



**INDUSTRIAL HEATING
TECHNOLOGY**

WATERFAN HEATER

INSTRUCTION MANUAL

FOR MORE INFORMATION PLEASE SEE OUR HOME PAGES: WWW.PAKOLE.COM

Ver.:01

Appliance type:

AIRFUSOR

AFR-0

AFR-1

AFR-2

AFR-3

AFR-SP



EAC CE



ATTENTION! Read and understand this manual thoroughly before installing starting or servicing this equipment. The improper installation or using can cause serious damages! Keep this manual in a safe place in order to obtain information in case of incidental problems!



GENERAL SAFETY NOTICES

Disregard of instructions and notices of this Manual can cause serious bodily injuries or damages as follows: burning, explosion, suffocation, carbon monoxide poisoning, electric shock and in extreme case death!

This appliance can only be used and serviced by such persons who understood and follow the instructions of this Manual

If you need help or information concerning the appliances – for example installation guide or labels etc. – in that case contact with the manufacturer!

This appliance must not be used by children and mentally or sensitively deficient persons! Take care that the children do not handle it and do not play with devices!

FURTHER INFORMATION: [HTTP://WWW.PAKOLE.HU](http://WWW.PAKOLE.HU)

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1. SAFETY INFORMATION

General information

HEATER heating and ventilation devices are manufactured in compliance with standards concerning quality, ecology, utility and work comfort.

HEATER devices are delivered ready-to-use in a cardboard package that is to protect from mechanical damages. The package consists of: the device, the Manual (Operation and Maintenance Documentation) and Guarantee. If the optional automatic control ordered, it shall be delivered in a separate package. Make sure all the aforementioned elements are in the package immediately after the delivery. In the absence of any element, please fill in the suitable carrier document.



ATTENTION !

Please Before mounting read the manual carefully and adhere to the rules concerning the mounting procedures. Not applying may result in inappropriate functioning of the device and the loss of the guarantee rights.

Pay special attention when working with electrical elements of the device.

Any installation operations must be carried out by qualified persons with appropriate authorizations

SAFETY INFORMATION**Installer's responsibilities**

- making up of electrical connection in compliance with the specifications (it is proposed to connect with the local Building Supervisory Authority or Fire-service),
- installation of equipments in accordance with the definitions of this manuel,
- installation according to the fire prevention rules,
- supply of the necessary materials/components for installation(which are not belong to appliance),
- planing of air duct systems (ventilation/connections)
- service execution,
- placing the copy of present manual at owner's disposal,
- assuring of sufficient air circulation around the appliance,
- determination and assuring of needed air for burning, ventilation and blowing in according to the specifications.

Data board

The appliance is equipped with data board, which is placed on the outside of housing. On this data board there are information about type of appliance / gas and electrical connection.

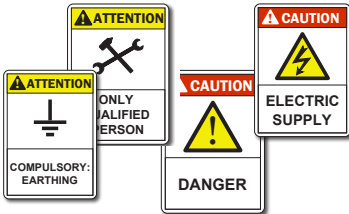
SAFETY INFORMATION**Safety signs****Safe usage**

Please observe the following rules during installation, first set-up, usage or maintenance:



- Installation must be carried out always strictly complying with the current standards of the country where the appliance is going to be used and following, of course, the instructions given by the producer.
- The installation and maintenance operations of the unit can be carried out by qualified and trained personnel only.

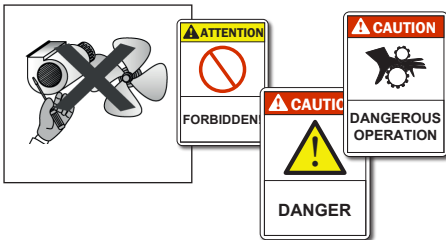
Qualified service engineers are those having specific technical experience and/or valid license in the field of heating and cooling installation for home and industry. In any case, call the Manufacturer office or the closest dealer (www.pakole.com) and ask for further informations.

SAFETY INFORMATION

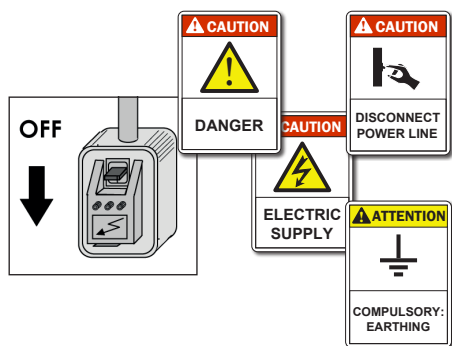
- According to the installation project, install the electric power lines.
- Always make sure that the unit and all its electrical parts have been correctly earthed prior starting up the unit.



- If you have to disassemble the unit, use special protective gloves.
- Beware of sharp edges inside the unit!
- Beware of roof corners of outdoor units!
- Keep suction grids clear!



- Before cleaning or maintaining the unit, make sure that all electrical parts have been switched off, the appliance gas supply chain is closed and wait until the appliance cools down. In particular, make sure that the fan is off and cannot be inadvertently started prior to opening inspection panels.
- Fans can reach a speed of 1000 rpm. Do not insert any object nor hands in the electric fan.

SAFETY INFORMATION

- We recommend to install a safety switch which can be easily reached to cut off the current, near the unit. Before any cleaning and servicing operation, cut off the power line to the unit.
- Before opening the unit, make sure that all electrical parts have been switched off. In particular, make sure that the fan is off and cannot be inadvertently started prior to opening inspection panels.
- **CHECK THE EARTHING !!**



- This unit is designed to be used for heating purposes only. Any different use is not allowed as it may be dangerous.
- Should the unit work in a house where disabled people and/or children live, it must be placed safely away from their reach. Always make sure that the access door to the inside control board stay locked.
- An incorrect installation can cause damages to people, animals and property. In case of erroneous installation, the manufacturer cannot be held responsible for such damages.
- **The manufacturer cannot be held responsible for such damages by improper uses, errate uses, etc.**



- Never use the unit to support other equipment.
- Never leave tools, spare parts, etc. inside the unit.
- Make sure that all inspection panels are closed properly.
- Do no expose the unit to inflammable gases.

