

USER'S OPERATION MANUAL

PA W



Air supply unit



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INTRODUCTION

The present user's operation manual contains technical description, data sheet, installation and mounting guidelines for the air supply unit PA W, VENTS series (hereinafter referred as the unit).

USE

The unit is designed for supply of intake warmed up air into cottages, offices, hotels, cafes, conference halls and other domestic and public premises.

The unit is a component unit and is not designed for independent operation.

Transported medium must not contain any flammable or explosive mixtures, evaporation of chemicals, coarse dust, soot and oil particles, sticky substances, fibrous materials, pathogens or any other harmful substances.



The unit is not designed to be used by children, physically or mentally disabled persons, persons with sensory disorder, persons with no appropriate experience or expertise.

The unit may be operated by qualified experts after appropriate instruction about its use and operation.

Install the unit to be out of reach of children.

DELIVERY SET

- Unit - 1 item;
- User's manual - 1 item;
- Transport packing: wooden box - 1 item.

DESIGNATION KEY

PA - XX - WX 3

Number of power supply phases

Heater type

W2 - 2-row water heater

W3 - 3-row water heater

W4 - 4-row water heater

Air capacity [m³/h]

01, 02, 03, 04

Unit type

PA - air supply unit

MAIN TECHNICAL DATA

The unit is designed for indoor application with the ambient temperature ranging from -25°C to $+55^{\circ}\text{C}$ for the units PA 01 W2 and PA 01 W4, from -25°C to $+45^{\circ}\text{C}$ for the units PA 02 W2, PA 02 W4, PA 03 W2 and PA 03 W4, from -25°C to $+70^{\circ}\text{C}$ for the units PA 04 W2 and PA 04 W3 at relative humidity up to 80%.

Ingress Protection (IP) rating from solid objects and liquids:

- IP 44 for the unit motors;
- IP 22 for the assembled unit connected to the air ducts.

The unit series designation, main overall and connecting dimensions, external view are shown in fig. 1 and in table 1. For the technical data, refer to the table 2.

The unit design is regularly being improved, so some models can slightly differ from those ones described in this manual.

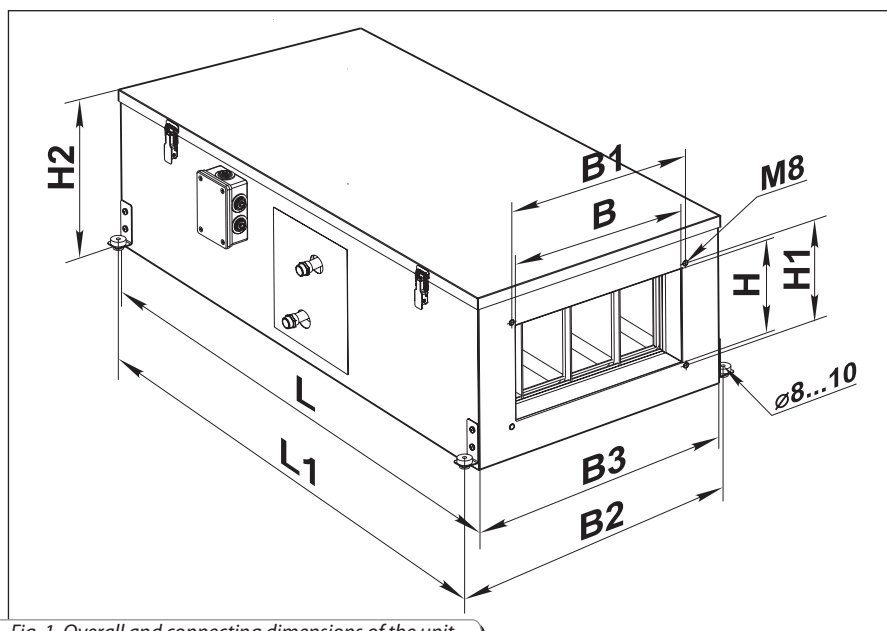


Fig. 1. Overall and connecting dimensions of the unit

Table 1. Overall and connecting dimensions of the unit

Type	Dimensions [mm]								
	B	B1	B2	B3	H	H1	H2	L	L1
PA 01 W	400	420	624	582	200	220	374	1145	1106
PA 02 W	500	520	689	646	300	320	447	1250	1212
PA 03 W	600	620	787	744	350	370	500	1252	1212
PA04 W	700	720	888	844	400	420	546	1302	1262

Table 2. Unit technical data

Type	PA 01 W2	PA 01 W4	PA 02 W2	PA 02 W4	PA 03 W2	PA 03 W4	PA 04 W2	PA 04 W3
Voltage, 50 Hz [V]	3 ~ 400							
Max. fan power [W]	320		620		1330		2300	
Fan current [A]	0,55		1,05		2,4		4,3	
Number of water heating rows	2	4	2	4	2	4	2	3
Total unit power [W]	0,32		0,62		1,33		2,30	
Total unit current [A]	0,55		1,05		2,4		4,3	
Max. air capacity, m ³ /h	1200		2350		3260		4100	
Rotation speed [min ⁻¹]	up to 2700		up to 2690		up to 2730		up to 2840	
Noise level, 3 m [dB(A)]	51		54		57		75	
Max. transported air temperature [°C]	from -25 to +55		from -25 to +45				from -25 to +70	
Casing material	Aluzinc							
Insulation	50 mm mineral wool							
Filter	Pocket G4(F7)*							
Connected air duct diameter [mm]	400x200		500x350		600x350		700x400	
Weight [kg]	55	57	61	63	91	94	107	110

* - option

The main technical data of the water heaters integrated into the units are shown in diagrams 2, 3, 4, 5, 6, 7, 8).

The basic thermal dynamic characteristics of the water heater for the units PA 01 W2 are stated in fig. 2.

