

**MANDIK®**

**WHIRLING AIR OUTFLOW OUTLET  
WITH FIXED BLADES**

**VVPM-E**



These technical specifications state a row of manufactured sizes and versions of whirling air outflow outlet with fixed blades VVPM-E (further only outlets). It is valid for production, designing, ordering, delivery, assembly and operation.

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**■ GENERAL****Description**

Inlet or outlet ceiling whirling outlet with fixed curved blades. Front panel is made from galvanised steel and powder coated standardly in RAL 9010. Front panel are delivered standardly with connecting box from galvanised steel, in case of air inlet could be equipped by perforated dispersion metal sheet or flap in connection flange in box. Front panels are installed in plenum boxes by using of central screw. This product is delivered in only one size – 600. Other sizes are not manufactured.

**Front panel****Connecting box****Material and design**

Front panel are made from galvanised steel. Surface is coated with white baking varnish, shade RAL 9010.

Requirements for other shades of the front panels shall be agreed in advance.

The plenum boxes are made of galvanized steel sheet.

**Services conditions**

Temperature in the place of installation is permitted to range from - 20°C to + 50°C. Outlets are suitable for systems without abrasive, chemical and adhesive particles. Outlets are intended for environment protected against weather impacts with the classification of climatic conditions class 3K5, without condensation, frost, ice formation, and without water even from other sources than rain according to EN 60 721-3-3.

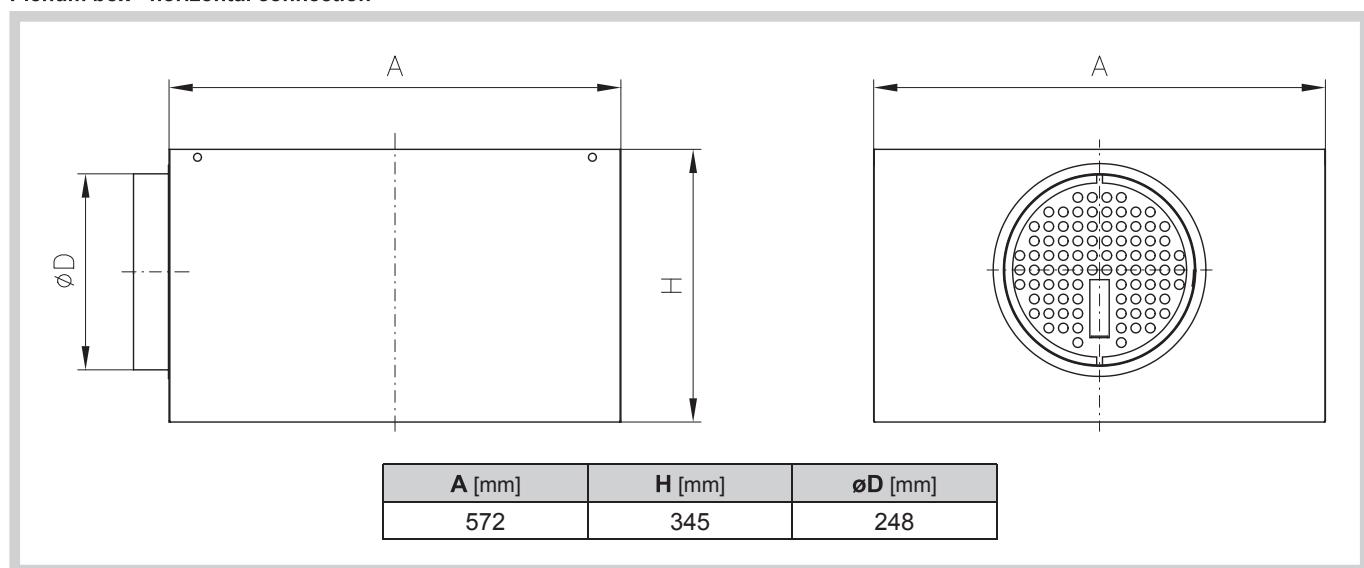
**Installation**

Connecting box is ready to be installed in ceiling. Front panels are installed in plenum boxes by using of central screw.