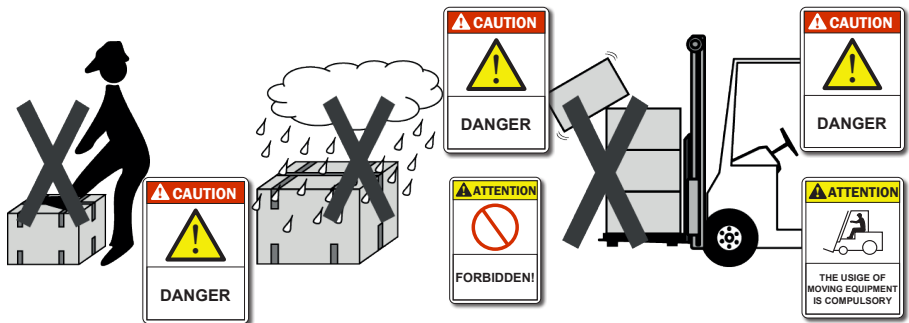


- In case of breakdown or failure: turn unit off, do not try to repair it on your own, call operator.
- If you are going to leave the heater switched off for a long time, first make sure that in no way this could cause harm to anyone in any way.

2. TRANSPORTATION, UNPACKING, HANDLING

- The delivery must be made according to the following:
 - The package must be carefully secured in the loading space.
 - The package must be transferred in a closed space (always keep packing parts away environmental impacts).
- The unit has a special safety packing for transport and delivery which must be kept in good conditions till the unit is positioned on the installation place.
- Make sure that the unit has all its parts, as specified in the order.
- Check if there are any damages and if the unit abbreviation is the same as the one of the ordered model.
- Every unit is factory tested before shipment, therefore, if there are damages, report them immediately to the carrier.

Transporting, unloading and moving is a process which must be made carefully to avoid any kind of damages. Try not to use the unit's components as handholds. When lifting, bear in mind that the centre of gravity of the unit may be off-centre.



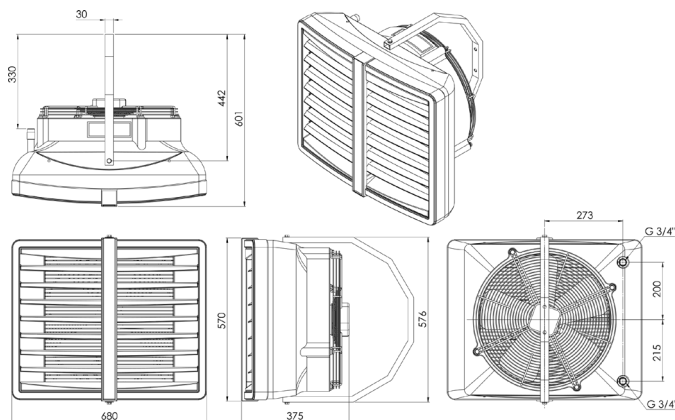
There is an envelope inside the unit containing the installation, use and maintenance manual and the warranty documents.

The identification label bearing the following data is applied on each unit:

- Manufacturer's data
- Model of the unit and Identification code
- Technical data and Wiring diagram

3. APPLIANCE STRUCTURE

Dimendison and basic technical parameters



Basic elements of HEATER devices :

- Casing made of highly resistant EPP (expended polypropylene) material
- Regulated air-conduits
- Installation bracket
- 3 step axial fan 450 mm dimension; fan is protected from direct access to revolving elements with safety netting
- Heat exchanger – (Cu/AL) made of copper tubes placed in an aluminum lamellar exchanger / block with stub connection 1/2", 3/4". Stub connections are equipped with air-release valves and heat outlet vent.

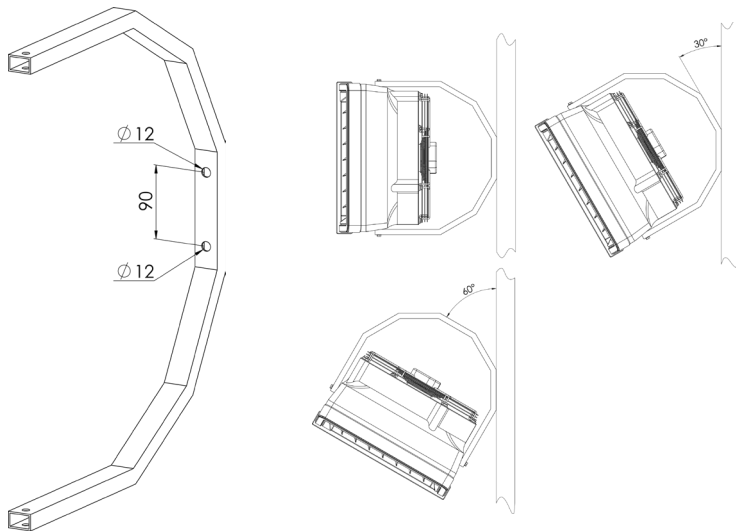
Parametry		AirFusor AFR-0	AirFusor AFR-1	AirFusor AFR-2	AirFusor AFR-3	AirFusor AFR-SP
No of unit rows	-	1	1	2	3	3
Max air output	[m³/h]	4 900	4 900	4 600	4 400	4 500
Heat output range	[kW]	5-20	10-30	30-50	50-70	20-45
Air temperature increase*	[°C]	14	18	33	48	31
Max working pressure	[Mpa]	1,6	1,6	1,6	1,6	1,6
max airflow range	[m]	27	27	25	24	25
Diameter of connection nozzles	[inch]	3/4"	3/4"	3/4"	3/4"	3/4"
Power supply	[V/Hz]	230/50 1,15 A				
Motor power	[kW]	0,25	0,25	0,25	0,25	0,25
Motor speed	[turn/min]	1350	1350	1350	1350	1350
Protection class IP	-	IP54	IP54	IP54	IP54	IP54
Sound level	dB (A)**	56	56	56	56	56
Weight without water/ with water	[kg]	10,1 / 11,2	10,8 / 11,9	12,7 / 14,8	14,5 / 16,9	13,4/15,8

*for temperatures of 90/70 and inlet temperature of 0°C

**maximum height of assembly for vertical airflow, max working range of up to 380m². Horizontal range of isothermal stream at velocity boundary/speed limit of 0,5 m/s

***measurement obtained when 5 m away from the device

4. Assembly

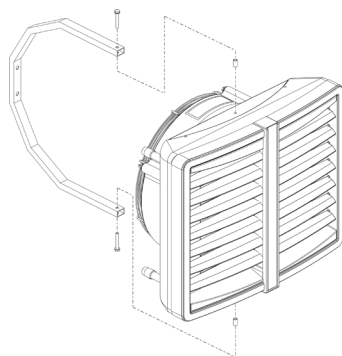


Prior to any installation procedures, take the following aspects into consideration: easy access for maintenance works, access to water and electrical installation, appropriate air distribution in a room.