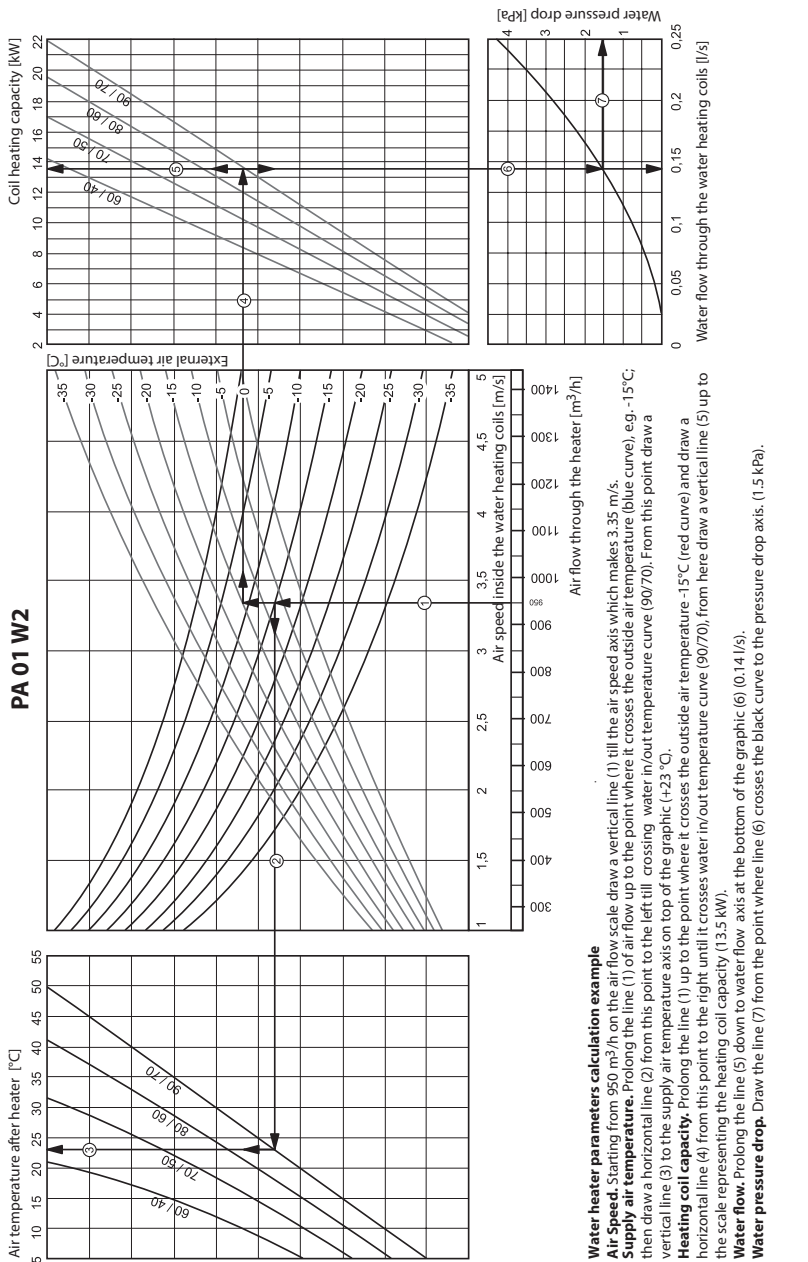


Fig. 2 Calculation of water heater parameters

Performance chart for the water heater parameters of the unit PA 01 W4 is shown in fig. 3.

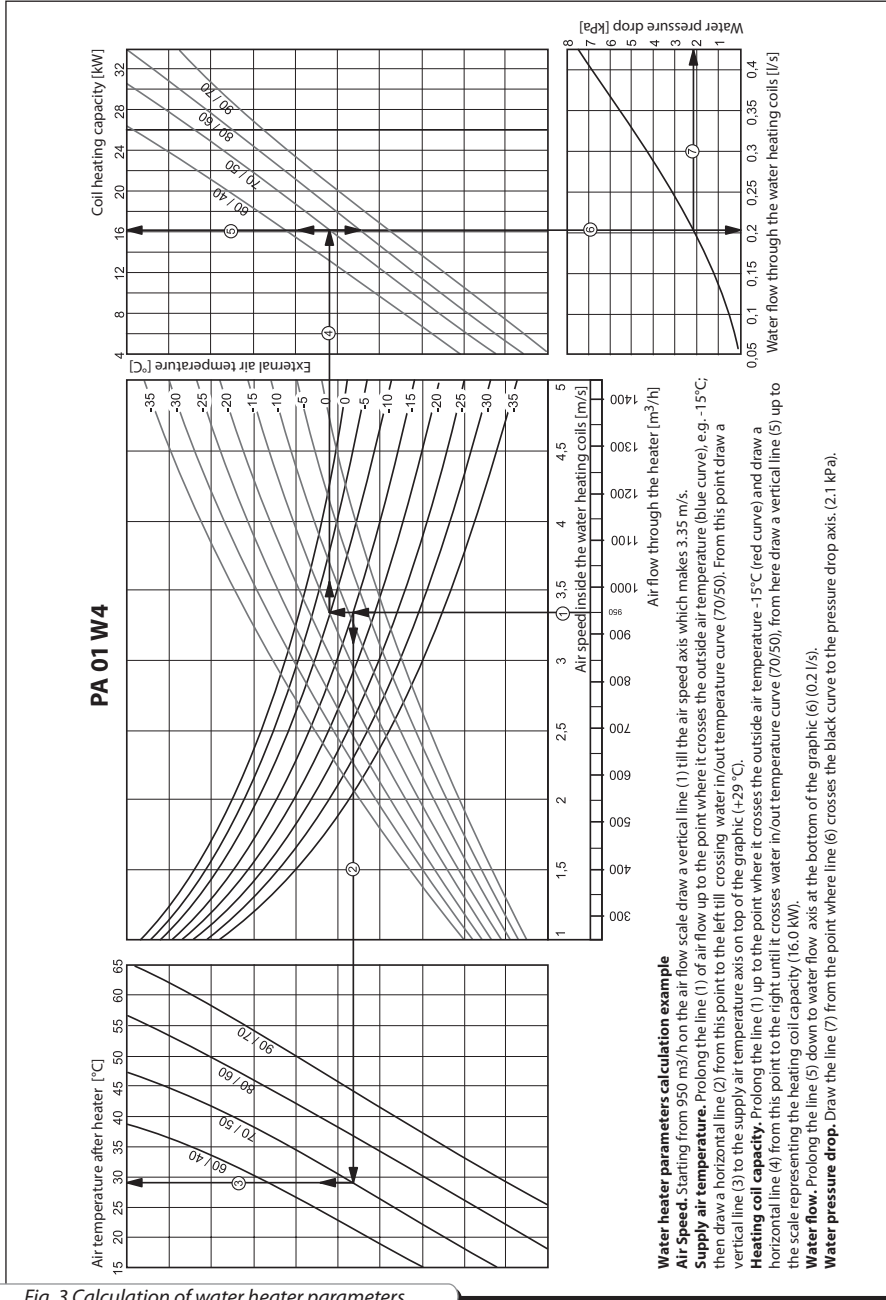


Fig. 3 Calculation of water heater parameters

Performance chart for the water heater parameters of the unit PA 02 W2 is shown in fig. 4.

