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Orte Power Pellet Air Heater

OPERATION AND MAINTENANCE MANUAL and WARRANTY

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CE

Manufactured in Poland

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I. Operating and maintenance manual

Before mounting the Orte Power pellet air heater (hereinafter Orte or air heater or device) read, understand, and always apply the instructions provided in this operation and maintenance manual, and read the warranty conditions.

DANGER!!! Mortal danger of explosion!

- **IF YOU WANT TO SWITCH OFF THE DEVICE – DO IT WITH A STOP BUTTON ON THE CONTROL PANEL, DO NOT DISCONNECT THE POWER SUPPLY BECAUSE THAT MAY CAUSE AN EXPLOSION.**
- **DO NOT USE THE DEVICE WITHOUT A PROPER CHIMNEY.**

National and local regulations on the installation and use must be complied with.

1. GENERAL INFORMATION

The operation and maintenance manual is an integral part of the device and must be supplied to the user together with the device.

The power supply must be connected by a properly licensed electrician and additionally secured with a residual current device (residual current 30mA). The electrician must fill in an appropriate report at the end of this operation and maintenance manual.

After connecting the device, it must be checked and accepted by a properly licensed chimney sweep. The chimney sweep must fill in an appropriate report at the end of this operation and maintenance manual.

The connection and commissioning of the heater must be entrusted to a properly licensed fitter indicated by the seller, having the necessary qualifications. The fitter must fill in an appropriate report at the end of this operation and maintenance manual.

The manufacturer reserves the right to make technological changes, change specifications, dimensions, appearance, the auxiliaries of the Orte Power device without prior notice if the differences are irrelevant and do not influence the operation of the Orte device. The updated operation and maintenance manual is available at www.orte.pl.

Orte Polska Sp. z o.o. shall not be held liable for any damage resulting from an improper installation of the heater, any changes in the device, prohibited modifications, use of spare parts not recommended by the manufacturer, or for not following the rules and conditions provided in the operation and maintenance manual.

2. USE AND CHARACTERISTICS

2.1. Use

The Orte Power devices model 24, 35, 45, 80, 130, 250 are delivered as an integrated heating device consisting of a heater with a power of 24 kW to 250 kW, with a burner and a pellet tank and a feeder. The Orte devices are designed for heating rooms in buildings where there is no water installation, or you do not want to use it. The heat generated by the heater in the form of heated air is transported to the heated room directly (model Orte Power 24) or through air channels (model Orte Power 35-250).

There are three types of Orte Power heaters: 24, 35, 45, 80, 130, 250, with the heated air flow rate of between 1500 and 15200 m3/h. With such a wide performance range, the devices can be used not only in single-family houses, but also in much larger buildings e.g.: offices, office blocks, multi-family houses, warehouses, industry and sports halls, greenhouses, and other buildings where heat needs to be supplied quickly.

The Orte Power heaters can be used for heating and ventilation in the existing buildings with the traditional gravity ventilation, without exhaust ducts and/or a recuperator. Then the heat is transmitted through the flue that distributes air sideways or through intake ducts. The excessive used air is removed through the gravity ventilation ducts due to overpressure. The air is supplied to the heater in a mixed way: an external intake vent supplies fresh air and mixes it with the air returning through the internal intake vent from the heated premises.

2.2. Safety systems

Each heater is fitted with 4 (or 5 in Orte Power 130 and 250) independent safety systems.

1. **Feeder temperature sensor**. It is mounted during the commissioning of the device in the smaller metal pipe between the burner and the flexible pipe connected to the feeder. The sensor sends a signal when the fire moves back towards the feeder and the feeder temperature is over 45°C.

2. **Flexible pipe between the metal burner pipe and the feeder**. If the feeder temperature sensor fails or is incorrectly mounted, the fire retracting into the feeder melts the flexible pipe within 2,3 seconds and cuts off the fire from the pellet bunker. Additionally, the flexible pipe is not placed directly over the burner, but laterally from it.

3. **Boiler overheat sensor.** If the water or air temperature exceeds 90°C, the burner will automatically go into the extinguishing mode. This prevents the situation when the burner keeps working when the heat removal is restricted.

