

VENTILATION AND AIR-CONDITIONING SYSTEMS

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VENTILATION SYSTEMS



Fan units are equipped with fan mode switch:
 I - continuous work,
 0 - fans disabled,
 II - thermostat control.
 Includes socket for thermostat connection. Thermostat is ordered separately.



PW fan units - 19" assembly

Fan units 1 U high, intended for assembly on 19" mounting profiles or in 19" swing frames.

TECHNICAL DATA:

Parameter	Type of fan unit			
	PW-1.2T	PW-1.3T	PW-2.4T	PW-2.6T
Power supply	230 V, 50 Hz			
Rated current [A]	0.28	0.42	0.56	0.84
Number of fans	2	3	4	6
Power rating [W]	44	66	88	132
Capacity [m ³ /h]	330	495	660	990
Ambient temperature [°C]	from -10 to +70			
Relative humidity [%]	from 20 to 80			
Protection degree	IP 20			
Electric shock protection	neutralization			

Material of enclosure:

Rear part - sheet steel, front panel - sheet aluminium

Enclosure colour:

Light grey (RAL 7035) or black (RAL 9005)

Scope of delivery:

Fan unit with power supply cable without plug and with fixing accessories.

Thermostat is ordered separately - see below.

Type of fan unit	Number of fans	Depth [mm]	Catalogue number	
			RAL 7035	RAL 9005
PW-1.2T	2	180	WZ-5606-25-02-011	WZ-5606-25-02-161
PW-1.3T	3	180	WZ-5606-05-02-011	WZ-5606-05-02-161
PW-2.4T	4	350	WZ-5606-35-02-011	WZ-5606-35-02-161
PW-2.6T	6	350	WZ-5606-10-02-011	WZ-5606-10-02-161

Package: 1 pc.

Thermostat for PW fan units

KTS 1141 thermostat with cable and plug.

Detailed description of the thermostat: see page 189.

Package	Catalogue number
1 pc.	WN-0201-12-00-000



VENTILATION SYSTEMS

PWD and PD roof fan units

PWD-4W and PWD-2W fan units are intended for assembly to 380 x 380 mm openings which are located in the top plates of SZB, OTS1, SZB SE nad DC cabinets. The PD-2W fan unit can be assembled to the 380 x 210 mm opening in the top plate of SZB SE and DC cabinets.

In the standard version, the units are equipped with 2 or 4 fans, an illuminated switch and a fuse.

TECHNICAL DATA:

Parameter	Type of fan unit		
	PWD-4W	PWD-2W	PD-2W
Power supply	230 V, 50 Hz		
Rated current [A]	0.56	0.28	0.28
Number of fans	4	2	2
Power rating [W]	88	44	44
Capacity [m ³ /h]	660	330	330
Ambient temperature [°C]	from -10 to +70		
Relative humidity [%]	from 20 to 80		
Protection degree	IP 20 (refers to fan units mounted in the cabinet)		
Electric shock protection	neutralization		

Material of enclosure:

PWD-4W and PWD-2W fan units - plastic
 PD-2W fan unit - sheet steel

Enclosure colour:

Light grey (RAL 7035) or black (RAL 9005)

Scope of delivery:

Fan unit with power cable (without plug) and fixing accessories.

Fans used in fan units:

PW, PWD and PD fan units are provided with high quality fans with ball bearings.

TECHNICAL DATA OF ONE FAN:

- voltage rating230 V
- frequency50 Hz
- power rating 22 W
- rated current 0.14 A
- speed of rotation 2850 1/min
- level of noise ca. 45 dB
- pressure 75 Pa
- capacity 165 m³/h
- durability min. 50 000 h
- dimensions 119 x 119 x 38 mm

Type of fan unit	Number of fans	For opening's dimensions [mm]	Possibility of controlling fan units by MPSK G0* panels	Catalogue number	
				RAL 7035	RAL 9005
PWD-4W	4	380 x 380	YES	WN-0200-06-01-011	WN-0200-06-01-161
PWD-4W with integrated thermostat	4	380 x 380	NO	WN-0200-06-04-011	WN-0200-06-04-161
PWD-2W	2	380 x 380	NO	WN-0200-07-01-011	WN-0200-07-01-161
PD-2W	2	380 x 210	NO	WN-0200-03-00-011	WN-0200-03-00-161

Package: 1 pc.

