

## DISA-601

Ceiling induction diffuser

### OPERATING CONDITIONS

- Coolant or heating fluid: water / water-glycol mixture
- Water inlet temperature: above the dew point up to 50°C
- Max. operating pressure: 8 bar
- Air inlet temperature: from 2 °C to 45 °C

### ADVANTAGES

- High energy efficiency
- High performance (compensation of high thermal loads)
- Compact dimensions and low height
- Saving in energy by means of reduced primary air
- Low noise level
- Low mounting and maintenance expenditure
- The variably adjustable induction nozzles are used to distribute the air volume and cooling capacity in a flexible way (nozzle -V)
- Great variability regarding the interior design even in case of subsequent space utilisation (nozzle -V)
- Constant volumetric flow controllers and sound absorbers can be omitted in a pressure-controlled duct (nozzle -V)

### PERFORMANCE DATA

Nozzles =	B	C	D	E	
$V_L =$	75	137	206	262	m <sup>3</sup> /h
$p_s =$	150	150	150	85	Pa
$L_{WA} =$	<23	30	35	40	dB(A)



$Q =$  2027 2296 2468 2168 W



$Q_S =$  1210 1317 1369 1224 W

**Heating:**  $t_{w1} = 40$  °C,  $\Delta T_w = 10$  K,  $t_R = 21$  °C,  $t_P = 21$  °C

**Cooling:**  $t_{w1} = 16$  °C,  $\Delta T_w = 4$  K,  $t_R = 26$  °C,  $t_P = 26$  °C

Nominal length 18, 2 primary air connection spigots  $\varnothing 148$ , 2-pipe system

### INTENDED USE

As an active heating/cooling strip for particularly energy-efficient discharge of high heat loads by means of water and the hygienically required air volume. Operation above dew point.

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## GENERAL DESCRIPTION

The active induction units DISA-601 are used for the energy-efficient and comfortable discharge of high thermal loads.

Ceiling induction diffusers combine the flow characteristics of air diffusers with the energetic advantages of load discharge via water-based heat exchangers, allowing them to remove high thermal loads from the room while keeping the hygienically required air exchange low.

Apart from energy saving, the induction diffusers are distinguished by their low costs regarding installation and maintenance.

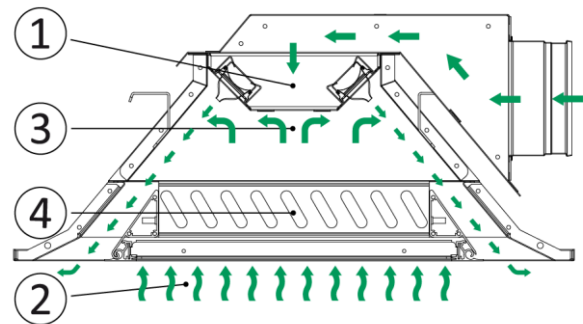
The construction of the ceiling induction diffuser DISA-601 is very maintenance- and mounting-friendly and is also suitable for low false ceiling heights, due to its small height.

Its 4 different nozzle configurations B, C, D, E plus the configuration of the infinitely variable nozzle V and lengths of up to 3.0 metres allow the ceiling induction diffuser DISA-601 to be precisely adapted to almost all room requirements.

Thanks to the option of a swing-down register and secondary air filter, the areas of application are extended which makes it an optimum solution for the use in rooms with high hygienic requirements e.g. in hospitals, laboratories or residential homes.

## OPERATION

The primary air ① supplied from the plenum box induces secondary air in the room ②, which is cooled or heated via the register ④. The primary air is mixed with the cooled secondary air. The combined ③ primary and secondary air flows are supplied to the room at low velocity via 2 linear supply air slots.

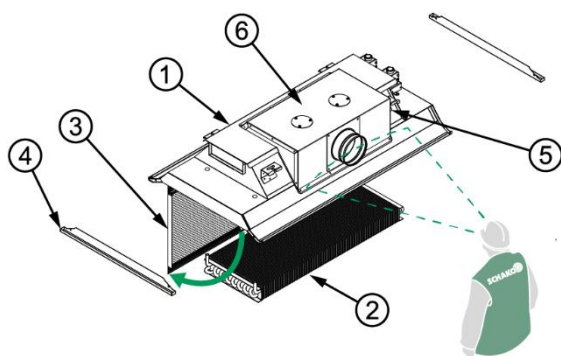


## DEVICE DESCRIPTION

### STANDARD MODEL

#### NOTE

The sides of the device are defined according to the opening position of the secondary air grille.



#### 1 Housing

Galvanised sheet steel with a thickness of 0.7 mm. Inside painted in black, outside not painted. Slot with steel sheet profile painted to RAL 9010 white.

#### 2 Heat exchanger

2-pipe system (cooling or heating) with fixed heat exchanger. Galvanised sheet steel frame. Aluminium blades. Copper pipes  $\varnothing$  12 mm.

#### 3 Tiltable secondary air grille

Painted sheet steel 1 mm, RAL 9010 white, with perforation  $\varnothing$  6 mm. Frame made of aluminium profile painted to RAL 9010 white.

#### 4 End pieces

Painted sheet steel 1 mm, RAL 9010 white.

#### 5 Fastening

Mounting brackets made of galvanised sheet steel 2 mm.

#### 6 Plenum box

Plenum box made of galvanised sheet steel 0.7 mm with 1 spigot located horizontally in the middle on the front side of the device, DN123 (with rubber lip seal) for the primary air inlet.

### PRODUCTS AND OPTIONS

- Product without register, active, only return air or dummy element.
- One-sided or two-sided throw.
- Fixed nozzle -B, -C, -D, -E, or adjustable nozzle -V.
- Heat exchanger with 2-pipe system or 4-pipe system.
- With fixed or tiltable heat exchanger.
- Water connection on the top left or the top right.
- Register painted to black RAL 9005 or antibacterial coating (natural colour).
- Total width 592 mm, 595 mm, 597 mm, 617 mm or 622 mm.
- Total width 900 mm for freely suspended installation.
- Single unit with 2 end pieces or band design without end pieces.
- Optional inspection opening.
- Optional return air connection spigot.
- Total length of 852 mm to 3000 mm.
- Extension side of the housing on the left, right or with distributed extension.
- Secondary air grille with tiltable perforated plate, perforation  $\varnothing$  6 mm, 8x8 mm, 12x5 mm, 18x6 mm or louvre grille, type PA-Z-08.
- Colour of secondary air grille and visible parts: black RAL 9005, white RAL 9010, white RAL 9016 or white aluminium RAL 9006.
- Housing colour: black RAL 9005, white RAL 9010, white RAL 9016, white aluminium RAL 9006 or unpainted.
- One or two primary air connection spigots, horizontal or vertical, on the front or the rear side of the device or without spigot.
- Horizontal or vertical return air connection spigot, on the front or the rear side of the device or without spigot.
- Spigot diameter from DN98 to DN158. Optional rubber lip seal.
- Optional filter with efficiency ISO Coarse 30 % for secondary air and/or return air.
- Air deflection blades, individually or blockwise adjustable, black RAL 9005 or white RAL 9010.
- Condensate monitor with remote sensor, 230 V AC or 24 V AC/DC.

### ACCESSORIES SUPPLIED LOOSE

- Flexible hydraulic connection.
- Pressure independent control valves.
- VPP valve adapter.
- Actuators.
- Room temperature control.
- Condensation monitor.
- Pressure measuring tube for the air flow measurement (only for fixed nozzle -B, -C, -D, -E).
- End pieces.

## DIMENSIONS AND WEIGHTS

$L_{min}$ : minimal length according to page 12 and 13.  
 LG: Total length of  $L_{min}$  up to 3000 mm.  
 Width B: {592, 595, 597, 617, 622, 900} mm.  
 Spigot diameter  $\varnothing D$ : {98, 123, 148, 158} mm.

### Weight of standard unit

NL	09	12	15	18	21	24	27	30
(kg)	23	28	34	39	45	51	56	62

Weight of the standard device with register without water.

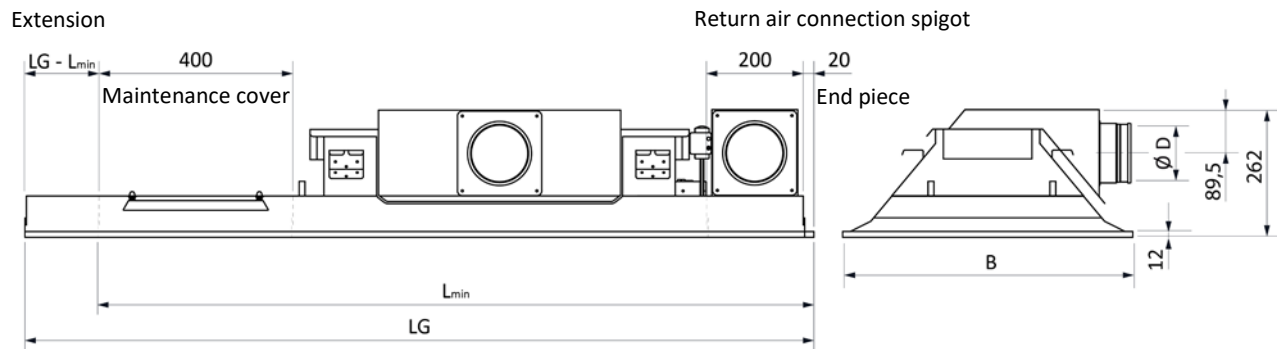
### Amount of water of the registers

NL	09	12	15	18	21	24	27	30
-2	1,6	2,1	2,7	3,3	3,8	4,4	4,5	5,5
-4(C)	0,3	0,5	0,6	0,7	0,8	1,0	1,1	1,2
-4(R)	1,2	1,7	2,1	2,5	3,0	3,4	3,9	4,3

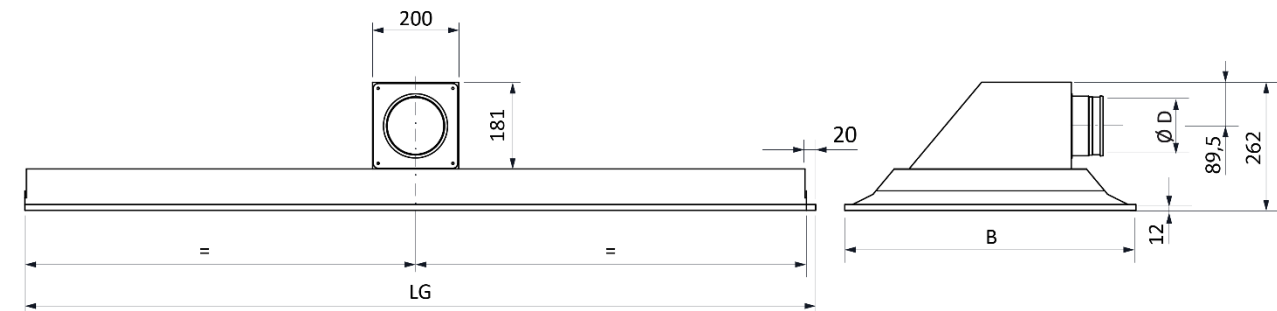
2 = 2-pipe system | 4 = 4-pipe system

H = heating circuit | K = cooling circuit

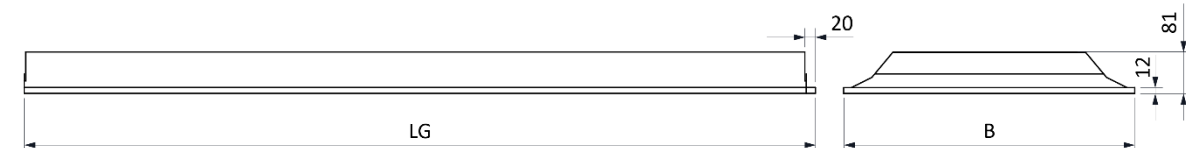
### Active product



### Return air product



### Dummy element product

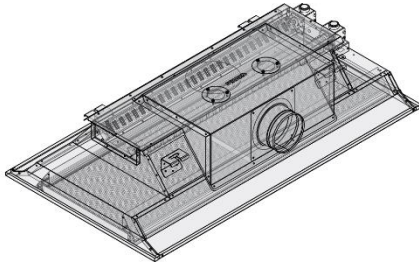


## MODELS

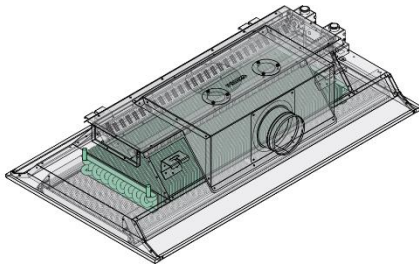
### MODEL

Several versions are available in order to comply with all possible technical and architectural demands.

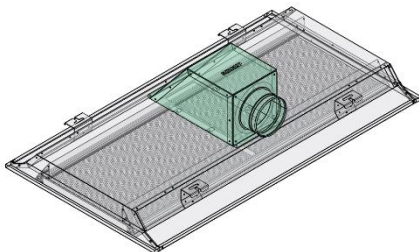
**0 =** Without register (only air, retrofitting of the register is possible)



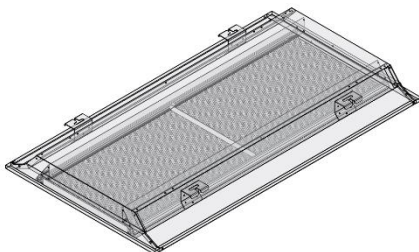
**A =** Active (with register) (standard)



**R =** Only return air (without nozzles)



**D =** Dummy element (without nozzles)



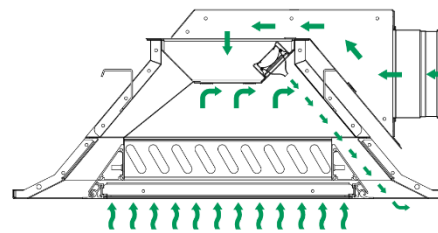
### NUMBER OF SUPPLY AIR INLETS

The number and position of the supply air inlets can be configured in a way that the device is adapted to the dimensions of the room.

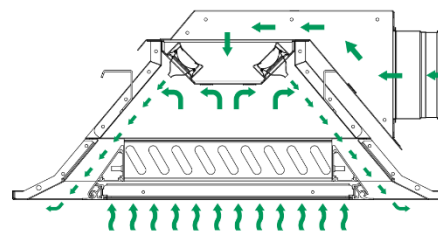
**0 =** Dummy element or return air element (without nozzles)



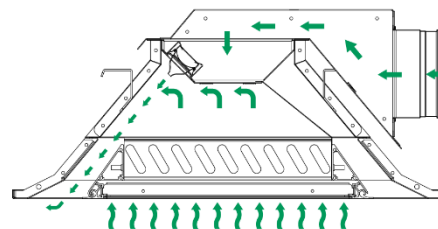
**1 =** One-way throw on the front side of the device



**2 =** Two-way throw (standard)



**3 =** One-way throw on the rear side of the device



### NOMINAL LENGTH

The nominal length defines the performance of the device and determines the minimum configurable length. Several configurations of the length are possible.

<b>00</b> =	Dummy element or return air element (without nozzles)	(L <sub>min</sub> = 200 mm)
<b>09</b> =	Nominal length 900	(L <sub>min</sub> = 852 mm)
<b>12</b> =	Nominal length 1200	(L <sub>min</sub> = 1152 mm)
<b>15</b> =	Nominal length 1500	(L <sub>min</sub> = 1452 mm)
<b>18</b> =	Nominal length 1800	(L <sub>min</sub> = 1752 mm)
<b>21</b> =	Nominal length 2100	(L <sub>min</sub> = 2052 mm)
<b>24</b> =	Nominal length 2400	(L <sub>min</sub> = 2352 mm)
<b>27</b> =	Nominal length 2700	(L <sub>min</sub> = 2652 mm)
<b>30</b> =	Nominal length 3000	(L <sub>min</sub> = 2952 mm)

### NOZZLE CONFIGURATION

The device can be configured with round nozzles in different diameters. From B to E.

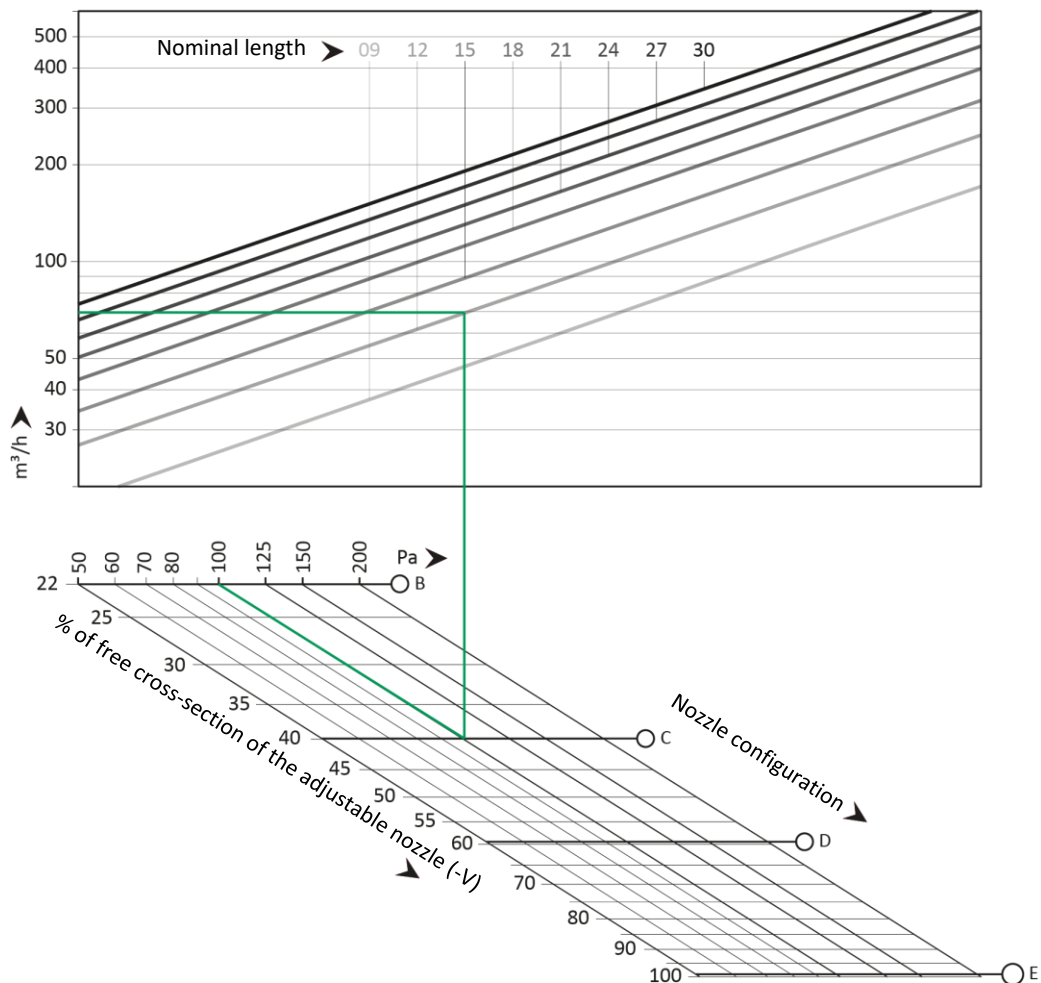
In addition, the device can be configured with an adjustable nozzle V.

The adjustable induction nozzles (-V) are especially suited to adapt air volume and diffusion as well as induction or cooling capacity to the requirements on site even at a later stage. The free cross-section of the nozzle and thus the air volume can be adjusted continuously for each side from zero to maximum. This opens up convenient freedom for alterations even in the distant future.

#### NOTE

The continuously adjustable nozzle increases the minimum configurable length of the device by 8 mm.

- 0** = Dummy element or return air element (without nozzles)
- B** = Nozzle configuration B
- C** = Nozzle configuration C
- D** = Nozzle configuration D
- E** = Nozzle configuration E
- V** = Continuously adjustable nozzle V (+ 8 mm)



**SYSTEM (WATER REGISTER VERSION)**

The water register can be designed for two-pipe and four-pipe installations.

For the tiltable register option, the register can be folded down without tools and without interrupting the hydraulic circuit which reduces the time for cleaning the heat exchanger significantly. Furthermore, the internal surfaces that come into contact with the secondary air can easily be accessed for cleaning. The tiltable register is recommended preferably for the use in hospitals since the strict hygienic conditions according to VDI 6022 require the cleaning of the upper surfaces of the registers.

**NOTE**

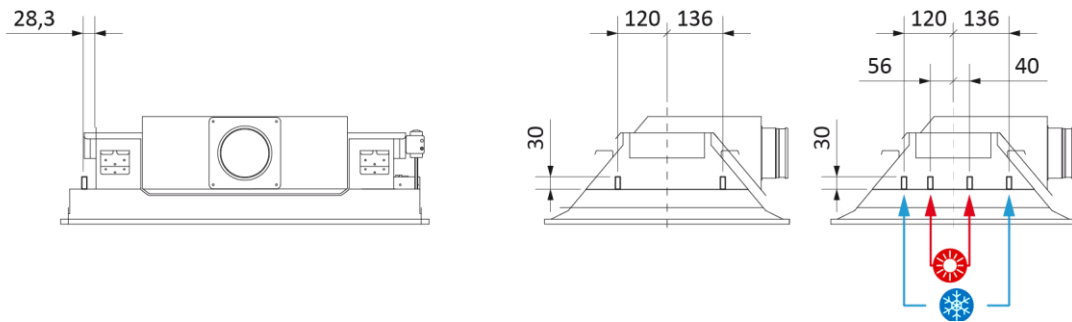
If the device is provided with a condensate monitor, the cold water must be supplied through the line with the condensate sensor.

**NOTE**

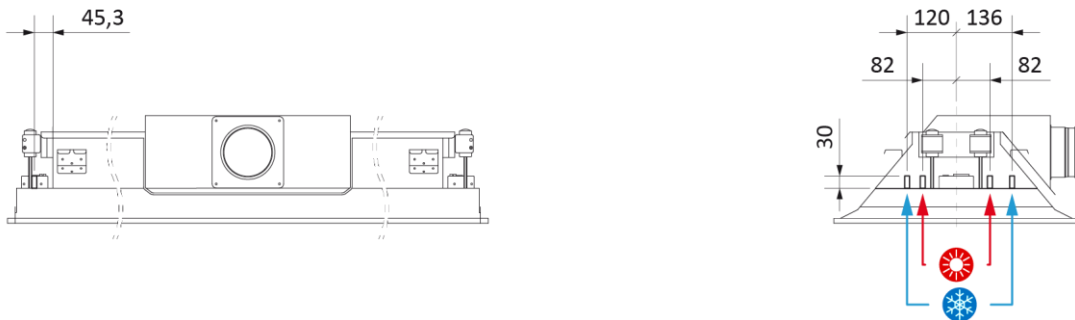
For the tiltable register option, an additional allowance for the length is required.

- 00** = Without register
- 2F** = 2-pipe system (cooling or heating) with fixed heat exchanger (standard)
- 4F** = 4-pipe system (cooling and heating) with fixed heat exchanger
- 2A** = 2-pipe system (cooling or heating) with tiltable heat exchanger  
 (NL ≤ 15 = + 142 mm, NL ≥ 18 = + 215 mm)
- 4A** = 4-pipe system (cooling or heating) with tiltable heat exchanger  
 (NL ≤ 15 = + 142 mm, NL ≥ 18 = + 215 mm)

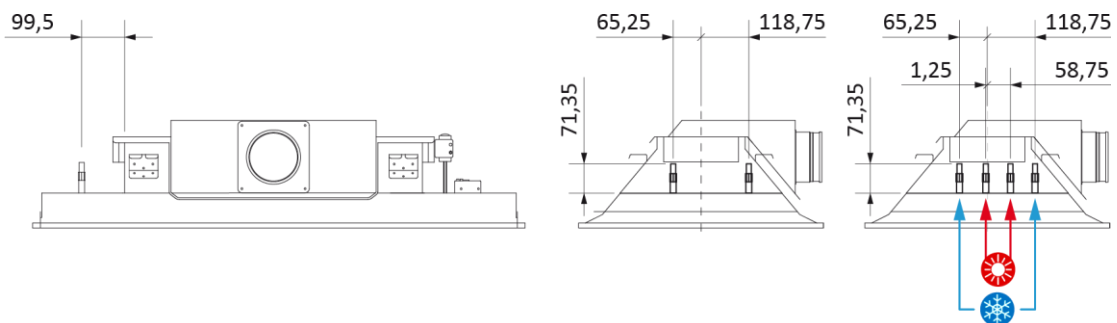
**Dimensions for model with fixed heat exchanger: 2-pipe system (all lengths) | 4-pipe system (NL ≤ 15)**



**Dimensions for model with fixed heat exchanger: 4-pipe system (NL > 15)**



**Dimensions for model with tiltable heat exchanger: 2-pipe system | 4-pipe system**



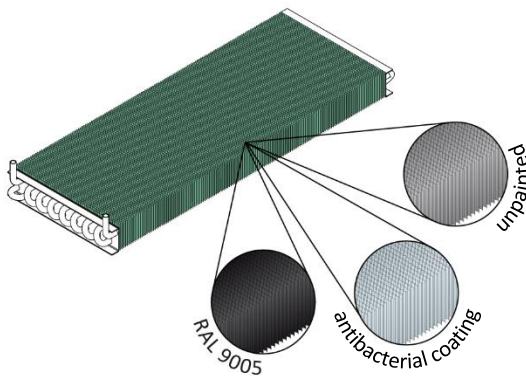


## REGISTER SURFACE

The register surface is available in black RAL 9005 to adapt the device to the room conditions.

It can also be configured with an antibacterial coating. This coating consists of a protective film which provides the register a protection against the growth of bacteria and therefore complies with the hygienic requirements of special facilities such as hospitals, resident rooms or laboratories.

- 0** = Unpainted register or without register (standard)
- 1** = Register painted to RAL 9005 black
- A** = Antibacterial coating



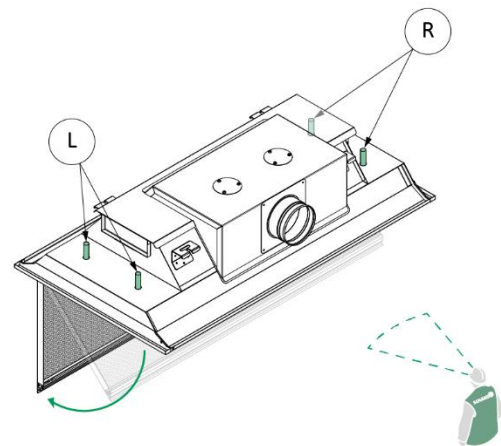
## Antibacterial coating

<b>Composition</b>	Epoxy resin
<b>Salt spray resistance ASTM B 117</b>	> 1000 h
<b>Acetic acid salt spray (AASS) resistance to ASTM B 117 and ASTM G 85</b>	> 750 h
<b>Cross-cut test ENISO 2409</b>	Class 0 - 1
<b>Migration test DM 21/03/73 (mod. 26/0493 n°220 and 22/07/98 n°338)</b>	Ok

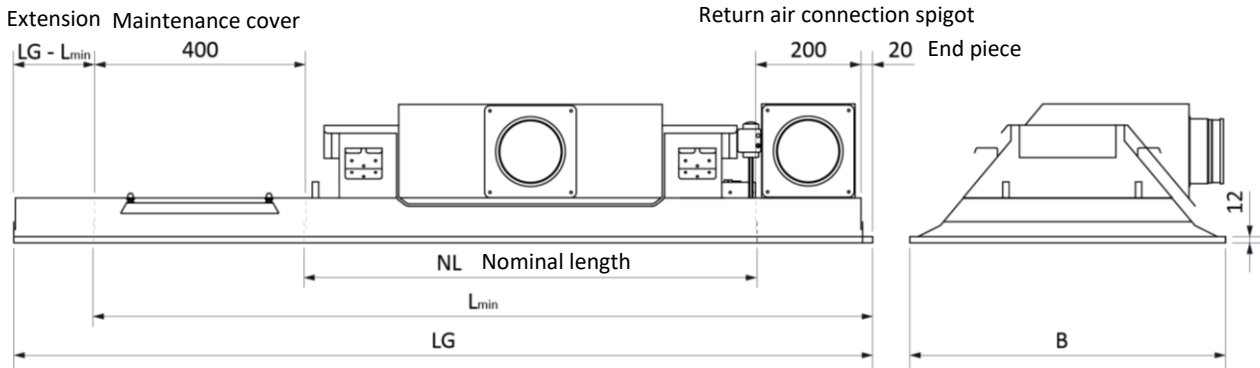
## WATER CONNECTION POSITION

The hydraulic connections can be either configured on the left or on the right side.

- 0** = Without register
- L** = Water connection top left (standard)
- R** = Water connection top right

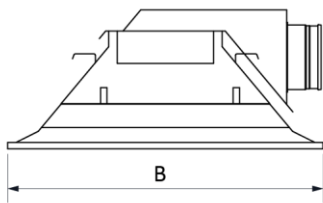


Identification of the dimensions



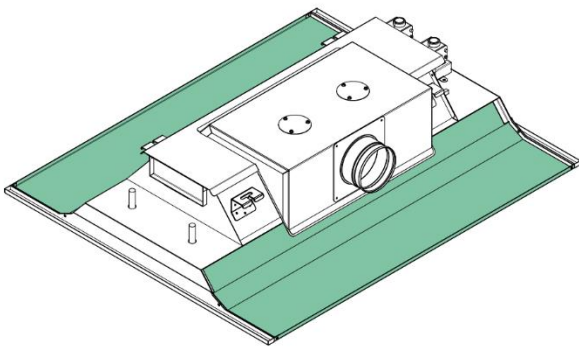
WIDTH

The device can be configured in different widths with the help of different construction standards.



- B1 = Width 592 mm
- B2 = Width 595 mm
- B3 = Width 597 mm (standard)
- B4 = Width 617 mm
- B5 = Width 622 mm
- B6 = Total width 900 mm for freely suspended installation

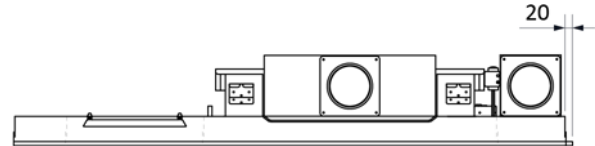
The width of 900 mm is provided with extensions to make sure that a horizontal air flow is generated even for freely suspended devices (without cover).



END PIECE

These parts are recommended for the end of a band design or for installed single devices.

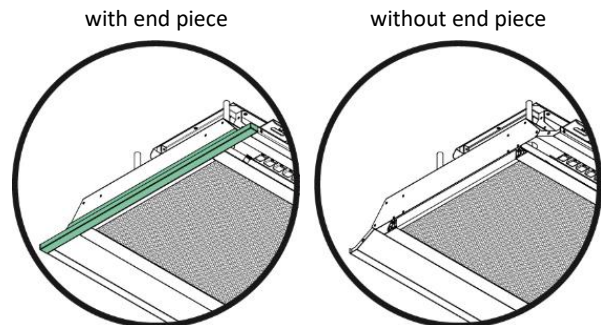
The end pieces are also available as accessories (see accessories/end pieces). In this case, the DISA is configured with the option 0 = without end piece. This option is recommended if several identical DISAs are planned for a band design. The devices located at the ends must not be treated differently and all devices can be ordered with the same code.



NOTE

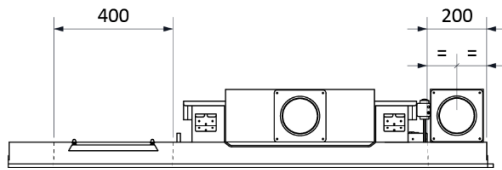
Each end piece increases the minimum configurable length of the device by 20 mm.

- O = Band design without end piece
- Z = Single unit with 2 end pieces (standard) (+ 40 mm)
- L = Band design with left end piece (+ 20 mm)
- R = Band design with right end piece (+ 20 mm)



## VERSIONS

The variant determines the additional modules of the device (return air and hydraulic inspection cover).



The hydraulic inspection cover provides access to the hydraulic connections from the bottom of the device without using the technical ceiling. Thanks to the rapid mounting system, the cover can be removed and remounted without tools.

The return air is removed through an additional plenum box independently of the supply air. By this, the air can be removed from the room without having to install additional devices and, moreover, a perfect aesthetic integration is obtained.

### NOTE

The variant increases the minimum configurable length of the device.

- V0** = Without inspection opening and without return air connection spigot (standard)
- V1** = Without inspection opening but with return air connection spigot on the left (+ 200 mm)
- V2** = Without inspection opening but with return air connection spigot on the right (+ 200 mm)
- V3** = With inspection opening on the water connection side but without return air connection spigot (+ 400 mm)
- V4** = With inspection opening on the water connection side and with left return air connection spigot (+ 600 mm)
- V5** = With inspection opening on the water connection side and with right return air connection spigot (+ 600 mm)
- V6** = Without inspection opening but with central return air connection spigot (only for Return air -R products) (+ 200 mm)

## TOTAL LENGTH

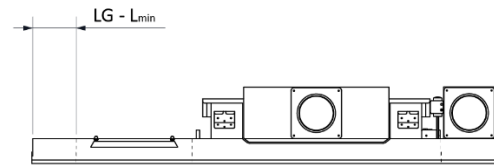
The device can be configured from its minimum length up to 3000 mm plus the length of the end pieces. The options defining the minimum length are:

1. Nominal length,
2. Nozzle configuration,
3. System (water register version),
4. Version,
5. End piece.

The difference between the selected total length and the minimum length is compensated by housing extensions (passive part of the device). The minimum length for each product is indicated in the table on the following page.

## EXTENSION SIDE OF THE HOUSING

If the total length is larger than the minimum length, the side of the housing to be extended must be selected.

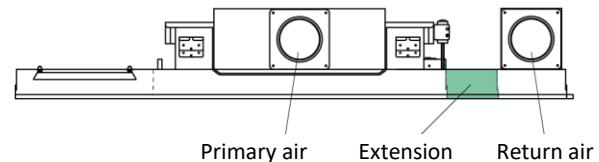


**M** = Without housing extension ( $LG = L_{min}$ ), or with distributed extension (only for version -V0 and  $LG > L_{min}$ ) (standard)

**L** = Extension of the housing, left ( $LG > L_{min}$ )

**L** = Extension of the housing, right ( $LG > L_{min}$ )

If the device with extension on the return air side is ordered, the extension is mounted between primary and return air.