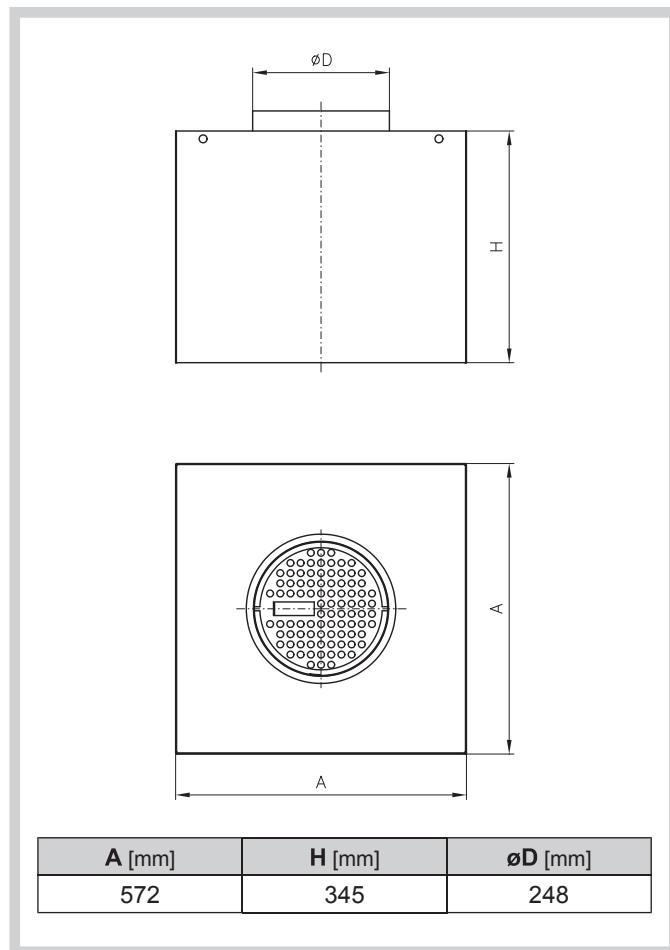
## ■ TECHNICAL DATA

### Dimensions

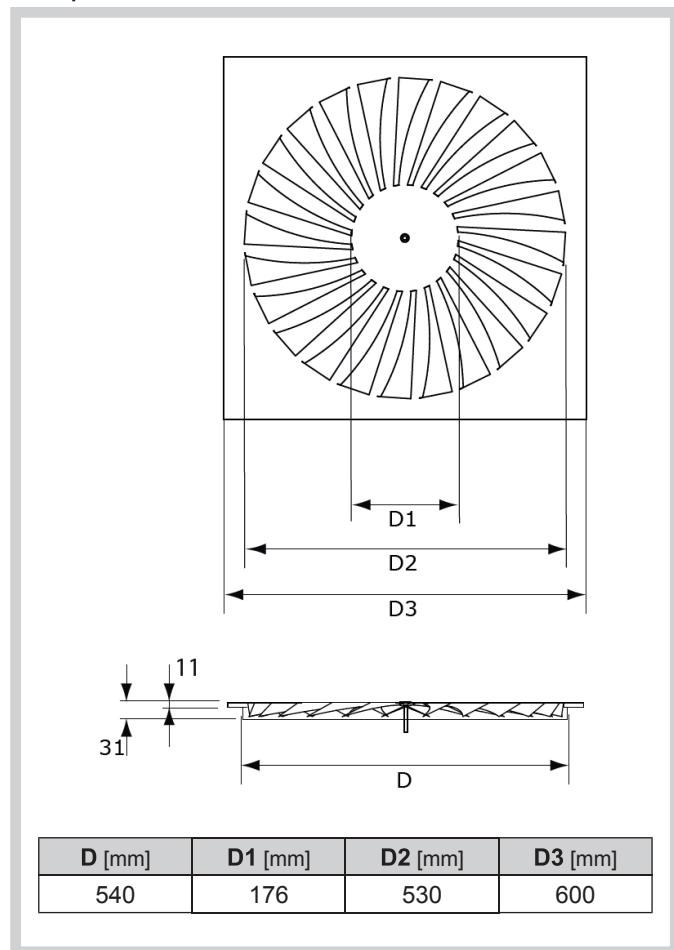
#### Plenum box - horizontal connection



#### Plenum box - vertical connection



#### Front panel



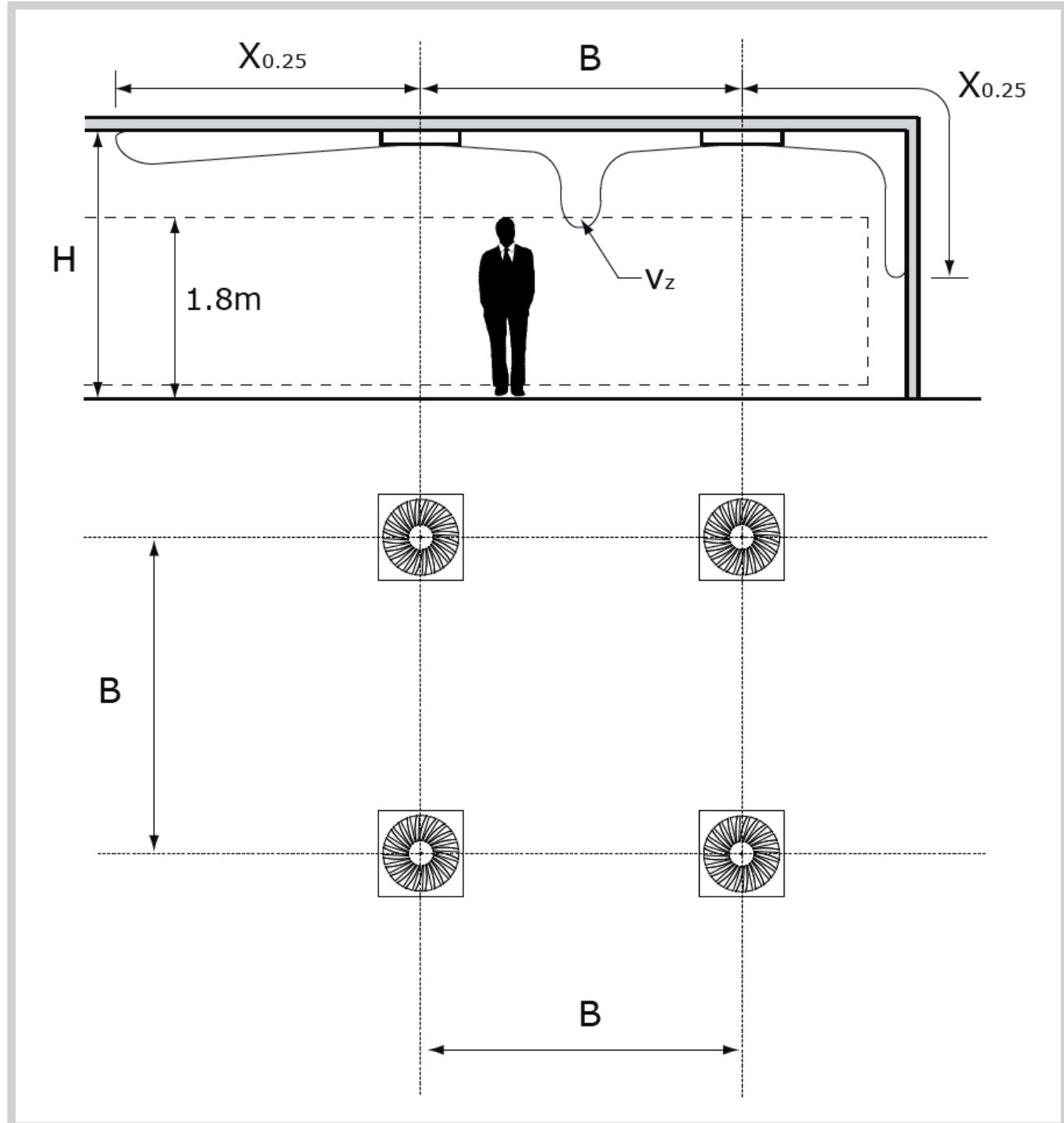
### Weights

Product	Weight [kg]
Front panel	3
Plenum box - horizontal connection	6,4
Plenum box - vertical connection	6,8

## Placement design

Radius of air stream  $X_{0,25}$  corresponds to the length of the air stream with a closing speed of **0,25 m/s** for smooth ceiling without barriers. Values are given for izotermic air flow. The values of the range of air flow for cooling mode when  $\Delta T = -11K$  can be calculated by dividing the value  $X_{0,25}$  by a factor of **1,1**. The value range of a stream of air for heating mode when  $\Delta T = +11K$  can be calculated by multiplying the value  $X_{0,25}$  by a factor of **1,1**. In cases where the requirement of achieving a greater