

# MultiMAXX<sup>®</sup> HE

DATA & FACTS



Dear Customer,

This catalogue focuses on the MultiMAXX HE unit heater and provides assistance in its layout according to your requirements and gives guidance in the selection of the corresponding order code.

**The wide variety:** We have a wide variety of possible equipment to choose from, so you're certain to find the right unit for your requirements. The following type code allows you to easily specify the configuration of your unit.

The 1st part also comprises and specifies technical exceptions to be considered in certain operating conditions.

We recommend the most popular fresh-air units which are specified on page 10 and further pages: complete unit type and accessory codes are also presented.

The catalogue is composed of four main sections:

**Part 1 Unit description**

This section provides ample data on all unit components.

**Part 2 Unit samples**

are used to demonstrate our know-how in most common applications with MultiMAXX HE units. Typical and possible combinations of components are summarized in the selection table. Options and combinations, that are not feasible from the technical point of view, are not considered by the current document.

**Part 3 Unit data**

specifies the most essential technical information for the MultiMAXX HE unit heaters. Dimensions, sizes and weight are summarized in this section as well.

**Part 4 Control units and regulation system**

Once you have decided on the unit, you can find data on possible regulation variants in Part 4 and the make your selection using controls order code.

**Unit code**

All unit variations are covered by unit code (Fig. 1-1). As with other DencoHappel products, the unit code contains all details necessary for ordering, subsequent extension of the unit or provision of spare parts.

**Accessory items code**

Accessory items have an individual type code (Fig. 1-2) and are to be added to the main unit code.

Fig. 1-1 Unit Code

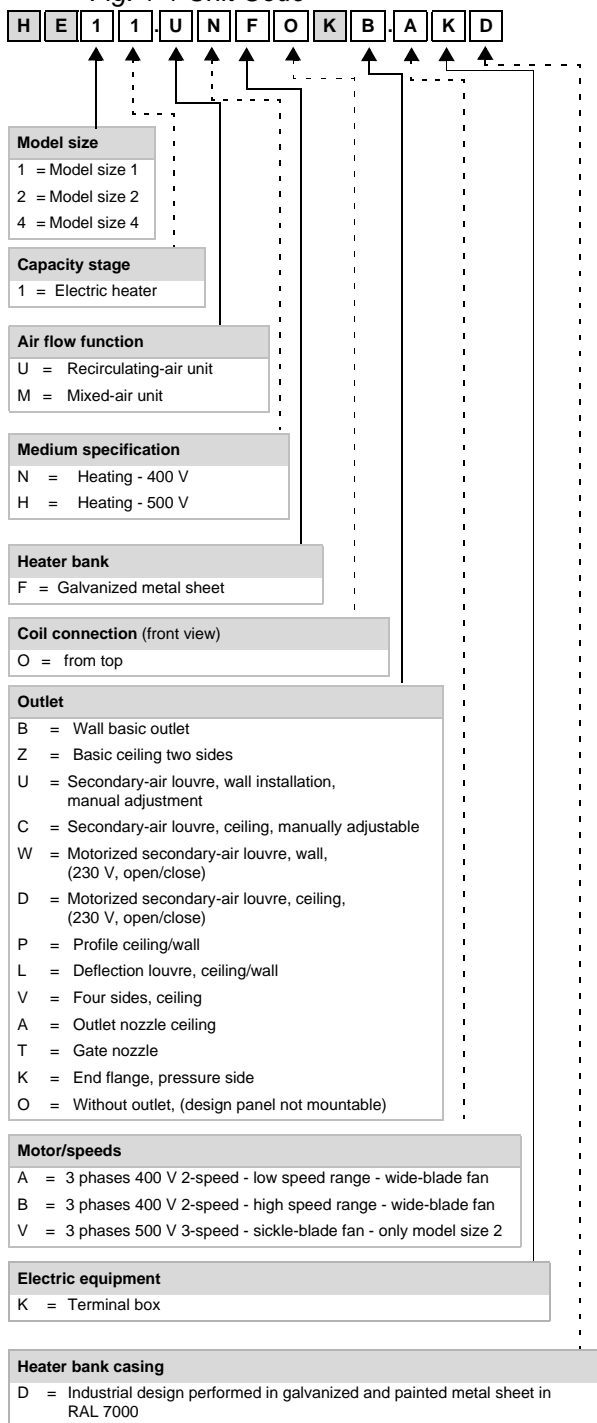


Fig. 1-2 Accessories Code

Z H 1 2 0 0 0

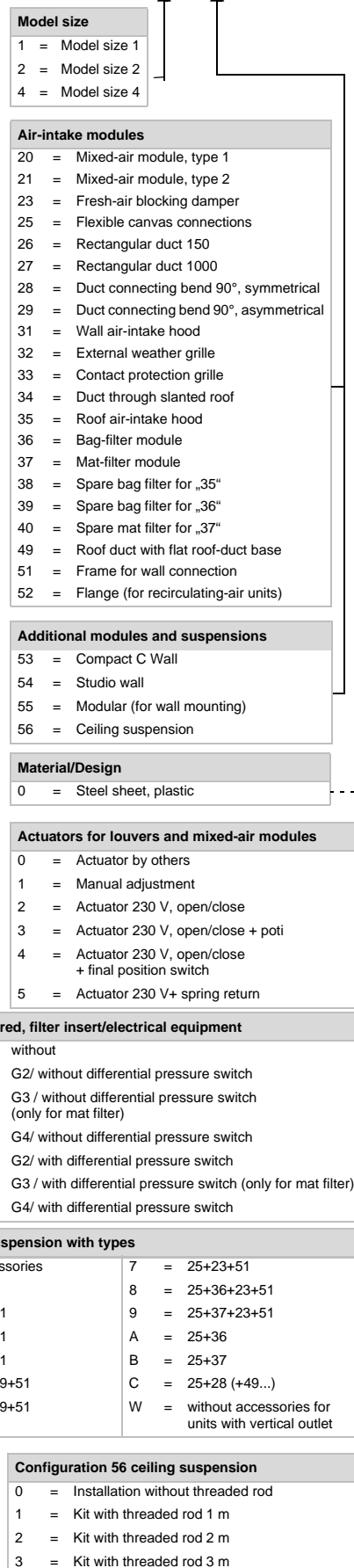
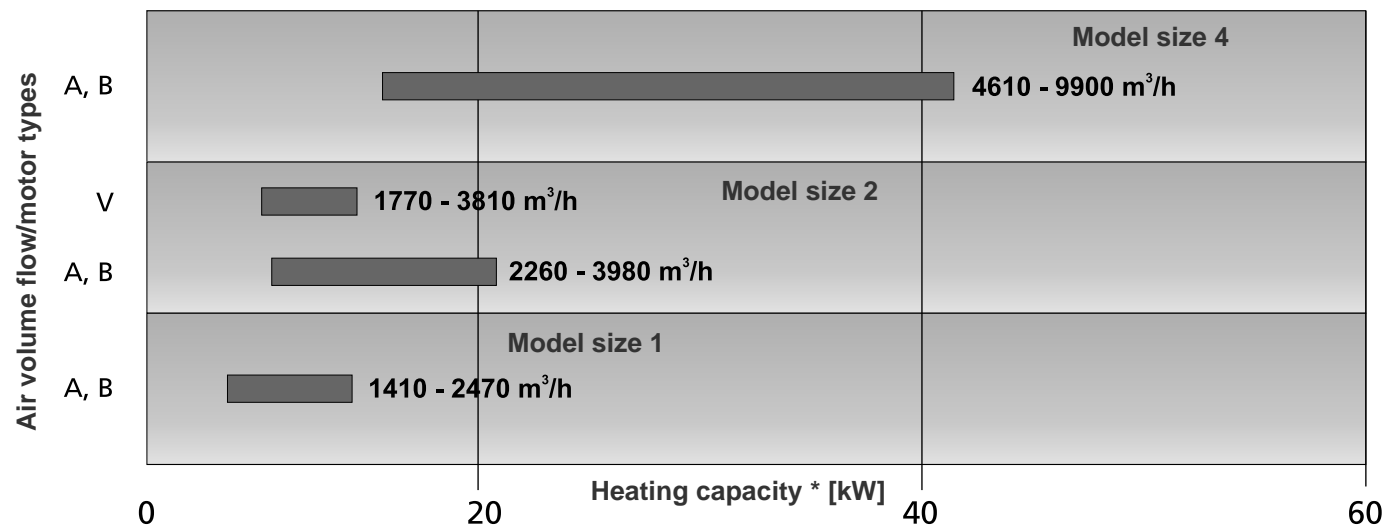


Fig. 1: Unit Type Code



\* Air 20 °C  
Air volume flow calculated for basic outlet

Fig. 2: Diagram with capacity overview

**PART 1:      *Unit Description***

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The MultiMAXX HE unit heaters are designed for heating, ventilating and filtering of indoor and outdoor air in commercial buildings. Filters, mixed air and air intake modules, suspension sets, control units and control devices can be supplied as optional accessories. Proper use also stipulates the observance of the current operation manual as well as adherence to all inspection and maintenance intervals specified by FläktGroup.

Unit heaters of MultiMAXX HE series are designed for operation at ambient temperatures up to +40 °C and normal ranges in accordance with EN 60 721-3-3 regulation. Unit protection class is IP 42 in conformity with EN 60 529.

### Improper use

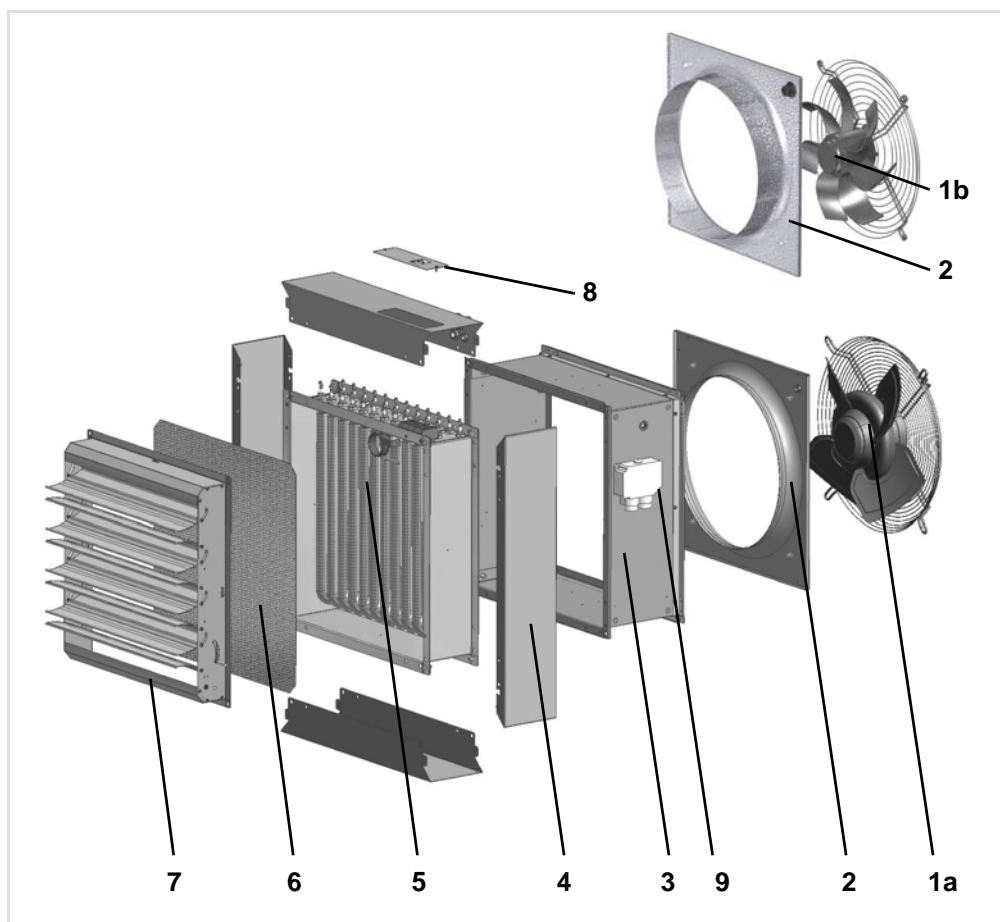
Any use other than that described above is considered improper. The manufacturer/supplier is not liable for any damages arising from improper use. The user alone bears the risk.



### NOTE!

Should you require further information, please contact our knowledgeable staff, who can assist you with designing units for all application types using our layout software.

Fig. 3: Sample unit design  
description of  
unit components



1a: Wide-blade fan - size 1, 2, 4 (3 x 400V, 50 Hz)

1b: Sickle-blade fan- size 2 (3 x 500V, 50 Hz)

2: Intake nozzle

3: Fan section

4: Heater bank casing

5: Electric heater bank

6: Contact protection grille

7: Secondary-air louver

8: Electric connection cover of heater battery

9: Terminal box for electric connection of fan motor

## Basic unit – operating conditions

### Fans

#### Sickle-blade fan

Low-noise axial fan with an external rotor motor for **increased** pressure and sound requirements with an integrated contact protection grille according to ISO 13 857. Maintenance-free sickle blade, balanced by factory and wired to terminal box with a humidity-proof motor. Pressure-stable model, even in mixed-air applications with a filter stage or for larger air throws/suspension heights. IP 54 protection class (as of EN 60 529), thermal class F (as of EN 60 034-1 ed. 2), thermal contact, designed for 500 V 3-speed operation.

Air-intake nozzle developed as full nozzle for minimum noise emission.

##### Range of application:

Air inlet temperature: -20 to +40 °C

**H E # # . # # # # # # . V # #** V = 3 phases 500 V 3-speed



Fig. 4: Sickle-blade fan with air-intake full nozzle

#### Wide-wing fan

Standard axial fan with an external rotor motor for **normal** pressure and sound requirements as well as fan protection curb with an integrated contact protection grille according to ISO 13 857. Aluminium wide blades, balanced by the factory, maintenance-free with moisture-proof motor and wired to the terminal box.

Protection class IP 54 (as of EN 60 529), thermal class F (as of EN 60 034-1 ed. 2) in two variants rated for 400 V. Air inlet nozzle is performed as short nozzle.

##### Range of application:

Air inlet temperature: -20 to +40 °C

**H E # # . # # # # # # . A # #** A = 3 phases 400 V 2-speed in low speed range  
**H E # # . # # # # # # . B # #** B = 3 phases 400 V 2-speed in high speed range



Fig. 5: Wide-blade fan with air-intake nozzle

#### Electric heater bank

The heater bank is performed as stainless heating rods mounted in three individual sections. These sections are wired to a terminal strip. Power supply (400 V, 50 Hz or 500 V, 50 Hz) is applied at this point.

The functions of overheat protection is performed by an automatic and manual fuse. The heater bank is mounted in a compact casing made of galvanized metal sheet.

**H E # # . # # F # # # . # # #** F = hot-dip galvanized metal sheet



Fig. 6: 400/500 V heater bank

#### Heater bank casing

Heater bank casing in industrial design is performed in galvanized and painted metal sheet in RAL 7000 and is mounted by the factory.

**H E # # . # # # # # # . # # D** D = Industrial configuration RAL 7000

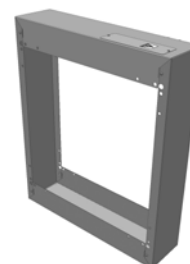


Fig. 7: Heater bank casing



Fig. 8: SAL Wall

## Outlets (wall)

### Secondary-air louvre

As anodized aluminium air deflection fins can be adjusted separately, the secondary-air louvre (SAL), which has been developed and patented by DencoHappel, allows to adjust the air discharge opening and therefore speed of the conditioned air to match individual requirements. Additional secondary air is therefore drawn in from the side and mixed with the primary air, making it possible to lower the air discharge temperature to a few degrees above the room temperature. The desired temperature is achieved faster contributing in such a way to an economic operation. Discharge air speed of 14 m/s allows to achieve maximum air throws! The secondary-air louvre is available in the following variants:

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| H | E | # | # | . | # | # | # | # | # | U | . | # | # | # | U = manually adjustable                                  |
| H | E | # | # | . | # | # | # | # | # | W | . | # | # | # | W = motorized by actuator<br>(actuator 230 V open/close) |

### Profile outlet

The profile outlet consisting of aluminium air deflection fins is a good compromise. It is used to increase the air throw at constant air discharge velocity.

Medium air throws can be achieved without any problems.

The profile outlet is manually adjustable and self-locking.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                    |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------------|
| H | E | # | # | . | # | # | # | # | # | P | . | # | # | # | P = profile outlet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------------|



Fig. 9: Profile outlet

### Basic wall outlet

Galvanized metal sheet fins of a basic wall outlet enable to deflect conditioned air at the needed discharge angle.