*) Microprocessor panel for fan control - see page 187.



VENTILATION SYSTEMS



PWS2 fan mounted on SZB SE server cabinet

PWS2 roof fan

The PWS2 fan is designed for high-ventilation demand cabinets installed in areas with low noise level requirements. **It emits more than one third less noise and saves up to 60 % of energy when compared with PWD-4W four-fan ventilation roof panel.**

Mechanically, it is adapted for mounting in 380 x 380 mm standard hole which is located in the top plate of SZB, OTS1, SZB SE, DC and SZE2 cabinets. The fan can be connected directly to the 230 V AC grid or via a speed controller which can adjust air flow and thus the noise. The fan is covered with a steel grille as standard. Optionally, it can be fitted with a discharge stack for connecting it to the customer's air ducts.

Design:

Rotor and the fan plate are made of RAL 9005 sheet steel. The fan uses a single-phase asynchronous motor with built-in thermal protection.

PWS2 fan can be controlled with:

- KTS thermostat (see page 189)
- ARO 0.6 speed controller (see page 186)
- MPSK G0 microprocessor panel for fan control (see page 187)
- MPSM-S1 microprocessor power control panel (see page 142)

Technical data:

Supply 230 V, 50 Hz
 Power 0.088 kW
 Maximum speed 1350 RPM
 Operating parameters at maximum speed:
 Efficiency 3600 m³/h
 Compression 58 Pa
 Noise 64 dB
 Ambient humidity 20 up to 85 %
 Permissible temperature of forced air -20 up to +80 °C
 Motor protection class IP 44
 Body protection class IP 20
 External dimensions (H x W x D) 182 x 405 x 405 mm

Scope of delivery:

Fan with power cord without plug, protective grille and fixing accessories for mounting on top of a cabinet, installation and operating instructions.

Product name	Package	Colour	Catalogue number
PWS2 roof fan	1 pc.	RAL 9005	WZ-6647-30-00-161



VENTILATION SYSTEMS

PWS2 FAN EFFICIENCY AND NOISE LEVEL

Noise is generated in fans both mechanically and aerodynamically. The mechanical method mainly depends on the fan rotational speed.

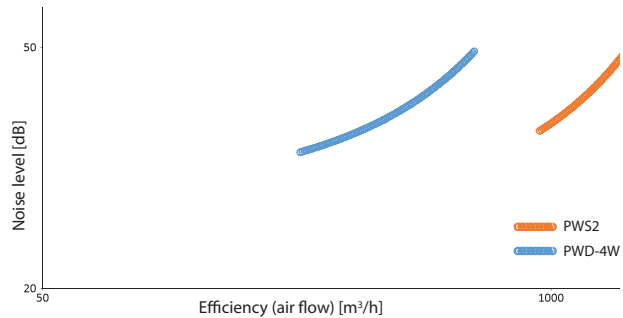
Noise level is a derivative of speed. By reducing the speed of the rotor, you can limit the noise emission significantly. PWS2 fan with max. efficiency of 3600 m³/h at rated speed of 1350 RPM emits noise of 64 dB. By reducing the rotational speed, let us say, by half, you get air flow of approximately 1800 m³/h and noise emissions below 38 dB, making the device virtually inaudible.

The actual noise generated by the fan increases logarithmically. The increase in noise by one decibel is, in fact, an increase of 26 % compared to the previous state. So noise increases twofold average every 3 dB. By slowing the fan down to the minimum speed, the noise generated is almost inaudible. This fan is ideal for office applications.