4. **Photoelement** determines the quality of the burning process. If in the furnace there is not enough air, the light intensity of the flame will drop to a set level. Then the burner will automatically go from the maximum

power mode (a large amount of fuel is fed) into the ignition mode (small amount of fuel). If the situation does not change, the light intensity of the flame will remain below the required level. The burner will display the error message “no fuel” and it will stop feeding the fuel, which will prevent an excessive emission of carbon monoxide

5. The safety system protecting against a wrong sequence, phase failure and phase asymmetry. The heaters 130 kW and 250 kW are additionally equipped with a PSF sensor (**phase sequence and failure sensor**), mounted on the white box of the fan rotation speed regulator. The red control lamp lights up when the phases are reversely/incorrectly connected or if one of the 3 phases is missing. If the PSF sensor is activated, the regulator power is cut off.

2.3. Heater structure

The device Orte Power consists of the following assemblies: a heat exchanger made of stainless steel, a centrifugal fan, a head with side throttles or a head that feeds the heated air into air ducts, a transformer fan speed control unit, a powder-coated casing with additional screens that are galvanized on the inside, galvanized deflectors before the input opening of the head. On the front casing there are: the burner with the feeder, a control unit, a regulator, and wiring. The bunker is made of powder-coated steel sheeting.

2.3.1 Burner structure

The ORTE burner is built of modules that are bolted together:

- mounting main plate,
- furnace,
- feeding mechanism bringing fuel into the furnace,
- blow fan,
- igniter,
- control unit (in a separate casing to be mounted on the wall of the heater/boiler/tank)

The burner was made of the highest quality steels: heat-resisting, acid-proof, zinc-plated and optionally powder-coated.

After mounting it, the entire burner furnace is in the heater so that the external surface of the burner during its operation does not get extremely hot, although it is necessary to use caution because in emergency there is a risk of burns.

Kindling, combustion, standby, and extinguishing are automatic. The fan is the first to start to remove the gases from the combustion chamber. The pellets burn thanks to the blow of the heated air. The photoelement detects fire so that the presence of flame in the combustion chamber is always monitored. The control unit supports three ways of detecting the flame.

2.4. Operating and storage conditions

Before mounting the device, please read this manual carefully, the requirements provided here as well as the national and local regulations. It is recommended that the plan of the installation and the operating plan for the device should be prepared by a licensed company, who will consult a chimney master and a fire protection expert, and provide a written report on the conditions of the installation and operation of the device, especially concerning insulation, bearing capacity of the ground, ventilation and exhaust systems.

When mounting the device, please consider the requirements in the applicable regulations. When in doubt, consult a fire protection expert.

The room where the forced air heater is to be mounted must be insulated and ventilated as required by applicable regulations, its ground must have an adequate bearing capacity, and it must be connected to a separate exhaust duct/chimney.

2.5 Fuel

In the Orte Power heaters 24-250 kW only high-quality pellets with a diameter between 6 and 8 mm, made of the saw dust of deciduous or coniferous trees without dusts, classified as DIN Plus or A1 acc. to EN 14961-2 can be burnt. Do not burn waste in the device.