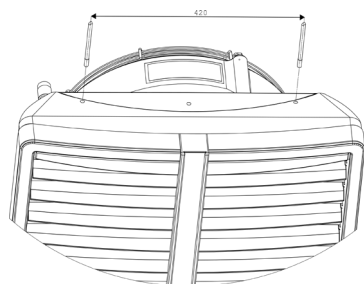
*It is advisable to mount the device to the wall or the ceiling on original mounting brackets, supporting mount pins (not delivered with the device) or supporting constructions (shapes and dimensions of the supporting construction may be individually designed in compliance with durability and strength requirements).

In case of mounting to the ceiling, pay attention to the fact that air-release/venting of the device may be difficult so it is advisable to place vent at the highest point of the pipework.

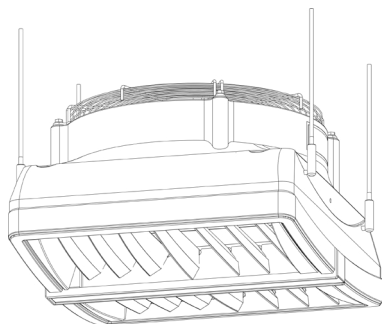
The device may be mounted to the wall with the use of a mounting bracket at the angle of 0°, 30° or 60°. A mounting bracket holder is made of curved profile. It has two holes for vertical assembly. Assembly to the wall and/or to the ceiling is possible at different angles but it requires making necessary holes in the holder.

ASSEMBLY**Mounting bracket to the heater**

The bracket set consist of: a holder, two sleeves, two M8 screws and washers. In order to mount the bracket, drill two Ø12-13mm holes in places visibly marked on the casing. Insert sleeves into drilled holes and place the bracket in. The included holder must be screwed with M8 screws with washers.

**Installation of mounting pins**

To mount the heater to the ceiling, use M8 mounting pins. Drill two Ø8-9mm holes in places visibly marked on the casing. Mounting pins may be screwed into the frame not deeper than 20 mm.

**Assembly of HEATERMIX air mixer**

To mount HEATERMIX air mixer to the ceiling, use M8 mounting pins. Drill two Ø8-9mm holes in places visibly marked on the casing. Mounting pins may be screwed into the frame of a heat exchanger to the maximum depth of 20mm. Mounting pins and connecting elements are not included with the unit.



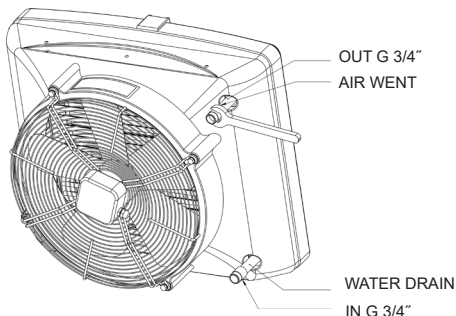
To sustain proper functioning of the device keep a safe distance– 200mm from its sides and 300 mm from its backside (from the fan)

ASSEMBLY**Electrical installation**

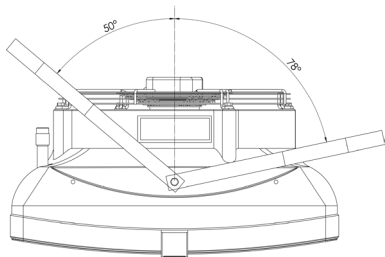
- The electrical installation and connection to power supply must be done in compliance with the existing regulations and standards for building industry.
- The fan's engine is equipped with the internal temperature limit fuse protecting the engine from its overheating.
- The unit set does not consist of: a feeding cable, a master switch (see diagram)
- The electrical installation must be done by an authorized person, acquainted with the Manual. The connection of the feeding cable and master switch must be done in compliance with electrical diagram (with or without the automatic control, depending on the option chosen). Any and all damages incurred as a result of the aforementioned causes are not provided with the Guarantee and the user will be charged with any costs of the device exchange. The connection of the automatic control should be carried out in accordance with the electrical diagram.
- In case of any doubts or problems, unplug the device and contact the device's installer or PAKOLE Trade Ltd. Authorized Service.

Water installation

The installation of the unit should be done in a way enabling maintenance service; on both stub pipes manual closing valves should be installed in order to cut off the device. Feeding cables of the heater shall be connected in accordance with the symbols/marking on the casing (inlet/outlet). In case of electromagnetic valve (with the option of the automatic control) it should be installed on the outlet as it may be damaged otherwise. When the pipework is being connected to the exchanger, secure the connections of the heater from oscillating torque (see figure) that may cause leakage in the exchanger.

**Heating medium**

The connector pipes are at the back of the device. When connecting the hydraulic pipes/connections, make sure you secure the connector pipes against rotational torque. Notice that the connector pipes are not strained by the pipes. The valve of heating medium is on the supply pipe and the vent is on the return pipe.

ASSEMBLY

Use flexible connections to allow the heater to be turned to the sides. Depending on the flexible connections, the maximum turn is 78° to both sides. Figure shows maximum angle to one side and 50° to the other with minimal distance left for connections.

5.AUTOMATIC CONTROL-INSTALLATION

A set of automatic control may be used (powered 230V) that consists of the following:

- COMFORT panel – including room thermostat and switch for regulation of 3 speeds of fan. One COMFORT panel may regulate up to 3 pcs of HEATER units
- 2-way water valve with actuator; valve should be installed on a return stub of the heater
- INTELLIGENT electronic control panel with an automatic speed controller, weekly program and BMS communication. One INTELLIGENT panel may regulate up to 2 pcs of HEATER units
- Splitter MULTI 6 - control up to 6 pcs of HEATER units from one COMFORT or INTELLIGENT Panel

The system is ready to start once the connections between the thermostat and the valve actuator are done, 230V power is supplied to the thermostat and the fan's motor is powered by the revs controller.

AUTOMATIC CONTROL-INSTALLATION**Comfort panel description**

ON/OFF – turning ON/OFF a unit

I-II-III – switch for fan speed regulation

HEAT - thermostat sends signal for valve and actuator and fan, fan turns off when temperature in room is achieved, valve/actuator closes water supply.

