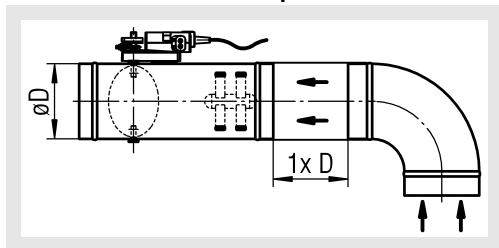
To avoid unnecessary controller errors, the min. distances according to the following table / drawings must be observed. For combinations of several connection pieces or pieces with fire dampers or silencers, the larger minimum distances must be observed.

All volumetric flow controllers can be assembled with horizontal or vertical damper axis.

Distance to:	VRA-RR
Connection piece with bend	1 x D
Other connection pieces: (e.g. T-junction, branching piece, reduction piece, etc.)	2 x D
Fire damper	2 x D
Silencers:	2 x D

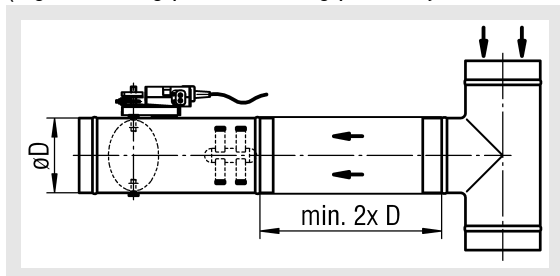
Installation information for VRA-RR (round)

Distance to a connection piece with bend

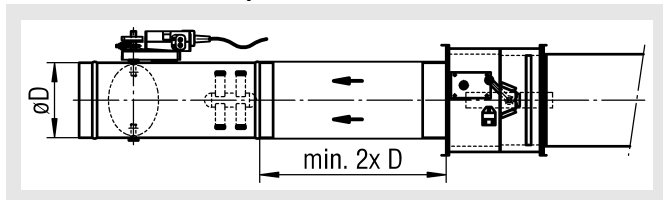


Distance to other connection pieces

(e.g. branching piece, reducing piece, T-junction, etc.)



Distance to a fire damper



D = diameter

Construction

Housing

- Galvanised sheet steel, painted to RAL 9010 white (standard)
- Painted to a RAL colour of your choice
- Galvanised sheet steel with DD coating
- Stainless steel 1.4301 (-V2A) or 1.4571 (-V4A) (VRA-RR only)

Damper leaf

- Galvanised sheet steel
- Stainless steel 1.4301 (-V2A) or 1.4571 (-V4A) (VRA-RR only)

Damper leaf seal

- made of PUR, silicone-free
- for airtight sealing design to DIN 1946/4

Damper bearing

- Brass

Measuring cross

- Extruded aluminium profile (for stainless steel design with DD coating)

Measuring cross support

- Plastic (PA6)

Model

VRA-RR-E - by means of electric controller

- Control voltage 24 V AC 50/60 Hz
- alternatively with spring return actuator zero-current "CLOSED" or zero-current "OPEN" (at an extra charge).
- alternatively by means of high-speed actuator running time 3-5 sec. for 90° angle of rotation (at an extra charge).

VRA-RR-P - by means of pneumatic controller in the design depressurised "CLOSED" (standard) or depressurised "OPEN".

- Feed pressure 1.2 ± 0.1 bar

Accessories

Rubber lip seal (-GD)

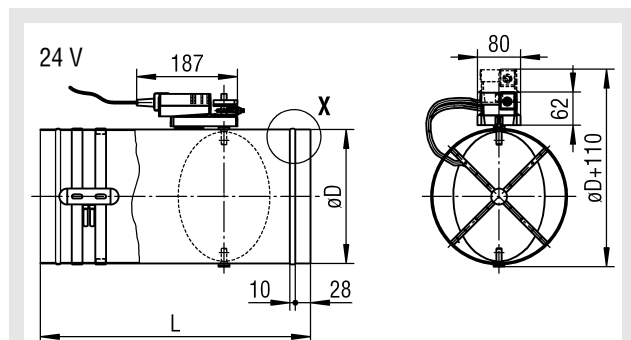
- on both sides, special rubber.

Round Duct System RR-Complete

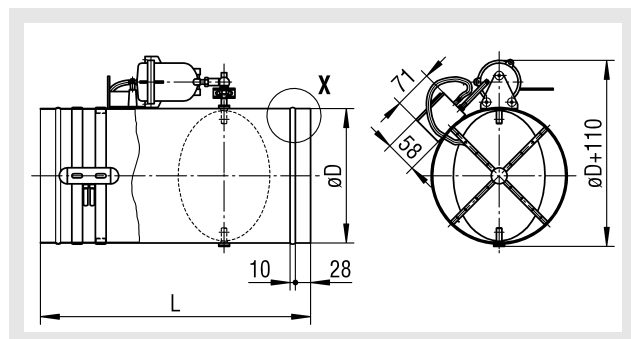
Models and dimensions

Dimensions

VRA-RR-E



VRA-RR-P



Available sizes VRA-RR-...

NW	øD	øD1	øD2	L
200	198	204	240	450
225	223	229	265	475
250	248	254	290	500
280	278	284	320	550
315	313	319	355	600
355	353	359	395	650
400	398	404	440	700
500	498	504	540	850

Size 200 - size 400 sealing airtight to DIN 1946/4

Standard controllers and drives

Type	Size (mm)	Controller / Drive	Actuator	Make
VRA-RR-E	ø200 - ø500	LMV-D3-MP	Compact	Belimo
	ø400 - ø500	NMV-D3-MP	Compact	Belimo
VRA-RR-P	ø200 - ø500	RLP10F001	AK31P1F001	Sauter

The listed Compact controllers of the Belimo make are compatible with the older generation of types LMV-D2M and NMV-D2M.

Round Duct System RR-Complete

Technical data

Quick selection for total air volumes of the duct system per branch duct

NW (mm)	V	Gruner	Belimo / Siemens / Gruner				
			Sauter RLP				
		1 m/sec	1 m/sec	2 m/sec	3 m/sec	4 m/sec	5 m/sec
200		111	111	222	333	444	555
	l/s	31	31	62	93	123	154
225		139	139	278	417	556	695
	l/s	39	38	77	116	154	193
250		174	174	348	522	696	870
	l/s	48	48	97	145	193	242
280		218	218	436	654	872	1090
	l/s	61	60	121	182	242	303
315		277	277	554	831	1108	1385
	l/s	77	77	154	231	308	385
355		352	35	704	1056	1408	1760
	l/s	98	98	196	293	391	489
400		448	448	896	1344	1792	2240
	l/s	124	124	249	373	498	622
450		651	651	1302	1953	2604	3255
	l/s	181	181	362	543	723	904
500		701	701	1402	2103	2804	3505
	l/s	195	194	389	584	779	974

Attention, the following specifications are important for the programming of the volumetric flow controllers:

- this table merely specifies the complete measuring range of the controller (volumetric flow range)
- If the customer absolutely wants a calibration curve different from 12 m/s, it must be specified!
- If the customer wants the V_{max} potentiometer to be set to 100%, a calibration curve must also be specified when placing the order.
- When the air volume drops below the V_{min} shown in the chart, the correct functioning of the volumetric flow controller is no longer guaranteed!
- If only one air volume is specified in the order (as V_{max} value), the volumetric flow controller will be delivered as variable volumetric flow controller. The V_{min} value will be set to the value specified in the catalogue.
- If only one air volume is specified in the order (as V_{min} or $V_{constant}$ value or without specifying a value), then the volumetric flow controller will be delivered as a constant volumetric flow controller. The volume specified in the order is set to the V_{min} value, and the V_{max} value is set to 100%.
- The air volumes can be changed using setting devices specific of the controller make, depending on the calibration curve set ex works.
- The controller of the Belimo make, type VRP, equipped with aneroid diaphragm VFP 300, can only be delivered with calibration curves 9, 12 or 15 m/s.

- The controller of the Gruner make, type 227V Compact, can only be used in the **round** model VRA-RR with a sensor linearised to an air velocity of 1 m/s!

Round Duct System RR-Complete

Static minimum pressure difference VRA-RR-E

NW	v _K (m/s)	V		Δp _{t min} (Pa)
		(m ³ /h)	[l/s]	
200	2	219	61	15
	6	658	183	20
225	2	279	78	15
	6	836	232	20
250	2	345	96	15
	6	1034	287	15
280	2	434	121	15
	6	1301	361	15
315	2	550	153	15
	6	1651	459	15
355	2	701	195	15
	6	2101	584	15
400	2	891	248	15
	6	2672	742	15
500	2	1402	398	15
	6	4206	1168	15

For further technical data, please refer to the SCHAKO layout program or the brochure Volumetric flow controller VRA, register 08, catalogue 2.

Round Duct System RR-Complete

Technical data of the control components

For the technical data, please refer to the SCHAKO layout program or the brochure Volumetric flow controller, register 08, catalogue 2.