comfort in the residential zone of persons should be draft done, that the required maximum air speed in residential zone was no more than equal to  $V_z$ . Pressure loss values for outlet are considered without flap, or with fully open control valve. For sound power level  $L_w(A)$  is valid the same as for pressure loss and without thinking of the reflection of sound waves in the room. Acoustic output **below 20 dB(A)** is listed in the tabular values such as "**<20**".

Drawing of placement design



## Technical data for the design

VVPM-E 600											
$\dot{V}$ [m <sup>3</sup> /h]	$A_k$ [m <sup>2</sup> ]		0,033			$\dot{V}$ [m <sup>3</sup> /h]	$A_k$ [m <sup>2</sup> ]		0,033		
	$B$ [m]		1,2	2,4	3,6		$B$ [m]		1,2	2,4	3,6
150	$V_z$ [m/s]	$h = 2,7$ [m]	0,16	0,12	0,1	300	$V_z$ [m/s]	$h = 2,7$ [m]	0,31	0,23	0,19
		$h = 3,2$ [m]	0,13	0,1	0,08		$V_z$ [m/s]	$h = 3,2$ [m]	0,24	0,19	0,16
		$h = 3,8$ [m]	0,1	0,08	0,07		$V_z$ [m/s]	$h = 3,8$ [m]	0,19	0,16	0,14