MINIMUM LENGTH DEPENDING ON THE PRODUCT (2) ROUND NOZZLES -B, -C, -D, -E)

Nominal length (1) ↓	Register (3) ↓	(4) → Version V0			Versions V1   V2			Version V3			Versions V4   V5			Version V6		
		(5) → Number of end pieces			Number of end pieces			Number of end pieces			Number of end pieces			Number of end pieces		
		0	1	2	0	1	2	0	1	2	0	1	2	0	1	2
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
NL 00	00	200	220	240	400	420	440	600	620	640	800	820	840	400	420	440
NL 09	00	852	872	892	1052	1072	1092	1252	1272	1292	1452	1472	1492	-	-	-
	2F 4F	852	872	892	1052	1072	1092	1252	1272	1292	1452	1472	1492	-	-	-
	2A 4A	994	1014	1034	1194	1214	1234	1394	1414	1434	1594	1614	1634	-	-	-
NL 12	00	1152	1172	1192	1352	1372	1392	1552	1572	1592	1752	1772	1792	-	-	-
	2F 4F	1152	1172	1192	1352	1372	1392	1552	1572	1592	1752	1772	1792	-	-	-
	2A 4A	1294	1314	1334	1494	1514	1534	1694	1714	1734	1894	1914	1934	-	-	-
NL 15	00	1452	1472	1492	1652	1672	1692	1852	1872	1892	2052	2072	2092	-	-	-
	2F 4F	1452	1472	1492	1652	1672	1692	1852	1872	1892	2052	2072	2092	-	-	-
	2A 4A	1594	1614	1634	1794	1814	1834	1994	2014	2034	2194	2214	2234	-	-	-
NL 18	00	1752	1772	1792	1952	1972	1992	2152	2172	2192	2352	2372	2392	-	-	-
	2F 4F	1752	1772	1792	1952	1972	1992	2152	2172	2192	2352	2372	2392	-	-	-
	2A 4A	1967	1987	2007	2167	2187	2207	2367	2387	2407	2567	2587	2607	-	-	-
NL 21	00	2052	2072	2092	2252	2272	2292	2452	2472	2492	2652	2672	2692	-	-	-
	2F 4F	2052	2072	2092	2252	2272	2292	2452	2472	2492	2652	2672	2692	-	-	-
	2A 4A	2267	2287	2307	2467	2487	2507	2667	2687	2707	2867	2887	2907	-	-	-
NL 24	00	2352	2372	2392	2552	2572	2592	2752	2772	2792	2952	2972	2992	-	-	-
	2F 4F	2352	2372	2392	2552	2572	2592	2752	2772	2792	2952	2972	2992	-	-	-
	2A 4A	2567	2587	2607	2767	2787	2807	2967	2987	3007	-	-	-	-	-	-
NL 27	00	2652	2672	2692	2852	2872	2892	-	-	-	-	-	-	-	-	-
	2F 4F	2652	2672	2692	2852	2872	2892	-	-	-	-	-	-	-	-	-
	2A 4A	2867	2887	2907	-	-	-	-	-	-	-	-	-	-	-	-
NL 30	00	2952	2972	2992	-	-	-	-	-	-	-	-	-	-	-	-
	2F 4F	2952	2972	2992	-	-	-	-	-	-	-	-	-	-	-	-
	2A 4A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NL = Nominal length | NL09 (900) | NL12 (1200) | NL15 (1500) | NL18 (1800) | NL21 (2100) | NL24 (2400) | NL27 (2700) | NL30 (3000)

NL00 = Dummy element without heat exchanger or return air without heat exchanger

Register 00 = Without heat exchanger

Register 2F | 4F = Fixed heat exchanger

Register 2A | 4A = Tilttable heat exchanger

Version V0 = Without inspection opening and without return air connection spigot

Version V1 = Without inspection opening but with return air connection spigot on the left

Version V2 = Without inspection opening but with return air connection spigot on the right

Version V3 = With inspection opening on the water connection side but without return air connection spigot

Version V4 = With inspection opening on the water connection side and with return air connection spigot on the left

Version V5 = With inspection opening on the water connection side and with return air connection spigot on the right

Version V6 = Without inspection opening but with central return air connection spigot

- = Cannot be manufactured (LG > 3000 mm)

- = Not compatible

MINIMUM LENGTH DEPENDING ON THE MODEL (② CONTINUOUSLY ADJUSTABLE NOZZLE -V)

Nominal length ① ↓	Register ③ ↓	④ → Version V0			Versions V1   V2			Version V3			Versions V4   V5			Version V6		
		⑤ → Number of end pieces			Number of end pieces			Number of end pieces			Number of end pieces			Number of end pieces		
		0	1	2	0	1	2	0	1	2	0	1	2	0	1	2
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
NL 00	00	200	220	240	400	420	440	600	620	640	800	820	840	400	420	440
NL 09	00	860	880	900	1060	1080	1100	1260	1280	1300	1460	1480	1500	-	-	-
	2F 4F	860	880	900	1060	1080	1100	1260	1280	1300	1460	1480	1500	-	-	-
	2A 4A	1002	1022	1042	1202	1222	1242	1402	1422	1442	1602	1622	1642	-	-	-
NL 12	00	1160	1180	1200	1360	1380	1400	1560	1580	1600	1760	1780	1800	-	-	-
	2F 4F	1160	1180	1200	1360	1380	1400	1560	1580	1600	1760	1780	1800	-	-	-
	2A 4A	1302	1322	1342	1502	1522	1542	1702	1722	1742	1902	1922	1942	-	-	-
NL 15	00	1460	1480	1500	1660	1680	1700	1860	1880	1900	2060	2080	2100	-	-	-
	2F 4F	1460	1480	1500	1660	1680	1700	1860	1880	1900	2060	2080	2100	-	-	-
	2A 4A	1602	1622	1642	1802	1822	1842	2002	2022	2042	2202	2222	2242	-	-	-
NL 18	00	1760	1780	1800	1960	1980	2000	2160	2180	2200	2360	2380	2400	-	-	-
	2F 4F	1760	1780	1800	1960	1980	2000	2160	2180	2200	2360	2380	2400	-	-	-
	2A 4A	1975	1995	2015	2175	2195	2215	2375	2395	2415	2575	2595	2615	-	-	-
NL 21	00	2060	2080	2100	2260	2280	2300	2460	2480	2500	2660	2680	2700	-	-	-
	2F 4F	2060	2080	2100	2260	2280	2300	2460	2480	2500	2660	2680	2700	-	-	-
	2A 4A	2275	2295	2315	2475	2495	2515	2675	2695	2715	2875	2895	2915	-	-	-
NL 24	00	2360	2380	2400	2560	2580	2600	2760	2780	2800	2960	2980	3000	-	-	-
	2F 4F	2360	2380	2400	2560	2580	2600	2760	2780	2800	2960	2980	3000	-	-	-
	2A 4A	2575	2595	2615	2775	2795	2815	2975	2995	3015	-	-	-	-	-	-
NL 27	00	2660	2680	2700	2860	2880	2900	-	-	-	-	-	-	-	-	-
	2F 4F	2660	2680	2700	2860	2880	2900	-	-	-	-	-	-	-	-	-
	2A 4A	2875	2895	2915	-	-	-	-	-	-	-	-	-	-	-	-
NL 30	00	2960	2980	3000	-	-	-	-	-	-	-	-	-	-	-	-
	2F 4F	2960	2980	3000	-	-	-	-	-	-	-	-	-	-	-	-
	2A 4A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NL = Nominal length | NL09 (900) | NL12 (1200) | NL15 (1500) | NL18 (1800) | NL21 (2100) | NL24 (2400) | NL27 (2700) | NL30 (3000)

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Register 2F | 4F = Fixed heat exchanger

Register 2A | 4A = Tilttable heat exchanger

Version V0 = Without inspection opening and without return air connection spigot

Version V1 = Without inspection opening but with return air connection spigot on the left

Version V2 = Without inspection opening but with return air connection spigot on the right

Version V3 = With inspection opening on the water connection side but without return air connection spigot

Version V4 = With inspection opening on the water connection side and with return air connection spigot on the left

Version V5 = With inspection opening on the water connection side and with return air connection spigot on the right

Version V6 = Without inspection opening but with central return air connection spigot

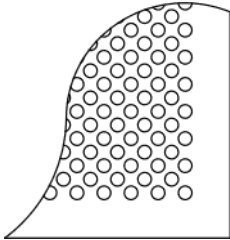
- = Cannot be manufactured (LG > 3000 mm)

- = Not compatible

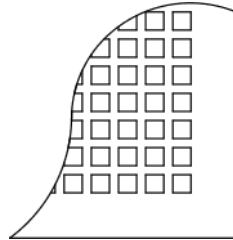
## SECONDARY AIR GRILLE

The device DISA-601 is provided with different types of tiltable secondary air grilles. All types are designed in a way that the pressure loss of the induced air is minimised and the performance is maximised.

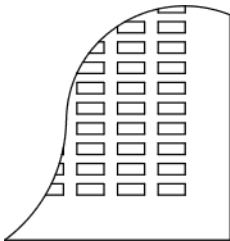
**SR** = Ø6 mm (standard)



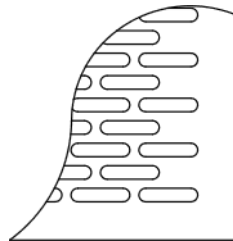
**SQ** = 8 mm x 8 mm



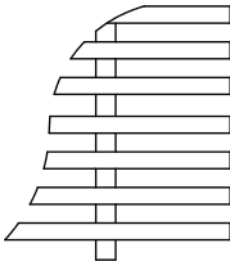
**RE** = 12 mm x 5 mm



**OB** = Oval 18 mm x 6 mm



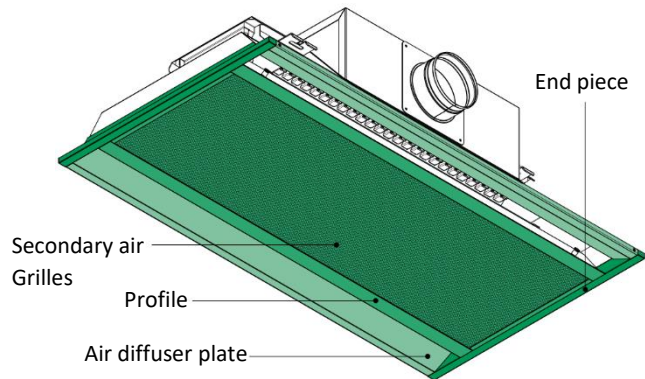
**PA** = Louvre grille  
 type PA-Z-08



## SURFACE FINISH

### COLOUR OF THE SECONDARY AIR GRILLE AND VISIBLE PARTS

This option can be used to configure the colour of the parts that are visible after installation.

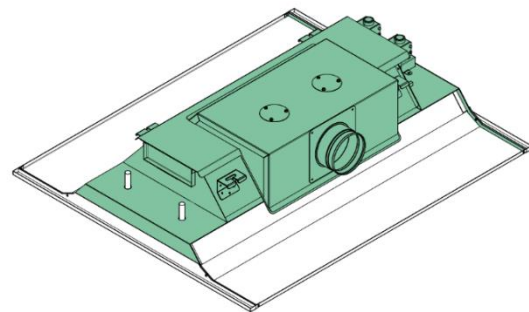


- 1 = Visible parts painted to RAL 9005 black
- 2 = Visible parts painted to RAL 9010 white (standard)
- 3 = Visible parts painted to RAL 9016 white
- 4 = Visible parts painted to RAL 9006 white aluminium

Further colours are available upon request.

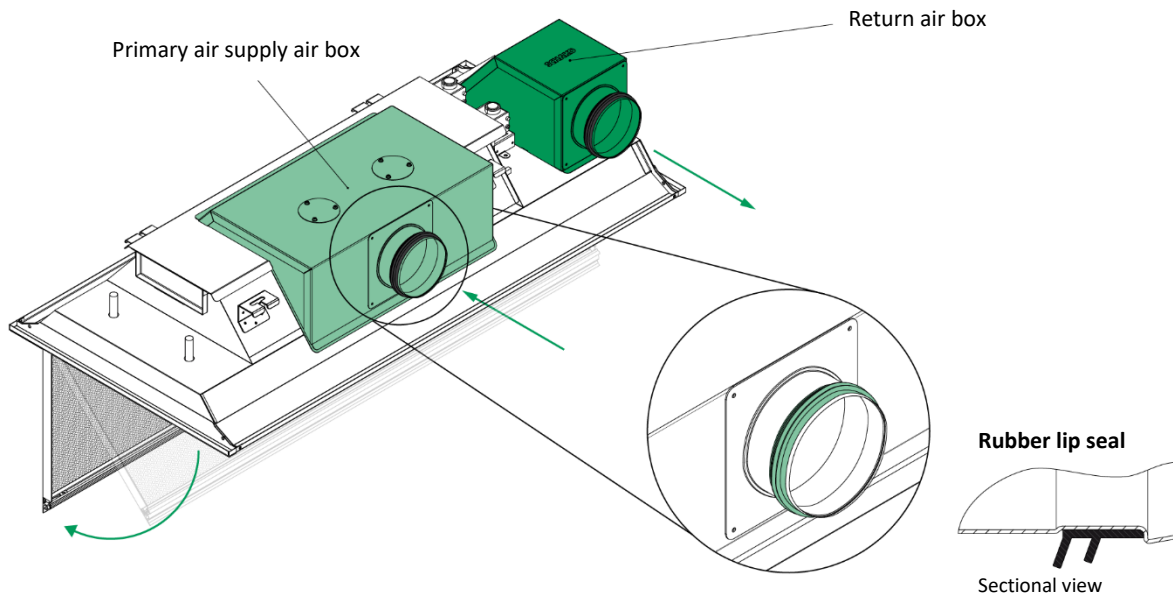
### HOUSING COLOUR (FOR FREELY SUSPENDED INSTALLATION)

This option can be used to configure the colour of the housing. Is recommended particularly for freely suspended installation after which the device housing is visible.



- 0 = Outside of the housing without paint (galvanised steel), inside pre-painted in black (standard)
- 1 = Housing painted on the inside and outside to RAL 9005 black
- 2 = Housing painted on the inside and outside to RAL 9010 white
- 3 = Housing painted on the inside and outside to RAL 9016 white
- 4 = Housing painted on the inside and outside to RAL 9006 white aluminium

## AIR CONNECTIONS



### PRIMARY AIR CONNECTING PIECE

The primary air connection spigot can be configured in different positions. If the air flow is high, two supply air spigots can be configured to reduce the air speed through the spigots and to diminish the pressure losses and noise.

- P0** = Without primary air connection spigot (only for dummy element -D and return air -R products)
- P1** = Primary air connection spigot vertically in the middle -on the upper side of the device
- P2** = Primary air connection spigot horizontally in the middle on the front side of the device (standard)
- P3** = Primary air connection spigot horizontally in the middle on the rear side of the device
- P4** = Two primary air connection spigot arranged vertically on the upper side of the device
- P5** = Two primary air connection spigot arranged horizontally on the front side of the device
- P6** = Two primary air connection spigot arranged horizontally on the rear side of the device

### RETURN AIR CONNECTION SPIGOT

Several positions and sizes can be selected not only for the primary air connection but also for the return air.

- A0** = Without return air connection spigot (standard)
- A1** = Vertical return air connection spigot
- A2** = Return air connection spigot on the front of the device
- A3** = Return air connection spigot on the rear of the device

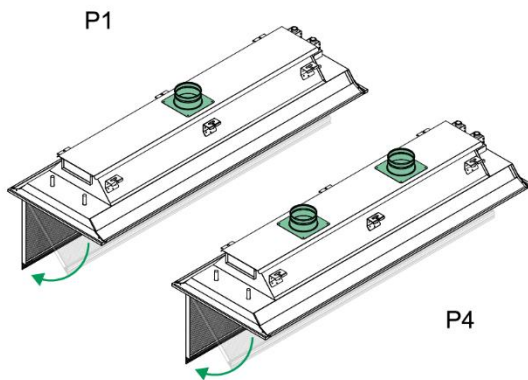
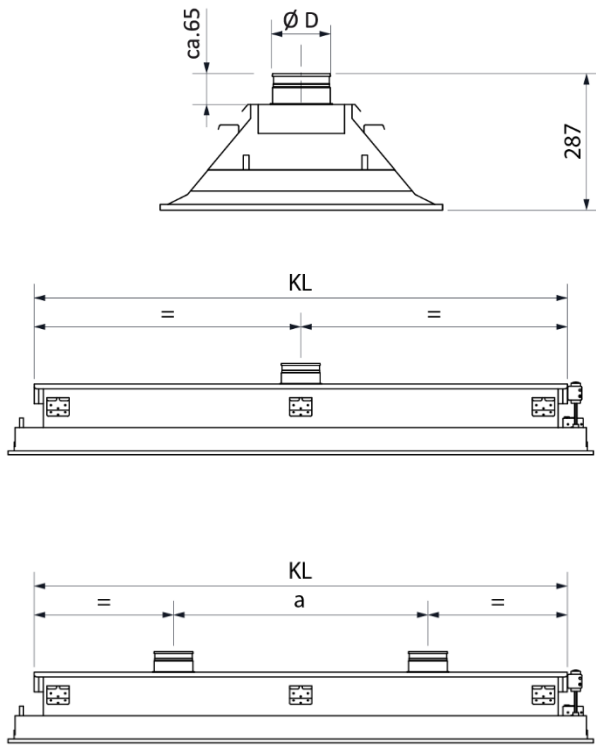
In all cases, diameters between 98 mm and 158 mm can be selected for the opening, with or without rubber lip seal.

The rubber lip seal is used to ensure a secure sealing between the device spigot and the connection for primary air and return air.

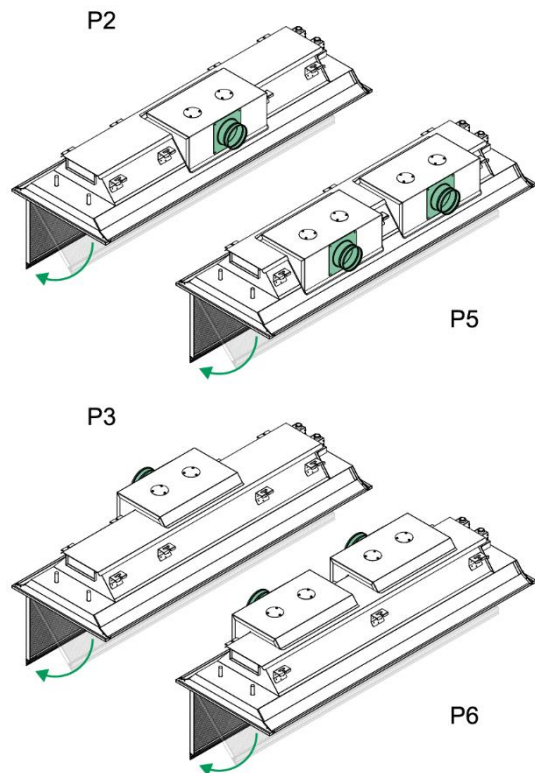
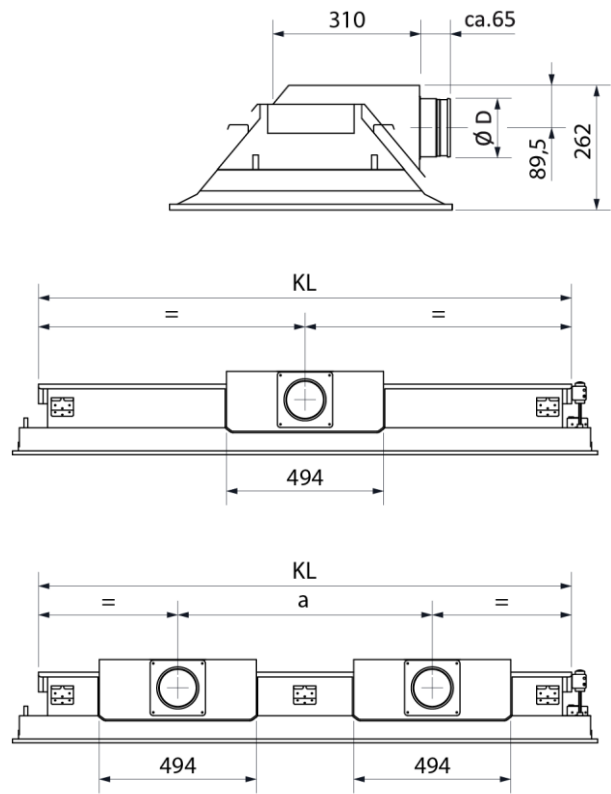
- 0** = Without spigot
- 1** = DN98
- 2** = DN123 (standard)
- 3** = DN148
- 4** = DN158
- 5** = DN98 with rubber lip seal
- 6** = DN123 with rubber lip seal
- 7** = DN148 with rubber lip seal
- 8** = DN158 with rubber lip seal

## DIMENSIONS OF THE PRIMARY AIR CONNECTION SPIGOT

### Vertical spigot -P1, -P4



### Horizontal spigot -P2,-P3, -P5,-P6

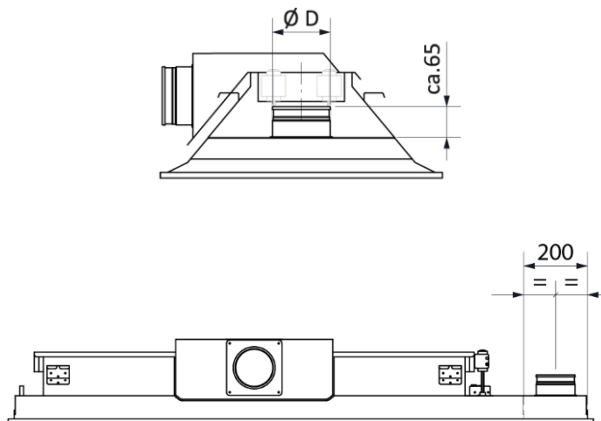


NL	09	12	15	18	21	24	27	30
KL (mm)	783	1083	1383	1676	1969	2275	2568	2874
a (mm)	322	322	322	800	800	800	1200	1200

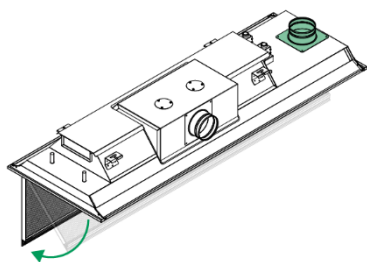


## RETURN AIR CONNECTION SPIGOT DIMENSIONS

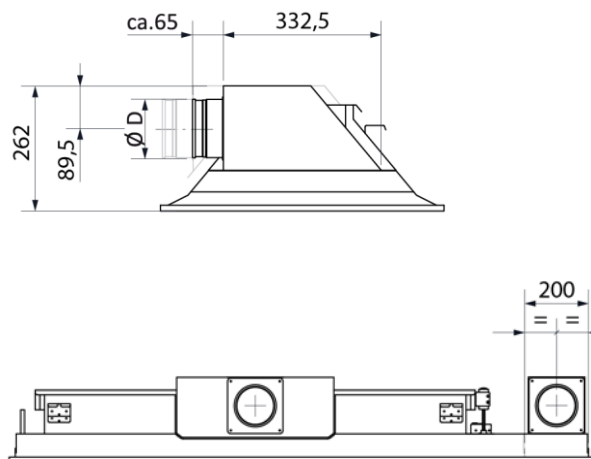
### Vertical spigot -A1



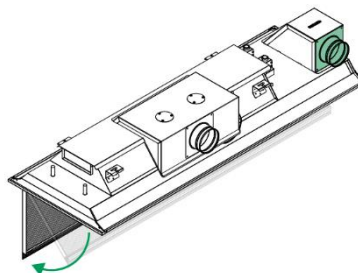
A1



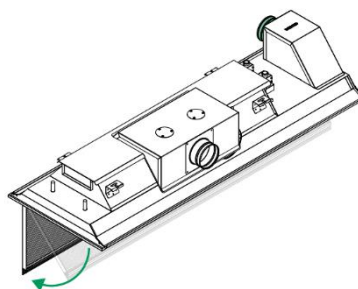
### Horizontal spigot -A2, -A3



A2



A3

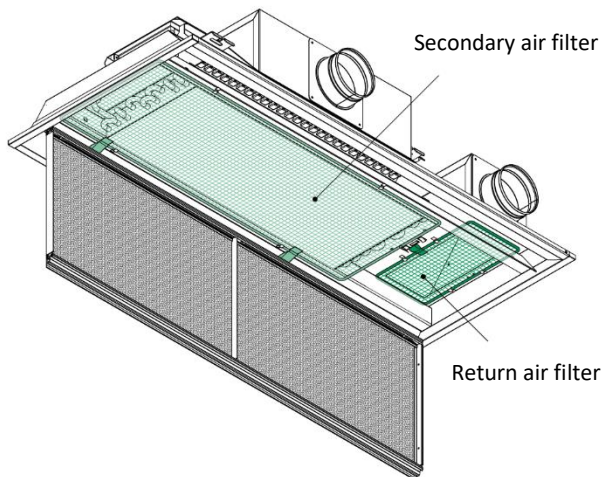


## AIR FILTER

The device can be configured with an air filter with efficiency ISO Coarse 30% according to ISO 16890. This filter protects the register against contamination with coarse particles or lint.

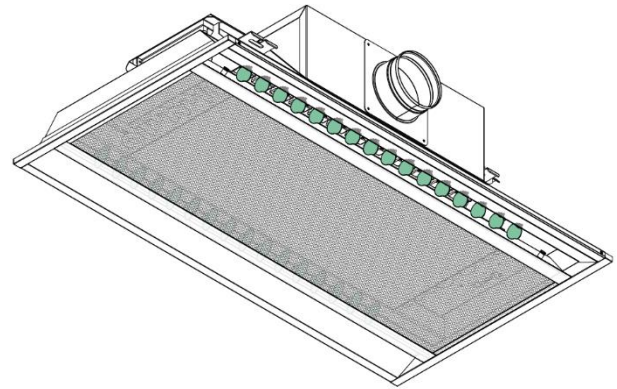
The filter can easily be removed without using a tool and can be re-used after having cleaned with compressed air or water thanks to its synthetic composition. This facilitates the maintenance work significantly, especially for applications with high hygienic requirements, e.g. in hospitals, laboratories or residential rooms.

- C0** = Without air filter (standard)
- C3** = With secondary air filter and return air filter (ISO Coarse 30%) (only with return air connection spigot)
- CS** = With secondary air filter (ISO Coarse 30%)
- CA** = With return air filter (ISO Coarse 30%) (only with return air connection spigot)



## AIR DEFLECTION BLADES

The air deflection blades are small ABS blades through which the primary air can be guided. It is possible to adjust the blades individually or in blocks of 5 blades. They are available in black similar to RAL 9005 or in white similar to RAL 9010.

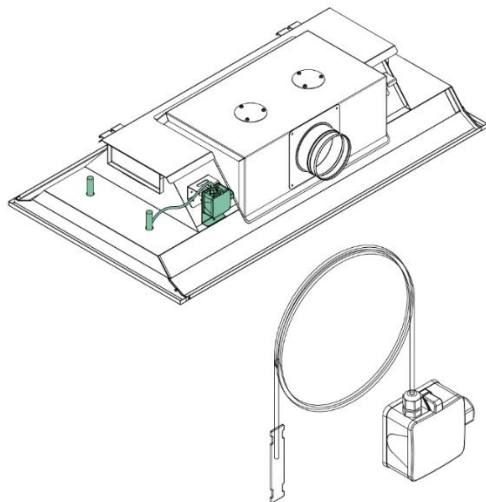


- L0** = Without air deflection blades (standard)
- L1** = With individually adjustable air deflection blades black, similar to RAL 9005
- L2** = With individually adjustable air deflection blades white, similar to RAL 9010
- L3** = With blockwise adjustable air deflection blades black, similar to RAL 9005
- L4** = With blockwise adjustable air deflection blades white, similar to RAL 9010

## CONDENSATE MONITOR

The condensate monitor prevents the formation of condensates if the device is used for cooling.

Available in the versions AC/DC 24 V and AC 230 V.



- Q0** = Without condensate monitor (standard)
- Q3** = With condensate monitor WK01+ ext. 230 V with remote sensor pre-mounted ex works (not possible with foldable heat exchanger -2A/-4A)
- Q4** = With condensate monitor WK01+ ext. 24 V with remote sensor pre-mounted ex works (not possible with foldable heat exchanger -2A/-4A)

### NOTE

If the device is provided with a condensate monitor, the cold water must be supplied through the line with the condensate sensor.

### ATTENTION

The condensate monitor is not designed for permanent dewing.

Model	WK01+ ext. 230 V	WK01+ ext. 24 V
<b>Measurement</b>	Conductivity	Humidity
<b>Output switch contact</b>	Switch-over contact, max. 230 V AC / 0,5 A (resistive, potential-free)	Switch-over contact, max. 24 V / 1,0 A (resistive, potential-free)
<b>Power supply</b>	230 V AC	24 V AC/DC
<b>Power consumption</b>	3,5 VA	1,6 VA (AC) 0,8 W (DC)
<b>Display</b>	LED green= power supply OK LED red = dewing	
<b>Protection type</b>	IP65 according to DIN EN 60529	
<b>Ambient conditions</b>	0 ... 50 °C, max. HR = 85%	-20 ... 60 °C, max. HR = 85%

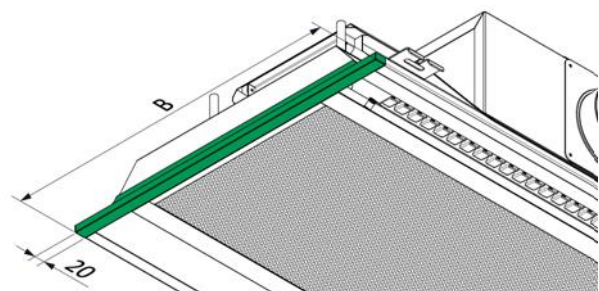
## END PIECE SUPPLIED LOOSE

The end pieces ordered as accessories are supplied separately together with the required connection screws.

This option facilitates the ordering of a band with several identical devices. The devices located at the ends must not be treated differently and all devices can be ordered with the same code.

### ATTENTION

For the calculation of the installation clearance for the device, please take into account that each end piece has an additional length of 20 mm.



End pieces are available for all widths of the DISA-601.

- B1** = Width 592 mm
- B2** = Width 595 mm
- B3** = Width 597 mm
- B4** = Width 617 mm
- B5** = Width 622 mm
- B6** = Total width 900 mm for freely suspended installation

End pieces are available for all colours of the DISA-601.

- 1** = Visible parts painted to RAL 9005 black
- 2** = Visible parts painted to RAL 9010 white
- 3** = Visible parts painted to RAL 9016 white
- 4** = Visible parts painted to RAL 9006 white aluminium

## ACCESSORIES SUPPLIED LOOSE

### NOTE

All accessories are supplied loose for mounting on site outside the device.

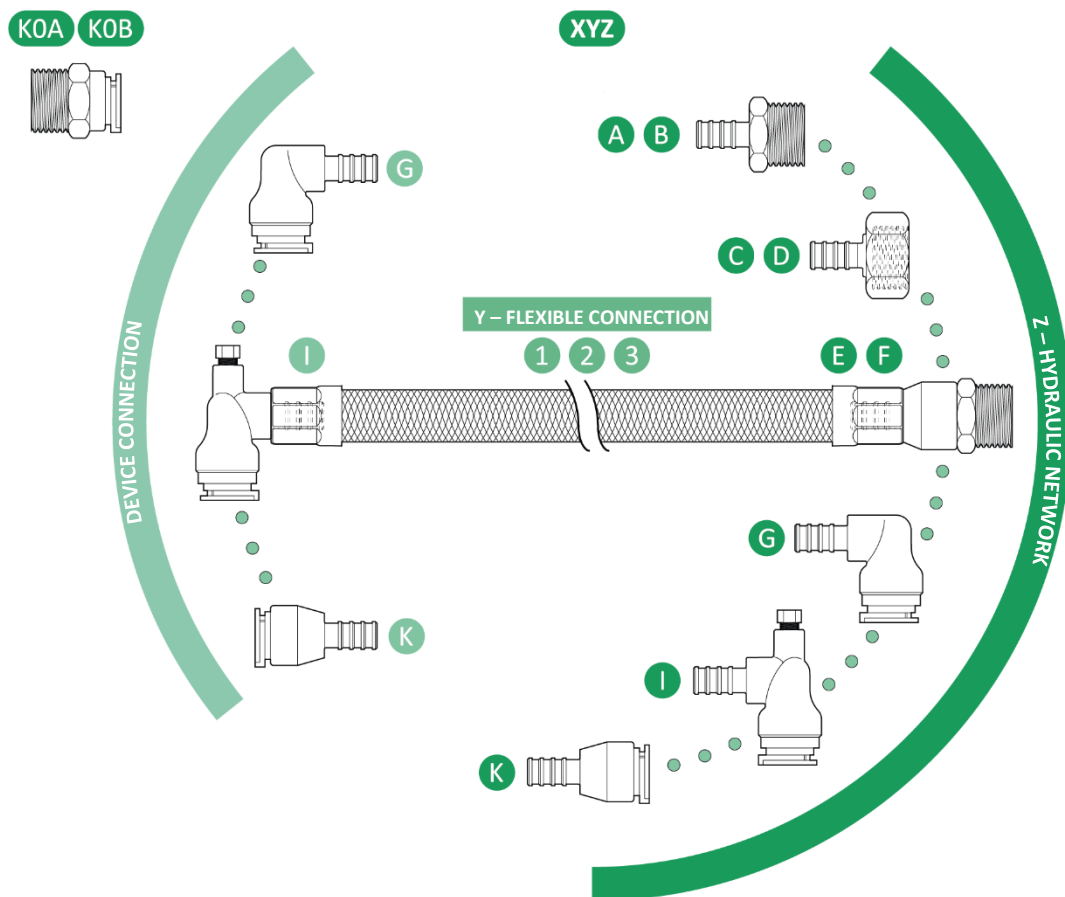
## FLEXIBLE HYDRAULIC CONNECTION

The flexible hydraulic connection allows the connection to the hydraulic network without great effort and reduces the transmission of noise and kinetic energy from the hydraulic network.