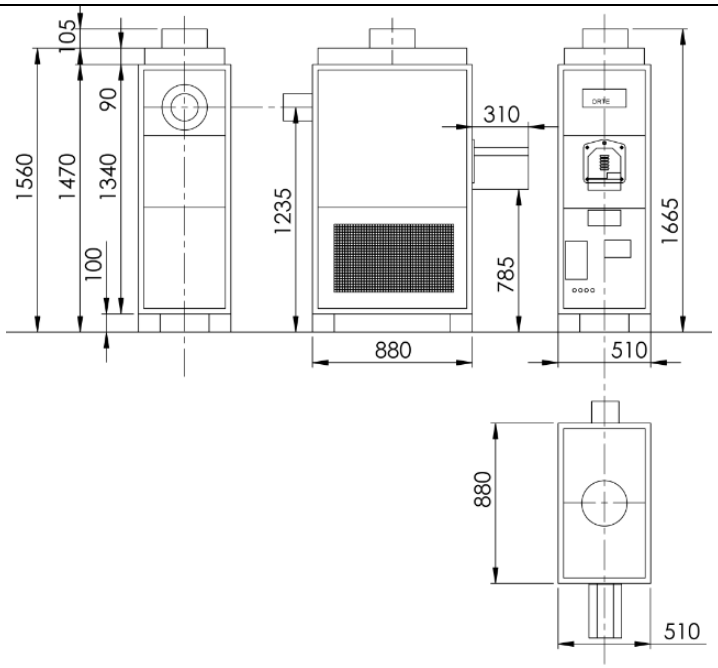
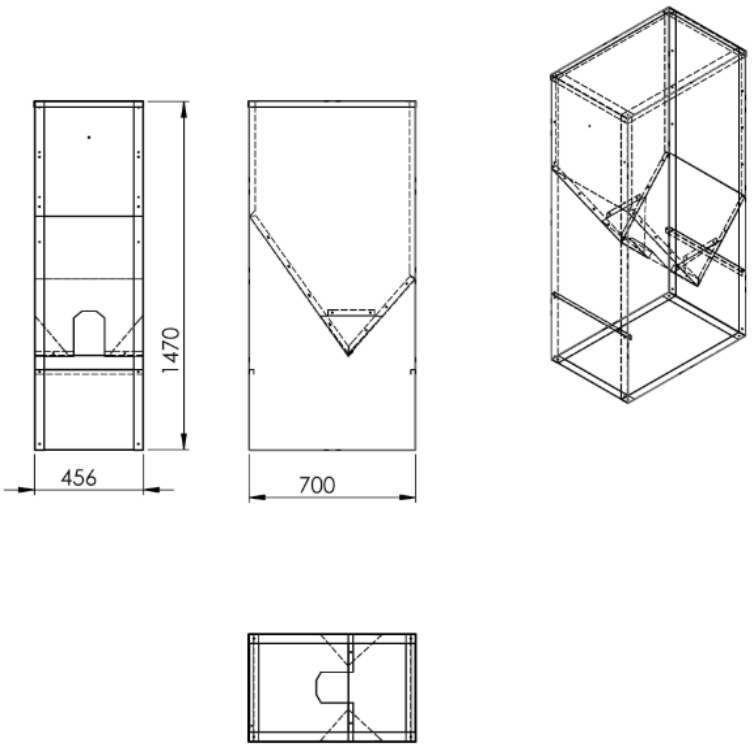
3. TECHNICAL SPECIFICATIONS