Controller selection

<u>Electric controller:</u>	<u>Actuator:</u>
- <u>Belimo:</u>	
- LMV-D3-MP	Compact
- NMV-D3-MP	Compact
- SMV-D3-MP	-
- VRD3	NM24A-V
- VRD3	SF24A-V
- VRD3	LF 24-V ^{4.)}
- VRP/VFP 300	NM24A-V
- VRP-STP-VFP 100/300/600	NM24A-V
- VRP-STP-VFP 100/300/600	SF24A-V
- VRP-M-VFP 300 ^{3.)}	LMQ24A-SRV-ST / NMQ24A-SRV-ST / NM24A-V-ST
- LMV-D3LON	Compact
- NMV-D3LON	Compact
- <u>Siemens:</u>	
- GLB181.1 E/3 ^{1.)}	Compact
- ASV181.1 E/3	GLB1..., GMA1..., GCA1...
- <u>Sauter:</u>	
- RLE152 F0..	ASM114S F132
- RLE152 F0..	Joventa SM1.12
- EYE 205 F902 ^{2.) 6.)}	ASM114 F122
- EYE 206 F902 ^{2.)}	ASM114S F132
- <u>Honeywell:</u>	
- W7751 H2009 ^{5.)}	Compact
- W7751 D2008 (upon request)	ML 6161
- <u>Gruner:</u>	
- 227V-024-08	Compact
- 227V-024-15 (upon request)	Compact
- GUAC-S3 (upon request)	227-024-08-V
- GUAC-P1/P3/P6 (upon request)	227-024-08-V
- GUAC-S3 (upon request)	238-024-15-V
- GUAC-P1/P3/P6 (upon request)	238-024-15-V
- <u>Delta Controls:</u>	
- DVC-V322A / V322F	Compact (VRA-RR-E 200-400)
The selection of each actuator (torque) depends on the housing dimensions.	

<u>Pneumatic controllers:</u>	<u>Servo cylinder: VRA-RR-P</u>
- <u>Sauter:</u>	
- RLP10 F001	AK31P1 F001
- RLP10 F905	AK31P1 F001
- RLP10 F904	AK31P1 F001
- RLP10 F916	AK31P1 F001
- RLP100 F001	AK31P1 F001
- RLP100 F002	AK31P1 F001
- RLP100 F914	AK31P1 F001
- RLP100 F123	AK31P1 F001

Accessories:

S1A/S2A, limit switch make Belimo, to fit all new compact controllers and actuators of make Belimo.

ZEV device for Belimo MV-D3-MP / PC-Tool for Belimo MV-D3-MP

AST10 for Siemens GLB/ASV 181.1 E/3 / GUIV-O for Gruner 227V.

- 1.) Available up to a maximum torque of 8 Nm.
- 2.) Mounting plate with integrated traction relief for controller EYE at an extra charge.
- 3.) Available up to NW 400. In NW 400, a cover plate (internal diameter 350 mm) is mounted on the pressure side in front of the measuring cross.
- 4.) Available for VRA-E from $\varnothing 100$ to $\varnothing 400$ mm.
- 5.) Controller with integrated LON bus connection.
- 6.) Not silicone-free!

Round Duct System RR-Complete

Maintenance and service

Assembly and maintenance instructions

1. When the device is delivered, check whether the controllers are complete and have been delivered without damage. Complaints have to be communicated immediately and directly to the transporter and SCHAKO company.
2. The volumetric flow controller must not be carried on the regulation components, measuring cross or the damper leaf, but only on the housing.
3. The controllers must be carefully stored on-site. They must be protected from dust, dirt and from direct weather effects.
4. The controllers must be assembled in a way to allow inspection.
5. Assembly must be carried out by expert personnel, observing recognised technical rules and regulations.
6. For ex-protected rooms, Ex-protected control components must be used (VRA-P).
7. **For polluted air, the volumetric flow controllers must be used with an integrated controller with a static membrane pressure sensor. In this case, it is absolutely necessary to observe the mounting position. The volumetric flow controllers are not suitable for air containing sticky and greasy particles.**

Zero adjustment of the static pressure sensors VFP-...

The pressure probe is based on a static pressure meter. Great care must be taken to ensure correct transport and correct assembly. The volumetric flow controllers have been adjusted in-factory by the OEM manufacturer according to their mounting position. If the controllers are installed in another position the sensors can be adjusted as follows.

1. Sensor VFP-... must be installed.
2. Connect VFP-... to VRP and supply VRP with 24 V AC mains voltage.
3. Remove lid from VFP-... .
4. Move damper to the "OPEN" position.
5. Pull damper drive plug from the VRP.
6. Remove the pressure hoses from the connection pipes.
Attention! Make a note of the (+) and (-) assignment.
7. The membrane position is considered balanced when both LEDs are dark (OFF). If the meter position is not balanced, one of the two LEDs will light up, and the position must be adjusted on the potentiometer in the VFP-...
8. Slowly turn the zero point adjustment of the potentiometer (non-painted potentiometer), until both LEDs are dark (OFF).
9. Assemble lid of VFP-...
10. Reconnect pressure pipes as before (+) and (-).
11. Reconnect the plug of the damper drive.

Cleaning of the dynamic differential pressure sensor

The dynamic differential pressure sensor integrated in the **NMV-D3-MP**, **LMV-D3-MP** und **VRD3-SO** requires little maintenance. However, if, depending on the degree of pollution of the air, unexpected volumetric flow deviations occur, then the following procedure is recommended.

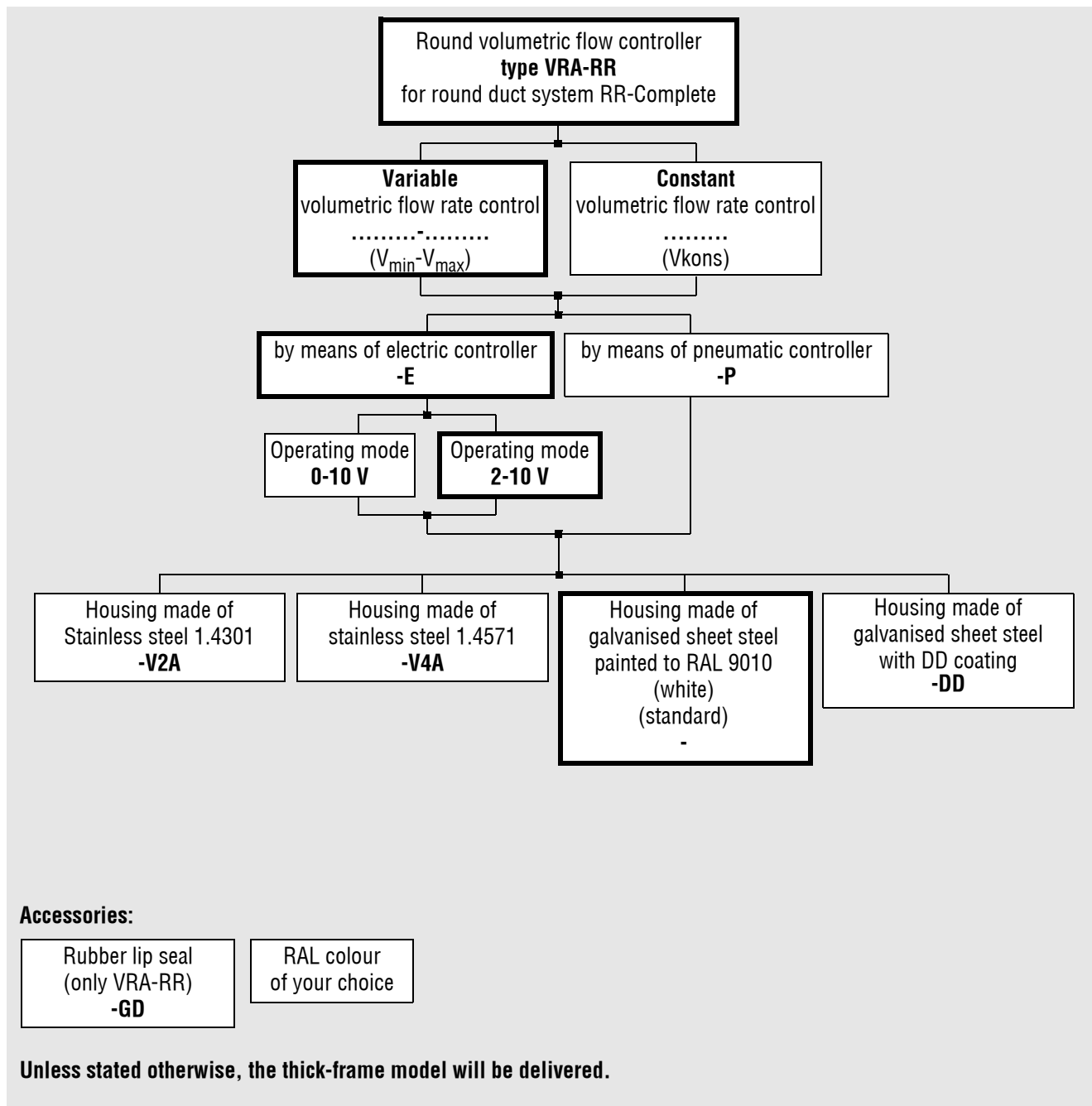
1. Pull off the pressure hoses from the sensor connection pipe of the NMV-D3-MP, LMV-D3-MP or of the VRD3.
Attention! Make a note of the (+) and (-) assignment.
2. Using a suitable hand pump, blow air into the (-) connection piece of the sensor (this will blow any dirt deposited inside the sensor out of the (+) connection piece).
3. Remove any dirt that may have formed from the connecting pieces and hose ends.
4. Reconnect pressure hoses, (+) and (-) as before.
5. Carry out a functional check of the controller.