The scale of noise with sample sound sources:

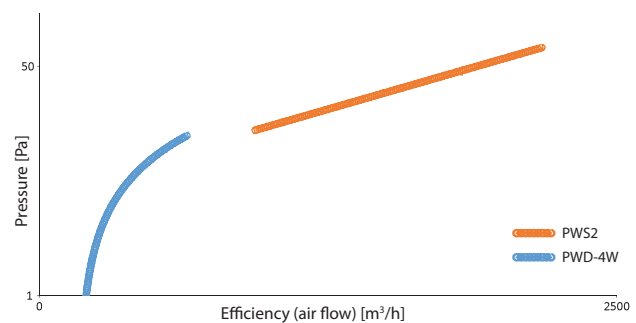
- 0 dB – threshold of audibility
- 10 dB – leaves rustling in a mild breeze
- 20 dB – whisper
- 30 dB – very quiet street with no traffic
- 40 dB – murmur in the house
- 50 dB – noise in offices
- 60 dB – vacuum cleaner
- 70 dB – inside a loud restaurant, tearing a paper, inside a car

NOISE EMISSION



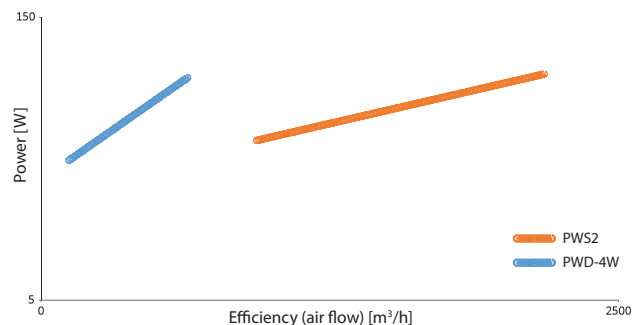
PWS2 fan emits more than one third less noise than the PWD-4W ventilation panel.

PRESSURE



Compared to PWD-4W ventilation panel, PWS2 fan generates as much as twice higher pressure with airflow being 5 times higher.

ENERGY CONSUMPTION



With more than twice higher air flow, PWS2 fan saves up to 60 % energy.



VENTILATION SYSTEMS



Server cabinet with ventilated rear door

Ventilated door

Ventilated door effectively enhance heat dissipation from server cabinets with the use of three fans. Given their intended use, ventilated door is mounted on the back of the server cabinet, and for safety reasons fans are located in a special enclosure, discharging air to the top.

Enclosure material:

Powder-painted steel sheet

Scope of delivery:

Complete door with a set of fans.

For cabinet		Catalogue number	
height	width	RAL 7035	RAL 9005
42 U	800	WZ-3174-03-02-011	WZ-3174-03-02-161
	600	WZ-3174-03-01-011	WZ-3174-03-01-161
45 U	800	WZ-3174-03-04-011	WZ-3174-03-04-161
	600	WZ-3174-03-03-011	WZ-3174-03-03-161
47 U	800	WZ-3174-03-06-011	WZ-3174-03-06-161
	600	WZ-3174-03-05-011	WZ-3174-03-05-161

Package: 1 pc.



ARO 0,6 speed controller

ARO 0.6 autotransformer controller is used to manually adjust speed of the PWS2 fan. It has 2nd insulation class and IP-52 protection class, max. ambient temperature is 40 °C, whereas thermal insulation class B (130 °C).

It has five-step transformer speed control so you can adjust the fan speed and also the noise generated by the PWS2 fan. The first 4 control steps are designed to achieve a compromise between performance and noise, while with the 5th step you can make use of fan's full power. The controller is very well matched to supply network and the fan (no adverse impact on the grid). It has a resettable thermal switch (90 °C).

Made in line with PN-EN 61558-2-13. To be mounted on a mounting plate or on the DIN rail. The controller can be mounted on 19" mounting profiles with PS-3U panel (see page 156; PS-3U panel not included in the controller's scope of delivery).

TECHNICAL DATA

Supply230V, 50 Hz
 Current0.5 A

Scope of delivery:

- ARO 0.6 controller,
- operating manual.

Product name	Package	Catalogue number
ARO 0,6 speed controller	1 pc.	WZ-6647-30-01-000



MPSK G0 microprocessor panel for fan control

Application:

Microprocessor panel for fan control is designed for measurement, control and automatic cabinet temperature maintenance at the pre-set threshold in 19" cabinets.

