



## NBS

Fan coil unit




### OPERATING CONDITIONS

- Medium: water
- Water inlet temperature: from 6 to 45 °C
- Max. air outlet temperature: 40 °C
- Max. operating pressure: 8 bar
- Power supply: 230 V 50 Hz AC
- Maximum relative humidity in the environment: 60%

### ADVANTAGES

- High energy efficiency
- High performance (compensation of high thermal loads)
- Low noise level
- Compact dimensions and low mounting height
- Low mounting and maintenance expenditure
- Decentral air conditioning

### PERFORMANCE DATA

|   | NBS-100-3                         | NBS-150-3                   |
|---|-----------------------------------|-----------------------------|
|  | $V_L = 1360 \text{ m}^3/\text{h}$ | $3529 \text{ m}^3/\text{h}$ |
|   | $p_s = 135 \text{ Pa}$            | $225 \text{ Pa}$            |
|   | $W = 274 \text{ W}$               | $1300 \text{ W}$            |
|  | $Q = 7.21 \text{ kW}$             | $16.04 \text{ kW}$          |
|  | $Q_T = 9.63 \text{ kW}$           | $22.15 \text{ kW}$          |
|   | $Q_S = 7.04 \text{ kW}$           | $16.60 \text{ kW}$          |

**Heating:**  $t_{w1} = 45 \text{ °C}$ ,  $t_{w2} = 40 \text{ °C}$ ,  $t_R = 20 \text{ °C}$

**Cooling:**  $t_{w1} = 7 \text{ °C}$ ,  $t_{w2} = 12 \text{ °C}$ ,  $t_R = 27 \text{ °C}$ , HR = 47 %

Technical data for the standard model according to (EU) 2016/2281 for product 3, 4-pipe model with ISO Coarse 50% filter at the point of maximum static performance.

### INTENDED USE

Intended use as fan coil unit according to Commission Regulation (EU) 2016/2281 of 30 November 2016

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## GENERAL DESCRIPTION

NBS room air conditioning modules are units with small mounting height for decentralised air treatment. They are particularly suitable for small units in which higher cooling capacities and pressures are required than those that a standard fan coil unit is able to provide. Additionally, NBS room air conditioning modules outdo the performance of standard fan coil units.

Its compact dimensions and low height make the NBS room air conditioning modules the perfect solution for horizontal installation in false ceilings or suspension-type mounting in industrial halls.

The room air conditioning module series consists of two product series, a modular unit (NBS -100) and a compact unit (NBS -150), which can both be delivered, depending on the desired performance profile, with different motor, register and filter equipment.

### NBS-100

- Fan group: 1 motor with 1, 2 or 3 fans
- Motor: 5 speeds
- Volumetric flow: from 200 to 2826 m<sup>3</sup>/h
- Static pressure: from 5 to 160 Pa
- Cooling capacity: from 1.6 kW to 16.1 kW
- Heating capacity: from 1.2 kW to 11.9 kW
- Filtering efficiency: ISO Coarse 50%

As per compliance with eco design requirements

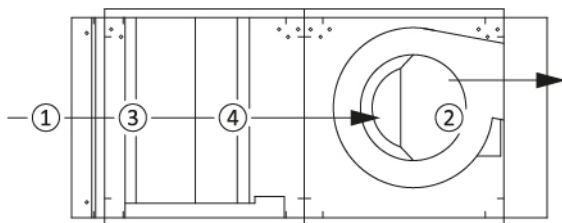
### NBS-150

- Fan group: 1, 2 or 3 motorised fans
- Motor: 3 speeds
- Volumetric flow: from 883 to 4697 m<sup>3</sup>/h
- Static pressure: from 148 to 310 Pa
- Cooling capacity: from 6.4 kW to 26.8 kW
- Heating capacity: from 4.5 kW to 19.4 kW
- Filtering efficiency: ISO Coarse 50% or ISO Coarse 60%

As per compliance with eco design requirements

## OPERATION

The air to be treated is taken in by the fan (2) on the secondary air side (1), filtered in the filter section (3) and conditioned in the heat exchanger (4).



Construction subject to change.  
 No return possible.

## DEVICE DESCRIPTION

### MODELS

|                |   |
|----------------|---|
| NBS-...        | Fan coil unit   |
| NBS-100...     | Model 100   |
| NBS-150...     | Model 150   |
| NBS -...-1...  | Size 1  |
| NBS -...-2...  | Size 2  |
| NBS -...-3...  | Size 3  |
| NBS -...-R2... | 2-pipe register 2 pipe rows   |
| NBS -...-R4... | 2-pipe register 4 pipe rows   |
| NBS -...-L4... | 4-pipe register 4 and 2 pipe rows   |
| NBS -...-W1... | Water connection position in air flow direction on the left and electrical connection position in air flow direction on the right |
| NBS -...-W2... | Water connection position in air flow direction on the right and electrical connection position in air flow direction on the left |

### OPTIONS

- Flange
- Flexible connection
- Filter of efficiency ISO Coarse 50% or ISO Coarse 60%
- Filter removal by pulling it out sideways or optionally downwards or upwards
- Droplet separator
- Mixing unit
- Plenum box for supply air
- Plenum box for return air
- Silencer

### ACCESSORIES

- Hydraulic regulation

## STANDARD MODEL PRODUCT NBS-100

### 1 Housing

- Galvanised sheet steel profiles.
- Galvanised sheet steel with a thickness of 1 mm.
- Sound and thermal insulation of 12 mm.
- Unpainted.

### 2 Heat exchanger

- Galvanised sheet steel frame with aluminium blades and copper pipes.
- Manual ventilation/draining system.
- Connection via ½" male thread for heating.
- Connection via ¾" male thread for cooling.

### 3 Condensate pan

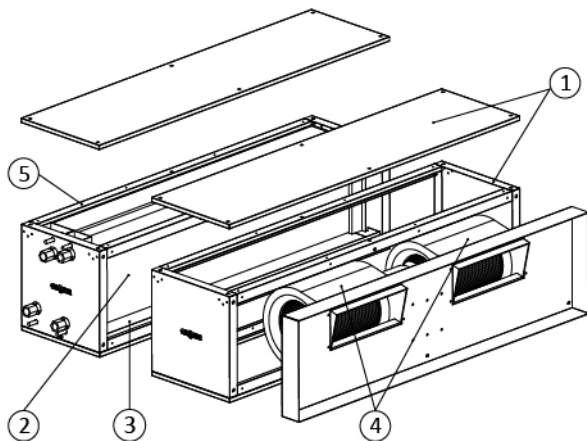
- Stainless steel.
- Condensate drain Ø 16 mm.

### 4 Motorised fan

- The built-in fans are dynamically balanced, double-sided intake-operated centrifugal blowers with forward directed blades.
- One motor with one, two or three fans.

### 5 Filter

- Filter of efficiency ISO Coarse 50% according to ISO 16890.
- Synthetic filter medium in galvanised steel frame.



## STANDARD MODEL PRODUCT NBS-150

### 1 Housing

- Aluminium profiles.
- Galvanised sheet steel with a thickness of 1 mm.
- Plastic corner pieces.
- Circumferential seal to guarantee tightness.
- Sound and thermal insulation 28 mm in thickness.
- Unpainted.

### 2 – Heat exchanger

- Galvanised sheet steel frame with aluminium blades and copper pipes.
- Manual ventilation/draining system.
- Connection via ½" male thread for heating.
- Connection via ¾" male thread for cooling.

### 3 – Condensate pan

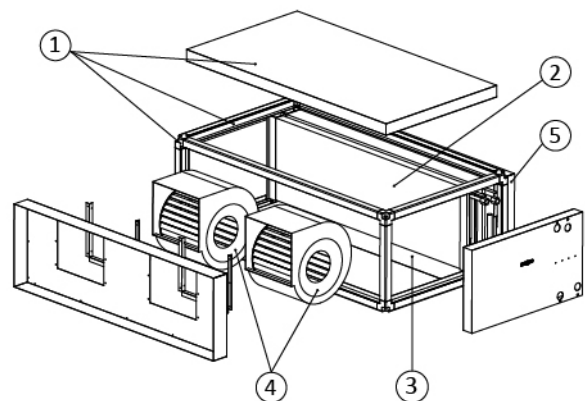
- Stainless steel.
- Condensate drain Ø 16 mm.

### 4 – Motorised fan

- The built-in fans are dynamically balanced, double-sided intake-operated centrifugal blowers with forward directed blades.
- One motorised fan for size 1, two motorised fans for size 2, and three motorised fans for size 3.

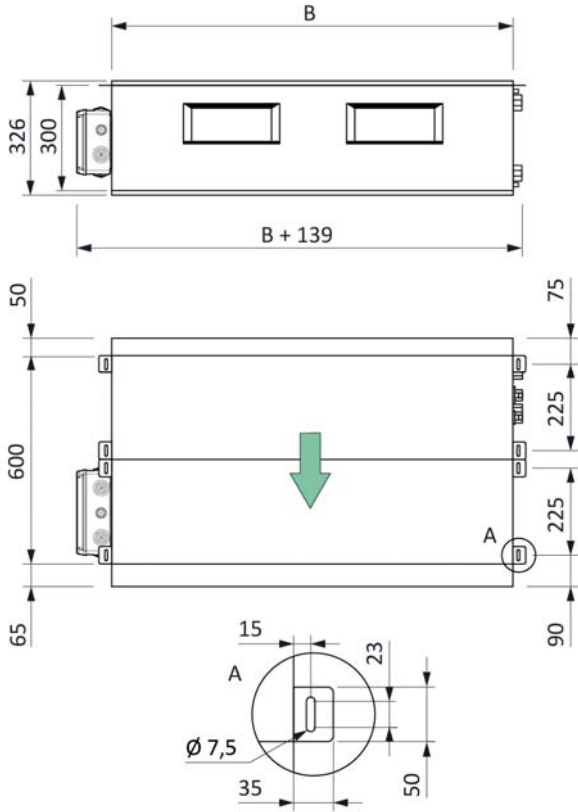
### 5 – Filter

- Filter of efficiency ISO Coarse 50% or ISO Coarse 60% according to ISO 16890.
- Synthetic filter medium in galvanised steel frame.

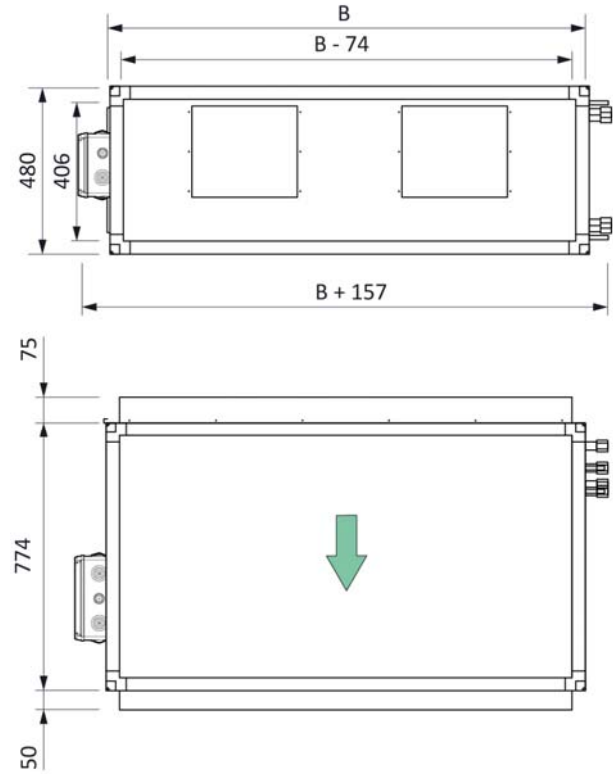


MODELS, DIMENSIONS AND WEIGHTS

NBS-100



NBS-150



| Model  | B (mm) | Weights (kg)  |                   |             |         |         |
|--------|--------|---------------|-------------------|-------------|---------|---------|
|        |        | Device unit * | Plenum box 300 mm | Mixing unit | Water   |         |
|        |        |               |                   |             | Cooling | Heating |
| -100-1 | 680    | 36            | 9                 | 18.5        | 1.89    | 0.89    |
| -100-2 | 1150   | 56            | 13                | 24.0        | 3.39    | 1.69    |
| -100-3 | 1660   | 75            | 17                | 29.5        | 5.04    | 2.55    |

\* = Housing + empty heat exchanger + motorised fan + air filter

| Model  | B (mm) | Weights (kg)  |                   |             |         |         |
|--------|--------|---------------|-------------------|-------------|---------|---------|
|        |        | Device unit * | Plenum box 300 mm | Mixing unit | Water   |         |
|        |        |               |                   |             | Cooling | Heating |
| -150-1 | 874    | 57            | 11                | 20          | 3.50    | 1.73    |
| -150-2 | 1374   | 77            | 15                | 26          | 5.82    | 2.97    |
| -150-3 | 1824   | 98            | 18.5              | 33          | 7.82    | 3.95    |

\* = Housing + empty heat exchanger + motorised fan + air filter

SYSTEM (WATER REGISTER VERSION)

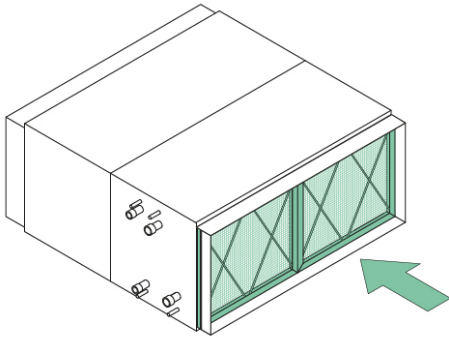
- R2 = 2-pipe register 2 pipe rows (cooling or heating)
- R4 = 2-pipe register 4 pipe rows (cooling or heating)
- L4 = 4-pipe register 4 and 2 pipe rows (cooling and heating)

## AIR FILTER

The filter of efficiency ISO Coarse 50% or ISO Coarse 60% (for type 150 only) consists of a galvanised steel frame and a synthetic filter medium.

To facilitate maintenance work, the filters are guided in profiles so that they can be easily removed by pulling them out sideways or optionally also downwards or upwards.

To facilitate filter removal, SCHAKO offers a divided filter.



### Classification

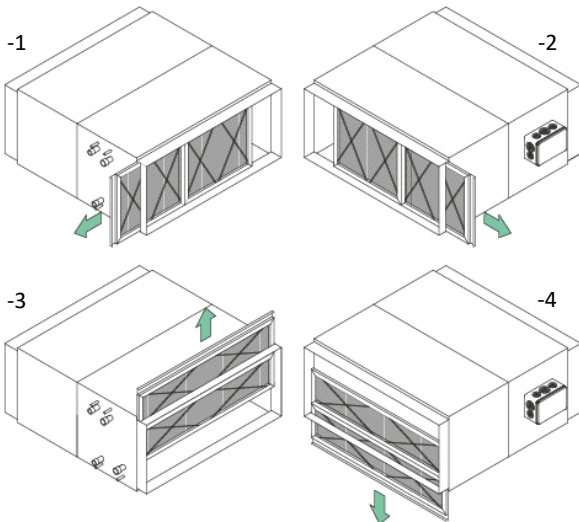
- C5 = ISO Coarse 50% (standard)
- C6 = ISO Coarse 60% (for type 150 only)

### NOTE

C5 und C6 correspond to efficiencies G3 and G4 to EN 779 (invalid).

### Filter removal

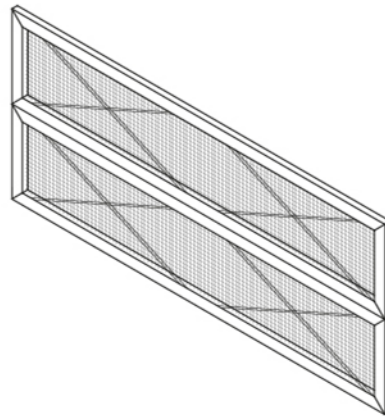
- 1 = in air flow direction on the left
- 2 = in air flow direction on the right (standard)
- 3 = upwards
- 4 = downwards



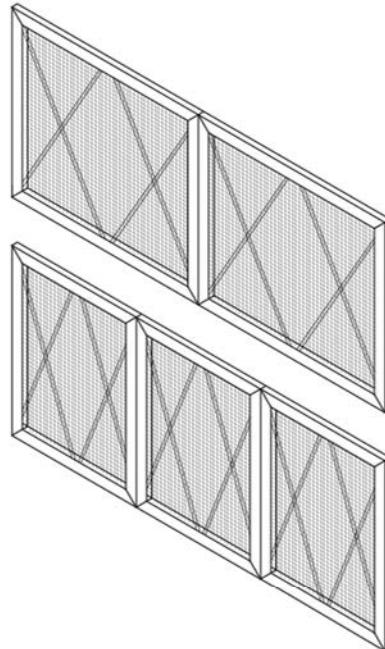
### Components filter section

| Model  | Filter removal vertical |                 | Filter removal sideways |                 |
|--------|-------------------------|-----------------|-------------------------|-----------------|
|        | St                      | Dimensions (mm) | St                      | Dimensions (mm) |
| -100-1 | 2                       | 678 x 148 x 10  | 2                       | 339x295x10      |
| -100-2 | 2                       | 1146x148x10     | 2                       | 573x295x10      |
| -100-3 | 2                       | 1656x148x10     | 3                       | 552x295x10      |
| -150-1 | 2                       | 796 x 198 x 10  | 2                       | 398x395x10      |
| -150-2 | 2                       | 1294x198x10     | 3                       | 431x395x10      |
| -150-3 | 2                       | 1744x198x10     | 3                       | 581x395x10      |

### Filter removal upwards and downwards (vertical)



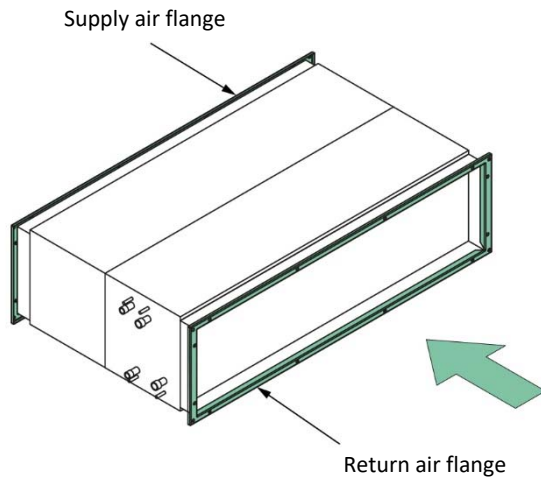
### Filter removal left and right (sideways)



## FLANGE

The units are connected to the air ducts by means of a flange.

- F0** = without flange (standard)
- FZ** = with supply air flange
- FA** = with return air flange
- FB** = with supply air and return air flange

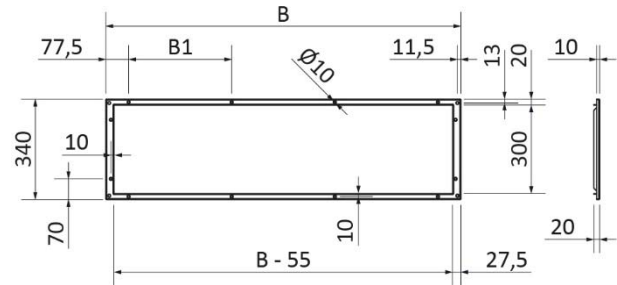


### NOTE

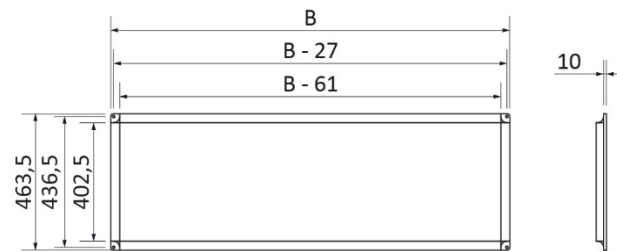
The screws required for installation of the flexible connection will be delivered together with the ordered items.