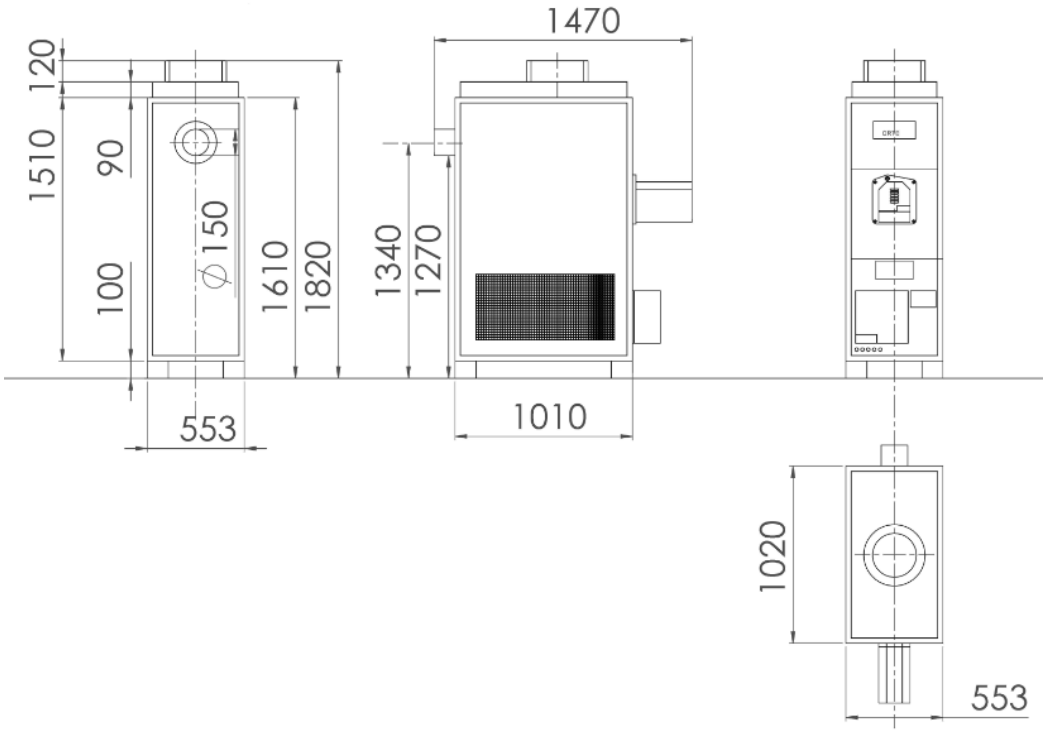
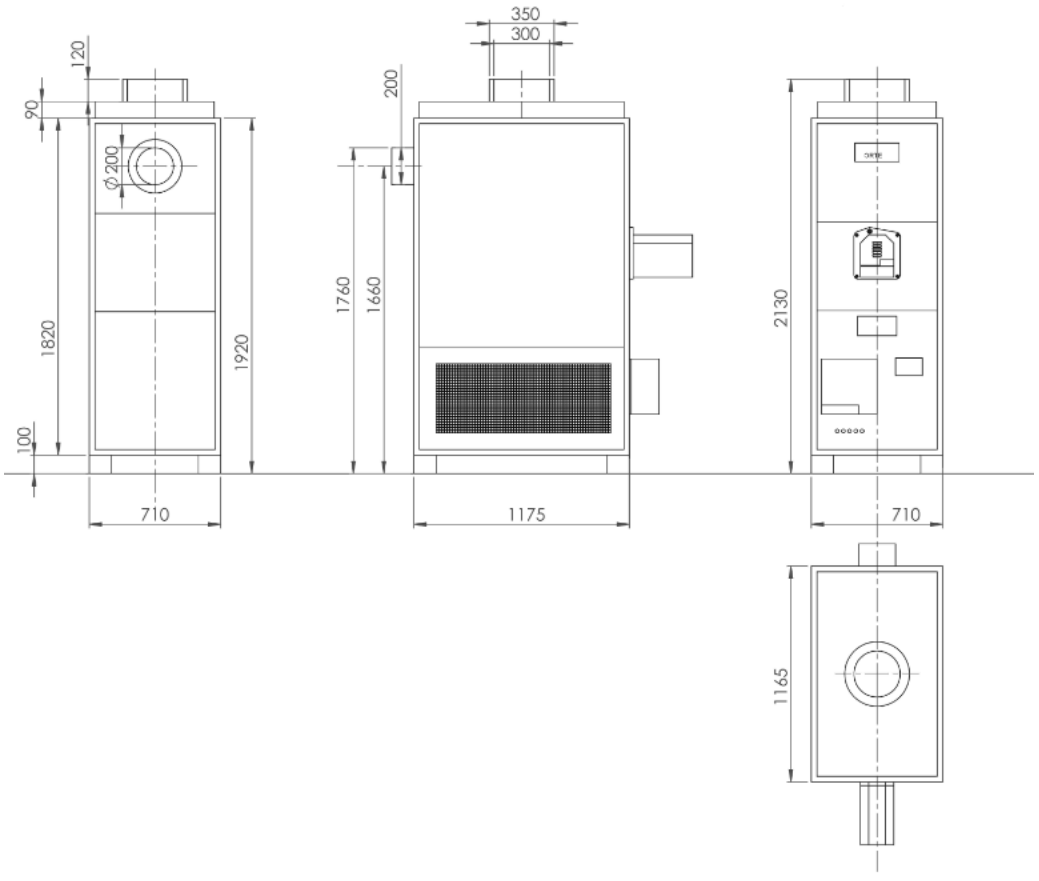
TYPE Orte Power with LPGN controller	Orte Power 24	Orte Power 35	Orte Power 45	Orte Power 80	Orte Power 130	Orte Power 250
TECHNICAL DETAILS						
Power delivered with fuel (kW)	24	35	45,5	80	131,1	246
Power nominal/max.	21	30	38,4	70	117	202,2
Power partial/min.	7	10	13,5	20	34	63,3
Emission class due to EN 303-5:2012	5	5	5	5	5	5
Efficiency for power max (%)	88	86	84,6	86	89	82