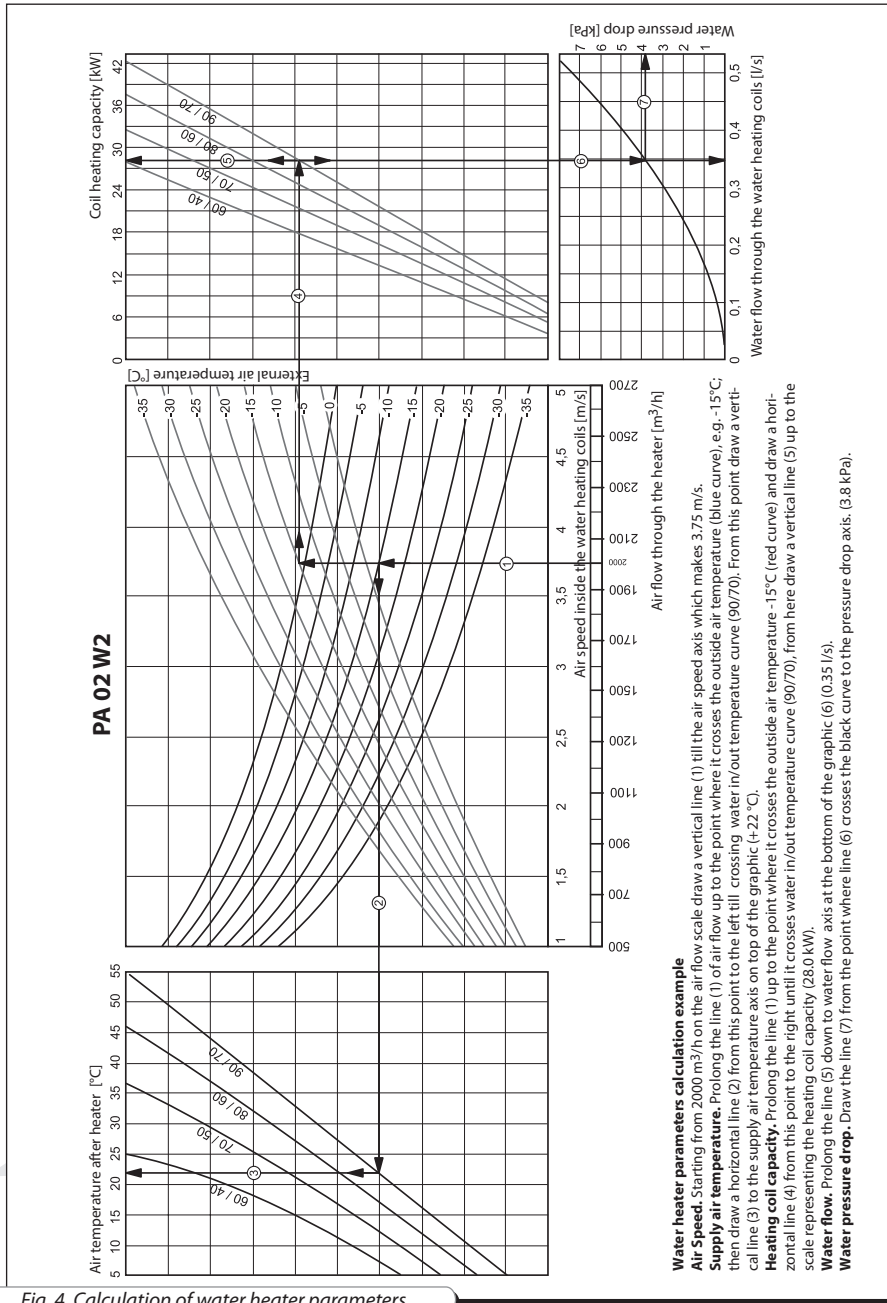


Fig. 4. Calculation of water heater parameters

Performance chart for the water heater parameters of the unit PA 02 W4 is shown in fig. 5.