## Dimensions

### Flange NBS-100



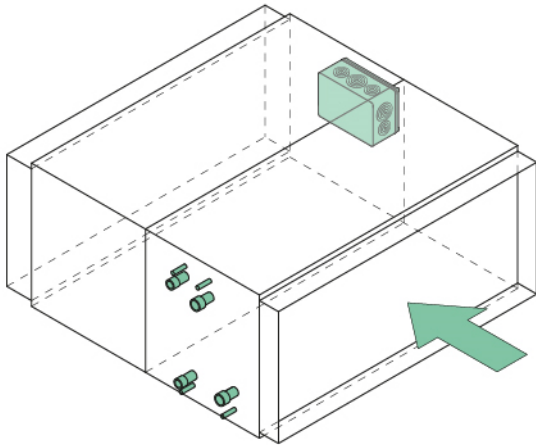
### Flange NBS-150



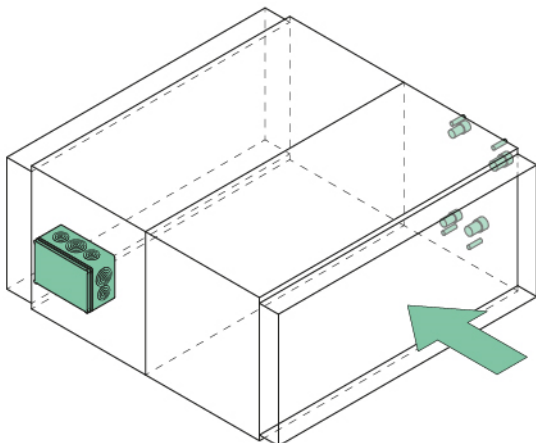
| Model  | B (mm) | B1 (mm) | Number of bores |
|--------|--------|---------|-----------------|
| -100-1 | 735    | 290     | 10 (+4 METU)    |
| -100-2 | 1205   | 350     | 12 (+4 METU)    |
| -100-3 | 1715   | 312     | 16 (+4 METU)    |
| -150-1 | 857    | -       | 4               |
| -150-2 | 1357   |         |                 |
| -150-3 | 1807   |         |                 |

## POSITION OF THE HYDRAULIC CONNECTIONS

**W1 =** In air flow direction on the left (standard)



**W2 =** In air flow direction on the right

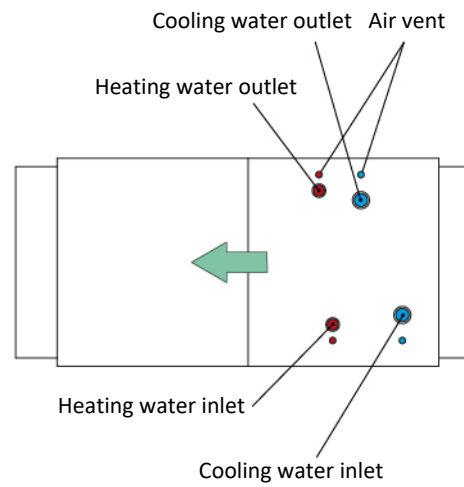


**NOTE**

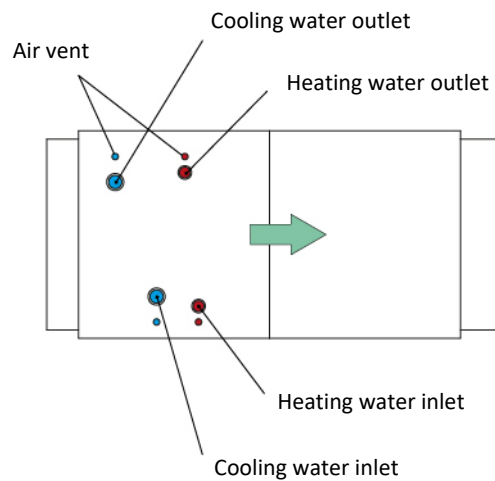
The electric connections are fitted on the opposite side of the hydraulic connections.

## Installation

**-W1**



**-W2**



**NOTE**

Register thread to EN 10226 standard:

- Heating: Pipe male thread EN 10226 R 1/2"
- Cooling: Pipe male thread EN 10226 R 3/4"

**NOTE**

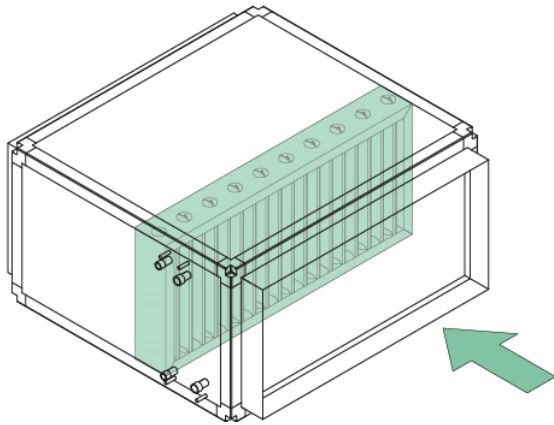
Use the air vents always in top position



## DROPLET SEPARATOR

The droplet separator consists of polypropylene leaves and a rack made of galvanised or stainless sheet steel.

- T0** = without droplet separator (standard)
- T1** = with droplet separator with polypropylene blades and a rack made of galvanised sheet steel.
- T2** = with droplet separator with polypropylene blades and a rack made of stainless sheet steel.
- Droplet separator available for type 150 only



### ATTENTION

The use of a droplet separator is obligatory when operating with condensate

Maximum admissible air flow to prevent condensate from spreading.

| Model  | V (m <sup>3</sup> /h) |
|--------|-----------------------|
| -150-1 | 2520                  |
| -150-2 | 4320                  |
| -150-3 | 5940                  |

## MIXING UNIT

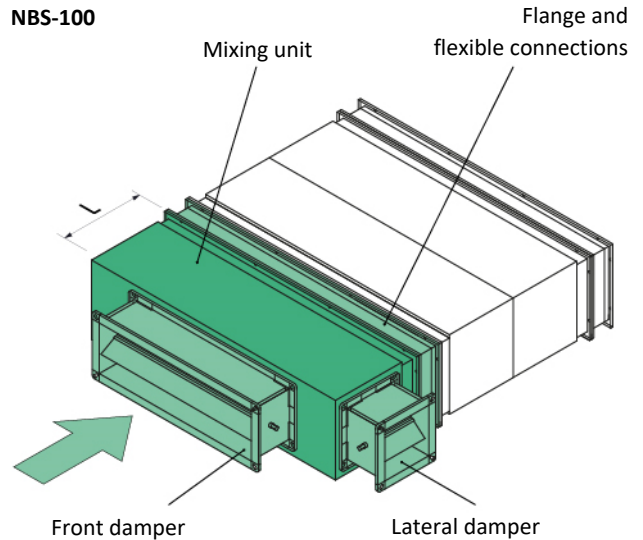
The mixing unit consists of galvanised sheet steel and is lined with sound and heat insulation. The mixing unit allows the air to be replenished by introducing a fresh air portion.

- M0** = without mixing unit (standard)
- M1** = with mixing unit in air flow direction on the left
- M2** = with mixing unit in air flow direction on the right
- The mixing unit of the NBS-100 must have a flange and a flexible connection
- The mixing unit of the NBS-150 is not compatible with a flange or flexible connection during the intake (secondary air)

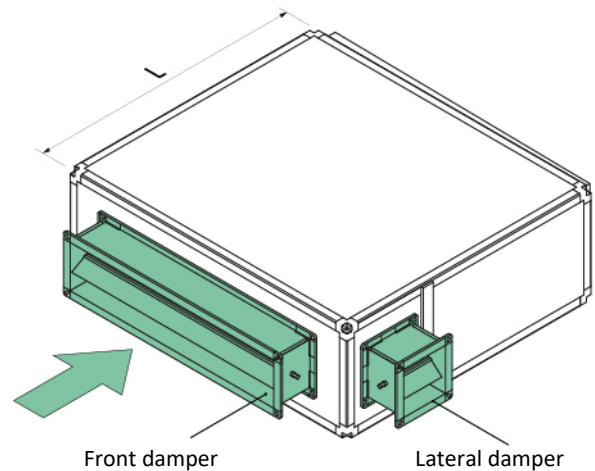
### NOTE

According to the Regulation (EU) 2016/2281, the admissible external air proportion (ODA) is <10% of the total air volume (SEK). If you want an external air proportion of ≥10%, conditioning (heat recovery) is required!

### NBS-100



### NBS-150



| Model  | L (mm) | Front damper  | Lateral damper      |
|--------|--------|---------------|---------------------|
| -100-1 | 370    | HK 401 x 201  | HK 180<br>201 x 201 |
| -100-2 |        | HK 711 x 201  |                     |
| -100-3 |        | HK 894 x 201  |                     |
| -150-1 | 1180   | HK 503 x 252  | HK 180<br>252 x 252 |
| -150-2 |        | HK 797 x 252  |                     |
| -150-3 |        | HK 1003 x 252 |                     |

### NOTE

Further information can be found in the technical documentation of the HK multi-leaf damper.

## FLEXIBLE CONNECTIONS

### NOTE

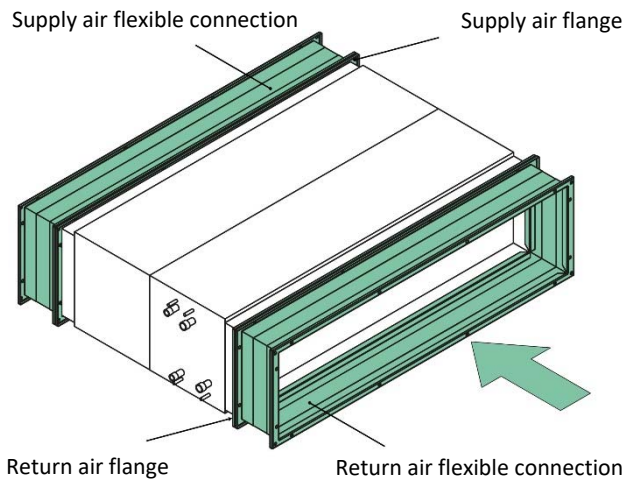
Flexible connection is ordered and supplied separately.

The unit is connected to the air ducts by means of a flexible connection to avoid the transmission of vibration to the duct.

- Z1** = 150 mm for supply air
- Z2** = 290 mm for supply air
- A1** = 150 mm for return air
- A2** = 150 mm for return air

### NOTE

To connect the flexible connections to NBS, the NBS must be configured with a flange.

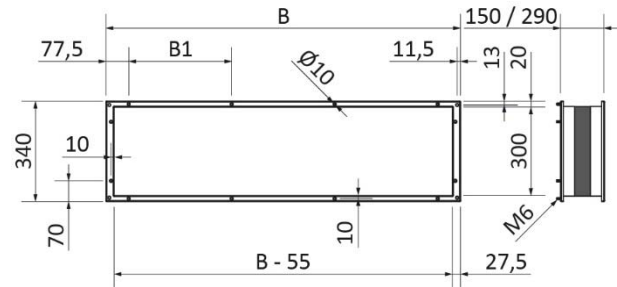


### NOTE

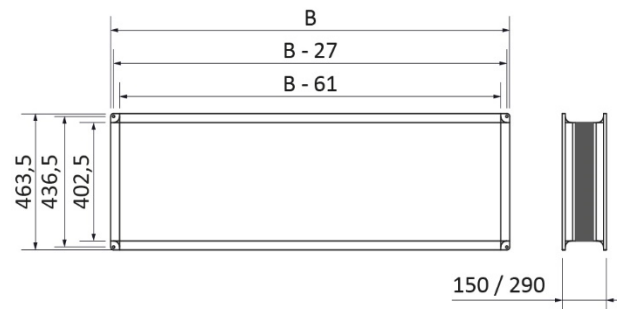
The screws required for installation of the flexible connection will be delivered together with the ordered items.

## Dimensions

### Flexible connections NBS-100



### Flexible connections NBS-150



| Model  | B (mm) | B1 (mm) | Number of bores |
|--------|--------|---------|-----------------|
| -100-1 | 735    | 290     | 10 (+4 METU)    |
| -100-2 | 1205   | 350     | 12 (+4 METU)    |
| -100-3 | 1715   | 312     | 16 (+4 METU)    |
| -150-1 | 857    | -       | 4               |
| -150-2 | 1357   |         |                 |
| -150-3 | 1807   |         |                 |

## SUPPLY AIR AND RETURN AIR BOXES

### NOTE

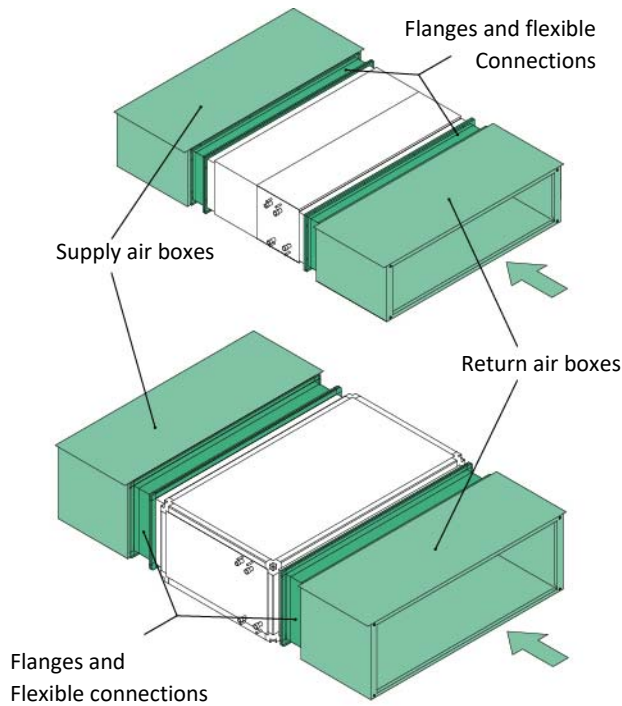
Plenum box is ordered and supplied separately.

### NOTE

To connect the plenum box to NBS, the NBS must be configured with flange or flange and flexible connection.

**Z** = Supply air (standard)

**A** = Return air



## Length

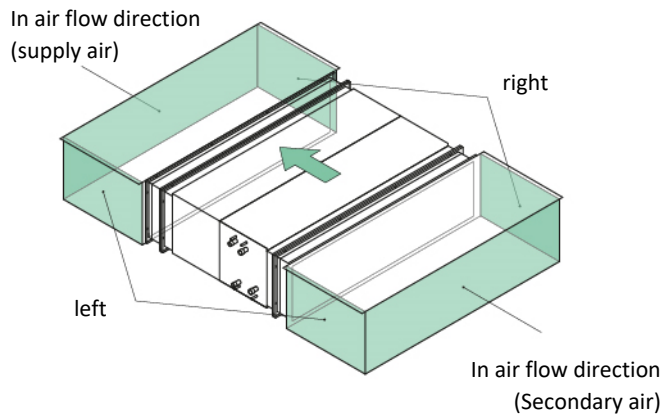
- 0300** = 300 mm
- 0400** = 400 mm
- 0500** = 500 mm (standard)
- 0600** = 600 mm
- 0700** = 700 mm
- 0800** = 800 mm
- 0900** = 900 mm
- 1000** = 1000 mm

## Insulations

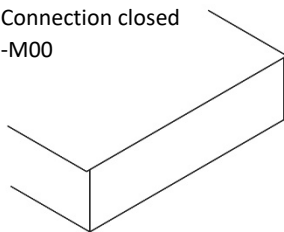
The boxes consist of galvanised sheet steel and are lined with sound and heat insulation. The following insulations are possible:

- I0** = Without insulation (standard)
- I1** = Thermal insulation made of polyethylene 10 mm in thickness, particularly suitable for avoiding condensate formation in the supply air box (cooling).
- I2** = Sound and thermal insulation made of mineral wool 20 mm in thickness, particularly suitable for reducing sound pressure and avoiding condensate formation.
- I4** = Sound and thermal insulation made of mineral wool 40 mm in thickness, particularly suitable for reducing sound pressure at frequencies below 100 Hz, and avoiding condensate formation. (Not compatible with spigots >DN123).

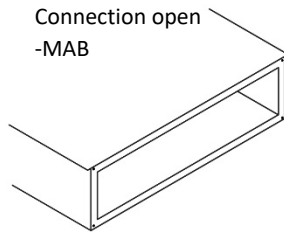
### Connection type



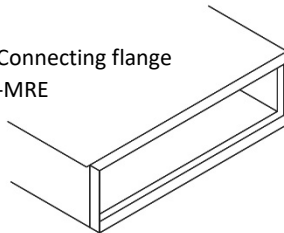
Connection closed  
-M00



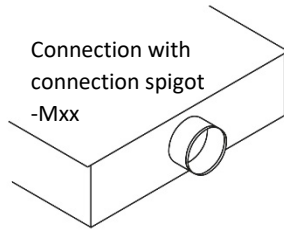
Connection open  
-MAB



Connecting flange  
-MRE



Connection with  
connection spigot  
-Mxx



### Connection in air flow direction

- M00** = Connection closed
- MAB** = Connection open
- MRE** = Connecting flange
- M1x** = with x spigots DN123
- M2x** = with x spigots DN158
- M3x** = with x spigots DN198
- M4x** = with x spigots DN248
- For the number of spigots, see table

| Model  | Max. number of connection pieces |       |       |       |
|--------|----------------------------------|-------|-------|-------|
|        | DN123                            | DN158 | DN198 | DN248 |
| -100-1 | 4                                | 3     | 2     | 2     |
| -100-2 | 7                                | 5     | 4     | 4     |
| -100-3 | 9                                | 8     | 7     | 5     |
| -150-1 | 5                                | 4     | 3     | 2     |
| -150-2 | 8                                | 6     | 5     | 4     |
| -150-3 | 9                                | 9     | 7     | 6     |

### Connection in air flow direction on the left

- L00** = without connection
- L1x** = with x spigots DN123
- L2x** = with x spigots DN158
- L3x** = with x spigots DN198
- L4x** = with x spigots DN248
- For the number of spigots, see table

### Connection in air flow direction on the right

- R00** = without connection
- R1x** = with x spigots DN123
- R2x** = with x spigots DN158
- R3x** = with x spigots DN198
- R4x** = with x spigots DN248
- For the number of spigots, see table

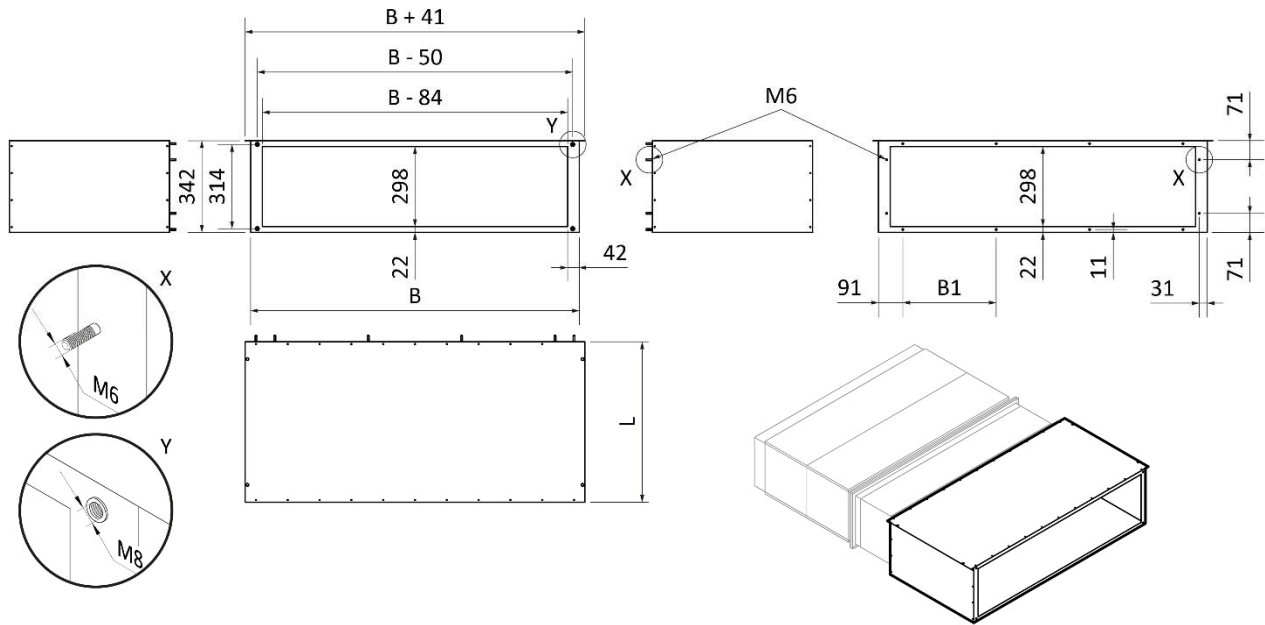
| Length of box | Max. number of connection pieces |       |       |       |
|---------------|----------------------------------|-------|-------|-------|
|               | DN123                            | DN158 | DN198 | DN248 |
| 0300          | 1                                | 1     | -     | -     |
| 0400          | 1                                | 1     | 1     | 1     |
| 0500          | 2                                | 2     | 1     | 1     |
| 0600          | 3                                | 2     | 2     | 1     |
| 0700          | 4                                | 3     | 2     | 2     |
| 0800          | 4                                | 3     | 3     | 2     |
| 0900          | 5                                | 4     | 3     | 2     |
| 1000          | 5                                | 4     | 4     | 3     |

**NOTE**

High flow rates at the spigot may cause noise. To reduce the rates, the diameter and/or the number of spigots should be modified.