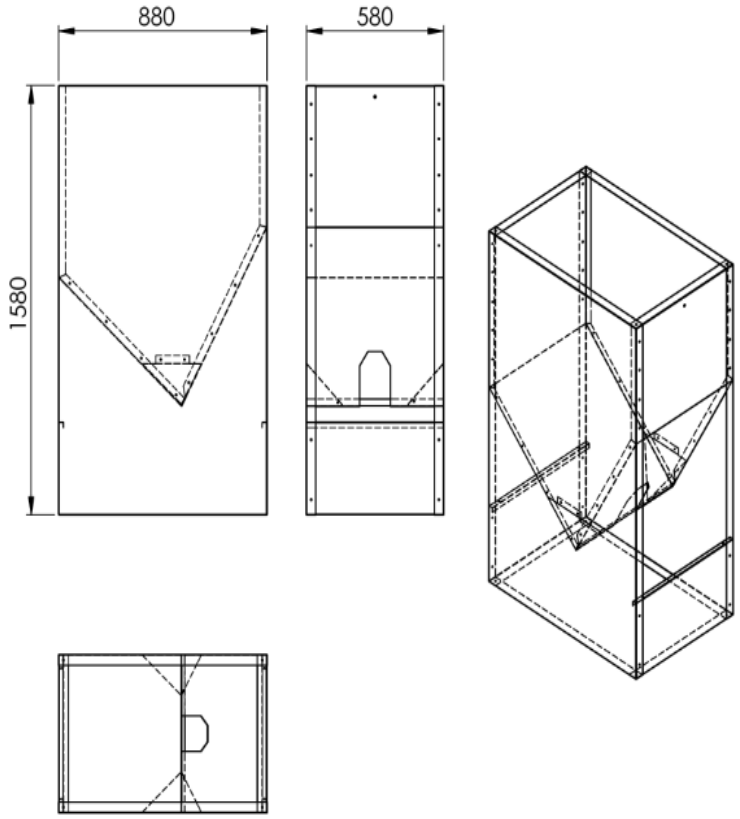
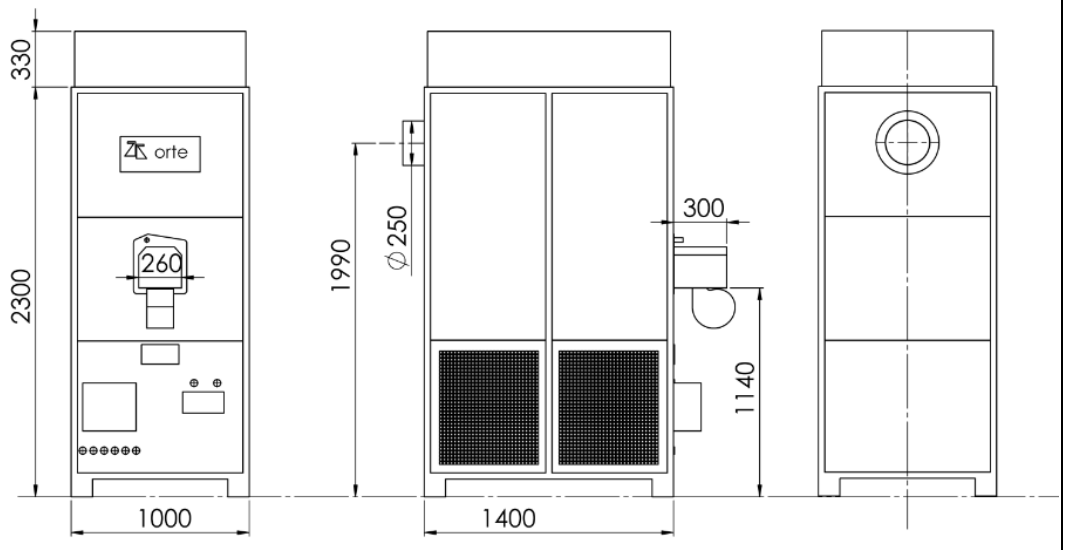
Efficiency for power min (%)	95	94	94	90	92,2	86,2
CO emission for power max. (mg/m3)	213	221	209	268	327	199
CO emission for power min. (mg/m3)	277	250	277	332	388	454
Voltage (V)	230	230	230	220-240	400	400
Air flow (m3)	1500	2100	3400	4100	7600	15200
Depth (mm)	880	880	880	1020	1170	1400
Width (mm)	510	510	510	553	710	1000
Height (mm)	1705	1705	1705	1900	2050	2630
Weight (kg)	124,5	125	138	170	380	550
Fuel consumption (kg/h)	4,8	7,5	9,2	17,2	25,25	49,45
Length of the feeder (m)	1,8	1,8	1,8	1,8	1,8	1,8
Ventilator force (W)	499	595	595	635	1785	3585
Max. power consumption (W)	600	711	796	836	1986	3786
Waste gas temperature for power max. (ºC)	190	220	244	235	226	290
Waste gas temperature for power min. (ºC)	80	90	91	100	109	172
Waste gas stream for power max. (g/s)	18	26	28	51	73	167
Waste gas stream for power min. (g/s)	6	9	10	20	30	64
Diameter of the waste gas channel (mm)	150	150	150	150	200	250
Temperature safety limit (ºC)	90	90	90	90	90	90
Chimney draught needed for power max. (Pa)	30	36	38	41	42	50
Chimney draught needed for power min. (Pa)	20	20	20	31	30	36
Required protection (A)	5	5	5	5	10	10
Frequency (Hz)	50	50	50	50	50	50
Noise level within 1 meter (dB)	45	53	56,7	58,4	75,1	77,2