FAN – function not active, unit will not operate when FAN switch is selected

COOL – thermostat sends signal only to fan, fan begins operation starting from temperature which is set on thermostat (function used to air mixer HEATER MIX or for room ventilation in summer season)

First start

Do all the connections (electrical, water and automatic control), check for tightness of all connections done by an installer and air-release/vent the device then start the device in the following sequence:

1. Switch on the mains,
2. Set requested speed of fan on revs controller,
3. Set requested temperature on thermostat,

The fan operates continuously irrespective of whether the heater's valve is opened or not.

Turning off

To switch the device off do the following:

1. Set minimum temperature on thermostat – after 7 seconds valve will be closed and heating switched off.
2. Set main switch to the "0" position (off); fan will be switched off and the thermostat will be off the power.

AUTOMATIC CONTROL-INSTALLATION**Operation**

The engine and fan used in HEATER units are maintenance-free devices but regular check-ups are advised, especially motor and bearing (fan's rotor should rotate freely, free from any axial and radial throws and undesired knocks/rattles).

**NOTICE !**

In case of any metallic knocks, vibration or increase in sound level check if the fan mounting/fixing does not work loose contact the installer or PAKOLE Trade Ltd. Authorized Service

6. TECHNICAL PARAMETERS HEATER

AirFusor AFR-0																
inlet/outlet water temperature		90/70					80/60					70/50				
inlet air temperature		0	5	10	15	20	0	5	10	15	20	0	5	10	15	20
air flow 4900 m ³ /h (speed 3)																
heat output	kW	21,1	19,9	18,7	17,5	16,3	18,3	17,1	15,9	14,7	13,6	15,4	14,2	12,9	11,7	10,6
outlet air temperature	°C	13,6	17,6	21,5	25,6	29,5	11,3	15,2	19,3	23,3	27,3	9,8	13,7	17,7	21,6	25,4
water flow	m ³ /h	1,0	1,0	0,9	0,8	0,7	0,8	0,8	0,7	0,6	0,5	0,6	0,6	0,5	0,4	0,3
pressure drop	kPa	1,9	1,7	1,5	1,3	1,1	1,5	1,3	1,1	0,9	0,7	1,1	0,9	0,7	0,5	0,3
air flow 3450 m ³ /h (speed 2)																
heat output	kW	17,2	16,0	14,8	13,6	12,4	14,4	13,2	12,1	10,9	9,5	12,6	11,1	9,6	8,2	7,4
outlet air temperature	°C	15,1	19,1	23,0	27,1	31,0	12,8	16,7	20,8	24,8	28,8	11,3	15,2	19,2	23,1	26,9
water flow	m ³ /h	0,8	0,8	0,7	0,6	0,5	0,6	0,6	0,5	0,4	0,3	0,4	0,4	0,3	0,2	0,1
pressure drop	kPa	1,3	1,1	0,9	0,7	0,5	0,9	0,7	0,5	0,3	0,1	0,5	0,5	0,4	0,3	0,2
air flow 2450 m ³ /h (speed 1)																
heat output	kW	14,7	13,5	12,3	11,1	9,9	12,1	10,9	9,7	8,5	7,4	10,3	8,5	7,3	6,1	4,9
outlet air temperature	°C	17,1	19,2	25,0	29,2	32,9	14,7	18,7	22,9	26,8	30,7	13,3	17,1	21,2	25,1	28,8
water flow	m ³ /h	0,6	0,5	0,4	0,3	0,2	0,4	0,4	0,3	0,2	0,1	0,2	0,2	0,2	0,1	0,1
pressure drop	kPa	0,9	0,7	0,7	0,6	0,5	0,6	0,6	0,5	0,4	0,3	0,3	0,3	0,2	0,1	0,1
AirFusor AFR-1																
inlet/outlet water temperature		90/70					80/60					70/50				
inlet air temperature		0	5	10	15	20	0	5	10	15	20	0	5	10	15	20
air flow 4900 m ³ /h (speed 3)																
heat output	kW	27,5	25,6	23,5	21,4	19,3	23,4	21,5	19,6	17,7	15,8	19,5	17,6	15,8	14,1	12,3
outlet air temperature	°C	17,5	21,5	25,5	29,5	33,5	15,0	19,0	23,0	27,0	31,0	12,5	16,5	20,5	24,5	28,5
water flow	m ³ /h	1,1	1,0	1,0	0,9	0,7	0,9	0,8	0,8	0,7	0,7	0,7	0,6	0,6	0,5	0,5
pressure drop	kPa	2,0	1,8	1,6	1,4	1,2	1,4	1,2	1,0	0,8	0,6	0,9	0,8	0,8	0,7	0,6
air flow 3450 m ³ /h (speed 2)																
heat output	kW	22,5	20,4	18,3	16,2	14,1	18,9	17,0	15,9	14,0	12,1	15,1	13,4	11,6	10,0	8,4
outlet air temperature	°C	19,0	23,1	26,5	30,5	34,5	16,5	20,4	24,5	29,3	33,2	14,6	18,5	22,5	26,5	30,5
water flow	m ³ /h	0,9	0,8	0,8	0,7	0,6	0,7	0,6	0,6	0,5	0,4	0,5	0,4	0,4	0,3	0,2
pressure drop	kPa	1,4	1,2	1,0	0,8	0,6	0,9	0,8	0,7	0,7	0,6	0,6	0,5	0,5	0,4	0,3
air flow 2450 m ³ /h (speed 1)																
heat output	kW	19,4	17,3	15,4	13,4	11,5	15,3	13,6	12,0	10,3	8,4	13,1	11,5	9,9	8,3	6,7
outlet air temperature	°C	21,1	25,1	29,0	33,0	37,1	19,0	23,0	27,1	30,9	34,9	16,6	20,6	24,5	28,5	32,6
water flow	m ³ /h	0,7	0,6	0,5	0,5	0,4	0,5	0,4	0,4	0,3	0,2	0,3	0,3	0,2	0,2	0,1
pressure drop	kPa	1,0	0,8	0,8	0,7	0,6	0,7	0,7	0,6	0,5	0,4	0,4	0,4	0,3	0,2	0,1