Principle of operation:

Panel temperature sensor continuously monitors and compares current temperature with pre-set threshold value, and causes switch on the fans of alternating current in four sequences.

Function possibilities:

- continuous temperature measurement,
- automatic fan selection for maintenance of pre-set parameters,
- possibility of service from PC by using RS 232 interface (data transmission in both directions),
- memory storage of pre-set parameters in case of power supply interruption.

Scope of delivery:

Microprocessor panel for fan control, temperature sensor with 2 m cable, fixing accessories.

Software for communication with the MPSK G0 panel via a serial port can be downloaded from our web site at www.zpas.pl

Product name	Package	Colour	Catalogue number
MPSK G0 microprocessor panel for fan control with temperature sensor	1 set	RAL 7035	WZ-SB66-00-00-011
		RAL 9005	WZ-SB66-00-00-161

TECHNICAL DATA:

Temperature measurement:

- measurement range from +5 °C to +80 °C,
- indication resolution ± 1 °C,
- measuring accuracy ± 1 °C.

Setting parameters:

- control range of pre-set temperature threshold value from ± 5 °C to +80 °C,
- tolerance range from the temperature threshold value from +1 °C to +10 °C,
- delay range of switching on/off fans from 1 s to 99 s,
- recovery time from the setting function to measurement: 10 s.

Displaying of measuring parameters:

Two-digit module LED:

- digits' height 14 mm,
- green colour,
- improved quality.

Housing form:

- 19" panel 1 U height, light grey colour (RAL 7035) or black (RAL 9005).



MPSK G0 mikroprocessor panel for fan control



Communication protocol with computer:

Parameters of RS 232 interface:

- transmission speed rate 9600 b/s,
- 8 bits, without even parity bit,
- 1 stop bit.

Temperature sensor:

Miniature, fixed to metal structure by means of latch, cable length - 2 m.

Fan connections:

- number of inputs - 4 mikroprocesorem,
- power supply - 230 V, 50 Hz,
- input's power carrying capacity - 100 W.

Power supply of the panel: 230 V; 50 Hz

Max. power consumption: 2 W



VENTILATION SYSTEMS



MFR 012i hygrostat

Scope of delivery:

- hygrostat MFR 012i,
- DIN rail,
- two holders,
- two screw clampse.

Hygrostat

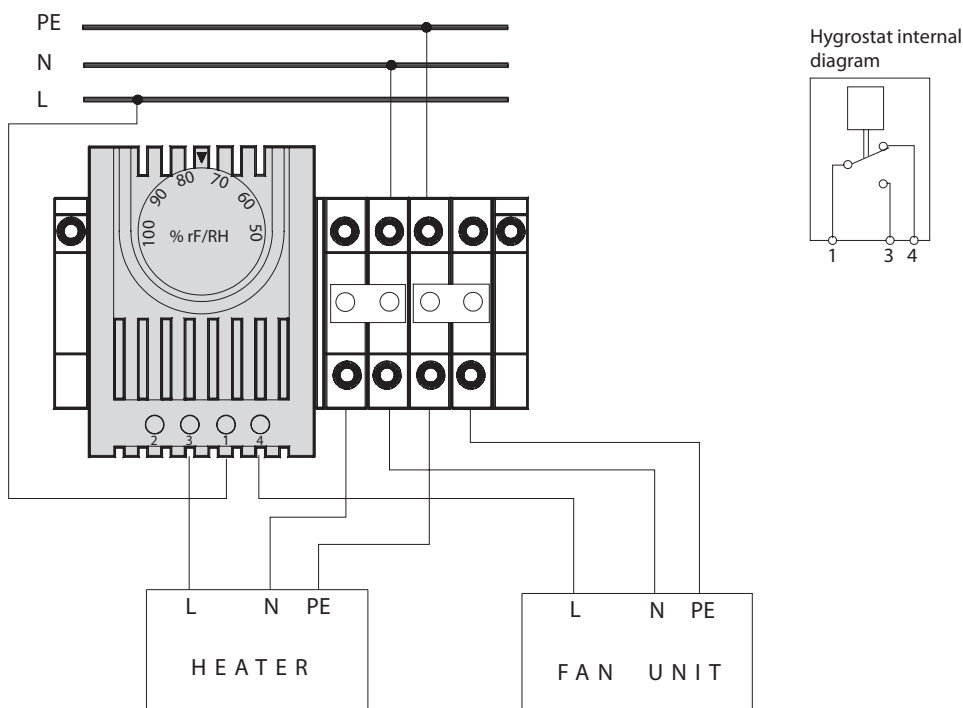
Electric regulator of humidity controls air humidity, switches on fans, heaters or air conditioning units.

