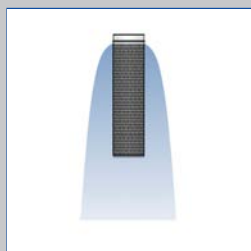
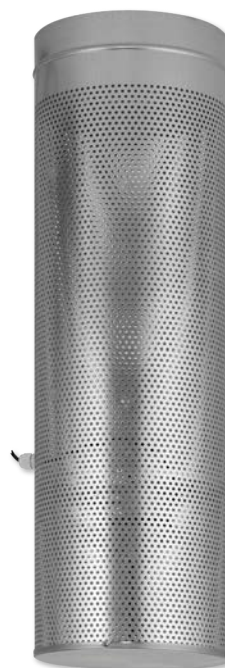
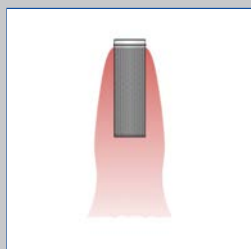


Displacement flow diffusers

Type QSH



Cooling mode, bell-shaped air discharge



Heating mode, vertical air discharge



Installation in corridors

For industrial zones with air polluting processes

Displacement flow diffusers with bell-shaped, low turbulence air discharge in cooling mode

- Nominal sizes 250, 355, 450, 560 mm
- Volume flow rate range 205 – 1570 l/s or 738 – 5652 m³/h
- Casing made of galvanised sheet steel
- For variable and constant volume flows
- Installation either free hanging or on walls or pillars
- Low-turbulence displacement ventilation
- Discharge direction can be adjusted manually or with an actuator
- Chain pull for adjusting the discharge direction manually

Optional equipment and accessories

- Exposed diffuser parts in RAL CLASSIC colours
- Electric and thermal actuators for adjusting the air discharge direction
- Bowden cable for adjusting the discharge direction manually
- Wall mount

Type		Page
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	Function	QSH – 3
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Application

Application

- Type QSH displacement flow diffusers are used primarily for industrial zones with air polluting work processes
- Bell-shaped air discharge in cooling mode, vertical air discharge in heating mode
- Low-turbulence displacement of polluted or contaminated air in the occupied zone
- For variable and constant volume flows
- For supply air to room air temperature differences from –8 to +12 K
- Installation at heights between 3.5 m and 10 m, either free hanging or on walls or pillars

- Installation preferably outside of occupied zones, e.g. in corridors
- Ideal for use with TDC temperature difference control module

Special characteristics

- Bell-shaped, low-turbulence air discharge in cooling mode
- Air discharge direction is adjusted manually or with an electric or thermal actuator

Nominal sizes

- 250, 355, 450, 560 mm

Description

Parts and characteristics

- Perforated sheet metal casing
- Air control disc to control the air discharge direction
- Top entry spigot for connection to a vertical duct

Attachments

- Chain pull for manual adjustment, approx. 2.0 m
- B: Bowden cable for manual adjustment, approx. 2.8 m
- E*: Electric actuator
- T: Thermal actuator

Accessories

- W00: Wall mount
- K00: Chain fixing
- WK0: Wall mount and chain fixing

Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180

Materials and surfaces

- Casing with base plate, cross bar and air control disc made of galvanised sheet steel
- Chain pull made of galvanised steel
- Pulley wheels made of plastic, UL 94, V-0, flame retardant
- B: Hand lever made of galvanised steel, Bowden cable made of galvanised steel and with PE sheath
- P0: Powder-coated RAL 9010, pure white
- P1: Powder-coated, RAL CLASSIC colour

Standards and guidelines

- Sound power level of the air-regenerated noise measured according to EN ISO 5135

Maintenance

- Maintenance-free as construction and materials are not subject to wear
- Inspection and cleaning to VDI 6022

Functional description

Displacement flow diffusers discharge the air from air conditioning systems vertically and with a low velocity into the room, causing very little turbulence. This results in a very good air quality in the occupied zone.

Type QSH displacement flow diffusers are used primarily for industrial zones with air polluting work processes. They are installed preferably outside of occupied zones, e.g. high up in corridors. An adjustable air control disc allows for adapting the air discharge direction to heating or cooling mode. The supply air to room air temperature difference may range from -8 to $+12$ K.