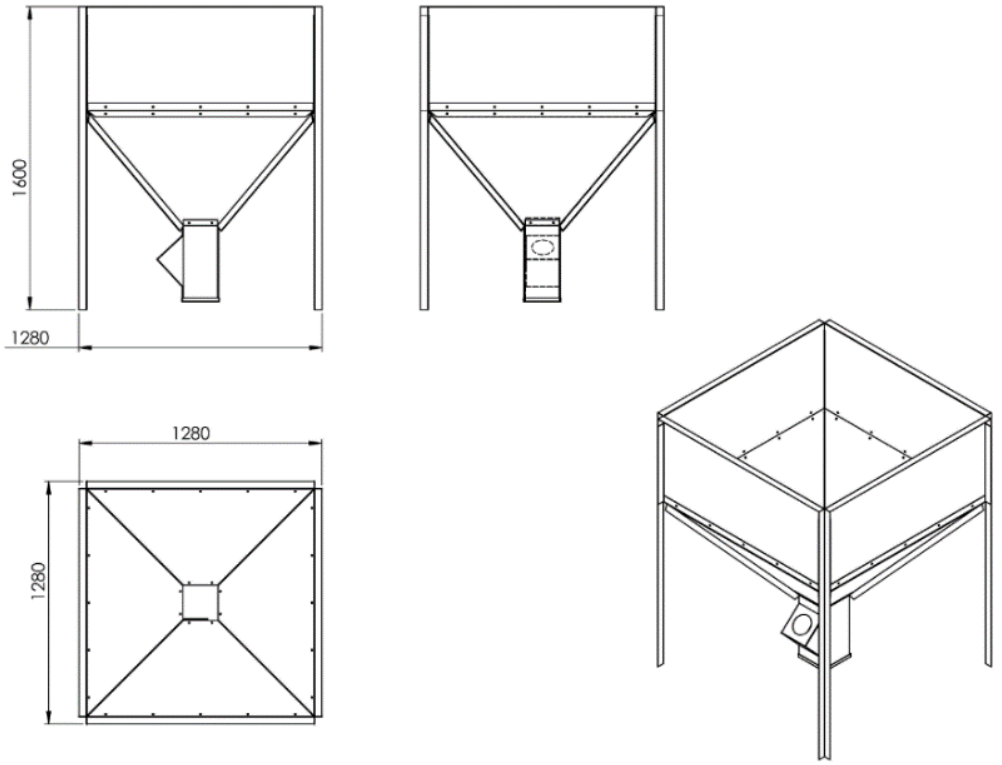
TYPE	Orte Power 24	Orte Power 35	Orte Power 45	Orte Power 80	Orte Power 130	Orte Power 250
Safety Systems	4	4	4	4	5	5
The minimal amount of air required to proper combustion of the fuel (m3)	80	90	120	225	300	600
IP	20	20	20	20	20	20
HOPPER	270 l.	270 l.	270 l.	480 l.	480 l.	750 l.
BURNER						
Steel quality: 1.4828	s	s	s	s	s	s
Cilindric burner	s	s	s	s	s	s
Furnace made of heat-proof steel	s	s	s	s	s	s
Chute burner	s	s	s	s	s	s
Automatic ash removing	s	s	s	s	s	s
Ventilator	s	s	s	s	-	-
Pressure Ventilator	-	-	-	-	s	s
Gear motor x 2 pieces	s	s	s	s	s	s
Photocell – flame detection control	s	s	s	s	s	s
Grill for pellet burning	s	s	s	s	s	s
AUTOMATIC EQUIPMENT						
Heater temperature sensor	s	s	s	s	s	s
Burner temperature sensor	s	s	s	s	s	s
Main off-switch	s	s	s	s	s	s
Safety switch	s	s	s	s	s	s
Indicator light	s	s	s	s	s	s
Temperature sensor	s	s	s	s	s	s
Enlargement possibility (extra modules)	s	s	s	s	s	s
AUTOMATIC CONTROLLER – POSSIBILITIES						
Feeder steering	S	S	S	S	S	S
Burner feeder controller	S	S	S	S	S	S
Pressure ventilator controller	S	S	S	S	S	S
Igniter controller	S	S	S	S	S	S
Heater fan controller	S	S	S	S	S	S
Cooperation with the Wi-Fi/GSM module	S	S	S	S	S	S
Cooperation with the room controller	S	S	S	S	S	S
AUTOMATIC SYSTEMS						
5-steps burner modulation	S	S	S	S	S	S
Fuel choice (3 possibilities)	S	S	S	S	S	S
Alternative function – “boiler mode”	S	S	S	S	S	S
Output testing	S	S	S	S	S	S
Simple menu	S	S	S	S	S	S
Advance menu	S	S	S	S	S	S
Alarm codes	S	S	S	S	S	S
Service mode	S	S	S	S	S	S
Multi languages	S	S	S	S	S	S