**Hxyz** = With device connection (x), flexible connection (y) and free connection to the hydraulic network (z) (for x, y, z, see diagram)

**HK0A** = Plug fitting AG-RV, device connection 12 mm, connection to the hydraulic network AG ½"

**HK0B** = Plug fitting AG-RV, device connection 12 mm, connection to the hydraulic network AG ¾"



x, z	Connection	Type	Connection	
			(mm)	(")
A	AG	External thread	-	AG ½"
B	AG	External thread	-	AG ¾"
C	ÜMF	Flat seal spigot nut	-	IG ½"
D	ÜMF	Flat seal spigot nut	-	IG ¾"
E	R-AG-D	Rotating male thread	-	AG ½"
F	R-AG-D	Rotating male thread	-	AG ¾"
G	C-RV	Bend plug-in fitting	12	-
I	CE-RV	Bend plug-in fitting with ventilation	12	-
K	RV	Straight connector / plug-in fitting	12	-

y	Flexible connection	Length (mm)	NW (mm)
1	EDE-13	500	13
2	EDE-13	800	13
3	EDE-13	1200	13

Flexible connection according to DIN 4726

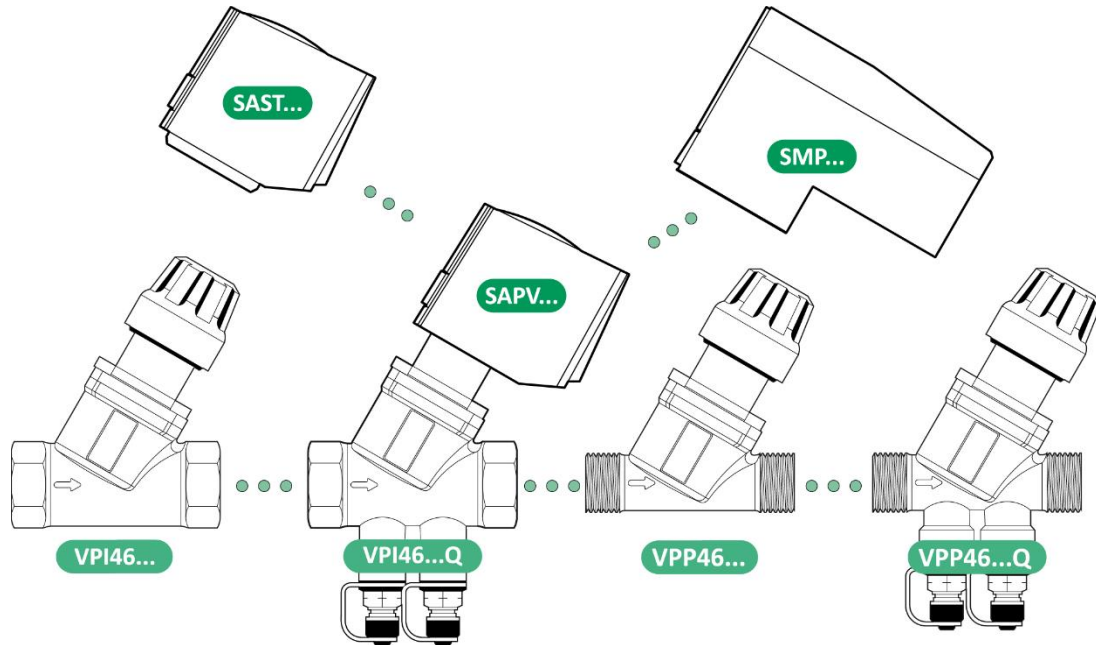
### LWZ-Hxyz

Construction subject to change.

No return possible.

## HYDRAULIC CONTROL

The thermal power can be controlled with the help of a two-way valve and an actuator. The valve and the actuators can be adjusted on site without tools.



### Pressure independent control valves

Code	Model	DN	H <sub>100</sub> (mm)	Connection (inch)	V <sub>w min-max</sub> (l/h)
VC01	VPP46.10L0.2	10	2,5	G ½	30 - 200
VC02	VPP46.10L0.4	10	4,5 5,0	G ½	65 - 333 65 - 370
VC03	VPP46.15L0.2	15	2,5	G ¾	30 - 200
VC04	VPP46.15L0.6	15	2,5	G ¾	100 - 575
VC08	VPP46.10L0.2Q	10	2,5	G ½	30 - 200
VC09	VPP46.10L0.4Q	10	4,5 5,0	G ½	65 - 333 65 - 370
VC10	VPP46.15L0.2Q	15	2,5	G ¾	30 - 200
VC11	VPP46.15L0.6Q	15	2,5	G ¾	100 - 575
VC15	VPI46.15L0.2	15	2,5	Rp ½	30 - 200
VC16	VPI46.15L0.6	15	2,5	Rp ½	100 - 575
VC20	VPI46.15L0.2Q	15	2,5	Rp ½	30 - 200
VC21	VPI46.15L0.6Q	15	2,5	Rp ½	100 - 575

Maximum allowed differential pressure = 600 kPa | Rp = female thread according to ISO 7-1 | G = male thread ISO 228-1 | DN = nominal width | H<sub>100</sub> = nominal stroke | V<sub>w</sub> = water volumetric flow

The volumetric flow [l/h] can be found in the technical documentation or in the SCHAKO design program. Selection of the optimum valve: the valve must be operated at approx. 80 % of its V<sub>wmax</sub>.

### NOTE

The device is preset ex works to the maximum flow unless otherwise specified.

### VPP valve adapter

Code	DN	Internal thread	External thread
VA01	10	G ½	R ¾
VA02	15	G ¾	R ½

DN = nominal width | G = acc. to ISO 228-1 | R = accr. to ISO 7-1

### Actuators

Code	Model	Type	Actuator signal	Operating voltage
AT01	SAST127474	T	ON/OFF - NC	230 V AC 50/60 Hz
AT02	SAST127475	T	ON/OFF - NC	24 V AC/DC 50/60 Hz
AT03	SAPV127957	T	DC 0...10 V - NC	24 V AC 50/60 Hz
AT04	SAPV128561	T	DC 0...10 V - NC	24 V DC
AM01	SMPV132351	M	DC 0...10 V	24 V AC/DC 50/60 Hz
AM02	SMPO132353	M	DC 0...10 V	24 V AC/DC 50/60 Hz

T = thermal | M = motorised

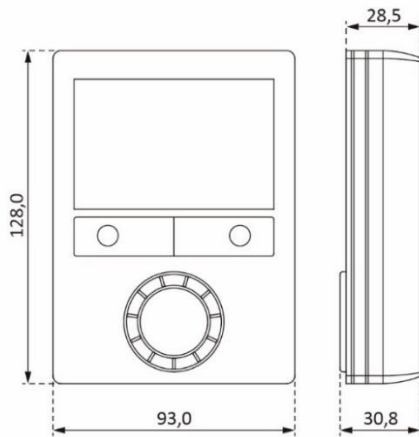
## ROOM THERMOSTAT

Depending on the desired application, different products are available:

Code	Model	Operating voltage	Control outputs *			
			ON/OFF	PWM	3-point	DC 0...10 V
TR01	RDG100	AC 230 V	3	2	2	-
TR02	RDG100T	AC 230 V	3	2	2	-
TR03	RDG110	AC 230 V	2	-	-	-
TK01	RDG100KN	AC 230 V	3	2	2	-
TR05	RDG160T	AC/DC 24 V	2	-	-	2
TK02	RDG160KN	AC 24 V	2	-	-	2

2 control outputs in total, On/Off (relay output) or DC

\*ON/OFF = 2-point activation | 3-point = 3-point activation | PWM = PWM activation | DC 0...10 V = DC 0...10 V activation



RDG...T models with three selection keys

## CONDENSATION MONITOR SUPPLIED LOOSE

The condensation monitor can be ordered separately if the device has been configured with the option -Q0.

### NOTE

In this case, the device is installed on site by the customer.

Code	Sensor	Operating voltage	I max.
WK01	Integrated	230 V AC	0,5 A
WK02	Integrated	24 V AC/DC	1,0 A
WK03	Cable 2 m	230 V AC	0,5 A
WK04	Cable 2 m	24 V AC/DC	1,0 A

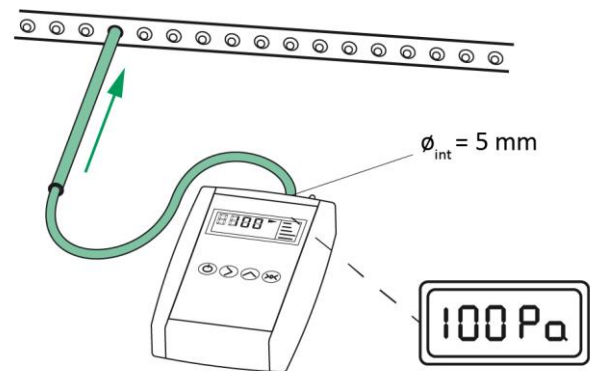
## PRESSURE MEASURING TUBE

The primary air flow with fixed nozzle -B, -C, -D, -E can be calculated from the static pressure inside the device. By mounting this accessory to a manometer, the static pressure of the device can be measured via the nozzles.

MRD1 = Pressure measuring tube for DISA devices

### NOTE

The manometer is not included in the delivery. The calculation data can be found in the mounting instructions.



## INSTALLATION

Please take into account already in the planning phase, that these devices only work in condensate-free operation. For valves, drives, condensate monitors and volumetric flow controllers, the required inspection openings must be planned.

The device is suspended by means of M8 threaded rods which are fastened with the help of nuts and washers to the mounting brackets of the device housing.

NL	09	12	15	18	21	24	27	30
KL (mm)	783	1083	1383	1676	1969	2275	2568	2874

### ATTENTION

If the primary air temperature is below the dew point, the outside of the housing must be insulated.

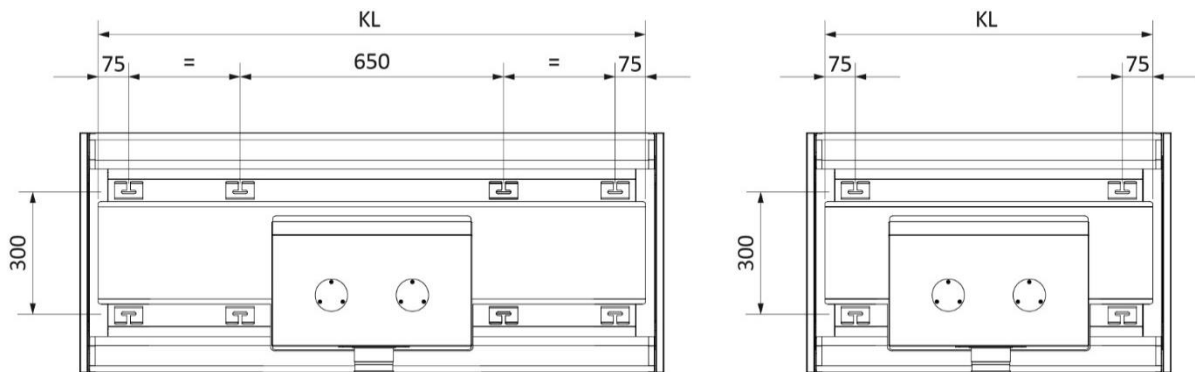
### ATTENTION

If the device is not equipped with an inspection cover, make sure that the clearance already available for the access to the hydraulic connections is big enough.

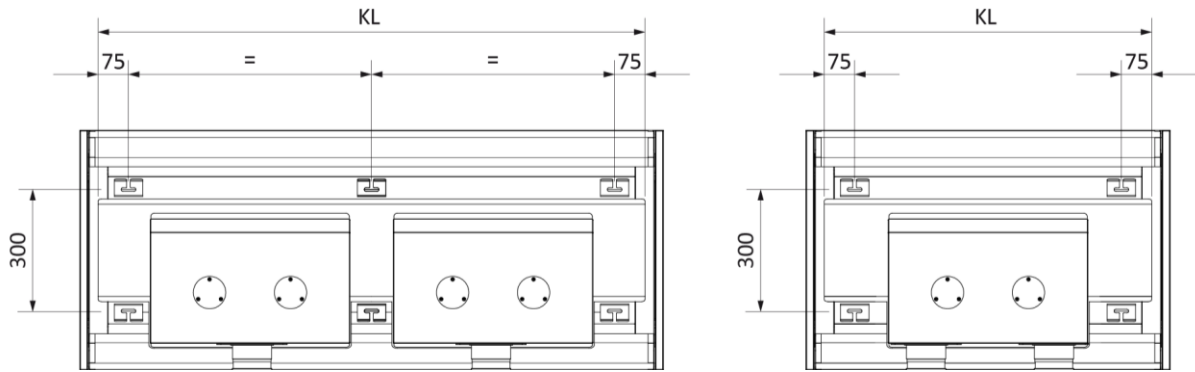
### NOTE

Installation elements such as rods, nuts or washers are not included in the delivery.

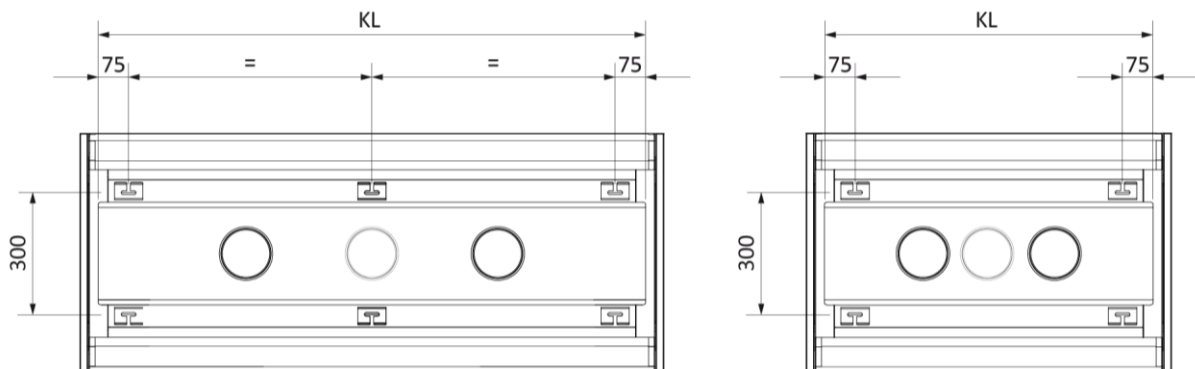
### Position of the mounting brackets, horizontal primary air connection spigot: NL ≥ 18 | NL ≤ 15



### Position of the mounting brackets, two horizontal primary air connection spigots: NL ≥ 18 | NL ≤ 15



### Position of the mounting brackets, vertical primary air connection spigot: NL ≥ 18 | NL ≤ 15

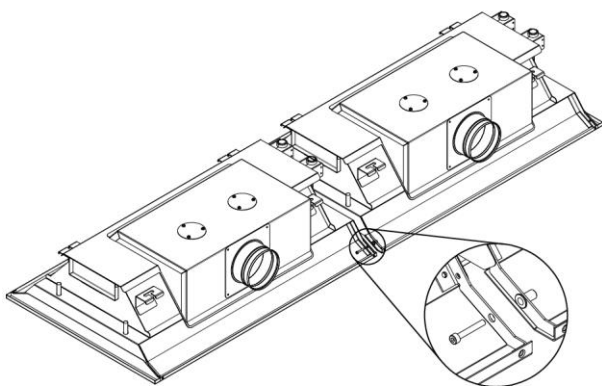


## BAND DESIGN

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For a band design, the DISA devices can be connected to one another. The material required for the band design is included in the delivery and supplied ex works.

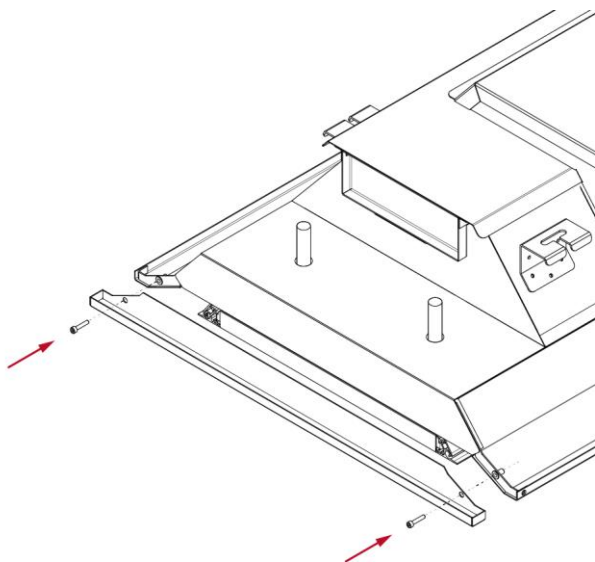
- 1 Align the devices.
- 2 Connect the devices with the material included in the delivery.
- 3 Make sure that the secondary air grille always remains aligned! If the secondary air grille is not perfectly aligned, the suspension points must be re-adjusted.



## ASSEMBLY OF THE END PIECES

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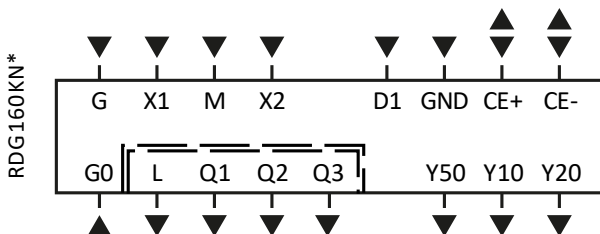
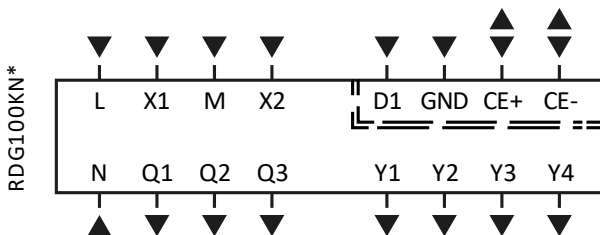
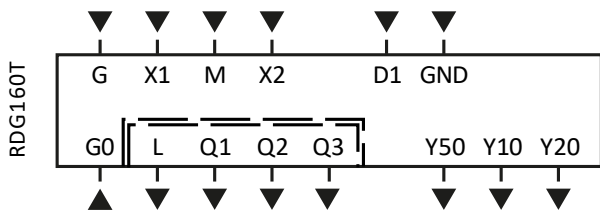
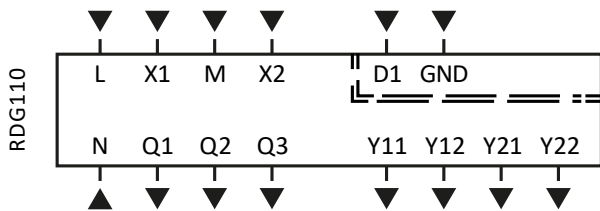
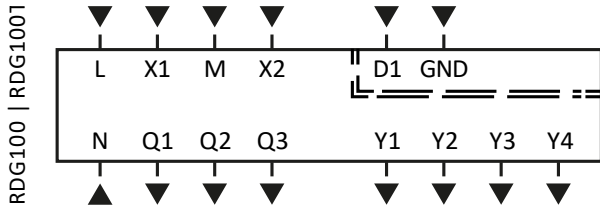
- 1 Connect the end pieces on the device with the material included in the delivery.





CONNECTION OF THE THERMOSTAT AND THE CONDENSATE MONITOR

Type of room thermostat



**\*NOTE**

For the KNX models, please read the specific documentation of the manufacturer since advanced knowledge regarding ETS and Synchro ACS tools are required for them.

Construction subject to change.  
 No return possible.

Terminals

**RDG100.../RDG110**

- L, N Operating voltage AC 230 V
- X1, X2 Multifunctional input for temperature sensor or potential-free switch
- M Measurement zero for sensor and switch
- D1, GND Multifunctional input for potential-free switch
- Q1 Control output fan speed "low"
- Q2 Control output fan speed "average"
- Q3 Control output fan speed "high"
- Y1...Y4 Control output "Valve" AC 230 V
- Y11, Y21 Control output "Valve" AC 230 V für RDG110
- Y12, Y22 Control output "Valve" AC 230 V für RDG110
- CE+ KNX data +
- CE- KNX data -

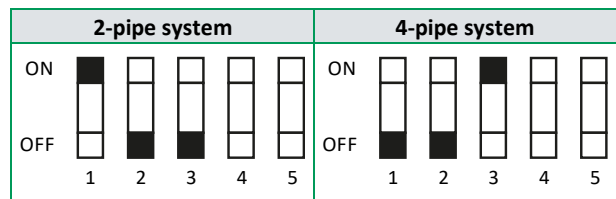
**RDG160...**

- G, G0 Operating voltage AC/DC 24 V
- For 24 V DC: G0 = -; G = +
- L (-N) Power supply relay output AC 24...230 V
- Y10, Y20 Control output for DC 0...10 V drive
- Y50 Control output "Fan" DC 0...10 V
- Q1...3 Control output fan, valve

**RDG...KN**

- CE+ KNX data +
- CE- KNX data -

Configuration of the application via DIP switches 1/2/3



Configuration of the control outputs via DIP switches 4/5 or parameters P46/P47

**RDG100 | RDG100T**

ON						
OFF						
Y1/Y2 =	2-point	2-point	3-point	3-point	3-point	3-point
Y3/Y4 =	2-point	3-point	2-point	3-point	3-point	3-point

If 2-point is selected, the factory setting is ON/OFF. If PWM is desired, the parameters P46 and/or P47 must be set to 2 = PWM.

### RDG110

Only Y11/Y12 and Y21/Y22 with On/Off signal is available.  
 Default DIP values 4/5.

### RDG160T

Via parameters P46/P47.

	Parameters	Signal	Terminal
<b>Control output 1</b>	P46 = 2	DC 0...10 V	Y10
	P46 = 1	2-point	Q1
<b>Control output 2</b>	P47 = 2	DC 0...10 V	Y20
	P47 = 1	2-point	Q2

Factory setting = 2

### Configuration of the multifunctional inputs via parameters

	Applikation	Range
P38	Functionality X1 (factory setting =1)	0 = --- (no function) 1 = Room temp ext/return air temp (AI) 2 = Switchover H/C (AI/DI) 3 = Operating mode contact (DI) 4 = Dew point sensor (DI) 5 = Enable electrical heating (DI) 6 = Fault input (DI) 9 = Supply air sensor *
P40	Functionality X2 (factory setting =2)	
P42	Functionality D1 (factory setting =3)	
P39	Direction of action X1 (DI)	NO = Work contact/open (factory setting) NC = Rest contact/closed
P41	Direction of action X2 (DI)	
P43	Direction of action D1 (DI)	

DI = Digital input | AI = Analog input

\* only for parameter P40 in model RDG160T

### Configuration of the fan via DIP and parameter P52

If the fan operation is locked, the fan symbol will disappear from the display.

P52	Fan operation (factory setting =1)	0 = locked 1 = enabled 2 = heating only 3 = cooling only
-----	---------------------------------------	---

### NOTE

Monitoring of the dew point is required to avoid condensation on the devices (cooling with fan locked, parameter P52).

A dew point detector with potential-free contact is connected to the multifunctional input X1, X2 or D1. If condensation occurs, the cooling valve is closed until no more condensation can be detected. During the temporary override, the symbol for condensation is shown on the display. The input must be set according to the table.

Construction subject to change.  
 No return possible.

### Auto Timer configuration

P02	Operating mode profile (factory setting =1)	1 = Auto Timer comfort protection 2 = Auto Timer comfort economy protection 3 = Comfort protection 4 = Comfort economy protection
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### RDG100T

The time and the day of the week are always visible on the display even if the Auto Timer is switched off (P02 = 3 or 4).

### RDG160T

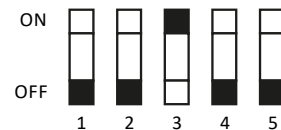
The time and the day of the week are NOT visible on the display if the Auto Timer has been deactivated by setting P02 to 3, 4 or DIP5 to ON.

### Example for the connection with RDG100

#### 1 Room thermostat type: RDG100

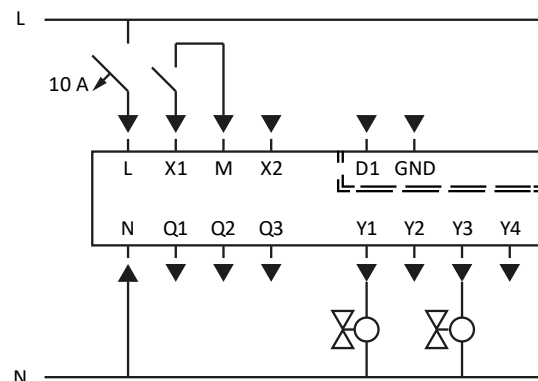
#### 2 DIP switches 1/2/3 and 4/5:

4-pipe system and 2-point actuator



#### 3 Terminals:

- L-L, N-N = Operating voltage AC 230 V
- Y1-N = Actuator AC 230 V On/Off heating
- Y3-N = Actuator AC 230 V On/Off cooling
- X1-M = Condensate detector



#### 4 Parameters:

- P38 = 4 (functionality X1 dew point sensor)
- P39 = NO (work contact/open)
- P46 = 1 (control output Y1 = On/Off)
- P47 = 1 (control output Y3 = On/Off)
- P52 = 0 (fan operation locked)

## USE

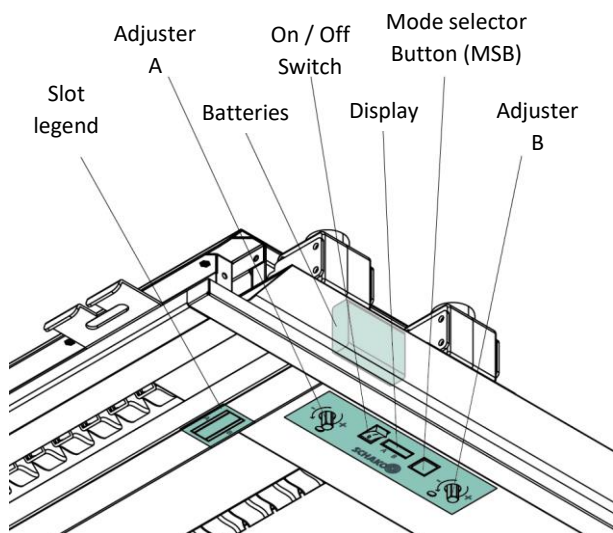
### PRIMARY AIR FLOW REGULATION

#### NOTE

Only for continuously adjustable nozzle (-V).

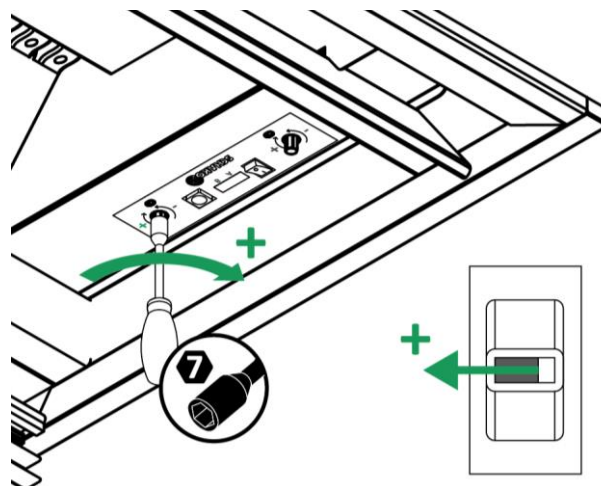
The air flow can be adjusted individually for each slot to the desired nominal value using the adjusters at the ends of the device.

Devices with a nominal length of 15 or less are provided with one regulation per way which can be adjusted at one end of the device. Devices with a nominal length of 18 or more are provided with two regulation sections per slot side which can be adjusted at both ends of the device. Thus the setting is done two times.



- 1 Switch the display on by pressing the On/Off switch. The nominal length of the device is shown on the display.
- 2 Press the mode selector button (MSB). A line in the display shows the selected slot. The slots are marked by a legend on the side profile.
- 3 Adjust the flow of the selected slot via the corresponding adjuster. The percentage of opening and the air flow quantity through the slot are shown.
- 4 Press the mode selector button (MSB). A line in the display shows the next selected slot.
- 5 Adjust the flow of the selected way via the corresponding adjuster. The percentage of opening and the air flow quantity through the slot are shown.
- 6 Press the mode selector button (MSB) again. The total air flow quantity is shown on the display. Check whether this is correct.
- 7 Switch the display off by pressing the On/Off switch.

Construction subject to change.  
 No return possible.



#### ATTENTION

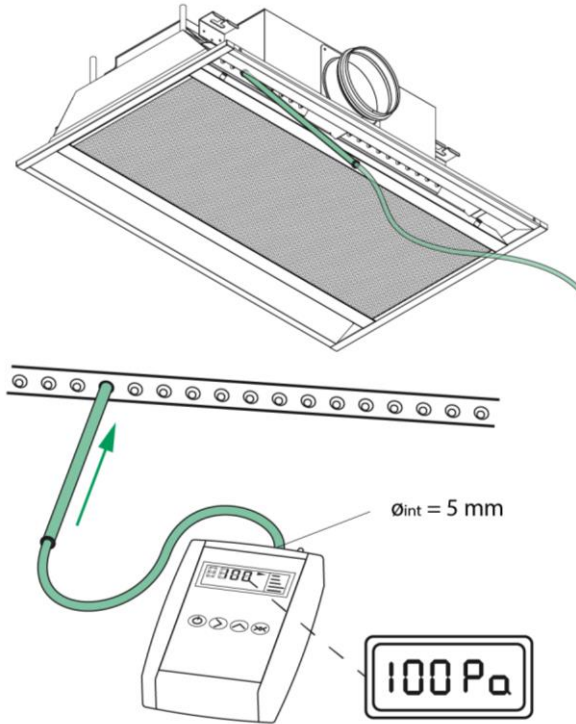
After the setting has been completed, switch the device off by pressing the On/Off switch in order to prevent discharging the batteries. Switch it off even if the display is in the Standby mode.

### CHECKING THE PRIMARY VOLUMETRIC FLOW

**NOTE**

With fixed nozzle -B, -C, -D, -E.

The primary air flow is calculated from the static pressure in the device and the nozzle configuration.



- 1 Connect the flexible end of the pressure measurement hose available as an accessory to the manometer (the manometer is not included in the delivery).
- 2 Press the free end of the tube against one of the nozzles and write down the measured static pressure.
- 3 Repeat the procedure at random on some of the other nozzles distributed along the length of the device and calculate the average of the result.
- 4 Use the following formula in order to obtain the primary air flow in l/s:

$$V_L = K \cdot \sqrt{p_s}$$

$p_s$  = Static pressure

K Pressure loss constant of the model (see table)

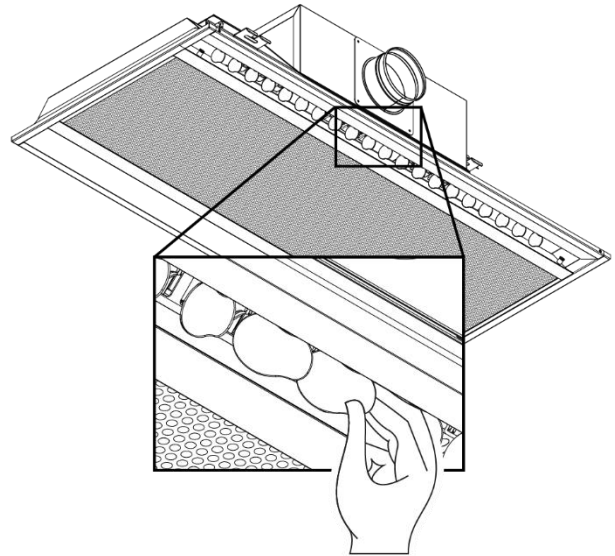
Nozzle s	NL							
	09	12	15	18	21	24	27	30
B	0,71	1,06	1,35	1,69	1,98	2,27	2,59	2,90
C	1,32	1,96	2,50	3,14	3,68	4,21	4,80	5,39
D	1,97	2,92	3,72	4,67	5,48	6,28	7,15	8,03
E	3,32	4,91	6,26	7,86	9,21	10,56	12,03	13,51

$\rho = 1,2\text{ kg/m}^3$

Construction subject to change.  
No return possible.

### ADJUSTMENT OF THE AIR DEFLECTION BLADES

Adjust the blades manually to the desired position. Please note that the device can be configured with individual blades or with blocks of five blades.



**NOTE**

The adjusting angle of the air deflection blades must not be more than  $\pm 45^\circ$ , in order to guarantee its function. At an adjusting angle of the air deflection blades outside the straight air throw of up to  $45^\circ$ , the cooling capacity of the heat exchanger is reduced by up to 5%, and the horizontal throw is reduced.

## MAINTENANCE

SCHAKO has optimised the DISA601 for tool-free maintenance work.

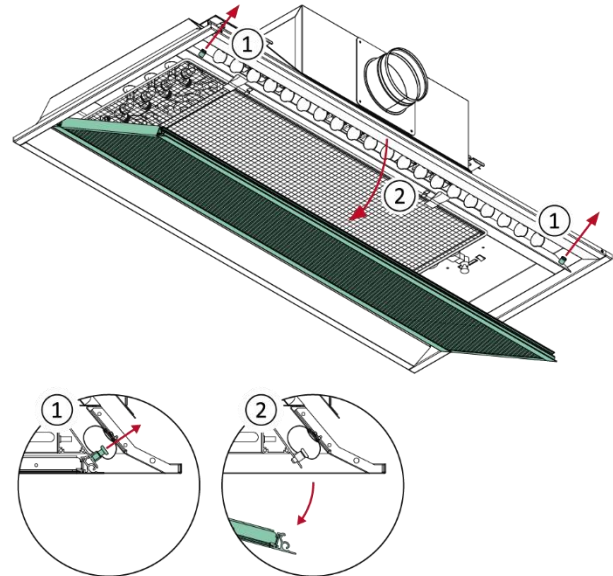
Recommended intervals for testing, maintenance and inspection. Depending on the environment and the contamination, the intervals can be extended.

Action	Corrective actions if applicable	Interval
External inspection: condition of the paint, no corrosion, no water leakage and no humidity.	Repair	12 months
Inspection of the air flow in the grille	Cleaning	6 months
Inspection of the filter: dirt, damage, odours	Cleaning, replacement	3 months
Maximum time interval for filter change	Replacement	24 months
Inspection of the register of devices without filter: dirt, corrosion, leaks, damage	Cleaning, repair	3 months
Inspection of the register of devices with filter: dirt, corrosion, leaks, damage	Cleaning, repair	6 months
Inspection of the nozzles: clogging	Cleaning	6 months
Inspection of the primary air flow	Adjustment	12 months
Inspection of the good functioning of the regulation and the condensate monitor	Repair	12 months

## ACCESS TO THE UNIT

Open the secondary air grille to get access to the device.