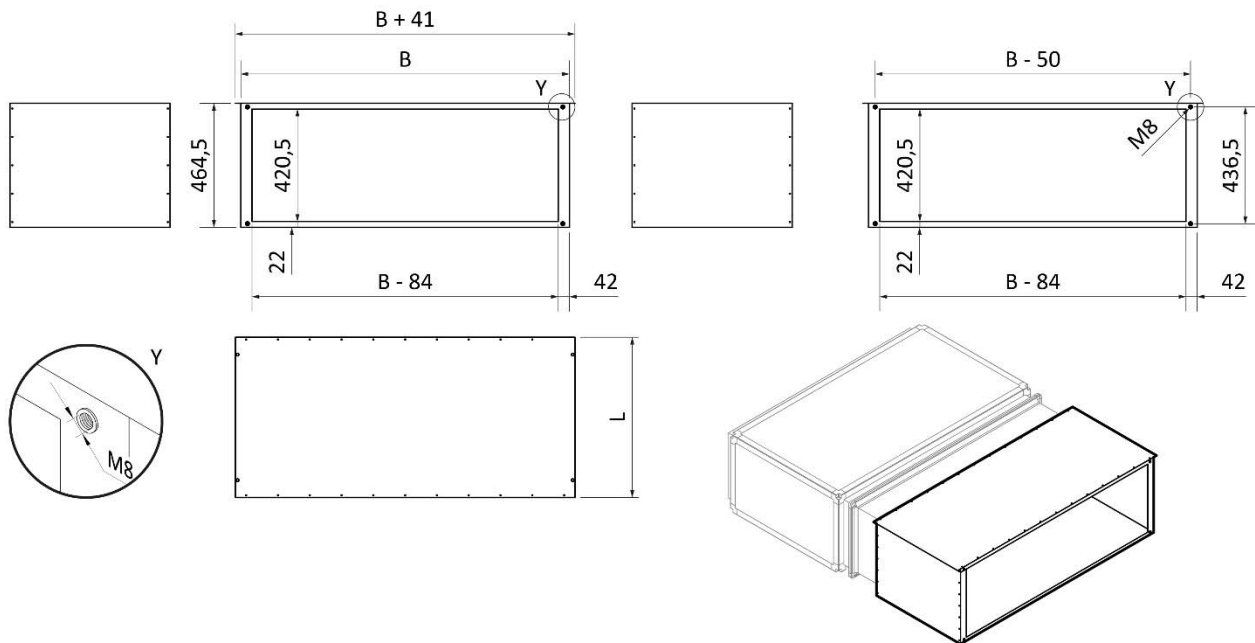
Dimensions with connection open

NBS-100



| Model  | B (mm) | B1 (mm) | Number of bores X |
|--------|--------|---------|-------------------|
| -100-1 | 762    | 290     | 10                |
| -100-2 | 1232   | 350     | 12                |
| -100-3 | 1742   | 312     | 16                |

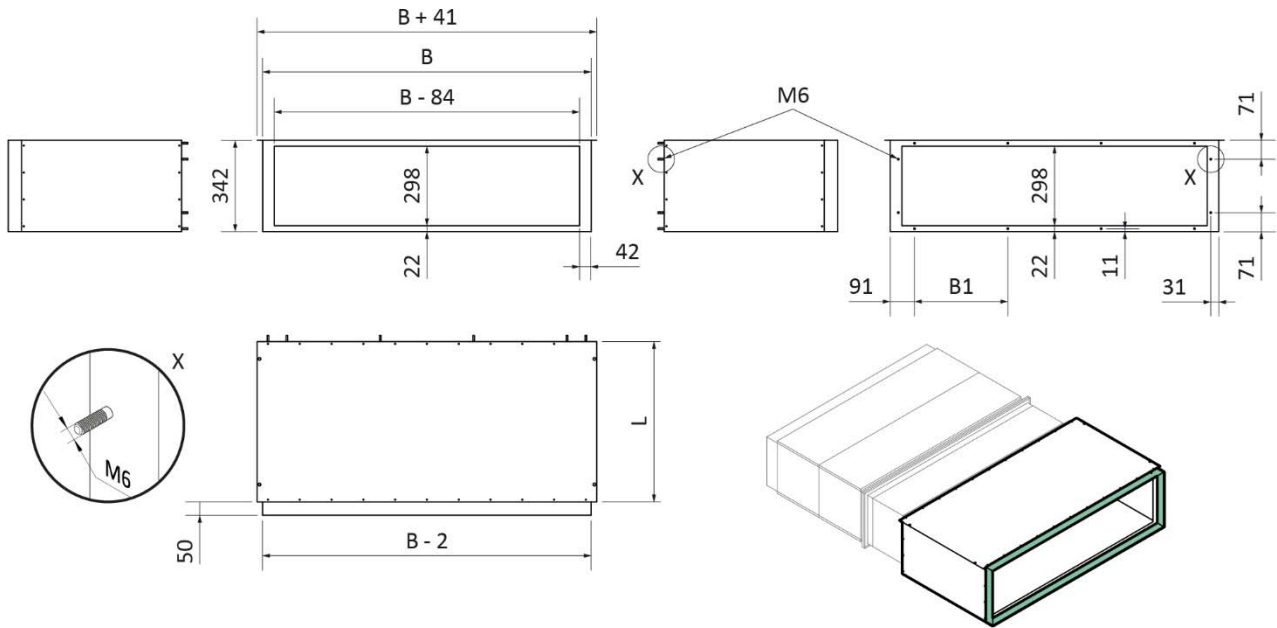
NBS-150



| Model  | B (mm) | B1 (mm) | Number of bores Y |
|--------|--------|---------|-------------------|
| -150-1 | 880    | -       | 4                 |
| -150-2 | 1380   |         | 4                 |
| -150-3 | 1830   |         | 4                 |

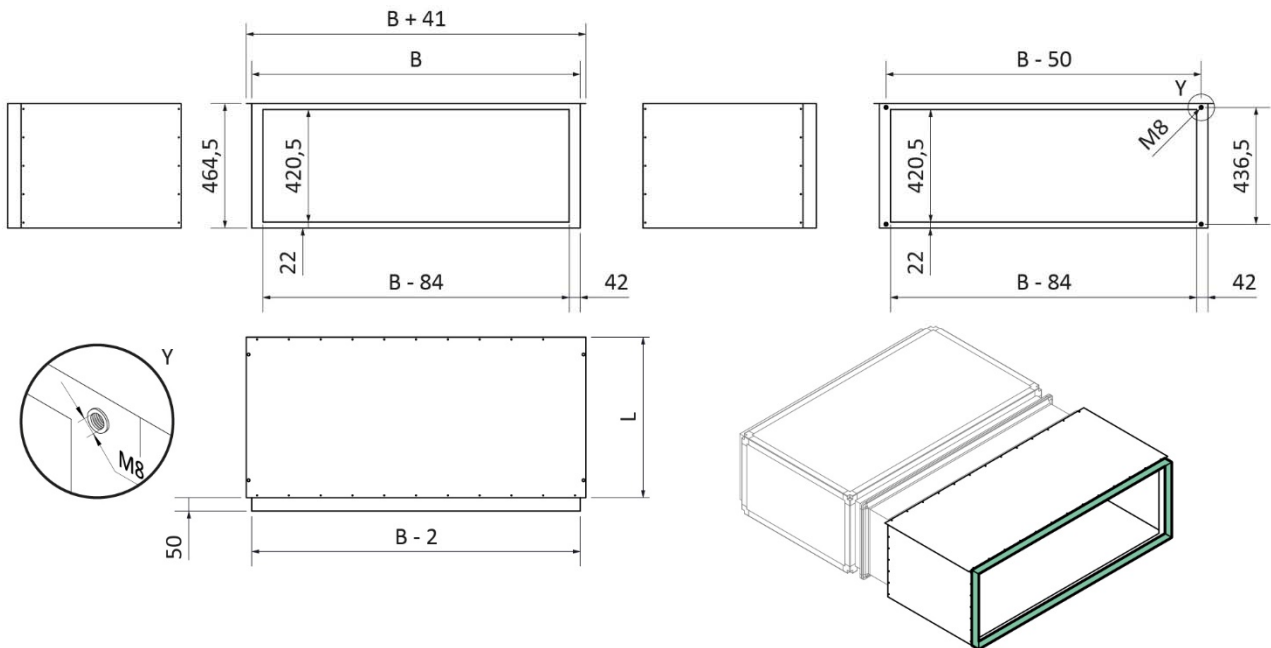
Connecting flange dimensions

NBS-100



| Model  | B (mm) | B1 (mm) | Number of bores X |
|--------|--------|---------|-------------------|
| -100-1 | 762    | 290     | 10                |
| -100-2 | 1232   | 350     | 12                |
| -100-3 | 1742   | 312     | 16                |

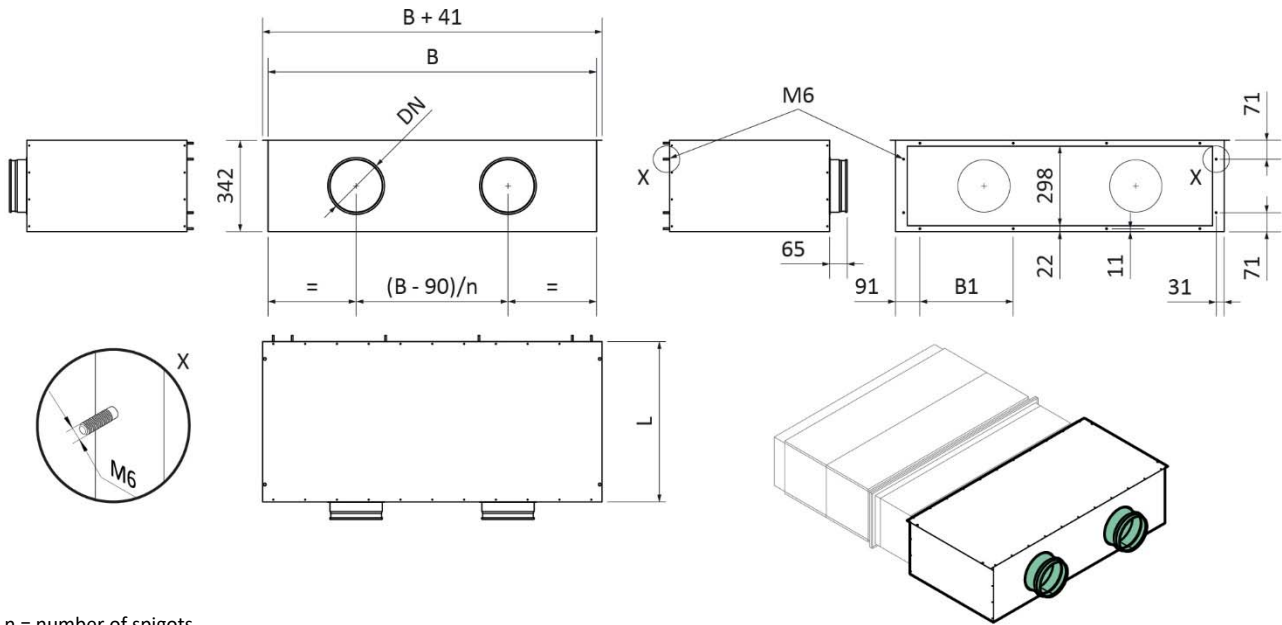
NBS-150



| Model  | B (mm) | B1 (mm) | Number of bores Y |
|--------|--------|---------|-------------------|
| -150-1 | 880    | -       | 4                 |
| -150-2 | 1380   |         | 4                 |
| -150-3 | 1830   |         | 4                 |

Spigot dimensions

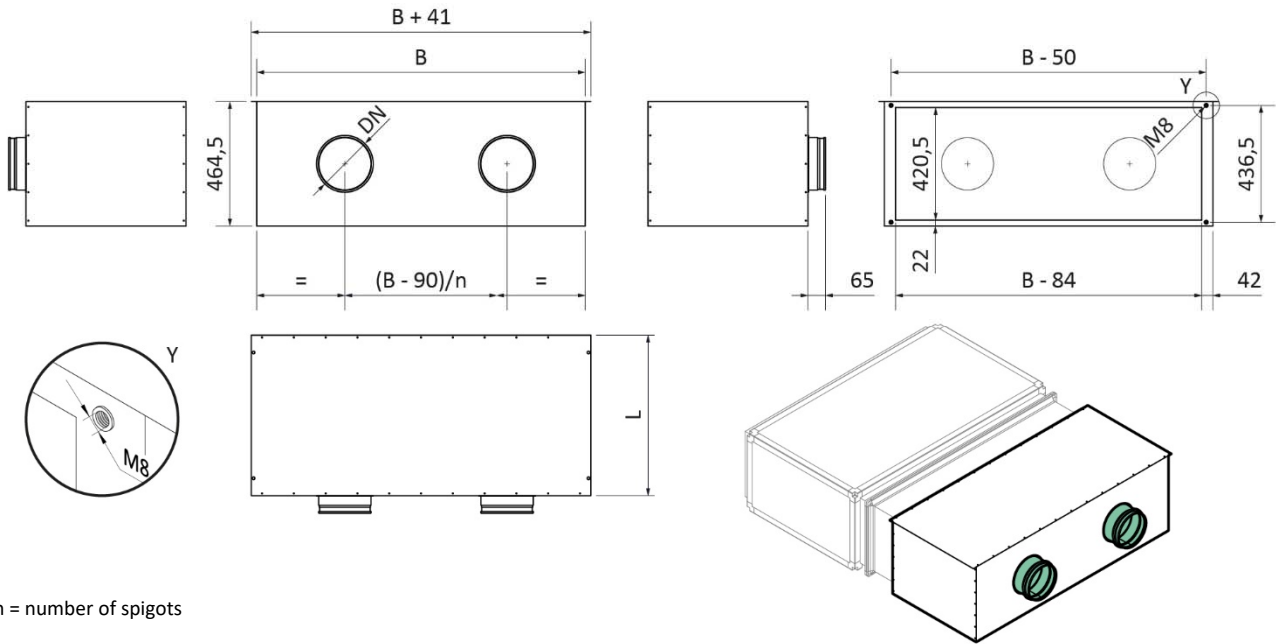
NBS-100



n = number of spigots

| Model  | B (mm) | B1 (mm) | Number of bores X |
|--------|--------|---------|-------------------|
| -100-1 | 762    | 290     | 10                |
| -100-2 | 1232   | 350     | 12                |
| -100-3 | 1742   | 312     | 16                |

NBS-150

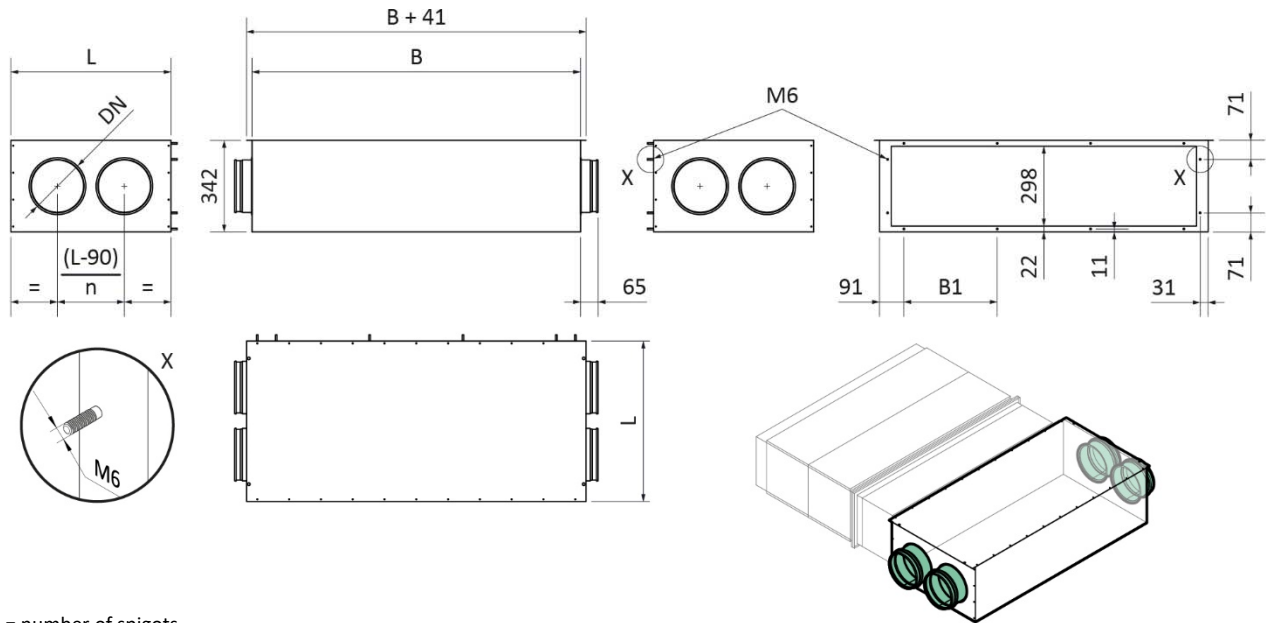


n = number of spigots

| Model  | B (mm) | B1 (mm) | Number of bores Y |
|--------|--------|---------|-------------------|
| -150-1 | 880    | -       | 4                 |
| -150-2 | 1380   |         | 4                 |
| -150-3 | 1830   |         | 4                 |

Spigot dimensions

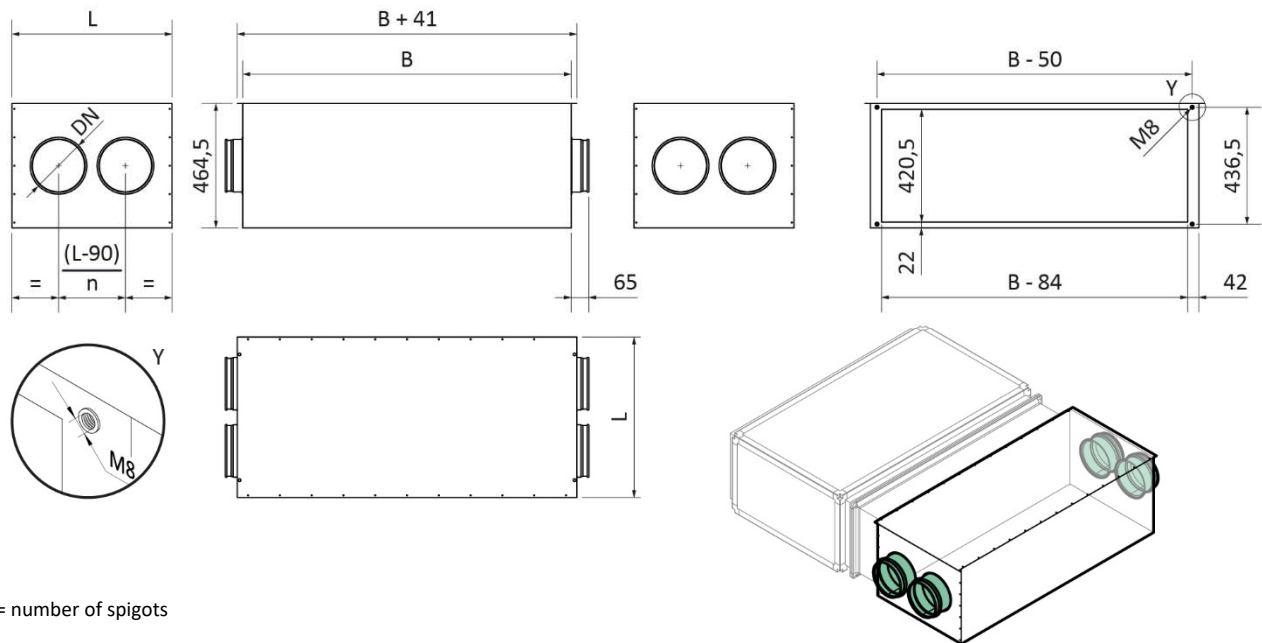
NBS-100



n = number of spigots

| Model  | B (mm) | B1 (mm) | Number of bores X |
|--------|--------|---------|-------------------|
| -100-1 | 762    | 290     | 10                |
| -100-2 | 1232   | 350     | 12                |
| -100-3 | 1742   | 312     | 16                |

NBS-150



n = number of spigots

| Model  | B (mm) | B1 (mm) | Number of bores Y |
|--------|--------|---------|-------------------|
| -150-1 | 880    | -       | 4                 |
| -150-2 | 1380   |         | 4                 |
| -150-3 | 1830   |         | 4                 |

Construction subject to change.  
 No return possible.



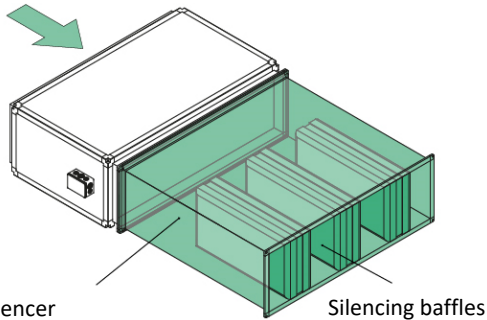
## SILENCER

### NOTE

Silencer is ordered and supplied separately.

For noise reduction purposes in the return air and supply air, it is possible to install a silencer. The silencers are equipped with vertically arranged flow-optimised silencing baffles. The baffles consist of mineral fibre boards and are covered with unmetabolisable glass silk, i.e. no bacteria can deposit on the glass silk, and they are not flammable according to DIN 4102.

In order to reduce noise, while ensuring minimum pressure loss, the length of the baffles and their spacing depend on the desired silencing effect. The cover of the baffles can be made of smooth or perforated plates, as desired, which can also be combined on one or both sides or one or two half-covers. An intermediate piece (box) of 500 mm is required between the air outlet or the air intake of the NBS and the silencer.



Due to their device-related design, the baffle distance and total length, SCHAKO's silencers provide an optimum silencing value while ensuring minimum pressure loss.

### NOTE

The technical data of the ZMWS-NBS can be found directly in the MWS documentation or SCHAKO's selection programme.

### NOTE

In cooling mode, silencers have to be insulated on the outside with cold insulation.

### Model

- MB** = contains sound-absorbing baffles MWK-MB. For use at a main interference frequency between 63 Hz and 500 Hz (standard).
- OB** = contains sound-absorbing baffles MWK-OB. For use at a main interference frequency between 500 Hz and 8000 Hz.