Cooling mode

In cooling mode the supply air is discharged

outside the occupied zone, from above and in a bell-shaped air pattern. This creates a pool of fresh air over the entire floor area, similar to displacement ventilation where the air is supplied near the floor. The convection from people and other heat sources causes the fresh air from the pool to rise and create comfortable conditions in the occupied zone.

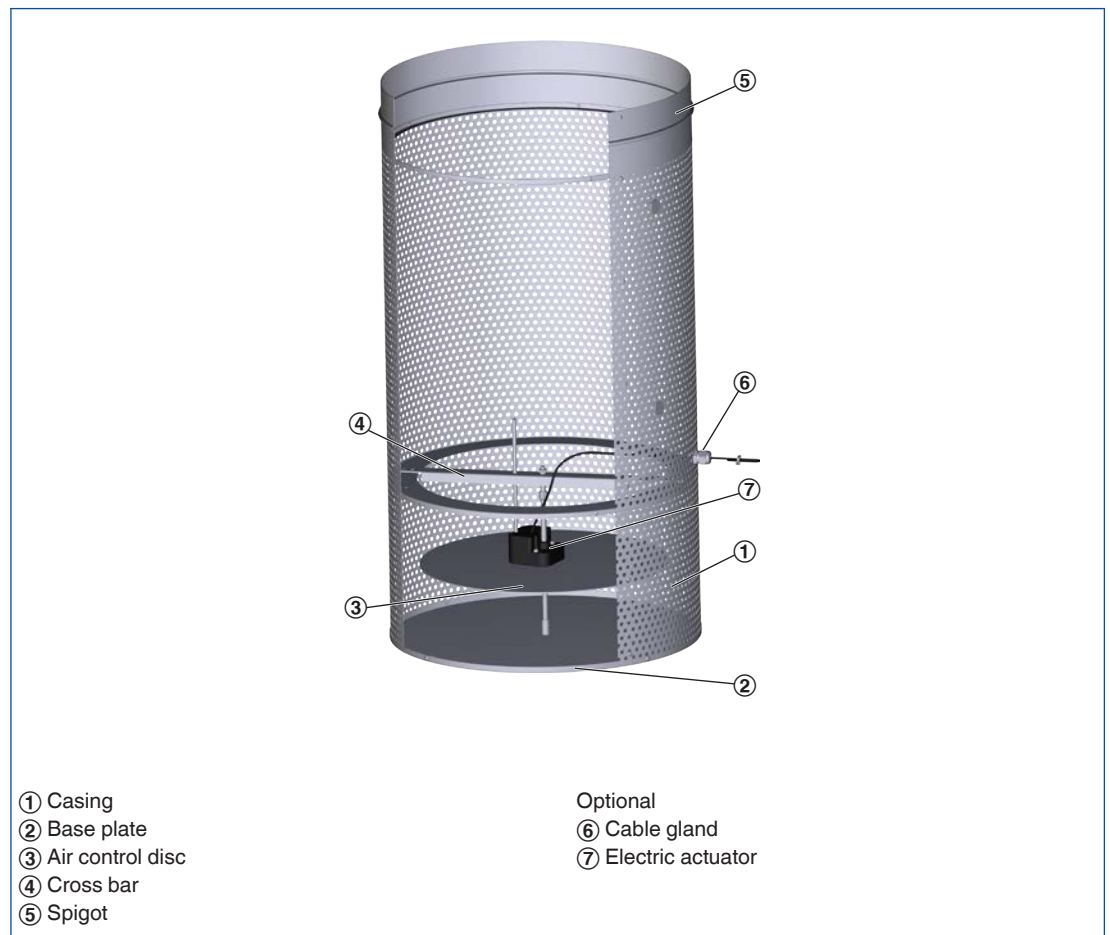
Heating mode

In heating mode the air is discharged vertically.

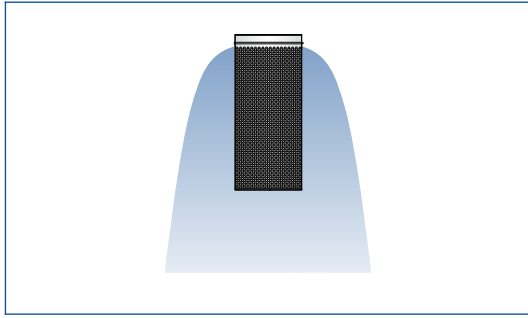
The air control disc can be adjusted manually or with a thermal or electric actuator.