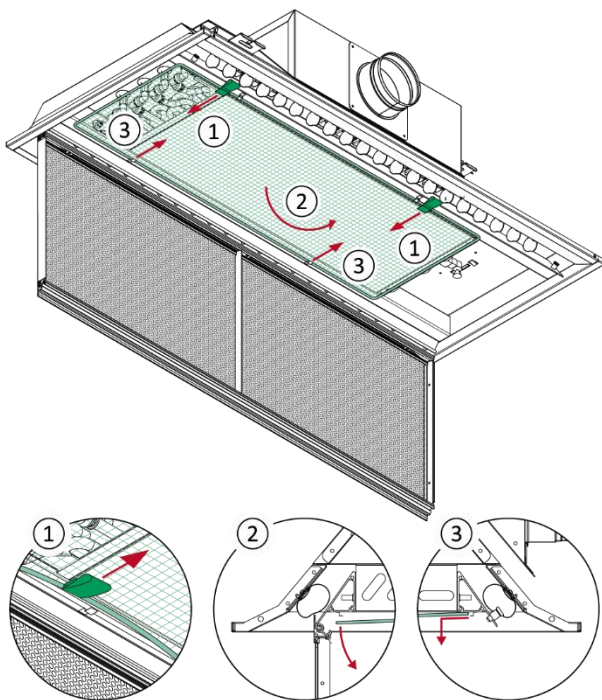
- 1 Loosen the two locks located at both ends of the device. Hold the secondary air grille with one hand to prevent the grille from opening too fast. If the device is longer than 1800 mm, two persons may be necessary.
- 2 Fold the grille manually down until it hangs vertically. At the long side, the secondary air grille is hold by a hinge.



After the end of the maintenance work, the secondary air grille is brought to its original position by pressing it into the device until you hear the locks click into place.

## REMOVING THE FILTER

- 0 Fold the secondary air grille down to get access to the filter.
- 1 Slightly pull the handle to loosen the filter.
- 2 Fold the filter down.
- 3 Pull the filter out.



The filter can be cleaned with a vacuum cleaner, compressed air or by washing with warm water and a non-aggressive cleaner.

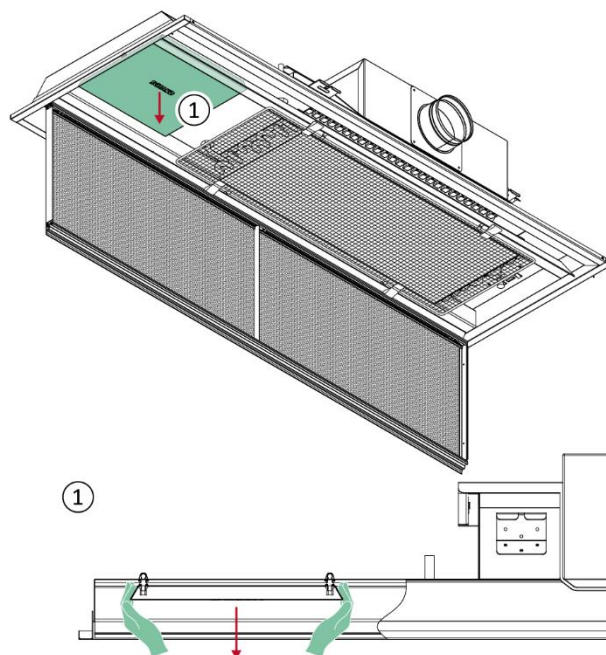
After maintenance of the filter, install the filter again in reverse order.

## ACCESS TO THE HYDRAULIC CONNECTIONS

If the device was not configured with a hydraulic inspection cover, sufficiently large access openings for accessing the hydraulic connections must be provided. For accessing the openings, please follow the instructions of the installer.

If the device was not configured with a hydraulic inspection cover:

- 1 Fold the grille down.
- 2 Remove the cover by pulling it downward. The cover can be removed without tools.



After the end of the maintenance work, insert the cover again in reverse order.

## ACCESS TO THE HEAT EXCHANGER REGISTER

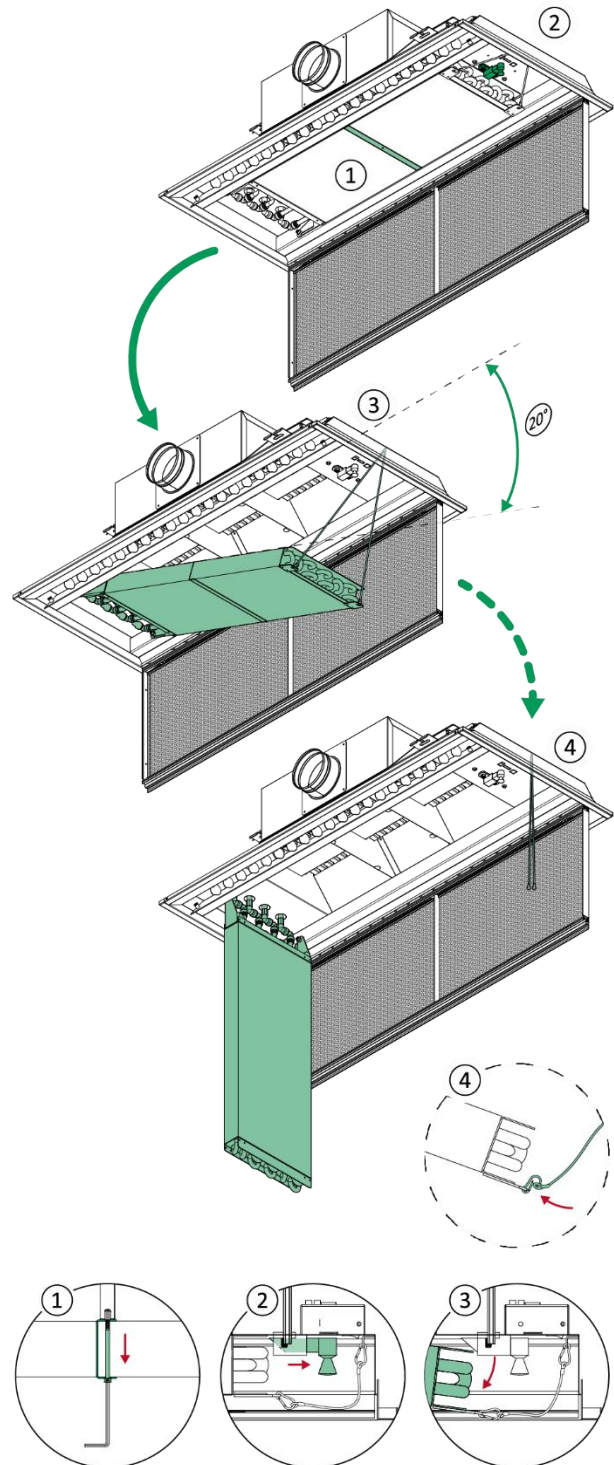
### NOTE

Only for devices with tiltable register.

- 0 Fold the secondary air grille down and remove the secondary air filter, if there is one.
- 1 Long devices are supplied with a shipping brace in order to avoid transport damage. Remove it, if there is one. It is not necessary to mount it again after the end of the maintenance work.
- 2 Hold the register with one hand while loosening the lock with the other hand.
- 3 Fold the register down and make sure that it does not fall down
- 4 The register is equipped with a safety rope. To get full access to the inner surface, loosen the hook completely and fold the register manually down.

The register can be cleaned with a vacuum cleaner or compressed air.

After maintenance of the register, remount the register in reverse order.



TECHNICAL DATA

COOLING CAPACITY

Nozzle -B

NL	V <sub>p</sub>		P <sub>s</sub>	Q <sub>s</sub> Primary air (W)				2-pipe system					4-pipe system				
	(m <sup>3</sup> /h)	[l/s]		(Pa)	t <sub>R</sub> - t <sub>P</sub> (K)				Q <sub>s</sub> Water (W)   t <sub>R</sub> - t <sub>w1</sub> (K)			Δ <sub>PW</sub>	Q <sub>s</sub> Water (W)   t <sub>R</sub> - t <sub>w1</sub> (K)				Δ <sub>PW</sub>
				6	8	10	12	6	8	10	12	(kPa)	6	8	10	12	(kPa)
09	18,1	5,0	50	36	48	60	73	210	282	354	428	14,0	208	277	346	416	10,4
	22,2	6,2	75	44	59	74	89	264	355	447	541	14,0	260	347	434	521	10,4
	25,7	7,1	100	51	68	86	103	304	408	515	623	14,0	298	397	497	596	10,4
	31,4	8,7	150	63	84	105	126	358	483	609	738	14,0	350	467	583	700	10,4
	36,3	10,1	200	73	97	121	145	395	533	673	817	14,0	385	513	642	770	10,4
12	26,9	7,5	50	54	72	90	108	295	395	497	600	17,4	291	389	486	583	12,9
	32,9	9,1	75	66	88	110	132	367	493	620	750	17,4	361	481	602	722	12,9
	38,0	10,6	100	76	101	127	152	418	562	708	857	17,4	410	547	683	820	12,9
	46,6	12,9	150	93	124	155	186	487	656	828	1003	17,4	476	635	793	952	12,9
	53,8	14,9	200	108	143	179	215	533	719	908	1102	17,4	520	693	867	1040	12,9
15	34,3	9,5	50	69	91	114	137	371	497	625	755	20,6	367	489	611	733	15,3
	42,0	11,7	75	84	112	140	168	448	602	758	916	20,6	442	589	736	883	15,3
	48,5	13,5	100	97	129	162	194	504	678	854	1033	20,6	495	661	826	991	15,3
	59,4	16,5	150	119	158	198	237	582	783	988	1196	20,6	570	759	949	1139	15,3
	68,5	19,0	200	137	183	228	274	634	854	1079	1307	20,6	620	826	1033	1239	15,3
18	43,0	11,9	50	86	115	143	172	453	608	765	923	23,7	448	598	747	897	17,7
	52,7	14,6	75	105	140	176	211	538	723	910	1100	23,7	530	707	884	1061	17,7
	60,8	16,9	100	122	162	203	243	599	805	1015	1228	23,7	589	786	982	1179	17,7
	74,5	20,7	150	149	199	248	298	684	920	1161	1406	23,7	671	894	1118	1341	17,7
	86,0	23,9	200	172	229	287	344	741	998	1260	1527	23,7	725	967	1209	1450	17,7
21	50,4	14,0	50	101	134	168	202	502	673	846	1021	26,9	497	662	828	994	20,1
	61,7	17,1	75	123	165	206	247	607	815	1026	1239	26,9	599	799	998	1198	20,1
	71,3	19,8	100	143	190	238	285	681	915	1152	1393	26,9	670	893	1117	1340	20,1
	87,3	24,2	150	175	233	291	349	779	1047	1321	1599	26,9	764	1019	1273	1528	20,1
	100,8	28,0	200	202	269	336	403	842	1133	1430	1732	26,9	824	1099	1374	1649	20,1
24	57,8	16,1	50	116	154	193	231	560	751	944	1139	30,1	555	740	925	1110	22,5
	70,8	19,7	75	142	189	236	283	678	910	1146	1384	30,1	670	893	1116	1339	22,5
	81,7	22,7	100	163	218	272	327	759	1020	1285	1553	30,1	748	997	1247	1496	22,5
	100,1	27,8	150	200	267	334	400	865	1163	1466	1775	30,1	849	1133	1416	1699	22,5
	115,6	32,1	200	231	308	385	462	932	1254	1582	1915	30,1	913	1218	1522	1827	22,5
27	65,9	18,3	50	132	176	220	263	658	883	1110	1339	33,3	652	869	1086	1303	25,0
	80,7	22,4	75	161	215	269	323	774	1040	1309	1581	33,3	765	1019	1274	1529	25,0
	93,1	25,9	100	186	248	310	373	855	1149	1447	1749	33,3	842	1123	1404	1685	25,0
	114,1	31,7	150	228	304	380	456	961	1292	1628	1970	33,3	944	1259	1573	1888	25,0
	131,7	36,6	200	263	351	439	527	1028	1383	1744	2111	33,3	1008	1344	1680	2016	25,0
30	73,9	20,5	50	148	197	246	296	690	925	1163	1403	36,5	684	912	1140	1368	27,3
	90,5	25,1	75	181	241	302	362	815	1094	1376	1662	36,5	806	1074	1343	1611	27,3
	104,5	29,0	100	209	279	348	418	903	1213	1527	1846	36,5	891	1188	1485	1782	27,3
	128,0	35,6	150	256	341	427	512	1023	1375	1732	2095	36,5	1006	1341	1677	2012	27,3
	147,8	41,1	200	296	394	493	591	1100	1479	1865	2257	36,5	1080	1440	1800	2160	27,3

V<sub>wn</sub> = 0,07 l/s corresponds to 250 l/h

Construction subject to change.  
 No return possible.



Nozzle -C

NL	V <sub>p</sub>		P <sub>s</sub>	Q <sub>s</sub> Primary air (W)				2-pipe system					4-pipe system				
	(m <sup>3</sup> /h)	[l/s]		t <sub>R</sub> - t <sub>P</sub> (K)				Q <sub>s</sub> Water (W)   t <sub>R</sub> - t <sub>w1</sub> (K)					ΔP <sub>w</sub>	Q <sub>s</sub> Water (W)   t <sub>R</sub> - t <sub>w1</sub> (K)			
			(Pa)	6	8	10	12	6	8	10	12	(kPa)	6	8	10	12	(kPa)
09	33,4	9,3	50	67	89	111	134	241	324	408	493	14,0	238	317	397	476	10,4
	40,9	11,4	75	82	109	136	164	300	404	509	616	14,0	295	393	491	590	10,4
	47,2	13,1	100	94	126	157	189	343	462	584	707	14,0	336	448	560	672	10,4
	57,9	16,1	150	116	154	193	231	404	545	689	836	14,0	393	525	656	787	10,4
	66,8	18,6	200	134	178	223	267	446	602	762	926	14,0	433	577	721	866	10,4
12	49,5	13,7	50	99	132	165	198	340	457	575	695	17,4	336	447	559	671	12,9
	60,6	16,8	75	121	162	202	242	418	563	709	858	17,4	411	547	684	821	12,9
	70,0	19,4	100	140	187	233	280	474	639	806	977	17,4	464	619	773	928	12,9
	85,7	23,8	150	171	229	286	343	552	744	941	1141	17,4	537	717	896	1075	12,9
	99,0	27,5	200	198	264	330	396	605	817	1034	1255	17,4	588	783	979	1175	12,9
15	63,1	17,5	50	126	168	210	252	402	540	680	821	20,6	398	530	663	795	15,3
	77,3	21,5	75	155	206	258	309	492	661	833	1008	20,6	484	645	806	968	15,3
	89,2	24,8	100	178	238	297	357	555	747	942	1140	20,6	544	726	907	1089	15,3
	109,3	30,4	150	219	291	364	437	640	862	1089	1320	20,6	625	834	1042	1250	15,3
	126,2	35,1	200	252	337	421	505	696	938	1185	1438	20,6	678	903	1129	1355	15,3
18	79,2	22,0	50	158	211	264	317	482	647	814	983	23,7	476	635	794	952	17,7
	97,0	26,9	75	194	259	323	388	584	784	988	1195	23,7	574	766	957	1149	17,7
	112,0	31,1	100	224	299	373	448	655	882	1112	1346	23,7	643	858	1072	1286	17,7
	137,1	38,1	150	274	366	457	549	751	1012	1277	1548	23,7	735	979	1224	1469	17,7
	158,4	44,0	200	317	422	528	633	813	1096	1385	1679	23,7	793	1058	1322	1586	17,7
21	92,8	25,8	50	186	247	309	371	547	734	923	1115	26,9	541	721	901	1082	20,1
	113,6	31,6	75	227	303	379	455	661	888	1118	1352	26,9	651	868	1085	1302	20,1
	131,2	36,5	100	262	350	437	525	740	995	1254	1517	26,9	727	969	1212	1454	20,1
	160,7	44,6	150	321	429	536	643	843	1135	1432	1735	26,9	826	1101	1376	1651	20,1
	185,6	51,5	200	371	495	619	742	909	1224	1545	1873	26,9	888	1184	1479	1775	20,1
24	106,4	29,6	50	213	284	355	426	608	816	1026	1239	30,1	602	802	1003	1204	22,5
	130,3	36,2	75	261	347	434	521	726	975	1227	1483	30,1	716	954	1193	1432	22,5
	150,5	41,8	100	301	401	502	602	807	1085	1367	1653	30,1	794	1059	1323	1588	22,5
	184,3	51,2	150	369	491	614	737	913	1228	1549	1875	30,1	895	1194	1492	1790	22,5
	212,8	59,1	200	426	567	709	851	978	1317	1662	2013	30,1	958	1277	1596	1915	22,5
27	121,2	33,7	50	242	323	404	485	697	935	1176	1420	33,3	689	919	1149	1379	25,0
	148,5	41,2	75	297	396	495	594	833	1119	1409	1703	33,3	821	1095	1369	1643	25,0
	171,5	47,6	100	343	457	572	686	924	1241	1564	1892	33,3	908	1211	1514	1816	25,0
	210,0	58,3	150	420	560	700	840	1034	1391	1755	2125	33,3	1014	1352	1690	2029	25,0
	242,5	67,4	200	485	647	808	970	1099	1479	1866	2261	33,3	1076	1434	1793	2151	25,0
30	136,1	37,8	50	272	363	454	544	757	1015	1277	1541	36,5	749	999	1248	1498	27,3
	166,7	46,3	75	333	444	556	667	896	1203	1514	1830	36,5	884	1178	1473	1768	27,3
	192,5	53,5	100	385	513	642	770	991	1332	1678	2029	36,5	976	1301	1626	1951	27,3
	235,7	65,5	150	471	629	786	943	1113	1498	1888	2285	36,5	1093	1457	1822	2186	27,3
	272,2	75,6	200	544	726	907	1089	1188	1599	2018	2443	36,5	1165	1553	1941	2329	27,3

V<sub>wn</sub> = 0,07 l/s corresponds to 250 l/h

Construction subject to change.  
 No return possible.

Nozzle -D

NL	V <sub>p</sub>		P <sub>s</sub>	Q <sub>s</sub> Primary air (W)				2-pipe system					4-pipe system				
	(m <sup>3</sup> /h)	[l/s]		t <sub>R</sub> - t <sub>P</sub> (K)				Q <sub>s</sub> Water (W)   t <sub>R</sub> - t <sub>w1</sub> (K)					ΔP <sub>w</sub>	Q <sub>s</sub> Water (W)   t <sub>R</sub> - t <sub>w1</sub> (K)			
			(Pa)	6	8	10	12	6	8	10	12	(kPa)	6	8	10	12	(kPa)
09	50,2	13,9	50	100	134	167	201	274	368	464	561	14,0	270	359	449	539	10,4
	61,4	17,1	75	123	164	205	246	330	444	561	679	14,0	323	431	539	647	10,4
	71,0	19,7	100	142	189	237	284	371	500	631	765	14,0	362	483	603	724	10,4
	86,9	24,1	150	174	232	290	348	427	576	729	885	14,0	415	553	691	830	10,4
	100,3	27,9	200	201	268	334	401	464	627	794	965	14,0	450	600	750	900	10,4
12	74,3	20,6	50	149	198	248	297	372	500	630	762	17,4	366	488	611	733	12,9
	91,0	25,3	75	182	243	303	364	446	600	757	916	17,4	437	583	728	874	12,9
	105,1	29,2	100	210	280	350	420	499	672	849	1029	17,4	488	650	813	975	12,9
	128,7	35,8	150	257	343	429	515	573	772	977	1185	17,4	557	742	928	1114	12,9
	148,7	41,3	200	297	396	496	595	621	839	1062	1290	17,4	603	804	1005	1205	12,9
15	94,8	26,3	50	190	253	316	379	448	602	758	916	20,6	442	589	736	884	15,3
	116,1	32,2	75	232	310	387	464	533	717	904	1094	20,6	523	698	872	1047	15,3
	134,0	37,2	100	268	357	447	536	593	799	1008	1221	20,6	581	774	968	1162	15,3
	164,2	45,6	150	328	438	547	657	674	908	1148	1392	20,6	657	876	1095	1314	15,3
	189,5	52,7	200	379	505	632	758	726	980	1239	1503	20,6	707	942	1178	1413	15,3
18	118,9	33,0	50	238	317	396	476	529	711	895	1081	23,7	522	696	870	1044	17,7
	145,7	40,5	75	291	388	486	583	626	841	1060	1283	23,7	615	820	1024	1229	17,7
	168,2	46,7	100	336	449	561	673	693	933	1177	1425	23,7	679	906	1132	1358	17,7
	206,0	57,2	150	412	549	687	824	783	1055	1332	1615	23,7	764	1019	1274	1529	17,7
	237,9	66,1	200	476	634	793	951	840	1133	1432	1737	23,7	819	1092	1365	1638	17,7
21	139,4	38,7	50	279	372	465	557	622	835	1052	1271	26,9	614	818	1023	1227	20,1
	170,7	47,4	75	341	455	569	683	730	982	1238	1498	26,9	718	957	1196	1436	20,1
	197,1	54,8	100	394	526	657	788	806	1084	1368	1656	26,9	790	1053	1317	1580	20,1
	241,4	67,1	150	483	644	805	966	905	1219	1540	1866	26,9	885	1179	1474	1769	20,1
	278,7	77,4	200	557	743	929	1115	968	1305	1649	2000	26,9	944	1259	1573	1888	20,1
24	159,8	44,4	50	320	426	533	639	694	932	1173	1418	30,1	685	914	1142	1371	22,5
	195,7	54,4	75	391	522	652	783	810	1088	1371	1658	30,1	796	1062	1327	1593	22,5
	226,0	62,8	100	452	603	753	904	892	1199	1512	1831	30,1	875	1167	1458	1750	22,5
	276,8	76,9	150	554	738	923	1107	1003	1351	1705	2066	30,1	981	1309	1636	1963	22,5
	319,6	88,8	200	639	852	1065	1278	1078	1452	1834	2224	30,1	1052	1403	1753	2104	22,5
27	182,1	50,6	50	364	486	607	728	762	1023	1288	1556	33,3	753	1004	1255	1506	25,0
	223,0	62,0	75	446	595	743	892	882	1185	1492	1805	33,3	868	1157	1447	1736	25,0
	257,5	71,5	100	515	687	858	1030	965	1298	1636	1980	33,3	948	1265	1581	1897	25,0
	315,4	87,6	150	631	841	1051	1262	1077	1449	1828	2214	33,3	1055	1406	1758	2109	25,0
	364,2	101,2	200	728	971	1214	1457	1147	1545	1951	2364	33,3	1122	1496	1870	2244	25,0
30	204,4	56,8	50	409	545	681	818	821	1102	1386	1674	36,5	811	1082	1352	1623	27,3
	250,4	69,5	75	501	668	835	1001	958	1287	1621	1959	36,5	944	1258	1573	1887	27,3
	289,1	80,3	100	578	771	964	1156	1052	1414	1782	2156	36,5	1034	1379	1723	2068	27,3
	354,0	98,3	150	708	944	1180	1416	1174	1579	1992	2412	36,5	1151	1534	1918	2301	27,3
	408,8	113,6	200	818	1090	1363	1635	1250	1683	2125	2574	36,5	1224	1631	2039	2447	27,3

V<sub>wn</sub> = 0,07 l/s corresponds to 250 l/h

Construction subject to change.  
 No return possible.

Nozzle -E

NL	V <sub>p</sub>		P <sub>s</sub>	Q <sub>s</sub> Primary air (W)				2-pipe system					4-pipe system				
	(m <sup>3</sup> /h)	[l/s]		t <sub>R</sub> - t <sub>p</sub> (K)				Q <sub>s</sub> Water (W)   t <sub>R</sub> - t <sub>w1</sub> (K)				ΔP <sub>w</sub>	Q <sub>s</sub> Water (W)   t <sub>R</sub> - t <sub>w1</sub> (K)				ΔP <sub>w</sub>
			(Pa)	6	8	10	12	6	8	10	12	(kPa)	6	8	10	12	(kPa)
09	84,8	23,6	50	170	226	283	339	345	465	587	711	14,0	338	450	563	676	10,4
	103,9	28,9	75	208	277	346	416	392	529	668	811	14,0	382	510	637	764	10,4
	119,9	33,3	100	240	320	400	480	426	574	727	882	14,0	414	552	690	827	10,4
	146,9	40,8	150	294	392	490	588	472	638	808	982	14,0	457	609	762	914	10,4
	169,6	47,1	200	339	452	565	679	504	682	864	1051	14,0	487	649	811	974	10,4
12	125,7	34,9	50	251	335	419	503	445	599	756	916	17,4	437	582	728	873	12,9
	153,9	42,7	75	308	410	513	616	502	676	853	1034	17,4	490	653	817	980	12,9
	177,7	49,4	100	355	474	592	711	541	729	921	1117	17,4	527	702	878	1053	12,9
	217,6	60,5	150	435	580	725	871	592	799	1011	1228	17,4	575	767	959	1151	12,9
	251,3	69,8	200	503	670	838	1005	627	846	1071	1302	17,4	608	810	1013	1215	12,9
15	160,2	44,5	50	320	427	534	641	541	727	917	1110	20,6	531	708	885	1061	15,3
	196,2	54,5	75	392	523	654	785	609	820	1035	1253	20,6	595	794	992	1191	15,3
	226,6	62,9	100	453	604	755	906	656	883	1116	1353	20,6	640	853	1067	1280	15,3
	277,5	77,1	150	555	740	925	1110	718	969	1225	1487	20,6	699	932	1165	1398	15,3
	320,4	89,0	200	641	854	1068	1282	761	1027	1300	1578	20,6	739	986	1232	1479	15,3
18	201,0	55,8	50	402	536	670	804	620	833	1050	1270	23,7	609	812	1015	1218	17,7
	246,2	68,4	75	492	657	821	985	692	932	1175	1423	23,7	678	905	1131	1357	17,7
	284,3	79,0	100	569	758	948	1137	742	999	1261	1528	23,7	726	967	1209	1451	17,7
	348,2	96,7	150	696	929	1161	1393	807	1087	1373	1665	23,7	787	1049	1312	1574	17,7
	402,1	111,7	200	804	1072	1340	1608	849	1145	1447	1756	23,7	827	1103	1379	1655	17,7
21	235,6	65,4	50	471	628	785	942	734	986	1243	1504	26,9	721	961	1201	1442	20,1
	288,5	80,2	75	577	769	962	1154	813	1094	1380	1671	26,9	797	1063	1328	1594	20,1
	333,2	92,6	100	666	888	1111	1333	867	1168	1474	1786	26,9	848	1131	1414	1697	20,1
	408,1	113,4	150	816	1088	1360	1632	939	1265	1598	1937	26,9	916	1222	1527	1832	20,1
	471,2	130,9	200	942	1257	1571	1885	988	1332	1683	2041	26,9	963	1283	1604	1925	20,1
24	270,1	75,0	50	540	720	900	1081	805	1082	1363	1649	30,1	792	1056	1320	1584	22,5
	330,9	91,9	75	662	882	1103	1323	892	1200	1513	1831	30,1	875	1167	1459	1751	22,5
	382,0	106,1	100	764	1019	1273	1528	950	1279	1614	1954	30,1	931	1241	1552	1862	22,5
	467,9	130,0	150	936	1248	1560	1872	1026	1382	1745	2115	30,1	1003	1338	1672	2007	22,5
	540,3	150,1	200	1081	1441	1801	2161	1079	1454	1837	2227	30,1	1053	1404	1756	2107	22,5
27	307,8	85,5	50	616	821	1026	1231	887	1192	1501	1815	33,3	873	1164	1455	1746	25,0
	377,0	104,7	75	754	1005	1257	1508	981	1319	1663	2012	33,3	963	1284	1605	1926	25,0
	435,4	120,9	100	871	1161	1451	1741	1047	1409	1777	2152	33,3	1027	1369	1711	2053	25,0
	533,2	148,1	150	1066	1422	1777	2133	1138	1533	1935	2344	33,3	1113	1484	1855	2226	25,0
	615,7	171,0	200	1231	1642	2052	2463	1201	1618	2044	2478	33,3	1173	1564	1955	2346	25,0
30	345,5	96,0	50	691	921	1152	1382	947	1272	1602	1936	36,5	933	1244	1555	1866	27,3
	423,2	117,6	75	846	1129	1411	1693	1046	1406	1772	2144	36,5	1028	1371	1714	2057	27,3
	488,7	135,7	100	977	1303	1629	1955	1113	1498	1888	2285	36,5	1093	1457	1821	2186	27,3
	598,5	166,2	150	1197	1596	1995	2394	1201	1617	2040	2471	36,5	1177	1569	1962	2354	27,3
	691,1	192,0	200	1382	1843	2304	2764	1260	1697	2142	2595	36,5	1233	1644	2055	2466	27,3

V<sub>min</sub> = 0,07 l/s corresponds to 250 l/h

Construction subject to change.  
 No return possible.

Nozzle -V, 25 %

NL	V <sub>p</sub>		P <sub>s</sub>	Q <sub>s</sub> Primary air (W)				2-pipe system					4-pipe system				
	(m <sup>3</sup> /h)	[l/s]		t <sub>R</sub> - t <sub>p</sub> (K)				Q <sub>s</sub> Water (W)   t <sub>R</sub> - t <sub>w1</sub> (K)					Q <sub>s</sub> Water (W)   t <sub>R</sub> - t <sub>w1</sub> (K)				
			(Pa)	6	8	10	12	6	8	10	12	ΔP <sub>w</sub>	6	8	10	12	ΔP <sub>w</sub>
								(kPa)									(kPa)
09	20,9	5,8	50	42	56	70	84	178	237	296	355	14,0	169	225	281	337	10,4
	25,9	7,2	75	52	69	86	104	213	284	356	427	14,0	200	267	334	401	10,4
	30,1	8,4	100	60	80	100	120	241	322	402	483	14,0	225	300	375	451	10,4
	37,2	10,3	150	74	99	124	149	285	380	475	571	14,0	264	351	439	527	10,4
	43,2	12,0	200	86	115	144	173	319	426	532	639	14,0	293	391	489	586	10,4
12	30,2	8,4	50	60	80	101	121	254	339	423	508	17,4	240	320	401	481	12,9
	37,4	10,4	75	75	100	125	150	304	405	506	607	17,4	284	379	474	569	12,9
	43,5	12,1	100	87	116	145	174	342	457	571	685	17,4	319	425	531	637	12,9
	53,8	14,9	150	108	143	179	215	402	536	670	804	17,4	371	494	618	742	12,9
	62,4	17,3	200	125	166	208	250	448	597	747	896	17,4	411	548	684	821	12,9
15	38,7	10,7	50	77	103	129	155	323	431	539	647	20,6	306	408	509	611	15,3
	47,9	13,3	75	96	128	160	192	385	514	642	771	20,6	361	481	601	721	15,3
	55,8	15,5	100	112	149	186	223	433	578	722	867	20,6	403	537	672	806	15,3
	68,9	19,1	150	138	184	230	276	507	675	844	1013	20,6	467	623	778	934	15,3
	80,0	22,2	200	160	213	267	320	562	749	937	1124	20,6	515	687	859	1030	15,3
18	47,9	13,3	50	96	128	160	192	396	529	661	793	23,7	374	499	623	748	17,7
	59,5	16,5	75	119	159	198	238	470	627	784	941	23,7	440	586	733	879	17,7
	69,2	19,2	100	138	184	231	277	527	703	879	1054	23,7	489	652	816	979	17,7
	85,5	23,7	150	171	228	285	342	613	817	1021	1225	23,7	564	752	940	1128	17,7
	99,2	27,6	200	198	265	331	397	676	902	1127	1353	23,7	620	826	1033	1239	17,7
21	56,4	15,7	50	113	151	188	226	463	617	772	926	26,9	436	582	727	873	20,1
	70,0	19,4	75	140	187	233	280	547	730	912	1094	26,9	511	681	851	1022	20,1
	81,4	22,6	100	163	217	271	326	611	815	1019	1223	26,9	567	756	945	1134	20,1
	100,6	28,0	150	201	268	335	403	706	942	1177	1413	26,9	651	867	1084	1301	20,1
	116,8	32,4	200	234	312	389	467	776	1035	1294	1553	26,9	712	949	1187	1424	20,1
24	65,7	18,3	50	131	175	219	263	533	711	889	1067	30,1	502	669	837	1004	22,5
	81,5	22,6	75	163	217	272	326	628	837	1046	1255	30,1	585	780	976	1171	22,5
	94,8	26,3	100	190	253	316	379	698	931	1164	1397	30,1	648	864	1079	1295	22,5
	117,2	32,5	150	234	312	391	469	802	1070	1337	1604	30,1	739	985	1232	1478	22,5
	136,0	37,8	200	272	363	453	544	877	1170	1462	1755	30,1	805	1074	1342	1611	22,5
27	74,2	20,6	50	148	198	247	297	597	796	994	1193	33,3	561	748	935	1122	25,0
	92,1	25,6	75	184	245	307	368	699	932	1166	1399	33,3	652	869	1086	1304	25,0
	107,1	29,7	100	214	286	357	428	775	1034	1292	1551	33,3	719	959	1198	1438	25,0
	132,3	36,8	150	265	353	441	529	886	1181	1476	1771	33,3	816	1089	1361	1633	25,0
	153,6	42,7	200	307	410	512	615	964	1285	1607	1928	33,3	887	1182	1478	1773	25,0
30	83,5	23,2	50	167	223	278	334	663	885	1106	1327	36,5	623	831	1039	1247	27,3
	103,6	28,8	75	207	276	345	414	774	1032	1290	1548	36,5	721	961	1202	1442	27,3
	120,5	33,5	100	241	321	402	482	855	1140	1425	1709	36,5	793	1057	1321	1585	27,3
	148,9	41,4	150	298	397	496	596	970	1293	1616	1940	36,5	895	1193	1492	1790	27,3
	172,8	48,0	200	346	461	576	691	1050	1401	1751	2101	36,5	968	1290	1613	1936	27,3

V<sub>wn</sub> = 0,07 l/s corresponds to 250 l/h

Construction subject to change.  
 No return possible.