### Length

- 1000** = 1000 mm with a baffle length of 0500 mm (standard)
- 1250** = 1250 mm with a baffle length of 0750 mm
- 1500** = 1500 mm with a baffle length of 1000 mm
- 1750** = 1750 mm with a baffle length of 1250 mm
- 2000** = 2000 mm with a baffle length of 1500 mm
- 2250** = 2250 mm with a baffle length of 1750 mm
- 2500** = 2500 mm with a baffle length of 2000 mm
- 3000** = 3000 mm with a baffle length of 2500 mm

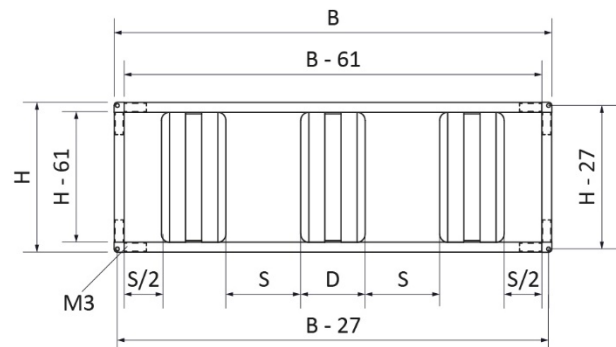
### Baffle thickness (D)

- 100** = 100 mm (standard)
- 200** = 200 mm

### Number of baffles

- xx** = xx baffles (from 1 to maximum number of baffles according to table, always 2-digit)

### Dimensions



| Model  | B (mm) | H (mm) | D (mm) | N    | L (mm) |
|--------|--------|--------|--------|------|--------|
| -100-1 | 739    | 341.0  | 100    | 4    | 1000   |
|        |        |        | 200    | 2    |        |
| -100-2 | 1209   |        | 100    | 8    | 1500   |
|        |        |        | 200    | 4    | 1750   |
| -100-3 | 1719   |        | 100    | 11   | 2000   |
|        |        |        | 200    | 6    | 2250   |
| -150-1 | 857    |        | 100    | 5    | 2500   |
|        |        |        | 200    | 3    | 3000   |
| -150-2 | 1357   |        | 100    | 9    | 1000   |
|        |        |        | 200    | 5    |        |
| -150-3 | 1807   | 100    | 12     | 1500 |        |
|        |        | 200    | 6      |      | 1750   |

N = maximum number of baffles | S = gap width

### LWZ-AT01

Construction subject to change.  
 No return possible.

## ACCESSORIES

### NOTE

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

### ACTUATORS

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

AT = thermal | AM = motorised

### PRESSURE INDEPENDENT CONTROL VALVES

- 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  $V_{wmax}$ .

### NOTE

The valve and the actuator can be adjusted on site without tools.

### NOTE

The unit has no external condensate pan. The valves must be thermally insulated on site.

| Code | Model         | DN | H <sub>100</sub><br>(mm) | Connection<br>(Inch) | V <sub>w</sub> min. - max.<br>(l/h) |
|------|---------------|----|--------------------------|----------------------|-------------------------------------|
| VC01 | VPP46.10L0.2  | 10 | 2.5                      | G ½                  | 30 - 200                            |
| VC02 | VPP46.10L0.4  | 10 | 4.5                      | G ½                  | 65 - 333                            |
|      |               |    | 5.0                      |                      | 65 - 370                            |
| VC03 | VPP46.15L0.2  | 15 | 2.5                      | G ¾                  | 30 - 200                            |
| VC04 | VPP46.15L0.6  | 15 | 2.5                      | G ¾                  | 100 - 575                           |
| VC05 | VPP46.20F1.4  | 20 | 4.5                      | G 1                  | 200 - 1190                          |
|      |               |    | 5.0                      |                      | 220 - 1330                          |
| VC06 | VPP46.25F1.8  | 25 | 4.5                      | G 1 ¼                | 238 - 1530                          |
|      |               |    | 5.0                      |                      | 260 - 1670                          |
|      |               |    | 5.5                      |                      | 280 - 1800                          |
| VC07 | VPP46.32F4.0  | 32 | 4.5                      | G 1 ½                | 468 - 3400                          |
|      |               |    | 5.0                      |                      | 510 - 3700                          |
|      |               |    | 5.5                      |                      | 550 - 4001                          |
| VC08 | VPP46.10L0.2Q | 10 | 2.5                      | G ½                  | 30 - 200                            |
| VC09 | VPP46.10L0.4Q | 10 | 4.5                      | G ½                  | 65 - 333                            |
|      |               |    | 2.5                      |                      | 65 - 370                            |
| VC10 | VPP46.15L0.2Q | 15 | 2.5                      | G ¾                  | 30 - 200                            |
| VC11 | VPP46.15L0.6Q | 15 | 2.5                      | G ¾                  | 100 - 575                           |
| VC12 | VPP46.20F1.4Q | 20 | 4.5                      | G 1                  | 200 - 1190                          |
|      |               |    | 5.0                      |                      | 220 - 1330                          |
| VC13 | VPP46.25F1.8Q | 25 | 4.5                      | G 1 ¼                | 238 - 1530                          |
|      |               |    | 5.0                      |                      | 260 - 1670                          |
|      |               |    | 5.5                      |                      | 280 - 1800                          |
| VC14 | VPP46.32F4Q   | 32 | 4.5                      | G 1 ½                | 468 - 3400                          |
|      |               |    | 5.0                      |                      | 510 - 3700                          |
|      |               |    | 5.5                      |                      | 550 - 4001                          |
| VC15 | VPI46.15L0.2  | 15 | 2.5                      | Rp ½                 | 30 - 200                            |
| VC16 | VPI46.15L0.6  | 15 | 2.5                      | Rp ½                 | 100 - 575                           |
| VC17 | VPI46.20F1.4  | 20 | 4.5                      | Rp ¾                 | 200 - 1190                          |
|      |               |    | 5.0                      |                      | 220 - 1130                          |
| VC18 | VPI46.25F1.8  | 25 | 4.5                      | Rp 1                 | 238 - 1530                          |
|      |               |    | 5.0                      |                      | 260 - 1670                          |
|      |               |    | 5.5                      |                      | 280 - 1800                          |
| VC19 | VPI46.32F4.0  | 32 | 4.5                      | Rp 1 ¼               | 468 - 3400                          |
|      |               |    | 5.5                      |                      | 510 - 3700                          |
|      |               |    | 5.0                      |                      | 550 - 4001                          |
| VC20 | VPI46.15L0.2Q | 15 | 2.5                      | Rp ½                 | 30 - 200                            |
| VC21 | VPI46.15L0.6Q | 15 | 2.5                      | Rp ½                 | 100 - 575                           |
| VC22 | VPI46.20F1.4Q | 20 | 4.5                      | Rp ¾                 | 200 - 1190                          |
|      |               |    | 5.0                      |                      | 220 - 1330                          |
| VC23 | VPI46.25F1.8Q | 25 | 4.5                      | Rp 1                 | 238 - 1530                          |
|      |               |    | 5.0                      |                      | 260 - 1670                          |
|      |               |    | 5.5                      |                      | 280 - 1800                          |
| VC24 | VPI46.32F4.0Q | 32 | 4.5                      | Rp 1 ¼               | 468 - 3400                          |
|      |               |    | 5.0                      |                      | 510 - 3700                          |
|      |               |    | 5.5                      |                      | 550 - 4001                          |

Maximum allowed differential pressure = 600 kPa

Rp = female thread | G = male thread

DN = nominal width | H<sub>100</sub> = nominal stroke | | V<sub>w</sub> = water volumetric flow | Δp = allowed differential pressure for the valve

### LWZ-AT01

Construction subject to change.

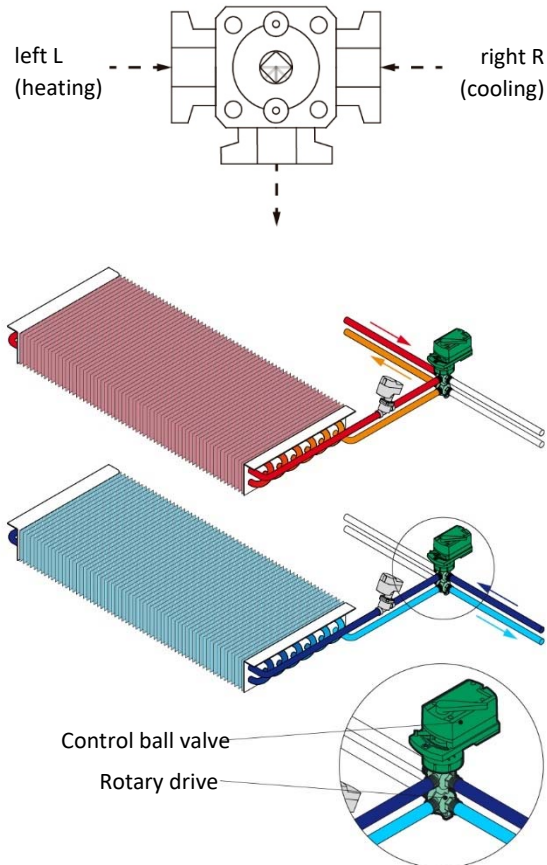
No return possible.

### 6-WAY BALL VALVE

| Code | Model              | DN | k <sub>vs</sub><br>left<br>(m³/h) | k <sub>vs</sub><br>right<br>(m³/h) | Adapter<br>DN |    |    |
|------|--------------------|----|-----------------------------------|------------------------------------|---------------|----|----|
|      |                    |    |                                   |                                    | 15            | 20 | 25 |
| V601 | VWG41.10-0.25-0.40 | 10 | 0.25                              | 0.40                               | ✓             | -  | -  |
| V602 | VWG41.10-0.25-0.65 | 10 | 0.25                              | 0.65                               | ✓             | -  | -  |
| V603 | VWG41.10-0.25-1.00 | 10 | 0.25                              | 1.00                               | ✓             | -  | -  |
| V604 | VWG41.10-0.40-0.65 | 10 | 0.40                              | 0.65                               | ✓             | -  | -  |
| V605 | VWG41.10-0.40-1.00 | 10 | 0.40                              | 1.00                               | ✓             | -  | -  |
| V606 | VWG41.10-0.40-1.30 | 10 | 0.40                              | 1.30                               | ✓             | -  | -  |
| V607 | VWG41.10-0.40-1.60 | 10 | 0.40                              | 1.60                               | ✓             | -  | -  |
| V608 | VWG41.10-0.65-1.00 | 10 | 0.65                              | 1.00                               | ✓             | -  | -  |
| V609 | VWG41.10-0.65-1.30 | 10 | 0.65                              | 1.30                               | ✓             | -  | -  |
| V610 | VWG41.10-0.65-1.60 | 10 | 0.65                              | 1.60                               | ✓             | -  | -  |
| V611 | VWG41.10-1.00-1.30 | 10 | 1.00                              | 1.30                               | ✓             | -  | -  |
| V612 | VWG41.10-1.00-1.60 | 10 | 1.00                              | 1.60                               | ✓             | -  | -  |
| V613 | VWG41.10-1.00-1.90 | 10 | 1.00                              | 1.90                               | ✓             | -  | -  |
| V614 | VWG41.10-1.30-1.60 | 10 | 1.30                              | 1.60                               | ✓             | -  | -  |
| V615 | VWG41.10-1.30-1.90 | 10 | 1.30                              | 1.90                               | ✓             | -  | -  |
| V616 | VWG41.10-1.60-1.90 | 10 | 1.60                              | 1.90                               | ✓             | -  | -  |
| V617 | VWG41.10-1.90-1.90 | 10 | 1.90                              | 1.90                               | ✓             | -  | -  |
| V618 | VWG41.10-0.25-1.30 | 10 | 0.25                              | 1.30                               | ✓             | -  | -  |
| V619 | VWG41.10-0.25-1.60 | 10 | 0.25                              | 1.60                               | ✓             | -  | -  |
| V620 | VWG41.10-0.25-1.90 | 10 | 0.25                              | 1.90                               | ✓             | -  | -  |
| V621 | VWG41.10-0.40-0.40 | 10 | 0.40                              | 0.40                               | ✓             | -  | -  |
| V622 | VWG41.10-0.40-1.90 | 10 | 0.40                              | 1.90                               | ✓             | -  | -  |
| V623 | VWG41.10-0.65-0.65 | 10 | 0.65                              | 0.65                               | ✓             | -  | -  |
| V624 | VWG41.10-0.65-1.90 | 10 | 0.65                              | 1.90                               | ✓             | -  | -  |
| V625 | VWG41.10-1.00-1.00 | 10 | 1.00                              | 1.00                               | ✓             | -  | -  |
| V626 | VWG41.10-1.30-1.30 | 10 | 1.30                              | 1.30                               | ✓             | -  | -  |
| V627 | VWG41.10-1.60-1.60 | 10 | 1.60                              | 1.60                               | ✓             | -  | -  |
| V628 | VWG41.20-0.65-2.50 | 20 | 0.65                              | 2.50                               | *             | ✓  | ✓  |
| V629 | VWG41.20-1.00-2.50 | 20 | 1.00                              | 2.50                               | *             | ✓  | ✓  |
| V630 | VWG41.20-1.60-2.50 | 20 | 1.60                              | 2.50                               | *             | ✓  | ✓  |
| V631 | VWG41.20-1.60-3.45 | 20 | 1.60                              | 3.45                               | *             | ✓  | ✓  |
| V632 | VWG41.20-2.50-3.45 | 20 | 2.50                              | 3.45                               | *             | ✓  | ✓  |
| V633 | VWG41.20-2.50-4.25 | 20 | 2.50                              | 4.25                               | *             | *  | *  |
| V634 | VWG41.20-4.25-4.25 | 20 | 4.25                              | 4.25                               | *             | *  | *  |
| V635 | VWG41.20-0.25-2.50 | 20 | 0.25                              | 2.50                               | *             | ✓  | ✓  |
| V636 | VWG41.20-0.25-3.45 | 20 | 0.25                              | 3.45                               | *             | ✓  | ✓  |
| V637 | VWG41.20-0.25-4.25 | 20 | 0.25                              | 4.25                               | *             | *  | *  |
| V638 | VWG41.20-0.40-2.50 | 20 | 0.40                              | 2.50                               | *             | ✓  | ✓  |
| V639 | VWG41.20-0.40-3.45 | 20 | 0.40                              | 3.45                               | *             | ✓  | ✓  |
| V640 | VWG41.20-0.40-4.25 | 20 | 0.40                              | 4.25                               | *             | *  | *  |
| V641 | VWG41.20-0.65-3.45 | 20 | 0.65                              | 3.45                               | *             | ✓  | ✓  |
| V642 | VWG41.20-0.65-4.25 | 20 | 0.65                              | 4.25                               | *             | *  | *  |
| V643 | VWG41.20-1.00-3.45 | 20 | 1.00                              | 3.45                               | *             | ✓  | ✓  |
| V644 | VWG41.20-1.00-4.25 | 20 | 1.00                              | 4.25                               | *             | *  | *  |
| V645 | VWG41.20-1.30-2.50 | 20 | 1.30                              | 2.50                               | *             | ✓  | ✓  |
| V646 | VWG41.20-1.30-3.45 | 20 | 1.30                              | 3.45                               | *             | ✓  | ✓  |
| V647 | VWG41.20-1.30-4.25 | 20 | 1.30                              | 4.25                               | *             | *  | *  |
| V648 | VWG41.20-1.60-4.25 | 20 | 1.60                              | 4.25                               | *             | *  | *  |
| V649 | VWG41.20-2.50-2.50 | 20 | 2.50                              | 2.50                               | *             | ✓  | ✓  |
| V650 | VWG41.20-3.45-3.45 | 20 | 3.45                              | 3.45                               | *             | ✓  | ✓  |

### ROTARY DRIVE FOR 6-WAY BALL VALVE

| Code | Model     | Type                        | Signal                  |
|------|-----------|-----------------------------|-------------------------|
| AR01 | GDB341.9E | AC 100...240 V ~            | 2 pos.;<br>switchover   |
| AR02 | GDB161.9E | AC 24 V ~<br>DC 24...48 V = | 2...10 V;<br>regulation |
| AR03 | GDB111.9E | AC 24 V                     | KNX-TP;<br>regulation   |



#### LEGEND

- ✓ = Nominal value of volumetric flow possible
- = Nominal value of volumetric flow not possible
- \* = Volumetric flow is limited. For DN15 = 1.6 m³/h, for DN20 = 3.45 m³/h, for DN25 = 4.0 m³/h
- DN = Nominal width
- k<sub>vs</sub> = Nominal value of volumetric flow of cold water (5...30 °C) through the fully open ball valve at a differential pressure of 100 kPa (1 bar)

#### LWZ-V601

Construction subject to change.  
 No return possible.

## ROOM THERMOSTAT

A room thermostat can be used both to actuate the actuators and to control the fans.

| Code | Model    | Operating voltage | Control outputs |                 |                 |             | 3-speed fan     |
|------|----------|-------------------|-----------------|-----------------|-----------------|-------------|-----------------|
|      |          |                   | ON/OFF          | PWM             | 3-point         | DC 0...10 V |                 |
| TR01 | RDG100   | AC 230 V          | 3 <sup>1)</sup> | 2 <sup>1)</sup> | 2 <sup>1)</sup> |             | ✓               |
| TR02 | RDG100T  |                   | 3 <sup>1)</sup> | 2 <sup>1)</sup> | 2 <sup>1)</sup> |             | ✓               |
| TR03 | RDG110   |                   | 2 <sup>2)</sup> |                 |                 |             | ✓               |
| TK01 | RDG100KN |                   | 3 <sup>1)</sup> | 2 <sup>1)</sup> | 2 <sup>1)</sup> |             | ✓               |
| TR05 | RDG160T  | AC/DC 24 V        |                 |                 |                 | 2           | ✓               |
| TK02 | RDG160KN | AC 24 V           |                 |                 |                 | 2           | ✓ <sup>3)</sup> |

1) On/Off, PWM or 3-point (Triac outputs)

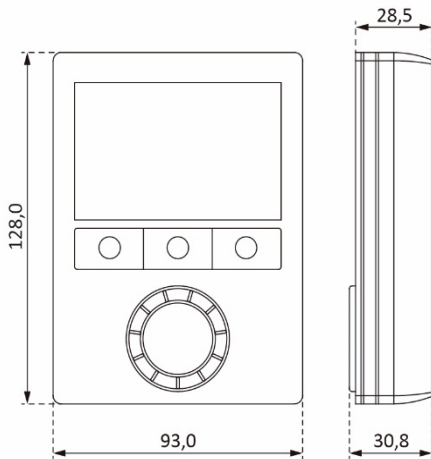
2) Relay output (selector switch)

3) 3-speed fan only selectable with DC outputs

### ATTENTION

When operating the room air conditioning modules in parallel, the load limits of the control and power consumption of the room air-conditioning modules must be taken into account.

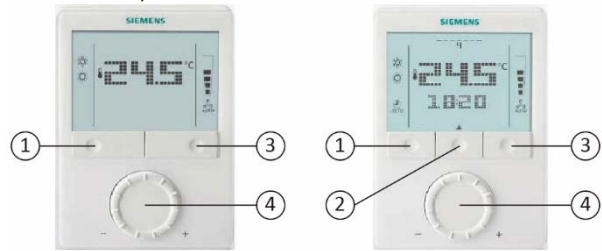
### Dimensions



## Operation

RDG100, RDG110,  
RDG100KN, RDG160KN

RDG100T, RDG160T

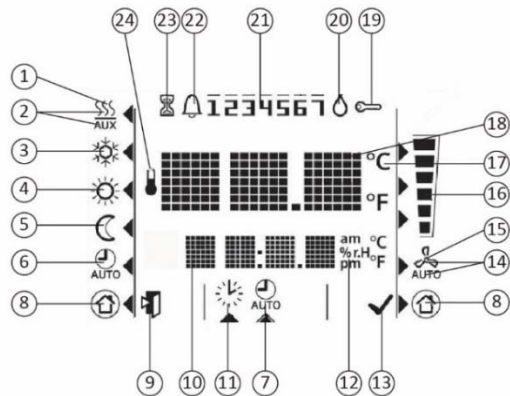


1 = Operating mode selection button/back to normal operation

2 = Button to set time and switching times of the timer (RDG...T only)

3 = Fan operation selection button/OK

4 = Rotary knob to set nominal values and parameters



- 1 = Heating mode
- 2 = Heating mode additional heating on (level 2)
- 3 = Cooling mode
- 4 = Comfort mode
- 5 = Economy mode
- 6 = Automatic timer mode
- 7 = Display and setting the automatic timer program
- 8 = Protection mode
- 9 = Back to normal operation
- 10 = Display of time, room temperature, setpoint value, etc.
- 11 = Setting the time and the day of the week
- 12 = Morning/afternoon 12-hour format
- 13 = Applying parameters
- 14 = Fan automatic
- 15 = Fan manual
- 16 = Fan speed
- 17 = Degrees Celsius/degrees Fahrenheit
- 18 = Display of room temperature and setpoint value
- 19 = Keyboard lock
- 20 = Condensation in room (dew point sensor active)
- 21 = Day of the week 1...7: 1 = Monday/7 = Sunday
- 22 = Fault
- 23 = Temporary switch function
- 24 = Room temperature is displayed

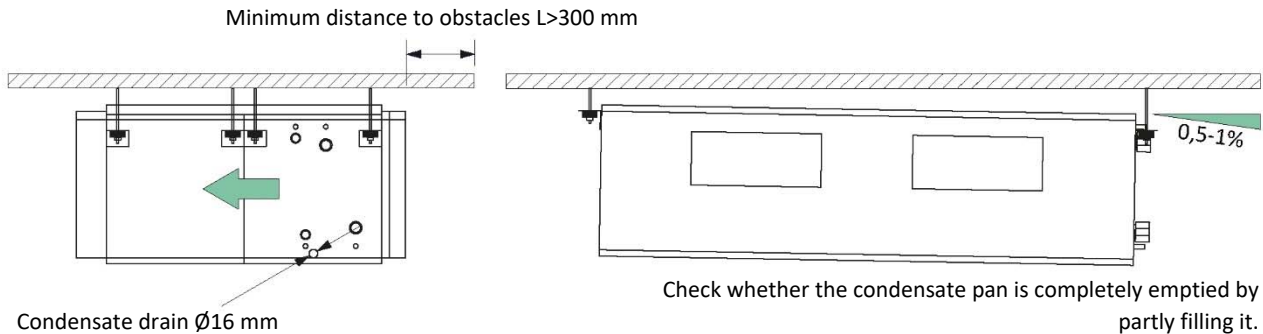
### LWZ-TR01

Construction subject to change.  
 No return possible.