Legend

V	(m ³ /h)	= Air volume
V	[l/s]	= Air volume
NW	(mm)	= Nominal width
v _K	(m/s)	= Duct velocity
Δp _{tmin}	(Pa)	= Minimum static pressure difference

Round Duct System RR-Complete

Order details



Accessories:

Rubber lip seal
(only VRA-RR)
-GD

RAL colour
of your choice

Unless stated otherwise, the thick-frame model will be delivered.

Round Duct System RR-Complete

Specification texts

Volumetric flow controller in round design, for spiral duct connection, for use in supply and return air systems for constant or variable volumetric flow, room or duct pressure regulation. With positive control V_{\min} , V_{\max} or "CLOSED". Allowed pressure difference range: 50-1000 Pa, allowed ambient temperature 0-55°C. Suitable for use with duct velocities of 2-12 m/s. It is possible to subsequently adjust the operating volumetric flows set ex works. The output signal can be used for master/slave or parallel operation of several controllers or for actual value display 2-10 V DC (0-10 V DC), which corresponds to 0-100 % of the set V_{\max} in DDC/ZLT systems. Housing made of galvanised sheet steel with damper leaf seal free of silicone (size \varnothing 125-400 airtight to DIN 1946/4), housing leakage class B according to DIN EN 1751 measuring cross made of extruded aluminium profile, measuring cross support made of plastic (PA6), damper bearing made of brass. With electric controller, control voltage 24 V AC, 50 / 60 Hz, temperature compensation of 10-40°C, wired and adjusted in factory. TÜV inspected according to **VDI 6022 Sheets 1+2** and **DIN 1946 Sheet 2**.

Product: SCHAKO **type VRA-RR-E**

- with spring return actuator (at an extra charge)
 - de-energised "CLOSED"
 - de-energised "OPEN"
- With pneumatic controller, feed pressure 1.2 ± 0.1 bar, suitable for duct velocities 3-12 m/s:
 - depressurised "CLOSED" or
 - depressurised "OPEN"
 Requirement: Measuring air 0...+ 50°C/5...95% rH, non-condensing.
 Product: SCHAKO **type VRA-RR-P**
- Housing (at an extra charge) made of
 - Sheet steel painted to a RAL colour of your choice
 - galvanised sheet steel with DD coating (-DD)
 - stainless steel 1.4301 (-V2A)
 - stainless steel 1.4571 (-V4A)

Accessories (at extra cost):

for VRA-RR :

- Rubber lip seal (-GD), made of special rubber.

Round Duct System RR-Complete

Volumetric flow restrictor DKG-MKA



Description

For quick, easy control of the supply air volume, the DKG-MKA was especially developed for the round duct system RR-Complete.

The **round, manually adjustable** volumetric flow meter DKG-MKA is suitable for installation in round **supply air and return air ducts** according to DIN 24145 or 24146. It is used for regulating the volumetric flows in room ventilation installations. The integrated volumetric flow controller measuring cross type is mainly used for measuring the air volumetric flow downstream of the central unit or fan or for adjusting branch ducts or in ventilation and air-conditioning installations of large shopping centres having several tenants, for determining the share in energy costs of the ventilation and air-conditioning installation.

The hand-adjustable device **with integrated position indicator** allows an exact setting of the damper blade, without tools, between 0° and 90°. The housing is dimensionally stable due to standard double beads.

The throttle damper can be used at temperatures between 0°C and +50°C.

Maximum duct pressure 500 Pa.

The measuring cross substantially facilitates the measurement of the air volumetric flow, compared with the previous cost- and time-intensive measuring method, in which many individual points have to be measured.

The measuring deviation of the volumetric flow measuring cross is

$\pm 5\%$ at a V_{max} of 100 %.

The measuring cross is largely insensitive to the intake flow, since 12 measuring points are distributed on this measuring cross according to the median line method. In comparison with measuring rods having only 4 measuring points or measuring orifices, this gives optimum measurement results. However, to avoid unnecessary sources of error, the measuring cross should be placed at a distance of at least $1 \times D$ behind bends or T-junctions.

The differential pressure determined at the measuring cross can be measured with a (static or dynamic) pressure measuring device.

In the design of type MKA-E with electric transducer, the controller calibrated ex works transmits a 0-10 V DC output signal (which corresponds to 0-100% of the set air volume V_{max}) to the DDC/ZLT system.

When using measuring crosses in systems with heavy dust contamination, suitable filters must be connected upstream. For polluted air, the measuring crosses must be used in combination with a controller with a static membrane pressure sensor. In this case, it is imperative to observe the notice sign regarding the mounting position. The measuring crosses are not suitable for air containing sticky and greasy particles.

For air contaminated with aggressive media, measuring crosses of type MKA-R-PPs in plastic design must be used.

For maintenance, service, retrofitting, etc., inspection openings in sufficient number and size must be provided on-site.

Advantages:

- stable design
- easy to regulate
- assembly-friendly
- fits position-independent

Construction

Housing

- made of galvanised sheet steel, painted to RAL 9010 white (standard)
- Painted to a RAL colour of your choice
- made of stainless steel 1.4301 (-V2A) or 1.4571 (-V4A)

Control flap

- made of galvanised sheet steel
- made of stainless steel 1.4301 (-V2A) or 1.4571 (-V4A)

Manual adjusting device

- made of plastic

Axle bearing

- made of plastic

Measuring cross

- extruded aluminium profile

Measuring cross support

- plastic PA6

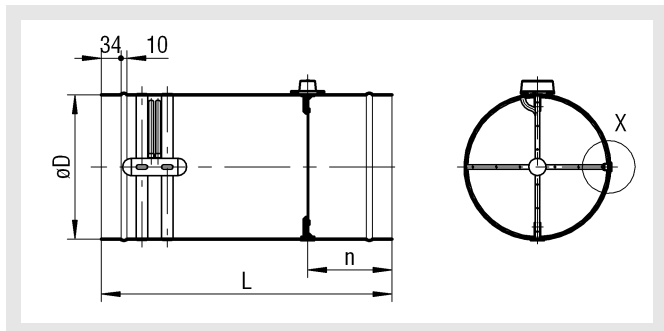
Field of application

- for supply and return air systems
- for constant or variable volumetric flows
- Differential pressure range from 50 to 1000 Pa
- for ambient temperatures of 0 - 55°C

Round Duct System RR-Complete

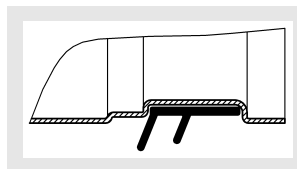
Models and dimensions

Dimensions



Accessories

- Rubber lip seal (-GD)

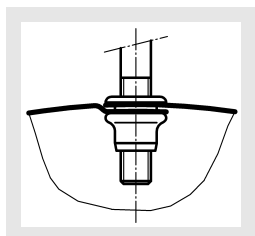


Available sizes

NW	øD	L	n
200	198	450	120
224	222	475	132
250	248	500	145
280	278	550	160
315	313	600	178
355	353	650	198
400	398	700	220
500	498	850	270