3.1. Technical drawings

TYPE	TECHNICAL DRAWINGS WITH DIMENSIONS
Orte Power 24 **Orte Power 35** **Orte Power 45**	
Hopper W2 - 270 l. **Standard for:** **Orte Power 24** **Orte Power 35** **Orte Power 45**	

Orte Power 80	
Orte Power 130	

Hopper W3 - 480 l. **Standard for:** **Orte Power 80** **Orte Power 130**	
Orte Power 250	

SILOS W4 – **750 l.** **Standard for:** **Orte Power 250**	

3.2. Suggested length of the channels distributing hot air

TYPE	Heated air flow rate (m3)	Channel Ø 200 mm/ suggested maximum channel length(m)	Channel Ø 250 mm/ suggested maximum channel length(m)	Channel Ø 350 mm/ suggested maximum channel length(m)	Channel Ø 400 mm/ suggested maximum channel length(m)
Orte Power 24	1500	7			
Orte Power 35	2100		7		
Orte Power 45	3400		10		
Orte Power 80	5400		15		
Orte Power 130	7600			15	
Orte Power 250	15200				20

The table shows the suggested diameter and the maximum length of the channels distributing hot air from the Orte Power heater. Remember that to heat the building/room effectively, you have to choose the right power of the Orte Power heater. Those values are for information only. We suggest consulting a system designer.

4. SAFETY AND THE EXPLANATION OF THE SYMBOLS

4.1 Safety

The heater must be fitted by a certified fitter indicated by the seller, who has all the necessary qualifications. The ORTE device must be mounted, set and used in accordance with the applicable regulations. The instructions in the operation and maintenance manual must be strictly followed. The heater must not be mounted in places with fire, explosion, or flooding hazard, or where there are other factors non-conformant to the operation and storage conditions. The device must be connected to an electric socket provided for this purpose.
No children or animals are allowed near the operating device.
Do not exceed the maximum power. Ensure adequate air circulation – required by applicable regulations. Have chimney inspections conducted as required by appropriate regulations, at least every 3 months.

When the system designer adjusts the power and number of devices to the size of the building, insulation, and the expected temperature in the building, the device will be able to meet the user's expectations. If there are not enough devices (the power demand is too high), the operation of the devices affects their reliability and safe use.

If the devices are operating continuously at their maximum power, and do not enter the modulated power mode, it means that the set temperature is impossible to reach. This means that the power demand is higher. This means in turn that the existing and used devices are overstressed.