TECHNICAL PARAMETERS HEATER

AirFusor AFR-2

inlet/outlet water temperature		90/70					80/60					70/50				
inlet air temperature		0	5	10	15	20	0	5	10	15	20	0	5	10	15	20
air flow 4600 m3/h (speed 3)																
heat output	kW	48,4	44,9	41,5	38,0	34,6	41,5	38,0	34,5	30,9	27,4	34,6	31,2	27,8	24,4	21,0
outlet air temperature	°C	32,5	35,4	38,5	41,5	44,6	28,5	31,5	34,4	37,5	40,5	24,0	26,9	29,9	33,0	36,1
water flow	m3/h	1,9	1,8	1,8	1,7	1,5	1,8	1,6	1,5	1,4	1,2	1,4	1,2	1,1	1,0	0,9
pressure drop	kPa	10,6	9,7	8,8	7,9	7,0	7,6	6,7	5,8	4,9	4,0	5,3	4,6	3,7	2,8	1,9
air flow 3250 m3/h (speed 2)																
heat output	kW	39,5	36,8	33,9	30,8	27,5	33,5	30,5	27,8	24,2	21,4	27,4	24,3	21,6	18,9	15,0
outlet air temperature	°C	34,5	37,3	40,3	43,2	46,2	30,5	33,0	36,1	39,2	42,2	26,0	28,9	32,0	35,0	38,1
water flow	m3/h	1,7	1,6	1,5	1,4	1,3	1,5	1,4	1,2	1,1	1,0	1,2	1,1	0,9	0,8	0,7
pressure drop	kPa	6,2	5,4	4,5	3,4	2,5	5,2	4,3	3,6	2,7	1,8	3,7	2,8	2,1	1,6	1,2
air flow 2300 m3/h (speed 1)																
heat output	kW	32,0	28,7	25,8	23,9	20,9	27,1	24,7	22,5	20,3	18,2	22,2	19,7	17,2	14,7	12,1
outlet air temperature	°C	37,0	39,8	42,8	45,7	48,5	33,0	35,4	37,7	41,6	44,6	29,0	31,5	34,6	37,5	40,6
water flow	m3/h	1,4	1,2	1,2	1,1	1,0	1,2	1,1	1,0	0,9	0,8	0,9	0,8	0,8	0,9	0,6
pressure drop	kPa	3,9	3,5	3,0	2,6	2,2	2,9	2,6	2,3	1,8	1,5	2,0	1,8	1,5	1,2	0,9

AirFusor AFR-3

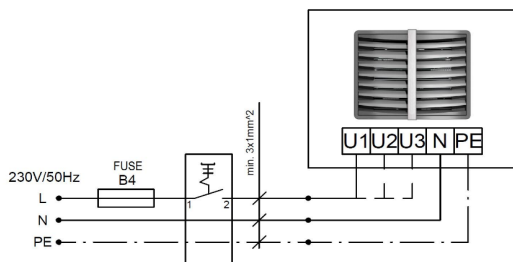
inlet/outlet water temperature		90/70					80/60					70/50				
inlet air temperature		0	5	10	15	20	0	5	10	15	20	0	5	10	15	20
air flow 4400 m3/h (speed 3)																
heat output	kW	67,6	63,4	59,3	55,1	51,1	58,4	54,2	50,1	46,1	42,3	49,2	45,3	41,6	38,3	34,4
outlet air temperature	°C	47,5	50,0	52,0	54,0	56,0	41,5	44,0	46,0	48,0	50,0	34,5	37,0	39,0	41,0	43,0
water flow	m3/h	2,8	2,8	2,6	2,4	2,2	1,8	2,4	2,2	1,9	1,8	1,9	1,9	1,7	1,5	1,3
pressure drop	kPa	21,7	18,1	15,8	13,7	11,8	16,7	13,6	11,6	9,7	8,1	12,3	9,6	7,9	6,4	5,0
air flow 3100 m3/h (speed 2)																
heat output	kW	54,7	51,5	48,4	45,5	42,4	47,4	44,5	41,6	38,4	35,6	40,1	36,8	33,5	30,1	26,8
outlet air temperature	°C	50,5	52,9	55,0	57,1	59,0	44,5	47,1	49,0	51,0	52,9	37,5	40,0	42,1	44,0	46,0
water flow	m3/h	2,2	2,2	2,1	1,9	1,8	1,9	1,8	1,7	1,6	1,4	1,5	1,5	1,4	1,2	1,1
pressure drop	kPa	14,4	11,9	10,4	9,1	7,8	11,1	8,1	7,7	6,5	5,4	8,2	6,4	5,3	4,3	3,3
air flow 2200 m3/h (speed 1)																
heat output	kW	44,2	42,0	40,2	38,4	36,6	38,5	36,6	34,8	32,6	30,8	32,7	30,5	28,4	26,1	23,9
outlet air temperature	°C	54,0	56,4	58,5	60,6	62,5	48,0	50,6	52,5	54,5	56,4	41,0	43,5	45,6	47,5	49,5
water flow	m3/h	1,8	1,8	1,7	1,5	1,4	1,5	1,4	1,4	1,3	1,2	1,3	1,2	1,2	0,9	0,8
pressure drop	kPa	9,5	7,8	6,9	6,0	5,1	7,4	5,9	5,1	4,3	3,6	5,5	4,3	3,5	2,8	2,2

TECHNICAL PARAMETERS HEATER

AirFusor AFR-SP																
inlet/outlet water temperature		90/70					80/60					70/50				
inlet air temperature		0	5	10	15	20	0	5	10	15	20	0	5	10	15	20
air flow 4500 m ³ /h (speed 3)																
heat output	kW	44,0	41,3	38,5	35,8	33,0	37,4	34,6	31,9	29,1	26,4	30,8	28,0	25,3	22,5	19,8
outlet air temperature	°C	31,3	34,5	37,6	40,7	43,9	27,4	30,7	34,0	37,3	40,6	22,4	26,3	29,9	33,5	37,1
water flow	m ³ /h	2,5	2,5	2,2	2,2	1,8	2,2	2,2	1,8	1,8	1,4	1,8	1,8	1,4	1,4	1,1
pressure drop	kPa	8,7	7,7	6,6	5,8	4,9	6,7	5,8	4,9	4,1	3,3	4,8	4,1	3,4	2,7	1,9
air flow 3200 m ³ /h (speed 2)																
heat output	kW	36,3	33,5	30,8	28,6	26,4	30,8	28,6	26,4	23,6	20,9	25,9	23,4	20,9	18,4	15,9
outlet air temperature	°C	36,4	37,6	40,1	43,8	47,0	30,5	33,8	37,1	40,4	43,5	25,5	29,4	33,0	36,6	40,2
water flow	m ³ /h	2,2	2,2	1,8	1,8	1,4	1,8	1,8	1,4	1,4	1,1	1,4	1,4	1,1	1,1	0,7
pressure drop	kPa	5,5	5,1	4,6	4,1	3,5	4,6	4,0	3,4	2,9	2,4	3,3	2,8	2,3	1,9	1,5
air flow 2250 m ³ /h (speed 1)																
heat output	kW	29,6	27,4	25,3	23,6	22,0	25,3	23,1	20,9	19,3	17,6	20,9	19,0	17,1	15,2	13,2
outlet air temperature	°C	39,7	41,4	43,7	47,5	50,5	34,1	37,4	40,7	44,0	47,1	31,1	33,0	36,6	39,9	43,3
water flow	m ³ /h	1,8	1,8	1,4	1,4	1,1	1,4	1,4	1,1	1,1	0,7	1,1	1,1	0,7	0,7	0,4
pressure drop	kPa	4,1	3,7	3,2	2,8	2,3	3,2	2,8	2,3	2,0	1,6	2,3	2,0	1,7	1,4	1,1