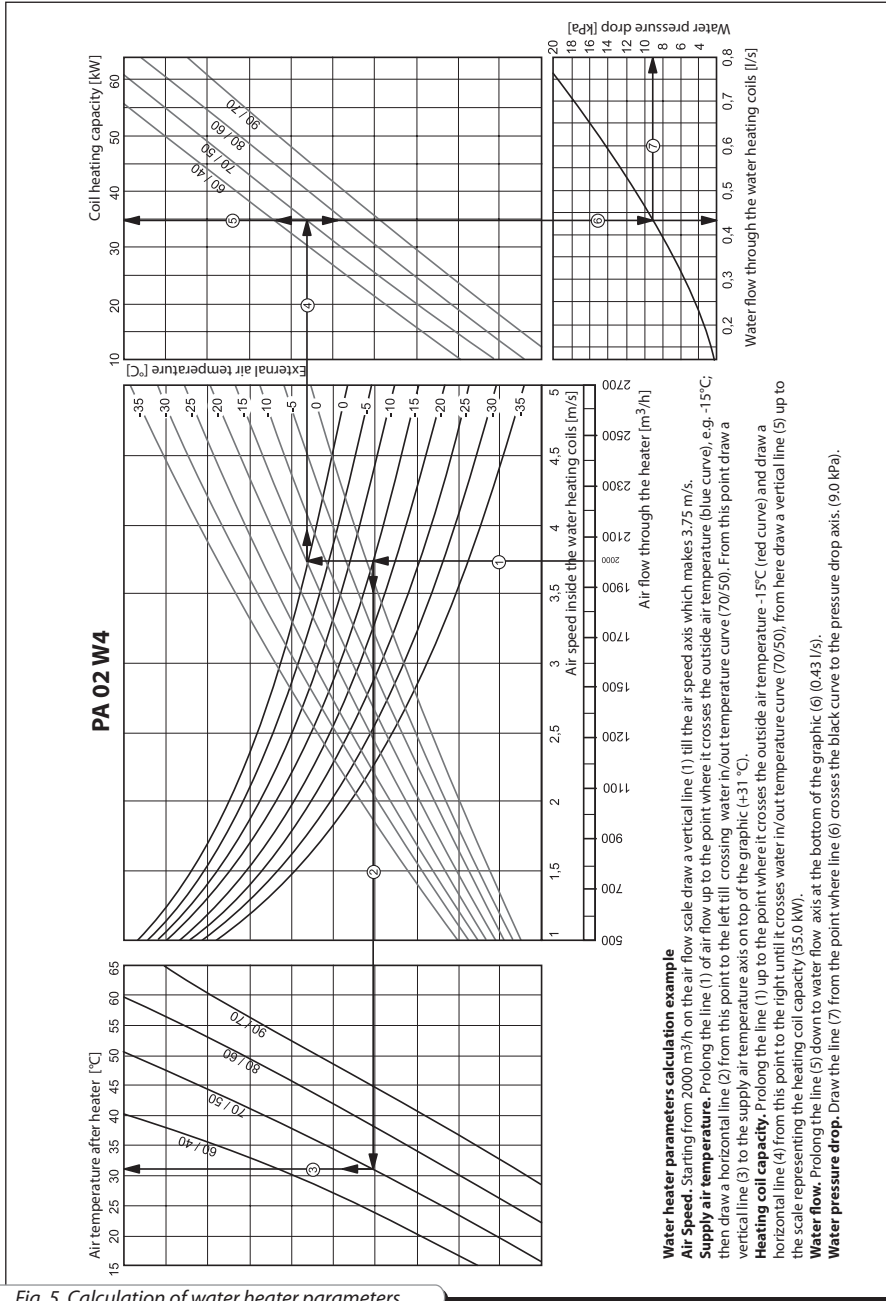


Fig. 5. Calculation of water heater parameters

Performance chart for the water heater parameters of the unit PA 03 W2 is shown in fig. 6.

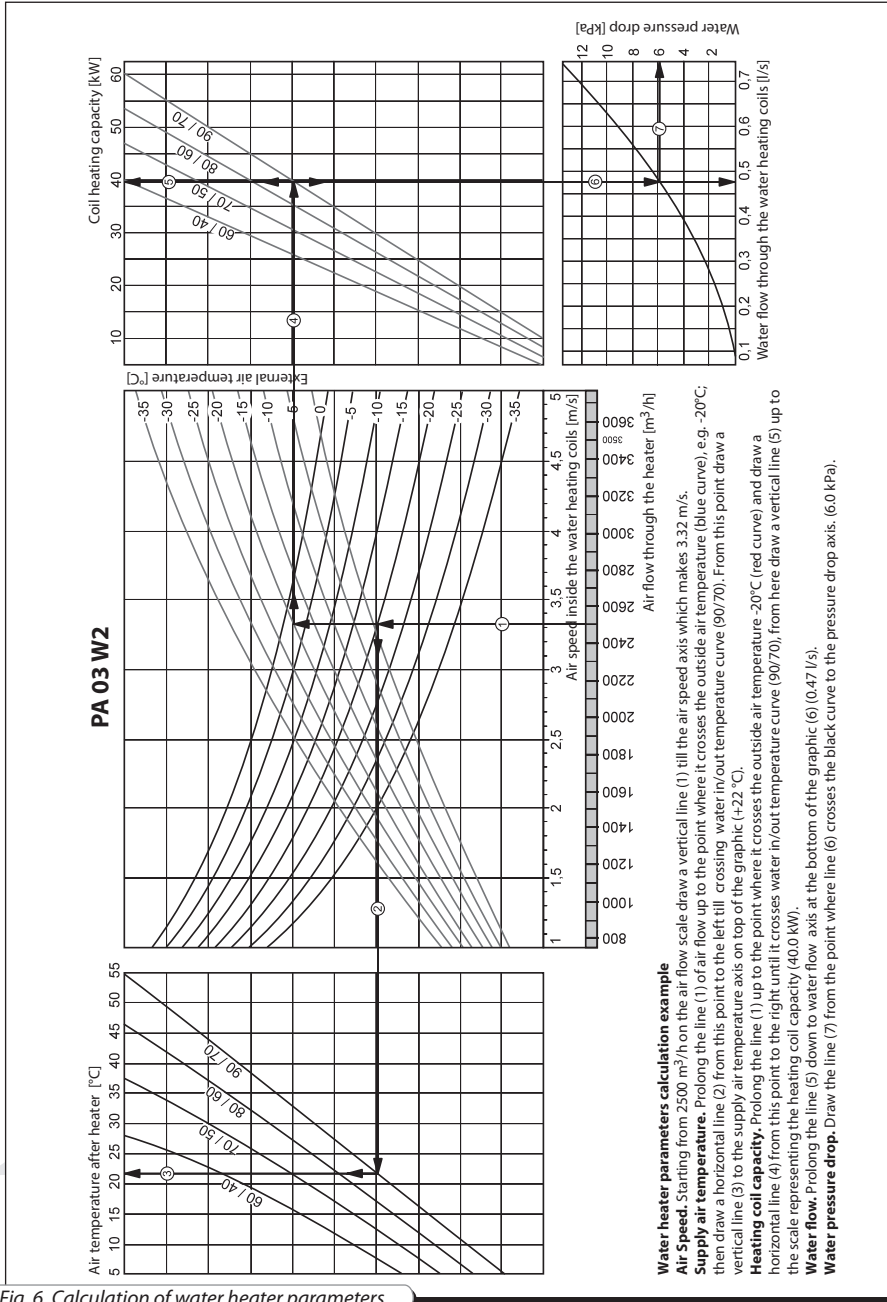


Fig. 6. Calculation of water heater parameters

Performance chart for the water heater parameters of the unit PA 03 W4 is shown in fig. 7.