Extract air units should be installed in the upper part of a room, above the occupied zone.

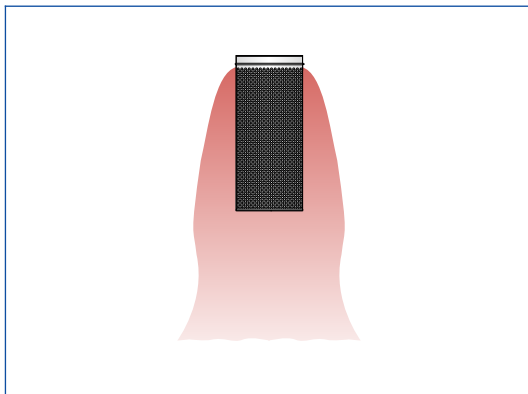
Schematic illustration of QSH with electric actuator



Bell-shaped air discharge



Vertical air discharge



Nominal sizes	250, 355, 450, 560 mm
Minimum volume flow rate	205 – 785 l/s or 738 – 2826 m ³ /h
Maximum volume flow rate, with $L_{WA} \cong 55$ dB(A)	410 – 1570 l/s or 1476 – 5652 m ³ /h
Supply air to room air temperature difference	-8 to +12 K

Quick sizing tables provide a good overview of the volume flow rates and corresponding sound power levels and differential pressures.
The maximum volume flow rates apply to a sound power level of approx. 55 dB (A).

QSH supply air, horizontal air discharge, sound power level and total differential pressure

Nominal size	\dot{V}		Δp_t	L_{WA}
	l/s	m ³ /h	Pa	dB(A)
250	205	738	12	31
	270	972	20	41
	340	1224	32	48
	410	1476	47	55
355	335	1206	11	34
	435	1566	18	43
	535	1926	27	50
	635	2286	39	55
450	470	1692	9	27
	625	2250	16	39
	780	2808	25	48
	940	3384	36	55
560	785	2826	14	29
	1050	3780	25	40
	1310	4716	39	49
	1570	5662	56	55

QSH supply air, vertical air discharge, sound power level and total differential pressure

Nominal size	\dot{V}		Δp_t	L_{WA}
	l/s	m ³ /h	Pa	dB(A)
250	205	738	12	36
	265	954	21	44
	335	1206	33	51
	385	1386	44	55
355	335	1206	11	38
	420	1512	17	45
	505	1818	25	51
	590	2124	34	55
450	470	1692	10	33
	595	2142	16	42
	725	2610	24	49
	855	3078	33	55
560	785	2826	15	36
	990	3564	24	45
	1180	4248	34	51
	1370	4932	46	55

Sizing example

Given data

$\dot{V} = 500$ l/s (1800 m³/h)
Displacement flow diffuser for installation in corridors
Maximum sound power level 50 dB(A)

Quick sizing

Type QSH
Nominal sizes: 355, 450
Selected: QSH/355

This specification text describes the general properties of the product. Texts for variants can be generated with our Easy Product Finder design programme.

Displacement flow diffusers with a cylindrical casing, for industrial zones with air polluting work processes. With adjustable air control disc for air discharge from bell-shaped to vertical (90°). For free hanging installation and also for installation on walls or pillars, preferably outside the occupied zone, e.g. in corridors.

Ready-to-install component which consists of a cylindrical, perforated metal casing, air control disc and top entry spigot.

Spigot suitable for ducts to EN 1506 or EN 13180. Sound power level of the air-regenerated noise measured according to EN ISO 5135.