7. ELECTRICAL CONNECTION DIAGRAMS

Connecting HEATER with no automatic control

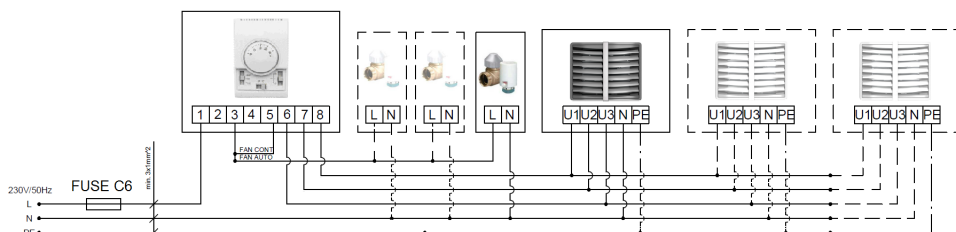


Fan wiring description

- U1 high speed – brown
- U2 middle speed – grey
- U3 low speed – red
- N neutral – black
- PE protection - yellow/green

* The unit set does not consist of: a master switch, a fuse, a feeding cable

Connecting a few HEATER units with COMFORT panel, valves and actuators.



* The unit set does not consist of: a master switch, a fuse, a feeding cable

* One COMFORT panel may regulate up to 3 pcs of HEATER units

HEAT - thermostat sends signal for valve/actuator and fan, fan turns off when temperature in room is achieved, valve/actuator closes water supply.

FAN – function not active, unit will not operate when FAN switch is selected

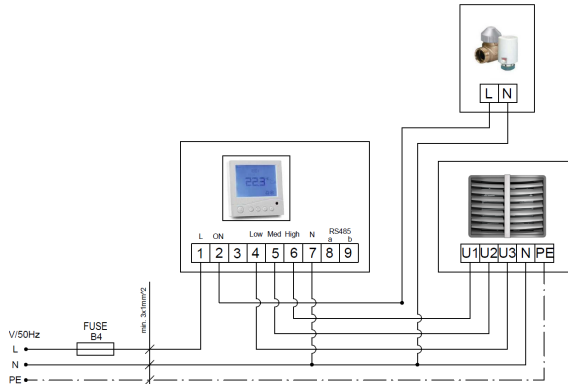
COOL – thermostat sends signal only to fan, fan begins operation starting from temperature which is set on thermostat (function used to air mixer HEATER MIX or for room ventilation in summer season)

Attention! You can use additional jumper on the contacts 4-5 of COMFORT Panel, in this case you may only use function of changing speed of fan I-II-III and ON / OFF. The thermostat and switches HEAT / FAN / COOL remain not active.

Additional jumper on terminals 4-5 might be applied when for ex different (supplied by user) thermostat is used to control the system.

ELECTRICAL CONNECTION DIAGRAMS

Connecting HEATER units with INTELLIGENT panel



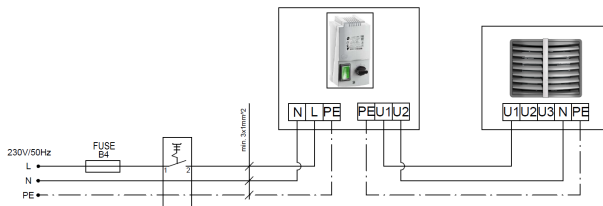
Intelligent PSH panel controls actuators/valves and automatically regulates fans' speed depending on the required room temperature. Fans speed changes automatically for lower rate, when temperature in a room gets closer to desired one.

Additional functions – weekly thermostat, availability of BMS communication signals

* One INTELLIGENT panel may regulate up to 2 pcs of HEATER units

* The unit set does not consist of: a master switch, a fuse, a feeding cable

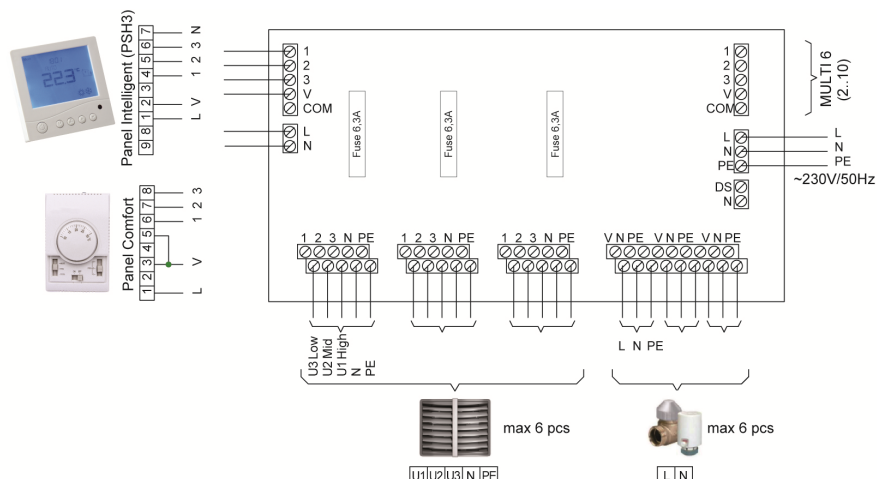
Connection of HEATER unit with transformer speed regulator



* When using transformer speed regulator please use only maximum speed connector on a fan - U1 high speed

ELECTRICAL CONNECTION DIAGRAMS

Splitter MULTI 6 - control up to 6 pieces of HEATERS from one COMFORT or INTELLIGENT Panel



MULTI 6 Splitter allows to connect and control more fan heaters (up to 6 pcs.) and valves with actuators (up to 6 pcs.). Control of fans and valves is done using COMFORT or INTELLIGENT panel.