Manual adjustment: available at the top or on the side

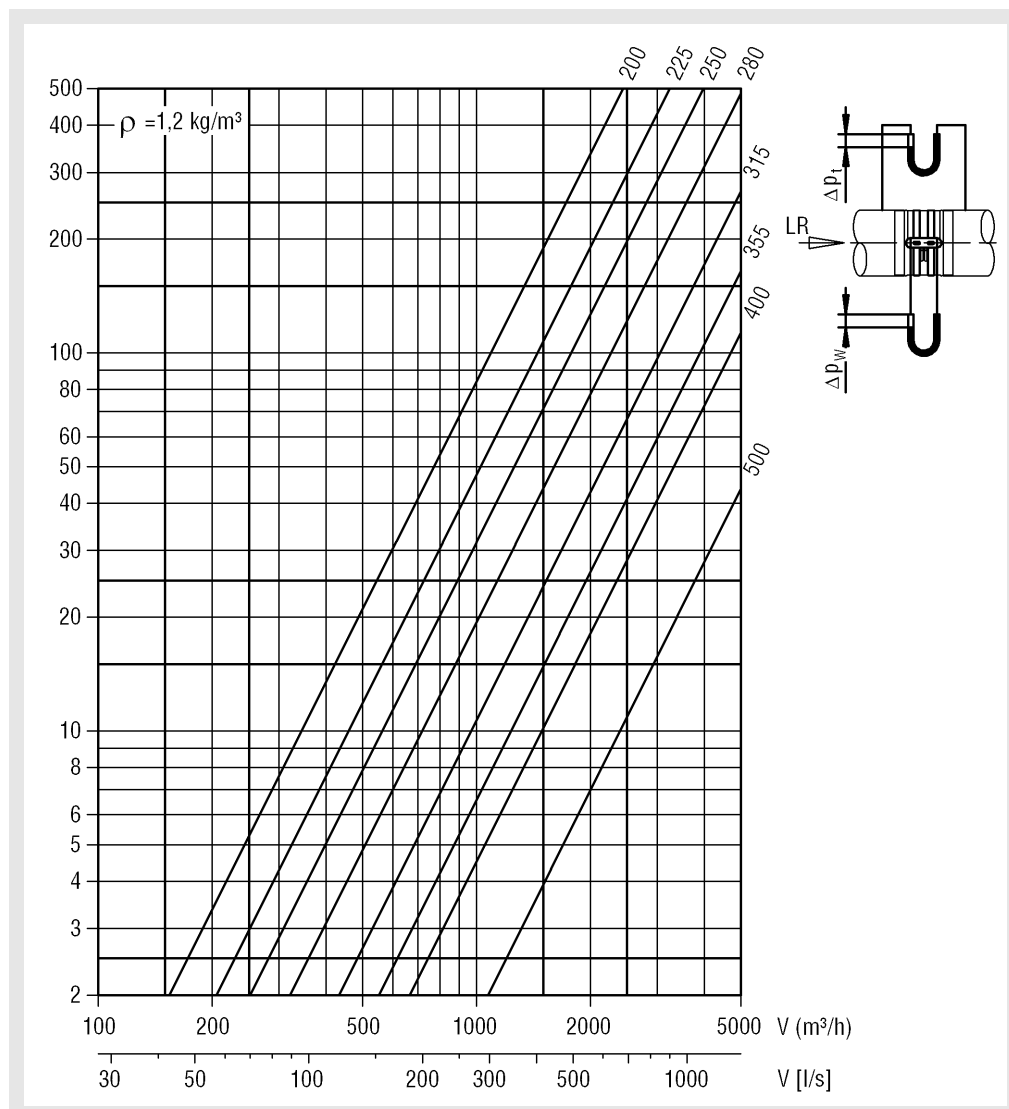
Detail X



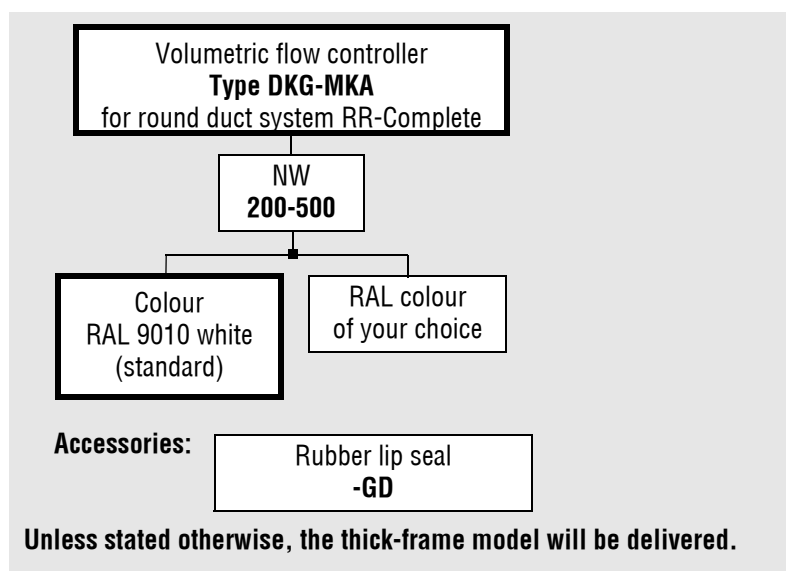
Rivet nut is also available rotated by 90°.

Round Duct System RR-Complete

Differential pressure diagram



Order details



Round Duct System RR-Complete

Specification text

Volumetric flow meter with manually adjustable in round design, for use in the round duct system RR-Complete, for constant or variable volumetric flows. Allowed differential pressure range: 50-1000 Pa. Allowed ambient temperatures: 0 - 55°C
Housing consisting of galvanised sheet steel painted to RAL 9010 (white), measuring cross made of extruded aluminium profile and measuring cross support made of plastic PA6. Special measuring cross allows position-independent installation.
Product: SCHAKO type **DKG-MKA**

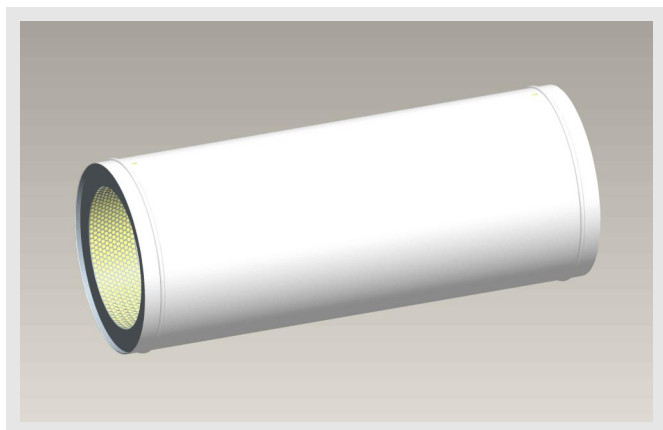
- Housing (at an extra charge):
 - painted to a RAL colour of your choice
 - made of stainless steel 1.4301 (-V2A) or 1.4571 (-V4A)
- Control damper (at an extra charge) made of:
 - made of stainless steel 1.4301 (-V2A) or 1.4571 (-V4A)

Accessories

- Rubber lip seal (-GD)

Round Duct System RR-Complete

Duct silencer RS-RR



Description

Silencing of the duct silencer type RS-RR in accordance with the absorption principle is done by means of an annular chamber filled with mineral wool and glass silk cover. Specially designed for the round duct system RR-Complete with the same duct diameter, the duct silencer is adapted optically to the remaining components.

For maintenance, service, retrofitting, etc., inspection openings in sufficient number and size must be provided on-site.

Construction

Outer jacket

- Sheet steel painted to RAL 9010 (white, standard)
- RAL colour of your choice
- Stainless steel 1.4301 (-V2A) (at an extra charge).
- Stainless steel 1.4571 (-V4A) (at an extra charge).

Perforated sheet

- Galvanised sheet steel
- Stainless steel 1.4301 (-V2A) (at an extra charge).
- Stainless steel 1.4571 (-V4A) (at an extra charge).

Accessories

Rubber lip seal (-GD)

- on both sides, special rubber

Model

RS-RR - Annular chamber with mineral wool filling

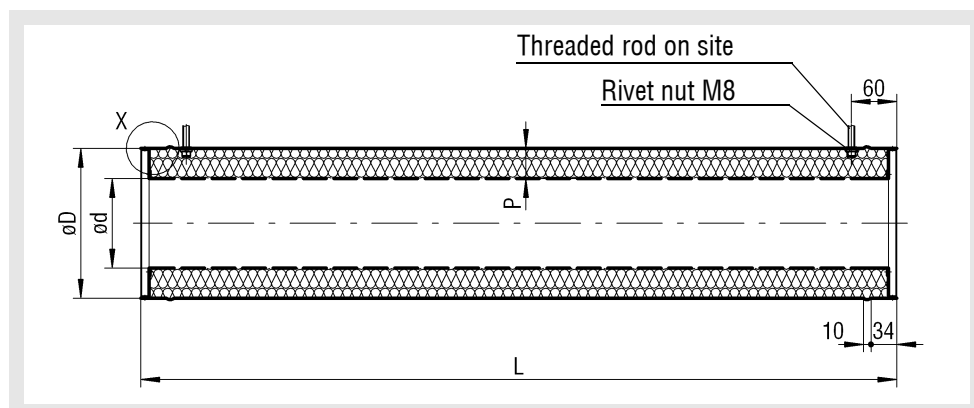
Attention:

The use of the RS-RR is not only designed for minimising the flow generated noise of the volumetric flow controller, fire dampers, etc., but also for preventing the cross-talk sound transmission from room to room by means of the RS-RR!