Individual fins of the basic outlet are manually adjustable and self-locking.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|------------------|
| H | E | # | # | . | # | # | # | # | # | B | . | # | # | # | B = basic outlet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|------------------|



Fig. 10: Basic wall outlet

### End flange

The flange is designed to connect the air duct directly to the exhaled side of the unit, allowing the unit to be placed behind a wall or other space.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|------------------|
| H | E | # | # | . | # | # | # | # | # | K | . | # | # | # | B = Basisauslass |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|------------------|



Fig. 11: End flange

## Outlets (ceiling)

### Secondary-air louvre

As anodized aluminium air deflection fins can be adjusted separately, the secondary-air louvre (SAL), which has been developed and patented by DencoHappel, allows to adjust the air discharge opening and therefore speed of the conditioned air to match individual requirements. Additional secondary air is therefore drawn in from the side and mixed with the primary air, making it possible to lower the air discharge temperature to a few degrees above the room temperature. The desired temperature is achieved faster contributing in such a way to an economic operation. Discharge air speed of 14 m/s allows to achieve maximum air throws!

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| H | E | # | # | . | # | # | # | # | # | C | . | # | # | # | C = manually adjustable                                  |
| H | E | # | # | . | # | # | # | # | # | D | . | # | # | # | D = motorized by actuator<br>(actuator 230 V open/close) |



Fig. 12: Secondary-air louvre



**Profile outlet**

The profile outlet consisting of aluminium anodized air deflection fins is a good compromise. It is used to increase the air throw at constant air discharge velocity.

In such a way the unit can be easily installed at average mounting heights.

The profile outlet is manually adjustable and self-locking.

**H E # # . # # # # # P . # # #** P = profile outlet



Fig. 13: Profile outlet

**Air deflection louvre**

Customized outlet for low installation heights. Independently-adjustable short metal sheet fins angled at 90° allow to deflect air volume flow to match individual requirements.

**H E # # . # # # # # L . # # #** L = air deflection louvre



Fig. 14: Air deflection louvre

**Basic ceiling outlet**

Outlet for low installation heights. Galvanized metal sheet fins enable to deflect conditioned air at two needed discharge angles. The adjustment mechanism is divided in the middle.

**H E # # . # # # # # Z . # # #** Z = basic ceiling outlet



Fig. 15: Basic ceiling outlet

**Four-side discharge**

Air distributing outlet for low mounting heights made of galvanized metal sheet fins. Independent adjustability in four directions enables to individually direct air volume flow. A direct flow of air to the vertical area underneath is avoided.

**H E # # . # # # # # V . # # #** V = four-side outlet



Fig. 16: Four-side discharge

**Outlet nozzle**

Made of galvanized metal sheet square cone-shaped nozzle.

Therefore air velocity increases which enables larger installation heights.

**H E # # . # # # # # A . # # #** A = outlet nozzle



Fig. 17: Outlet nozzle

**Gate nozzle**

Made of galvanized metal sheet, one-sided cone-shaped nozzle.

Therefore air velocity is increased which enables targeted deflection of air volume flow for shielding lager gates in combination with multiple units.

**H E # # . # # # # # T . # # #** T = gate nozzle



Fig. 18: Gate nozzle

## Sample for ceiling mounting - mixed-air units, secondary-air louvre

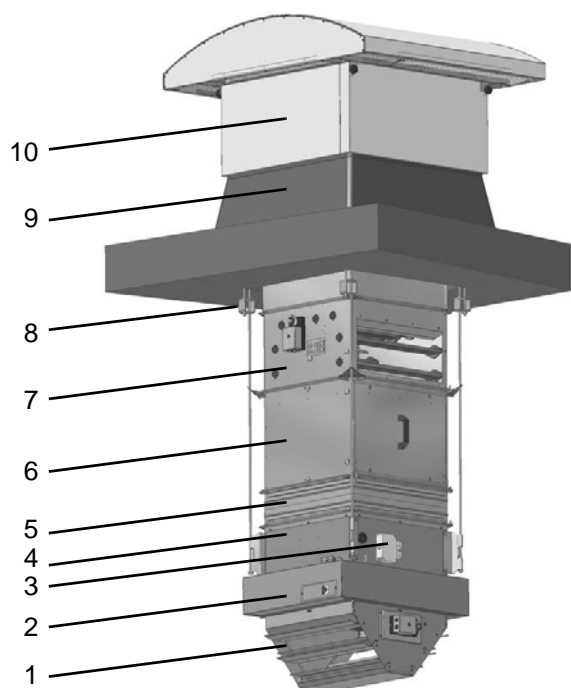


Fig. 18: Sample of ceiling mounting

|    | Unit/accessory item  | Unit/accessory type code   |
|----|--|----------------------------|
| 1  | Secondary-air louvre                                       | HE#1.MNFOKD.BKD            |
| 2  | Electric heater  |                            |
| 3  | Terminal box   |                            |
| 4  | Fan module   |                            |
| 5  | Rectangular duct 150<br>or<br>flexible canvas connection   | ZH#.2600<br>or<br>ZH#.2500 |
| 6  | Bag filter module G4<br>with differential pressure switch  | ZH#.3607                   |
| 7  | Mixed-air module type 1<br>with actuator 230 V, open/close | ZH#.2002                   |
| 8  | Ceiling suspension   | ZH#.5602                   |
| 9  | Roof opening duct with base                                | ZH#.4900                   |
| 10 | Air intake hood  | ZH#.3500                   |

# = size 1, 2, 4 can be selected

## Sample for wall mounting - mixed-air units, secondary-air louvre

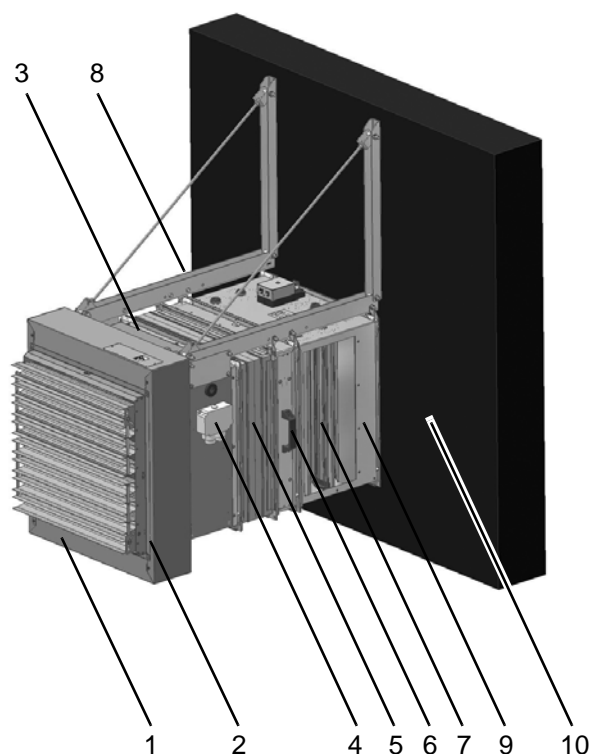


Fig. 19: Example for wall mounting

|    | Unit/accessory item  | Unit/accessory type code   |
|----|--|----------------------------|
| 1  | Secondary-air louvre   | HE#1.MNFOKP.BKD            |
| 2  | Electric heater  |                            |
| 3  | Fan module   |                            |
| 4  | Terminal box   |                            |
| 5  | Flexible intake connector  | ZH#.2500                   |
| 6  | Bag filter module G3<br>with differential pressure switch                      | ZH#.3606                   |
| 7  | Mixed-air module type 1 with actuator<br>230 V, open/close                     | ZH#.2002                   |
| 8  | Modular suspension for selected acces-<br>sories 25 + 37 + 20 + 51             | ZH#.5503                   |
| 9  | Wall connection frame<br>(not illustrated)                                     | ZH#.5100                   |
| 10 | External weather grille<br>or<br>vertical air-intake hood<br>(not illustrated) | ZH#.3200<br>or<br>ZH#.3100 |

# = size 1, 2, 4 can be selected

## Using performance data diagrams „Air-side pressure drops”

In order to explain how to use the following diagrams, individual steps with calculations and final results are presented in the following example.

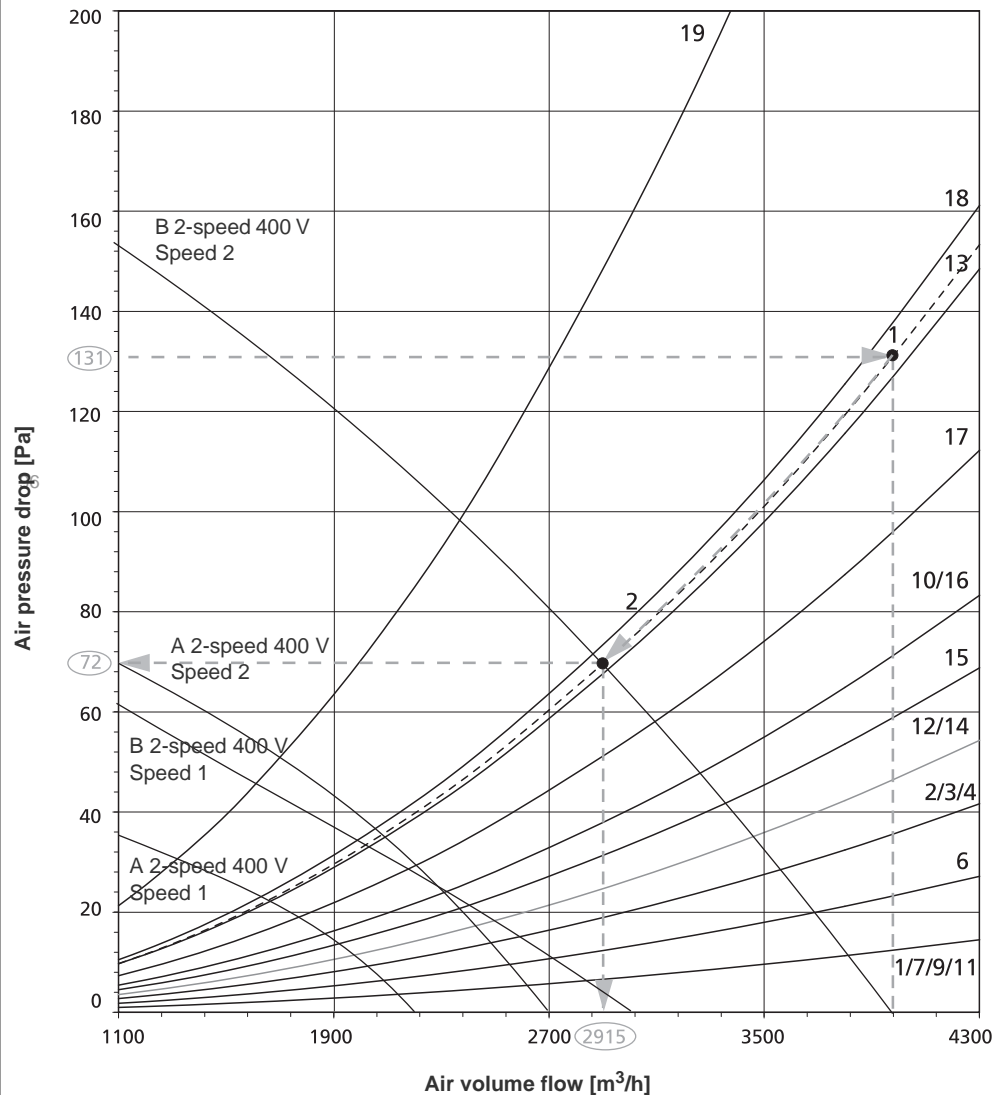
### EXAMPLE

|   | Input data   | → Result        |
|---|--|-----------------|
| <p><b>Input</b></p> <p>This example is based on a size 2 unit with a heating ceiling SAL and a bag filter module (class G4).</p>  | <p>Air flow rate <math>V_{L1}</math> → <math>V_{L1} = 3,980 \text{ m}^3/\text{h}</math></p> <p>Model size 2 / capacity stage 1, wide blade</p> <p>SAL ceiling (heating) (marked 4 in diagram legend)</p> <p>Bag filter module (G4) (marked 17 in diagram legend)</p> |                 |
| <p><b>1. Step</b></p> <p>Using the specified air volume flow <math>V_{L1}</math> in the performance data tables on page 15, refer to the relevant diagram – in this case “Model size 2 „A” and „B” wide blade” (from page 13). (Consider model size and fan type!)</p> <p>From the air volume flow <math>V_{L1}</math> on the x-axis extend a vertical line upwards to the intersection point with the characteristic curve for the air- and suction-side accessories. Then extend a horizontal line across to the y-axis and read off the relevant pressure drop values <math>p_1</math> and <math>p_2</math>.</p> | <p>Pressure drop SAL ceiling (<math>p_1</math>) → 35 Pa</p> <p>Pressure drop in bag-filter module (<math>p_2</math>) → 96 Pa</p>   |                 |
| <p><b>2. Step</b></p> <p>Sum up individual pressure drops.</p>  | <p><math>p_1 + p_2 = p_G</math>      35 Pa + 96 Pa = 131 Pa</p>  | <p>→ 131 Pa</p> |

## 3. Step

Re-enter the total sum  $p_G$  on the y-axis.

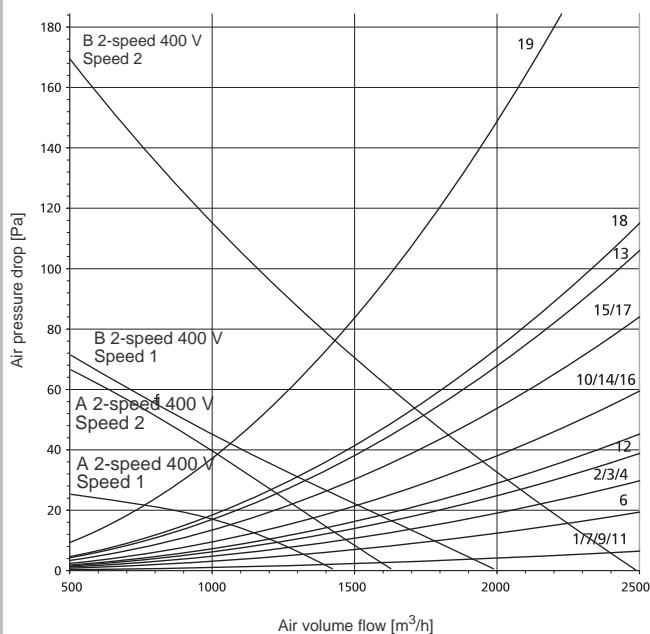
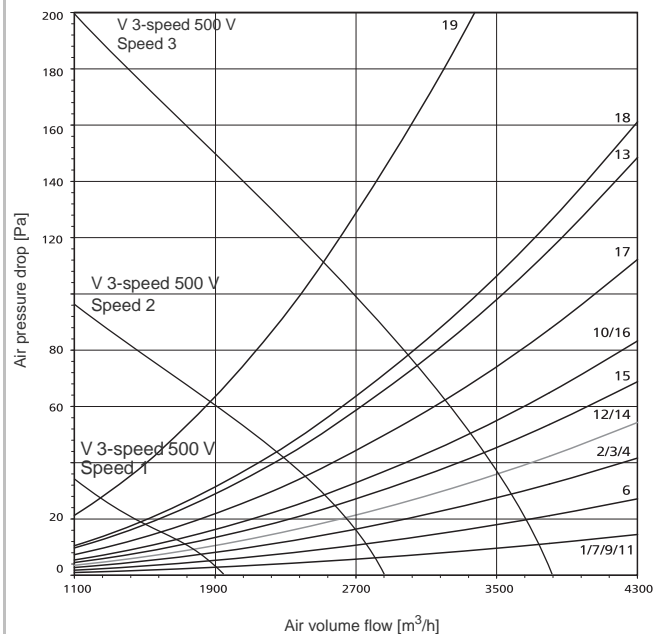
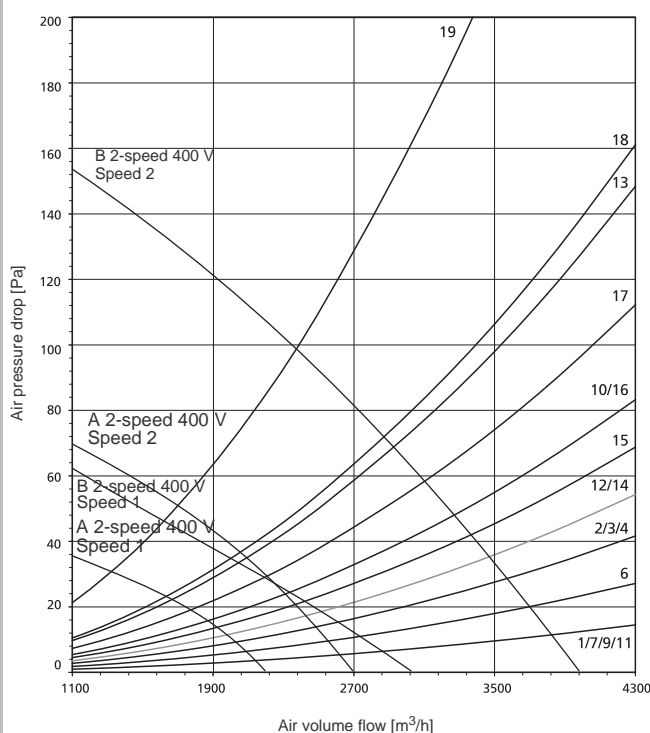
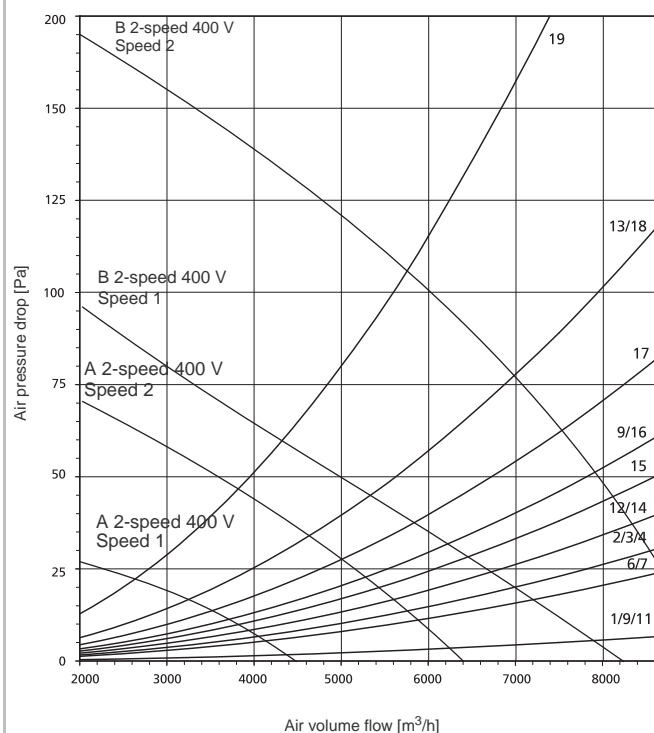
The intersection point with the air volume flow  $V_{L1}$  returns a point<sub>1</sub> on the total characteristic curve that can now be continued according to individual characteristic curves. At intersection point<sub>2</sub> on the fan - heater bank characteristic curve, actual maximum air volume flow  $V_{LK}$  and the total pressure drop  $p_{GK}$  can be read off.