TECHNICAL DATA

- Measuring range:
50-100 % of relative humidity
- Measuring accuracy:
±3% of relative humidity
- Operating range:
50-90% of relative humidity
- Deviation of switching referred to 50 % of relative humidity:
about 4% of relative humidity
- Maximum voltage:
250 V AC.
- Minimum load:
100 mA 20 V DC/AC
- Maximum load:
resistive 5 A 230 V
inductive $\cos \varphi = 0.8$: 0.2 A 230 V AC
inductive L/R = 3 ms: 1 A to 50 V DC
0.5 A to 75 V DC

Hygrostat	Package	Catalogue number
MFR 012i	1 pc.	WN-0201-03-00-000/A

CONNECTION DIAGRAM



VENTILATION SYSTEMS

Thermostat

Thermostats are used for controlling fan units, heaters and heat exchangers; they can also be used as signal generators for monitoring the internal temperature of the enclosure.

TECHNICAL DATA

- Sensor element:
thermal bimetal
- Temperature range:
0-60°C, hysteresis ca. 7 °C
- Contact types:
snap action contact
- Power carrying capacity:
6 A (1) 250 V AC
- Radio frequency interference:
N (according to VDE 0875)

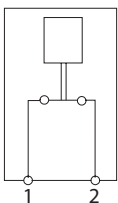


KTS 1141 - thermostat normally open
Switches on ventilation system (e. g. fans)
at selected temperature limit.

Type of thermostat	Colour of handwheel	Package	Numer katalogowy
KTO 1140 - normally closed	●	1 pc.	WN-0201-01-00-000/A
KTS 1141 - normally open	●	1 pc.	WN-0201-02-00-000/A

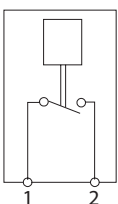
CONNECTION DIAGRAM

Integral diagram of KTO 1140 thermostat (normally closed)

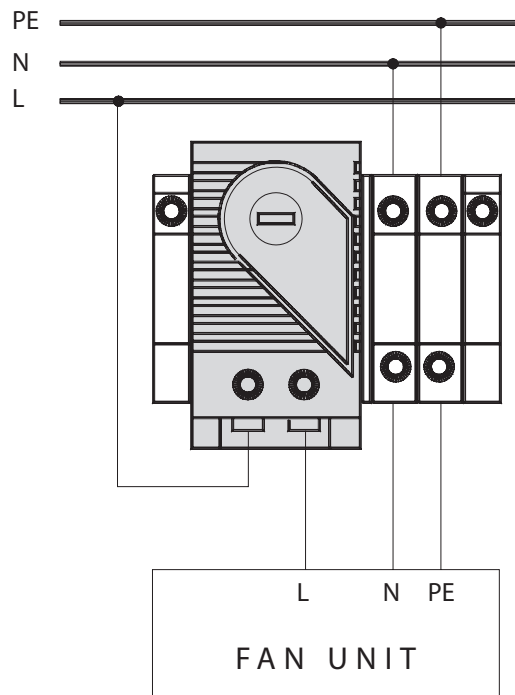


KTO 1140 switches off devices (e. g. heaters) at selected temperature limit

Integral diagram of KTS 1141 thermostat (normally open)



KTS 1141 switches on ventilation system (e. g. fans) at selected temperature limit.