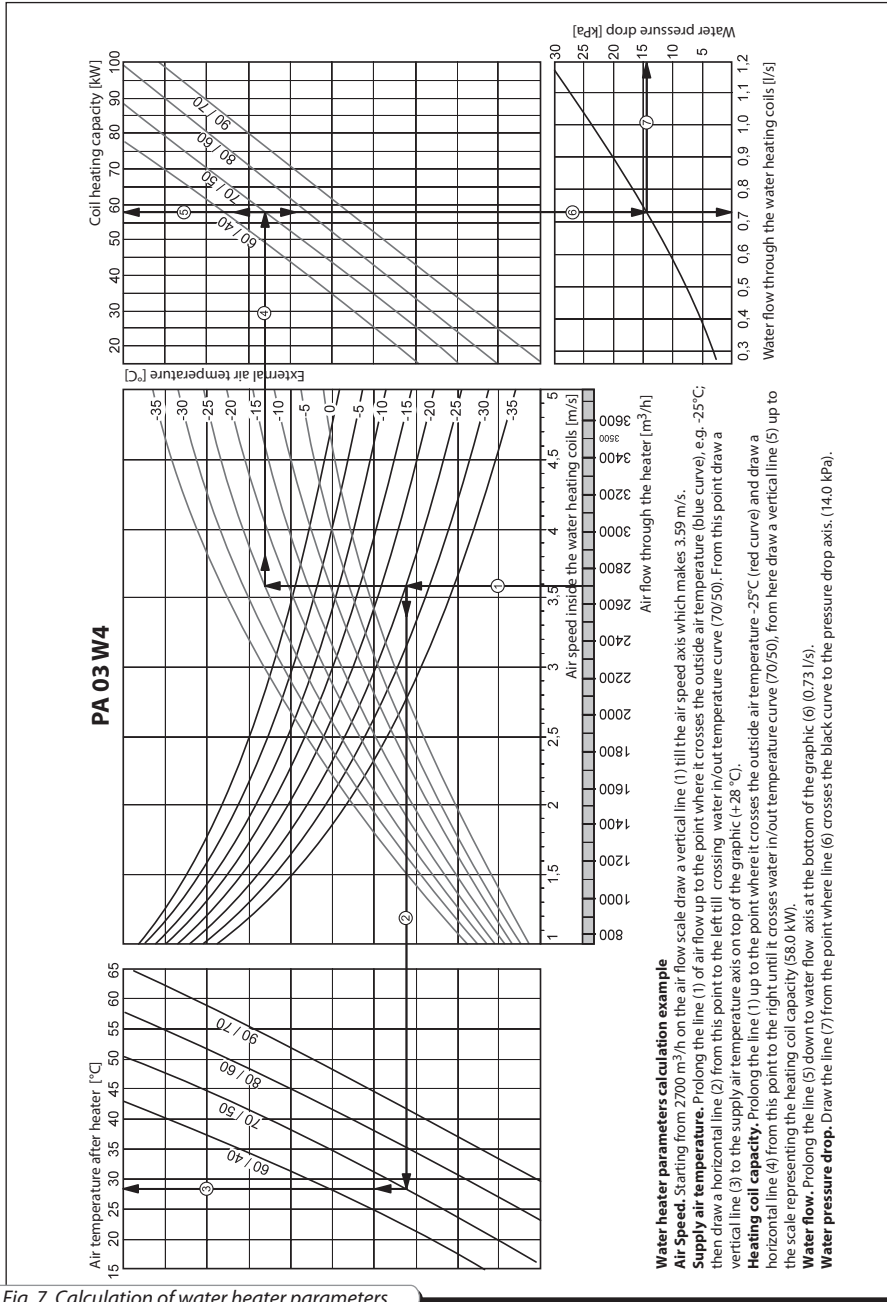


Fig. 7. Calculation of water heater parameters

Performance chart for the water heater parameters of the unit PA 04 W2 is shown in fig. 8.