	$V_k$ [m/s]		1,3				$V_k$ [m/s]	2,5			
	$X_{0,25}$ [m]		0,9				$X_{0,25}$ [m]	1,9			
	$P_s$ [Pa]		3				$P_s$ [Pa]	10			
	$L_w(A)$ [dB(A)]		<20				$L_w(A)$ [dB(A)]	27			
	$V_z$ [m/s]	$h = 2,7$ [m]	0,21	0,16	0,13		$V_z$ [m/s]	$h = 2,7$ [m]	0,42	0,32	0,25
		$h = 3,2$ [m]	0,16	0,13	0,11		$V_z$ [m/s]	$h = 3,2$ [m]	0,33	0,26	0,22
		$h = 3,8$ [m]	0,13	0,11	0,09		$V_z$ [m/s]	$h = 3,8$ [m]	0,26	0,22	0,19
200	$V_k$ [m/s]		1,7			400	$V_k$ [m/s]	3,4			
	$X_{0,25}$ [m]		1,2				$X_{0,25}$ [m]	2,7			
	$P_s$ [Pa]		4				$P_s$ [Pa]	18			
	$L_w(A)$ [dB(A)]		<20				$L_w(A)$ [dB(A)]	35			
	$V_z$ [m/s]	$h = 2,7$ [m]	0,26	0,2	0,16		$V_z$ [m/s]	$h = 2,7$ [m]	0,52	0,39	0,31
		$h = 3,2$ [m]	0,2	0,16	0,14		$V_z$ [m/s]	$h = 3,2$ [m]	0,41	0,32	0,27
		$h = 3,8$ [m]	0,16	0,14	0,12		$V_z$ [m/s]	$h = 3,8$ [m]	0,32	0,27	0,23
250	$V_k$ [m/s]		2,1			500	$V_k$ [m/s]	4,2			
	$X_{0,25}$ [m]		1,6				$X_{0,25}$ [m]	3,5			
	$P_s$ [Pa]		7				$P_s$ [Pa]	27			
	$L_w(A)$ [dB(A)]		22				$L_w(A)$ [dB(A)]	40			