## Diagram legend

- 1 Basic
- 2 Profile
- 3 SAL
- 4 SAL ceiling
- 6 Outlet nozzle
- 7 Four sides
- 9 Mixed-air module type 1, direct

- 10 Mixed-air module type 2, lateral
- 11 Fresh air blocking damper
- 12 Air intake hood - wall
- 13 External weather grille
- 14 Roof intake hood G2
- 15 Roof intake hood G4
- 16 Bag filter module G2
- 17 Bag filter module G4
- 18 Mat filter module G2
- 19 Mat filter module G4

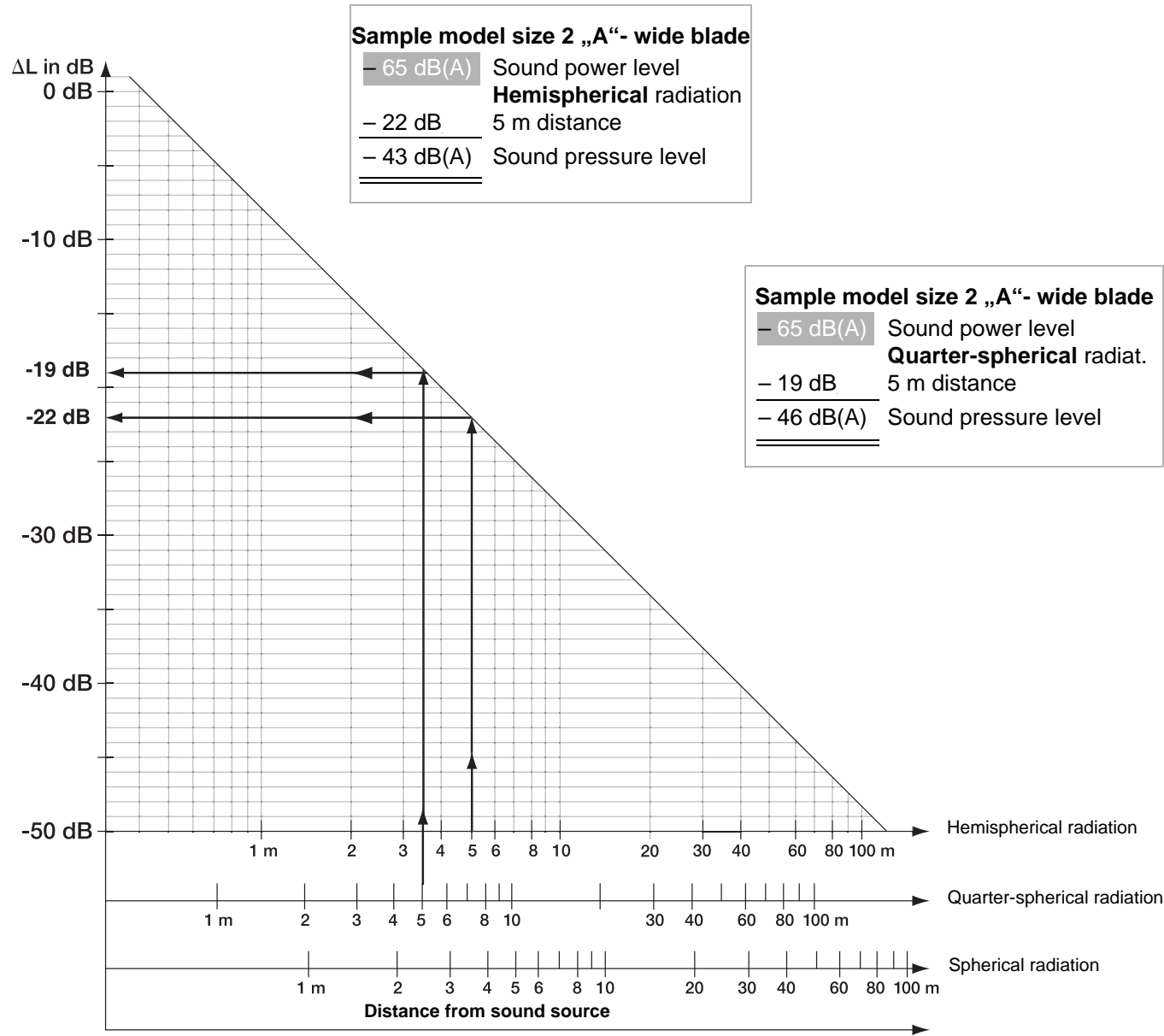
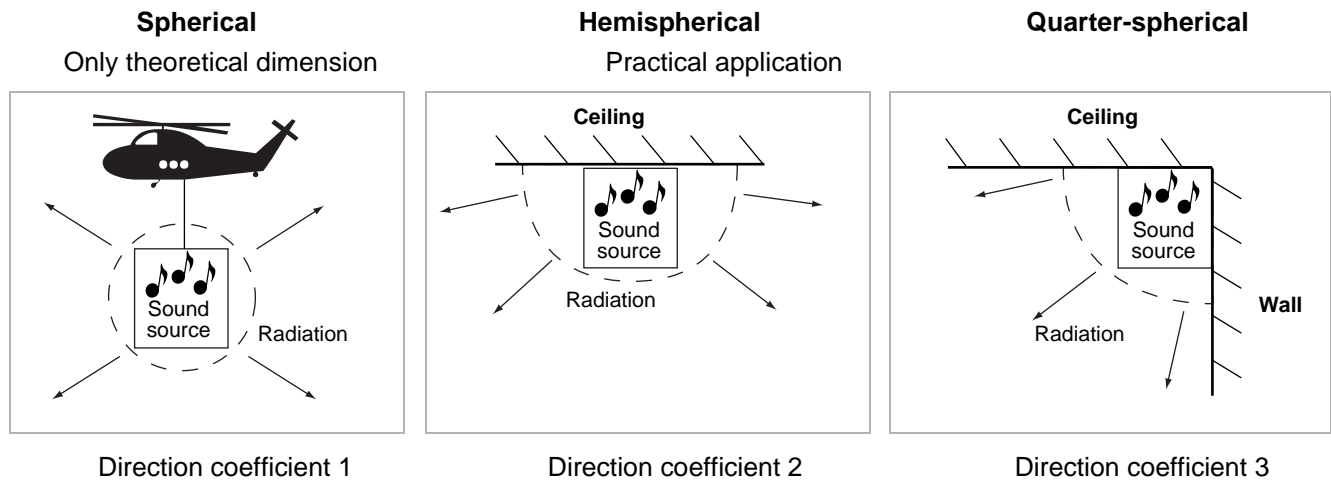
**Fig. 20: Model size 1 „A“ and „B“ wide blade****Fig. 21: Model size 2 „V“ sickle blade****Fig. 22: Model size 2 „A“ and „B“ wide blade****Fig. 23: Model size 4 „A“ and „B“ wide blade****Diagram legend**

- 1 Basic
- 2 Profile
- 3 SAL
- 4 SAL ceiling
- 6 Outlet nozzle
- 7 Four sides
- 9 Mixed-air module type 1, direct

- 10 Mixed-air module type 2, lateral
- 11 Fresh air blocking damper
- 12 Wall air-intake hood
- 13 External weather grille
- 14 Roof air-intake hood G2
- 15 Roof air-intake hood G4
- 16 Bag-filter module G2
- 17 Bag-filter module G4
- 18 Mat-filter module G2
- 19 Mat-filter module G4

Conversion of sound power in sound pressure

Radiation of sound source without reflections



Sound power level: measurable, but not perceptible. Like the heat output of a radiator.  
Sound pressure level: measurable, but not perceptible. Like the increase in room temperature by a radiator.

| Model size  | Speed | Sound power level (dB)       |     |     |     |      |      |      |      | A-rated sum level |                 | Max. power consumption | Max. current consumption |
|---|-------|------------------------------|-----|-----|-----|------|------|------|------|-------------------|-----------------|------------------------|--------------------------|
|   |       | Octave centre frequency [Hz] |     |     |     |      |      |      |      | Sound power       | Sound pressure* |                        |                          |
|   | RPM   | 63                           | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dB(A)             | dB(A)           | kW                     | A                        |
| <b>A - 3 phases 400 V 2-speed in low speed range</b>  |       |                              |     |     |     |      |      |      |      |                   |                 |                        |                          |
| 1   | 860   | 73                           | 64  | 57  | 57  | 57   | 53   | 48   | 38   | 61                | 46              | 0.05                   | 0.16                     |
|   | 670   | 63                           | 54  | 53  | 53  | 51   | 46   | 38   | 28   | 55                | 40              | 0.03                   | 0.08                     |
| 2   | 910   | 69                           | 66  | 63  | 63  | 60   | 57   | 53   | 44   | 65                | 50              | 0.12                   | 0.45                     |
|   | 710   | 63                           | 60  | 58  | 58  | 57   | 53   | 47   | 38   | 61                | 46              | 0.07                   | 0.26                     |
| 4   | 650   | 71                           | 73  | 65  | 65  | 64   | 60   | 53   | 46   | 68                | 53              | 0.24                   | 0.49                     |
|   | 500   | 65                           | 63  | 56  | 56  | 56   | 49   | 41   | 32   | 59                | 44              | 0.15                   | 0.28                     |
| <b>B - 3 phases 400 V 2-speed in high speed range</b> |       |                              |     |     |     |      |      |      |      |                   |                 |                        |                          |
| 1   | 1320  | 60                           | 70  | 67  | 65  | 65   | 65   | 61   | 53   | 71                | 56              | 0.14                   | 0.49                     |
|   | 1050  | 54                           | 65  | 65  | 60  | 62   | 61   | 57   | 47   | 67                | 52              | 0.09                   | 0.28                     |
| 2   | 1270  | 73                           | 80  | 79  | 67  | 70   | 69   | 65   | 58   | 76                | 61              | 0.29                   | 0.61                     |
|   | 890   | 70                           | 73  | 63  | 64  | 64   | 62   | 58   | 49   | 69                | 54              | 0.19                   | 0.35                     |
| 4   | 910   | 80                           | 81  | 85  | 77  | 73   | 72   | 69   | 62   | 81                | 66              | 0.51                   | 0.86                     |
|   | 740   | 69                           | 69  | 80  | 72  | 69   | 68   | 64   | 56   | 76                | 61              | 0.37                   | 0.61                     |
| <b>V - 3 phases 500 V 3-speed</b>                     |       |                              |     |     |     |      |      |      |      |                   |                 |                        |                          |
| 2   | 1370  | 60                           | 70  | 72  | 70  | 69   | 69   | 63   | 57   | 75                | 60              | 0.34                   | 0.70                     |
|   | 1070  | 57                           | 64  | 65  | 63  | 62   | 61   | 56   | 51   | 67                | 52              | 0.26                   | 0.40                     |
|   | 700   | 52                           | 57  | 57  | 55  | 53   | 50   | 47   | 44   | 58                | 43              | 0.07                   | 0.34                     |

\* **Sound pressure:** standard values at 5 m distance to the unit side, at maximum air flow rate and low-reflection room.  
 Industrial hall volume 1,500 m<sup>3</sup>/h, absorption surface 200 m<sup>2</sup> Sabin, hemispherical radiation = direction coefficient 2.  
 These values can be significantly influenced by the indoor characteristics in a positive or negative way.

## Performance data

| MultiMAXX HE    | Air flow rate $V_L$<br>[m <sup>3</sup> /h] | Heating capacity $Q_T$<br>[kW] |     |      |      | Air heating<br>at max. heating<br>$\Delta T$ | Weight without<br>outlet<br>[kg] | Voltage<br>heater bank<br>U [V] | Rated current<br>heater bank<br>I [A] |
|-----------------|--|--------------------------------|-----|------|------|--|----------------------------------|---------------------------------|---------------------------------------|
|                 |  | Max.                           | 1   | 2    | 3    |  |                                  |                                 |                                       |
| HE11.##F###.AKD | 1410                                       | 12                             | 4   | 8    | 12   | 26   | 28                               | 3 x 400                         | 17.3                                  |
|                 | 1620                                       | 12                             | 4   | 8    | 12   | 23   |                                  |                                 |                                       |
| HE11.##F###.BKD | 1990                                       | 12                             | 4   | 8    | 12   | 18   |                                  |                                 |                                       |
|                 | 2470                                       | 12                             | 4   | 8    | 12   | 15   |                                  |                                 |                                       |
| HE21.##F###.AKD | 2260                                       | 21                             | 7   | 14   | 21   | 27   | 34                               | 3 x 400                         | 30.3                                  |
|                 | 2710                                       | 21                             | 7   | 14   | 21   | 23   |                                  |                                 |                                       |
| HE21.##F###.BKD | 3010                                       | 21                             | 7   | 14   | 21   | 21   |                                  |                                 |                                       |
|                 | 3980                                       | 21                             | 7   | 14   | 21   | 16   |                                  |                                 |                                       |
| HE41.##F###.AKD | 4610                                       | 42                             | 14  | 28   | 42   | 27   | 69                               | 3 x 400                         | 60.6                                  |
|                 | 6480                                       | 42                             | 14  | 28   | 42   | 19   |                                  |                                 |                                       |
| HE41.##F###.BKD | 8340                                       | 42                             | 14  | 28   | 42   | 15   |                                  |                                 |                                       |
|                 | 9900                                       | 42                             | 14  | 28   | 42   | 13   |                                  |                                 |                                       |
| HE21.##F###.VKD | 1970                                       | 12.2                           | 6.1 | 9.15 | 12.2 | 18   | 36                               | 3 x 500                         | 24.2                                  |
|                 | 2870                                       | 12.2                           | 6.1 | 9.15 | 12.2 | 13   |                                  |                                 |                                       |
|                 | 3810                                       | 12.2                           | 6.1 | 9.15 | 12.2 | 10   |                                  |                                 |                                       |