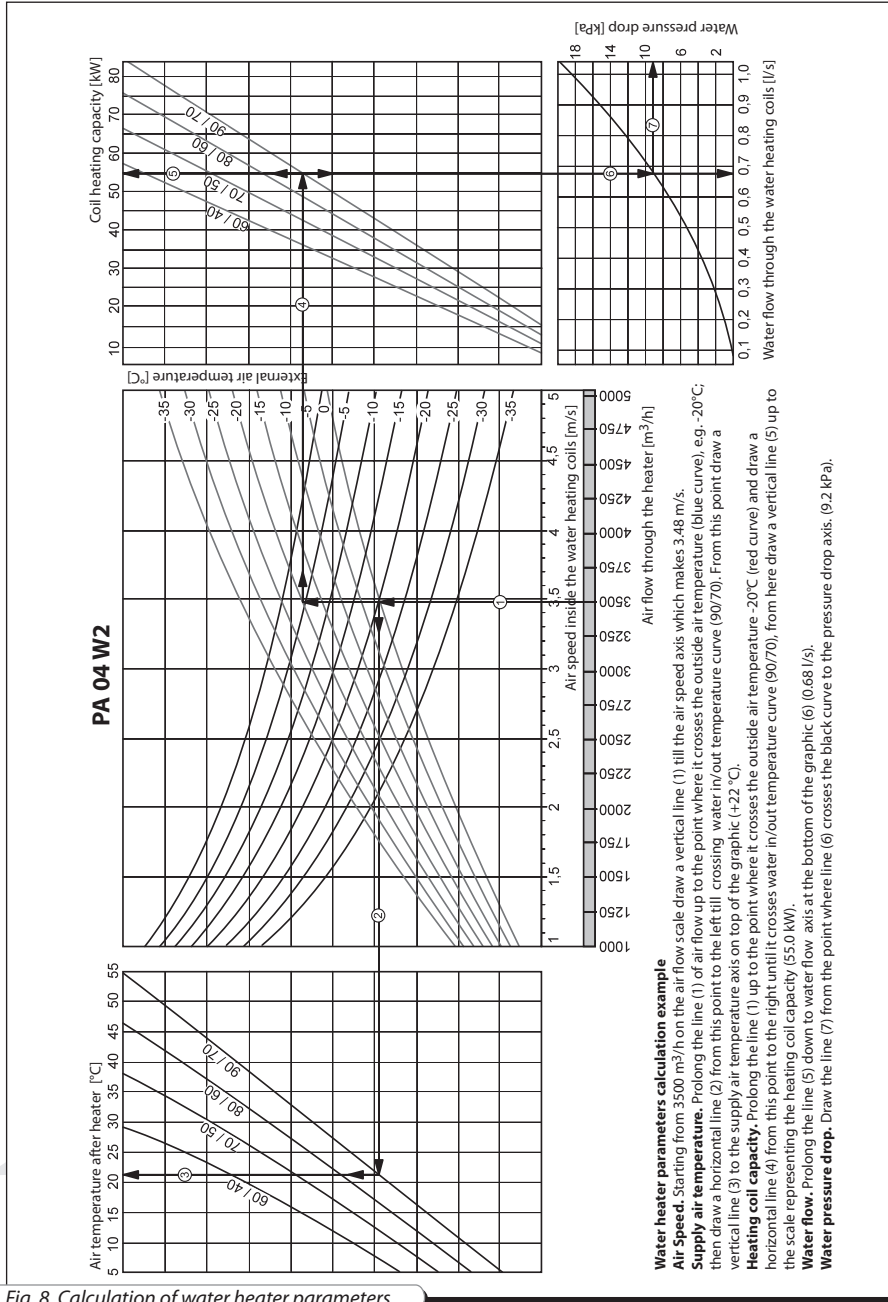


Fig. 8. Calculation of water heater parameters

Performance chart for the water heater parameters of the unit PA 04 W3 is shown in fig. 9.

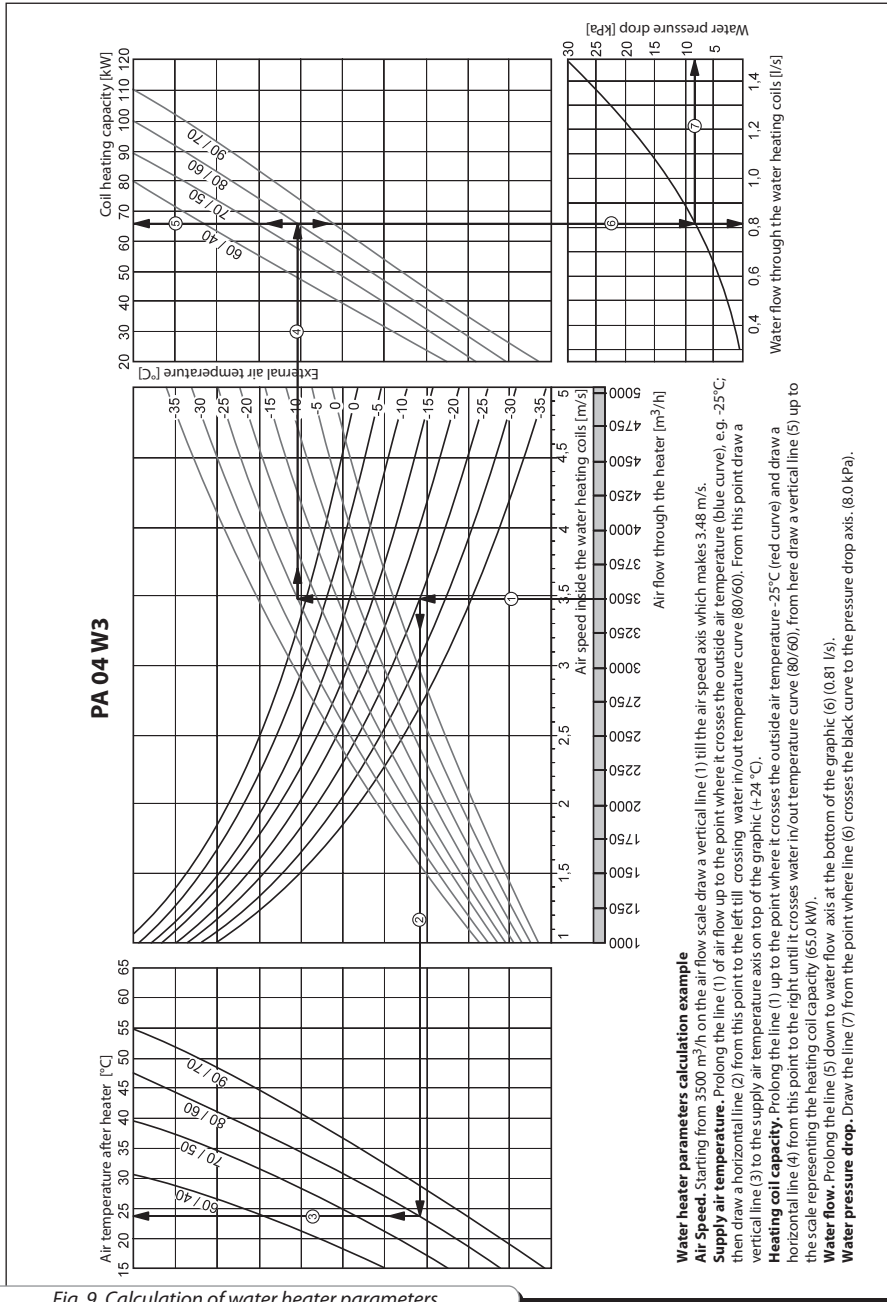


Fig. 9. Calculation of water heater parameters

SAFETY REQUIREMENTS

While operating and mounting the unit consider the requirements of the present operation manual as well as general requirements of all applicable local and national building and electrical codes and standards.

Before connecting the unit to power mains make sure that the unit is free of any visible damages or any other foreign objects inside the casing that can damage the impeller blades.

Otherwise please contact the service centre.



Warning!
Disconnect the unit from power supply prior to any mounting, servicing, connection or repair operations with the unit.



Do not!

- **Do not operate the unit beyond the specified temperature range. The unit is not rated for operation in an aggressive and explosive medium!**
- **Do not connect clothes dryers or similar equipment to the ventilation system!**
- **Do not use the unit for transportation of air-dust mixture!**

DESIGN AND OPERATING LOGIC

The units are designed for supply of filtered warmed-up air to the premises.

The unit design is shown in fig. 10. The unit basic modification includes:

- Electric motor and fan, item 1.
- Built-in water heater, item 2.
- Filter of G4 (F7) class, item 3.
- Removable cover, item 4.