Round Duct System RR-Complete

Models and dimensions

Dimensions



NW	øD mm	ød mm	P mm
200	198	158	20
224	222	182	20
250	248	168	40
280	278	198	40
315	313	213	40
355	353	253	50
400	398	298	50
450	448	348	50
500	498	398	50

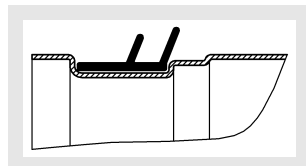
L mm	
1- teilig	500
	750
	1000
2-part	1500
	1750
	2000

P = Packing thickness

Dimensions of accessories

Rubber lip seal (-GD)

Detail X

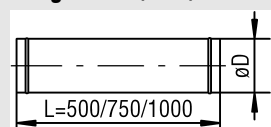


Technical data

For the technical data, please refer to the SCHAKO layout program.

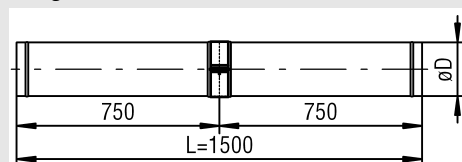
Division of length 1-part

Lengths 500/750/1000

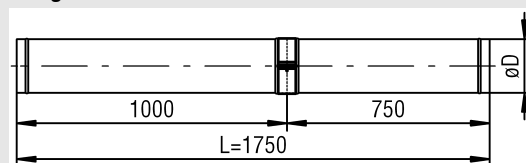


Division of length 2-part

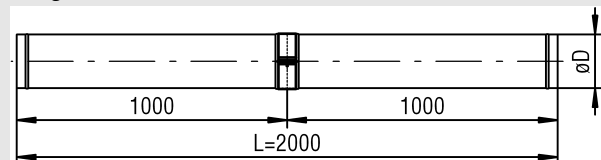
Length 1500



Length 1750

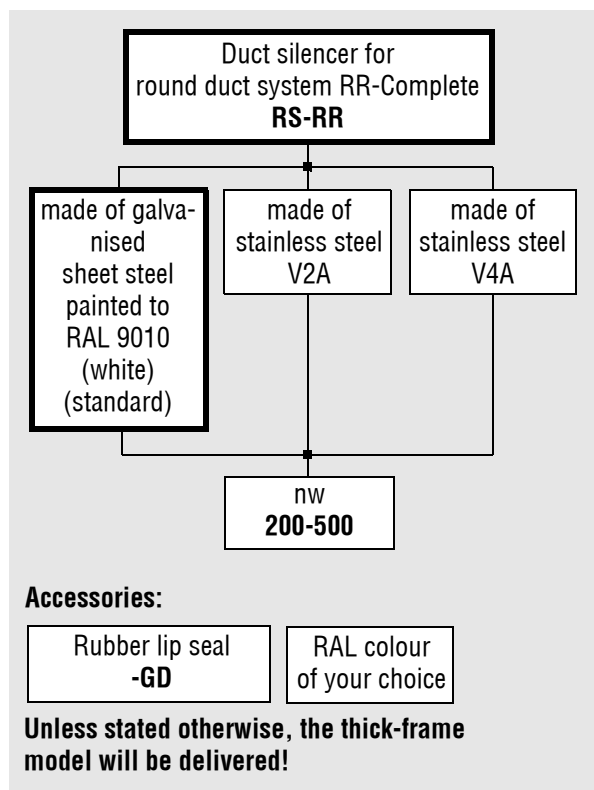


Length 2000



Round Duct System RR-Complete

Order details



Specification texts

Optically suitable duct silencer type RS-RR for round duct system RR-Complete, with silencing in accordance with the absorption principle by means of an annular chamber filled with mineral wool and glass silk cover. Consisting of 1.0 to 1.5 mm thick outer jacket with a perforated sheet covered abrasion-resistant toward the air flow direction.

Product: SCHAKO **type RS-RR**

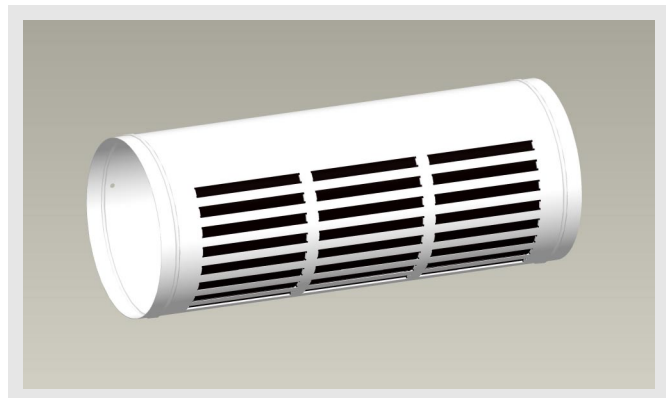
- Outer jacket, perforated sheet, connection piece and central sound-absorbing element made of:
 - Galvanised sheet steel, painted to RAL 9010 white (standard)
 - Painted to a RAL colour of your choice
 - Stainless steel V2A (at an extra charge).
 - Stainless steel V4A (at an extra charge).

Accessories:

- Rubber lip seal (-GD), made of special rubber.

Round Duct System RR-Complete

Round Duct Diffuser Model DBB-RR



Description

In modern architecture, sheet metal and spiral ducts of air-conditioning systems are often incorporated in the design of the room. Parts of the supply system are often intentionally placed at the front. In this visible installation of the ventilation ducts, it is a good idea to integrate the air diffusers into the ducts.

In order to be able to offer planners a technically advanced air diffuser, which can also be well integrated into modern architectural concepts, we have developed our round duct diffuser type DBB-RR.

The diffuser type DBB-RR consists of a **round duct with integrated, linear blades, which can also be adjusted subsequently by hand**, with integrated hit-and-miss damper, which allows the air to be blown absolutely uniformly over the entire diffuser area. The centrally arranged blades in support profile sections ensure that the free **cross-section at every blade is the same**. As a result, the noise level and pressure are not affected by changing the blade position. **In heating mode**, this allows a **large penetration depth**, thus providing an **effective, cost-saving heating phase**. In cooling mode, the maximum end velocity of jet and temperature difference are reduced to such an extent that **no draughts** are produced **in the occupied zone**.

This uniform admission allows the round duct diffuser type DBB-RR to be installed at any point along the duct system.

Accessories, such as dummy pipes, end covers and connecting sleeves complete the range for this diffuser (See documents: Accessories for round duct systems).

For maintenance, service, retrofitting, etc., inspection openings in sufficient number and size must be provided on-site.

Advantages:

- Sound power level and pressure loss remain constant in all blade positions.
- Dimensionally stable smooth duct is easy to clean.

Construction

Blades

- Plastic RAL 9010 (white) or RAL 9005 (black)
- Aluminium painted to the RAL colour of the faceplate. Painted blades cannot be adjusted afterwards.

Round duct

- Galvanised sheet steel
- Sheet steel painted to RAL 9010 (white, standard)
 - painted to a RAL colour of your choice
- Natural aluminium
- Stainless steel 1.4301 (V2A) painted in the color sand silver

Hit-and-miss damper

- manufactured from the same material as the round duct
 - Galvanised sheet steel
 - Natural aluminium
 - stainless steel 1.4301 (V2A)

Model

- | | |
|----------|---|
| DBB-RR-Z | - Supply air model with air deflection blades. |
| DBB-RR-A | - Return air model without air deflection blades. |

Accessories

- Rubber lip seal (-GD)
- Separate brochure on request

Installation

Suspension

- ready to be mounted with a M8 threaded rod provided by the customer.

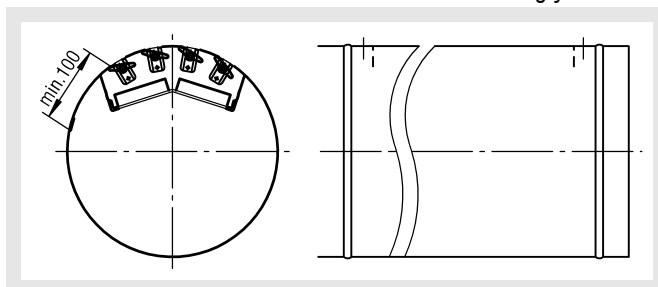
Attention!

We would like to point out that for cleaning stainless steel models, only suitable cleaning materials may be used!

In order to avoid corrosion-caused damage, we recommend subjecting the components in the natural aluminium design on-site to an after-treatment by anodisation or painting.

Round Duct System RR-Complete

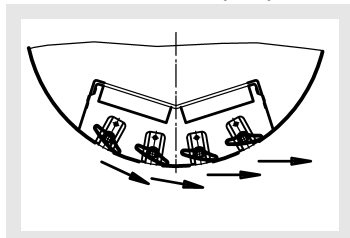
Please note that for vertical throw a distance of at least 100 mm must be available between the weld seam and the diffuser. This means that the weld seam must be offset accordingly.