## Air throw and installation height for basic outlet and SAL

| MultiMAXX       | Air throw Basic B<br>[m] | Air throw SAL U, W<br>[m] | Max. height SAL C, D<br>[m] |
|-----------------|--------------------------|---------------------------|-----------------------------|
| HE11.##F###.AKD | 4.50                     | 5.00                      | 5.40                        |
|                 | 5.10                     | 5.90                      | 7.00                        |
| HE11.##F###.BKD | 6.00                     | 6.90                      | 8.80                        |
|                 | 7.20                     | 8.40                      | 11.70                       |
| HE21.##F###.AKD | 5.20                     | 6.20                      | 7.20                        |
|                 | 6.10                     | 7.30                      | 9.20                        |
| HE21.##F###.BKD | 6.60                     | 7.80                      | 9.90                        |
|                 | 8.40                     | 9.90                      | 14.30                       |
| HE41.##F###.AKD | 5.50                     | 6.50                      | 7.00                        |
|                 | 7.30                     | 8.60                      | 10.60                       |
| HE41.##F###.BKD | 9.10                     | 10.30                     | 14.10                       |
|                 | 10.50                    | 12.00                     | 17.70                       |
| HE21.##F###.VKD | 4.60                     | 5.70                      | 6.30                        |
|                 | 6.40                     | 7.80                      | 10.10                       |
|                 | 8.10                     | 10.00                     | 14.30                       |



## Medium function - heating (W)

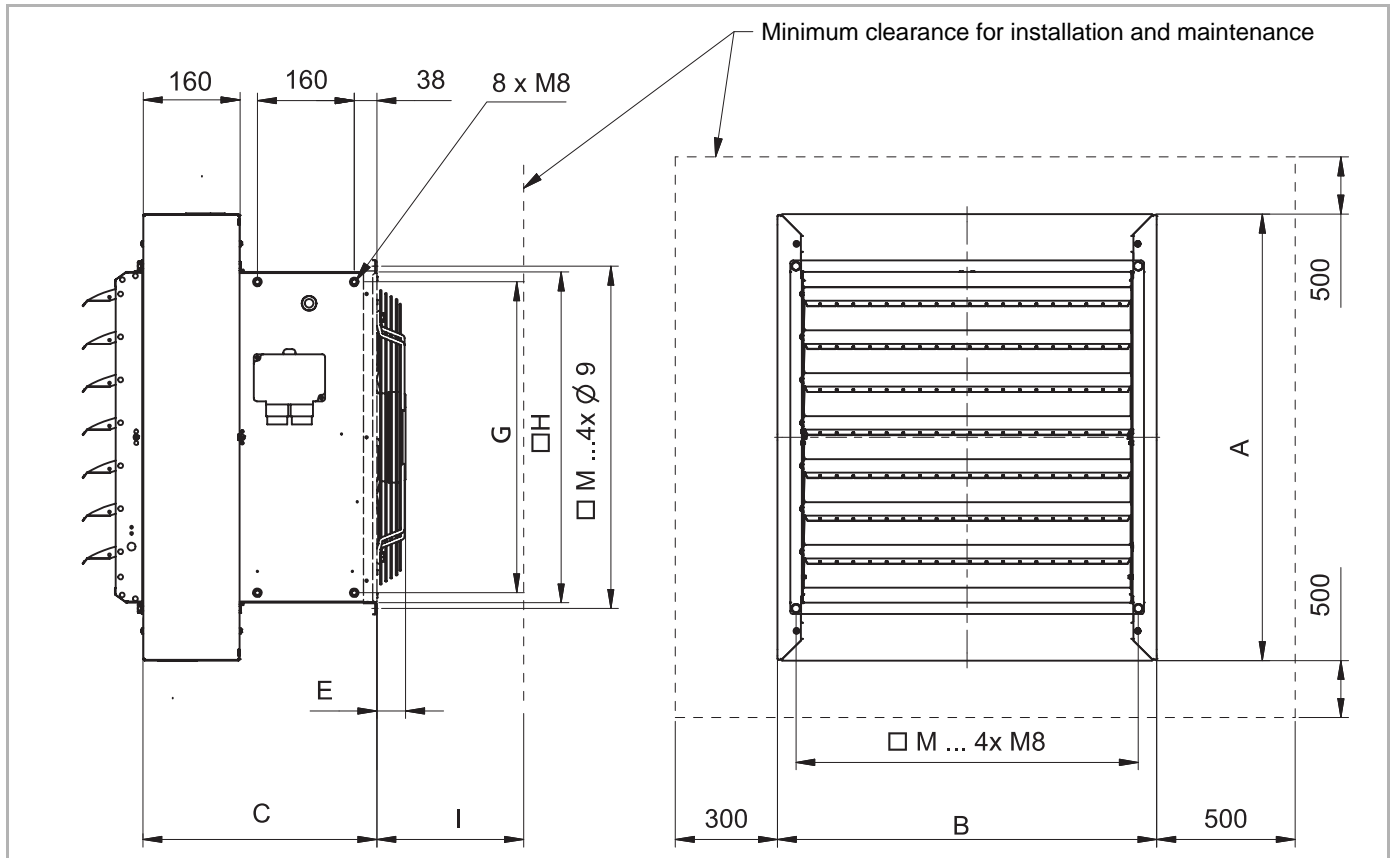


Fig. 26: Dimensions of electric unit heater

| Dimensions/unit size | 1   | 2   | 4    |
|----------------------|-----|-----|------|
| A                    | 642 | 738 | 1026 |
| B                    | 520 | 616 | 904  |
| C                    | 387 | 387 | 452  |
| E (wide-blade fan)   | 60  | 81  | 112  |
| E (sickle-blade fan) | –   | 50  | –    |
| G                    | 418 | 514 | 802  |
| H                    | 451 | 547 | 835  |
| I                    | 300 | 300 | 400  |
| M                    | 470 | 566 | 854  |

## Suspension and mounting

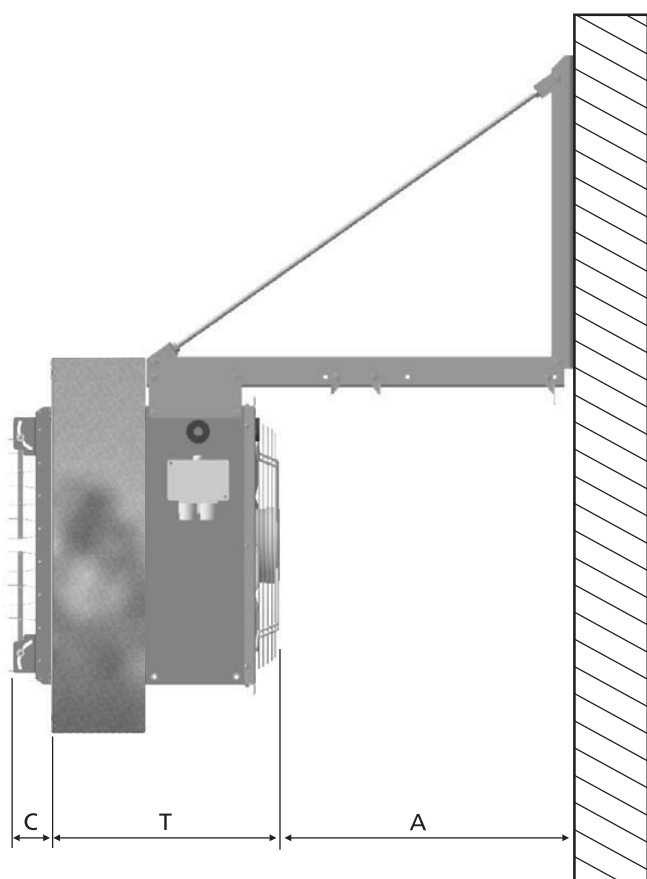


Fig. 27: Sample suspension ZH#.5500

Before moving on to section „Unit data“ for data on weight and relevant individual unit dimensions, first pay attention to the example of a **wall-mounted** variant.

Refer to the following table for different model sizes for **unit depth T** (dimensions are different for sickle-blade and wide-blade fan types).

**Depth of outlet C** must be added to the unit depth T (the table specifies dimensions for basic wall outlet and secondary-air louver - for dimensions of other outlets - refer to page 19).

If a modular suspension is used, it is required to maintain a minimum clearance to **Wall A**. Keep this clearance to ensure supply of required air flow and thus the designed unit capacity.

This clearance is also sufficient for maintenance and servicing which is required to ensure trouble-free operation over the entire unit life cycle.

Fan module **weight** varies depending on the fan type.

| Wall clearance A [mm]  |              |     | HE1 | HE2 | HE4 |
|------------------------|--------------|-----|-----|-----|-----|
|                        |              |     | 300 | 300 | 400 |
| Unit depth T [mm]      |              |     | HE1 | HE2 | HE4 |
| Sickle blade           |              |     | –   | 437 | –   |
| Wide blade             |              |     | 447 | 468 | 564 |
| Depth of outlet C [mm] |              |     | HE1 | HE2 | HE4 |
| Wall basic outlet      | Ceiling/wall | B+Z | 105 | 105 | 105 |
| Secondary-air louver   | Ceiling      | C+D | 291 | 291 | 376 |
| Four sides, ceiling    | Ceiling      | V   | 190 | 260 | 260 |
| Outlet nozzle          | Ceiling      | A   | 154 | 178 | 253 |
| Gate nozzle            | Ceiling/wall | T   | 286 | 302 | 525 |
| Air-deflection louver  | Ceiling/wall | L   | 70  | 70  | 70  |
| Profile                | Ceiling/wall | P   | 100 | 100 | 100 |
| Secondary-air louver   | Wall         | U+W | 150 | 150 | 150 |
| Flange                 | Ceiling/wall | K   | 60  | 60  | 60  |

## Outlets (wall)

### Secondary-air louvre



for adjusting discharge velocity and air throw in the following variants.

**HE##.#.#.#.#U.###** – Manual adjustment  
**HE##.#.#.#.#W.###** – Motorized and adjustable (actuator 230 V up/down)

| Model size  | 1   | 2   | 4    |
|-------------|-----|-----|------|
| A (mm)      | 470 | 566 | 854  |
| B (mm)      | 489 | 585 | 873  |
| Weight (kg) | 6.7 | 8.9 | 17.7 |

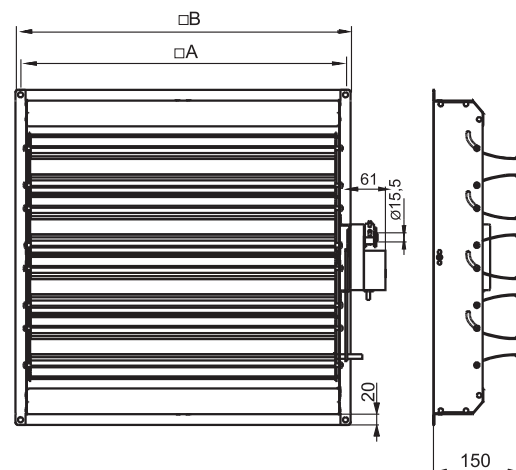


Fig. 28: Secondary-air louvre wall

### Profile outlet



made of aluminium air-deflection profiles for increasing air-discharge speed and air throw

**HE##.#.#.#.#P.###** – manually adjustable, self-locking

| Model size  | 1   | 2   | 4    |
|-------------|-----|-----|------|
| A (mm)      | 470 | 566 | 854  |
| B (mm)      | 489 | 585 | 873  |
| Weight (kg) | 5.6 | 7.8 | 16.4 |

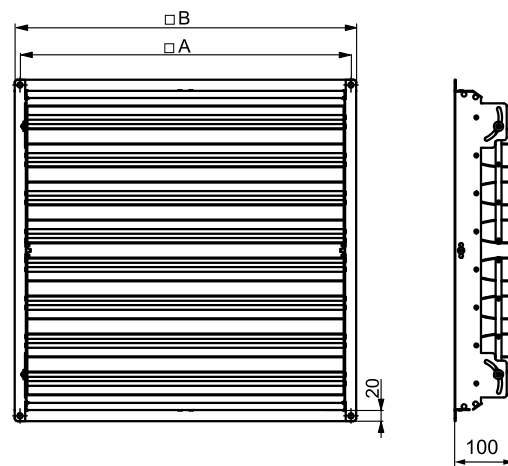


Fig. 29: Profile outlet

### Basic wall outlet



Louvers are curved outwards; adjustable, self-locking for changing air flow direction

**HE##.#.#.#.#B.###** – manually adjustable, self-locking

| Model size  | 1   | 2   | 4   |
|-------------|-----|-----|-----|
| A (mm)      | 470 | 566 | 854 |
| B (mm)      | 489 | 585 | 873 |
| Weight (kg) | 2.5 | 3.6 | 8   |

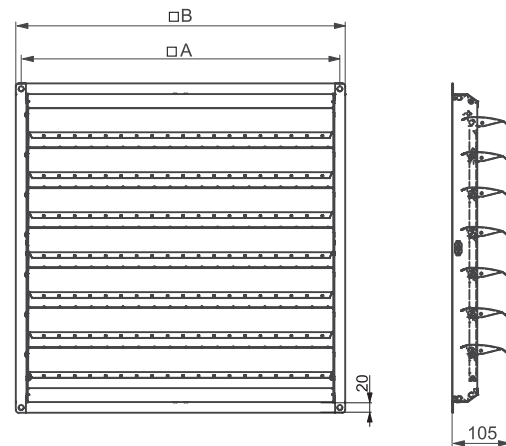


Fig. 30: Basic wall outlet

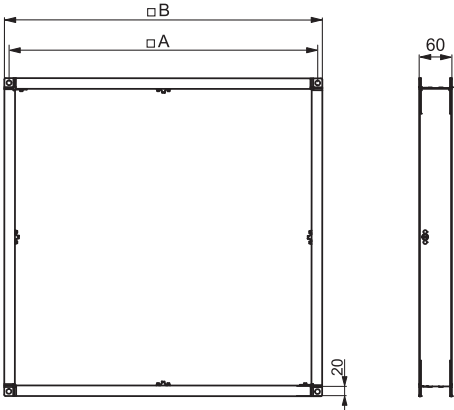
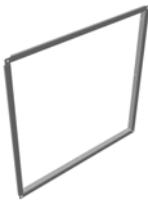


Fig. 31: End flange

End flange

The flange is designed to connect the air duct directly to the exhaled side of the unit, allowing the unit to be placed behind a wall or other space.