Nozzle -V, 50 %

NL	V <sub>p</sub>		P <sub>s</sub> (Pa)	Q <sub>s</sub> Primary air (W)				2-pipe system					4-pipe system				
	(m <sup>3</sup> /h)	[l/s]		t <sub>R</sub> - t <sub>P</sub> (K)				Q <sub>s</sub> Water (W)   t <sub>R</sub> - t <sub>w1</sub> (K)				ΔP <sub>w</sub> (kPa)	Q <sub>s</sub> Water (W)   t <sub>R</sub> - t <sub>w1</sub> (K)				ΔP <sub>w</sub> (kPa)
				6	8	10	12	6	8	10	12		6	8	10	12	
09	42,7	11,9	50	85	114	142	171	254	338	423	508	14,0	236	315	394	472	10,4
	52,8	14,7	75	106	141	176	211	299	399	498	598	14,0	276	367	459	551	10,4
	61,2	17,0	100	122	163	204	245	334	445	557	668	14,0	306	408	510	612	10,4
	75,4	21,0	150	151	201	251	302	388	517	646	775	14,0	352	469	587	704	10,4
	87,4	24,3	200	175	233	291	350	428	571	714	857	14,0	387	516	645	774	10,4
12	61,7	17,1	50	123	165	206	247	359	479	599	719	17,4	333	445	556	667	12,9
	76,2	21,2	75	152	203	254	305	421	561	701	842	17,4	387	516	645	774	12,9
	88,4	24,6	100	177	236	295	354	468	624	780	936	17,4	428	570	713	856	12,9
	109,0	30,3	150	218	291	363	436	538	718	897	1077	17,4	489	652	815	978	12,9
	126,3	35,1	200	253	337	421	505	591	788	986	1183	17,4	535	713	891	1069	12,9
15	79,1	22,0	50	158	211	264	316	454	606	757	908	20,6	421	562	702	842	15,3
	97,7	27,1	75	195	261	326	391	529	706	882	1058	20,6	487	649	811	973	15,3
	113,4	31,5	100	227	302	378	454	586	781	976	1171	20,6	536	714	893	1072	15,3
	139,7	38,8	150	279	373	466	559	670	893	1116	1339	20,6	609	811	1014	1217	15,3
	161,9	45,0	200	324	432	540	648	731	975	1219	1462	20,6	662	883	1104	1325	15,3
18	98,1	27,3	50	196	262	327	392	552	735	919	1103	23,7	511	681	851	1021	17,7
	121,2	33,7	75	242	323	404	485	639	851	1064	1277	23,7	587	782	978	1173	17,7
	140,6	39,1	100	281	375	469	562	703	938	1172	1406	23,7	643	858	1072	1286	17,7
	173,2	48,1	150	346	462	577	693	797	1063	1329	1595	23,7	726	968	1210	1451	17,7
	200,8	55,8	200	402	535	669	803	865	1154	1442	1731	23,7	786	1048	1310	1571	17,7
21	115,5	32,1	50	231	308	385	462	639	851	1064	1277	26,9	591	788	985	1182	20,1
	142,7	39,6	75	285	380	476	571	735	980	1225	1470	26,9	676	901	1126	1352	20,1
	165,6	46,0	100	331	441	552	662	806	1074	1343	1612	26,9	738	984	1230	1476	20,1
	204,0	56,7	150	408	544	680	816	907	1209	1512	1814	26,9	827	1103	1379	1655	20,1
	236,4	65,7	200	473	630	788	946	979	1305	1631	1958	26,9	892	1189	1486	1783	20,1
24	134,5	37,4	50	269	359	448	538	728	971	1214	1457	30,1	674	899	1123	1348	22,5
	166,1	46,1	75	332	443	554	664	833	1111	1388	1666	30,1	766	1022	1277	1533	22,5
	192,8	53,5	100	386	514	643	771	908	1211	1514	1817	30,1	833	1111	1389	1666	22,5
	237,5	66,0	150	475	633	792	950	1014	1352	1691	2029	30,1	928	1237	1547	1856	22,5
	275,3	76,5	200	551	734	918	1101	1088	1450	1813	2176	30,1	995	1327	1658	1990	22,5
27	151,9	42,2	50	304	405	506	608	807	1077	1346	1615	33,3	747	996	1246	1495	25,0
	187,6	52,1	75	375	500	625	750	918	1224	1530	1836	33,3	845	1127	1409	1691	25,0
	217,7	60,5	100	435	581	726	871	996	1328	1661	1993	33,3	915	1221	1526	1831	25,0
	268,3	74,5	150	537	715	894	1073	1104	1472	1840	2209	33,3	1014	1351	1689	2027	25,0
	310,9	86,4	200	622	829	1036	1244	1178	1570	1963	2355	33,3	1082	1442	1803	2163	25,0
30	170,9	47,5	50	342	456	570	684	888	1185	1481	1777	36,5	823	1097	1371	1645	27,3
	211,0	58,6	75	422	563	703	844	1003	1338	1672	2006	36,5	925	1234	1542	1850	27,3
	244,9	68,0	100	490	653	816	980	1083	1444	1805	2166	36,5	998	1330	1663	1995	27,3
	301,8	83,8	150	604	805	1006	1207	1191	1588	1985	2382	36,5	1097	1463	1829	2195	27,3
	349,7	97,2	200	699	933	1166	1399	1263	1684	2105	2526	36,5	1165	1554	1942	2331	27,3

V<sub>wn</sub> = 0,07 l/s corresponds to 250 l/h

Construction subject to change.  
 No return possible.

Nozzle -V, 75 %

NL	V <sub>p</sub>		P <sub>s</sub> (Pa)	Q <sub>s</sub> Primary air (W)				2-pipe system					4-pipe system					
	(m <sup>3</sup> /h)	[l/s]		t <sub>R</sub> - t <sub>P</sub> (K)				Q <sub>s</sub> Water (W)   t <sub>R</sub> - t <sub>w1</sub> (K)					ΔP <sub>w</sub> (kPa)	Q <sub>s</sub> Water (W)   t <sub>R</sub> - t <sub>w1</sub> (K)				ΔP <sub>w</sub> (kPa)
				6	8	10	12	6	8	10	12	6		8	10	12		
09	64,6	17,9	50	129	172	215	258	297	397	496	595	14,0	274	365	457	548	10,4	
	79,7	22,1	75	159	212	266	319	347	463	579	695	14,0	317	423	529	635	10,4	
	92,4	25,7	100	185	246	308	370	386	514	643	771	14,0	350	467	584	701	10,4	
	113,7	31,6	150	227	303	379	455	444	592	739	887	14,0	400	534	667	800	10,4	
	131,7	36,6	200	263	351	439	527	488	650	813	975	14,0	438	584	729	875	10,4	
12	93,3	25,9	50	187	249	311	373	419	558	698	837	17,4	385	513	642	770	12,9	
	115,1	32,0	75	230	307	384	460	485	647	809	971	17,4	443	591	738	886	12,9	
	133,4	37,1	100	267	356	445	534	536	715	893	1072	17,4	487	649	811	973	12,9	
	164,3	45,6	150	329	438	548	657	611	815	1018	1222	17,4	551	735	919	1103	12,9	
	190,2	52,8	200	380	507	634	761	666	889	1111	1333	17,4	600	799	999	1199	12,9	
15	119,6	33,2	50	239	319	399	479	526	702	877	1053	20,6	484	646	807	968	15,3	
	147,5	41,0	75	295	393	492	590	607	809	1011	1213	20,6	554	739	923	1108	15,3	
	171,1	47,5	100	342	456	570	684	667	889	1111	1333	20,6	606	808	1010	1212	15,3	
	210,6	58,5	150	421	562	702	842	754	1005	1256	1508	20,6	682	910	1137	1364	15,3	
	243,9	67,8	200	488	650	813	976	817	1090	1362	1635	20,6	738	984	1230	1476	15,3	
18	148,3	41,2	50	297	396	494	593	635	847	1059	1271	23,7	584	779	973	1168	17,7	
	182,9	50,8	75	366	488	610	732	727	969	1212	1454	23,7	664	885	1107	1328	17,7	
	212,1	58,9	100	424	566	707	849	794	1059	1323	1588	23,7	723	964	1205	1446	17,7	
	261,1	72,5	150	522	696	870	1045	890	1186	1483	1780	23,7	808	1077	1346	1615	17,7	
	302,4	84,0	200	605	807	1008	1210	958	1277	1597	1916	23,7	868	1158	1447	1737	17,7	
21	174,7	48,5	50	349	466	582	699	732	976	1219	1463	26,9	673	897	1121	1345	20,1	
	215,4	59,8	75	431	574	718	862	832	1109	1386	1663	26,9	761	1014	1268	1521	20,1	
	249,8	69,4	100	500	666	833	999	903	1205	1506	1807	26,9	824	1099	1374	1649	20,1	
	307,5	85,4	150	615	820	1025	1230	1004	1339	1674	2009	26,9	915	1220	1525	1830	20,1	
	356,1	98,9	200	712	950	1187	1424	1075	1433	1791	2149	26,9	979	1305	1632	1958	20,1	
24	203,4	56,5	50	407	542	678	813	829	1106	1382	1659	30,1	763	1017	1272	1526	22,5	
	250,8	69,7	75	502	669	836	1003	936	1248	1559	1871	30,1	857	1143	1429	1715	22,5	
	290,8	80,8	100	582	776	969	1163	1011	1348	1684	2021	30,1	925	1233	1541	1849	22,5	
	358,0	99,4	150	716	955	1193	1432	1114	1485	1856	2228	30,1	1019	1358	1698	2038	22,5	
	414,6	115,2	200	829	1106	1382	1659	1184	1579	1973	2368	30,1	1084	1446	1807	2169	22,5	
27	229,7	63,8	50	459	613	766	919	914	1219	1524	1828	33,3	842	1123	1403	1684	25,0	
	283,3	78,7	75	567	755	944	1133	1024	1366	1707	2049	33,3	941	1254	1568	1881	25,0	
	328,5	91,2	100	657	876	1095	1314	1101	1467	1834	2201	33,3	1010	1347	1684	2020	25,0	
	404,3	112,3	150	809	1078	1348	1617	1203	1605	2006	2407	33,3	1106	1474	1843	2212	25,0	
	468,3	130,1	200	937	1249	1561	1873	1272	1696	2120	2544	33,3	1171	1562	1952	2342	25,0	
30	258,4	71,8	50	517	689	861	1034	999	1332	1665	1998	36,5	922	1229	1536	1843	27,3	
	318,7	88,5	75	637	850	1062	1275	1111	1482	1852	2223	36,5	1023	1364	1706	2047	27,3	
	369,5	102,6	100	739	985	1232	1478	1187	1583	1979	2375	36,5	1094	1458	1823	2188	27,3	
	454,9	126,4	150	910	1213	1516	1819	1288	1717	2146	2575	36,5	1189	1586	1982	2378	27,3	
	526,8	146,3	200	1054	1405	1756	2107	1353	1804	2254	2705	36,5	1253	1671	2089	2506	27,3	

V<sub>wn</sub> = 0,07 l/s corresponds to 250 l/h

Construction subject to change.  
 No return possible.

Nozzle -V, 100 %

NL	V <sub>p</sub>		P <sub>s</sub>	Q <sub>s</sub> Primary air (W)				2-pipe system					4-pipe system				
	(m <sup>3</sup> /h)	[l/s]		t <sub>R</sub> - t <sub>P</sub> (K)				Q <sub>s</sub> Water (W)   t <sub>R</sub> - t <sub>w1</sub> (K)					ΔP <sub>w</sub>	Q <sub>s</sub> Water (W)   t <sub>R</sub> - t <sub>w1</sub> (K)			
			(Pa)	6	8	10	12	6	8	10	12	(kPa)	6	8	10	12	(kPa)
09	86,5	24,0	50	173	231	288	346	330	440	550	660	14,0	302	403	504	605	10,4
	106,6	29,6	75	213	284	355	426	383	511	638	766	14,0	348	464	580	696	10,4
	123,5	34,3	100	247	329	412	494	424	565	706	847	14,0	383	511	638	766	10,4
	152,0	42,2	150	304	405	507	608	485	646	808	969	14,0	435	580	725	870	10,4
	176,0	48,9	200	352	469	587	704	530	707	884	1061	14,0	474	633	791	949	10,4
12	124,9	34,7	50	250	333	416	500	462	616	770	924	17,4	423	564	705	846	12,9
	154,0	42,8	75	308	411	513	616	532	710	887	1065	17,4	484	645	806	967	12,9
	178,5	49,6	100	357	476	595	714	585	780	975	1170	17,4	529	706	882	1058	12,9
	219,6	61,0	150	439	585	732	878	663	884	1105	1326	17,4	596	795	994	1193	12,9
	254,2	70,6	200	508	678	847	1017	720	960	1200	1440	17,4	646	861	1077	1292	12,9
15	160,2	44,5	50	320	427	534	641	579	772	965	1158	20,6	530	707	883	1060	15,3
	197,4	54,8	75	395	526	658	790	662	883	1104	1325	20,6	603	803	1004	1205	15,3
	228,8	63,6	100	458	610	763	915	724	965	1207	1448	20,6	656	875	1094	1312	15,3
	281,5	78,2	150	563	751	938	1126	813	1084	1355	1626	20,6	734	979	1224	1468	15,3
	325,9	90,5	200	652	869	1086	1304	877	1170	1462	1754	20,6	791	1055	1318	1582	15,3
18	198,6	55,2	50	397	530	662	794	696	927	1159	1391	23,7	637	849	1061	1273	17,7
	244,8	68,0	75	490	653	816	979	789	1053	1316	1579	23,7	719	958	1198	1438	17,7
	283,7	78,8	100	567	757	946	1135	857	1143	1429	1715	23,7	779	1038	1298	1558	17,7
	349,0	97,0	150	698	931	1163	1396	954	1271	1589	1907	23,7	864	1153	1441	1729	17,7
	404,1	112,3	200	808	1078	1347	1617	1021	1362	1702	2043	23,7	926	1234	1543	1851	17,7
21	233,9	65,0	50	468	624	780	935	798	1063	1329	1595	26,9	731	974	1218	1461	20,1
	288,2	80,1	75	576	769	961	1153	899	1198	1498	1797	26,9	820	1093	1367	1640	20,1
	334,0	92,8	100	668	891	1113	1336	971	1294	1618	1941	26,9	884	1179	1474	1769	20,1
	411,0	114,2	150	822	1096	1370	1644	1070	1427	1784	2140	26,9	975	1300	1625	1949	20,1
	475,8	132,2	200	952	1269	1586	1903	1139	1518	1898	2277	26,9	1038	1384	1730	2076	20,1
24	272,3	75,6	50	545	726	908	1089	900	1200	1499	1799	30,1	825	1100	1376	1651	22,5
	335,6	93,2	75	671	895	1119	1342	1006	1341	1676	2011	30,1	920	1227	1534	1841	22,5
	388,9	108,0	100	778	1037	1296	1556	1079	1439	1799	2159	30,1	987	1316	1646	1975	22,5
	478,5	132,9	150	957	1276	1595	1914	1179	1573	1966	2359	30,1	1080	1440	1800	2160	22,5
	554,1	153,9	200	1108	1478	1847	2216	1247	1662	2078	2493	30,1	1144	1525	1906	2288	22,5
27	307,5	85,4	50	615	820	1025	1230	987	1316	1645	1974	33,3	907	1210	1512	1815	25,0
	379,0	105,3	75	758	1011	1263	1516	1096	1461	1826	2191	33,3	1006	1341	1676	2011	25,0
	439,3	122,0	100	879	1171	1464	1757	1169	1559	1949	2339	33,3	1074	1432	1790	2148	25,0
	540,4	150,1	150	1081	1441	1801	2162	1267	1690	2112	2535	33,3	1167	1556	1945	2334	25,0
	625,8	173,8	200	1252	1669	2086	2503	1332	1776	2219	2663	33,3	1230	1640	2050	2460	25,0
30	346,0	96,1	50	692	923	1153	1384	1074	1432	1790	2148	36,5	989	1319	1649	1978	27,3
	426,4	118,4	75	853	1137	1421	1705	1182	1577	1971	2365	36,5	1089	1452	1815	2178	27,3
	494,2	137,3	100	988	1318	1647	1977	1255	1673	2091	2510	36,5	1158	1544	1929	2315	27,3
	608,0	168,9	150	1216	1621	2027	2432	1349	1798	2248	2697	36,5	1249	1665	2082	2498	27,3
	704,0	195,6	200	1408	1877	2347	2816	1408	1878	2347	2817	36,5	1310	1746	2183	2619	27,3

V<sub>min</sub> = 0,07 l/s corresponds to 250 l/h

Construction subject to change.  
 No return possible.

## HEATING CAPACITY

### Nozzle -B

NL	V <sub>p</sub>		P <sub>s</sub>	Q <sub>s</sub> Primary air (W)				2-pipe system					4-pipe system				
	(m <sup>3</sup> /h)	[l/s]		t <sub>p</sub> - t <sub>r</sub> (K)				Q <sub>s</sub> Water (W)   t <sub>w1</sub> - t <sub>r</sub> (K)				ΔP <sub>w</sub>	Q <sub>s</sub> Water (W)   t <sub>w1</sub> - t <sub>r</sub> (K)				ΔP <sub>w</sub>
			(Pa)	6	8	10	12	16	20	24	28	(kPa)	16	20	24	28	(kPa)
09	18,1	5,0	50	36	48	60	73	512	647	785	924	5,6	394	493	591	690	1,3
	22,2	6,2	75	44	59	74	89	642	812	989	1169	5,6	492	615	738	862	1,3
	25,7	7,1	100	51	68	86	103	736	934	1138	1347	5,6	563	703	844	985	1,3
	31,4	8,7	150	63	84	105	126	866	1103	1346	1597	5,6	659	824	989	1154	1,3
	36,3	10,1	200	73	97	121	145	954	1216	1487	1767	5,6	724	905	1086	1267	1,3
12	26,9	7,5	50	54	72	90	108	701	886	1074	1267	6,9	543	679	815	950	1,6
	32,9	9,1	75	66	88	110	132	867	1097	1334	1577	6,9	669	836	1003	1170	1,6
	38,0	10,6	100	76	101	127	152	982	1246	1517	1796	6,9	756	945	1134	1323	1,6
	46,6	12,9	150	93	124	155	186	1137	1445	1763	2091	6,9	872	1091	1309	1527	1,6
	53,8	14,9	200	108	143	179	215	1239	1576	1926	2286	6,9	949	1187	1424	1661	1,6
15	34,3	9,5	50	69	91	114	137	882	1114	1351	1594	8,2	689	861	1034	1206	2,0
	42,0	11,7	75	84	112	140	168	1058	1340	1628	1923	8,2	827	1033	1240	1446	2,0
	48,5	13,5	100	97	129	162	194	1185	1502	1828	2162	8,2	925	1156	1387	1619	2,0
	59,4	16,5	150	119	158	198	237	1359	1726	2103	2491	8,2	1060	1325	1590	1854	2,0
	68,5	19,0	200	137	183	228	274	1473	1874	2286	2712	8,2	1150	1437	1724	2012	2,0
18	43,0	11,9	50	86	115	143	172	1065	1346	1632	1924	9,5	839	1048	1258	1468	2,3
	52,7	14,6	75	105	140	176	211	1254	1586	1928	2276	9,5	988	1235	1482	1729	2,3
	60,8	16,9	100	122	162	203	243	1389	1759	2139	2529	9,5	1095	1368	1642	1915	2,3
	74,5	20,7	150	149	199	248	298	1572	1995	2430	2877	9,5	1240	1550	1860	2170	2,3
	86,0	23,9	200	172	229	287	344	1694	2151	2623	3108	9,5	1337	1671	2005	2339	2,3
21	50,4	14,0	50	101	134	168	202	1171	1479	1792	2111	10,8	927	1158	1390	1622	2,6
	61,7	17,1	75	123	165	206	247	1399	1770	2149	2536	10,8	1110	1387	1665	1942	2,6
	71,3	19,8	100	143	190	238	285	1558	1973	2397	2832	10,8	1237	1547	1865	2165	2,6
	87,3	24,2	150	175	233	291	349	1764	2237	2723	3222	10,8	1405	1756	2107	2459	2,6
	100,8	28,0	200	202	269	336	403	1893	2403	2928	3468	10,8	1512	1890	2268	2646	2,6
24	57,8	16,1	50	116	154	193	231	1296	1635	1981	2333	12,1	1032	1290	1548	1807	3,0
	70,8	19,7	75	142	189	236	283	1548	1958	2377	2803	12,1	1239	1548	1858	2167	3,0
	81,7	22,7	100	163	218	272	327	1720	2177	2644	3123	12,1	1378	1722	2067	2411	3,0
	100,1	27,8	150	200	267	334	400	1936	2454	2985	3530	12,1	1555	1944	2333	2722	3,0
	115,6	32,1	200	231	308	385	462	2067	2622	3193	3778	12,1	1665	2082	2498	2914	3,0
27	65,9	18,3	50	132	176	220	263	1504	1899	2301	2711	13,5	1205	1507	1808	2109	3,3
	80,7	22,4	75	161	215	269	323	1747	2208	2680	3162	13,5	1405	1756	2108	2459	3,3
	93,1	25,9	100	186	248	310	373	1912	2420	2939	3470	13,5	1542	1927	2313	2698	3,3
	114,1	31,7	150	228	304	380	456	2123	2690	3270	3867	13,5	1717	2147	2576	3005	3,3
	131,7	36,6	200	263	351	439	527	2252	2855	3474	4110	13,5	1827	2283	2740	3197	3,3
30	73,9	20,5	50	148	197	246	296	1572	1983	2402	2828	14,7	1264	1580	1896	2212	3,6
	90,5	25,1	75	181	241	302	362	1825	2307	2797	3298	14,7	1483	1853	2224	2595	3,6
	104,5	29,0	100	209	279	348	418	2003	2533	3075	3628	14,7	1634	2042	2451	2859	3,6
	128,0	35,6	150	256	341	427	512	2237	2831	3441	4065	14,7	1831	2288	2746	3204	3,6
	147,8	41,1	200	296	394	493	591	2383	3019	3672	4341	14,7	1954	2442	2931	3419	3,6

V<sub>wn</sub> = 0,04 l/s corresponds to 150 l/h

Construction subject to change.  
 No return possible.



Nozzle -C

NL	V <sub>p</sub>		P <sub>s</sub>	Q <sub>s</sub> Primary air (W)				2-pipe system					4-pipe system				
	(m <sup>3</sup> /h)	[l/s]		t <sub>p</sub> – t <sub>r</sub> (K)				Q <sub>s</sub> Water (W)   t <sub>w1</sub> - t <sub>r</sub> (K)				Δ <sub>pW</sub>	Q <sub>s</sub> Water (W)   t <sub>w1</sub> - t <sub>r</sub> (K)				Δ <sub>pW</sub>
			(Pa)	6	8	10	12	16	20	24	28	(kPa)	16	20	24	28	(kPa)
09	33,4	9,3	50	67	89	111	134	585	741	900	1062	5,6	445	556	667	778	1,3
	40,9	11,4	75	82	109	136	164	725	920	1121	1327	5,6	547	684	821	958	1,3
	47,2	13,1	100	94	126	157	189	827	1052	1283	1521	5,6	621	776	931	1087	1,3
	57,9	16,1	150	116	154	193	231	969	1236	1511	1796	5,6	722	903	1083	1264	1,3
	66,8	18,6	200	134	178	223	267	1066	1361	1667	1985	5,6	790	987	1185	1382	1,3
12	49,5	13,7	50	99	132	165	198	801	1013	1230	1452	6,9	606	757	909	1060	1,6
	60,6	16,8	75	121	162	202	242	978	1241	1511	1788	6,9	738	922	1106	1291	1,6
	70,0	19,4	100	140	187	233	280	1104	1403	1712	2026	6,9	830	1037	1245	1452	1,6
	85,7	23,8	150	171	229	286	343	1275	1624	1984	2357	6,9	953	1191	1429	1667	1,6
	99,0	27,5	200	198	264	330	396	1389	1771	2167	2577	6,9	1033	1291	1549	1807	1,6
15	63,1	17,5	50	126	168	210	252	952	1205	1462	1725	8,2	743	929	1115	1300	2,0
	77,3	21,5	75	155	206	258	309	1156	1465	1782	2106	8,2	900	1125	1350	1575	2,0
	89,2	24,8	100	178	238	297	357	1298	1648	2007	2377	8,2	1009	1262	1514	1767	2,0
	109,3	30,4	150	219	291	364	437	1487	1891	2308	2738	8,2	1154	1442	1731	2019	2,0
	126,2	35,1	200	252	337	421	505	1609	2048	2503	2972	8,2	1246	1558	1869	2181	2,0
18	79,2	22,0	50	158	211	264	317	1122	1419	1721	2030	9,5	886	1108	1330	1551	2,3
	97,0	26,9	75	194	259	323	388	1344	1702	2070	2445	9,5	1062	1327	1593	1858	2,3
	112,0	31,1	100	224	299	373	448	1498	1900	2312	2737	9,5	1184	1480	1776	2071	2,3
	137,1	38,1	150	274	366	457	549	1698	2158	2631	3118	9,5	1344	1679	2015	2351	2,3
	158,4	44,0	200	317	422	528	633	1824	2320	2831	3358	9,5	1445	1806	2168	2529	2,3
21	92,8	25,8	50	186	247	309	371	1270	1604	1947	2295	10,8	1011	1264	1517	1769	2,3
	113,6	31,6	75	227	303	379	455	1516	1919	2332	2755	10,8	1209	1512	1814	2116	2,3
	131,2	36,5	100	262	350	437	525	1684	2134	2596	3071	10,8	1344	1680	2016	2352	2,3
	160,7	44,6	150	321	429	536	643	1897	2409	2935	3476	10,8	1517	1896	2276	2655	2,3
	185,6	51,5	200	371	495	619	742	2027	2576	3141	3723	10,8	1624	2029	2435	2841	2,3
24	106,4	29,6	50	213	284	355	426	1412	1784	2163	2549	12,1	1138	1423	1708	1992	3,0
	130,3	36,2	75	261	347	434	521	1663	2104	2555	3016	12,1	1347	1684	2021	2357	3,0
	150,5	41,8	100	301	401	502	602	1834	2324	2825	3338	12,1	1490	1862	2235	2607	3,0
	184,3	51,2	150	369	491	614	737	2052	2603	3169	3750	12,1	1674	2092	2510	2929	3,0
	212,8	59,1	200	426	567	709	851	2183	2772	3377	4000	12,1	1787	2234	2681	3128	3,0
27	121,2	33,7	50	242	323	404	485	1584	1999	2425	2858	13,5	1271	1589	1907	2224	3,3
	148,5	41,2	75	297	396	495	594	1863	2358	2863	3379	13,5	1504	1881	2257	2633	3,3
	171,5	47,6	100	343	457	572	686	2047	2593	3152	3724	13,5	1658	2072	2487	2901	3,3
	210,0	58,3	150	420	560	700	840	2268	2876	3500	4141	13,5	1844	2305	2767	3228	3,3
	242,5	67,4	200	485	647	808	970	2393	3036	3698	4377	13,5	1952	2440	2928	3417	3,3
30	136,1	37,8	50	272	363	454	544	1696	2141	2594	3057	14,7	1362	1703	2043	2384	3,6
	166,7	46,3	75	333	444	556	667	1976	2499	3033	3578	14,7	1597	1996	2395	2794	3,6
	192,5	53,5	100	385	513	642	770	2166	2741	3329	3932	14,7	1755	2194	2633	3072	3,6
	235,7	65,5	150	471	629	786	943	2403	3044	3702	4378	14,7	1957	2446	2935	3425	3,6
	272,2	75,6	200	544	726	907	1089	2543	3224	3924	4641	14,7	2079	2599	3118	3638	3,6

V<sub>wn</sub> = 0,04 l/s corresponds to 150 l/h

Construction subject to change.  
 No return possible.

Nozzle -D

NL	V <sub>p</sub>		P <sub>s</sub>	Q <sub>s</sub> Primary air (W)				2-pipe system					4-pipe system				
	(m <sup>3</sup> /h)	[l/s]		t <sub>p</sub> - t <sub>r</sub> (K)				Q <sub>s</sub> Water (W)   t <sub>w1</sub> - t <sub>r</sub> (K)				ΔP <sub>w</sub>	Q <sub>s</sub> Water (W)   t <sub>w1</sub> - t <sub>r</sub> (K)				ΔP <sub>w</sub>
			(Pa)	6	8	10	12	16	20	24	28	(kPa)	16	20	24	28	(kPa)
09	50,2	13,9	50	100	134	167	201	664	842	1024	1211	5,6	511	639	767	894	1,3
	61,4	17,1	75	123	164	205	246	798	1014	1236	1466	5,6	612	765	918	1071	1,3
	71,0	19,7	100	142	189	237	284	895	1138	1391	1651	5,6	684	856	1027	1198	1,3
	86,9	24,1	150	174	232	290	348	1028	1312	1606	1909	5,6	784	980	1176	1372	1,3
	100,3	27,9	200	201	268	334	401	1117	1426	1749	2084	5,6	851	1064	1277	1489	1,3
12	74,3	20,6	50	149	198	248	297	889	1126	1369	1619	6,9	688	860	1032	1204	1,6
	91,0	25,3	75	182	243	303	364	1057	1343	1637	1938	6,9	817	1021	1225	1429	1,6
	105,1	29,2	100	210	280	350	420	1178	1499	1830	2170	6,9	908	1136	1363	1590	1,6
	128,7	35,8	150	257	343	429	515	1343	1713	2095	2490	6,9	1034	1292	1551	1809	1,6
	148,7	41,3	200	297	396	496	595	1452	1853	2269	2700	6,9	1116	1395	1674	1953	1,6
15	94,8	26,3	50	190	253	316	379	1065	1348	1638	1936	8,2	837	1046	1255	1465	2,0
	116,1	32,2	75	232	310	387	464	1256	1593	1939	2296	8,2	986	1233	1480	1726	2,0
	134,0	37,2	100	268	357	447	536	1390	1765	2152	2551	8,2	1091	1364	1637	1910	2,0
	164,2	45,6	150	328	438	547	657	1568	1995	2437	2893	8,2	1231	1539	1847	2155	2,0
	189,5	52,7	200	379	505	632	758	1682	2144	2620	3113	8,2	1322	1652	1983	2313	2,0
18	118,9	33,0	50	238	317	396	476	1241	1570	1907	2251	9,5	981	1226	1471	1716	2,3
	145,7	40,5	75	291	388	486	583	1452	1842	2241	2651	9,5	1151	1438	1726	2014	2,3
	168,2	46,7	100	336	449	561	673	1600	2031	2474	2931	9,5	1269	1586	1903	2220	2,3
	206,0	57,2	150	412	549	687	824	1793	2279	2782	3299	9,5	1424	1780	2136	2492	2,3
	237,9	66,1	200	476	634	793	951	1915	2437	2975	3532	9,5	1523	1904	2285	2266	2,3
21	139,4	38,7	50	279	372	465	557	1429	1807	2195	2591	10,8	1130	1413	1695	1978	2,6
	170,7	47,4	75	341	455	569	683	1657	2100	2555	3021	10,8	1315	1643	1972	2301	2,6
	197,1	54,8	100	394	526	657	788	1815	2303	2805	3320	10,8	1443	1803	2164	2525	2,6
	241,4	67,1	150	483	644	805	966	2020	2566	3129	3709	10,8	1611	2014	2417	2820	2,6
	278,7	77,4	200	557	743	929	1115	2146	2729	3330	3951	10,8	1718	2148	2577	3007	2,6
24	159,8	44,4	50	320	426	533	639	1585	2005	2433	2871	12,1	1263	1578	1894	2210	3,0
	195,7	54,4	75	391	522	652	783	1823	2308	2806	3316	12,1	1456	1820	2184	2548	3,0
	226,0	62,8	100	452	603	753	904	1988	2521	3068	3629	12,1	1591	1988	2386	2784	3,0
	276,8	76,9	150	554	738	923	1107	2208	2804	3417	4048	12,1	1768	2211	2653	3095	3,0
	319,6	88,8	200	639	852	1065	1278	2350	2985	3642	4316	12,1	1881	2352	2822	3293	3,0
27	182,1	50,6	50	364	486	607	728	1724	2178	2643	3117	13,5	1386	1733	2079	2426	3,3
	223,0	62,0	75	446	595	743	892	1964	2487	3021	3568	13,5	1590	1987	2385	2782	3,3
	257,5	71,5	100	515	687	858	1030	2131	2700	3284	3882	13,5	1731	2164	2597	3030	3,3
	315,4	87,6	150	631	841	1051	1262	2349	2980	3628	4294	13,5	1918	2397	2876	3356	3,3
	364,2	101,2	200	728	971	1214	1457	2483	3153	3841	4549	13,5	2035	2544	3053	3561	3,3
30	204,4	56,8	50	409	545	681	818	1841	2326	2821	3326	14,7	1487	1858	2230	2602	3,6
	250,4	69,5	75	501	668	835	1001	2110	2670	3243	3828	14,7	1712	2140	2568	2996	3,6
	289,1	80,3	100	578	771	964	1156	2292	2902	3527	4169	14,7	1864	2330	2796	3262	3,6
	354,0	98,3	150	708	944	1180	1416	2519	3195	3888	4600	14,7	2056	2570	3084	3599	3,6
	408,8	113,6	200	818	1090	1363	1635	2657	3371	4106	4859	14,7	2173	2716	3259	3803	3,6

V<sub>wn</sub> = 0,04 l/s corresponds to 150 l/h

Construction subject to change.  
 No return possible.