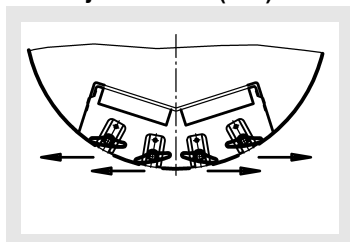
Blade adjustment options

Throw directions (blade position 6 o'clock)

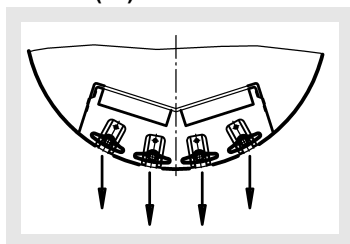
one-way horizontal (-He)



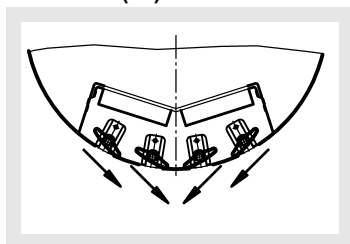
two-way horizontal (-Hb)



vertical (-V)

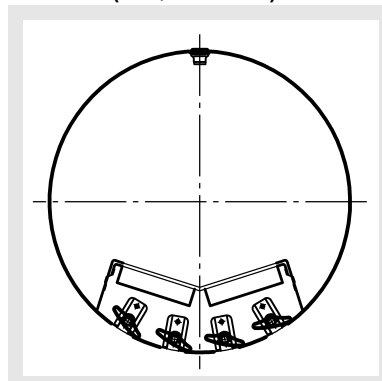


crosswise (-K)

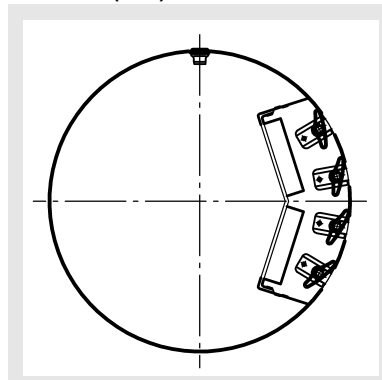


Blade position

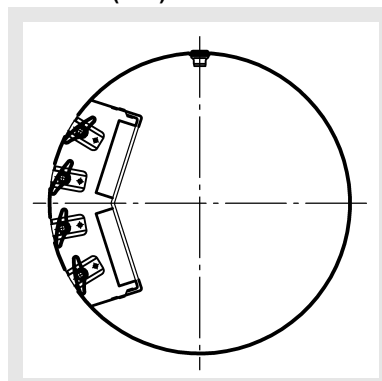
6 o'clock (-6U, standard)



3 o'clock (-3U)



9 o'clock (-9U)



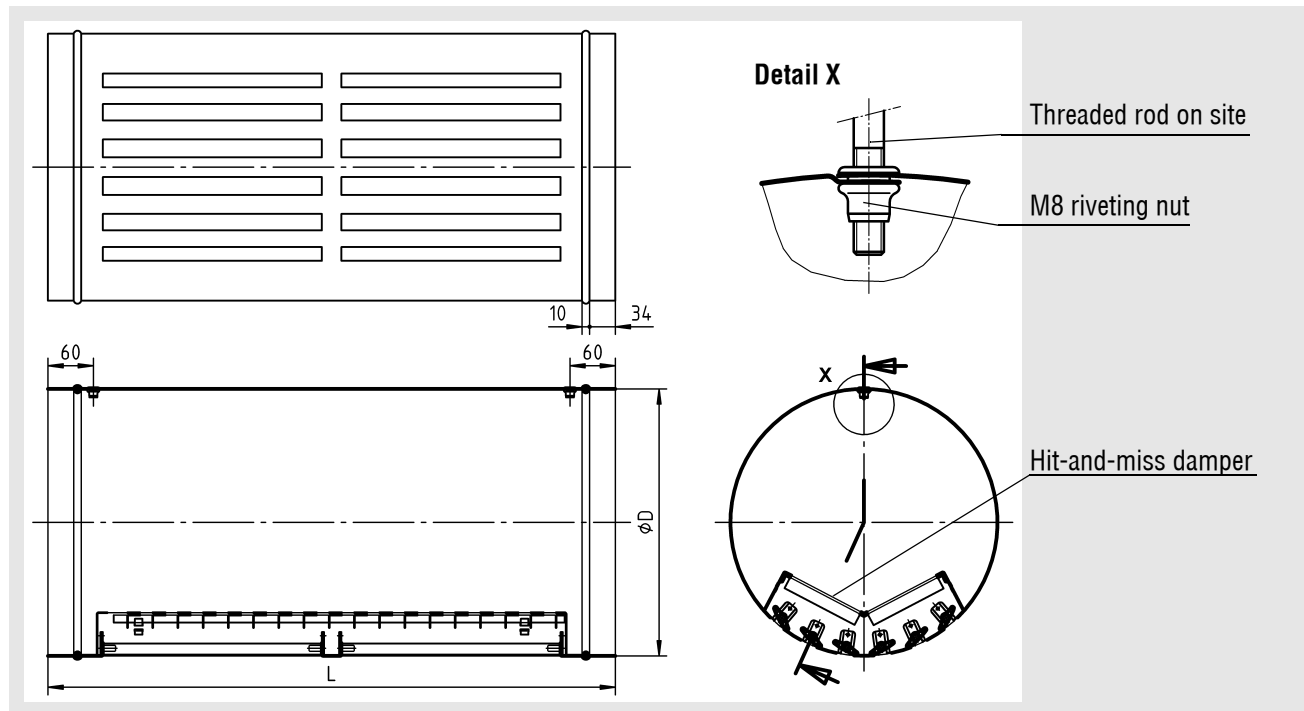
Ex works, the blades are set to the 6 o'clock blade position. On request the blade position "3 o'clock" or "9 o'clock", each in the air flow direction, is also available.

Round Duct System RR-Complete

Models and dimensions

Dimensions

DBB-RR



Available sizes

NW	øD	Number of slots along circumference							
		2	4	6	8	10	12	14	
200	198	x	x	-	-	-	-	-	
224	222	x	x	-	-	-	-	-	
250	248	x	x	-	-	-	-	-	
280	278	x	x	x	-	-	-	-	
315	313	x	x	x	-	-	-	-	
355	353	x	x	x	x	-	-	-	
400	398	x	x	x	x	-	-	-	
450	448	x	x	x	x	-	-	-	
500	498	x	x	x	x	x	x	x	

Length L	Number of slots lengthwise
750	2
1000	3
1500	4
1750	5
2000	6

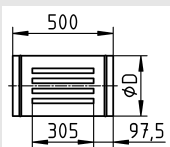
x = available
- = not available

Round Duct System RR-Complete

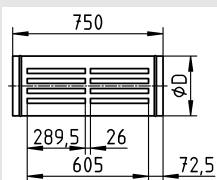
Length of sections

1-part:

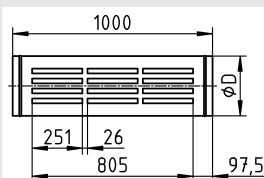
Length 500



Length 750

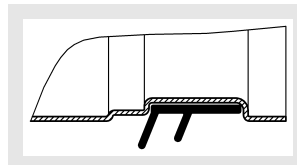


Length 1000



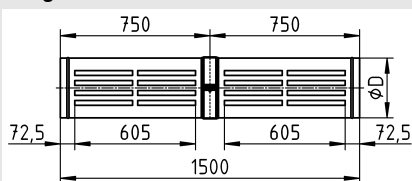
Accessories

- Rubber lip seal (-GD)

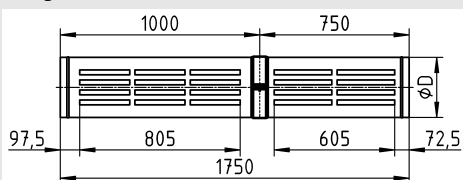


2-part:

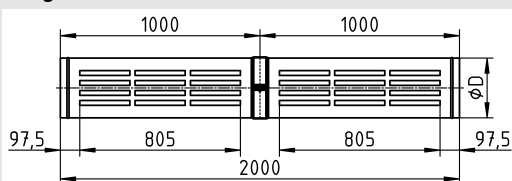
Length 1500



Length 1750



Length 2000



Round duct diffusers having a length of > 1000 are produced in two sections and joined at the factory using a sleeve. The dimensions of the dummy pipes are the same as the dimensions of the diffuser type DBB-RR.