To connect more than 6 fans and valves, it is possible to connect Splitter MULTI 6 with each other (maximum extension of up to 10 MULTI 6 splitters). In such case, in the first Splitter MULTI 6 there should be connector DS-N left open, in other Splitters MULTI 6 (2..10) connector DS-N must be closed.

8. INTELLIGENT AUTOMATIC CONTROLL

Programmable logic controller manual

The control panel that is equipped with a weekly programmer selects speed of a device automatically depending on required/set temperature. The lower the room temperature is, the higher the air output is. Any change of fan speed is automatic, without user's manual intervention.






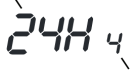



Symbol	Meaning of the symbol
	Switching ON/OFF
	Programme selection Auto/Cool/Heat, Menu button, programming button
	Selection of fan operating mode, selection of days and times
	Increase
	Decrease
	Screen lock
	Heating
	Cooling
	Fan speed: low, medium, high
	Automatic fan speed control
	Number of a selected programme

To switch on the heater, press . If the programmable controller is off, the OFF symbol will be displayed.

When a controller is off, press and hold the button for 3 seconds and the configuration will start. Press to select menu function.

INTELLIGENT AUTOMATIC CONTROLL

Menu No	Description	Meaning/explanation	Regulation  
01	Sensitivity adjustment of controller  Menu No.	The mount of degrees Celsius which changes fan speed. The standard threshold level is set 1°C which means that the thermostat activates heating if the outside temperature is less than 0,5°C than the required/set temperature and switches heating off if the outside temperature is more than 0,5°C than the required/set temperature. When the minimum threshold level is 2°C, thermostat activates heating if the outside temperature is less than 1°C than the required/set temperature and switches heating off if the outside temperature is more than 1°C than the required/set temperature.	Factory settings: 1°C, Regulation ranges from 1°C to 10°C
02	Temperature calibration  Menu No.	Menu allows you to calibrate displayed room temperature	- 1°C = temperature reduction by 1°C 0°C = temperature unchanged 1°C = increase by 1°C
03	Temperature format  Menu No.	Menu allows you to select °C or °F	°C = °C °F = °F
04	Clock format  Menu No.	Menu allows you to select 12-hour or 24-hour clock	Factory settings: 24H, options: 24H lub 12H
05	Fan operation modes  Menu No.	Operation options – fan may run continuously or only when heating/cooling system is on	1 = fan working when heating system is on (factory settings) 0 = fan runs continuously

Error warning

If any errors have occurred, one of the following messages will be displayed:

LO – room temperature is below 0°C,

HI – room temperature is higher than 50°C,

ERR –electrical shorts or controller is damaged

INTELLIGENT AUTOMATIC CONTROLL

Controller programming

Controller is factory pre-programmed as follows:

Hours	Programme	Heating (Mon. – Fri.)	Cooling (Mon. – Fri)	Heating (Sat – Sun.)	Cooling (Sat – Sun.)
Alarm (07:00)		22°C	24°C	22°C	24°C
Out (09:30)		16°C	28°C	16°C	28°C
Back (16:30)		22°C	24°C	22°C	24°C
Night (22:30)		16°C	25°C	16°C	25°C

Setting mode of operation:

Step1	Press to select Heating mode, press and hold for 5 seconds to choose programmes for days Monday - Friday
Step2	When flashing icon of programme 1 is displayed, you can change Hours of programme 1. Press or to set time (07:00 – factory settings). Press or to change time to the nearest 15 minutes.
Step3	Press and use or to set required temperature for programme 1 (22 °C – factory settings)
Step4	Press to change settings of programme 2. Press or to set hours (09:30 – factory settings).
Step5	Press and use or to set required temperature for programme 2 (16 °C – factor settings)
Step6	Press to change settings of programme 3. Press or to set hours (16:30 – factory settings).
Step7	Press use or to set required temperature for programme 3 (22 °C – factory settings)
Step8	Press to change settings for programme 4. Press or to set hours (22:30 – factory settings).
Step9	Press and use or to set required temperature for programme 4 (16 °C – factory settings)
Step10	Press to change weekend settings. Repeat steps from 2 to 9 and press to confirm.
Notice	Press to select cooling mode and repeat all of the above steps to programme cooling mode.
To deactivate programme 2 and 3 for weekends, press in step 4 (not or) – which deactivates time settings for weekends and press in step 6 (not or – which deactivates time settings for weekends . To reset changes, press again.	

Time settings: the controller is equipped with a clock, which is important to be set right. To set time, press and hold till displayed time is flashing. By pressing and set the right time. Press and hold till displayed day of the week is flashing. By pressing and set the right day of the week. Press to confirm.

Resetting device to default settings: In stand-by mode, with the controller off press those buttons and hold them for 5 seconds till „RES“ symbol is displayed (display time – 5 seconds).

Button lock: Press those buttons and hold them for 3 seconds to lock the device (repeat to unlock the device)

Fan speed setting: Press to select Low , Medium or High speed. In Auto mode the controller adjusts fan speed on the basis of the following settings:

- **Heating:** 1° C below – LOW, 2° C below – Medium, 3° C below – High

- **Cooling:** 1° C above – LOW, 2° C above – Medium, 3° C above – High

Heating/Cooling/Auto mode: Press to select Heating, Cooling or Auto mode.

Heating: the controller controls a system of heaters. **Cooling:** the controller controls a system of fans. **Auto:** the controller controls a system of heaters or fans depending on the outside temperature.

9. MAINTENANCE

The heat exchanger requires systematical cleaning all dirt /impurities off. Before the start of the heating period the heat exchanger is advised to be cleaned with compressed air directed to the air outlets; there is no need for dismantling of the device. Pay special attention when cleaning the exchanger's fin due to high possibility of damaging them. If fins are bent use a tool specifically designated to carry out such repairs. If the device has not been used for a longer period of time, unplug it before the next use.

The heat exchanger is not equipped with any fire protection device. The heat exchanger may be damaged if the room temperature goes below 0 C.