Special characteristics

- Bell-shaped, low-turbulence air discharge in cooling mode
- Air discharge direction is adjusted manually or with an electric or thermal actuator

Materials and surfaces

- Casing with base plate, cross bar and air control disc made of galvanised sheet steel
- Chain pull made of galvanised steel
- Pulley wheels made of plastic, UL 94, V-0,

flame retardant

- B: Hand lever made of galvanised steel, Bowden cable made of galvanised steel and with PE sheath
- P0: Powder-coated RAL 9010, pure white
- P1: Powder-coated, RAL CLASSIC colour

Technical data

- Nominal sizes: 250, 355, 450, 560 mm
- Minimum volume flow rate: 205 – 785 l/s or 738 – 2826 m³/h
- Maximum volume flow rate, with $L_{WA} \approx 55$ dB(A): 410 – 1570 l/s or 1476 – 5652 m³/h
- Supply air to room air temperature difference: -8 to +12 K

Sizing data

- \dot{V} _____ [m³/h]
 - Δp_t _____ [Pa]
- Air-regenerated noise
- L_{WA} _____ [dB(A)]

QSH

QSH – E4 / 450 / W00 / P0 – RAL ...				
1	2	3	4	5

1 Type

QSH Displacement flow diffuser

2 Actuator

No entry: chain pull for manual adjustment

B Bowden cable for manual adjustment

E4 230 V AC, 3-point

E5 24 V AC/DC, 3-point

E6 24 V AC/DC, modulating 0 – 10 V DC

T Thermal actuator

3 Nominal size [mm]

250

355

450

560

4 Fixing

No entry: none

W00 With wall mount

K00 With chain fixing (only for variants with chain pull)

WK0 With wall mount and chain fixing (only for variants with chain pull)

5 Exposed surface

No entry: galvanised

P0 Powder-coated RAL 9010, pure white

P1 Powder-coated, specify RAL CLASSIC colour

Gloss level

RAL 9010 50 %

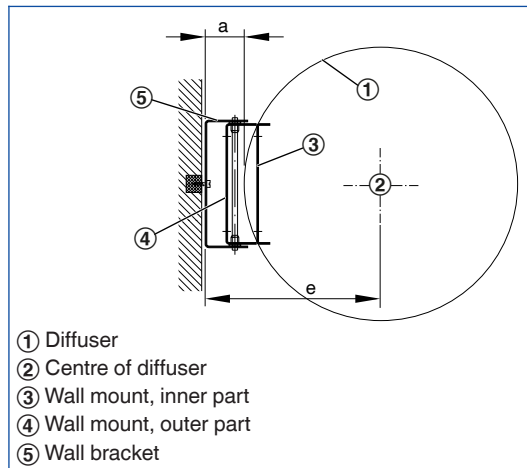
RAL 9006 30 %

All other RAL colours 70 %

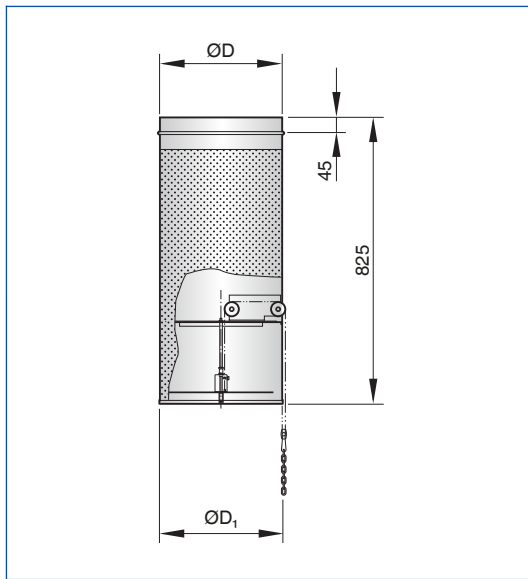
Order example: QSH-E5/450/P1-RAL 9016

Actuator	24 V AC/DC, 3-point
Nominal size	450 mm
Fixing	Without
Exposed surface	RAL 9016, traffic white, gloss level 70 %

Wall mount (accessory)