AIR-CONDITIONING SYSTEMS

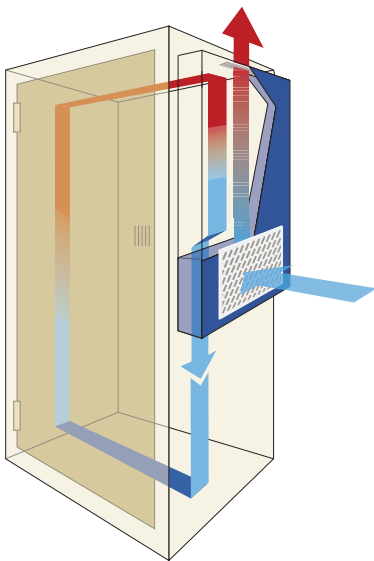


In Data Center facilities the right temperature, humidity and quality of air delivered by precision cooling devices are the most important factors ensuring operational continuity of computational units. Precision air conditioning is essential for providing proper microclimate 24 hours a day throughout the year.

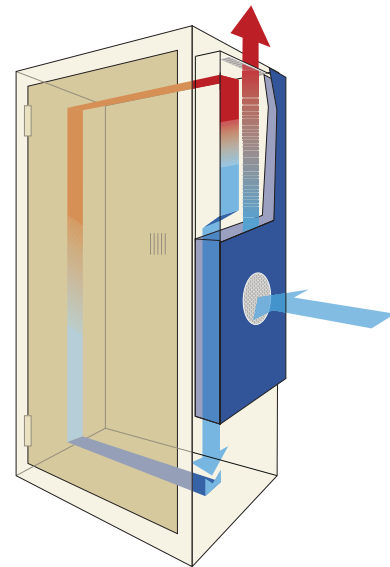
ZPAS precision air conditioning portfolio can be divided according to air flow concepts and cooling agent. Our offer encompasses both air conditioners for single cabinets, as well as precision air-conditioning cabinets for server rooms.

Separate air-conditioning units

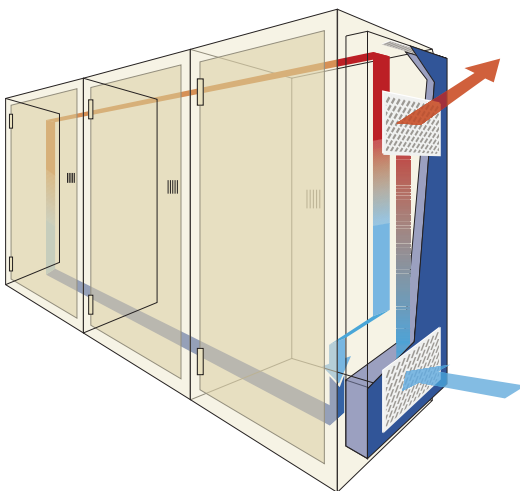
Separate air-conditioning units make up a group of air-conditioning equipment designed for RACK type cabinets. Separate air-conditioning units make additional devices delivering air into the cabinet unnecessary.



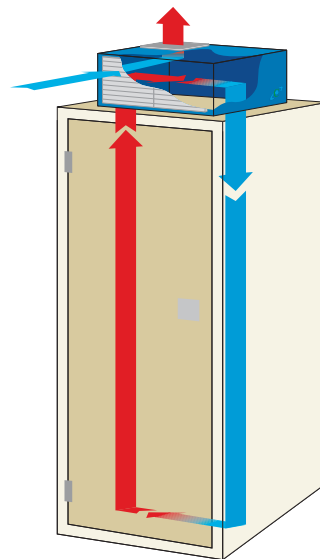
PROTHEM
Air-conditioning unit mounted on the cabinet's side panel Cooling capacity ranging from 330 to 4000 W



SLIM
Air-conditioning unit mounted on the cabinet's door or side panel Cooling capacity: from 500 to 3000 W



MODULE
Air-conditioning unit intended for cooling more than one cabinet. Mounted on the side of a system of combined cabinets. Cooling capacity ranging from 5800 to 10000 W



TOP
Rooftop air-conditioning unit Cooling capacity ranging from 330 to 5200 W