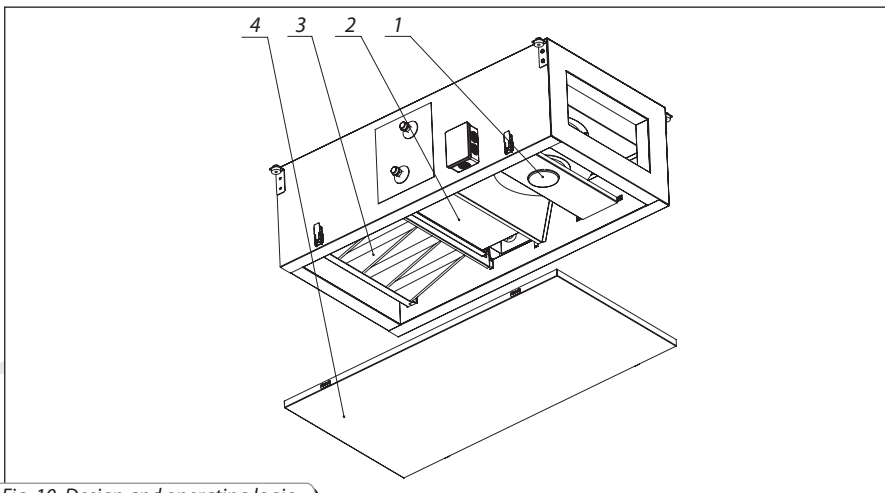


Fig. 10. Design and operating logic

MOUNTING AND SET-UP

Mount the unit in such a way to provide a sufficient access to the unit for maintenance and servicing works. Air flow direction in the system must match the pointer direction on the unit cover.

Suspend the unit to the ceiling on the threaded rod that is fixed inside the dowel or fix it rigidly on a horizontal surface (fig. 11).

Integrate the unit into the ventilation system by connecting it to rectangular or round air ducts. For connection to round air ducts, use matching duct connectors (available upon separate order).

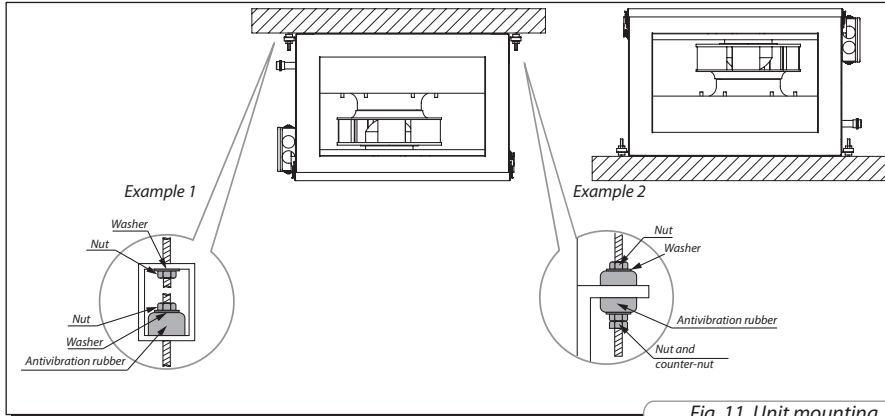


Fig. 11. Unit mounting

To attain the best performance of the unit while mounting connect a straight 1 m duct section on both sides of the unit.

If the unit is installed at the air duct inlet or outlet it shall be equipped with a grille with the mesh width up to 12.5 mm or any other protecting device to prevent free access to the unit fans.

To increase the unit efficiency connect the water heating coils on counter-flow basis (fig. 12).

All the stated calculations are valid for counter-flow connection of the water heater. The water heater connected on counter-flow basis has lower capacity but higher frost-resistance.

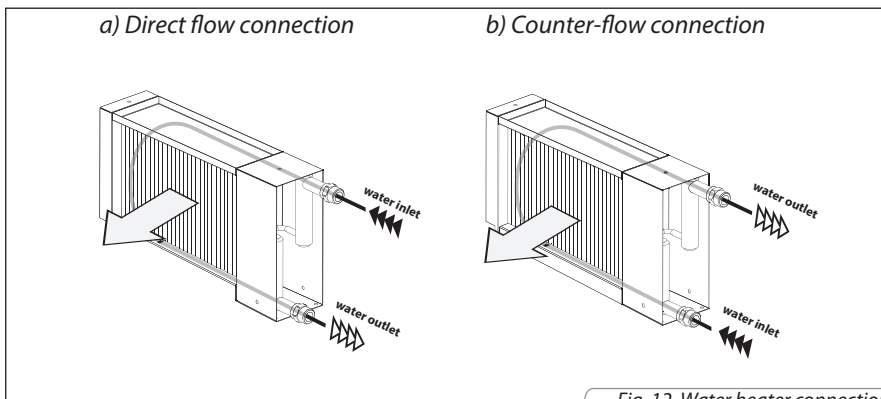


Fig. 12. Water heater connection

SAFETY PRECAUTIONS:

Mount the unit on a rigid and stable structure.

Use bolts to suspend the unit to the ceiling. Make sure that the construction has sufficient load capacity to carry the unit weight. Otherwise reinforce an installation place by beams etc. After that fix the bolts.

If the construction strength or surface is not rigid enough it can resonate with the unit and create abnormal noise and vibration. While mounting the unit provide enough service space and an access door in the ceiling for inspection and maintenance of the filters, heat exchanger and fans.

One access door is required for each unit. For details, refer the outline drawing, fig. 1.

If the bolts used for the unit suspension to the ceiling are too short, the unit may generate abnormal noise and resonate with the ceiling.

Use longer bolts with to prevent resonance. If the connection point to the spiral seam duct is supposed to be the source of the abnormal noise, install a flexible air duct instead of the flexible one.

For the better effect you may use the flexible anti-vibration connectors.

CONNECTION TO POWER MAINS



Disconnect the unit from power mains prior to any wireworks. Connection of the unit to power mains is allowed by a qualified electrician with a work permit for the electric units up to 1000 V after detailed study of the present user's manual. The rated electrical parameters of the unit are shown on the sticker. Any internal connection modifications are not allowed and void warranty.

The unit is rated for connection to three-phase ac 400 V / 50 Hz.

Connect the unit to power supply by means of insulated, durable and thermal-resistant cords (cables, wires) with respective cross section, in any case no less 4 mm².

However, the given section value is tentative.

The choice of the required wire section in each case shall be based on the wire type, its maximum permissible heating temperature, its insulation, length and installation method.

Use copper wires only.

Connect the unit to power supply through the external automatic thermal-magnetic circuit breaker integrated into the power mains.

The trip current must be somewhat above the current consumption, refer table 2.