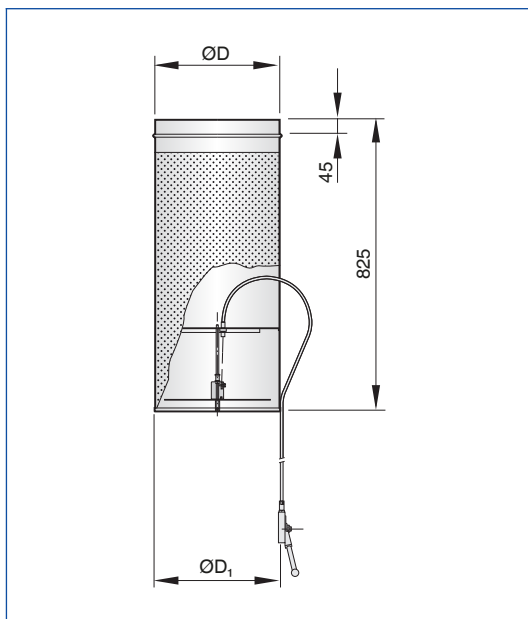


QSH



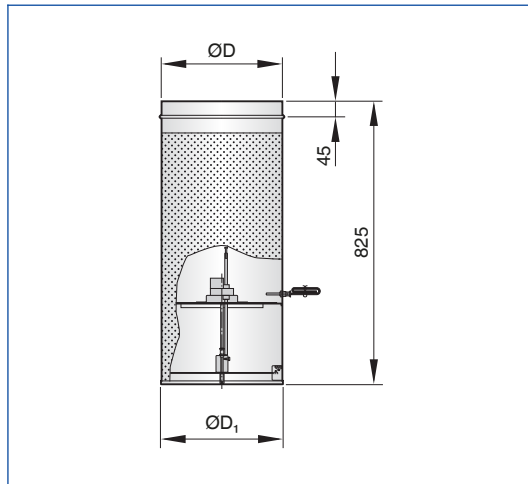
Chain pull for manual adjustment

QSH-B



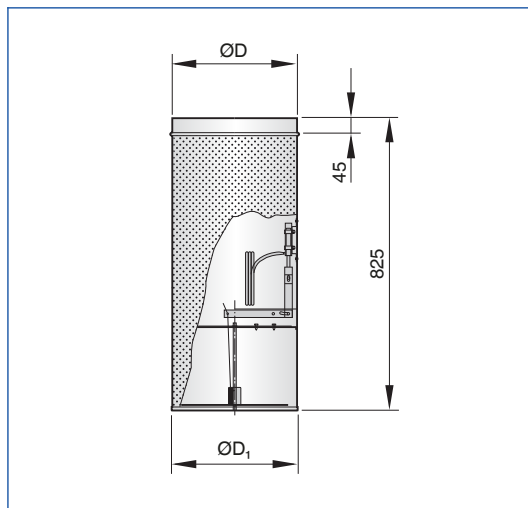
Bowden cable for manual adjustment

QSH-E*



Electric actuator

QSH-T



Thermal actuator

QSH

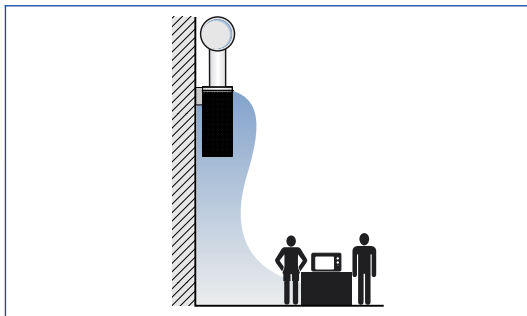
Nominal size	ØD ₁	ØD	m
	mm	mm	kg
250	252	248	4.8
355	357	353	7.2
450	452	448	9.9
560	562	558	12.8

Installation and commissioning

- Installation preferably at heights between 3.5 m and 10 m
- Freely suspended installation
- Vertical duct connection
- The spigot has to be screw-fixed to the duct and the entire system has to be securely fixed and suspended (by others)
- Fixing to walls or pillars with optional wall mount
- Attach the chain fixing and the hand lever of the Bowden cable to the wall or pillar, if necessary