Nozzle -E

NL	V <sub>p</sub>		P <sub>s</sub>	Q <sub>s</sub> Primary air (W)				2-pipe system					4-pipe system				
	(m <sup>3</sup> /h)	[l/s]		t <sub>p</sub> – t <sub>R</sub> (K)				Q <sub>s</sub> Water (W)   t <sub>w1</sub> - t <sub>R</sub> (K)				Δ <sub>pW</sub>	Q <sub>s</sub> Water (W)   t <sub>w1</sub> - t <sub>R</sub> (K)				Δ <sub>pW</sub>
			(Pa)	6	8	10	12	16	20	24	28	(kPa)	16	20	24	28	(kPa)
09	84,8	23,6	50	170	226	283	339	828	1052	1284	1522	5,6	568	709	851	993	1,3
	103,9	28,9	75	208	277	346	416	937	1194	1459	1733	5,6	646	808	970	1131	1,3
	119,9	33,3	100	240	320	400	480	1015	1294	1584	1883	5,6	703	879	1055	1231	1,3
	146,9	40,8	150	294	392	490	588	1121	1431	1755	2091	5,6	782	977	1173	1368	1,3
	169,6	47,1	200	339	452	565	679	1193	1526	1873	2234	5,6	836	1045	1253	1462	1,3
12	125,7	34,9	50	251	335	419	503	1061	1347	1642	1946	6,9	822	1027	1233	1438	1,6
	153,9	42,7	75	308	410	513	616	1190	1514	1847	2192	6,9	921	1151	1381	1611	1,6
	177,7	49,4	100	355	474	592	711	1278	1628	1989	2363	6,9	989	1236	1483	1730	1,6
	217,6	60,5	150	435	580	725	871	1395	1780	2178	2590	6,9	1079	1349	1619	1889	1,6
	251,3	69,8	200	503	670	838	1005	1473	1881	2304	2742	6,9	1141	1426	1712	1997	1,6
15	160,2	44,5	50	320	427	534	641	1266	1606	1956	2315	8,2	988	1235	1482	1729	2,0
	196,2	54,5	75	392	523	654	785	1416	1798	2193	2599	8,2	1104	1380	1656	1932	2,0
	226,6	62,9	100	453	604	755	906	1517	1930	2355	2795	8,2	1182	1478	1773	2069	2,0
	277,5	77,1	150	555	740	925	1110	1652	2103	2570	3054	8,2	1285	1607	1928	2249	2,0
	320,4	89,0	200	641	854	1068	1282	1742	2221	2717	3230	8,2	1355	1694	2033	2372	2,0
18	201,0	55,8	50	402	536	670	804	1440	1826	2221	2627	9,5	1142	1428	1713	1999	2,3
	246,2	68,4	75	492	657	821	985	1597	2027	2470	2925	9,5	1270	1587	1904	2222	2,3
	284,3	79,0	100	569	758	948	1137	1704	2165	2640	3129	9,5	1357	1696	2035	2374	2,3
	348,2	96,7	150	696	929	1161	1393	1843	2344	2861	3395	9,5	1471	1839	2207	2575	2,3
	402,1	111,7	200	804	1072	1340	1608	1943	2462	3007	3570	9,5	1548	1936	2323	2710	2,3
21	235,6	65,4	50	471	628	785	942	1670	2116	2574	3044	10,8	1327	1659	1991	2323	2,6
	288,5	80,2	75	577	769	962	1154	1835	2330	2836	3358	10,8	1463	1828	2194	2560	2,6
	333,2	92,6	100	666	888	1111	1333	1947	2472	3012	3568	10,8	1554	1942	2330	2719	2,6
	408,1	113,4	150	816	1088	1360	1632	2090	2656	3240	3843	10,8	1674	2092	2511	2929	2,6
	471,2	130,9	200	942	1257	1571	1885	2188	2783	3398	4031	10,8	1761	2201	2641	3081	2,6
24	270,1	75,0	50	540	720	900	1081	1814	2297	2794	3300	12,1	1457	1822	2186	2550	3,0
	330,9	91,9	75	662	882	1103	1323	1990	2523	3071	3633	12,1	1605	2006	2407	2808	3,0
	382,0	106,1	100	764	1019	1273	1528	2108	2673	3256	3855	12,1	1703	2129	2554	2980	3,0
	467,9	130,0	150	936	1248	1560	1872	2258	2867	3495	4141	12,1	1831	2288	2746	3204	3,0
	540,3	150,1	200	1081	1441	1801	2161	2360	2998	3657	4335	12,1	1918	2397	2877	3356	3,0
27	307,8	85,5	50	616	821	1026	1231	1964	2487	3021	3568	13,5	1583	1979	2375	2771	3,3
	377,0	104,7	75	754	1005	1257	1508	2145	2719	3306	3909	13,5	1735	2169	2603	3037	3,3
	435,4	120,9	100	871	1161	1451	1741	2270	2878	3502	4144	13,5	1839	2299	2759	3218	3,3
	533,2	148,1	150	1066	1422	1777	2133	2433	3088	3762	4454	13,5	1975	2469	2962	3456	3,3
	615,7	171,0	200	1231	1642	2052	2463	2541	3227	3934	4660	13,5	2065	2581	3097	3614	3,3
30	345,5	96,0	50	691	921	1152	1382	2081	2633	3197	3774	14,7	1694	2117	2541	2964	3,6
	423,2	117,6	75	846	1129	1411	1693	2273	2878	3497	4133	14,7	1857	2321	2786	3250	3,6
	488,7	135,7	100	977	1303	1629	1955	2399	3040	3697	4371	14,7	1965	2456	2948	3439	3,6
	598,5	166,2	150	1197	1596	1995	2394	2560	3246	3952	4676	14,7	2103	2629	3155	3681	3,6
	691,1	192,0	200	1382	1843	2304	2764	2666	3384	4120	4877	14,7	2197	2746	3295	3844	3,6

V<sub>wn</sub> = 0,04 l/s corresponds to 150 l/h

Construction subject to change.  
 No return possible.

Nozzle -V, 25 %

NL	V <sub>p</sub>		P <sub>s</sub>	Q <sub>s</sub> Primary air (W)				2-pipe system					4-pipe system				
	(m <sup>3</sup> /h)	[l/s]		t <sub>p</sub> - t <sub>R</sub> (K)				Q <sub>s</sub> Water (W)   t <sub>w1</sub> - t <sub>R</sub> (K)				Δ <sub>pW</sub>	Q <sub>s</sub> Water (W)   t <sub>w1</sub> - t <sub>R</sub> (K)				Δ <sub>pW</sub>
			(Pa)	6	8	10	12	16	20	24	28	(kPa)	16	20	24	28	(kPa)
09	20,7	5,8	50	41	55	69	83	475	593	712	831	5,6	303	379	455	531	1,3
	25,7	7,1	75	51	69	86	103	566	708	850	991	5,6	346	432	518	605	1,3
	29,9	8,3	100	60	80	100	120	638	797	957	1116	5,6	378	472	566	661	1,3
	36,9	10,3	150	74	98	123	148	747	933	1120	1307	5,6	426	532	638	745	1,3
	42,9	11,9	200	86	114	143	171	829	1037	1244	1451	5,6	462	577	693	808	1,3
12	29,9	8,3	50	60	80	100	120	674	842	1010	1179	6,9	426	533	639	746	1,6
	37,1	10,3	75	74	99	124	149	798	997	1197	1396	6,9	484	605	726	847	1,6
	43,2	12,0	100	86	115	144	173	893	1116	1339	1562	6,9	527	659	791	923	1,6
	53,4	14,8	150	107	142	178	213	1034	1293	1551	1810	6,9	591	739	887	1035	1,6
	61,9	17,2	200	124	165	206	248	1139	1424	1709	1994	6,9	639	799	959	1119	1,6
15	38,4	10,7	50	77	102	128	154	851	1064	1277	1490	8,2	538	673	808	942	2,0
	47,6	13,2	75	95	127	159	190	1002	1253	1503	1754	8,2	609	762	914	1066	2,0
	55,4	15,4	100	111	148	185	221	1115	1394	1673	1951	8,2	662	828	993	1159	2,0
	68,4	19,0	150	137	182	228	274	1280	1600	1920	2240	8,2	740	925	1110	1295	2,0
	79,4	22,1	200	159	212	265	318	1399	1749	2099	2448	8,2	798	997	1197	1396	2,0
18	47,6	13,2	50	95	127	159	190	1035	1293	1552	1810	9,5	652	815	978	1141	2,3
	59,0	16,4	75	118	157	197	236	1208	1509	1811	2113	9,5	735	918	1102	1286	2,3
	68,7	19,1	100	137	183	229	275	1334	1668	2002	2335	9,5	796	995	1194	1393	2,3
	84,8	23,6	150	170	226	283	339	1515	1894	2272	2651	9,5	886	1107	1329	1550	2,3
	98,5	27,3	200	197	263	328	394	1642	2052	2462	2873	9,5	952	1190	1428	1666	2,3
21	56,0	15,6	50	112	149	187	224	1197	1496	1795	2094	10,8	755	943	1132	1321	2,6
	69,5	19,3	75	139	185	232	278	1386	1733	2079	2426	10,8	848	1060	1272	1484	2,6
	80,8	22,5	100	162	216	269	323	1522	1903	2283	2664	10,8	917	1146	1375	1604	2,6
	99,9	27,7	150	200	266	333	399	1711	2139	2566	2994	10,8	1016	1270	1524	1778	2,6
	115,9	32,2	200	232	309	386	464	1840	2299	2759	3219	10,8	1089	1361	1633	1906	2,6
24	65,3	18,1	50	131	174	218	261	1363	1704	2045	2385	12,1	861	1076	1292	1507	3,0
	80,9	22,5	75	162	216	270	324	1565	1956	2348	2739	12,1	964	1205	1446	1687	3,0
	94,1	26,1	100	188	251	314	376	1706	2133	2559	2986	12,1	1039	1299	1559	1818	3,0
	116,3	32,3	150	233	310	388	465	1896	2370	2845	3319	12,1	1147	1434	1721	2008	3,0
	135,0	37,5	200	270	360	450	540	2022	2528	3033	3539	12,1	1226	1532	1838	2145	3,0
27	73,7	20,5	50	147	197	246	295	1508	1885	2262	2639	13,5	956	1195	1434	1673	3,3
	91,4	25,4	75	183	244	305	366	1717	2146	2575	3004	13,5	1067	1334	1600	1867	3,3
	106,3	29,5	100	213	283	354	425	1859	2324	2789	3254	13,5	1147	1434	1721	2008	3,3
	131,3	36,5	150	263	350	438	525	2046	2557	3069	3580	13,5	1262	1578	1893	2209	3,3
	152,4	42,3	200	305	407	508	610	2165	2707	3248	3789	13,5	1345	1681	2017	2353	3,3
30	82,9	23,0	50	166	221	276	332	1654	2067	2481	2894	14,7	1054	1318	1581	1845	3,6
	102,8	28,6	75	206	274	343	411	1866	2332	2798	3265	14,7	1172	1465	1758	2051	3,6
	119,6	33,2	100	239	319	399	478	2006	2507	3009	3510	14,7	1257	1571	1885	2200	3,6
	147,7	41,0	150	295	394	492	591	2184	2729	3275	3821	14,7	1377	1722	2066	2410	3,6
	171,5	47,6	200	343	457	572	686	2294	2867	3440	4014	14,7	1463	1829	2194	2560	3,6

V<sub>min</sub> = 0,04 l/s corresponds to 150 l/h

Construction subject to change.  
 No return possible.

Nozzle -V, 50 %

NL	V <sub>p</sub>		P <sub>s</sub>	Q <sub>s</sub> Primary air (W)				2-pipe system					4-pipe system				
	(m <sup>3</sup> /h)	[l/s]		t <sub>p</sub> - t <sub>r</sub> (K)				Q <sub>s</sub> Water (W)   t <sub>w1</sub> - t <sub>r</sub> (K)				Δ <sub>pW</sub>	Q <sub>s</sub> Water (W)   t <sub>w1</sub> - t <sub>r</sub> (K)				Δ <sub>pW</sub>
			(Pa)	6	8	10	12	16	20	24	28	(kPa)	16	20	24	28	(kPa)
09	42,4	11,8	50	85	113	141	170	669	836	1003	1170	5,6	391	489	587	685	1,3
	52,4	14,5	75	105	140	175	209	780	975	1170	1365	5,6	440	550	660	770	1,3
	60,8	16,9	100	122	162	203	243	865	1081	1297	1513	5,6	477	596	716	835	1,3
	74,9	20,8	150	150	200	250	299	990	1237	1485	1732	5,6	532	665	798	931	1,3
	86,7	24,1	200	173	231	289	347	1082	1353	1623	1894	5,6	573	716	860	1003	1,3
12	61,2	17,0	50	122	163	204	245	933	1167	1400	1633	6,9	546	682	818	955	1,6
	75,6	21,0	75	151	202	252	303	1077	1347	1616	1885	6,9	611	764	917	1069	1,6
	87,8	24,4	100	176	234	293	351	1183	1479	1775	2071	6,9	660	825	990	1155	1,6
	108,1	30,0	150	216	288	360	432	1336	1670	2004	2338	6,9	732	915	1098	1281	1,6
	125,3	34,8	200	251	334	418	501	1446	1807	2168	2530	6,9	785	982	1178	1374	1,6
15	78,5	21,8	50	157	209	262	314	1163	1453	1744	2035	8,2	684	856	1027	1198	2,0
	97,0	26,9	75	194	259	323	388	1329	1661	1993	2326	8,2	764	955	1145	1336	2,0
	112,5	31,3	100	225	300	375	450	1448	1810	2173	2535	8,2	822	1028	1233	1439	2,0
	138,6	38,5	150	277	370	462	554	1615	2019	2423	2827	8,2	908	1135	1362	1589	2,0
	160,6	44,6	200	321	428	535	643	1731	2164	2597	3030	8,2	971	1213	1456	1699	2,0
18	97,4	27,0	50	195	260	325	389	1387	1734	2081	2428	9,5	822	1027	1233	1438	2,3
	120,2	33,4	75	240	321	401	481	1567	1959	2351	2743	9,5	913	1141	1369	1598	2,3
	139,5	38,8	100	279	372	465	558	1693	2116	2540	2963	9,5	980	1225	1470	1714	2,3
	171,9	47,7	150	344	458	573	688	1863	2329	2795	3261	9,5	1076	1346	1615	1884	2,3
	199,2	55,3	200	398	531	664	797	1977	2471	2965	3460	9,5	1147	1434	1720	2007	2,3
21	114,6	31,8	50	229	306	382	459	1578	1973	2367	2762	10,8	945	1182	1418	1655	2,6
	141,6	39,3	75	283	377	472	566	1765	2206	2647	3088	10,8	1046	1308	1569	1831	2,6
	164,3	45,6	100	329	438	548	657	1891	2364	2836	3309	10,8	1119	1399	1679	1959	2,6
	202,4	56,2	150	405	540	675	810	2056	2571	3085	3599	10,8	1225	1531	1837	2143	2,6
	234,5	65,1	200	469	625	782	938	2163	2704	3245	3786	10,8	1300	1626	1951	2276	2,6
24	133,5	37,1	50	267	356	445	534	1763	2204	2645	3086	12,1	1071	1338	1606	1873	3,0
	164,8	45,8	75	330	440	549	659	1949	2437	2924	3411	12,1	1180	1474	1769	2064	3,0
	191,3	53,1	100	383	510	638	765	2071	2589	3107	3624	12,1	1258	1573	1887	2202	3,0
	235,7	65,5	150	471	628	786	943	2225	2782	3338	3894	12,1	1370	1713	2055	2398	3,0
	273,1	75,9	200	546	728	910	1092	2321	2901	3482	4062	12,1	1450	1813	2175	2538	3,0
27	150,8	41,9	50	302	402	503	603	1916	2395	2874	3353	13,5	1181	1476	1771	2066	3,3
	186,2	51,7	75	372	496	621	745	2096	2621	3145	3669	13,5	1296	1620	1944	2268	3,3
	216,0	60,0	100	432	576	720	864	2211	2764	3317	3869	13,5	1379	1723	2068	2413	3,3
	266,1	73,9	150	532	710	887	1065	2351	2939	3527	4114	13,5	1495	1869	2243	2617	3,3
	308,4	85,7	200	617	822	1028	1234	2435	3044	3653	4261	13,5	1578	1972	2366	2761	3,3
30	169,6	47,1	50	339	452	565	678	2060	2576	3091	3606	14,7	1292	1615	1938	2261	3,6
	209,4	58,2	75	419	558	698	838	2231	2788	3346	3904	14,7	1413	1766	2119	2472	3,6
	243,0	67,5	100	486	648	810	972	2335	2919	3502	4086	14,7	1498	1873	2247	2622	3,6
	299,4	83,2	150	599	798	998	1198	2458	3072	3687	4301	14,7	1618	2022	2427	2831	3,6
	347,0	96,4	200	694	925	1157	1388	2529	3161	3793	4425	14,7	1701	2127	2552	2977	3,6

V<sub>wn</sub> = 0,04 l/s corresponds to 150 l/h

Construction subject to change.  
 No return possible.

Nozzle -V, 75 %

NL	V <sub>p</sub>		P <sub>s</sub>	Q <sub>s</sub> Primary air (W)				2-pipe system					4-pipe system				
	(m <sup>3</sup> /h)	[l/s]		t <sub>p</sub> - t <sub>r</sub> (K)				Q <sub>s</sub> Water (W)   t <sub>w1</sub> - t <sub>r</sub> (K)				Δ <sub>pW</sub>	Q <sub>s</sub> Water (W)   t <sub>w1</sub> - t <sub>r</sub> (K)				Δ <sub>pW</sub>
			(Pa)	6	8	10	12	16	20	24	28	(kPa)	16	20	24	28	(kPa)
09	64,1	17,8	50	128	171	214	256	776	970	1164	1358	5,6	438	548	658	767	1,3
	79,1	22,0	75	158	211	264	316	896	1120	1344	1568	5,6	491	613	736	859	1,3
	91,7	25,5	100	183	244	306	367	985	1232	1478	1724	5,6	530	662	795	927	1,3
	112,8	31,3	150	226	301	376	451	1116	1395	1674	1953	5,6	588	735	882	1029	1,3
	130,7	36,3	200	261	348	436	523	1212	1514	1817	2120	5,6	632	790	948	1106	1,3
12	92,6	25,7	50	185	247	309	370	1072	1340	1608	1876	6,9	609	761	913	1065	1,6
	114,2	31,7	75	228	304	381	457	1222	1528	1833	2139	6,9	678	847	1017	1186	1,6
	132,4	36,8	100	265	353	441	530	1331	1663	1996	2329	6,9	729	912	1094	1276	1,6
	163,0	45,3	150	326	435	543	652	1485	1856	2227	2598	6,9	805	1006	1207	1409	1,6
	188,7	52,4	200	377	503	629	755	1593	1992	2390	2788	6,9	861	1076	1291	1507	1,6
15	118,7	33,0	50	237	317	396	475	1323	1654	1985	2315	8,2	761	951	1141	1331	2,0
	146,4	40,7	75	293	390	488	586	1491	1864	2237	2610	8,2	844	1055	1266	1476	2,0
	169,7	47,1	100	339	453	566	679	1610	2012	2415	2817	8,2	905	1131	1357	1583	2,0
	208,9	58,0	150	418	557	696	836	1772	2215	2658	3101	8,2	994	1242	1491	1739	2,0
	242,0	67,2	200	484	645	807	968	1882	2353	2823	3294	8,2	1059	1324	1588	1853	2,0
18	147,2	40,9	50	294	393	491	589	1561	1951	2342	2732	9,5	910	1137	1365	1592	2,3
	181,5	50,4	75	363	484	605	726	1737	2172	2606	3041	9,5	1004	1255	1506	1757	2,3
	210,5	58,5	100	421	561	702	842	1857	2322	2786	3251	9,5	1073	1341	1610	1878	2,3
	259,1	72,0	150	518	691	864	1036	2016	2520	3024	3528	9,5	1173	1466	1759	2052	2,3
	300,0	83,3	200	600	800	1000	1200	2120	2650	3180	3710	9,5	1245	1556	1867	2178	2,3
21	173,3	48,1	50	347	462	578	693	1758	2198	2637	3077	10,8	1042	1303	1564	1824	2,6
	213,7	59,4	75	427	570	712	855	1935	2418	2902	3386	10,8	1146	1432	1719	2005	2,6
	247,8	68,8	100	496	661	826	991	2051	2564	3076	3589	10,8	1221	1526	1831	2136	2,6
	305,0	84,7	150	610	813	1017	1220	2199	2749	3299	3849	10,8	1328	1660	1992	2324	2,6
	353,3	98,1	200	707	942	1178	1413	2293	2866	3439	4012	10,8	1405	1756	2107	2458	2,6
24	201,8	56,1	50	404	538	673	807	1943	2429	2915	3400	12,1	1176	1470	1764	2057	3,0
	248,9	69,1	75	498	664	830	995	2113	2641	3169	3697	12,1	1287	1608	1930	2252	3,0
	288,6	80,2	100	577	769	962	1154	2220	2775	3330	3885	12,1	1366	1708	2049	2391	3,0
	355,2	98,7	150	710	947	1184	1421	2353	2941	3529	4117	12,1	1479	1849	2218	2588	3,0
	411,3	114,3	200	823	1097	1371	1645	2433	3041	3649	4257	12,1	1559	1948	2338	2728	3,0
27	227,9	63,3	50	456	608	760	912	2091	2613	3136	3658	13,5	1292	1615	1938	2261	3,3
	281,1	78,1	75	562	750	937	1124	2249	2812	3374	3936	13,5	1408	1761	2113	2465	3,3
	325,9	90,5	100	652	869	1086	1304	2347	2933	3520	4107	13,5	1491	1864	2237	2610	3,3
	401,1	111,4	150	802	1070	1337	1604	2462	3078	3693	4309	13,5	1607	2009	2411	2812	3,3
	464,6	129,0	200	929	1239	1549	1858	2530	3162	3795	4427	13,5	1688	2111	2533	2955	3,3
30	256,4	71,2	50	513	684	855	1026	2225	2781	3338	3894	14,7	1409	1761	2113	2465	3,6
	316,2	87,8	75	632	843	1054	1265	2369	2961	3553	4146	14,7	1529	1911	2293	2676	3,6
	366,6	101,8	100	733	978	1222	1467	2454	3068	3681	4295	14,7	1614	2017	2420	2824	3,6
	451,3	125,3	150	903	1203	1504	1805	2551	3189	3827	4465	14,7	1731	2164	2597	3030	3,6
	522,6	145,2	200	1045	1394	1742	2090	2606	3257	3909	4560	14,7	1813	2266	2719	3172	3,6

V<sub>wn</sub> = 0,04 l/s corresponds to 150 l/h

Construction subject to change.  
 No return possible.

Nozzle -V, 100 %

NL	V <sub>p</sub>		P <sub>s</sub>	Q <sub>s</sub> Primary air (W)				2-pipe system					4-pipe system				
	(m <sup>3</sup> /h)	[l/s]		t <sub>p</sub> - t <sub>R</sub> (K)				Q <sub>s</sub> Water (W)   t <sub>w1</sub> - t <sub>R</sub> (K)				Δ <sub>pW</sub>	Q <sub>s</sub> Water (W)   t <sub>w1</sub> - t <sub>R</sub> (K)				Δ <sub>pW</sub>
			(Pa)	6	8	10	12	16	20	24	28	(kPa)	16	20	24	28	(kPa)
09	85,8	23,8	50	172	229	286	343	855	1068	1282	1495	5,6	473	591	709	827	1,3
	105,8	29,4	75	212	282	353	423	979	1224	1469	1714	5,6	527	659	791	923	1,3
	122,6	34,0	100	245	327	409	490	1071	1339	1607	1875	5,6	568	710	852	994	1,3
	150,8	41,9	150	302	402	503	603	1205	1507	1808	2109	5,6	629	786	943	1101	1,3
	174,6	48,5	200	349	466	582	698	1302	1628	1953	2279	5,6	674	843	1011	1180	1,3
12	124,0	34,4	50	248	331	413	496	1171	1464	1756	2049	6,9	654	818	981	1145	1,6
	152,8	42,4	75	306	407	509	611	1324	1654	1985	2316	6,9	726	907	1089	1270	1,6
	177,0	49,2	100	354	472	590	708	1433	1791	2149	2508	6,9	779	974	1169	1363	1,6
	217,8	60,5	150	436	581	726	871	1586	1983	2379	2776	6,9	857	1072	1286	1500	1,6
	252,2	70,0	200	504	672	841	1009	1693	2116	2539	2963	6,9	915	1144	1372	1601	1,6
15	158,9	44,1	50	318	424	530	636	1434	1793	2152	2510	8,2	815	1019	1223	1427	2,0
	195,8	54,4	75	392	522	653	783	1602	2002	2403	2803	8,2	901	1126	1351	1576	2,0
	227,0	63,1	100	454	605	757	908	1718	2148	2577	3007	8,2	963	1204	1445	1686	2,0
	279,2	77,6	150	558	745	931	1117	1875	2344	2813	3282	8,2	1055	1318	1582	1846	2,0
	323,3	89,8	200	647	862	1078	1293	1981	2476	2971	3466	8,2	1121	1402	1682	1962	2,0
18	197,1	54,7	50	394	526	657	788	1679	2098	2518	2938	9,5	972	1215	1458	1701	2,3
	242,9	67,5	75	486	648	810	971	1850	2312	2774	3237	9,5	1068	1336	1603	1870	2,3
	281,5	78,2	100	563	751	938	1126	1964	2455	2946	3437	9,5	1139	1423	1708	1993	2,3
	346,3	96,2	150	693	923	1154	1385	2113	2642	3170	3698	9,5	1240	1550	1860	2170	2,3
	400,9	111,4	200	802	1069	1336	1604	2209	2762	3314	3866	9,5	1313	1641	1969	2298	2,3
21	232,0	64,5	50	464	619	773	928	1877	2346	2815	3284	10,8	1111	1388	1666	1944	2,6
	285,9	79,4	75	572	763	953	1144	2043	2554	3065	3576	10,8	1216	1520	1824	2128	2,6
	331,4	92,1	100	663	884	1105	1326	2151	2689	3227	3765	10,8	1292	1615	1937	2260	2,6
	407,7	113,2	150	815	1087	1359	1631	2287	2859	3431	4002	10,8	1400	1750	2099	2449	2,6
	472,0	131,1	200	944	1259	1573	1888	2371	2964	3556	4149	10,8	1477	1846	2215	2584	2,6
24	270,2	75,1	50	540	721	901	1081	2057	2572	3086	3601	12,1	1249	1561	1874	2186	3,0
	332,9	92,5	75	666	888	1110	1332	2213	2767	3320	3874	12,1	1361	1701	2041	2382	3,0
	385,9	107,2	100	772	1029	1286	1543	2311	2888	3466	4044	12,1	1441	1801	2161	2522	3,0
	474,7	131,9	150	949	1266	1582	1899	2428	3035	3642	4249	12,1	1554	1942	2330	2719	3,0
	549,6	152,7	200	1099	1466	1832	2198	2498	3122	3746	4371	12,1	1633	2041	2450	2858	3,0
27	305,2	84,8	50	610	814	1017	1221	2198	2748	3297	3847	13,5	1369	1711	2054	2396	3,3
	376,0	104,5	75	752	1003	1253	1504	2341	2926	3511	4096	13,5	1486	1857	2229	2600	3,3
	435,8	121,1	100	872	1162	1453	1743	2426	3033	3639	4246	13,5	1568	1960	2352	2744	3,3
	536,1	148,9	150	1072	1430	1787	2145	2526	3157	3788	4420	13,5	1683	2104	2525	2946	3,3
	620,7	172,4	200	1241	1655	2069	2483	2583	3228	3874	4519	13,5	1763	2204	2645	3086	3,3
30	343,3	95,4	50	687	915	1144	1373	2324	2904	3485	4066	14,7	1488	1860	2232	2605	3,6
	423,0	117,5	75	846	1128	1410	1692	2449	3061	3673	4285	14,7	1608	2010	2412	2814	3,6
	490,3	136,2	100	981	1307	1634	1961	2521	3152	3782	4412	14,7	1692	2115	2538	2961	3,6
	603,1	167,5	150	1206	1608	2010	2413	2603	3253	3904	4554	14,7	1808	2259	2711	3163	3,6
	698,3	194,0	200	1397	1862	2328	2793	2647	3309	3971	4633	14,7	1887	2359	2831	3303	3,6

V<sub>wn</sub> = 0,04 l/s corresponds to 150 l/h

Construction subject to change.  
 No return possible.

SOUND POWER LEVEL

Nozzles -B, -C, -D, -E

NL	P <sub>s</sub> (Pa)	Nozzle configuration -B						Nozzle configuration -C						Nozzle configuration -D						Nozzle configuration -E							
		1 x Ø98	1 x Ø123	1 x Ø148	2 x Ø98	2 x Ø123	2 x Ø148	1 x Ø98	1 x Ø123	1 x Ø148	2 x Ø98	2 x Ø123	2 x Ø148	1 x Ø98	1 x Ø123	1 x Ø148	2 x Ø98	2 x Ø123	2 x Ø148	1 x Ø98	1 x Ø123	1 x Ø148	2 x Ø98	2 x Ø123	2 x Ø148		
09	50	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	30	26	<23	<23	<23	<23
	75	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	35	32	28	29	28	25
	100	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	25	<23	<23	<23	<23	<23	<23	39	36	32	33	32	30
	150	<23	<23	<23	<23	<23	<23	26	25	24	<23	<23	<23	<23	32	29	28	28	27	27	45	41	38	39	38	36	
	200	<23	<23	<23	<23	<23	<23	31	30	29	26	26	26	36	34	32	33	32	32	49	46	42	44	42	41		
12	50	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	35	31	29	30	29	28
	75	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	26	<23	<23	<23	<23	<23	<23	39	37	34	35	34	33
	100	<23	<23	<23	<23	<23	<23	25	<23	<23	<23	<23	<23	30	27	26	25	24	<23	43	40	38	39	38	37		
	150	<23	<23	<23	<23	<23	<23	30	28	27	29	27	26	35	33	31	32	31	30	47	45	43	45	44	43		
	200	26	<23	<23	24	<23	<23	34	32	32	33	32	31	39	37	35	37	36	35	51	49	47	49	48	47		
15	50	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	25	<23	<23	<23	<23	<23	<23	39	35	34	35	34	33	
	75	<23	<23	<23	<23	<23	<23	25	<23	<23	<23	<23	<23	30	27	26	27	25	24	43	40	39	40	38	38		
	100	<23	<23	<23	<23	<23	<23	29	26	25	25	24	<23	34	31	30	30	29	28	47	44	42	43	42	41		
	150	25	<23	<23	<23	<23	<23	34	32	30	31	29	28	39	37	35	36	34	33	51	49	47	48	46	45		
	200	28	27	25	26	24	<23	38	36	34	35	33	32	43	41	39	40	38	37	54	52	51	51	50	49		
18	50	<23	<23	<23	<23	<23	<23	24	<23	<23	<23	<23	<23	29	25	24	24	<23	<23	43	39	38	38	37	35		
	75	<23	<23	<23	<23	<23	<23	29	26	24	25	<23	<23	34	31	29	30	28	26	47	44	43	43	41	40		
	100	<23	<23	<23	<23	<23	<23	32	30	28	29	26	25	37	35	33	34	31	30	50	47	46	46	44	43		
	150	28	26	24	25	<23	<23	37	35	33	34	32	28	42	40	38	39	37	35	54	52	50	51	49	47		
	200	32	30	28	29	26	24	41	39	37	38	35	34	46	44	42	43	40	39	57	56	54	55	52	50		
21	50	<23	<23	<23	<23	<23	<23	26	<23	<23	<23	<23	<23	31	28	26	27	25	24	45	42	41	43	39	38		
	75	<23	<23	<23	<23	<23	<23	31	28	27	27	25	24	36	33	32	32	30	29	50	47	45	48	44	42		
	100	<23	<23	<23	<23	<23	<23	35	32	31	31	29	27	40	37	36	36	34	32	53	50	48	51	47	45		
	150	31	28	27	26	25	<23	40	38	36	37	34	33	45	43	41	42	39	38	57	55	53	56	51	50		
	200	34	32	31	30	29	26	44	42	40	41	38	36	49	47	45	46	43	41	60	58	56	59	54	53		
24	50	<23	<23	<23	<23	<23	<23	29	25	24	24	<23	<23	34	30	29	29	27	26	48	44	43	44	42	40		
	75	24	<23	<23	<23	<23	<23	34	31	29	30	28	26	39	36	34	35	33	32	52	49	48	48	46	45		
	100	28	25	24	24	<23	<23	37	34	33	34	31	30	42	39	38	39	36	35	55	52	51	52	49	48		
	150	33	31	29	30	27	25	42	40	38	39	37	35	47	45	43	44	42	40	59	57	55	56	54	52		
	200	36	35	33	34	31	29	46	44	42	43	40	38	51	49	47	48	45	43	62	60	59	59	57	55		
27	50	<23	<23	<23	<23	<23	<23	31	27	26	27	25	<23	36	32	31	32	30	28	50	47	45	47	44	43		
	75	26	<23	<23	<23	<23	<23	36	33	31	32	30	28	41	38	36	37	35	33	54	51	50	50	48	47		
	100	30	27	26	27	24	<23	39	37	35	36	33	32	44	42	40	41	38	37	57	54	53	54	51	50		
	150	35	33	31	32	29	28	44	42	40	41	39	37	49	47	45	46	44	42	61	59	57	58	56	54		
	200	39	37	35	36	33	31	48	46	44	45	42	40	53	51	49	50	47	45	64	62	61	62	59	57		
30	50	<23	<23	<23	<23	<23	<23	33	29	28	28	26	25	38	34	33	33	31	30	52	48	47	48	46	44		
	75	28	25	24	24	<23	<23	37	34	33	34	31	30	42	39	38	39	36	35	56	53	51	52	50	48		
	100	32	29	27	28	26	24	41	38	37	37	35	33	46	43	42	42	40	38	59	56	55	55	53	51		
	150	37	34	33	33	31	29	46	44	42	43	40	38	51	49	47	48	45	43	63	61	59	60	57	55		
	200	40	38	36	37	34	33	49	47	46	47	44	42	54	52	51	52	49	47	66	64	62	63	60	58		