## INSTALLATION

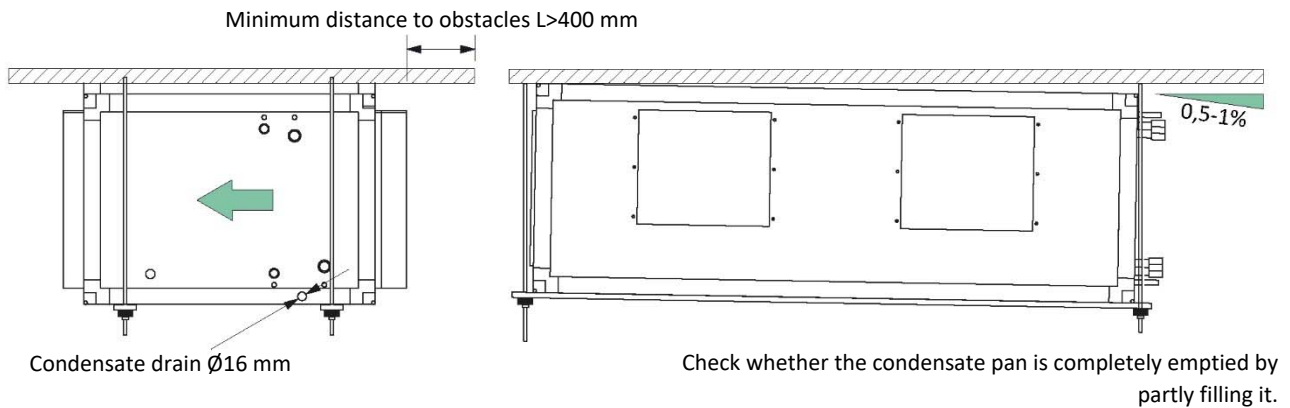
### NBS-100

The ceiling installation of NBS-100 is executed by means of installed fixing lugs.



### NBS-150

The ceiling installation of NBS-150 is executed by means of a pole brace or an equivalent system.



#### NOTE

SCHAKO recommends installing vibration-damping fixing elements to avoid structure-borne noise transmission.

#### NOTE

The rods, screws or vibration damping fixing elements required for installation are not included in the delivery.

## MAINTENANCE

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### Air filter

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Filters should be cleaned or replaced regularly. SCHAKO recommends a bimonthly check at high-medium air quality and a monthly check at low air qualities. If no differential pressure gauge is available, the filter should be replaced when it is full (dark filter mat). SCHAKO recommends purchasing replacement filters to avoid prolonged downtimes during maintenance activities.

### Heat exchanger

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The registers should be cleaned and ventilated once every three months and the ribs should be checked to ensure that there are no leaks.

### Condensate discharge

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Twice a year you should check to ensure that there are neither corrosion nor leaks, and the condensate drains should be cleaned.

### Motorised fan

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Twice a year the fan operation should be checked in the different speeds to ensure that no exceptional noise is generated and that the motor intensity does not exceed the maximum allowed value.

The motors of the NBS fans are equipped with capacitors of class A to EN-60252-1. These components have a limited service life. SCHAKO recommends replacing the capacitors every 5 years or after 20,000 operating hours.

#### **ATTENTION**

Overvoltage can significantly reduce the service life of capacitors.

#### **ATTENTION**

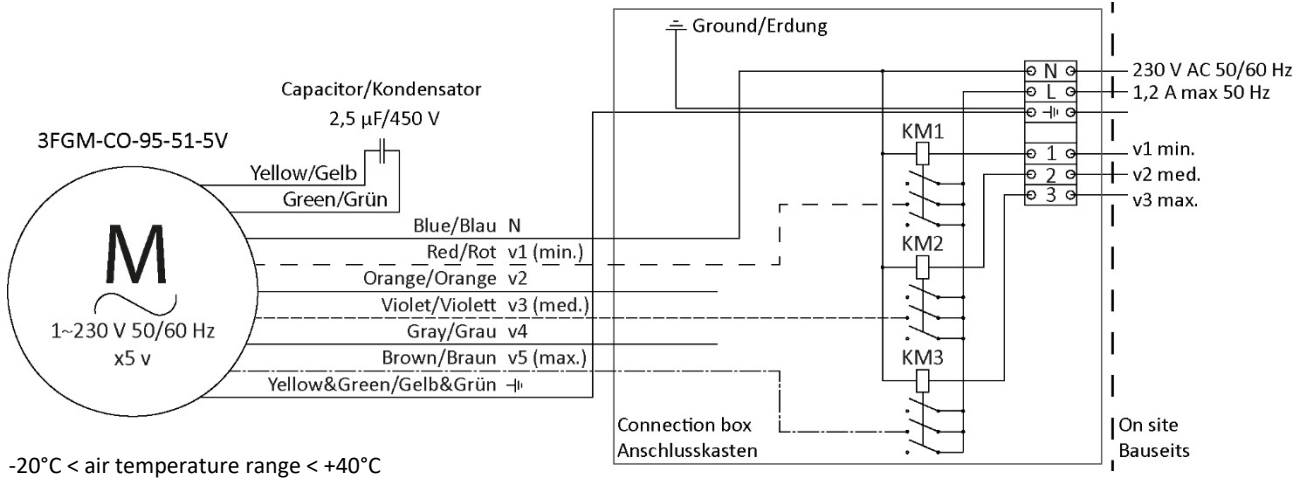
For maintenance, service, retrofitting, etc., inspection openings in sufficient number and size must be provided on site. When determining the size of inspection openings, the size of the unit and any mounted components, such as valves and electrical boxes, must be taken into account!

## CIRCUIT DIAGRAMS

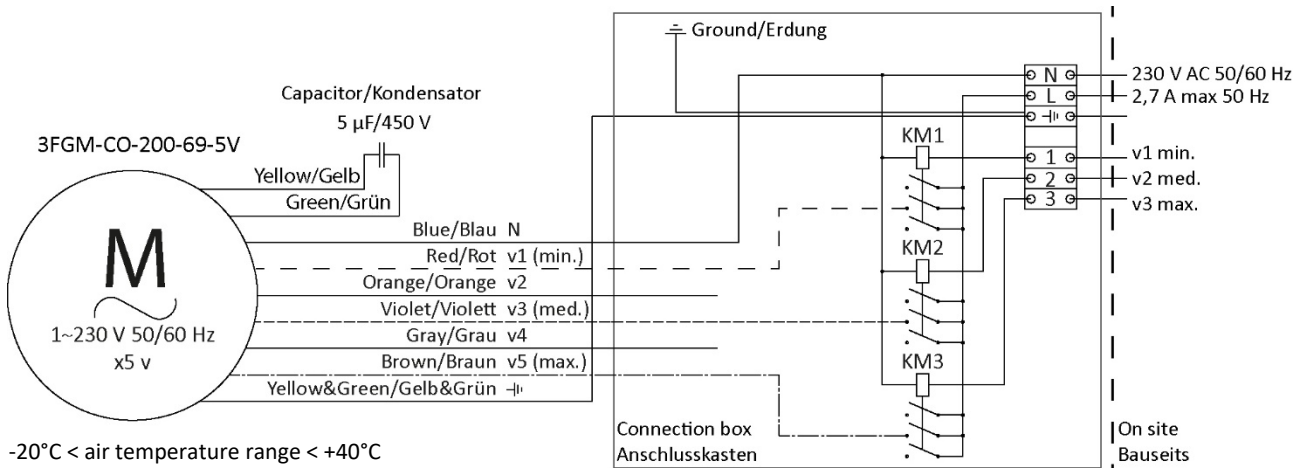
### NOTE

Type NBS-100 is delivered with prewired speeds v1, v3 and v5, if no other data are given on the order. On-site modification possible!

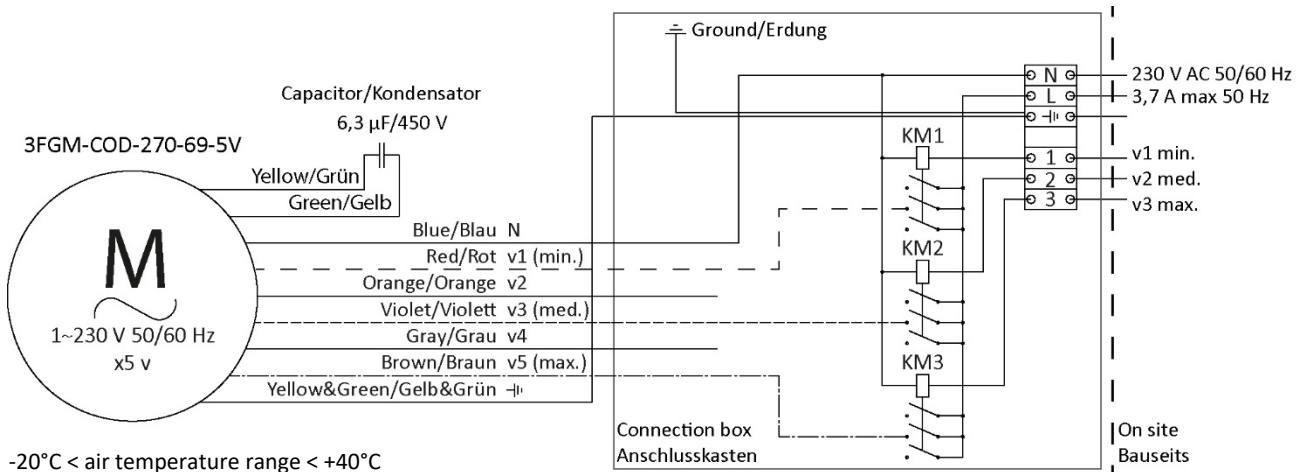
### NBS-100-1



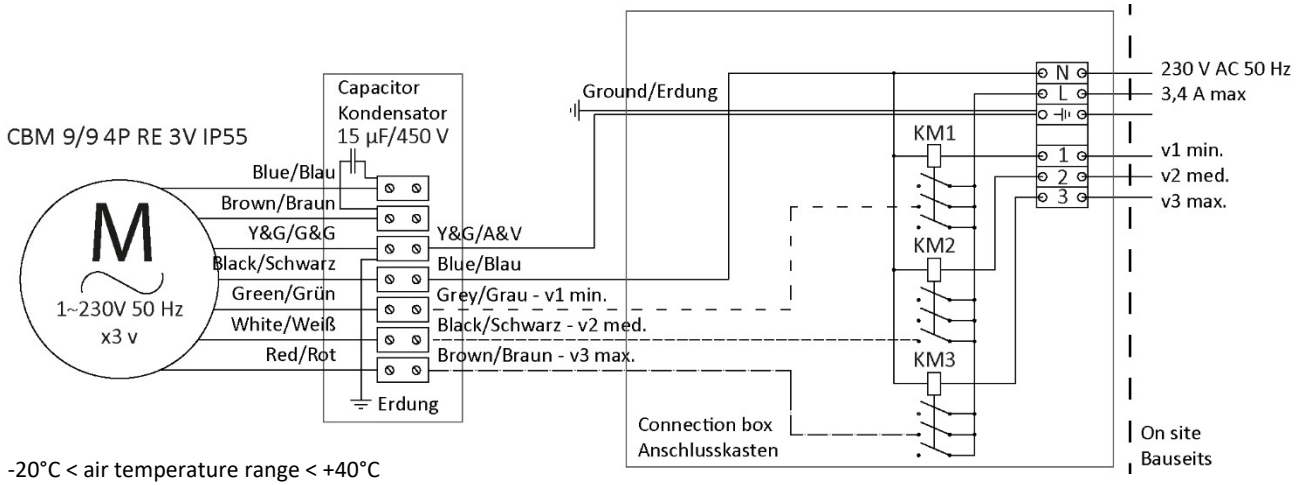
### NBS-100-2



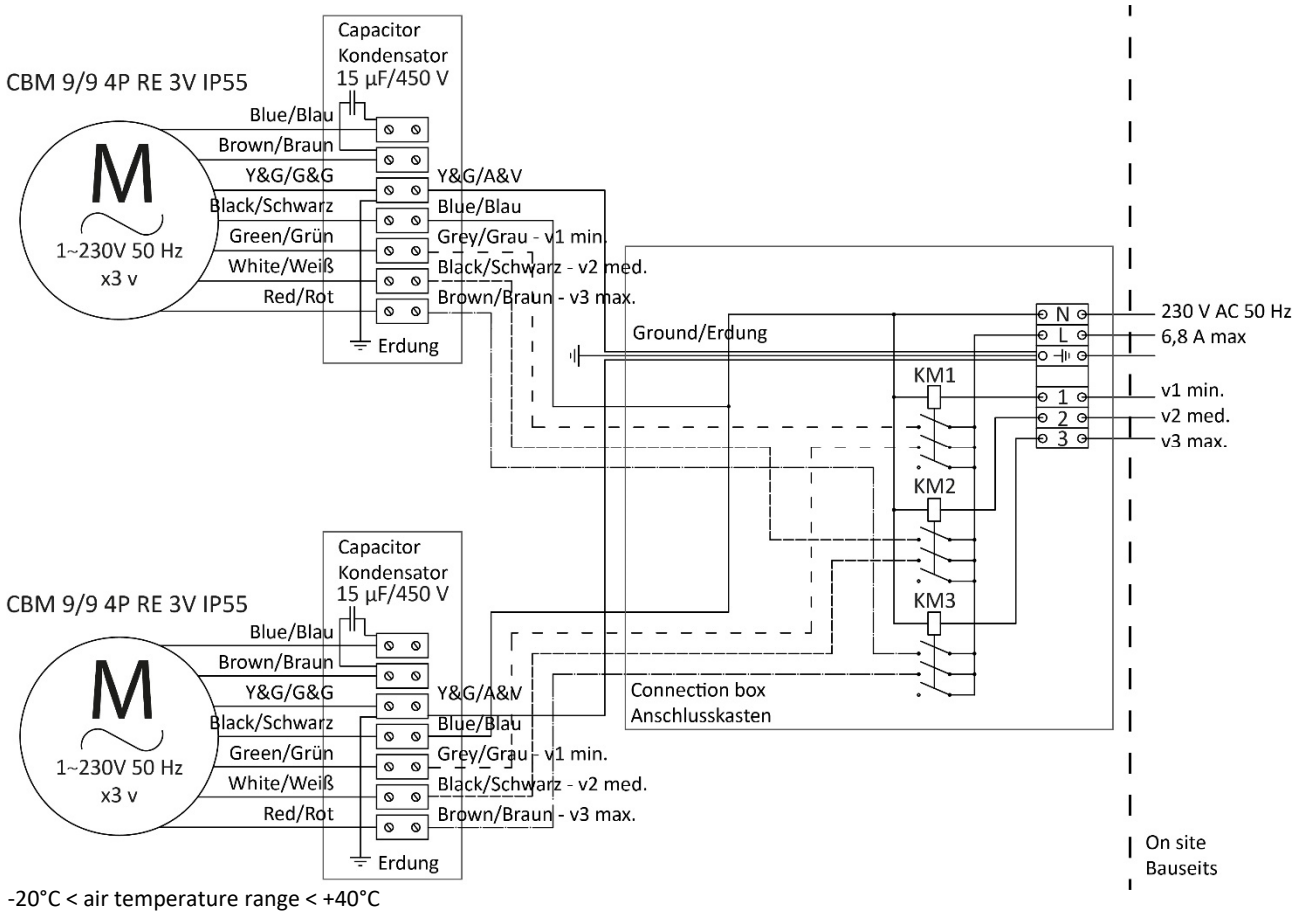
### NBS-100-3



## NBS-150-1

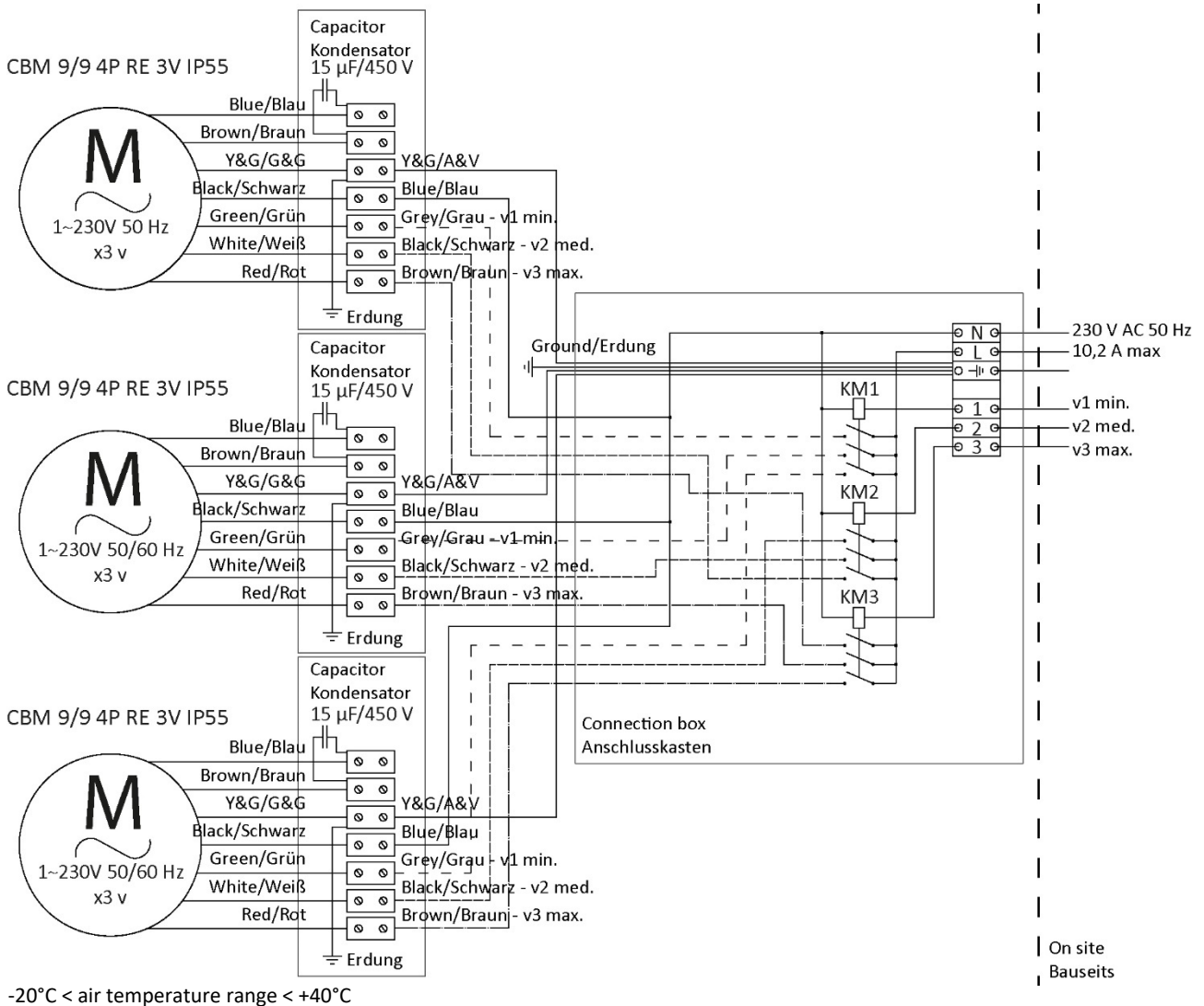


## NBS-150-2





NBS-150-3



Operating conditions

| Model                              | -100-1                          | -100-2 | -100-3 | -150-1                       | -150-2 | -150-3 |
|------------------------------------|---------------------------------|--------|--------|------------------------------|--------|--------|
| Supply voltage                     | 230 V AC, 50/60 Hz single-phase |        |        | 230 V AC, 50 Hz single-phase |        |        |
| Type of insulation                 | Type B                          |        |        | Type B                       |        |        |
| Type of motor                      | 5 speeds                        |        |        | 3 speeds                     |        |        |
| Type of protection                 | IP20                            |        |        | IP55                         |        |        |
| Max. allowed current intensity (A) | 1.20 A                          | 2.70 A | 3.70 A | 3.40 A/motor                 |        |        |
| Air temperature range (°C)         | -20 °C < T < +40 °C             |        |        | -20 °C < T < +40 °C          |        |        |