HE##.####K.### – air duct connection

| Model size  | 1   | 2   | 4   |
|-------------|-----|-----|-----|
| A (mm)      | 470 | 566 | 854 |
| B (mm)      | 491 | 587 | 875 |
| Weight (kg) | 2.6 | 3.1 | 4.8 |

Outlets (ceiling)

Secondary-air louver

For adjusting discharge speed and air throw in the following variants:



HE##.####C.### – Manual adjustment

HE##.####D.### – Motorized and adjustable (actuator 230 V up/down)

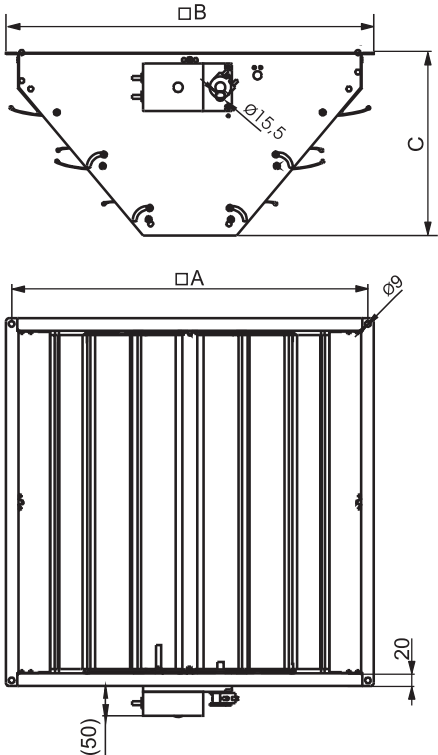


Fig. 32: Secondary-air louver ceiling

Shaft diameter = 15.5 mm

| Model size                   | 1   | 2   | 4    |
|------------------------------|-----|-----|------|
| A (mm)                       | 470 | 566 | 854  |
| B (mm)                       | 489 | 585 | 873  |
| C (mm)                       | 291 | 291 | 376  |
| Weight (kg) without actuator | 4.4 | 5.9 | 11.5 |

Profile outlet

for increasing discharge velocity and air throw



HE##.####P.### – manually adjustable, self-locking

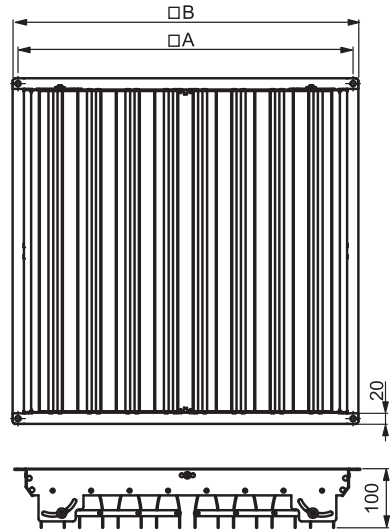
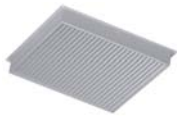


Fig. 33: Profile outlet

| Model size  | 1   | 2   | 4    |
|-------------|-----|-----|------|
| A (mm)      | 470 | 566 | 854  |
| B (mm)      | 489 | 585 | 873  |
| Weight (kg) | 5.6 | 7.8 | 16.4 |

**Air-deflection louvre**

Air-deflection unit for distributing supply air flow in 4 directions

**HE**##.#.#.#.#.#**L**## – manually adjustable, self-locking

| Model size  | 1   | 2   | 4    |
|-------------|-----|-----|------|
| A (mm)      | 470 | 566 | 854  |
| B (mm)      | 489 | 585 | 873  |
| Weight (kg) | 4.7 | 6.8 | 15.6 |

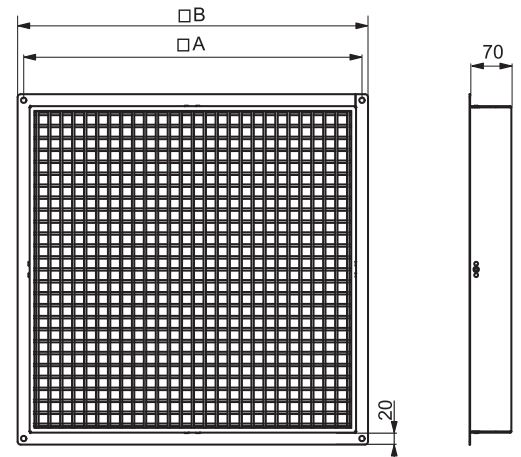
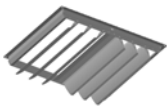


Fig. 34: Air deflection louvre

**Two-side basic ceiling outlet**

Air deflection unit for distributing supply air flow in 2 directions

**HE**##.#.#.#.#.#**Z**## – manually adjustable, self-locking

| Model size  | 1   | 2   | 4   |
|-------------|-----|-----|-----|
| A (mm)      | 470 | 566 | 854 |
| B (mm)      | 489 | 585 | 873 |
| Weight (kg) | 2.5 | 3.6 | 8   |

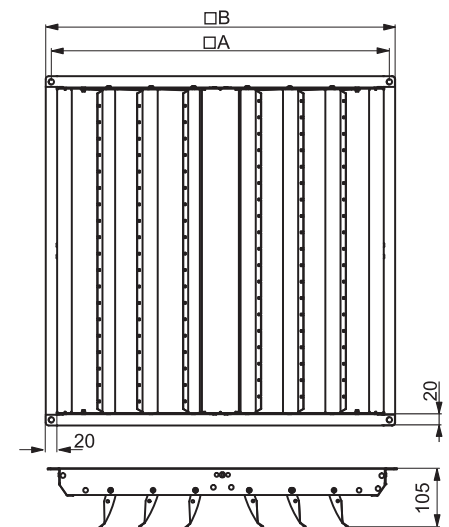


Fig. 35: Basic ceiling outlet

**Four-side discharge**

Air deflection unit for low installation height (2.5 - 3.5 m); to prevent direct blowing at persons

**HE**##.#.#.#.#.#**V**## – for air discharge on 4 sides

| Model size  | 1   | 2   | 4    |
|-------------|-----|-----|------|
| A (mm)      | 470 | 566 | 854  |
| B (mm)      | 489 | 585 | 873  |
| C (mm)      | 190 | 260 | 260  |
| E (mm)      | 600 | 700 | 985  |
| Weight (kg) | 6.4 | 8.5 | 16.6 |

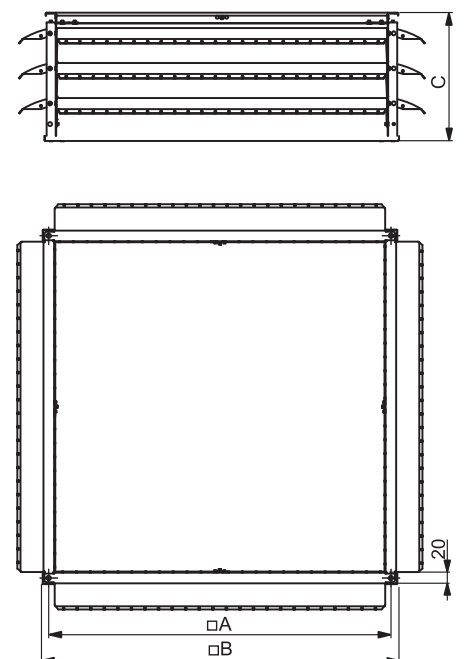


Fig. 36: Four-side discharge

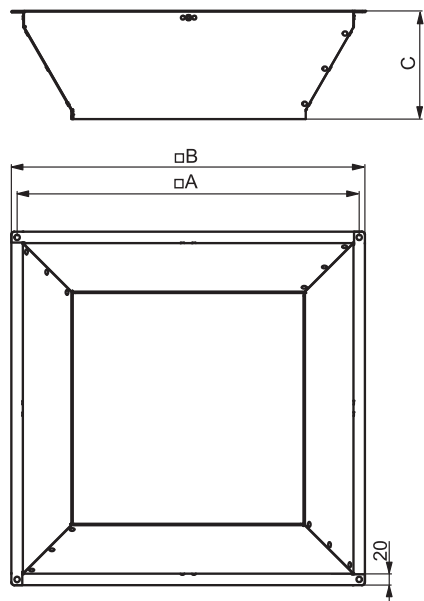


Fig. 37: Outlet nozzle

Outlet nozzle

square, cone-shaped, air speed and air throw increase due to reduced outlet surface



HE##.#####A.### – for large mounting heights

| Model size  | 1   | 2   | 4    |
|-------------|-----|-----|------|
| A (mm)      | 470 | 566 | 854  |
| B (mm)      | 489 | 585 | 873  |
| C (mm)      | 154 | 178 | 253  |
| Weight (kg) | 3.6 | 5   | 10.5 |

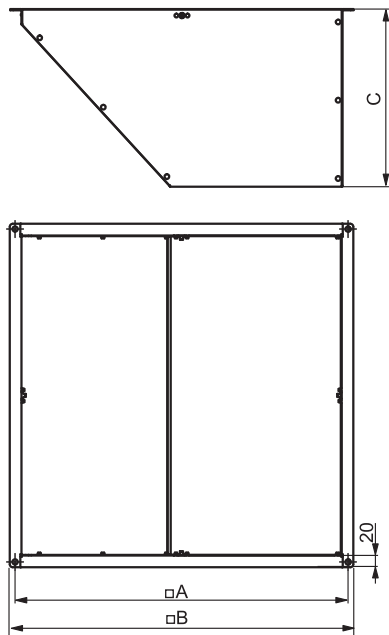


Fig. 38: Gate nozzle

Gate nozzle

Increase of discharge speed for precise air-flow diffusion



HE##.#####T.### – for gate curtains

| Model size  | 1   | 2   | 4   |
|-------------|-----|-----|-----|
| A (mm)      | 470 | 566 | 854 |
| B (mm)      | 489 | 585 | 873 |
| C (mm)      | 286 | 302 | 525 |
| Weight (kg) | 4.4 | 5.6 | 14  |

## Heater bank casing



**HE##.####.##D**

– **Industrial variant** made of galvanized and painted metal sheet in RAL 7000, mounted by the factory

| Variants C and D | 1   | 2   | 4    |
|------------------|-----|-----|------|
| A (mm)           | 454 | 550 | 838  |
| B (mm)           | 642 | 738 | 1026 |
| C (mm)           | 520 | 616 | 904  |
| Weight (kg)      | 5.1 | 6.2 | 9.4  |

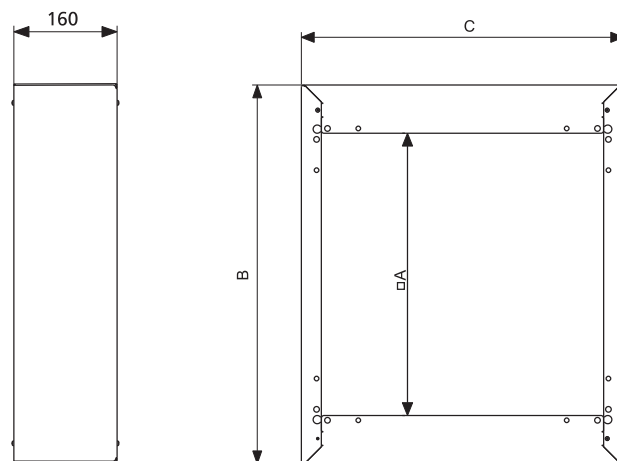
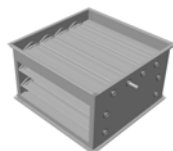


Fig. 39: Heater bank casing in industrial variant

## Air-intake side



### Mixed-air module, type 1

direct, 1 outside-air damper and 2 recirculating-air louvers; outside air and recirculating air angled at 90°; shaft diameter = 15.5 mm

**ZH#.200#** – Depending on equipment, use the table to complete data:

| Model size  | 1   | 2   | 4   |
|-------------|-----|-----|-----|
| A (mm)      | 470 | 566 | 854 |
| B (mm)      | 491 | 587 | 875 |
| C (mm)      | 340 | 340 | 450 |
| Weight (kg) | 13  | 16  | 31  |

Flange width = 20 mm

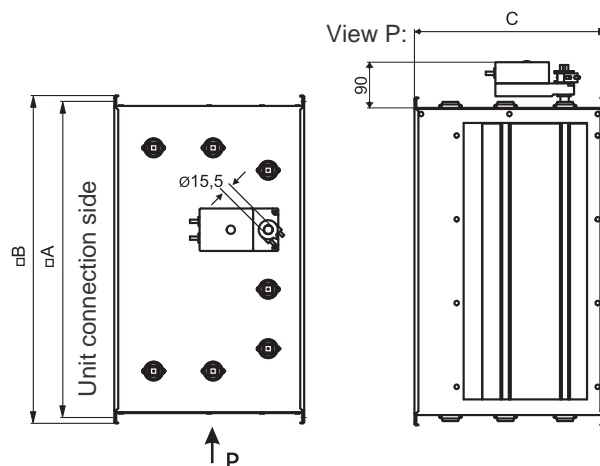
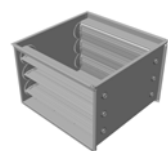


Fig. 40: Mixed-air module, type 1



### Mixed-air module, type 2

Each model with 1 fresh air damper (FA) and 1 recirculating air louver (RA); outdoor air and recirculating air at opposing 180°; shaft diameter = 15.5 mm

**ZH#.210#** – Depending on equipment, use the table to complete data:

| Model size  | 1    | 2    | 4    |
|-------------|------|------|------|
| A (mm)      | 470  | 566  | 854  |
| B (mm)      | 491  | 587  | 875  |
| C (mm)      | 400  | 400  | 510  |
| D (mm)      | 363  | 363  | 473  |
| Weight (kg) | 12.8 | 15.4 | 31.5 |

Flange width = 20 mm

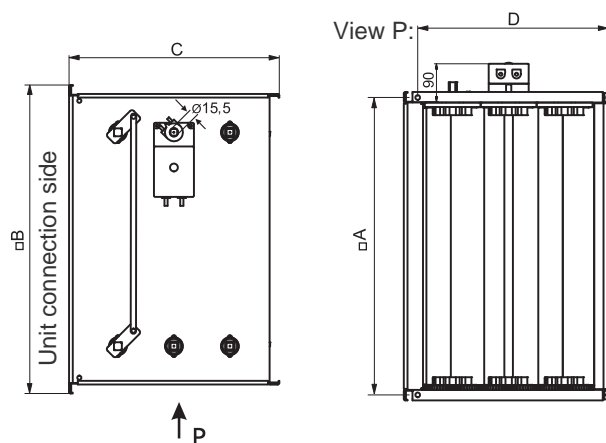


Fig. 41: Mixed-air module, type 2

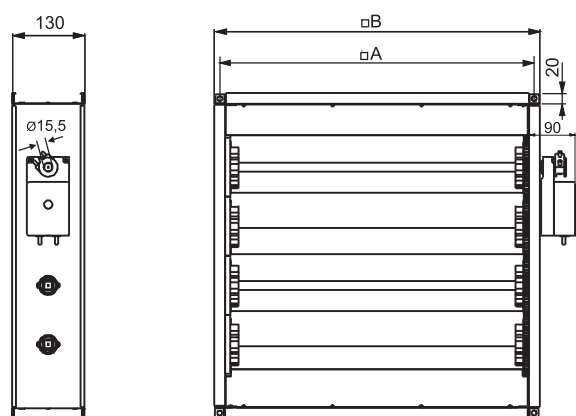
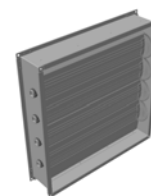


Fig. 42: Fresh-air blocking damper

### Fresh-air blocking damper

Fins made of galvanized metal sheet;  
shaft diameter = 15.5 mm



**ZH# . 2 3 0 #** – Depending on equipment,  
use the table to complete data:

| Model size  | 1   | 2   | 4    |
|-------------|-----|-----|------|
| A (mm)      | 470 | 566 | 854  |
| B (mm)      | 491 | 587 | 875  |
| Weight (kg) | 6.5 | 8.2 | 15.1 |

Flange width = 20 mm

**Table: Type code designations for mixing-air modules and fresh-air blocking damper** depend on used actuator

|                      |   |
|----------------------|---|
| <b>ZH# . 2 # 0 0</b> | – with actuator provided by others (shaft diameter = 15.5 mm) |
| <b>ZH# . 2 # 0 1</b> | – manual adjustment   |
| <b>ZH# . 2 # 0 2</b> | – with actuator 230 V open/close                              |
| <b>ZH# . 2 # 0 3</b> | – with actuator 230 V open/close + poti                       |
| <b>ZH# . 2 # 0 4</b> | – with actuator 230 V open/close + final position switch      |
| <b>ZH# . 2 # 0 5</b> | – with actuator 230 V + spring return                         |

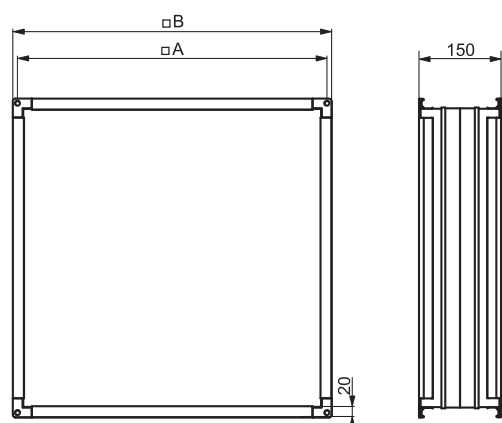


Fig. 43: Flexible canvas connection

### Flexible canvas connection

elastic fitting with a run-around mounting frame;  
always used together (or rectangular duct 150)  
with accessories on suction side

**ZH# . 2 5 0 0** – Air-tight, tear-resistant

| Model size  | 1   | 2   | 4   |
|-------------|-----|-----|-----|
| A (mm)      | 470 | 566 | 854 |
| B (mm)      | 487 | 583 | 871 |
| Weight (kg) | 2.6 | 3.2 | 4.8 |

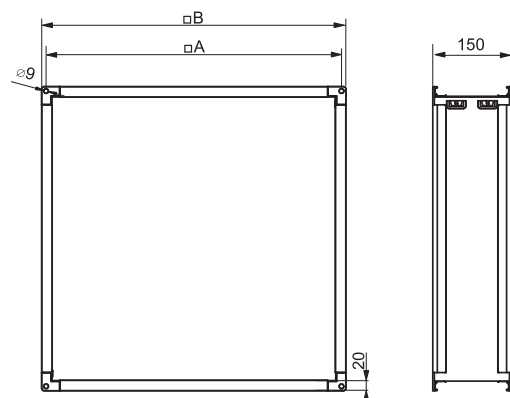


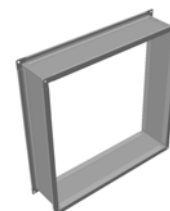
Fig. 44: Rectangular duct 150 mm

### Rectangular duct 150

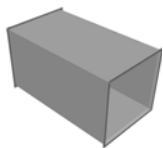
Spacer made of metal sheet with run-around  
mounting frame; to be used if mat filter module  
is to be installed directly below the fan  
module