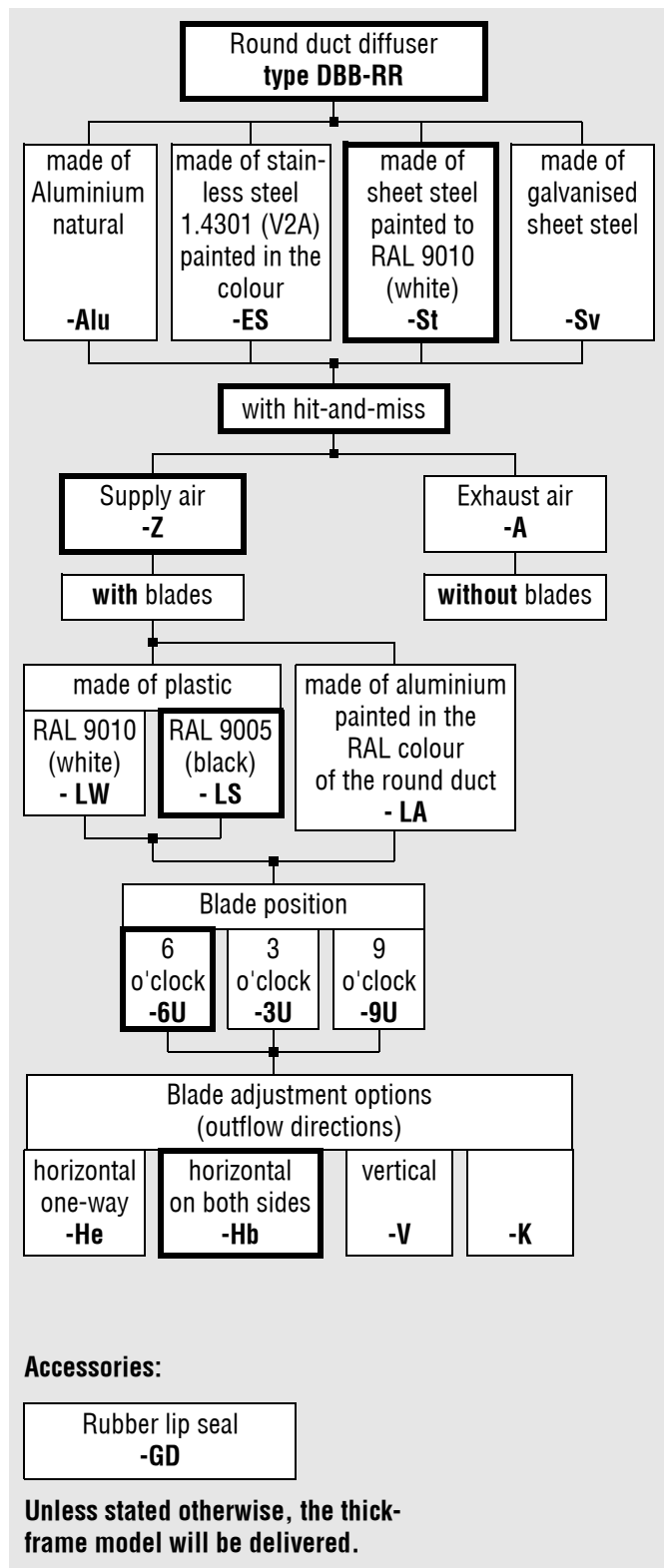
A different length of sections is possible on request. However, the maximum length for a middle or end piece is 1000 mm.

Round Duct System RR-Complete

Technical data

For the technical data, please refer to the SCHAKO layout program or the brochure Round duct diffuser DBB-RR, register 01, catalogue 1.

Order details



Specification texts

Round duct diffuser suitable for connection to DIN ducts. With integrated, manually adjustable air deflection blades support blade profile section made of plastic, in colours RAL 9010 (white), RAL 9005 (black) or aluminium painted to the RAL colour of the round duct (blades are not adjustable later on). Sound intensity and pressure loss remain same in all blade positions. With integrated hit-and-miss damper for simple air volume regulation and ductwork regulation, made of the material the round duct is made of.

Product: SCHAKO type **DBB-RR-Z**.

- for return air, without air deflection blades
Product: SCHAKO type **DBB-RR-A**

- Round duct made of

- Galvanised sheet steel
- Sheet steel painted to RAL 9010 (white) (standard)
- Painted to a RAL colour of your choice
- Stainless steel 1.4301 (V2A) painted in the color sand silver
- Natural aluminium

- Blade position

- 3 o'clock (-3U)
- 6 o'clock (-6U, standard)
- 9 o'clock (-9U)

- Blade adjustment options (throw directions)

- one-way horizontal (-He)
- two-way horizontal (-Hb, standard)
- vertical (-V)
- crosswise (-K)

Accessories:

Rubber lip seal (-GD)

Separate brochure on request

Round Duct System RR-Complete

Accessories

for round duct system RR-Complete

Description

In modern architecture, sheet metal and spiral ducts of air-conditioning systems are often incorporated in the design of the room. Parts of the supply system are often intentionally placed at the front. In this visible installation of the ventilation ducts, a logical option is to integrate the fire dampers, volumetric flow controllers, duct silencers and air diffusers into the ducts.

Accessories, such as dummy pipes, end covers and connecting sleeves complete the range for the round duct system RR-Complete.

Construction

Dummy pipe (-BR)

- Galvanised sheet steel
- Sheet steel painted to RAL 9010 (white)
- Natural aluminium
- Stainless steel 1.4301 (V2A) painted in the color sand silver

Pressed bend (-BGE)

- Galvanised sheet steel
- Sheet steel painted to RAL 9010 (white)
- available up to \varnothing 250 mm

Segment bend (-BSE)

- Galvanised sheet steel
- Sheet steel painted to RAL 9010 (white)

Spigot (-BK)

- Galvanised sheet steel
- Sheet steel painted to RAL 9010 (white)
- Natural aluminium
- Stainless steel 1.4301 (V2A) painted in the color sand silver

Slanted end cover (-EA)

- Galvanised sheet steel
- Sheet steel painted to RAL 9010 (white)
- Natural aluminium
- Stainless steel 1.4301 (V2A) painted in the color sand silver

Straight end cover (-EG)

- Galvanised sheet steel
- Sheet steel painted to RAL 9010 (white)
- Natural aluminium
- Stainless steel 1.4301 (V2A) painted in the color sand silver

Rubber lip seal (-GD)

- Special rubber

Y-piece (-HSE)

- Galvanised sheet steel
- Sheet steel painted to RAL 9010 (white)

Asymmetric reduction piece (-UAE)

- Galvanised sheet steel
- Sheet steel painted to RAL 9010 (white)

Symmetric reduction piece (-USE)

- Galvanised sheet steel
- Sheet steel painted to RAL 9010 (white)
- Galvanised sheet steel
- Sheet steel painted to RAL 9010 (white)

Connection sleeve (-M)

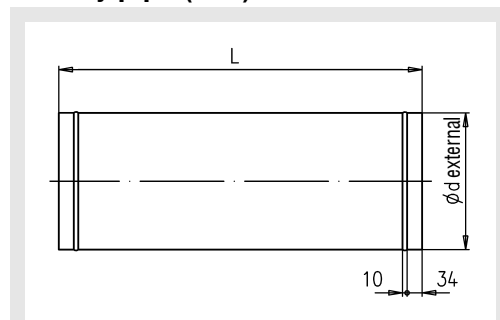
- Galvanised sheet steel
- Sheet steel painted to RAL 9010 (white)
- Natural aluminium
- Stainless steel 1.4301 (V2A) painted in the color sand silver

All accessories are also available in the RAL colour of your choice.

Models and dimensions

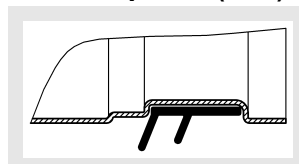
Dimensions

Dummy pipe (-BR)

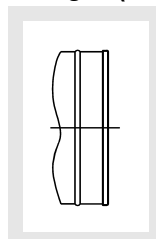


Dummy pipe available in the same dimensions as the diffuser for round duct.

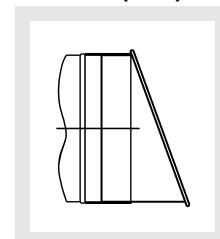
Rubber lip seal (-GD)



End cover straight (-EG)



slanted (-EA)

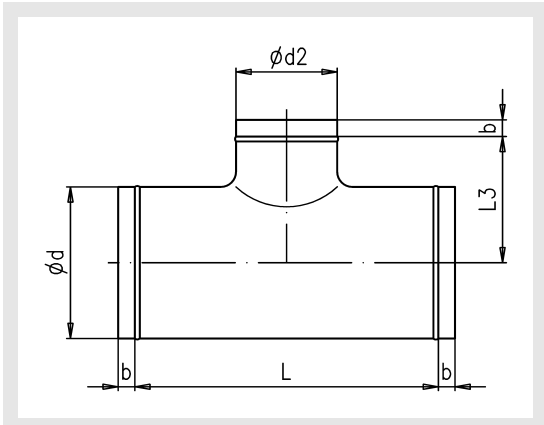


End piece for mounting to round duct diffusers

Round Duct System RR-Complete

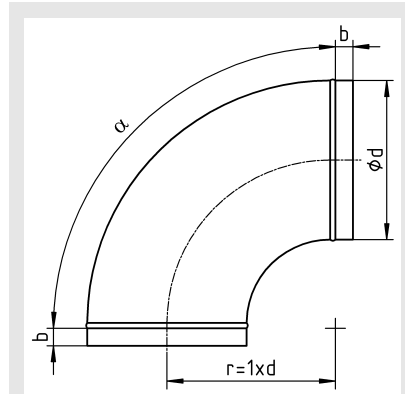
T-piece 90 ° (-ATE)

according to DIN 24 147/6



Pressed bend (-BGE)