Anti-freeze liquid must be added to the water circulation/system. Anti-freeze liquid must be appropriate for the material the exchanger is made of (copper) as well as other elements of the hydraulic system/circulation. The liquid must be diluted with water according to the solution recommended by the anti-freeze manufacturer.

10. GUARANTEE TERMS AND CONDITIONS

§1 Guarantee Scope

1. The Guarantee entitles the Buyer to have the device or its part replaced with the faultless one only if within the Guarantee period the Manufacturer claims that a disclosed defective product or part cannot be repaired.
2. The proof of purchase and a correctly completed complaint form must be delivered to demand repairs with no additional costs.
3. This Guarantee covers material defects of the device which make its functioning impossible. This Warranty does not extend to the installation and maintenance works.
4. The Guarantee for the product sold by the Seller covers 24 months. The guarantee period commences upon delivery of the device to the Buyer specified in the sales invoice. The warranty covers any and all parts/components specified in the scope of the delivery.
5. Products delivered by third persons are guaranteed by this supplier.
6. Devices may be started and serviced only by qualified persons trained in the areas of maintenance and operation of the device. Any and all operations related to start, maintenance and repairs must be noted that such operations have occurred in the Guarantee Card.
7. The precondition for issuing the Guarantee by the manufacturer is the assembly and activation of the device in accordance with the Operation and Maintenance Documentation not later than 6 months after the date of purchase.
8. The product is guaranteed for a full period of warranty only if service works implied in the Operation and Maintenance Documentation for the device specified in the 'Maintenance' section are carried out. All services related to the maintenance of the device are carried out at the User's cost and expenses.
9. The provision of warranty services does not cease or suspend the duration of the Warranty. The warranty for replaced or repaired parts/elements shall end with the expiry of the Guarantee for the device.

§2 Warranty Exclusions/Disclaimers

1. The Warranty does not extend to the mechanical damages and damages to electrical parts caused by improper use, transport, abnormal voltage or other damages arising from a product defect. For the above reasons, the Warranty is solely limited to the replacement of parts/components having construction defects that shall be delivered without any additional costs only if the defective part/component has been returned.
2. The Warranty for devices does not apply to when technical mistakes occurred during the procedures concerning installation, regulation and controlling including any of the following:
 - a) Defects caused by connecting a device to an inappropriately designed ventilation system that allows additional heat loads that do not meet any standards and decrease the efficiency of heat exchanger.
 - b) Defects caused by connecting to the components or parts that are part of the heating system but have not been delivered by the Seller and whose inappropriate functioning has a negative impact on the device's functioning.
 - c) Defects caused by connecting to the components that are not original spare parts
 - d) Defects incurred by reselling of the product by the first buyer/user to another buyer who dismantles/installs the device that was previously installed and operated in a specific building and its conditions.
 - e) Defects caused by an improper expertise and insufficient knowledge of the installer and technical staff who, in an improper way carry out after-sale service of the device
 - f) Defects caused by special conditions of use that differ from typical/standard applications unless the parties (the Seller and customer's technical staff) have previously agreed otherwise in writing.
 - g) Defects incurred by natural disasters such as fire, explosions and other incidents that may result in damages to mechanical, electrical and protection devices
 - h) Defects caused by inappropriate cleaning of the technical facility or place where the device has been installed; cleaning must take place periodically to suit the specific working conditions and the amount of dust.
 - i) Defects arising from the absence or improper cleaning of heat exchangers; cleaning must be done periodically to suit the specific working conditions and the amount of dust.
 - j) Defects incurred by the inappropriate installation inadequate for low outside temperature of working conditions.
 - k) Defects incurred by low temperature if no protection device is installed by the installing contractor to avoid:
 - low temperatures on electrical and mechanical parts such as valves, electric and electronic controlling devices,
 - water condensation and frost/ice near the device,
 - thermal shock of the heater and heat exchanger caused by sudden changes of outside temperature.

GUARANTEE TERMS AND CONDITIONS**§3 PAKOLE Trade Ltd. is not liable to:**

1. Current maintenance works, inspections following from Operation and Maintenance Documentation and device programming.
2. Defects caused by banking of a device while waiting for the warranty service.
3. Any and all defects caused to the company's property.

§4. Complaint Procedure

1. In the event of the complaint under the Warranty conditions the user may make lodge a complaint directly to the Distributor.
2. All repairs covered by the warranty shall be done as part of the activity of an installation company and Factory Service. All repairs ensuing from the guarantee shall be done in a place where the device is installed.
3. The user with respect to the service activities is obliged to:
 - Allow to have full access to the rooms where the devices were installed and provide the necessary facilities allowing direct access to the device (lift, scaffolding etc.) in order to do all the servicing covered by the guarantee.
 - Present the original of the Guarantee Card and VAT invoice recording the purchase,
 - Ensure the safety while doing the servicing,
 - Allow to start works immediately after the arrival of the Service.
4. In order to make a complaint under the warranty it is necessary to deliver to the Distributor's address the following documents:
 - a. a correctly filled-in complaint form that is available at the website of www.SONNIGER.com
 - b. a copy of the Guarantee Card
 - c. a copy of the proof-of-purchase - the sales invoice
5. Repair service including the replacement of the parts shall be done free of charge only if the representative of the installing contractor or the Service claim that the defect or faulty device is caused by fault of the producer.
6. Any and all costs (cost of repair, travel and exchanged components) incurred due to the unjustified complaint especially in the situation when the representative of the Installing Contractor of the Factory Repair Service claims that defect/damage was caused as a result of breaching the guidelines provided in the Operation and Maintenance Documentation or notices the exclusions under §2 (Warranty exclusions) will be requested from the Buyer/Custom-er who reported the failure.
7. The Claimant is obliged to give a written confirmation of the service provided.
8. PAKOLE Trade Ltd. is entitled to refuse the warranty service if SONNIGER has not received full payment for the product complained about under the Guarantee or any previous servicing activities.

GUARANTEE TERMS AND CONDITIONS

WARRANTY CARD

INVESTMENT NAME.....

Unit type.....

Unit number.....

Purchase date.....

Startup date.....

Installation company date:

Name of startup Installer:.....

Company name.....

Address:.....

Phone.....

Signature of startup installer.....

Maitanance and repair registration:

Date	Maitanance and repair description	Stamp and signature of installation company

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FURTHER INFORMATION: [HTTP://WWW.PAKOLE.HU](http://WWW.PAKOLE.HU)