## Legend:

 $\dot{V}$  - air volume flow rate for one outlet [m<sup>3</sup>/h] $A_k$  - effective area [m<sup>2</sup>] $B$  - distance between two outlets [m] $H$  - height of outlet installation [m] $V_z$  - maximum speed on limit of occupied zone of persons depending on distance between outlets B and installation height H [m/s] $V_k$  - average speed of air in effective area of outlet [m/s] $X_{0,25}$  - radius of air stream for final speed  $v_t = 0,25$  m/s [m] $P_s$  - pressure loss [Pa] $L_w(A)$  - level of acoustic output [dB(A)]

## ■ PACKING, TRANSPORTATION, TAKE-OVER, STORAGE AND GUARANTY

## Logistic terms

The outlets are delivered in cardboard packaging. They are transported in bulk by common means of transport. If agreed with the customer, the outlets can be delivered on pallets. When handling during transport or storage, the outlets must be protected against mechanical damage and weather effects.

If it is not in order determined method of acceptance, acceptance will be treated as transmission of the outlets to the carrier.

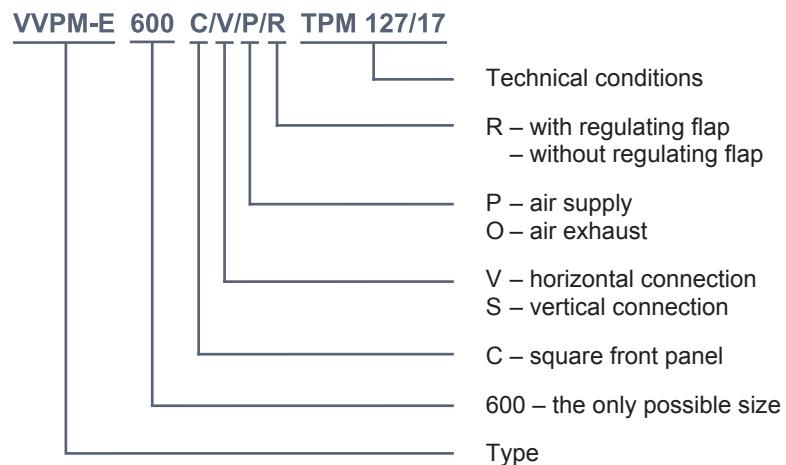
The outlets must be stored in closed rooms, in environment without aggressive vapours, gases and dust. The temperature in the rooms must be maintained from -5 to +40°C and relative humidity max. 80%.

## Guaranty

The manufacturer provides guaranty to outlets for the period of 24 months from the date of shipment.

The warranty becomes invalid when the outlets are used for other purposes, other equipment and working conditions than those permitted by this standard or also after mechanical damage during handling.

When experiencing damage to the outlets during the transport, it is necessary to complete a protocol at the moment of acceptance, i.e. the protocol completed together with a carrier for ensuring possibility of subsequent complaints.

**■ ORDERING KEY**

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