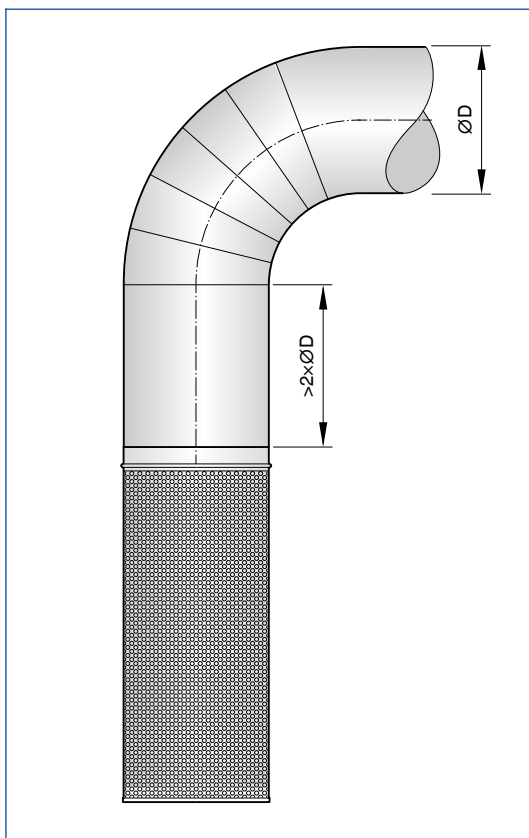
These are only schematic diagrams to illustrate installation details.

Installation above the aisle area

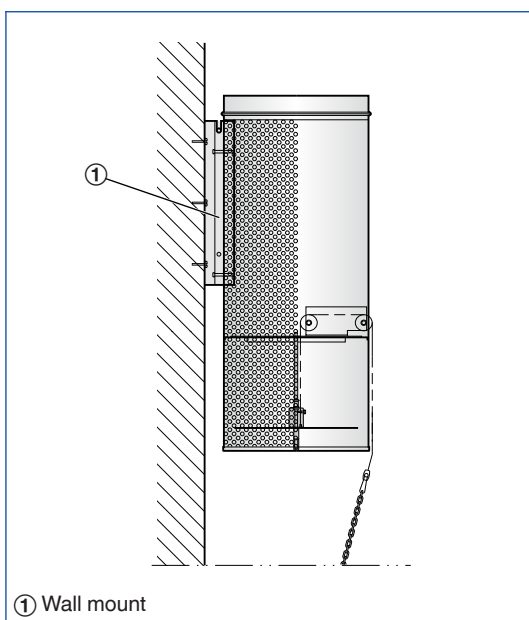


- For industrial zones with air polluting work processes
- Installation preferably outside of occupied zones, e.g. in corridors

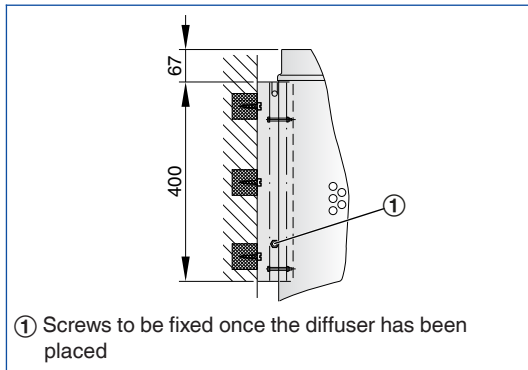
Free hanging installation



Wall fixing



Wall fixing, detail



Principal dimensions

B_1 [mm]

Width of diffuser face

B_4 [mm]

Width of a rectangular spigot

$\varnothing D$ [mm]

Outer diameter of the spigot

$\varnothing D_1$ [mm]

Casing diameter

H_1 [mm]

Height of diffuser face

T_1 [mm]

Casing depth

T_4 [mm]

Depth of a rectangular spigot

m [kg]

Weight

Nomenclature

L_{WA} [dB(A)]

Sound power level of the air-regenerated noise, A-rated

\dot{V} [m^3/h] and [l/s]

Volume flow rate

v_0 [m/s]

Theoretical airflow velocity across the diffuser area, at a distance of 0 m from the diffuser face

L_{nz} [m]

Near zone of the displacement flow diffuser, where the comfort criteria may not be achieved
The near zone is at least 0.5 m, independent of the airflow velocity

At distance L_{nz} the airflow velocity is 0.2 m/s max., measured 0.1 m above the floor

Δt_z [K]

Supply air to room air temperature difference, i.e. supply air temperature minus room temperature

Δp_t [Pa]

Total differential pressure

A_{eff} [m^2]

Effective air discharge area

All sound power levels are based on 1 pW.