**ZH# . 2 6 0 0** – Overall length 150 mm

| Model size  | 1   | 2   | 4   |
|-------------|-----|-----|-----|
| A (mm)      | 470 | 566 | 854 |
| B (mm)      | 487 | 583 | 871 |
| Weight (kg) | 1.8 | 2.2 | 3.3 |





**Rectangular duct 1000**

Fitting made of galvanized metal sheet with run-around mounting frame

**ZH# . 2700** – Overall length 1000 mm

| Model size  | 1    | 2   | 4    |
|-------------|------|-----|------|
| A (mm)      | 470  | 566 | 854  |
| B (mm)      | 487  | 583 | 871  |
| Weight (kg) | 12.5 | 15  | 22.4 |

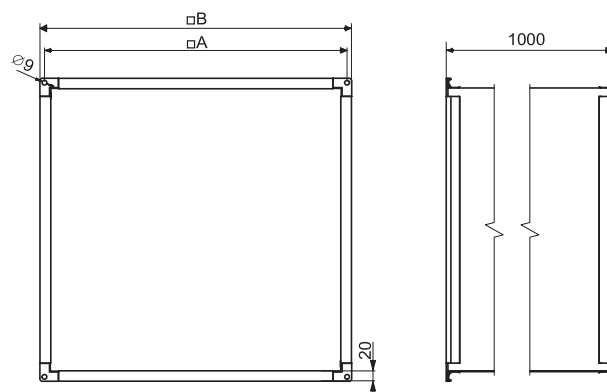
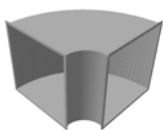


Fig. 45: Rectangular duct 1000 mm

**Duct bend 90°, symmetrical**

made of galvanized metal sheet with run-around mounting frame

**ZH# . 2800**

| Model size  | 1   | 2    | 4    |
|-------------|-----|------|------|
| A (mm)      | 470 | 566  | 854  |
| B (mm)      | 487 | 583  | 871  |
| D (mm)      | 646 | 742  | 1030 |
| E (mm)      | 403 | 451  | 595  |
| Weight (kg) | 7.3 | 11.5 | 33   |

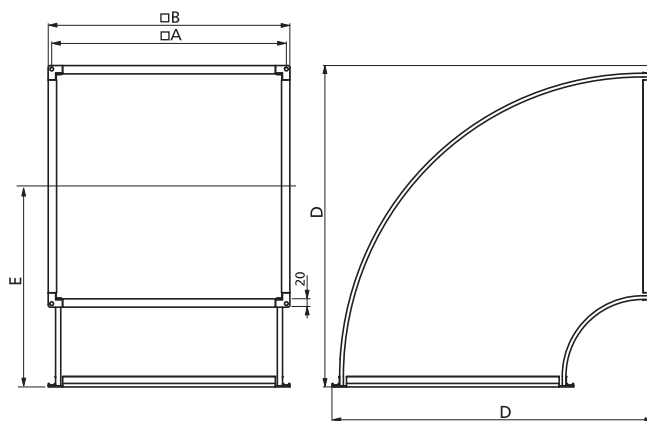
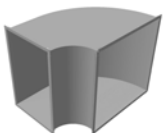


Fig. 46: Duct connecting bend 90°, symmetrical

**Duct bend 90°, asymmetrical**

made of galvanized metal sheet with run-around mounting frame

**ZH# . 2900** – 90° asymmetrically tapered

| Model size  | 1   | 2    | 4    |
|-------------|-----|------|------|
| A1 (mm)     | 470 | 566  | 854  |
| A2 (mm)     | 363 | 363  | 473  |
| B1 (mm)     | 487 | 583  | 871  |
| B2 (mm)     | 380 | 380  | 490  |
| C (mm)      | 540 | 540  | 650  |
| D (mm)      | 646 | 742  | 1030 |
| E (mm)      | 403 | 451  | 595  |
| F (mm)      | 350 | 350  | 405  |
| Weight (kg) | 7.3 | 11.5 | 33   |

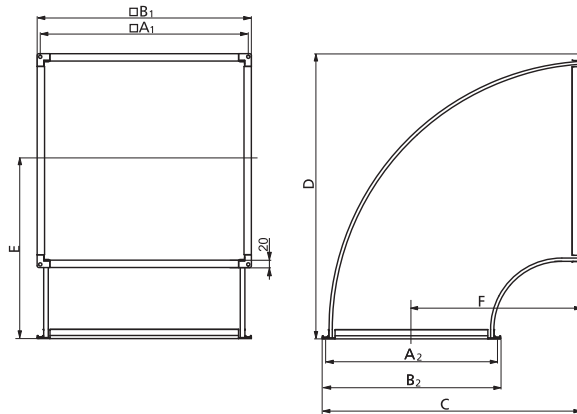
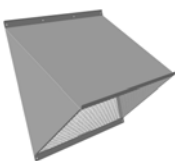


Fig. 47: Duct connecting bend 90°, asymmetrical

**Wall air-intake hood**

External weather grille made of galvanized metal sheet (RAL 9002) with bird protection, low pressure drop

**ZH# . 3100** – Overall height 300 mm

| Model size  | 1   | 2   | 4   |
|-------------|-----|-----|-----|
| X (mm)      | 496 | 592 | 880 |
| y (mm)      | 500 | 596 | 884 |
| Z (mm)      | 288 | 350 | 532 |
| Weight (kg) | 2.8 | 3.9 | 8.6 |

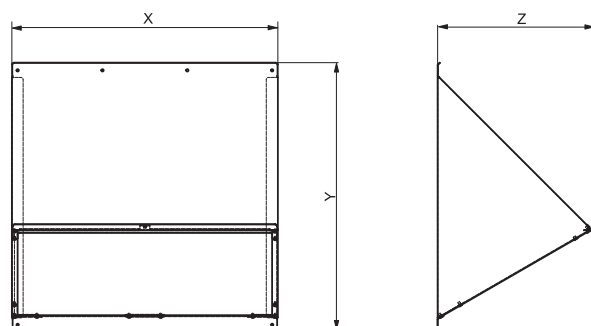


Fig. 48: Wall air-intake hood

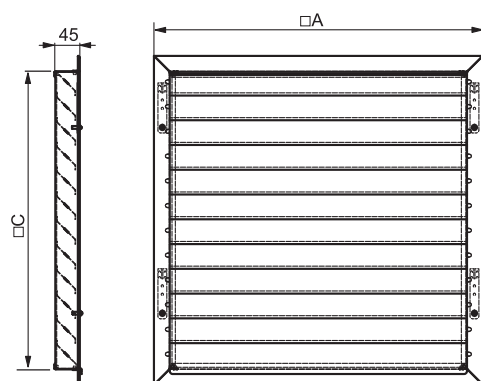


Fig. 49: External weather grille

### External weather grille

made of galvanized metal sheet with bird protection grille and screw-off wall brackets

**ZH# . 3 2 0 0** – Overall depth 45 mm

| Model size  | 1   | 2   | 4    |
|-------------|-----|-----|------|
| A (mm)      | 496 | 592 | 880  |
| C (mm)      | 438 | 534 | 822  |
| Weight (kg) | 3.7 | 5.2 | 11.5 |

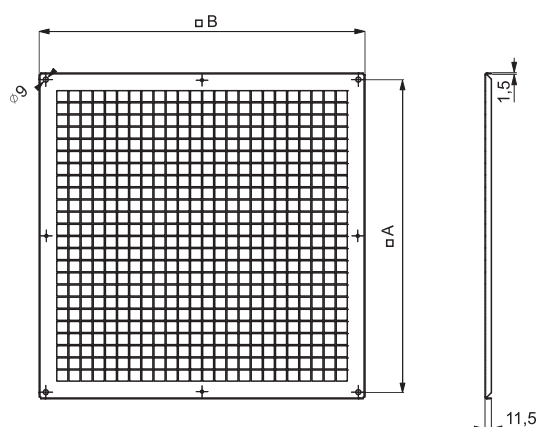
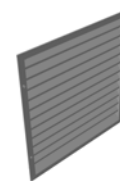


Fig. 50: Contact protection grille

### Contact protection grille

End grille for accessories made of galvanized metal sheet

**ZH# . 3 3 0 0** – Overall depth 11.5 mm

| Model size  | 1   | 2   | 4   |
|-------------|-----|-----|-----|
| A (mm)      | 470 | 566 | 854 |
| B (mm)      | 494 | 590 | 878 |
| Weight (kg) | 3.5 | 3.3 | 5.1 |

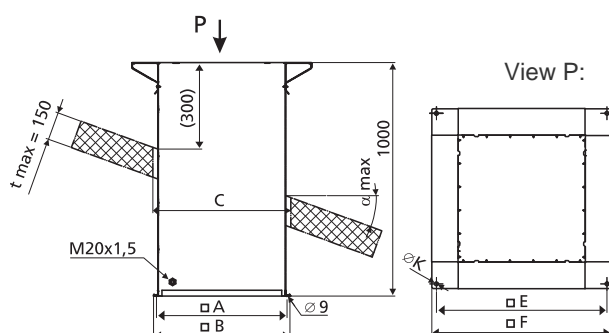
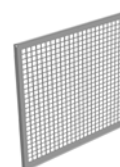


Fig. 51: Duct through slanted roof

### Duct through slanted roof

made of galvanized metal sheet including mounting brackets with run-around mounting frame

**ZH# . 3 4 0 0**

| Model size  | 1   | 2   | 4    |
|-------------|-----|-----|------|
| A (mm)      | 470 | 566 | 854  |
| B (mm)      | 487 | 583 | 871  |
| min. C (mm) | 473 | 570 | 860  |
| max. C (mm) | 536 | 775 | 1095 |
| E (mm)      | 490 | 730 | 1050 |
| F (mm)      | 528 | 768 | 1088 |
| K (mm)      | 12  | 16  | 16   |
| a max       | 50° | 45° | 35°  |
| Weight (kg) | 17  | 21  | 31   |

Flange width = 20 mm



**Roof air-intake hood**

made from metal sheet in RAL 9002 with bird protection grille, other colours available on request;

**optionally** available with **bag filter** (filter grade G2 and G4 as per DIN EN 779); tiltable hood 90° for easy filter replacement

**ZH# . 3 5 0 0** – Complete data, depending on equipment as specified in table on page 28

**ZH# . 3 8 0 2** – Spare bag filter G2

**ZH# . 3 8 0 4** – Spare bag filter G4

| Model size  | 1    | 2    | 4    |
|-------------|------|------|------|
| A (mm)      | 490  | 730  | 1050 |
| B (mm)      | 970  | 1260 | 1700 |
| C (mm)      | 800  | 1044 | 1500 |
| D (mm)      | 569  | 623  | 712  |
| d (mm)      | 11   | 13   | 13   |
| Weight (kg) | 24.5 | 39.5 | 78   |

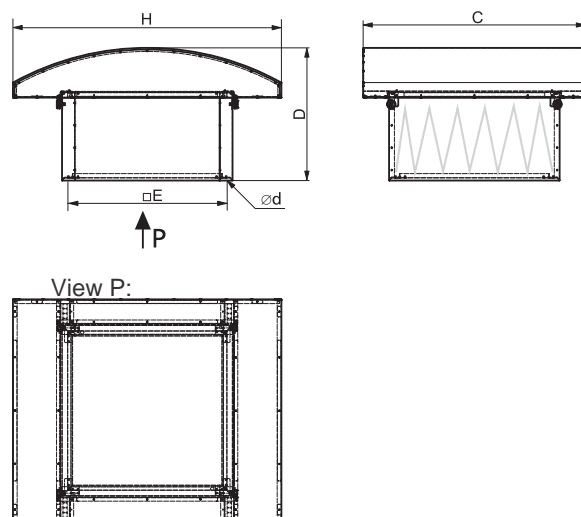


Fig. 52: Roof air-intake hood

**Bag-filter module**

Bag filter cassette, filter grade G2 and G4 as of DIN EN 779; casing made of galvanized metal sheet; lateral service opening with 20 mm run-around connection frame; Differential pressure switch - option

**ZH# . 3 6 0 0** – Depending on equipment, use the table page 28 to complete data

**ZH# . 3 9 0 2** – Spare bag filter G2

**ZH# . 3 9 0 4** – Spare bag filter G4

| Model size  | 1   | 2   | 4   |
|-------------|-----|-----|-----|
| A (mm)      | 470 | 566 | 854 |
| B (mm)      | 487 | 583 | 871 |
| Z (mm)      | 430 | 430 | 430 |
| Weight (kg) | 13  | 16  | 25  |

Flange width = 20 mm

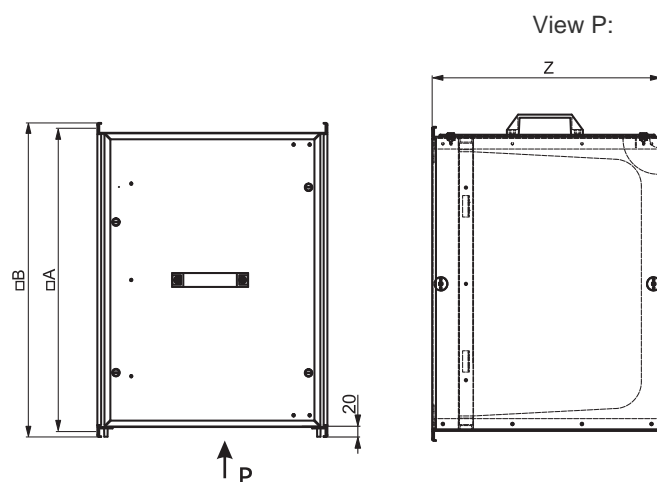


Fig. 53: Bag-filter module

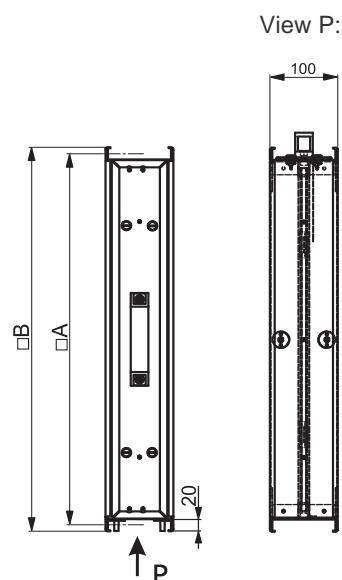


Fig. 54: Mat-filter module

**Mat-filter module**

in frame, with filter mat of grade G2-G4 as per DIN EN 779; casing made of galvanized metal sheet steel, lateral service opening, with 20 mm run-around connection frame; removable; Differential pressure switch - option



**ZH# . 3 7 0 0** – Depending on equipment, use the table to complete data:

|              |                |                       |
|--------------|----------------|-----------------------|
| <b>ZH# .</b> | <b>4 0 0 2</b> | – Spare mat filter G2 |
| <b>ZH# .</b> | <b>4 0 0 3</b> | – Spare mat filter G3 |
| <b>ZH# .</b> | <b>4 0 0 4</b> | – Spare mat filter G4 |

| Model size  | 1   | 2   | 4   |
|-------------|-----|-----|-----|
| A (mm)      | 470 | 566 | 854 |
| B (mm)      | 487 | 583 | 871 |
| Weight (kg) | 5   | 6.2 | 10  |

**Table: type code designations for mat-filter modules, bag-filter modules and roof air-intake hood - depending on used filter and electrical equipment:**

|              |                |   |
|--------------|----------------|---|
| <b>ZH# .</b> | <b>3 # 0 0</b> | – without filter insert and electric equipment                                  |
| <b>ZH# .</b> | <b>3 # 0 2</b> | – with G2 filter and without differential pressure switch                       |
| <b>ZH# .</b> | <b>3 # 0 3</b> | – with G3 filter and without differential pressure switch (only for mat filter) |
| <b>ZH# .</b> | <b>3 # 0 4</b> | – with G4 filter and without differential pressure switch                       |
| <b>ZH# .</b> | <b>3 # 0 5</b> | – with G2 filter and with differential pressure switch                          |
| <b>ZH# .</b> | <b>3 # 0 6</b> | – with G3 filter and with differential pressure switch (only for mat filter)    |
| <b>ZH# .</b> | <b>3 # 0 7</b> | – with G4 filter and with differential pressure switch                          |

View P:

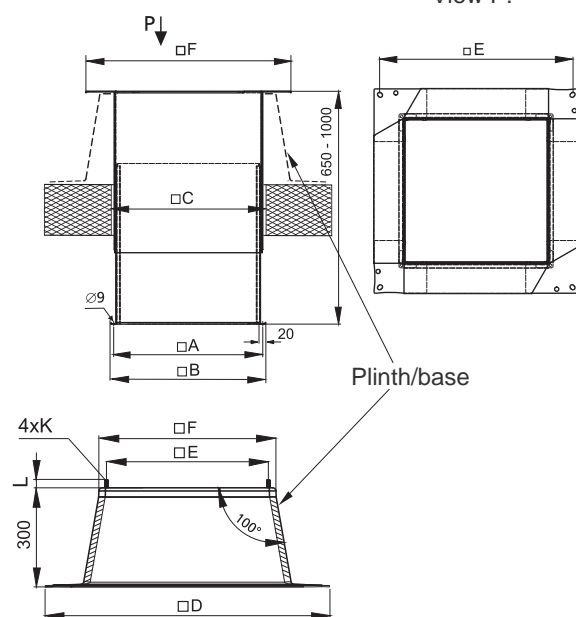


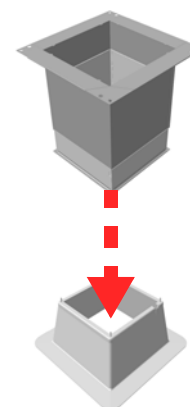
Fig. 55: Roof duct with flat roof-duct base

**Roof duct with flat roof-duct base**

Roof opening performed in galvanized metal sheet, including mounting bracket with a peripheral run-around mounting frame, including flat roof-duct base, thermally isolated

**ZH# . 4 9 0 0**

| Model size                      | 1      | 2      | 4      |
|---------------------------------|--------|--------|--------|
| A (mm)                          | 470    | 566    | 854    |
| B (mm)                          | 487    | 583    | 871    |
| min. C (mm)                     | 476    | 570    | 860    |
| max. C (mm)                     | 536    | 775    | 1095   |
| D (mm)                          | 860    | 1100   | 1420   |
| E (mm)                          | 490    | 730    | 1050   |
| F (mm)                          | 528    | 768    | 1088   |
| Weight (kg) roof opening        | 15.6   | 19.2   | 29.4   |
| Weight (kg) flat roof-duct base | 8      | 10     | 13     |
| K1xL (mm)                       | M10x22 | M12x27 | M12x27 |



**Frame for wall connection**

As spacer for wall opening

**ZH# . 5 1 0 0** – Galvanized metal sheet

| Model size  | 1   | 2   | 4   |
|-------------|-----|-----|-----|
| A (mm)      | 470 | 566 | 854 |
| B (mm)      | 487 | 583 | 871 |
| C (mm)      | 451 | 547 | 835 |
| Weight (kg) | 2.6 | 3.1 | 4.8 |

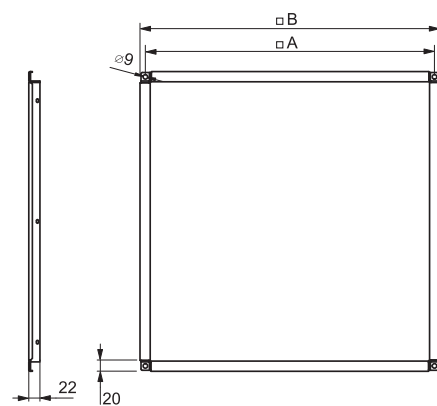
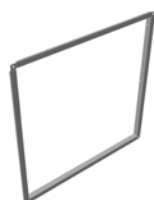


Fig. 56: Frame for wall connection

**Flange** (only required for recirculating-air units) with run-around mounting frame for suction-side accessories in recirculating-air units

(Standard for mixed-air units!)

**ZH# . 5 2 0 0** – Galvanized metal sheet

| Model size  | 1   | 2   | 4   |
|-------------|-----|-----|-----|
| A (mm)      | 470 | 566 | 854 |
| B (mm)      | 487 | 583 | 871 |
| Weight (kg) | 2.6 | 3.1 | 4.8 |

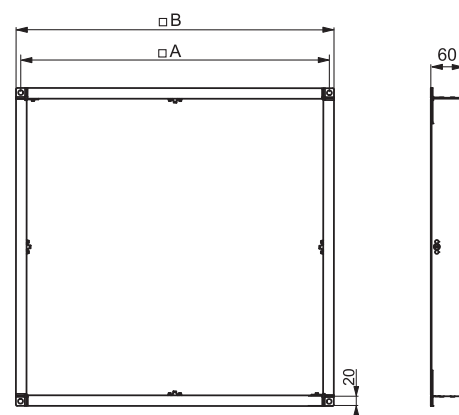
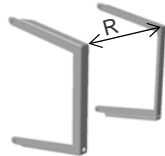


Fig. 57: Flange

**Suspensions****Suspension type compact C**

For recirculating-air units for wall and ceiling installation; galvanized metal sheet

**ZH# . 5 3 0 0** – Wall/ceiling mounting

| Model size  | 1   | 2   | 4    |
|-------------|-----|-----|------|
| A (mm)      | 303 | 389 | 628  |
| B (mm)      | 340 | 392 | 578  |
| C (mm)      | 445 | 544 | 845  |
| D (mm)      | 40  | 40  | 62   |
| R (mm)      | 414 | 510 | 776  |
| Weight (kg) | 2.9 | 3.9 | 12.2 |

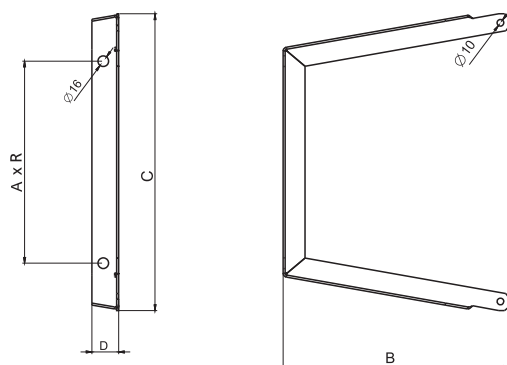


Fig. 58: Suspension type compact C

**Suspension type studio**

for recirculating-air unit as design model; painted in RAL 7000; other colours on request

**ZH# . 5 4 0 0** – Wall installation

| Model size  | 1   | 2   | 4    |
|-------------|-----|-----|------|
| A (mm)      | 138 | 175 | 282  |
| B (mm)      | 496 | 544 | 728  |
| C (mm)      | 183 | 220 | 327  |
| D (mm)      | 60  | 60  | 60   |
| R (mm)      | 400 | 496 | 784  |
| Weight (kg) | 6.8 | 8.1 | 13.5 |

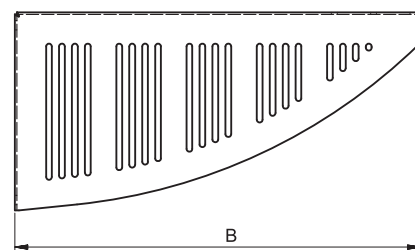
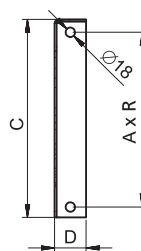
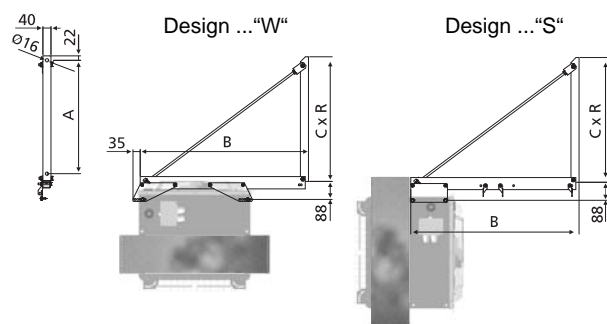


Fig. 59: Suspension type studio

**Modular type suspension**

comprising brackets performed in galvanized metal sheet; mounting rails with threaded rods and tensioning locks; attached to wall with steel bracket; suitable for all HX versions

W – vertical unit outlet

S – horizontal unit outlet

**Z H # . 5 5 0 #** – Wall installation

| Model size | 1   | 2   | 4   |
|------------|-----|-----|-----|
| R (mm)     | 414 | 510 | 798 |

Fig. 60: Modular type suspension

| Z          | H | # | .  | 5 | 5 | 0 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | W |
|------------|---|---|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model size |   |   | Structure of accessories                         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|            |   |   | without accessories                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|            |   |   | 25 (or 26) +20+51                                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Model size |   |   | Modular Type 55 type code                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|            |   |   | 5S 7S 11S 8S 9S 13S 10S 5S 9S 6S 10S 7S 10S 7W   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|            |   |   | 6S 7S 11S 8S 9S 13S 10S 5S 9S 6S 11S 8S 11S 8W   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Model size |   |   | 8S 8S 12S 9S 10S 14S 11S 5S 9S 6S 12S 9S 14S 11W |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

Insert number or letter in the last position in the accessory code.

| Type code   | 5S  | 6S  | 7S/7W | 8S/8W | 9S/9W | 10S  | 11S/11W | 12S/12W | 13S  | 14S  |
|-------------|-----|-----|-------|-------|-------|------|---------|---------|------|------|
| A (mm)      | 386 | 386 | 386   | 556   | 556   | 556  | 556     | 556     | 656  | 656  |
| B (mm)      | 505 | 605 | 715   | 825   | 935   | 1045 | 1155    | 1265    | 1375 | 1485 |
| C (mm)      | 442 | 442 | 442   | 612   | 612   | 612  | 612     | 612     | 712  | 712  |
| Weight (kg) | 7.5 | 8.3 | 9.3   | 11.2  | 12.1  | 12.9 | 13.9    | 15      | 16.1 | 17   |

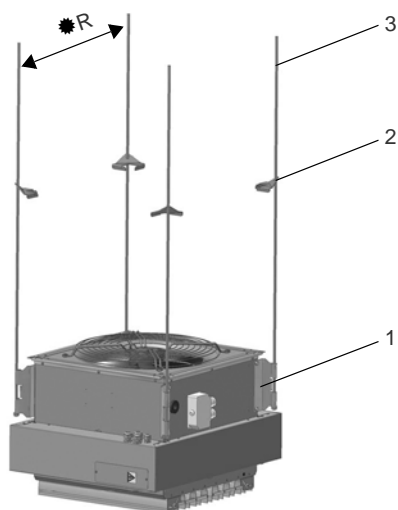


Fig. 61: Ceiling suspension

**Ceiling suspension**

including 4 unit mounting brackets (1) with fixing material for optional accessories (2) and 4 threaded rods (3); for ceiling mounting. The threaded rods M10 are available in different lengths:

|                        |   |
|------------------------|---|
| <b>Z H # . 5 6 0 0</b> | – Installation without threaded rod, 2.4 kg |
| <b>Z H # . 5 6 0 1</b> | – Mounting kit threaded rod 1 m, 5.7 kg     |
| <b>Z H # . 5 6 0 2</b> | – Mounting kit threaded rod 2 m, 8.1 kg     |
| <b>Z H # . 5 6 0 3</b> | – Mounting kit threaded rod 3 m, 10.5 kg    |

| Model size | 1   | 2   | 4   |
|------------|-----|-----|-----|
| R (mm)     | 531 | 627 | 915 |

## Connecting electrical motor

Electrical motor may only be wired to the corresponding terminal strip in accordance with the valid connection diagram by qualified staff (connection diagram is enclosed with the unit).

Fan motors shall be connected as 3 phases 400 V or 3 phases 500 V with exiting thermal contacts. The supply line must be fitted with all-pole disconnect switch (protective conductors to be excluded from disconnection). To protect the el. motors must be fitted with a motor-type circuit breaker. The current catalog [A] is informative and may be according to the type of el. engine with a tolerance of  $\pm 20\%$ . Set the locking elements when installing according to the value on the label of the el. engine.

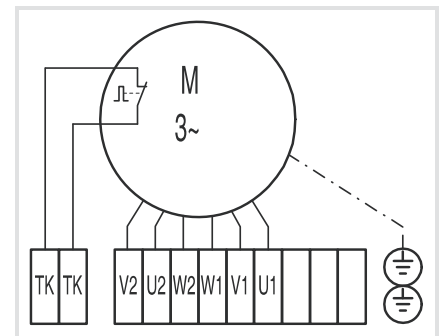
To protect the group, the thermal contacts in the motor winding can be used. Then it is sufficient to overload the whole group of units to the total current.

### Terminal diagram for 2-speed 3-phase external rotor motor - 400 V

- With thermal contacts
- Slip regulator
- Winding  $\Delta/Y$
- Without voltage change-over!
- For operating voltage refer to the unit identification plate.

#### 2-speed operation mode

- with two-speed switch (OSHE)
- Connection cable: 6 + PE = 7 wires
- Electrically screened cable: 2 TK connecting wires

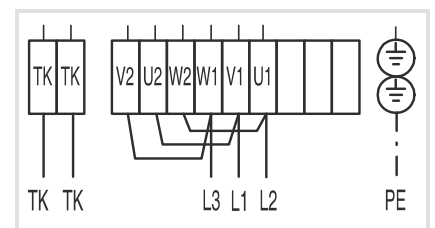


#### 1-speed operation mode

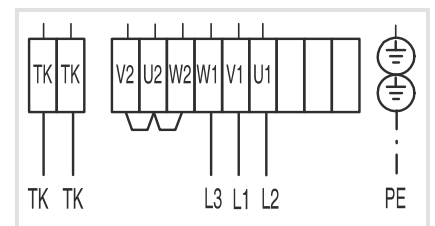
- Connection cable: 3 + PE = 4 wires
- Electrically screened cable: 2 TK connecting wires

High speed

or



Low speed



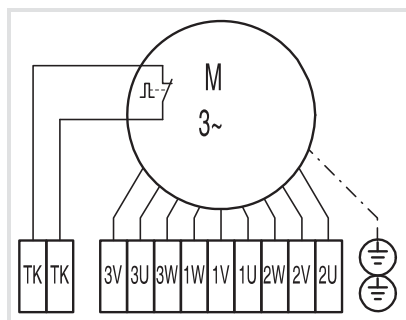
#### NOTE!

For proper operation of the unit, ensure the rotation direction marked with an arrow on the fan impeller. To reverse the fan in case of wrong rotation direction, 2 phases must be changed.

### Terminal diagram for 2-speed 3-phase external rotor motor - 500 V

- With thermal contacts
- With pole reversal
- Winding  $\Delta/Y$
- Without voltage change-over!
- For operating voltage - refer to the unit identification plate.

### 3-speed operation mode



- With three speed switch (OSHE)
- Connection cable: 9 + PE = 10 wires
- Electrically screened cable: 2 TC connecting wires

### 1-speed operation mode

- Connection cable: 3+PE = 4 connecting wires
- Electrically screened cable: 2 TC connecting wires