TECHNICAL DATA

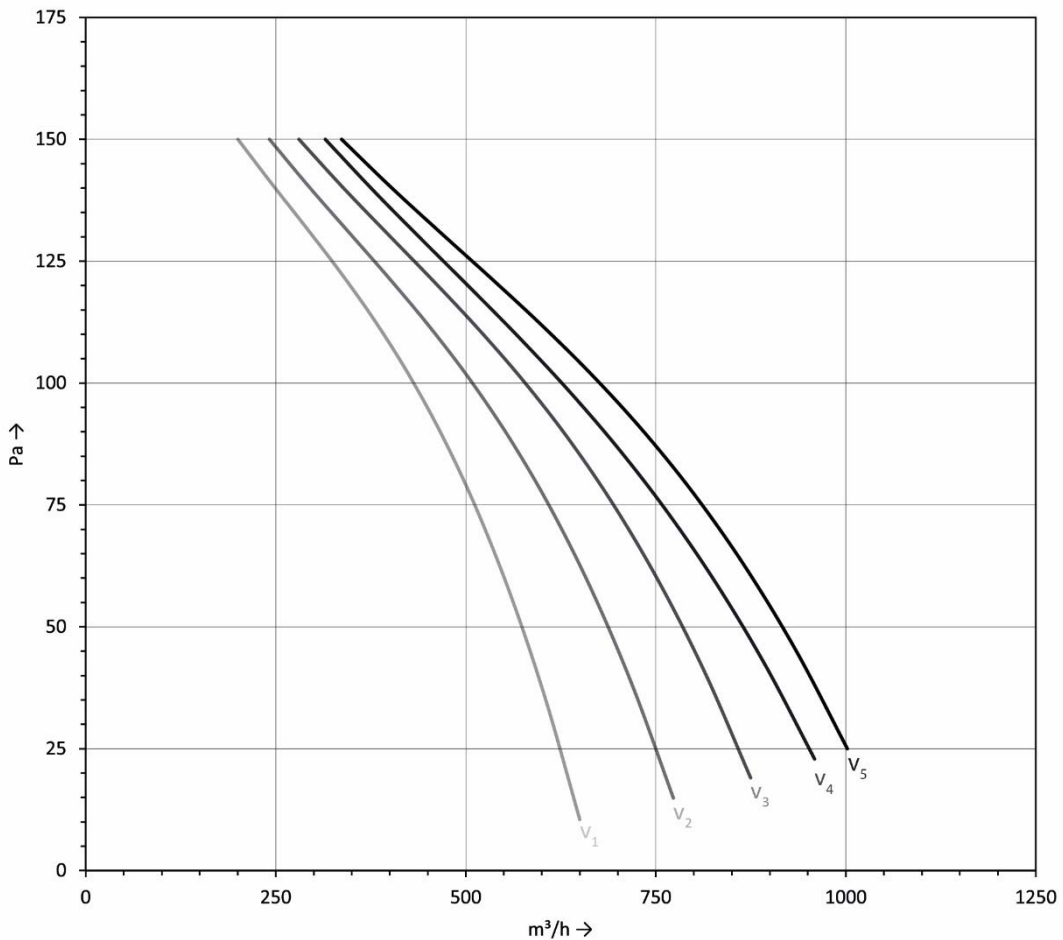
NBS-100-1-L4-C5

|                  | $V_{motor}$ | $V_L$<br>(m <sup>3</sup> /h) | $p_s$<br>(Pa) | $W$<br>(W) | $Q_T$<br>(kW) | $Q_S$<br>(kW) | $V_w$<br>(l/h) | $\Delta p_w$<br>(kPa) | $t_{L2}$<br>(°C) | $V_K$<br>(l/h) | $Q$<br>(kW) | $V_w$<br>(l/h) | $\Delta p_w$<br>(kPa) | $t_{L2}$<br>(°C) |
|------------------|-------------|------------------------------|---------------|------------|---------------|---------------|----------------|-----------------------|------------------|----------------|-------------|----------------|-----------------------|------------------|
| $p_{s, max}$     | 5           | 337                          | 150           | 95         | 2.52          | 1.82          | 434            | 5.2                   | 10.4             | 1.0            | 1.87        | 319            | 7.5                   | 36.6             |
|                  | 4           | 315                          | 150           | 84         | 2.39          | 1.72          | 411            | 4.7                   | 10.3             | 1.0            | 1.77        | 303            | 6.8                   | 36.8             |
|                  | 3           | 281                          | 150           | 77         | 2.17          | 1.55          | 373            | 4.0                   | 10.0             | 0.9            | 1.62        | 276            | 5.8                   | 37.2             |
|                  | 2           | 242                          | 150           | 69         | 1.91          | 1.36          | 328            | 3.1                   | 9.8              | 0.8            | 1.43        | 245            | 4.6                   | 37.7             |
|                  | 1           | 200                          | 150           | 64         | 1.61          | 1.15          | 278            | 2.3                   | 9.5              | 0.7            | 1.22        | 209            | 3.5                   | 38.2             |
| $\eta_{se, max}$ | 5           | 583                          | 130           | 115        | 3.86          | 2.89          | 665            | 11.4                  | 11.8             | 1.4            | 2.83        | 484            | 16.0                  | 34.5             |
|                  | 4           | 522                          | 130           | 102        | 3.56          | 2.64          | 612            | 9.8                   | 11.5             | 1.3            | 2.61        | 446            | 13.8                  | 34.9             |
|                  | 3           | 463                          | 130           | 91         | 3.25          | 2.39          | 560            | 8.3                   | 11.2             | 1.2            | 2.39        | 408            | 11.7                  | 35.4             |
|                  | 2           | 400                          | 130           | 83         | 2.90          | 2.11          | 499            | 6.7                   | 10.8             | 1.1            | 2.14        | 365            | 9.6                   | 35.9             |
|                  | 1           | 331                          | 130           | 75         | 2.49          | 1.80          | 429            | 5.1                   | 10.4             | 1.0            | 1.85        | 315            | 7.3                   | 36.6             |
| $V_{L, max}$     | 5           | 1002                         | 25            | 159        | 5.59          | 4.40          | 963            | 22.6                  | 13.6             | 1.7            | 4.13        | 705            | 31.6                  | 32.3             |
|                  | 4           | 959                          | 23            | 151        | 5.44          | 4.26          | 936            | 21.4                  | 13.4             | 1.7            | 4.01        | 684            | 30.0                  | 32.5             |
|                  | 3           | 875                          | 19            | 147        | 5.12          | 3.97          | 882            | 19.2                  | 13.1             | 1.7            | 3.77        | 643            | 26.8                  | 32.8             |
|                  | 2           | 773                          | 15            | 140        | 4.71          | 3.61          | 812            | 16.5                  | 12.7             | 1.6            | 3.46        | 591            | 23.0                  | 33.4             |
|                  | 1           | 650                          | 11            | 133        | 4.18          | 3.15          | 719            | 13.2                  | 12.2             | 1.5            | 3.06        | 523            | 18.4                  | 34.1             |

Heating (2 pipe rows):  $t_{w1} = 45\text{ °C}$ ,  $t_{w2} = 40\text{ °C}$ ,  $t_r = 20\text{ °C}$

Cooling (4 pipe rows):  $t_{w1} = 7\text{ °C}$ ,  $t_{w2} = 12\text{ °C}$ ,  $t_r = 27\text{ °C}$ , HR = 47 %

Available static pressure values with clean filter.



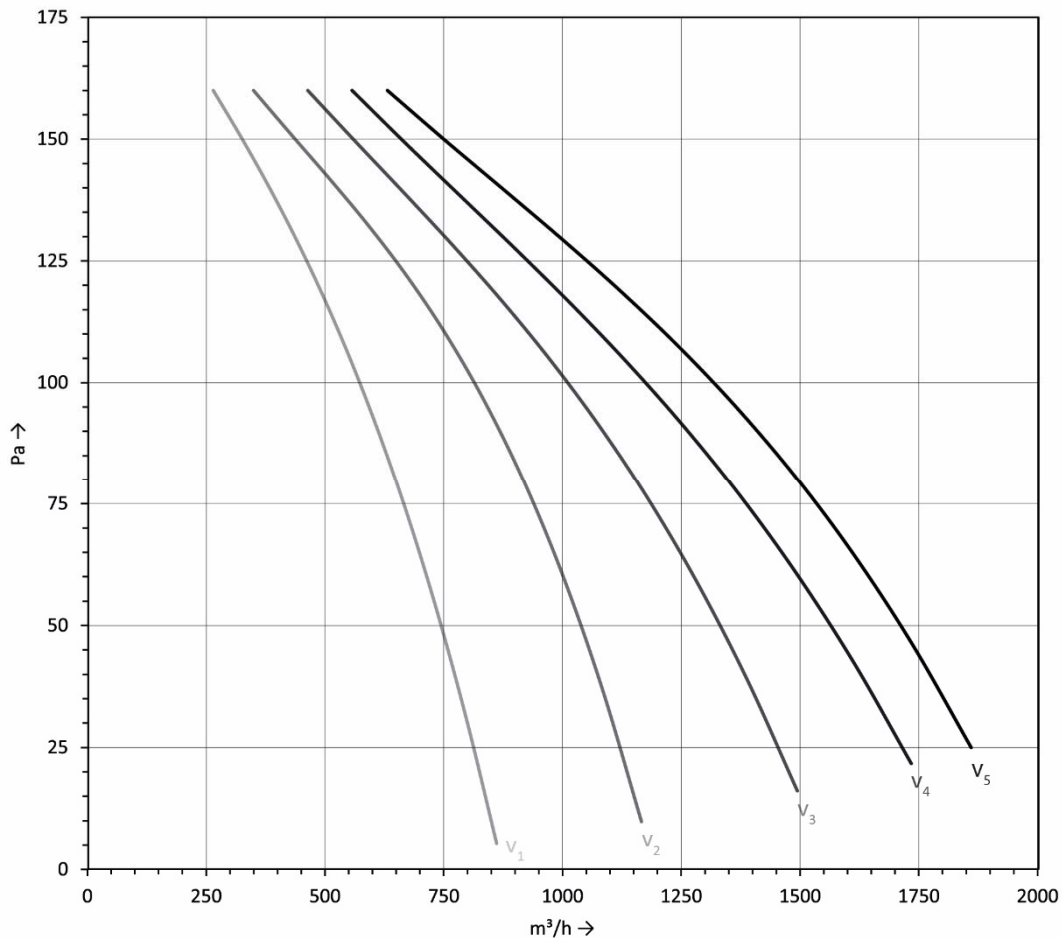
NBS-100-2-L4-C5

|                  | $V_{motor}$ | $V_L$<br>(m <sup>3</sup> /h) | $p_s$<br>(Pa) | $W$<br>(W) | $Q_T$<br>(kW) | $Q_S$<br>(kW) | $V_w$<br>(l/h) | $\Delta p_w$<br>(kPa) | $t_{l2}$<br>(°C) | $V_K$<br>(l/h) | $Q$<br>(kW) | $V_w$<br>(l/h) | $\Delta p_w$<br>(kPa) | $t_{l2}$<br>(°C) |
|------------------|-------------|------------------------------|---------------|------------|---------------|---------------|----------------|-----------------------|------------------|----------------|-------------|----------------|-----------------------|------------------|
| $p_{s, max}$     | 5           | 631                          | 160           | 182        | 4.83          | 3.46          | 832            | 7.5                   | 10.2             | 2.0            | 3.48        | 595            | 6.8                   | 36.5             |
|                  | 4           | 557                          | 160           | 151        | 4.35          | 3.10          | 749            | 6.2                   | 10.0             | 1.8            | 3.16        | 539            | 5.6                   | 36.9             |
|                  | 3           | 464                          | 160           | 132        | 3.72          | 2.64          | 641            | 4.7                   | 9.6              | 1.6            | 2.72        | 465            | 4.3                   | 37.5             |
|                  | 2           | 350                          | 160           | 115        | 2.89          | 2.04          | 498            | 3.0                   | 9.2              | 1.2            | 2.15        | 367            | 2.8                   | 38.4             |
|                  | 1           | 265                          | 160           | 104        | 2.23          | 1.57          | 384            | 1.8                   | 8.9              | 1.0            | 1.69        | 289            | 1.8                   | 39.0             |
| $\eta_{se, max}$ | 5           | 993                          | 130           | 207        | 6.89          | 5.06          | 1186           | 14.4                  | 11.4             | 2.6            | 4.91        | 838            | 12.7                  | 34.8             |
|                  | 4           | 874                          | 130           | 175        | 6.26          | 4.56          | 1077           | 12.1                  | 11.0             | 2.5            | 4.47        | 763            | 10.7                  | 35.3             |
|                  | 3           | 752                          | 130           | 154        | 5.56          | 4.02          | 958            | 9.8                   | 10.6             | 2.2            | 3.99        | 681            | 8.7                   | 35.8             |
|                  | 2           | 610                          | 130           | 139        | 4.69          | 3.36          | 808            | 7.2                   | 10.2             | 1.9            | 3.39        | 579            | 6.4                   | 36.6             |
|                  | 1           | 437                          | 130           | 123        | 3.53          | 2.50          | 607            | 4.3                   | 9.5              | 1.5            | 2.59        | 442            | 3.9                   | 37.7             |
| $V_{L, max}$     | 5           | 1860                         | 25            | 281        | 10.67         | 8.27          | 1836           | 32.0                  | 13.4             | 3.5            | 7.59        | 1297           | 28.6                  | 32.2             |
|                  | 4           | 1734                         | 22            | 258        | 10.19         | 7.84          | 1755           | 29.4                  | 13.2             | 3.4            | 7.25        | 1238           | 26.2                  | 32.5             |
|                  | 3           | 1494                         | 16            | 242        | 9.23          | 7.00          | 1589           | 24.6                  | 12.7             | 3.2            | 6.55        | 1119           | 21.8                  | 33.1             |
|                  | 2           | 1166                         | 10            | 220        | 7.76          | 5.77          | 1336           | 17.9                  | 11.9             | 2.9            | 5.51        | 941            | 15.8                  | 34.1             |
|                  | 1           | 861                          | 5             | 196        | 6.19          | 4.50          | 1065           | 11.8                  | 11.0             | 2.4            | 4.42        | 755            | 10.5                  | 35.3             |

Heating (2 pipe rows):  $t_{w1} = 45\text{ °C}$ ,  $t_{w2} = 40\text{ °C}$ ,  $t_r = 20\text{ °C}$

Cooling (4 pipe rows):  $t_{w1} = 7\text{ °C}$ ,  $t_{w2} = 12\text{ °C}$ ,  $t_r = 27\text{ °C}$ , HR = 47 %

Available static pressure values with clean filter.



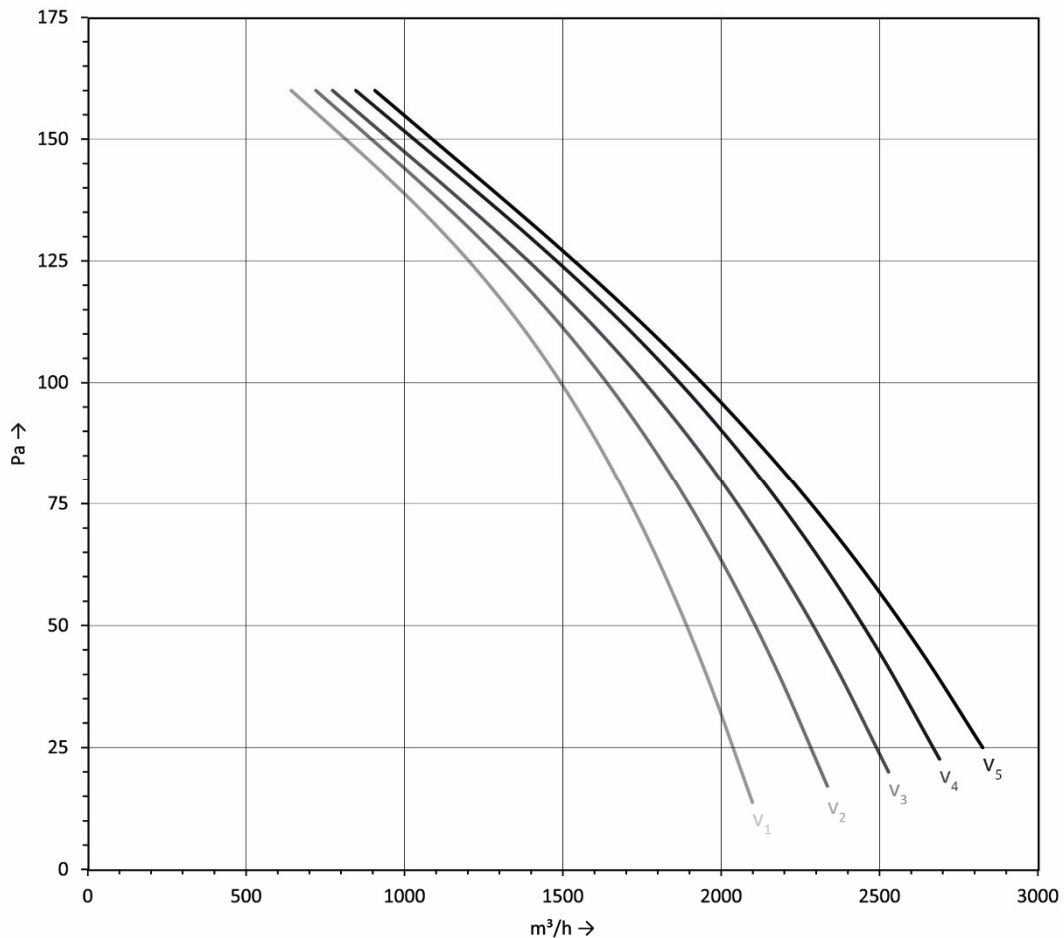
NBS-100-3-L4-C5

|                  | $V_{motor}$ | $V_L$<br>(m <sup>3</sup> /h) | $p_s$<br>(Pa) | $W$<br>(W) | $Q_T$<br>(kW) | $Q_s$<br>(kW) | $V_w$<br>(l/h) | $\Delta p_w$<br>(kPa) | $t_{12}$<br>(°C) | $V_K$<br>(l/h) | $Q$<br>(kW) | $V_w$<br>(l/h) | $\Delta p_w$<br>(kPa) | $t_{12}$<br>(°C) |
|------------------|-------------|------------------------------|---------------|------------|---------------|---------------|----------------|-----------------------|------------------|----------------|-------------|----------------|-----------------------|------------------|
| $p_{s, max}$     | 5           | 907                          | 160           | 244        | 6.98          | 4.99          | 1202           | 6.4                   | 10.1             | 2.9            | 5.33        | 909            | 8.7                   | 37.5             |
|                  | 4           | 846                          | 160           | 217        | 6.59          | 4.70          | 1134           | 5.8                   | 10.0             | 2.7            | 5.05        | 862            | 7.9                   | 37.8             |
|                  | 3           | 773                          | 160           | 198        | 6.10          | 4.34          | 1051           | 5.0                   | 9.8              | 2.6            | 4.70        | 803            | 6.9                   | 38.2             |
|                  | 2           | 720                          | 160           | 183        | 5.74          | 4.08          | 989            | 4.5                   | 9.7              | 2.4            | 4.45        | 759            | 6.2                   | 38.4             |
|                  | 1           | 643                          | 160           | 172        | 5.20          | 3.68          | 895            | 3.7                   | 9.5              | 2.2            | 4.06        | 693            | 5.3                   | 38.8             |
| $\eta_{se, max}$ | 5           | 1360                         | 135           | 274        | 9.63          | 7.04          | 1659           | 11.5                  | 11.2             | 3.8            | 7.21        | 1232           | 15.1                  | 35.8             |
|                  | 4           | 1305                         | 135           | 250        | 9.34          | 6.81          | 1607           | 10.9                  | 11.0             | 3.7            | 7.00        | 1196           | 14.3                  | 36.0             |
|                  | 3           | 1222                         | 135           | 231        | 8.87          | 6.44          | 1527           | 9.9                   | 10.9             | 3.5            | 6.67        | 1139           | 13.1                  | 36.3             |
|                  | 2           | 1152                         | 135           | 216        | 8.47          | 6.13          | 1458           | 9.1                   | 10.7             | 3.4            | 6.38        | 1090           | 12.1                  | 36.5             |
|                  | 1           | 1059                         | 135           | 205        | 7.92          | 5.71          | 1364           | 8.1                   | 10.5             | 3.2            | 6.00        | 1024           | 10.8                  | 36.9             |
| $V_{L, max}$     | 5           | 2826                         | 25            | 422        | 16.09         | 12.50         | 2770           | 29.4                  | 13.5             | 5.2            | 11.92       | 2035           | 37.8                  | 32.6             |
|                  | 4           | 2689                         | 23            | 398        | 15.59         | 12.04         | 2683           | 27.7                  | 13.3             | 5.1            | 11.54       | 1971           | 35.7                  | 32.8             |
|                  | 3           | 2529                         | 20            | 375        | 14.97         | 11.50         | 2577           | 25.8                  | 13.1             | 5.0            | 11.09       | 1893           | 33.2                  | 33.1             |
|                  | 2           | 2336                         | 17            | 361        | 14.20         | 10.83         | 2445           | 23.4                  | 12.8             | 4.9            | 10.52       | 1796           | 30.1                  | 33.4             |
|                  | 1           | 2099                         | 14            | 310        | 13.20         | 9.97          | 2273           | 20.5                  | 12.5             | 4.7            | 9.79        | 1671           | 26.4                  | 33.9             |

Heating (2 pipe rows):  $t_{w1} = 45\text{ °C}$ ,  $t_{w2} = 40\text{ °C}$ ,  $t_r = 20\text{ °C}$

Cooling (4 pipe rows):  $t_{w1} = 7\text{ °C}$ ,  $t_{w2} = 12\text{ °C}$ ,  $t_r = 27\text{ °C}$ , HR = 47 %

Available static pressure values with clean filter.