L<sub>WA</sub> ≤ 23 dB(A) displayed <23



Nozzle -V

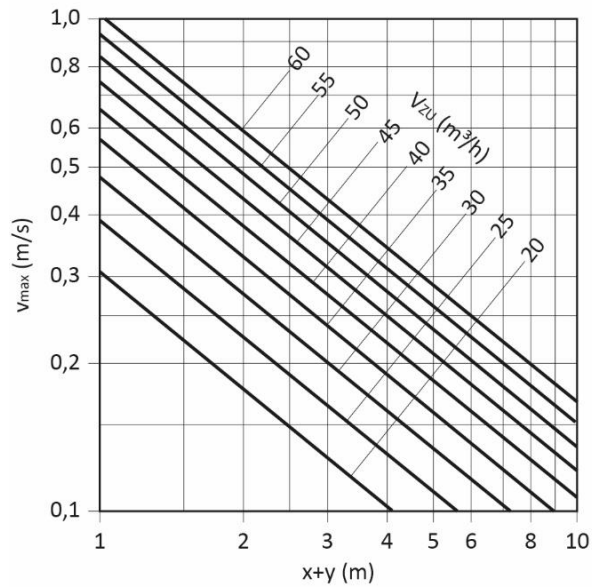
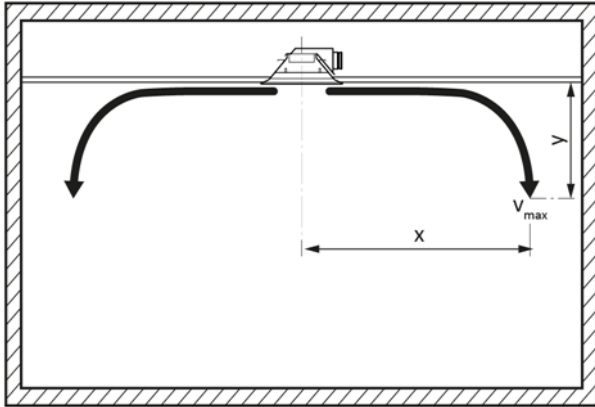
NL	P <sub>s</sub> (Pa)	Free cross-section 25%						Free cross-section 50%						Free cross-section 75%						Free cross-section 100%						
		1 x Ø98	1 x Ø123	1 x Ø148	2 x Ø98	2 x Ø123	2 x Ø148	1 x Ø98	1 x Ø123	1 x Ø148	2 x Ø98	2 x Ø123	2 x Ø148	1 x Ø98	1 x Ø123	1 x Ø148	2 x Ø98	2 x Ø123	2 x Ø148	1 x Ø98	1 x Ø123	1 x Ø148	2 x Ø98	2 x Ø123	2 x Ø148	
09	50	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	29	29	28	27	27	26	36	36	35	34	34	33
	75	<23	<23	<23	<23	<23	<23	24	24	<23	<23	<23	<23	<23	34	34	33	32	32	31	41	41	40	39	39	38
	100	<23	<23	<23	<23	<23	<23	27	27	26	25	25	24	37	37	36	35	35	34	44	44	43	42	42	41	41
	150	<23	<23	<23	<23	<23	<23	32	32	31	30	30	29	42	42	41	40	40	39	49	49	48	47	47	46	46
	200	<23	<23	<23	<23	<23	<23	38	38	37	36	36	35	46	46	45	44	44	43	52	52	51	50	50	49	49
12	50	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	<23	31	31	30	29	29	28	38	38	37	36	36	35	35
	75	<23	<23	<23	<23	<23	<23	26	26	25	24	24	23	36	36	35	34	34	33	42	42	41	40	40	39	39
	100	<23	<23	<23	<23	<23	<23	30	30	29	28	28	27	39	39	38	37	37	36	46	46	45	44	44	43	43
	150	<23	<23	<23	<23	<23	<23	35	35	34	33	33	32	44	44	43	42	42	41	51	51	50	49	49	48	48
	200	24	24	<23	<23	<23	<23	39	39	38	37	37	36	47	47	46	45	45	44	54	54	53	52	52	51	51
15	50	<23	<23	<23	<23	<23	<23	25	25	24	<23	<23	<23	34	34	33	32	32	31	41	41	40	39	39	38	38
	75	<23	<23	<23	<23	<23	<23	30	30	29	28	28	27	39	39	38	37	37	36	46	46	45	44	44	43	43
	100	<23	<23	<23	<23	<23	<23	33	33	32	31	31	30	43	43	42	41	41	40	50	50	49	48	48	47	47
	150	<23	<23	<23	<23	<23	<23	38	38	37	36	36	35	48	48	47	46	46	45	54	54	53	52	52	51	51
	200	26	26	25	24	24	23	42	42	41	40	40	39	51	51	50	49	49	48	58	58	57	56	56	55	55
18	50	<23	<23	<23	<23	<23	<23	26	26	25	24	24	23	37	37	36	35	35	34	44	44	43	42	42	41	41
	75	<23	<23	<23	<23	<23	<23	32	32	31	30	30	29	42	42	41	40	40	39	49	49	48	47	47	46	46
	100	<23	<23	<23	<23	<23	<23	35	35	34	33	33	32	45	45	44	43	43	42	53	53	52	51	51	50	50
	150	<23	<23	<23	<23	<23	<23	40	40	39	38	38	37	51	51	50	49	49	48	58	58	57	56	56	55	55
	200	28	28	27	26	26	25	44	44	43	42	42	41	54	54	53	52	52	51	61	61	60	59	59	58	58
21	50	<23	<23	<23	<23	<23	<23	28	28	27	26	26	25	38	38	37	36	36	35	45	45	44	43	43	42	42
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	150	24	24	23	<23	<23	<23	42	42	41	40	40	39	52	52	51	50	50	49	59	59	58	57	57	56	56
	200	30	30	29	28	28	27	46	46	45	44	44	43	55	55	54	53	53	52	62	62	61	60	60	59	59
24	50	<23	<23	<23	<23	<23	<23	29	29	28	27	27	26	39	39	38	37	37	36	46	46	45	44	44	43	43
	75	<23	<23	<23	<23	<23	<23	34	34	33	32	32	31	44	44	43	42	42	41	52	52	51	50	50	49	49
	100	<23	<23	<23	<23	<23	<23	38	38	37	36	36	35	48	48	47	46	46	45	55	55	54	53	53	52	52
	150	26	26	25	24	24	<23	43	43	42	41	41	40	53	53	52	51	51	50	60	60	59	58	58	57	57
	200	31	31	30	29	29	28	47	47	46	45	45	44	57	57	56	55	55	54	64	64	63	62	62	61	61
27	50	<23	<23	<23	<23	<23	<23	30	30	29	28	28	27	40	40	39	38	38	37	48	48	47	46	46	45	45
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	150	27	27	26	25	25	24	44	44	43	42	42	41	54	54	53	52	52	51	61	61	60	59	59	58	58
	200	32	32	31	30	30	29	48	48	47	46	46	45	58	58	57	56	56	55	65	65	64	63	63	62	62
30	50	<23	<23	<23	<23	<23	<23	31	31	30	29	29	28	42	42	41	40	40	39	49	49	48	47	47	46	46
	75	<23	<23	<23	<23	<23	<23	37	37	36	35	35	34	47	47	46	45	45	44	54	54	53	52	52	51	51
	100	<23	<23	<23	<23	<23	<23	40	40	39	38	38	37	50	50	49	48	48	47	58	58	57	56	56	55	55
	150	28	28	27	26	26	25	45	45	44	43	43	42	56	56	55	54	54	53	63	63	62	61	61	60	60
	200	33	33	32	31	31	30	49	49	48	47	47	46	59	59	58	57	57	56	66	66	65	64	64	63	63

L<sub>WA</sub> ≤ 23 dB(A) displayed <23

FLOW DATA

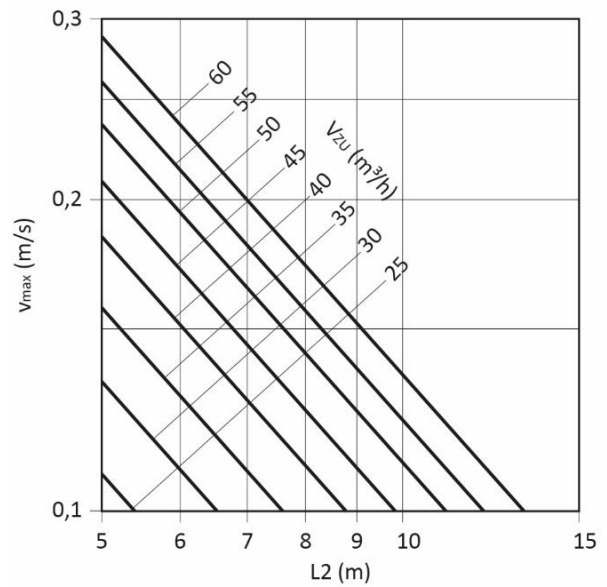
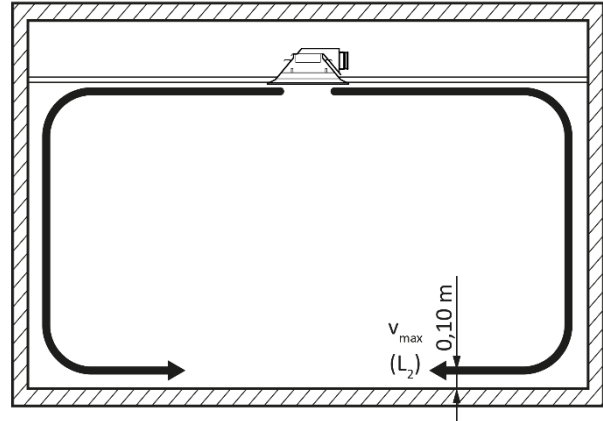
D601-A-2-[...]-B-[...]

Maximum end velocity of jet (isotherm) with coanda effect



D601-A-2-[...]-B-[...]

Maximum end velocity of jet (isotherm) at floor level



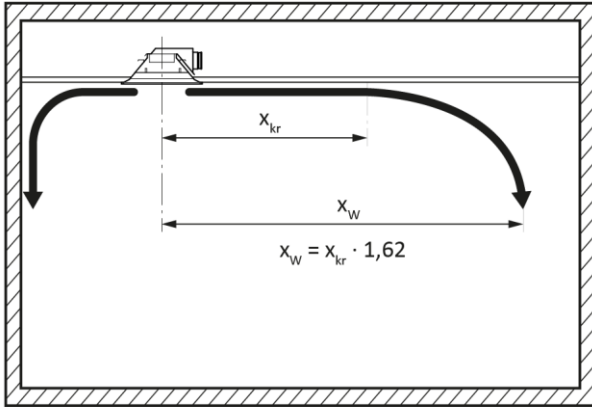
Length correction factor for air volumes ( $V_{zu} \times KF$ )

	NL	KF
$V_L \times KF$	09	x 1,33
	12	x 1,00
	15	x 0,80
	18	x 0,66
	21	x 0,57
	24	x 0,50
	27	x 0,44
	30	x 0,40

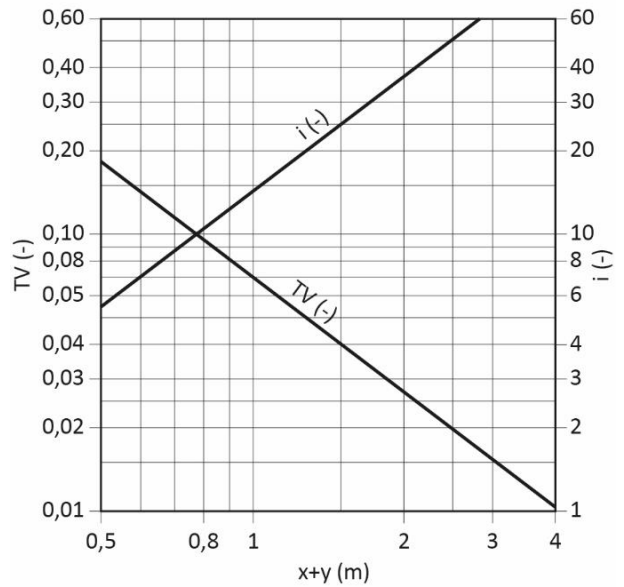
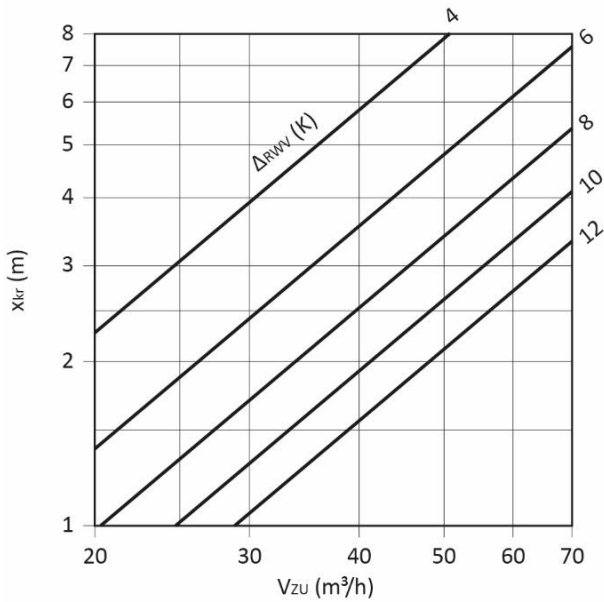
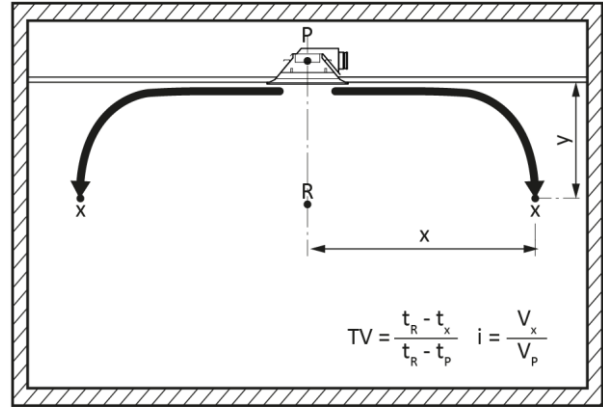
Calculation of the average velocity

$$V_{average} = V_{max} \times 0,8$$

D601-A-2-[...]-B-[...]  
 Critical throw



D601-A-2-[...]-B-[...]  
 Temperature ratio / induction ratio



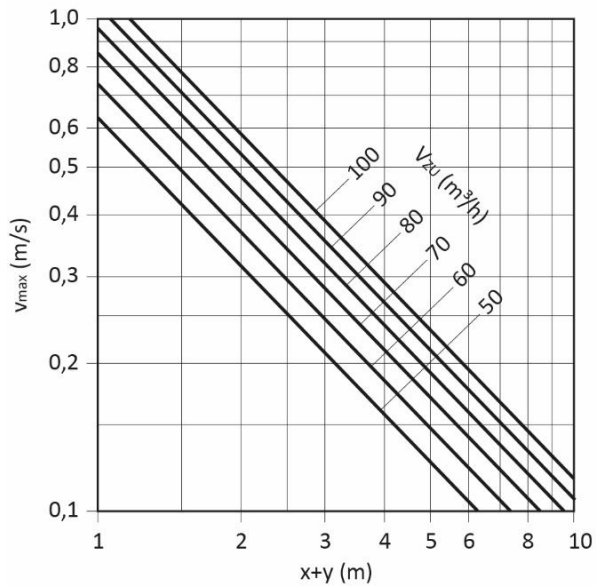
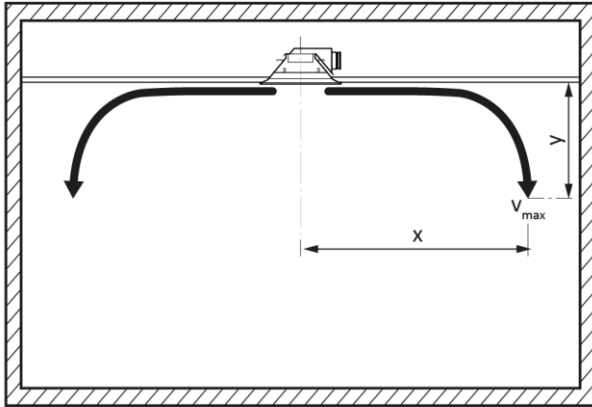
Length correction factor for air volumes (V<sub>zu</sub> x KF)

Water Δt <sub>RWV</sub> (K)	V <sub>w</sub> (l/h)	KF
6	150	x 0,78
8	150	x 0,72
10	150	x 0,66
6	250	x 0,70
8	250	x 0,65
10	250	x 0,59

Secondary slot- primary air only

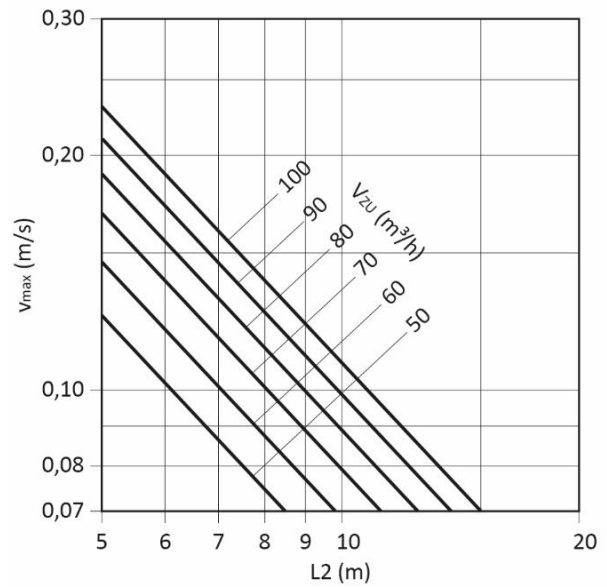
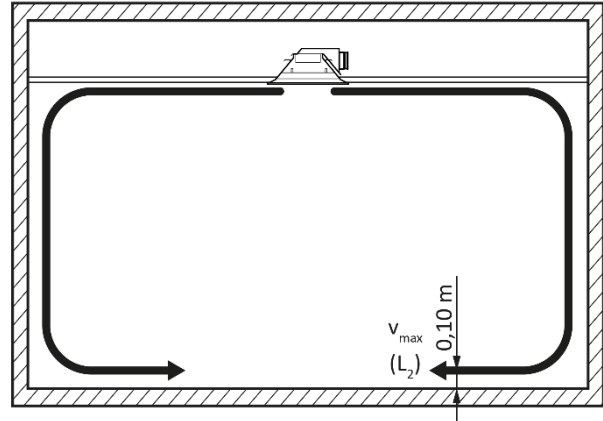
**D601-A-2-[...]-C-[...]**

Maximum end velocity of jet (isotherm) with coanda effect



**D601-A-2-[...]-C-[...]**

Maximum end velocity of jet (isotherm) at floor level



**Length correction factor for air volumes (V<sub>zu</sub> x KF)**

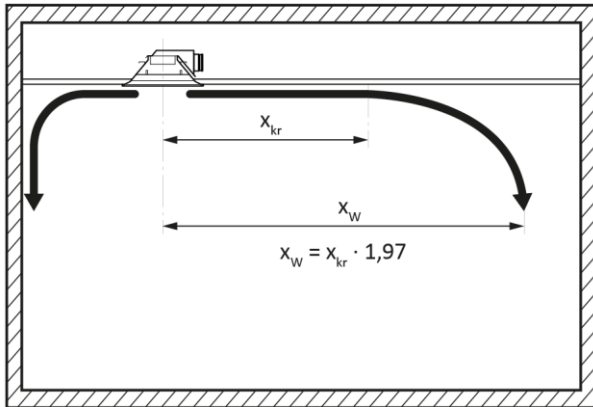
	NL	KF
V <sub>L</sub> x KF	09	x 1,33
	12	x 1,00
	15	x 0,80
	18	x 0,66
	21	x 0,57
	24	x 0,50
	27	x 0,44
	30	x 0,40

**Calculation of the average velocity**

$V_{average} = V_{max} \times 0,8$

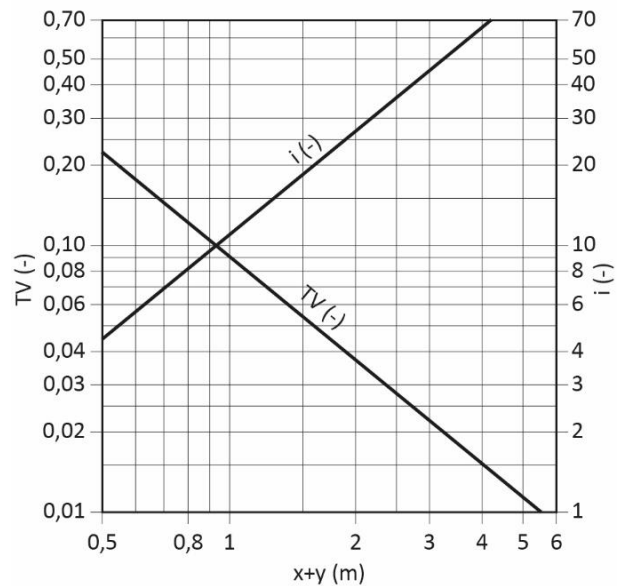
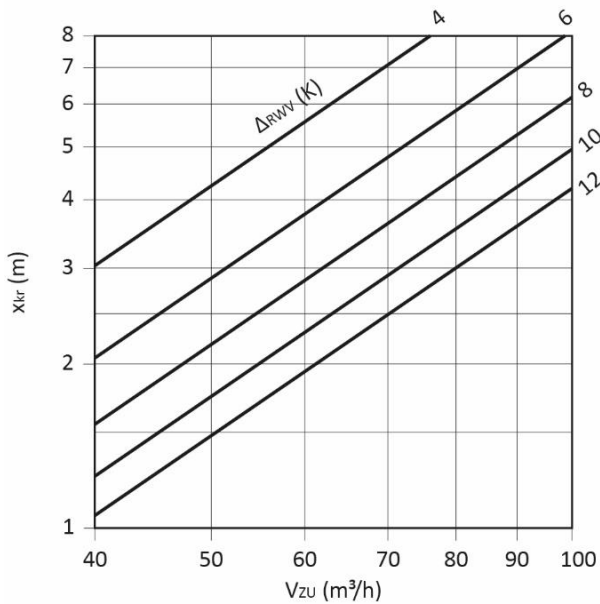
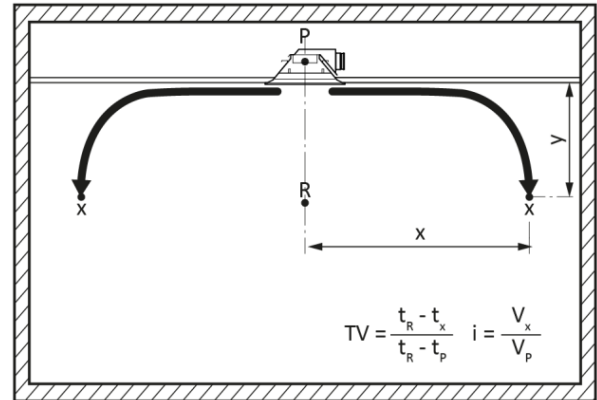
D601-A-2-[...]-C-[...]

Critical throw



D601-A-2-[...]-C-[...]

Temperature ratio / induction ratio



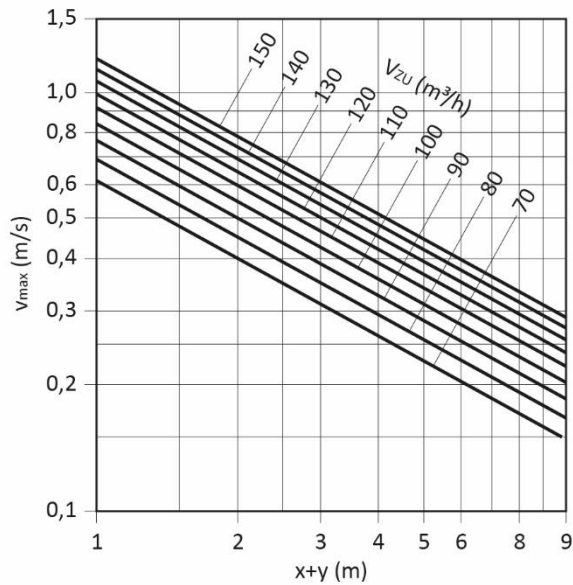
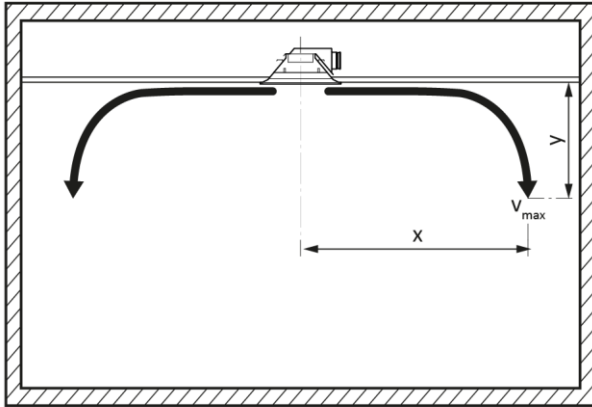
Length correction factor for air volumes ( $V_{zu} \times KF$ )

Water $\Delta t_{RWV}$ (K)	$V_w$ (l/h)	KF
6	150	x 0,59
8	150	x 0,57
10	150	x 0,55
6	250	x 0,46
8	250	x 0,44
10	250	x 0,42

Secondary slot- primary air only

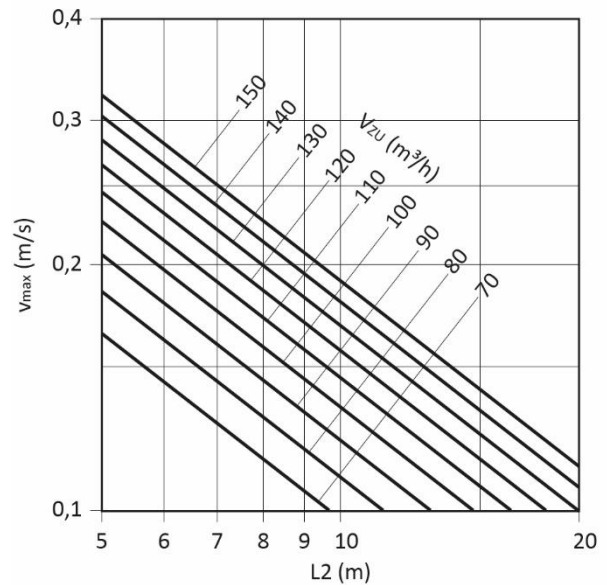
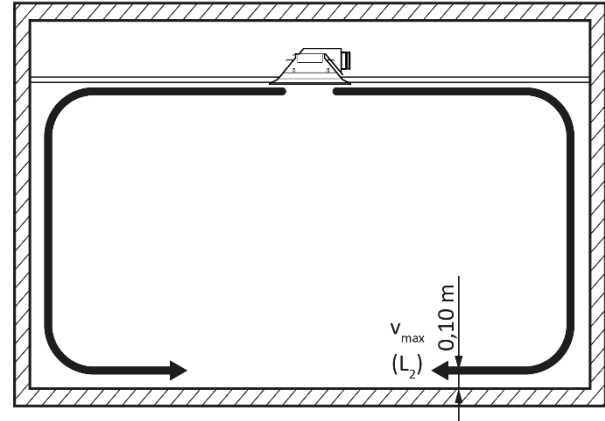
**D601-A-2-[...]-D-[...]**

Maximum end velocity of jet (isotherm) with coanda effect



**D601-A-2-[...]-D-[...]**

Maximum end velocity of jet (isotherm) at floor level



**Length correction factor for air volumes (V<sub>zu</sub> x KF)**

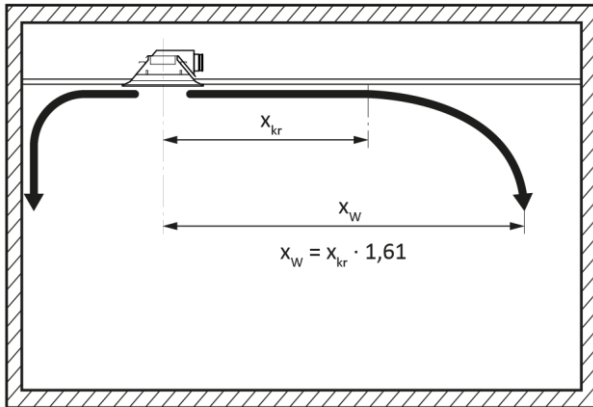
	NL	KF
V <sub>L</sub> x KF	09	x 1,33
	12	x 1,00
	15	x 0,80
	18	x 0,66
	21	x 0,57
	24	x 0,50
	27	x 0,44
	30	x 0,40

**Calculation of the average velocity**

$V_{average} = V_{max} \times 0,8$

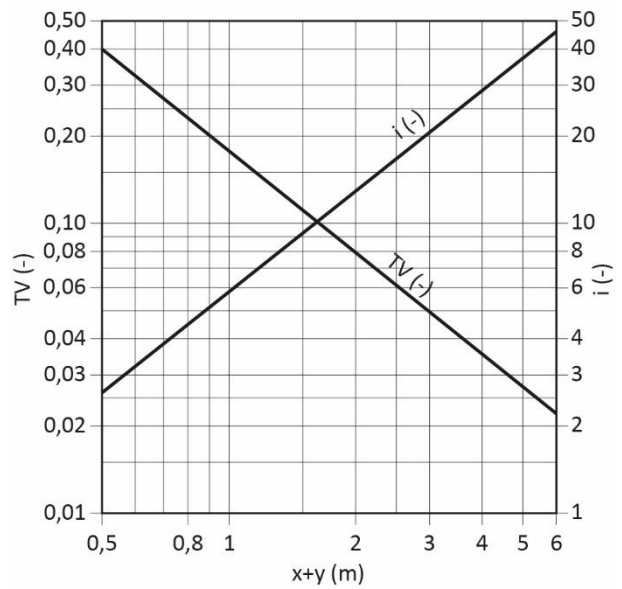
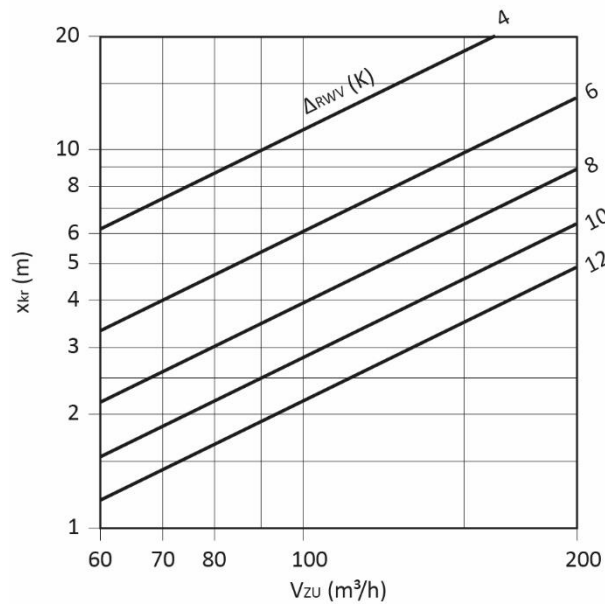
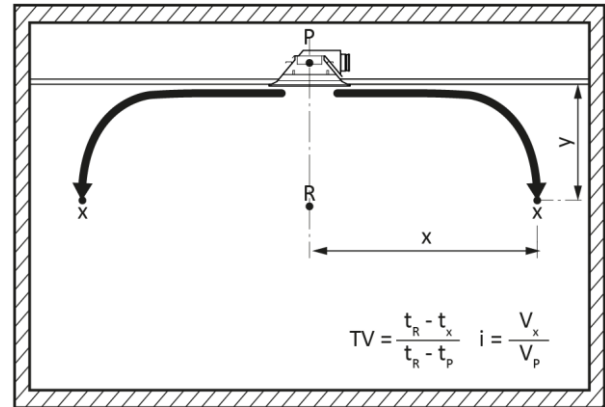
D601-A-2-[...]-D-[...]

Critical throw



D601-A-2-[...]-D-[...]