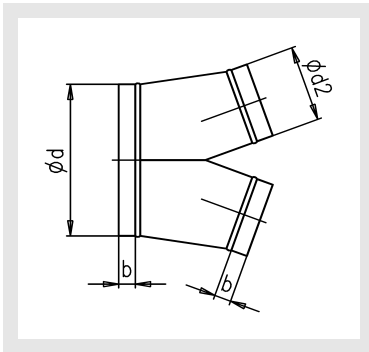
according to DIN 24 147/2



$a = 30^\circ / 45^\circ / 90^\circ$
available up to $\phi 250$ mm

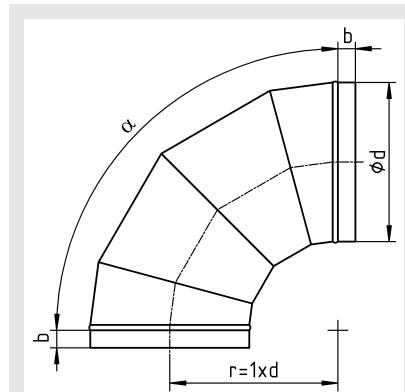
Y-piece (-HSE)

according to DIN 24 147/13



Bent segment (-BSE)

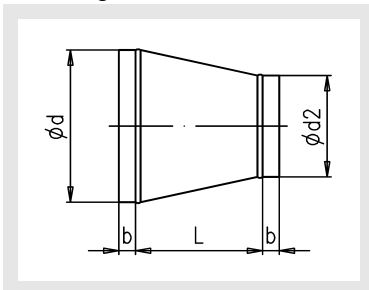
according to DIN 24 147/3



$a = 15^\circ / 30^\circ / 45^\circ / 60^\circ / 90^\circ$

Symmetric reduction piece (-USE)

according to DIN 24 147/4

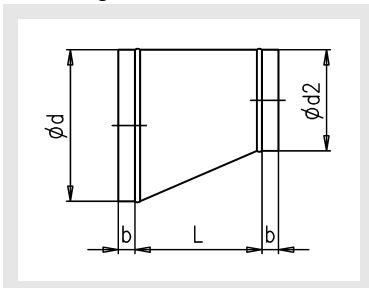


Inserted lengths (for ATE / HSE / USE / UAE / BGE / BSE)

$\phi d / \phi d2$ [mm]	b [mm]
200-224	40
250-355	60
400-500	80

Asymmetric reduction piece (-UAE)

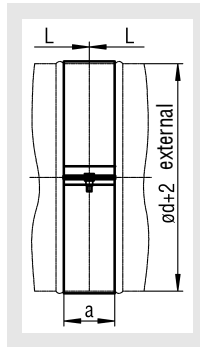
according to DIN 24 147/4



Round Duct System RR-Complete

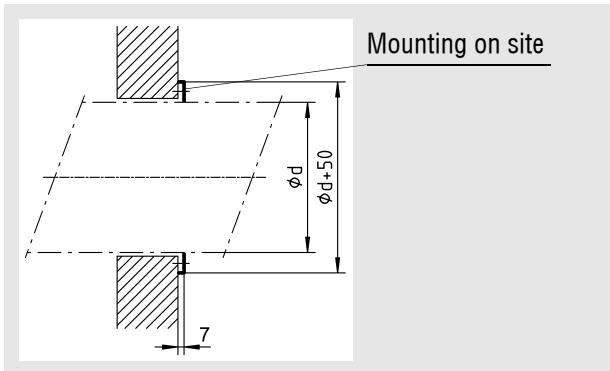
Connection sleeve (-M)

- To connect round duct diffuser to round duct diffuser:
a = 68 mm (standard)
- To connect round duct diffuser to DIN accessories:
 $\varnothing D = 200 - 224 : a = 74 \text{ mm}$
 $\varnothing D = 250 - 355 : a = 94 \text{ mm}$
 $\varnothing D = 400 - 500 : a = 114 \text{ mm}$

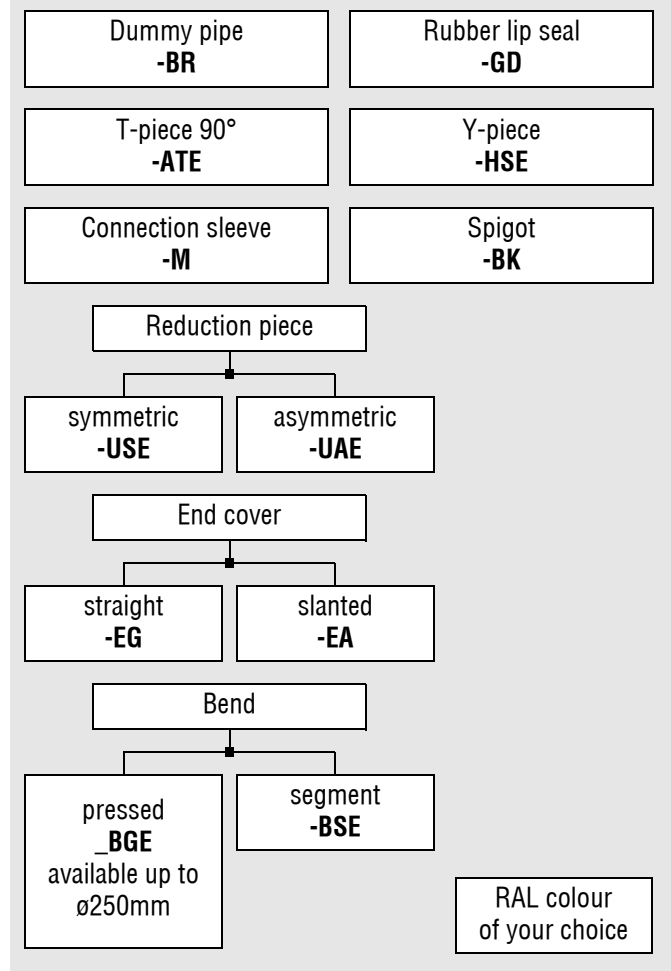


- When ordering, the a dimension must be specified. Unless stated otherwise in the order, the connection sleeves of the standard a dimension of 68 mm will be delivered.
- The maximum a dimension available is 170 mm.
- The connection sleeve is not an airtight connection of the pipes. In order to achieve an airtight connection, sealing must take place on-site or a rubber lip seal (GD) at the round duct must be ordered at an extra charge.

Spigot (-BK)



Order details



Round Duct System RR-Complete

Specification texts

- Dummy pipe (-BR) consisting of:
 - Sheet steel painted to RAL 9010 (white)
 - Galvanised sheet steel
 - Natural aluminium
 - Stainless steel 1.4301 (V2A) painted in the color sand silver
- Bend
 - pressed (-BGE) (available up to \varnothing 250 mm)
 - segment (-BSE)
consisting of:
 - Sheet steel painted to RAL 9010 (white)
 - Galvanised sheet steel
- Spigot (-BK) consisting of:
 - Sheet steel painted to RAL 9010 (white)
 - Galvanised sheet steel
 - Natural aluminium
 - Stainless steel 1.4301 (V2A) painted in the color sand silver
- End cover
 - straight (-EG)
 - slanted (-EA)
consisting of:
 - Sheet steel painted to RAL 9010 (white)
 - Galvanised sheet steel
 - Natural aluminium
 - Stainless steel 1.4301 (V2A) painted in the color sand silver
- Rubber lip seal (-GD)
- Y-piece (-HSE) consisting of:
 - Sheet steel painted to RAL 9010 (white)
 - Galvanised sheet steel
- Reduction piece
 - symmetric (-USE)
 - asymmetric (-UAE)
consisting of:
 - Sheet steel painted to RAL 9010 (white)
 - Galvanised sheet steel
- T-piece 90 ° (-ATE) consisting of:
 - Sheet steel painted to RAL 9010 (white)
 - Galvanised sheet steel
- Connection sleeve (-M) consisting of:
 - Sheet steel painted to RAL 9010 (white)
 - Galvanised sheet steel
 - Natural aluminium
 - stainless steel 1.4301 (V2A)

All accessories are also available in the RAL colour of your choice.

Round Duct System RR-Complete Installation, Mounting and Maintenance

BSK-RB

The installation of the SCHAKO BSK-RB-S must take place in accordance with the general building supervisory approval no. Z-41.3-628 and the relevant technical documentation. See SCHAKO brochure BSK-RB and functional test.

VRA-E-R

See SCHAKO brochure VRA

Assembly

The duct system must be mounted by skilled personnel using suitable and approved suspension material.

Maintenance

Maintenance can be carried out by removing individual duct segments.