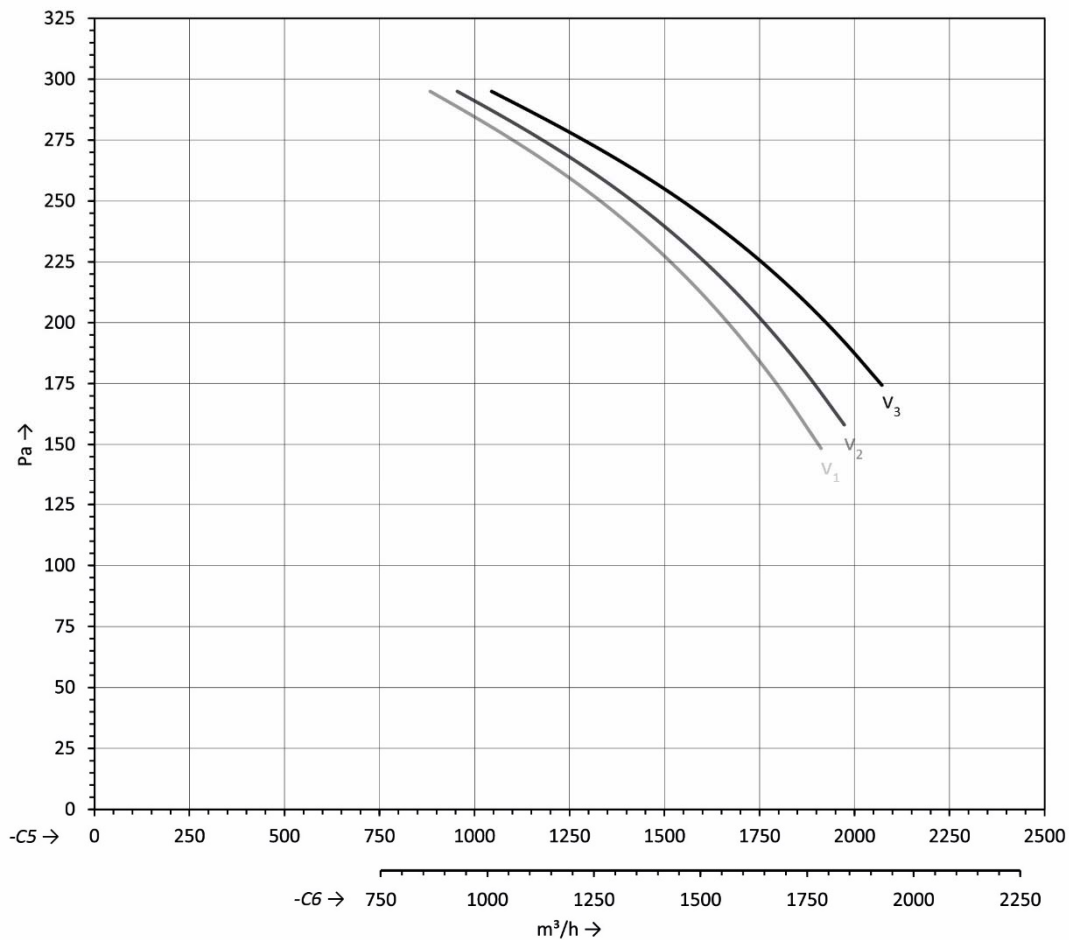
NBS-150-1-L4-C5

|                  | $V_{motor}$ | $V_L$<br>(m <sup>3</sup> /h) | $p_s$<br>(Pa) | $W$<br>(W) | $Q_T$<br>(kW) | $Q_s$<br>(kW) | $V_w$<br>(l/h) | $\Delta p_w$<br>(kPa) | $t_{l2}$<br>(°C) | $V_K$<br>(l/h) | $Q$<br>(kW) | $V_w$<br>(l/h) | $\Delta p_w$<br>(kPa) | $t_{l2}$<br>(°C) |
|------------------|-------------|------------------------------|---------------|------------|---------------|---------------|----------------|-----------------------|------------------|----------------|-------------|----------------|-----------------------|------------------|
| $p_{s, max}$     | 3           | 1045                         | 295           | 528        | 7.27          | 5.32          | 1252           | 27.4                  | 11.4             | 2.8            | 5.08        | 867            | 14.9                  | 34.5             |
|                  | 2           | 955                          | 295           | 440        | 6.79          | 4.94          | 1169           | 24.2                  | 11.2             | 2.7            | 4.75        | 812            | 13.2                  | 34.9             |
|                  | 1           | 883                          | 295           | 397        | 6.39          | 4.63          | 1101           | 21.7                  | 11.0             | 2.6            | 4.49        | 766            | 11.9                  | 35.2             |
| $\eta_{se, max}$ | 3           | 1450                         | 260           | 582        | 9.21          | 6.92          | 1586           | 42.2                  | 12.4             | 3.3            | 6.40        | 1093           | 22.9                  | 33.2             |
|                  | 2           | 1327                         | 260           | 489        | 8.66          | 6.45          | 1491           | 37.7                  | 12.1             | 3.2            | 6.02        | 1028           | 20.4                  | 33.5             |
|                  | 1           | 1245                         | 260           | 442        | 8.27          | 6.13          | 1424           | 34.7                  | 11.9             | 3.1            | 5.76        | 983            | 18.8                  | 33.8             |
| $V_{L, max}$     | 3           | 2072                         | 174           | 704        | 11.67         | 9.07          | 2010           | 64.8                  | 13.6             | 3.8            | 8.12        | 1387           | 35.6                  | 31.7             |
|                  | 2           | 1973                         | 158           | 624        | 11.32         | 8.75          | 1948           | 61.2                  | 13.4             | 3.7            | 7.87        | 1344           | 33.5                  | 31.9             |
|                  | 1           | 1912                         | 148           | 586        | 11.09         | 8.54          | 1909           | 59.0                  | 13.3             | 3.7            | 7.71        | 1316           | 32.3                  | 32.0             |

Heating (2 pipe rows):  $t_{w1} = 45\text{ °C}$ ,  $t_{w2} = 40\text{ °C}$ ,  $t_R = 20\text{ °C}$

Cooling (4 pipe rows):  $t_{w1} = 7\text{ °C}$ ,  $t_{w2} = 12\text{ °C}$ ,  $t_R = 27\text{ °C}$ , HR = 47 %

Available static pressure values with clean filter.



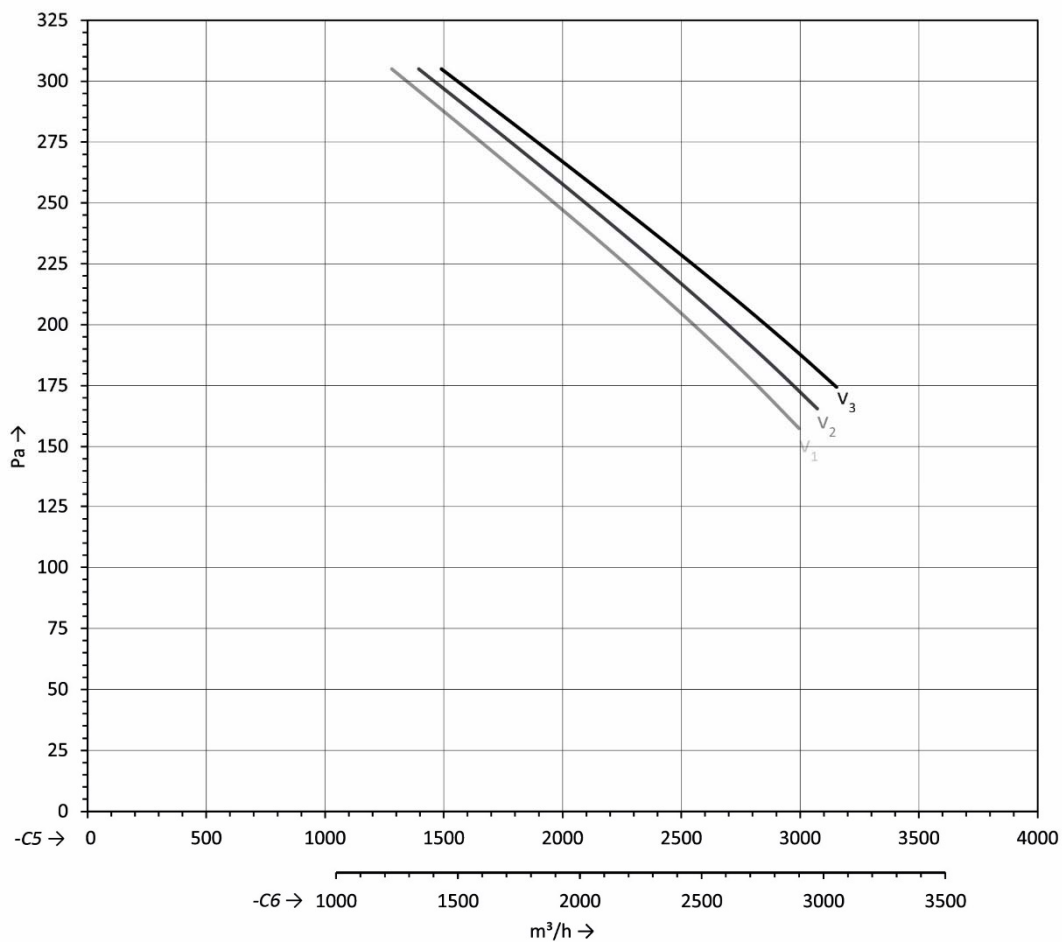
NBS-150-2-L4-C5

|                  | $V_{motor}$ | $V_L$<br>(m <sup>3</sup> /h) | $p_s$<br>(Pa) | $W$<br>(W) | $Q_T$<br>(kW) | $Q_s$<br>(kW) | $V_w$<br>(l/h) | $\Delta p_w$<br>(kPa) | $t_{l2}$<br>(°C) | $V_K$<br>(l/h) | $Q$<br>(kW) | $V_w$<br>(l/h) | $\Delta p_w$<br>(kPa) | $t_{l2}$<br>(°C) |
|------------------|-------------|------------------------------|---------------|------------|---------------|---------------|----------------|-----------------------|------------------|----------------|-------------|----------------|-----------------------|------------------|
| $p_{s, max}$     | 3           | 1423                         | 310           | 844        | 10.40         | 7.52          | 1790           | 15.6                  | 10.8             | 4.2            | 7.38        | 1260           | 12.1                  | 35.5             |
|                  | 2           | 1329                         | 310           | 705        | 9.86          | 7.11          | 1697           | 14.2                  | 10.6             | 4.0            | 7.01        | 1197           | 11.0                  | 35.7             |
|                  | 1           | 1218                         | 310           | 630        | 9.19          | 6.60          | 1582           | 12.5                  | 10.4             | 3.8            | 6.56        | 1120           | 9.7                   | 36.1             |
| $\eta_{se, max}$ | 3           | 1960                         | 270           | 921        | 13.25         | 9.79          | 2282           | 24.3                  | 11.7             | 5.0            | 9.34        | 1595           | 18.6                  | 34.2             |
|                  | 2           | 1845                         | 270           | 781        | 12.68         | 9.33          | 2183           | 22.4                  | 11.5             | 4.9            | 8.94        | 1527           | 17.2                  | 34.5             |
|                  | 1           | 1719                         | 270           | 703        | 12.03         | 8.80          | 2070           | 20.4                  | 11.3             | 4.7            | 8.49        | 1450           | 15.6                  | 34.7             |
| $V_{L, max}$     | 3           | 3154                         | 174           | 1118       | 18.39         | 14.15         | 3166           | 44.2                  | 13.3             | 6.1            | 12.97       | 2214           | 33.9                  | 32.3             |
|                  | 2           | 3072                         | 166           | 996        | 18.08         | 13.88         | 3113           | 42.8                  | 13.2             | 6.1            | 12.74       | 2176           | 32.8                  | 32.4             |
|                  | 1           | 2996                         | 157           | 934        | 17.79         | 13.62         | 3062           | 41.6                  | 13.1             | 6.0            | 12.53       | 2140           | 31.8                  | 32.5             |

Heating (2 pipe rows):  $t_{w1} = 45\text{ °C}$ ,  $t_{w2} = 40\text{ °C}$ ,  $t_R = 20\text{ °C}$

Cooling (4 pipe rows):  $t_{w1} = 7\text{ °C}$ ,  $t_{w2} = 12\text{ °C}$ ,  $t_R = 27\text{ °C}$ , HR = 47 %

Available static pressure values with clean filter.



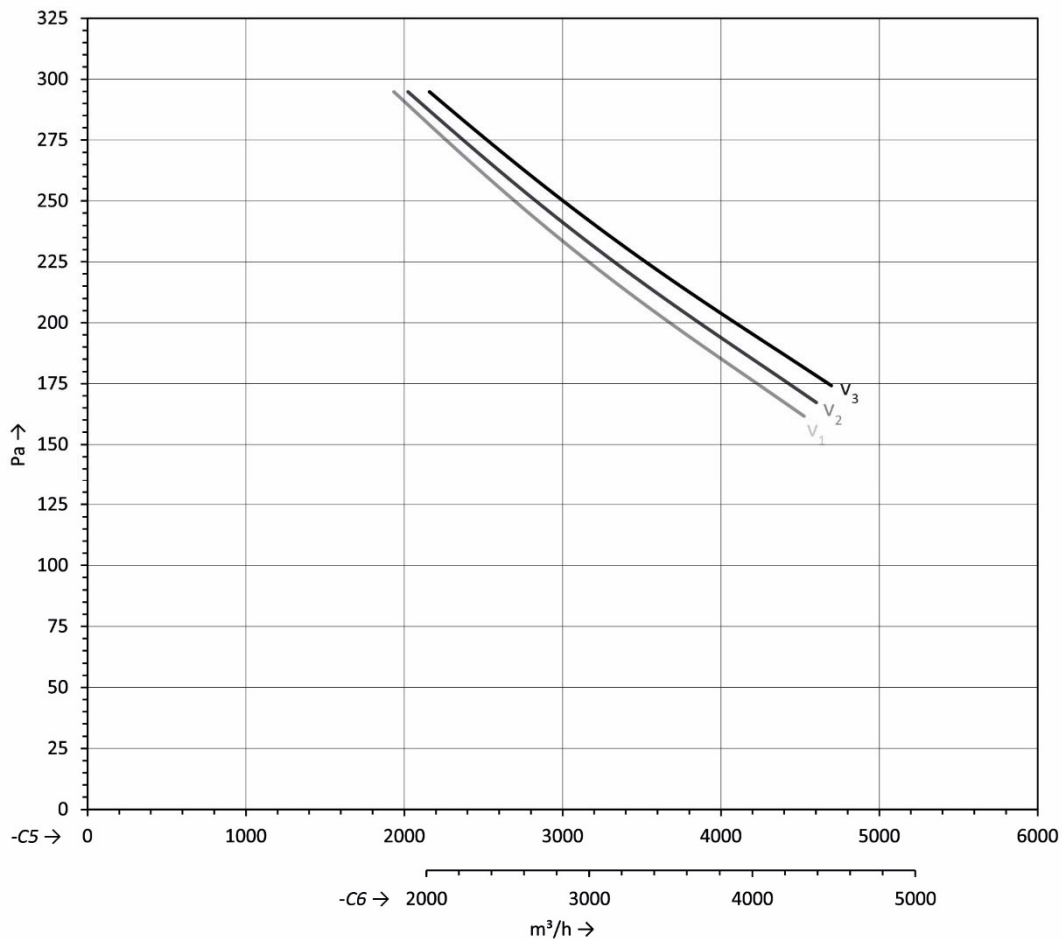
NBS-150-3-L4-C5

|                  | $V_{motor}$ | $V_L$<br>(m <sup>3</sup> /h) | $p_s$<br>(Pa) | $W$<br>(W) | $Q_T$<br>(kW) | $Q_s$<br>(kW) | $V_w$<br>(l/h) | $\Delta p_w$<br>(kPa) | $t_{l2}$<br>(°C) | $V_K$<br>(l/h) | $Q$<br>(kW) | $V_w$<br>(l/h) | $\Delta p_w$<br>(kPa) | $t_{l2}$<br>(°C) |
|------------------|-------------|------------------------------|---------------|------------|---------------|---------------|----------------|-----------------------|------------------|----------------|-------------|----------------|-----------------------|------------------|
| $p_{s, max}$     | 3           | 2160                         | 295           | 1165       | 15.47         | 11.25         | 2663           | 20.6                  | 11.1             | 6.1            | 11.39       | 1945           | 18.1                  | 35.7             |
|                  | 2           | 2024                         | 295           | 972        | 14.70         | 10.65         | 2531           | 18.8                  | 10.9             | 5.9            | 10.86       | 1855           | 16.6                  | 36.0             |
|                  | 1           | 1935                         | 295           | 866        | 14.19         | 10.26         | 2443           | 17.6                  | 10.8             | 5.7            | 10.51       | 1795           | 15.6                  | 36.2             |
| $\eta_{se, max}$ | 3           | 3529                         | 225           | 1300       | 22.15         | 16.70         | 3813           | 39.8                  | 12.5             | 7.9            | 16.04       | 2740           | 34.1                  | 33.6             |
|                  | 2           | 3330                         | 225           | 1112       | 21.27         | 15.96         | 3663           | 37.0                  | 12.3             | 7.7            | 15.43       | 2635           | 31.7                  | 33.8             |
|                  | 1           | 3169                         | 225           | 996        | 20.54         | 15.35         | 3537           | 34.7                  | 12.2             | 7.5            | 14.92       | 2547           | 29.8                  | 34.0             |
| $V_{L, max}$     | 3           | 4697                         | 174           | 1420       | 26.78         | 20.75         | 4610           | 56.3                  | 13.5             | 8.7            | 19.35       | 3305           | 48.2                  | 32.3             |
|                  | 2           | 4603                         | 167           | 1251       | 26.43         | 20.44         | 4550           | 55.0                  | 13.4             | 8.7            | 19.10       | 3262           | 47.1                  | 32.4             |
|                  | 1           | 4525                         | 162           | 1149       | 26.14         | 20.18         | 4501           | 53.9                  | 13.4             | 8.6            | 18.90       | 3227           | 46.1                  | 32.5             |

Heating (2 pipe rows):  $t_{w1} = 45\text{ °C}$ ,  $t_{w2} = 40\text{ °C}$ ,  $t_r = 20\text{ °C}$

Cooling (4 pipe rows):  $t_{w1} = 7\text{ °C}$ ,  $t_{w2} = 12\text{ °C}$ ,  $t_r = 27\text{ °C}$ , HR = 47 %

Available static pressure values with clean filter.



SOUND POWER LEVEL

| Model     | v <sub>motor</sub> | L <sub>w</sub> (dB) |        |        |        |         |         |         |         | L <sub>WA</sub><br>(dB(A)) |
|-----------|--------------------|---------------------|--------|--------|--------|---------|---------|---------|---------|----------------------------|
|           |                    | 63 Hz               | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz |                            |
| NBS-100-1 | 5                  | 62                  | 60     | 63     | 68     | 65      | 62      | 60      | 57      | 70                         |
|           | 4                  | 58                  | 56     | 58     | 63     | 60      | 56      | 54      | 51      | 65                         |
|           | 3                  | 53                  | 51     | 53     | 59     | 55      | 50      | 47      | 43      | 60                         |
|           | 2                  | 49                  | 47     | 50     | 55     | 50      | 45      | 41      | 35      | 55                         |
|           | 1                  | 46                  | 44     | 49     | 51     | 45      | 40      | 34      | 28      | 51                         |
| NBS-100-2 | 5                  | 62                  | 60     | 64     | 68     | 66      | 62      | 60      | 57      | 70                         |
|           | 4                  | 59                  | 57     | 60     | 64     | 62      | 58      | 56      | 52      | 66                         |
|           | 3                  | 55                  | 53     | 56     | 61     | 57      | 53      | 50      | 46      | 62                         |
|           | 2                  | 52                  | 50     | 53     | 58     | 53      | 49      | 45      | 40      | 58                         |
|           | 1                  | 50                  | 48     | 52     | 56     | 49      | 44      | 39      | 34      | 55                         |
| NBS-100-3 | 5                  | 61                  | 59     | 65     | 68     | 66      | 63      | 60      | 57      | 71                         |
|           | 4                  | 59                  | 57     | 62     | 65     | 63      | 60      | 57      | 53      | 68                         |
|           | 3                  | 57                  | 55     | 60     | 62     | 60      | 56      | 53      | 49      | 65                         |
|           | 2                  | 55                  | 53     | 57     | 60     | 57      | 52      | 49      | 44      | 61                         |
|           | 1                  | 53                  | 51     | 54     | 61     | 54      | 48      | 44      | 39      | 60                         |
| NBS-150-1 | 3                  | 50                  | 60     | 69     | 72     | 77      | 76      | 73      | 64      | 81                         |
|           | 2                  | 46                  | 56     | 65     | 68     | 73      | 72      | 69      | 60      | 77                         |
|           | 1                  | 44                  | 54     | 63     | 66     | 71      | 70      | 67      | 58      | 75                         |
| NBS-150-2 | 3                  | 53                  | 63     | 72     | 75     | 80      | 79      | 76      | 67      | 84                         |
|           | 2                  | 49                  | 59     | 68     | 71     | 76      | 75      | 72      | 63      | 80                         |
|           | 1                  | 47                  | 57     | 66     | 69     | 74      | 73      | 70      | 61      | 78                         |
| NBS-150-3 | 3                  | 55                  | 65     | 73     | 76     | 82      | 80      | 77      | 68      | 86                         |
|           | 2                  | 51                  | 61     | 69     | 72     | 78      | 76      | 73      | 64      | 82                         |
|           | 1                  | 49                  | 59     | 67     | 70     | 76      | 74      | 71      | 62      | 80                         |

Sound power level measured at max. motor speed, free throw.

The sound power level is reduced in case of duct mounting.