Temperature ratio / induction ratio



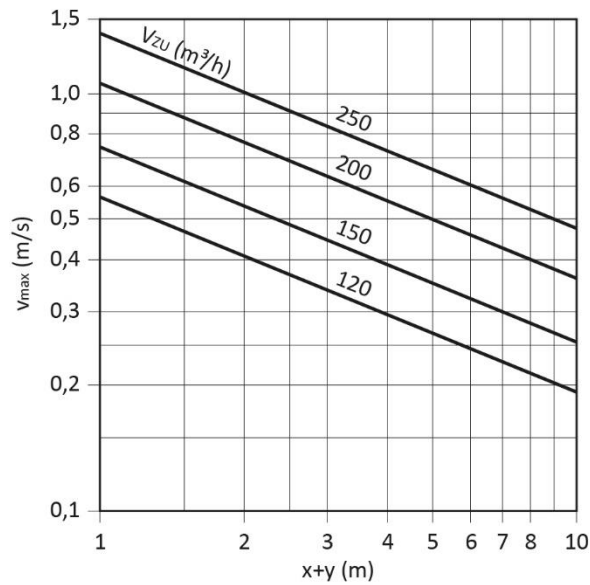
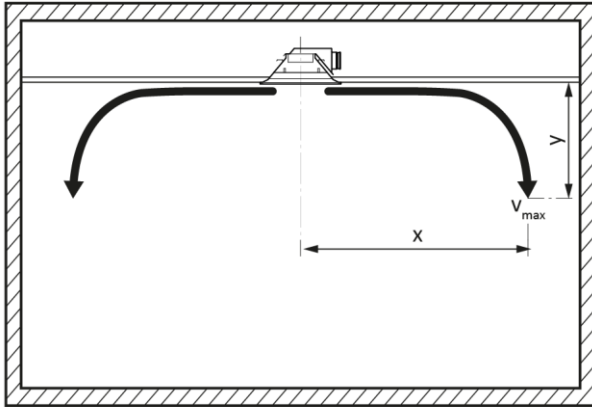
Length correction factor for air volumes (V<sub>zu</sub> x KF)

Water Δt <sub>RWV</sub> (K)	V <sub>w</sub> (l/h)	KF
6	150	x 0,73
8	150	x 0,61
10	150	x 0,57
6	250	x 0,67
8	250	x 0,57
10	250	x 0,53

Secondary slot- primary air only

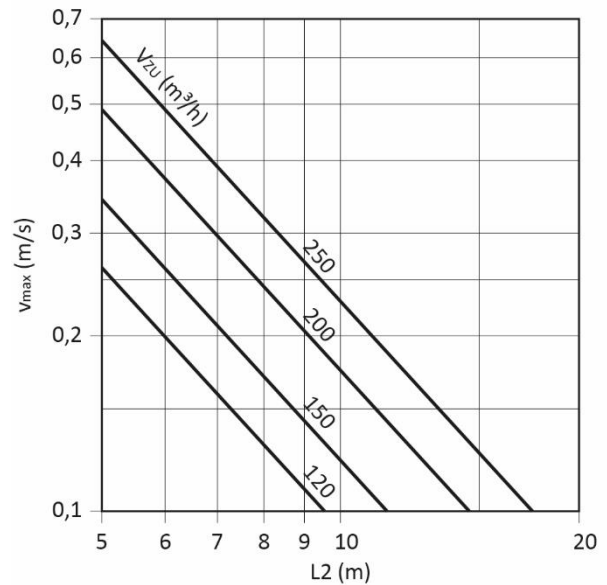
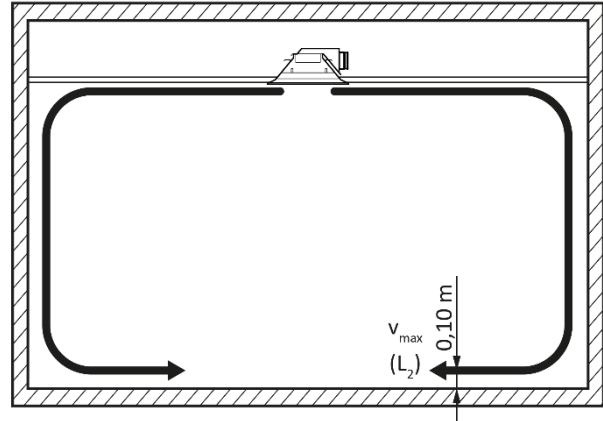
**D601-A-2-[...]-E-[...]**

Maximum end velocity of jet (isotherm) with coanda effect



**D601-A-2-[...]-E-[...]**

Maximum end velocity of jet (isotherm) at floor level



**Length correction factor for air volumes ( $V_{zu} \times KF$ )**

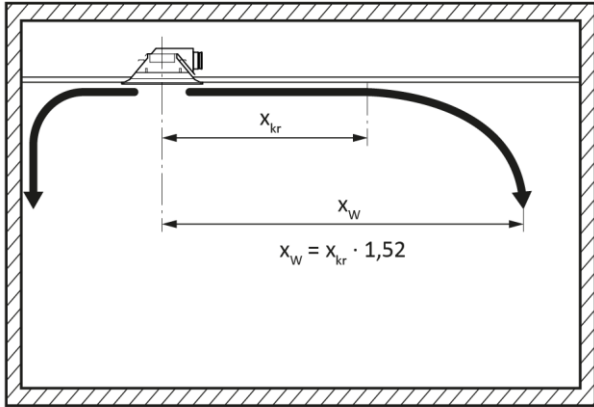
	NL	KF
$V_L \times KF$	09	x 1,33
	12	x 1,00
	15	x 0,80
	18	x 0,66
	21	x 0,57
	24	x 0,50
	27	x 0,44
	30	x 0,40

**Calculation of the average velocity**

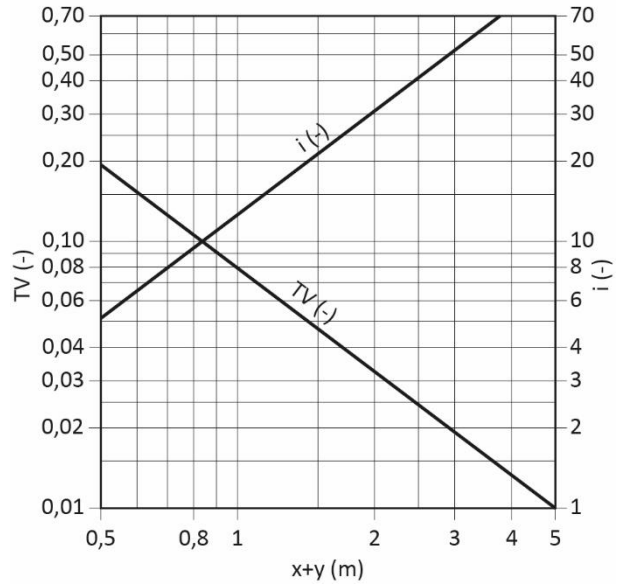
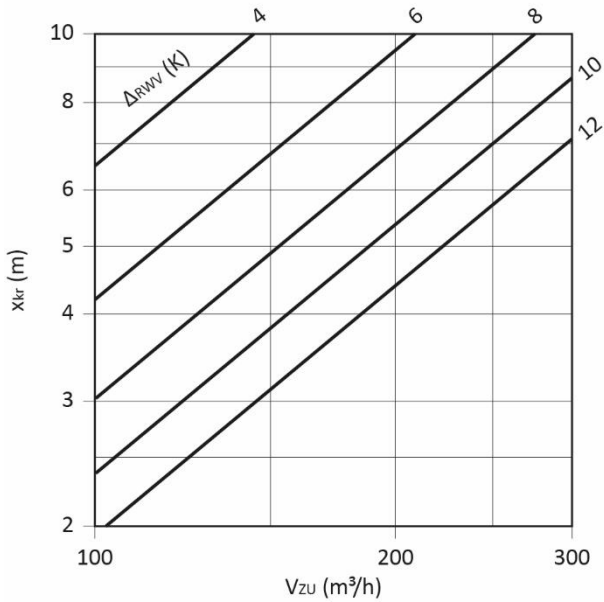
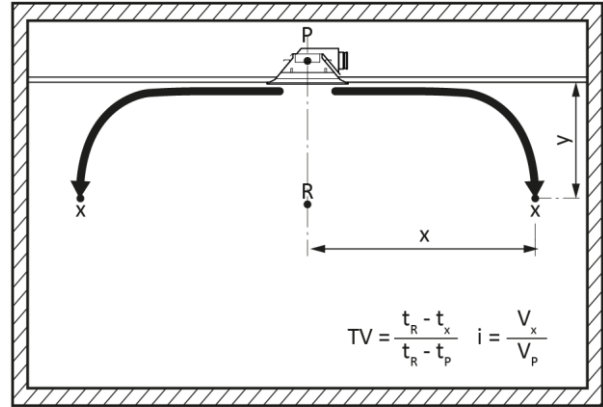
$V_{average} = V_{max} \times 0,8$



D601-A-2-[...]-E-[...]  
 Critical throw



D601-A-2-[...]-E-[...]  
 Temperature ratio / induction ratio



Length correction factor for air volumes (V<sub>zu</sub> x KF)

Water Δt <sub>RWV</sub> (K)	V <sub>w</sub> (l/h)	KF
6	150	x 0,66
8	150	x 0,63
10	150	x 0,60
6	250	x 0,55
8	250	x 0,53
10	250	x 0,50

Secondary slot- primary air only

## LEGEND

i	(-)	=	Induction ratio ( $i = V_x/V_P$ )
KL	(mm)	=	Length of box
LG	(mm)	=	Total length
L <sub>WA</sub>	[dB(A)]	=	A-weighted sound power level ( $W_{ref} = 1 \text{ pW}$ )
L2	(m)	=	Distance covered by the jet path to the floor level
NL	(mm)	=	Nominal length
P <sub>S</sub>	(Pa)	=	Static pressure
Q <sub>S</sub>	(W)	=	Sensible capacity
t <sub>P</sub>	(°C)	=	Primary air temperature
t <sub>R</sub>	(°C)	=	Room air temperature
TV	(-)	=	Temperature ratio ( $TV = (t_x - t_R)/(t_P - t_R)$ )
t <sub>w1</sub>	(°C)	=	Water inlet temperature
v <sub>max</sub>	(m/s)	=	Maximum end velocity of jet
V <sub>P</sub>	(m <sup>3</sup> /h) [l/s]	=	Primary air flow
V <sub>Wn</sub>	[l/s]	=	Standard amount of water flow
V <sub>x</sub>	(m <sup>3</sup> /h) [l/s]	=	Total air jet volume at point x
x+y	(m)	=	Horizontal + vertical throw
x <sub>kr</sub>	(m)	=	critical throw
x <sub>w</sub>	(m)	=	Throw distance
Δp <sub>w</sub>	(kPa)	=	Water-side pressure loss
ΔT <sub>x</sub>	(K)	=	Temperature difference at point x
ΔT <sub>w</sub>	(K)	=	Coolant temperature difference

## ORDER CODE DISA-601

01	02	03	04	05	06
Type	Model	Air flow direction	Nominal length	Nozzle configuration	System (water register version)
<b>Example</b>					
D601	-A	-2	-09	-V	-2F

07	08	09	10	11	12
Register colour	Water connection	Width	End piece	Versions	Total length
-0	-L	-B3	-Z	-V0	-1200

13	14	15	16	17	18
Extension side of the housing	Secondary air grille	Colour of the secondary air grille and visible parts	Housing colour (for freely suspended installation)	Primary air connection spigot position	Diameter of primary air connection spigot
-M	-SR	-2	-0	-P2	-2

19	20	21	22	23
Return air connection spigot	Diameter of return air connection spigot	Air filter	Air deflection blades	Condensate monitor
-A0	-0	-C0	-L0	-Q0

### NOTE

Please always specify the complete order code in the order! In case of missing information, processing is impossible.

Any special model not included in the order code must be queried before ordering.

\* = if no details are given, processing is impossible.

### EXAMPLE

#### **D601-A-2-09-V-2F-0-L-B3-Z-V0-1200-M-SR-2-0-P2-2-A0-0-C0-L0-Q0**

Ceiling induction diffuser DISA-601 | Active (with register) | Two-way through | Nominal length 900 | Continuously adjustable nozzle V | 2-pipe system (cooling or heating) with fixed heat exchanger | Unpainted register or without register | Water connection top left | Width 597 mm | Single unit with 2 end pieces | Without inspection opening and without return air connection spigot | Total length 1200 mm | With distributed extension | Tiltable perforated plate, perforation  $\varnothing$ 6 mm | Visible parts painted to RAL 9010 white | Outside of the housing without paint (galvanised sheet steel), Inside pre-painted in black | Primary air connection spigot horizontally in the middle on the front side of the device | DN123 | Without return air connection spigot | Without return air connection spigot | Without air filter | Without air deflection blades | Without condensate monitor

## ORDER DETAILS

### 1 - Type

D601 = Ceiling induction diffuser DISA-601

### 2 - Model

0 = Without register (only air, retrofitting of the register is possible)

A = Active (with register) (standard)

R = Only return air (without nozzles)

D = Dummy element (without nozzles)

### 3 - Air flow direction

0 = Dummy element or return air element (without nozzles)

1 = One-way throw on the front side of the device

2 = Two-way throw (standard)

3 = One-way throw on the rear side of the device

#### 4 - Nominal length

00	= Dummy element or return air element (without nozzles)	(L <sub>min</sub> = 200 mm)
09	= Nominal length 900	(L <sub>min</sub> = 852 mm)
12	= Nominal length 1200	(L <sub>min</sub> = 1152 mm)
15	= Nominal length 1500	(L <sub>min</sub> = 1452 mm)
18	= Nominal length 1800	(L <sub>min</sub> = 1752 mm)
21	= Nominal length 2100	(L <sub>min</sub> = 2052 mm)
24	= Nominal length 2400	(L <sub>min</sub> = 2352 mm)
27	= Nominal length 2700	(L <sub>min</sub> = 2652 mm)
30	= Nominal length 3000	(L <sub>min</sub> = 2952 mm)

#### 5 - Nozzle configuration

0	= Dummy element or return air element (without nozzles)	
B	= Nozzle configuration B	
C	= Nozzle configuration C	
D	= Nozzle configuration D	
E	= Nozzle configuration E	
V	= Continuously adjustable nozzle V	(+ 8 mm)

#### 6 - System (water register version)

00	= Without register	
2F	= 2-pipe system (cooling or heating) with fixed heat exchanger (standard)	
4F	= 4-pipe system (cooling and heating) with fixed heat exchanger	
2A	= 2-pipe system (cooling or heating) with tiltable heat exchanger	(NL ≤ 15 = + 142 mm, NL ≥ 18 = + 215 mm)
4A	= 4-pipe system (cooling or heating) with tiltable heat exchanger	(NL ≤ 15 = + 142 mm, NL ≥ 18 = + 215 mm)

#### 7 - Register colour

0	= Unpainted register or without register (standard)
1	= Register painted to RAL 9005 black
A	= Antibacterial coating (natural colour)

#### 8 - Water connection

0	= Without register
L	= Water connection top left (standard)
R	= Water connection top right

#### 9 - Width

B1	= Width 592 mm
B2	= Width 595 mm
B3	= Width 597 mm (standard)
B4	= Width 617 mm
B5	= Width 622 mm
B6	= Total width 900 mm for freely suspended installation

#### 10 - End piece

0	= Band design without end piece	
Z	= Single unit with 2 end pieces (standard)	(+ 40 mm)
L	= Band design with left end piece	(+ 20 mm)
R	= Band design with right end piece	(+ 20 mm)

#### 11 - Versions

V0	= Without inspection opening and without return air connection spigot (standard)	
V1	= Without inspection opening but with return air connection spigot on the left	(+ 200 mm)
V2	= Without inspection opening but with return air connection spigot on the right	(+ 200 mm)
V3	= With inspection opening on the water connection side but without return air connection spigot	(+ 400 mm)
V4	= With inspection opening on the water connection side and with left return air connection spigot	(+ 600 mm)
V5	= With inspection opening on the water connection side and with right return air connection spigot	(+ 600 mm)
V6	= Without inspection opening but with central return air connection spigot (only for Return air -R products)	(+ 200 mm)

#### 12 - Total length

xxxx	= Total length xxxx mm (from L <sub>min</sub> acc. to table to 3000; always with 4 digits in mm)
0900	= Total length 900 mm
1200	= Total length 1200 mm
1500	= Total length 1500 mm
1800	= Total length 1800 mm
2100	= Total length 2100 mm
2400	= Total length 2400 mm
2700	= Total length 2700 mm
3000	= Total length 3000 mm

#### 13 - Extension side of the housing

M	= Without housing extension (LG = L <sub>min</sub> ), or with distributed extension (only for version -V0 and LG > L <sub>min</sub> ) (standard)
L	= Extension of the housing, left (LG > L <sub>min</sub> )
R	= Extension of the housing, right (LG > L <sub>min</sub> )

#### 14 - Secondary air grille

SR	= Tiltable perforated plate, perforation Ø6 mm (standard)
SQ	= Tiltable perforated plate, perforation 8x8 mm
RE	= Tiltable perforated plate, perforation 12x5 mm
OB	= Tiltable perforated plate, oval perforation 18x6 mm
PA	= Foldable louvre grille, type PA-Z-08

#### 15 - Colour of the secondary air grille and visible parts

1	= Visible parts painted to RAL 9005 black
2	= Visible parts painted to RAL 9010 white (standard)
3	= Visible parts painted to RAL 9016 white
4	= Visible parts painted to RAL 9006 white aluminium

#### 16 - Housing colour (for freely suspended installation)

0	= Outside of the housing without paint (galvanised sheet steel), inside pre-painted in black (standard)
1	= Housing painted on the inside and outside to RAL 9005 black
2	= Housing painted on the inside and outside to RAL 9010 white
3	= Housing painted on the inside and outside to RAL 9016 white
4	= Housing painted on the inside and outside to RAL 9006 white aluminium

**17 - Primary air connection spigot position**

- P0 = Without primary air connection spigot (only for dummy element -D and return air -R products)
- P1 = Primary air connection spigot vertically in the middle - on the upper side of the device
- P2 = Primary air connection spigot horizontally in the middle on the front side of the device (standard)
- P3 = Primary air connection spigot horizontally in the middle on the rear side of the device
- P4 = Two primary air connection spigot arranged vertically on the upper side of the device
- P5 = Two primary air connection spigot arranged horizontally on the front side of the device
- P6 = Two primary air connection spigot arranged horizontally on the rear side of the device

**18 - Diameter of primary air connection spigot**

- 0 = Without primary air connection spigot (only for dummy element -D and return air -R products)
- 1 = DN98
- 2 = DN123 (standard)
- 3 = DN148
- 4 = DN158
- 5 = DN98 with rubber lip seal
- 6 = DN123 with rubber lip seal
- 7 = DN148 with rubber lip seal
- 8 = DN158 with rubber lip seal

**19 - Return air connection spigot**

- A0 = Without return air connection spigot (standard)
- A1 = Vertical return air connection spigot
- A2 = Return air connection spigot on the front of the device
- A3 = Return air connection spigot on the rear of the device

**20 - Diameter of return air connection spigot**

- 0 = Without return air connection spigot (standard)
- 1 = DN98
- 2 = DN123
- 3 = DN148
- 4 = DN158
- 5 = DN98 with rubber lip seal
- 6 = DN123 with rubber lip seal
- 7 = DN148 with rubber lip seal
- 8 = DN158 with rubber lip seal

**21 - Air filter**

- C0 = Without air filter (standard)
- C3 = With secondary air filter and return air filter (ISO Coarse 30%) (only with return air connection spigot)
- CS = With secondary air filter (ISO Coarse 30%)
- CA = With return air filter (ISO Coarse 30%) (only with return air connection spigot)

**22 - Air deflection blades**

- L0 = Without air deflection blades (standard)
- L1 = With individually adjustable air deflection blades - black, similar to RAL 9005
- L2 = With individually adjustable air deflection blades - white, similar to RAL 9010
- L3 = With blockwise adjustable air deflection blades - black, similar to RAL 9005
- L4 = With blockwise adjustable air deflection blades - white, similar to RAL 9010

**23 - Condensate monitor**

- Q0 = Without condensate monitor (standard)
- Q3 = With condensate monitor WK01+ ext. 230 V with remote sensor pre-mounted ex works (not possible with foldable heat exchanger -2A/-4A)
- Q4 = With condensate monitor WK01+ ext. 24 V with remote sensor pre-mounted ex works (not possible with foldable heat exchanger -2A/-4A)

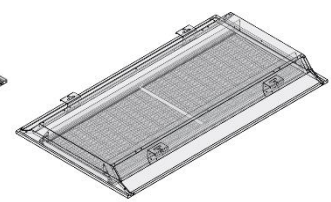
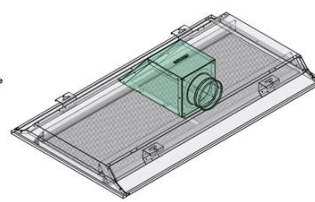
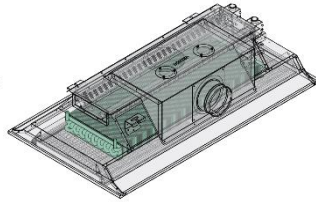
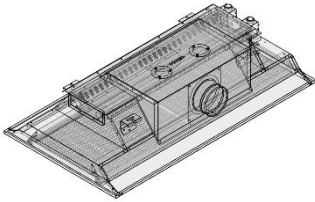
COMPATIBLE OPTION DEPENDING ON THE PRODUCT

0 = Without register

A = Active (with register)

R = Return air only

D = Dummy element



Model	Air flow direction	Nominal length	Nozzle configuration	Water register version	Register colour	Water connection	Width	End piece	Versions	Total length	Extension side of the housing	Secondary air grille	Colour of visible parts	Housing colour	Primary air connection spigot position	Primary air connecting piece	Return air connection spigot	Return air connection spigot	Air filter	Air deflection blades	Condensate monitor
-A	-1 -2 -3	-09 -12 -15 -18 -21 -24 -27 -30	-B -C -D -E -V	-2F -2 A -4F -4 A	-0 -1 -A	-L -R	-B1 -B2 -B3 -B4 -B5 -B6	-0 -Z -L -R	-V0 -V1 -V2 -V3 -V4 -V5	-xxxx	-M -L -R	-SR -SQ -RE -OB -PA	-1 -2 -3 -4	-0 -1 -2 -3 -4	-P1 -P2 -P3 -P4 -P5 -P6	-1 -2 -3 -4 -5 -6 -7 -8	-A0 -A1 -A2 -A3	-0 -1 -2 -3 -4 -5 -6 -7 -8	-CO -C3 -CS -CA	-L0 -L1 -L2 -L3 -L4	-Q0 -Q3 -Q4
-0	-1 -2 -3	-09 -12 -15 -18 -21 -24 -27 -30	-B -C -D -E -V	-00	-0	-0	-B1 -B2 -B3 -B4 -B5 -B6	-0 -Z -L -R	-V0 -V1 -V2 -V3 -V4 -V5	-xxxx	-M -L -R	-SR -SQ -RE -OB -PA	-1 -2 -3 -4	-0 -1 -2 -3 -4	-P1 -P2 -P3 -P4 -P5 -P6	-1 -2 -3 -4 -5 -6 -7 -8	-A0 -A1 -A2 -A3	-0 -1 -2 -3 -4 -5 -6 -7 -8	-CO -C3 -CS -CA	-L0 -L1 -L2 -L3 -L4	-Q0
-R	-0	-00	-0	-00	-0	-0	-B1 -B2 -B3 -B4 -B5 -B6	-0 -Z -L -R	-V6	-xxxx	-M	-SR -SQ -RE -OB -PA	-1 -2 -3 -4	-0 -1 -2 -3 -4	-P0	-0	-A1 -A2 -A3	-1 -2 -3 -4 -5 -6 -7 -8	-CO -CA	-L0 -L1 -L2 -L3 -L4	-Q0
-D	-0	-00	-0	-00	-0	-0	-B1 -B2 -B3 -B4 -B5 -B6	-0 -Z -L -R	-V0	-xxxx	-M	-SR -SQ -RE -OB -PA	-1 -2 -3 -4	-0 -1 -2 -3 -4	-P0	-0	-A0	-0	-CO	-L0 -L1 -L2 -L3 -L4	-Q0

**NOTE**

All options mentioned above can be configured for the installation of spigots on site by indicating -P0/-A0 in the fields Primary air connection spigot and Return air connection spigot

Construction subject to change.  
 No return possible.

## ORDER CODE FOR END PIECE SUPPLIED LOOSE

01	02	03	04
Type	Family	Width	Colour
<b>Example</b>			
END	-601	-B1	-2

### NOTE

Please always specify the complete order code in the order! In case of missing information, processing is impossible.

Any special model not included in the order code must be queried before ordering.

\* = if no details are given, processing is impossible.

### EXAMPLE

#### END-601-B1-2

End piece | For ceiling induction diffuser DISA-601 | Width 592 mm | Visible parts painted to RAL 9010 white

## ORDER DETAILS

### 1 - Type

END = End piece

### 2 - Family

601 = For ceiling induction diffuser DISA-601

### 3 - Width\*

B1 = Width 592 mm

B2 = Width 595 mm

B3 = Width 597 mm

B4 = Width 617 mm

B5 = Width 622 mm

B6 = Total width 900 mm for freely suspended installation

### 4 - Colour\*

1 = Visible parts painted to RAL 9005 black

2 = Visible parts painted to RAL 9010 white

3 = Visible parts painted to RAL 9016 white

4 = Visible parts painted to RAL 9006 white aluminium

## ORDER CODE FOR ACCESSORIES SUPPLIED LOOSE

01	02
Type	Model
<b>Example</b>	
LWZ	-VC01

### NOTE

Please always specify the complete order code in the order! In case of missing information, processing is impossible.

Any special model not included in the order code must be queried before ordering.

\* = if no details are given, processing is impossible.

### EXAMPLE

#### LWZ-VC01

Accessories for air-water systems products | Pressure-independent control valve VPP46.10L0.2

## ORDER DETAILS

### 1 - Type

LWZ = accessories for air-water systems

### 2 - Model\*

#### 2.1 - Flexible hydraulic connection

Hxyz = With device connection (x), flexible connection (y) and connection to the hydraulic network (z) (x, y, z see table)

HK0A = Plug fitting AG-RV, device connection 12 mm, connection to the hydraulic network AG ½"

HK0B = Plug fitting AG-RV, device connection 12 mm, connection to the hydraulic network AG ¾"

#### 2.2 - Pressure-independent control valve

VC01 = VPP46.10L0.2

VC02 = VPP46.10L0.4

VC03 = VPP46.15L0.2

VC04 = VPP46.15L0.6

VC08 = VPP46.10L0.2Q

VC09 = VPP46.10L0.4Q

VC10 = VPP46.15L0.2Q

VC11 = VPP46.15L0.6Q

VC15 = VPI46.15L0.2

VC16 = VPI46.15L0.6

VC20 = VPI46.15L0.2Q

VC21 = VPI46.15L0.6Q

#### 2.3 - VPP valve adapter

VA01 = Female thread G1/2" to male thread R3/8"

VA02 = Female thread G3/4" to male thread R1/2"

### 2.4 - Valve drive

AT01 = SAST127474

AT02 = SAST127475

AT03 = SAPV127957

AT04 = SAPV128561

AM01 = SMPV132351

AM02 = SMPO132353

### 2.5 - Room thermostat

TR01 = RDG100

TR02 = RDG100T

TR03 = RDG110

TK01 = RDG100KN

TR05 = RDG160T

TK02 = RDG160KN

### 2.6 - Condensation monitor

WK01 = AC 230 V integrated sensor, change-over contact max. 230 V/0,5 A

WK02 = AC/DC 24 V integrated sensor, change-over contact max. 24 V/1 A

WK03 = AC 230 V remote sensor, cable 2 m, change-over contact max. 230 V/0,5 A

WK04 = AC/DC 24 V remote sensor, cable 2 m, change-over contact max. 24 V/1 A

### 2.7 - Measuring accessories

MRD1 = Pressure measuring tube for DISA devices



## SPECIFICATION TEXT

Ceiling induction diffuser DISA-601 with front side slot and horizontal heat exchanger for energy-efficient cooling and heating, high performance with low volumetric flow. For installation in false ceilings, or freely suspended installation. 2-slot housing made of galvanised sheet steel with fixed non-flammable induction nozzles made of sheet steel painted to RAL 9005 (black), or two rows of mechanically continuously adjustable nozzles from 0-100% and digital display of the individual air volumes and the static pressure. With tiltable secondary air grille, type SCHAKO-PA or perforated plate made of sheet steel painted to RAL 9010 (white, standard). Primary and secondary air flows are mixed in the unit and supplied horizontally to the room with Coanda effect through diffuser slots. For the conditioning of the secondary air flow, a horizontal 2-pipe (standard) or 4-pipe register (option) is installed. The register consists of a galvanised sheet steel frame, copper pipes and aluminium blades. As an option, the register can be folded down by 90° without tools and without separating the hydraulic circuit in order to clean the heat exchanger from above and all internal surfaces circulated by the secondary air. To protect the register from uncontrolled swiveling down, it is equipped with a safety rope. A lint separator reversible without tools of the filter class ISO Coarse 30% (G1) is located below the register. Width 592-900 mm, height 262 mm, length 852-3000 mm.

**Product:** SCHAKO

**Family:** Ceiling induction diffuser DISA-601

### Models DISA-601

#### Type

Ceiling induction diffuser DISA-601 D601

#### Model

Without register (only air, retrofitting of the register is possible) -0  
 Active (with register) -A  
 Only return air (without nozzles) -R  
 Dummy element (without nozzles) -D

#### Air flow direction

Dummy element or return air element (without nozzles) -0  
 One-way throw on the front side of the device -1  
 Two-way throw -2  
 One-way throw on the rear side of the device -3

#### Nominal length

Dummy element or return air element (without nozzles) -00  
 Nominal length 900 -09  
 Nominal length 1200 -12  
 Nominal length 1500 -15  
 Nominal length 1800 -18  
 Nominal length 2100 -21  
 Nominal length 2400 -24  
 Nominal length 2700 -27  
 Nominal length 3000 -30

#### Nozzle configuration

Dummy element or return air element (without nozzles) -0  
 Nozzle configuration B -B  
 Nozzle configuration C -C  
 Nozzle configuration D -D  
 Nozzle configuration E -E  
 Continuously adjustable nozzle V -V

#### System (water register version)

Without register -00  
 2-pipe system (cooling or heating) with fixed heat exchanger -2F  
 4-pipe system (cooling and heating) with fixed heat exchanger -4F  
 2-pipe system (cooling or heating) with tiltable heat exchanger -2A  
 4-pipe system (cooling or heating) with tiltable heat exchanger -4A

#### Register colour

Unpainted register or without register -0  
 Register painted to RAL 9005 black -1  
 Antibacterial coating (natural colour) -A

#### Water connection

Without register -0  
 Water connection top left -L  
 Water connection top right -R

#### Width

Width 592 mm -B1  
 Width 595 mm -B2  
 Width 597 mm -B3  
 Width 617 mm -B4  
 Width 622 mm -B5  
 Total width 900 mm for freely suspended installation -B6

#### End piece

Band design without end piece -0  
 Single unit with 2 end pieces -Z  
 Band design with left end piece -L  
 Band design with right end piece -R

### Versions

Without inspection opening and without return air connection spigot	-V0
Without inspection opening but with return air connection spigot on the left	-V1
Without inspection opening but with return air connection spigot on the right	-V2
With inspection opening on the water connection side but without return air connection spigot	-V3
With inspection opening on the water connection side and with left return air connection spigot	-V4
With inspection opening on the water connection side and with right return air connection spigot	-V5
Without inspection opening but with central return air connection spigot	-V6

### Total length

Total length xxxx mm	-xxxx
Total length 900 mm	-0900
Total length 1200 mm	-1200
Total length 1500 mm	-1500
Total length 1800 mm	-1800
Total length 2100 mm	-2100
Total length 2400 mm	-2400
Total length 2700 mm	-2700
Total length 3000 mm	-3000

### Extension side of the housing

Without housing extension (LG = L <sub>min</sub> ), or with distributed extension (only for version -V0 and LG > L <sub>min</sub> )	-M
Housing extension on the left	-I
Housing extension on the right	-R

### Secondary air grille

Tiltable perforated plate, perforation Ø6 mm	-SR
Tiltable perforated plate, perforation 8x8 mm	-SQ
Tiltable perforated plate, perforation 12x5 mm	-RE
Tiltable perforated plate, oval perforation 18x6 mm	-OB
Tiltable louvre grille type PA-Z-08	-PA

### Colour of the secondary air grille and visible parts

Visible parts painted to RAL 9005 black	-1
Visible parts painted to RAL 9010 white	-2
Visible parts painted to RAL 9016 white	-3
Visible parts painted to RAL 9006 white aluminium	-4

### Housing colour (for freely suspended installation)

Outside of the housing without paint (galvanised sheet steel), inside pre-painted in black	-0
Housing painted on the inside and outside to RAL 9005 black	-1
Housing painted on the inside and outside to RAL 9010 white	-2
Housing painted on the inside and outside to RAL 9016 white	-3
Housing painted on the inside and outside to RAL 9006 white aluminium	-4

Construction subject to change.  
 No return possible.

### Primary air connection spigot position

Without primary air connection spigot	-P0
primary air connection spigot arranged vertically on the upper side of the device	-P1
Primary air connection spigot horizontally in the middle on the front side of the device	-P2
Primary air connection spigot horizontally in the middle on the rear side of the device	-P3
Two primary air connection spigot arranged vertically on the upper side of the device	-P4
Two primary air connection spigot arranged horizontally on the front side of the device	-P5
Two primary air connection spigots horizontally on the rear side of the device	-P6

### Diameter of primary air connection spigot

Without primary air connection spigot	-0
DN98	-1
DN123	-2
DN148	-3
DN158	-4
DN98 with rubber lip seal	-5
DN123 with rubber lip seal	-6
DN148 with rubber lip seal	-7
DN158 with rubber lip seal	-8

### Return air connection spigot

Without return air connection spigot	-A0
Vertical return air connection spigot	-A1
Return air connection spigot on the front side	-A2
Return air connection spigot on the rear of the device	-A3

### Diameter of return air connection spigot

without return air connection spigot	-0
DN98	-1
DN123	-2
DN148	-3
DN158	-4
DN98 with rubber lip seal	-5
DN123 with rubber lip seal	-6
DN148 with rubber lip seal	-7
DN158 with rubber lip seal	-8

### Air filter

Without air filter	-C0
With secondary air filter and return air filter (ISO Coarse 30%)	-C3
With secondary air filter (ISO Coarse 30%)	-CS
With return air filter (ISO Coarse 30%)	-CA

#### Air deflection blades

Without air deflection blades	-L0
With individually adjustable air deflection blades - black, similar to RAL 9005	-L1
With individually adjustable air deflection blades - white, similar to RAL 9010	-L2
With blockwise adjustable air deflection blades - black, similar to RAL 9005	-L3
With blockwise adjustable air deflection blades - white, similar to RAL 9010	-L4

#### Condensate monitor

Without condensate monitor	-Q0
With condensate monitor WK01+ ext. 230 V with remote sensor pre-mounted ex works	-Q3
With condensate monitor WK01+ ext. 24 V with remote sensor pre-mounted ex works	-Q4

#### End piece supplied loose

##### Type

End piece	-END
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##### Family

For ceiling induction diffuser DISA-601	-601
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##### Width

Width 592 mm	-B1
Width 595 mm	-B2
Width 597 mm	-B3
Width 617 mm	-B4
Width 622 mm	-B5
Total width 900 mm for freely suspended installation	-B6

##### Colour

Visible parts painted to RAL 9005 black	-1
Visible parts painted to RAL 9010 white	-2
Visible parts painted to RAL 9016 white	-3
Visible parts painted to RAL 9006 white aluminium	-4

#### Accessories supplied loose

##### Flexible hydraulic connection

EDE-13 500 mm	-1
EDE-13 800 mm	-2
EDE-13 1200 mm	-3
AG male thread ½"	-A
AG male thread ¾"	-B
ÜMF flat seal spigot nut ½"	-C
ÜMF flat seal spigot nut ¾"	-D
R-AG-D rotating male thread ½"	-E
R-AG-D rotating male thread ¾"	-F
C-RV bend plug-in fitting 12 mm	-G
CE-RV bend plug-in fitting with ventilation 12 mm	-I
RV straight connector / plug-in fitting 12 mm	-K
Plug fitting AG-RV, device connection 12 mm,	

Construction subject to change.  
 No return possible.

connection to the hydraulic network AG ½"	-K0A
Plug fitting AG-RV, device connection 12 mm, connection to the hydraulic network AG ¾"	-K0B

##### Pressure-independent control valve

VPP46.10L0.2	-VC01
VPP46.10L0.4	-VC02
VPP46.15L0.2	-VC03
VPP46.15L0.6	-VC04
VPP46.10L0.2Q	-VC08
VPP46.10L0.4Q	-VC09
VPP46.15L0.2Q	-VC10
VPP46.15L0.6Q	-VC11
VPI46.15L0.2	-VC15
VPI46.15L0.6	-VC16
VPI46.15L0.2Q	-VC20
VPI46.15L0.6Q	-VC21

##### VPP valve adapter

Female thread G1/2" to male thread R3/8"	-VA01
Female thread G3/4" to male thread R1/2"	-VA02

##### Valve drive

SAST127474	-AT01
SAST127475	-AT02
SAPV127957	-AT03
SAPV128561	-AT04
SMPV132351	-AM01
SMPO132353	-AM02

##### Room thermostat

RDG100	-TR01
RDG100T	-TR02
RDG110	-TR03
RDG100KN	-TK01
RDG160T	-TR05
RDG160KN	-TK02

##### Condensation monitor

AC 230 V integrated sensor, change-over contact max. 230 V/0,5 A	-WK01
AC/DC 24 V integrated sensor, change-over contact max. 24 V/1 A	-WK02
AC 230 V remote sensor, cable 2 m, change-over contact max. 230 V/0,5 A	-WK03
AC/DC 24 V remote sensor, cable 2 m, change-over contact max. 24 V/1 A	-WK04

##### Measuring accessories

Pressure measuring tube for DISA devices	-MRD1
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