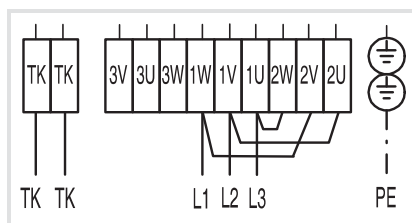
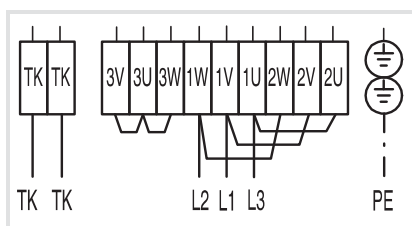
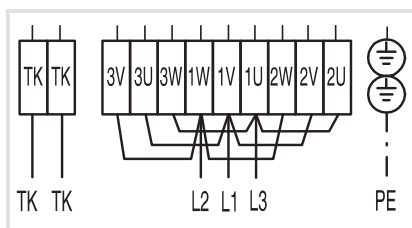
High speed

or

Medium speed

or

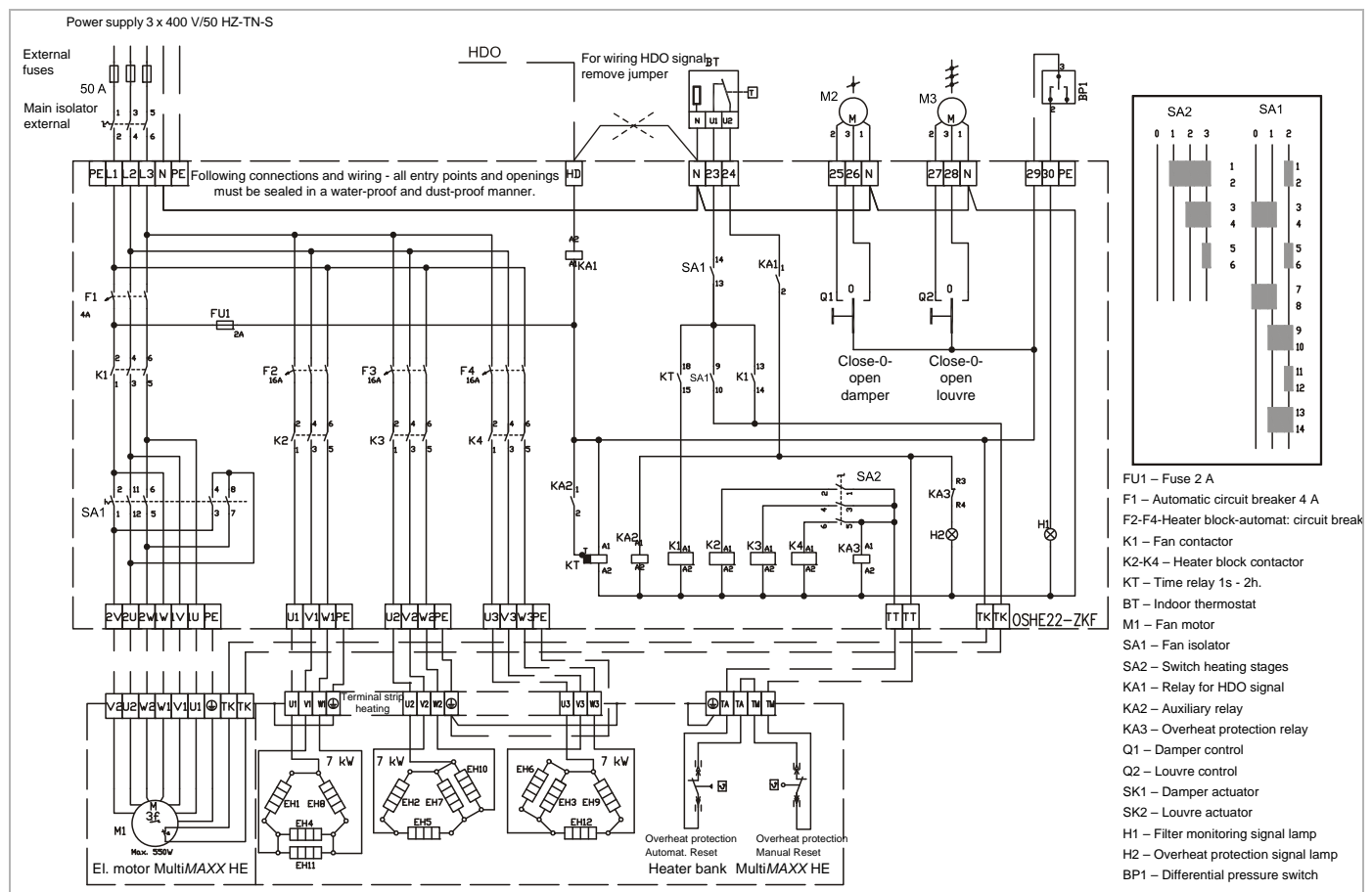
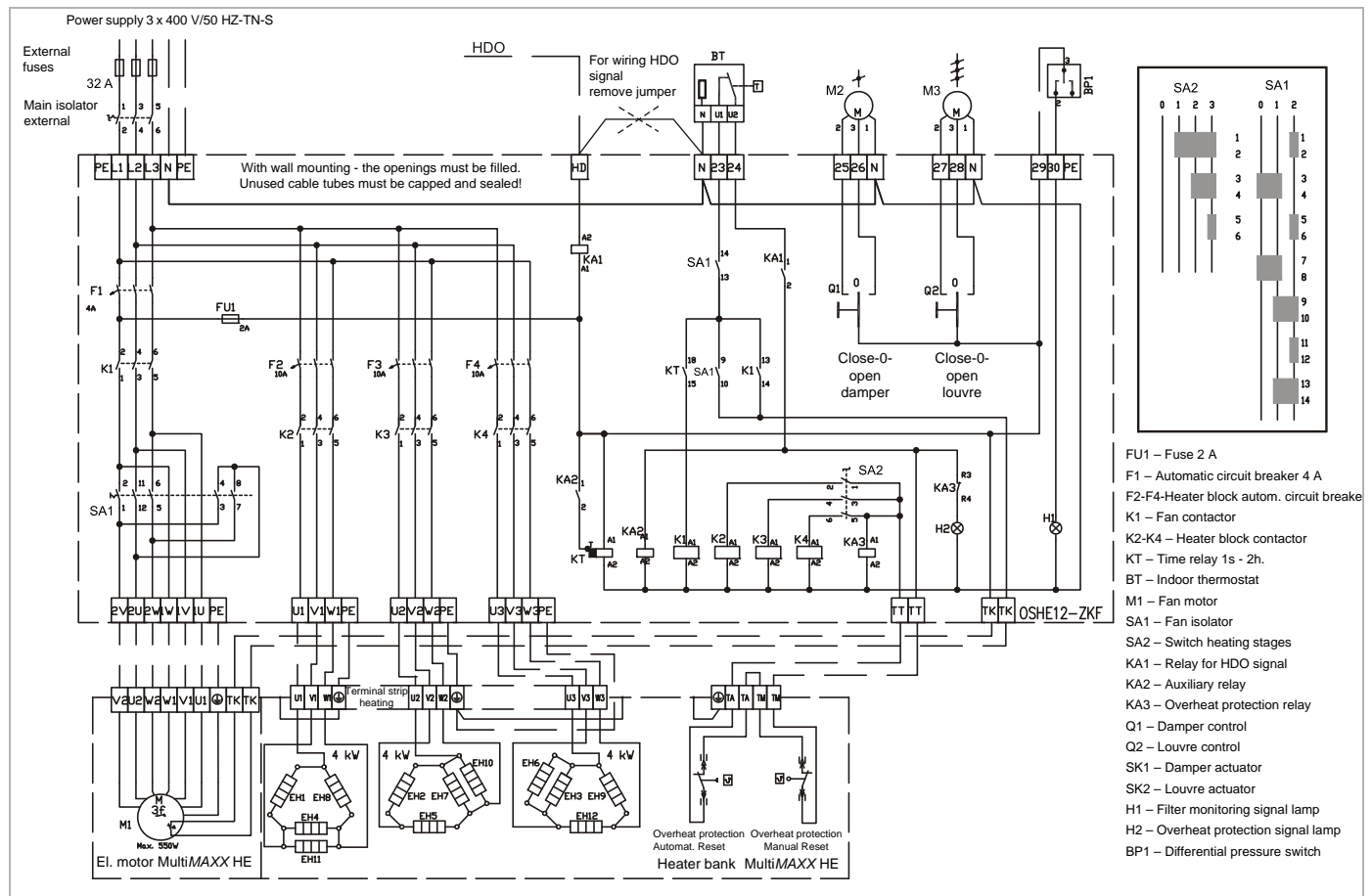
Low speed



#### NOTE!

For proper operation of the unit ensure the rotation direction marked with an arrow on the fan impeller. To reverse the fan in case of wrong rotation direction, 2 phases must be changed.





Power supply 3 x 400 V/50 HZ-TN-S

External fuses

100 A

Main isolator external

1 2 3 4 5 6

PE L1 L2 L3 N PE

Following connections and wiring - all entry points and openings must be sealed in a water-proof and dust-proof manner.

HDO

For wiring HDO signal remove jumper

BT

M2

M3

BP1

KA1

KA2

KA3

KT

SA1

SA2

Q1

Q2

Close-O-open damper

Close-O-open louvre

H1

H2

TK

OSHE42-ZKF

U1 U2 U3

V1 V2 V3

W1 W2 W3

PE

EH10 EH16

EH1 EH7

EH8 EH15

EH2 EH9

EH3 EH6

EH4 EH5

EH11 EH12

EH13 EH14

EH17 EH18

EH19

M1

Max. 550V

El. motor MultiMAXX HE

Heater bank MultiMAXX HE

Overheat protection Automat. Reset

Overheat protection Manual Reset

Legend:

- SA1 – Fuse 2 A
- F1 – Automatic circuit breaker 4 A
- F2-F4-Heater block-autom. circuit breaker
- K1 – Fan contactor
- K2-K4 – Heater block contactor
- KT – Time relay 1s - 2h.
- BT – Indoor thermostat
- M1 – Fan motor
- SA1 – Fan isolator
- SA2 – Switch heating stages
- KA1 – Relay for HDO signal
- KA2 – Auxiliary relay
- KA3 – Overheat protection relay
- Q1 – Damper control
- Q2 – Louvre control
- SK1 – Damper actuator
- SK2 – Louvre actuator
- H1 – Filter monitoring signal lamp
- H2 – Overheat protection signal lamp
- BP1 – Differential pressure switch

The schematic diagram illustrates the electrical layout of the heating system. It begins with an 'Overheat protection' section featuring a terminal block with terminals V3, U3, W3, V2, U2, W2, V1, U1, W1, and two TK terminals. These are connected to a motor M1 (3φ, Max. 550V). The main power supply then passes through a terminal block with TA, TM, and TM terminals, which are connected to two switches: 'Overheat protection automatic reset' and 'Overheat protection manual reset'. The power then splits into three heating zones:

- Heating 6.1 kW:** This zone has terminals L1, L2, L3, and PE. It includes a terminal strip heating unit with terminals U, V, W, and a ground symbol. Below this, a delta network of heater elements is shown, with individual elements labeled EH1, EH3, EH9, EH11, EH6, and EH8.
- Heating 3.05 kW:** This zone has terminals L1, L2, L3, and PE. It includes a terminal strip heating unit with terminals U1, V1, W1, and a ground symbol. Below this, a delta network of heater elements is shown, with individual elements labeled EH2, EH5, EH12, and EH4.
- Heating 3.05 kW:** This zone has terminals PE, L1, L2, and L3. It includes a terminal strip heating unit with terminals U2, V2, and W2. Below this, a delta network of heater elements is shown, with individual elements labeled EH7, EH10, and EH4.

| Actuator 230V<br>- open/close<br>(ZH#.2#02) | Actuator 230V<br>- open/close + poten-<br>tiometer (ZH#.2#03) | Actuator 230V<br>- open/close + final position<br>switch (ZH#.2#04) | Actuator 230V<br>+ spring return<br>(ZH#.2#05) | Actuator 24V<br>- open/close<br>(ZH#.2#06) | Actuator 24V<br>(0 - 10V)<br>(ZH#.2#07) |
|---|---|---|--|--|---|
|   |   |   |  |  |   |

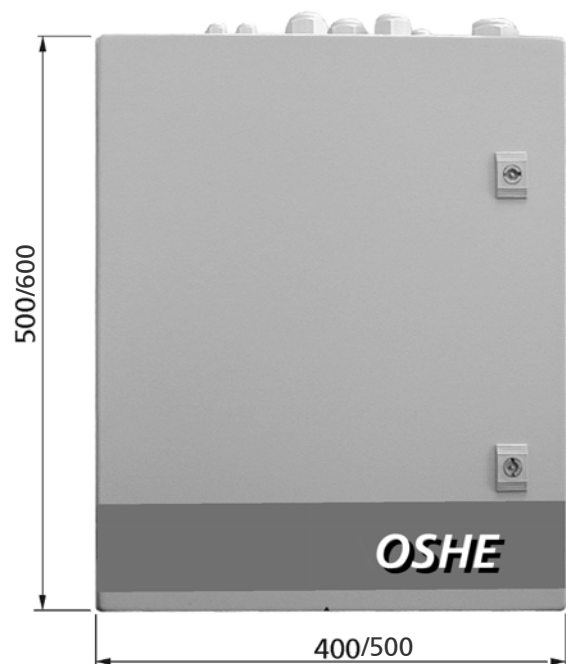
## Planning instructions for MultiMAXX HE

These documents apply to the project planning, installation and maintenance of MultiMAXX HE electric air heaters. Be sure to plan the use of the units most effectively by selecting the optimum model size and design. The planned use must not conflict with the applicable hygiene and safety regulations or the manufacturer's instructions.

- When installing an air heater, be sure to observe the safety distance of at least 150 mm to combustible building materials of fire classifications B1, C1, C2 in accordance with the CSN 061008 standard. For highly combustible building materials of fire classification C3, this distance must be 300 mm.
- When planning the ventilation pipework for the suction or discharge side, take their pressure differences into account that cause a reduction in the rated power of the unit.
- The units are equipped with M8 nuts required for suspension.
- The units are equipped with a protective terminal to protect the metal parts against dangerous touch voltage in accordance with the CSN 33 2000-4-41 Ed.2 standard.  
An external protective terminal of the electric motor can be used for any external connection. The units are also equipped with protective terminals for connecting protective conductors (PE). This is the unit with protection class OI. Non-earthed metal unit parts are conductively connected to the protective terminals, thus fulfilling the necessary prerequisites for implementing protection against the risk of contact of unearthed parts in accordance with the CSN 33 2000-4-41 Ed. 2 standard. On the rear side of the unit (motor fan rear side) there is another protective terminal to provide additional protection against dangerous contact of unearthed parts through their connection.
- With regard to the structure and conditional electrical connections between the fan run and the heating rods or the control of the servomotors and secondary air louvres, heating and overcurrent protection, motor overrun, possible unit operational blocking by the HDO signal (mass remote control) or the connection of a room thermostat with thermal feedback, the electrical connection to the power supply system must be carried out in accordance with the specified connection diagrams.
- All electric fan motors of the MultiMAXX HE units are equipped as standard with a thermal contact, which must be connected (thermal contacts TC in the OSHE switch cabinet).
- Thermal protection of heating elements is ensured by two temperature fuses (one automatic and one manual reset fuse).
- The automatic temperature fuse also performs the function of a temperature limiter with a fixed working temperature, i.e. it is activated or triggered in normal operation (depending on the room temperature). If the air flow through the unit is not significantly reduced (e.g. due to a soiled filter or high air resistance due to the closed unit air outlet louver), the automatic circuit breaker switches off at the room temperature of approx. 25 - 28 °C. The air flow through the unit is not reduced. This fact must be taken into account if a so-called technical application of the unit is required, i.e. where a higher room temperature is achieved. At the same time, the maximum temperature (heating of the electric motor) must also be taken into account in order to prevent activation of the thermal protection. The manual temperature fuse triggers, for example, if the automatic fuse fails. The restart may only be carried out by a qualified employee in accordance with Regulation No. 50/78 Sb. (Sb.=Czech Code of Laws) paragraph 6, who must first determine the cause and then eliminate it. The reset button of this temperature fuse is visible and accessible after removing the heating rod casing (pos. 8 on page 4).
- The servo drives of the dampers and louvres are available in standard design (i.e. fed in via two lines, without limit switches). The stop of the servo drive end positions can be adjusted directly at the servo drives.  
The actuators can remain energized in the end positions without consequences.
- Before commissioning the unit, an initial revision in accordance with the CSN 331500 standard must be carried out. The operator is obliged to carry out regular inspections in accordance with CSN 331500 within the specified periods.
- The unit or switchgear or OSHE switch box supply must be protected in accordance with the CSN 33 2000-4-43 Ed. 2, CSN 33 2000-4-473, CSN 33 2000-5-523 Ed. 2 standard. A main switch must be integrated into the unit supply, which must meet the requirements for main switches specified in standard EN 60204-1 Ed. 2 in accordance with the circumstances.

## OSHE control box

|                        |                                      |   |            |
|------------------------|--------------------------------------|---|------------|
|                        |                                      |   | Z, K, F, V |
| 1, 2, 4                | Model size                           |   |            |
| 2                      | 2-speed 3 phases 400 V               |   |            |
| 3                      | 3-speed 3 phases 500 V (only size 2) |   |            |
| Functions and features |                                      |   |            |
| Z                      | K                                    | F | V          |



The OSHE switch boxes are equipped with full fuses (motor and heating parts of the unit). All types have the function DSM (radio ripple control technology - night current tariff), further functions do not have to be integrated. These functions can be combined in any way.

Protection class IP 44, voltage 400 V / 50 Hz (500 V / 50 Hz).

The basic offer includes a fully equipped switch box for the execution of all control functions (Z,K,F) with the possibility of shutting down the functions not desired according to the project.

Function "K" - control switch for regulation of secondary-air louvre

Function "K" - control switch for regulation of actuator for mixed-air module

Function „F“ – control lamp and connection for filter differential pressure switch

All OSHE switch boxes enable the set fan speed and the heating section to be activated/controlled by a signal from the room thermostat.

Dimensions 400 x 500 x 155 mm or 500 x 600 x 155 mm (depending on configuration of the control box)

The distances between the openings for hanging the switch box on the wall are shown on the back of the switch box.



## Industrial thermostat

Measurement of room temperature, casing performed in aluminium die-cast / plastic with closed capillary system:

- Sensor coil: V4A steel with a protective cage
- Protection class: IP 54
- Setpoint setting: 0 ... 35 °C
- Switching difference: 0.5 ... 1 K
- Output: change-over contact 15 A ohm. 8 A ind. 250 V

**Type: 902013**





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Air Treatment | Air Movement | Air Diffusion | Air Distribution | Air Filtration  
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