## LEGEND

|              |                           |   |  |
|--------------|---------------------------|---|--|
| B            | (mm)                      | = | Width  |
| H            | (mm)                      | = | Height   |
| L            | (mm)                      | = | Length   |
| DN           | (mm)                      | = | Diameter, nominal width                          |
| HR           | (%)                       | = | Relative humidity in the room                    |
| $\Delta p_w$ | (kPa)                     | = | Water pressure loss in the heat exchanger        |
| $p_s$        | (Pa)                      | = | Available static pressure                        |
| Q            | (kW)                      | = | Thermal capacity                                 |
| $Q_s$        | (kW)                      | = | Sensible capacity                                |
| $Q_T$        | (kW)                      | = | Total capacity                                   |
| $t_{L2}$     | (°C)                      | = | Air outlet temperature                           |
| $t_R$        | (°C)                      | = | Room air temperature                             |
| $t_{w1}$     | (°C)                      | = | Water inlet temperature                          |
| $t_{w2}$     | (°C)                      | = | Water outlet temperature                         |
| v            | (-)                       | = | Speed  |
| $V_K$        | (l/h)                     | = | Amount of condensate                             |
| $V_L$        | (m <sup>3</sup> /h) [l/s] | = | Volumetric flow                                  |
| $V_w$        | (l/h)                     | = | Water volumetric flow                            |
| W            | (W)                       | = | Operating power                                  |
| $\eta_{se}$  | (%)                       | = | Static efficiency                                |
| $L_w$        | (dB)                      | = | Sound power level ( $W_{ref} = 1 \text{ pW}$ )   |
| $L_{WA}$     | [dB(A)]                   | = | Sound power level A ( $W_{ref} = 1 \text{ pW}$ ) |

## ORDER CODE NBS

| 01             | 02    | 03   | 04     | 05         | 06             | 07     |
|----------------|-------|------|--------|------------|----------------|--------|
| Type           | Model | Size | System | Air filter | Filter removal | Flange |
| <b>Example</b> |       |      |        |            |                |        |
| NBS            | -100  | -1   | -L4    | -C5        | -2             | -F0    |

| 08                        | 09                | 10          |
|---------------------------|-------------------|-------------|
| Water connection position | Droplet separator | Mixing unit |
| <b>Example</b>            |                   |             |
| -W1                       | -T0               | -M0         |

### NOTE

Please always specify the complete order code in the order!  
 If details are missing from the order, the standard model will be delivered.  
 Any special model not included in the order code must be queried before ordering.  
 \* = if no details are given, processing is impossible.

### EXAMPLE

#### NBS-100-1-L4-C5-2-F0-W1-T0-M0

Room air conditioning module NBS | product 100 | size 1 | 4-pipe register with 4 and 2 pipe rows (cooling and heating) | air filter ISO Coarse 50% | filter removal in air flow direction on the right | without flange | in air flow direction on the left | without droplet separator | without mixing unit

## ORDER DETAILS

### 1 – Type

NBS = Air conditioning module NBS

### 2 – Model\*

100 = Model 100  
 150 = Model 150

### 3 – Size\*

1 = Size 1  
 2 = Size 2  
 3 = Size 3

### 4 – System (water register version)\*

R2 = 2-pipe register 2 pipe rows (heating or cooling)  
 R4 = 2-pipe register 4 pipe rows (cooling or heating)  
 L4 = 4-pipe register 4 and 2 pipe rows (cooling and heating)

### 5 – Air filter

C5 = air filter ISO Coarse 50% (standard)  
 C6 = air filter ISO Coarse 60% (not possible for product -100)

### 6 – Filter removal

1 = filter removal in air flow direction on the left  
 2 = filter removal in air flow direction on the right (standard)  
 3 = upwards  
 4 = downwards

### 7 – Flange

F0 = without flange (standard)  
 FZ = with supply air flange  
 FA = with return air flange  
 FB = with supply air and return air flange

### 8 – Water connection position

W1 = in air flow direction on the left (standard) (the electric connections are fitted on the opposite side)  
 W2 = in air flow direction on the right (the electric connections are fitted on the opposite side)

### 9 – Droplet separator

T0 = without droplet separator (standard)  
 T1 = with droplet separator with polypropylene blades and a rack made of galvanised sheet steel (not possible for product -100)  
 T2 = with droplet separator with polypropylene blades and a rack made of stainless sheet steel (not possible for product -100)

### 10 – Mixing unit

M0 = without mixing unit (standard)  
 M1 = with mixing unit in air flow direction on the left  
 M2 = with mixing unit in air flow direction on the right

## ORDER CODE FA-NBS

| 01             | 02     | 03    | 04   | 05    |
|----------------|--------|-------|------|-------|
| Type           | Family | Model | Size | Model |
| <b>Example</b> |        |       |      |       |
| FA             | -NBS   | -100  | -1   | -Z1   |

### NOTE

Please always specify the complete order code in the order!

If details are missing from the order, the standard model will be delivered.

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

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

### EXAMPLE

#### FA-NBS-100-1-Z1

Flexible connection | for room air conditioning module NBS | for product NBS-100 | size 1 | 150 mm for supply air

## ORDER DETAILS

### 1 – Type

FA = flexible connection

### 2 – Family

NBS = for room air conditioning module NBS

### 3 – Model\*

100 = for product NBS-100

150 = for product NBS-150

### 4 – Size\*

1 = Size 1

2 = Size 2

3 = Size 3

### 5 – Model\*

Z1 = 150 mm for supply air

Z2 = 290 mm for supply air

A1 = 150 mm for return air

A2 = 150 mm for return air

## ORDER CODE PL-NBS

| 01             | 02     | 03    | 04   | 05    | 06     | 07         |
|----------------|--------|-------|------|-------|--------|------------|
| Type           | Family | Model | Size | Model | Length | Insulation |
| <b>Example</b> |        |       |      |       |        |            |
| PL             | -NBS   | -100  | -1   | -Z    | -0500  | -I0        |

| 08                               | 09   | 10  |
|----------------------------------|--|---|
| Connection in air flow direction | Connection in air flow direction on the left | Connection in air flow direction on the right |
| <b>Example</b>                   |  |   |
| -MAB                             | -L00   | -R00  |

### NOTE

Please always specify the complete order code in the order!  
 If details are missing from the order, the standard model will be delivered.  
 Any special model not included in the order code must be queried before ordering.  
 \* = if no details are given, processing is impossible.

### EXAMPLE

#### PL-NBS-100-1-Z-0500-I0-MAB-L00-R00

Plenum box | for room air conditioning module NBS | for product NBS-100 | size 1 | supply air box | length 500 mm | without insulation | connection open in air flow direction | connection closed in air flow direction on the left | connection closed in air flow direction on the right

## ORDER DETAILS

### 1 – Type

PL = Plenum box

### 2 – Family

NBS = for room air conditioning module NBS

### 3 – Model\*

100 = for product NBS-100

150 = for product NBS-150

### 4 – Size\*

1 = Size 1

2 = Size 2

3 = Size 3

### 5 – Model

Z = supply air box (standard)

A = return air box

### 6 – Length

xxxx = length xxxx mm (from 0300 to 1000, always with 4 digits in mm)

0500 = length 500 mm (standard)

### 7 – Insulation

I0 = without insulation (standard)

I1 = thermal insulation of 10 mm

I2 = sound and thermal insulation of 20 mm

I4 = sound and thermal insulation of 40 mm (not compatible with spigots >DN123)

### 8 – Connection in air flow direction\*

M00 = connection closed in air flow direction

MAB = connection open in air flow direction

MRE = connecting flange in air flow direction

M1x = with x spigot DN123 in air flow direction

M2x = with x spigot DN158 in air flow direction

M3x = with x spigot DN198 in air flow direction

M4x = with x spigot DN248 in air flow direction

--- (for the number of spigots, see table)

### 9 – Connection in air flow direction on the left\*

L00 = connection closed in air flow direction on the left

L1x = with x spigot DN123 in air flow direction on the left

L2x = with x spigot DN158 in air flow direction on the left

L3x = with x spigot DN198 in air flow direction on the left

L4x = with x spigot DN248 in air flow direction on the left

--- (for the number of spigots, see table)

### 10 – Connection in air flow direction on the right\*

R00 = connection closed in air flow direction on the right

R1x = with x spigot DN123 in air flow direction on the right

R2x = with x spigot DN158 in air flow direction on the right

R3x = with x spigot DN198 in air flow direction on the right

R4x = with x spigot DN248 in air flow direction on the right

--- (for the number of spigots, see table)

## ORDER CODE ZMWS-NBS

| 01             | 02     | 03    | 04   | 05    | 06     | 07               |
|----------------|--------|-------|------|-------|--------|------------------|
| Type           | Family | Model | Size | Model | Length | Baffle thickness |
| <b>Example</b> |        |       |      |       |        |                  |
| ZMWS           | -NBS   | -100  | -1   | -MB   | -1000  | -100             |

| 08                |
|-------------------|
| Number of baffles |
| <b>Example</b>    |
| -02               |

### NOTE

Please always specify the complete order code in the order!  
 If details are missing from the order, the standard model will be delivered.  
 Any special model not included in the order code must be queried before ordering.  
 \* = if no details are given, processing is impossible.

### EXAMPLE

#### ZMWS-NBS-100-1-MB-1000-100-02

Accessories for baffle silencer MWS | for room air conditioning module NBS | for product NBS-100 | size 1 | with sound-absorbing baffles MWK-MB. For use at a main interfering frequency of 63 Hz and 500 Hz | length 1000 mm with 0500 mm baffle length | baffle thickness 100 mm | with 2 baffles

### ORDER DETAILS

#### 1 – Type

ZMWS = Accessories for baffle silencer MWS

#### 2 – Family

NBS = for room air conditioning module NBS

#### 3 – Model\*

100 = for product NBS-100  
 150 = for product NBS-150

#### 4 – Size\*

1 = Size 1  
 2 = Size 2  
 3 = Size 3

#### 5 – Model

MB = contains sound-absorbing baffles MWK-MB. For use at a main interference frequency between 63 Hz and 500 Hz (standard)  
 OB = contains sound-absorbing baffles MWK-OB. For use at a main interference frequency between 500 Hz and 8000 Hz

#### 6 – Length

1000 = length 1000 mm with a baffle length of 0500 mm (standard)  
 1250 = length 1250 mm with a baffle length of 0750 mm  
 1500 = length 1500 mm with a baffle length of 1000 mm  
 1750 = length 1750 mm with a baffle length of 1250 mm  
 2000 = length 2000 mm with a baffle length of 1500 mm  
 2250 = length 2250 mm with a baffle length of 1750 mm

2500 = length 2500 mm with a baffle length of 2000 mm  
 3000 = length 3000 mm with a baffle length of 2500 mm

#### 7 – Baffle thickness

100 = baffle thickness 100 mm (standard)  
 200 = baffle thickness 200 mm

#### 8 – Number of baffles\*

xx = with xx baffles (from 01 to maximum number of baffles according to table, always 2-digit)

## ORDER CODE FOR LWZ ACCESSORIES

| 01             | 02    |
|----------------|-------|
| Type           | Model |
| <b>Example</b> |       |
| LWZ            | -VC03 |

### NOTE

Please always specify the complete order code in the order!

If details are missing from the order, the standard model will be delivered.

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

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

### EXAMPLE

#### LWZ-VC03

Accessories for air-water systems products | Pressure-independent control valve VPP46.15L0.2

## ORDER DETAILS

### 1 - Type

LWZ = accessories for air-water systems

### 2 – Model

VCxy = pressure-independent control valve xy

V6xy = 6-way ball valve xy

ATxy = thermal actuators xy

AMxy = motoric valve drive xy

ARxy = rotary drives for 6-way ball valve xy

TRxy = room thermostat with weekly program xy

TKxy = room thermostat with KNX interface xy

## SPECIFICATION TEXT

NBS air-conditioning unit for horizontal installation in false ceilings. The housing of the NBS-100 consists of galvanised sheet steel profiles and heat and sound insulation. The housing of the NBS-150 consists of aluminium profiles, a jacket in sandwich design made of galvanised sheet steel, an interior heat and sound insulation, plastic corners and a circumferential seal. The motorised fan consists of a double-sided intake-operated centrifugal blower with built-in motor, heat exchanger register with galvanised steel frame, aluminium sheets and copper pipes. The filter element consists of a galvanised steel frame and a synthetic filter medium.

Models for operation with circulating air only or a mixture of processed fresh air and circulating air!

**Manufacturer:** SCHAKO

**Family:** room air conditioning module NBS

### Models NBS

|   |  |      |
|---|--|------|
| <b>Type</b>   |  |      |
| Room air conditioning module NBS                            |  | -NBS |
| <b>Model</b>  |  |      |
| Model 100   |  | -100 |
| Model 150   |  | -150 |
| <b>Size</b>   |  |      |
| Size 1 -1   |  |      |
| Size 2 -2   |  |      |
| Size 3 -3   |  |      |
| <b>System (water register version)</b>                      |  |      |
| 2-pipe register 2 pipe rows (heating or cooling)            |  | -R2  |
| 2-pipe register 4 rows of pipes (cooling or heating)        |  | -R4  |
| 4-pipe register 4 and 2 rows of pipes (cooling and heating) |  | -L4  |
| <b>Air filter</b>   |  |      |
| Air filter ISO Coarse 50%                                   |  | -C5  |
| Air filter ISO Coarse 60%                                   |  | -C6  |
| <b>Filter removal</b>                                       |  |      |
| Filter removal in air flow direction on the left            |  | -1   |
| Filter removal in air flow direction on the right           |  | -2   |
| upwards -3  |  |      |
| downwards   |  | -4   |

### Flange

|                                       |     |
|---------------------------------------|-----|
| without flange                        | -F0 |
| with supply air flange                | -FZ |
| with return air flange                | -FA |
| with supply air and return air flange | -FB |
| <b>Water connection position</b>      |     |
| in air flow direction on the left     | -W1 |
| in air flow direction on the right    | -W2 |

### Droplet separator

|  |     |
|--|-----|
| without droplet separator  | -T0 |
| with droplet separator with polypropylene blades and a rack made of galvanised sheet steel | -T1 |
| with droplet separator with polypropylene blades and a rack made of stainless sheet steel  | -T2 |

### Mixing unit

|   |     |
|---|-----|
| without mixing unit                                 | -M0 |
| with mixing unit in air flow direction on the left  | -M1 |
| with mixing unit in air flow direction on the right | -M2 |

### Models FA-NBS (flexible connection to NBS)

|                                      |  |      |
|--------------------------------------|--|------|
| <b>Type</b>                          |  |      |
| Flexible connection                  |  | -FA  |
| <b>Family</b>                        |  |      |
| for room air conditioning module NBS |  | -NBS |
| <b>Model</b>                         |  |      |
| for product NBS-100                  |  | -100 |
| for product NBS-150                  |  | -150 |
| <b>Size</b>                          |  |      |
| Size 1 -1                            |  |      |
| Size 2 -2                            |  |      |
| Size 3 -3                            |  |      |
| <b>Model</b>                         |  |      |
| 150 mm for supply air                |  | -Z1  |
| 290 mm for supply air                |  | -Z2  |
| 150 mm for return air                |  | -A1  |
| 150 mm for return air                |  | -A2  |

## PL-NBS (plenum box for NBS)

Plenum box made of galvanised sheet steel

**Type**  
 plenum box -PL

**Family**  
 for room air conditioning module NBS -NBS

**Model**  
 for product NBS-100 -100  
 for product NBS-150 -150

**Size**  
 Size 1 -1  
 Size 2 -2  
 Size 3 -3

**Model**  
 supply air box -Z  
 return air box -A

**Length**  
 length xxxx mm -xxxx  
 length 500 mm -0500

**Insulation**  
 without insulation -I0  
 thermal insulation of 10 mm -I1  
 sound and thermal insulation of 20 mm -I2  
 sound and thermal insulation of 40 mm -I4

**Connection in air flow direction**  
 connection closed in air flow direction -M00  
 connection open in air flow direction -MAB  
 connecting flange in air flow direction -MRE  
 connection with x spigot DN123 in air flow direction -M1x  
 connection with x spigot DN158 in air flow direction -M2x  
 connection with x spigot DN198 in air flow direction -M3x  
 connection with x spigot DN248 in air flow direction -M4x

**Connection in air flow direction on the left**  
 connection closed in air flow direction on the left -L00  
 connection with x spigot DN123 in air flow direction on the left -L1x  
 connection with x spigot DN158 in air flow direction on the left -L2x  
 connection with x spigot DN198 in air flow direction on the left -L3x  
 connection with x spigot DN248 in air flow direction on the left -L4x

**Connection in air flow direction on the right**  
 connection closed in air flow direction on the right -R00  
 connection with x spigot DN123 in air flow direction on the right -R1x  
 connection with x spigot DN158 in air flow direction on the right -R2x  
 connection with x spigot DN198 in air flow direction on the right -R3x  
 connection with x spigot DN248 in air flow direction on the right -R4x

## ZMWS-NBS (baffle silencer for NBS)

**Type**  
 Accessories for baffle silencer MWS -ZMWS

**Family**  
 for room air conditioning module NBS -NBS  
 Model  
 for product NBS-100 -100  
 for product NBS-150 -150

**Size**  
 Size 1 -1  
 Size 2 -2  
 Size 3 -3

**Model**  
 contains MWK-MB sound-absorbing baffles. For use at a main interference frequency of 63 Hz and 500 Hz -MB  
 contains MWK-OB sound-absorbing baffles. For use at a main interference frequency of 500 Hz and 8000 Hz -OB

**Length**  
 length 1000 mm with a baffle length of 0500 mm -1000  
 length 1250 mm with a baffle length of 0750 mm -1250  
 length 1500 mm with a baffle length of 1000 mm -1500  
 length 1750 mm with a baffle length of 1250 mm -1750  
 length 2000 mm with a baffle length of 1500 mm -2000  
 length 2250 mm with a baffle length of 1750 mm -2250  
 length 2500 mm with a baffle length of 2000 mm -2500  
 length 3000 mm with a baffle length of 2500 mm -3000

**Baffle thickness**  
 baffle thickness 100 mm -100  
 baffle thickness 200 mm -200

**Number of baffles**  
 with xx baffles -xx



## Accessories

### Pressure independent control valves

|               |       |
|---------------|-------|
| VPP46.10L0.2  | -VC01 |
| VPP46.10L0.4  | -VC02 |
| VPP46.15L0.2  | -VC03 |
| VPP46.15L0.6  | -VC04 |
| VPP46.20F1.4  | -VC05 |
| VPP46.25F1.8  | -VC06 |
| VPP46.32F4.0  | -VC07 |
| VPP46.10L0.2Q | -VC08 |
| VPP46.10L0.4Q | -VC09 |
| VPP46.15L0.2Q | -VC10 |
| VPP46.15L0.6Q | -VC11 |
| VPP46.20F1.4Q | -VC12 |
| VPP46.25F1.8Q | -VC13 |
| VPP46.32F4.0Q | -VC14 |
| VPI46.15L0.2  | -VC15 |
| VPI46.15L0.6  | -VC16 |
| VPI46.20F1.4  | -VC17 |
| VPI46.25F1.8  | -VC18 |
| VPI46.32F4.0  | -VC19 |
| VPI46.15L0.2Q | -VC20 |
| VPI46.15L0.6Q | -VC21 |
| VPI46.20F1.4Q | -VC22 |
| VPI46.25F1.8Q | -VC23 |
| VPI46.32F4.0Q | -VC24 |

### Actuators

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

### Rotary drive for 6-way ball valve

|           |       |
|-----------|-------|
| GDB341.9E | -AR01 |
| GDB161.9E | -AR02 |
| GDB111.9E | -AR03 |

### Room thermostat

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

### 6-way ball valve

|                    |       |
|--------------------|-------|
| VWG41.10-0.25-0.40 | -V601 |
| VWG41.10-0.25-0.65 | -V602 |
| VWG41.10-0.25-1.00 | -V603 |
| VWG41.10-0.40-0.65 | -V604 |
| VWG41.10-0.40-1.00 | -V605 |
| VWG41.10-0.40-1.30 | -V606 |
| VWG41.10-0.40-1.60 | -V607 |
| VWG41.10-0.65-1.00 | -V608 |
| VWG41.10-0.65-1.30 | -V609 |
| VWG41.10-0.65-1.60 | -V610 |
| VWG41.10-1.00-1.30 | -V611 |
| VWG41.10-1.00-1.60 | -V612 |
| VWG41.10-1.00-1.90 | -V613 |
| VWG41.10-1.30-1.60 | -V614 |
| VWG41.10-1.30-1.90 | -V615 |
| VWG41.10-1.60-1.90 | -V616 |
| VWG41.10-1.90-1.90 | -V617 |
| VWG41.10-0.25-1.30 | -V618 |
| VWG41.10-0.25-1.60 | -V619 |
| VWG41.10-0.25-1.90 | -V620 |
| VWG41.10-0.40-0.40 | -V621 |
| VWG41.10-0.40-1.90 | -V622 |
| VWG41.10-0.65-0.65 | -V623 |
| VWG41.10-0.65-1.90 | -V624 |
| VWG41.10-1.00-1.00 | -V625 |
| VWG41.10-1.30-1.30 | -V626 |
| VWG41.10-1.60-1.60 | -V627 |
| VWG41.20-0.65-2.50 | -V628 |
| VWG41.20-1.00-2.50 | -V629 |
| VWG41.20-1.60-2.50 | -V630 |
| VWG41.20-1.60-3.45 | -V631 |
| VWG41.20-2.50-3.45 | -V632 |
| VWG41.20-2.50-4.25 | -V633 |
| VWG41.20-4.25-4.25 | -V634 |
| VWG41.20-0.25-2.50 | -V635 |
| VWG41.20-0.25-3.45 | -V636 |
| VWG41.20-0.25-4.25 | -V637 |
| VWG41.20-0.40-2.50 | -V638 |
| VWG41.20-0.40-3.45 | -V639 |
| VWG41.20-0.40-4.25 | -V640 |
| VWG41.20-0.65-3.45 | -V641 |
| VWG41.20-0.65-4.25 | -V642 |
| VWG41.20-1.00-3.45 | -V643 |
| VWG41.20-1.00-4.25 | -V644 |
| VWG41.20-1.30-2.50 | -V645 |
| VWG41.20-1.30-3.45 | -V646 |
| VWG41.20-1.30-4.25 | -V647 |
| VWG41.20-1.60-4.25 | -V648 |
| VWG41.20-2.50-2.50 | -V649 |
| VWG41.20-3.45-3.45 | -V650 |