Connect the fan motor to power mains through the terminal block X1 located on the unit side wall in compliance with wiring diagram and terminal designation.

Fig. 4 shows the wiring diagram for connection of the fan motor to three-phase power mains.

The terminal designations are shown on the sticker inside the terminal box.

To connect the unit to power mains route the cables through the screwed cable gland located on the terminal block side to preserve the ingress protection rating.

Install an external automatic thermal-magnetic circuit breaker on the external input (400 V / 50 Hz) to enable breaking of all the mains phases.

Easy access to the external circuit breaker QF should be provided for the emergency power cutoff of the unit.



If the unit is equipped with a full set of automatic control system, for the internal wireworks and internal connection to the user's manual of the automatic control system for air handling unit with water heater. The manual is included into the delivery set.

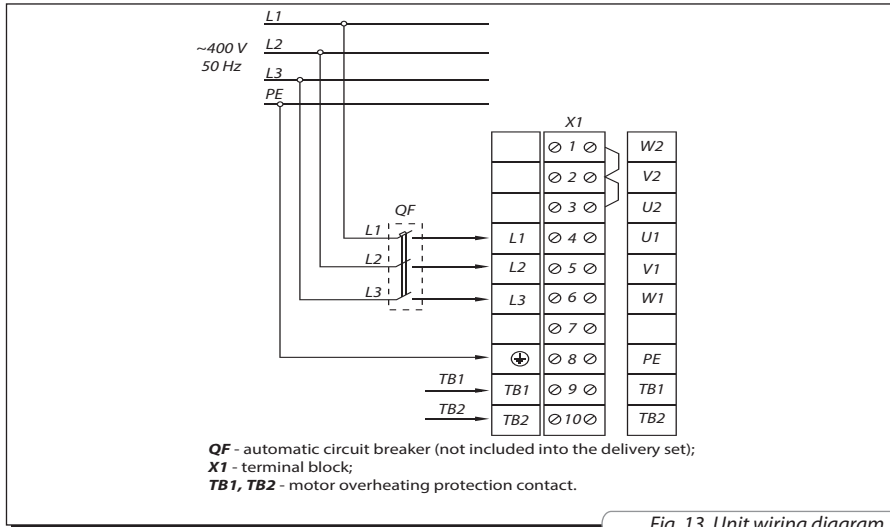


Fig. 13. Unit wiring diagram

MAINTENANCE

Maintenance operations of the unit are required 3-4 times per year.

Maintenance includes regular cleaning and the following operations:

1. Filter maintenance (3-4 times per year).

Dirty filter increases air resistance in the system and reduces supply air volume. The filter requires cleaning once in 3-4 months. Clean the filter with a vacuum cleaner or replace it. For new filters, contact your seller.

To replace the filter:

1. remove the cover;
2. replace the filter;
3. re-install the cover;

2. Fan inspection (once per year).

Even in case of regular maintenance of the filters, some dust and grease can get accumulated inside the fans and reduce the fan performance and supply air flow. Clean the fans with a soft brush or cloth.

Do not use water and abrasive detergent, sharp objects or solvents for cleaning to prevent the impeller damage.

3. Ductwork system inspection (once in 5 years).

Even if you follow all the listed maintenance guidelines, some dust can get accumulated inside the air ducts and reduce the unit performance.

Duct maintenance means their regular cleaning or replacements.

FAULT HANDLING

Possible faults and fault handling

Problem	Possible reasons	Fault handling
The fan(s) do(es) not get started.	No power supply.	Make sure the power supply line is connected correct, otherwise troubleshoot the connection error.
Low air flow.	The filter or fan is soiled.	Clean or replace the filter, clean the fans.
	Ventilation system is soiled or damaged.	Check the grille and clean it of required; make sure that the air ducts are not soiled and not damaged.
Noise, vibration.	The impeller is soiled.	Clean the impeller.
	Loose screw tightening.	Tighten the screws to stop.

STORAGE AND TRANSPORTATION RULES

Store the unit in the manufacturer's original packing box in a closed ventilated premise with temperature range from +10°C to +40°C and relative humidity less than 80% (at +20°C).

Vapours or particles which can cause corrosion or damage the insulation or connection tightness are not allowed in the storage environment.

Use hoist machinery for handling and transportation to prevent possible mechanical damages of the unit.

Fulfil the requirements for transportation of the specified cargo type during cargo-handling operations.

Use any vehicle types for the unit transportation provided that it is protected against mechanical or weather damage.

Avoid any mechanical shocks and strokes during handling operations.



MANUFACTURER'S WARRANTY

Manufacturer hereby guarantees normal performance of the unit during two years from the date of retail sale provided compliance with transport, storage, mounting and operation regulations.

In case of no confirmation of the sales date the warranty period is calculated from the manufacturing date.

In case of failures in the unit operation during the warranty period the manufacturer will accept reclamations and complaints from the owner of the device only after receiving technically sound act with detailed description of the failure.

Unit damage as a result of unauthorized tampering with the circuit diagram is not a warranty case.

For warranty and post-warranty services of the unit please contact the product manufacturer.

In case of warranty claim please submit the present user's manual with the seller's stamp, filled connection certificate and warranty card.

Warranty and post-warranty services are fulfilled at the manufacturing facility.



WARRANTY CLAIMS ARE ACCEPTED WITH THIS USER'S MANUAL AND FILLED CONNECTION CERTIFICATE ONLY.



The MANUFACTURER is not responsible for any mechanical or physical damages resulting from the manual requirements violence, the unit misuse or gross mechanical effect.

Fulfil the requirements set in the user's manual to ensure proper functioning of the unit.

ACCEPTANCE CERTIFICATE

Supply unit PA W has been duly certified as serviceable.

We hereby declare that the product complies with the essential protection requirements of Electromagnetic Council Directive 2004/108/EC, 89/336/EEC and Low Voltage Directive 2006/95/EC, 73/23/EEC and CE-marking Directive 93/68/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. This certificate is issued following test carried out on samples of the product referred to above.

Acceptance Inspector's Stamp _____

Date of manufacture _____

Sold by

Name of trade company _____

Date of sale _____

ELECTRICAL CONNECTION CERTIFICATE

This is to certify that the air supply unit PA W has been connected to power mains pursuant to the requirements stated in the present user's manual by a qualified technician:

Company: _____

Name _____

Date _____ Signature _____

WARRANTY CARD