Therefore, we suggest using the devices so that they reach the set temperature within 6 hours and then go into modulated power mode. Please remember not to exceed the nominal power of the device because this also affects the reliability and safe operation of the device.

The ventilation system in the room where the device is mounted must be in accordance with the applicable regulations.

Risk of electrical shock in a situation when the device is not connected by a properly licensed electrician. The Orte Power device must be connected with the pellet tank via a bridge, which will ground the tank (or the tanks must be grounded individually)

Risk of carbon monoxide poisoning

- Insufficient air supply may cause the production of carbon monoxide in the combustion process.
- Do not limit or close the intake-exhaust openings.
- If the lack is not removed immediately, the use/further use of the device is not allowed.

- If fumes start appearing in the room, air and leave the room, if needed, call in the fire department.

The device requires an **air supply** to work correctly and safely**.**
The air should be supplied in a mixed way: an external intake vent supplies fresh air and mixes it with the air returning through the internal intake vent from the heated premises.

Remember that the amount of air to be heated that is supplied to the Orte Power device must be at least the same as the flow rate volume of the heated air (m3) and the min. amount of the air necessary for appropriate combustion of the fuel (m3), as provided in the technical specifications in this operation and maintenance manual.

It is not recommended that the device **works simultaneously** with other furnaces. However, if there are other heating devices mounted in the room, ensure a sufficient amount of air for the combustion taking place in every such device and also ensure enough air for the ventilation of the room, taking into account all the devices.

Do not touch (except for the control unit) or open the device during operation, due to the **risk of burning**.

Do not store inflammable materials in the room.

Fuel storage – in accordance with the applicable regulations and standards.

There must be an ABC powder **extinguisher** near the device.
In the event of a **chimney fire,** extinguish the fire in the furnace immediately by pressing the STOP button on the control unit. Do not open the ash box, but cut off all access of air necessary for combustion. Do not open windows. Then secure the outlet of the chimney with a chimney sieve. It should make the soot combustion less intense by quenching the fire, and also prevent the burning soot from getting outside and possibly starting a fire on the nearby roofs or other structures. Instead of the chimney sieve you may use a wet cloth, with which the chimney outlet must be covered. The cloth must be wetted with water until the soot stops burning. Do not extinguish chimney fires with water, because the rapid cooling of the chimney and the water vapour may cause the chimney to crack and spread the fire.

When the device works in **unfavourable weather** i.e. when the chimney draught is unfavourable (too low) or when the wind is strong or changeable, extinguish the device to avoid the exhaust gases being pushed back. Re-ignite the heater when the weather improves.

If the device **does not work for a longer period of time**, have the chimney inspected because there is a risk of the chimney being clogged.

Hazard due to not following the safety rules in emergency situations, e.g. during fire

- Never expose yourself to mortal danger. Your own safety is always the most important.

Damage caused by the operator's mistakes

- The operator's mistakes can cause injuries and/or damage to property.
- Ensure that only persons who can really operate the boiler can access it.

- The mounting, commissioning, and maintenance may be done only by properly licensed fitters.

Basic **fire protection requirements and norms** on the Polish territory applying to the devices Orte Power 24-250 kW:

1) decrees of the Minister of Internal Affairs and Administration:
– on the preparation of a construction project in terms of fire protection, 16 June 2003 published in the Journal of Laws No. 121 item 1137 (amended by the decree of the MIAaA of 16 July 2009, Journal of Laws No. 119, item 998),
– on the water supply for fire protection purposes and on escape routes, 24 July 2009 published in the Journal of Laws No. 124 item 1030,
– on the fire protection of buildings and other structures and land areas, 7 June 2010 published in the Journal of Laws No. 109, item 719,
2) decree of the Minister of Infrastructure:
– on the technical conditions to be met by buildings and their situation, 12 April 2002 published in the Journal of Laws No. 75 item 690 as amended,
3) PN-B-02411 Heating. Built-in solid fuel boilers - Requirements.

The buyer of the device must strictly follow the instructions in the operation and maintenance manual.

4.2. Explanation of the symbols

The words at the beginning of each warning notice indicate the type and the gravity of the consequences of the omissions aimed at avoiding risk.

INFO means important information.
NOTICE means the risk of material damage.
CAUTION means the risk of not serious bodily injury.
WARNING means the risk of grave bodily injury.
DANGER means the risk of life-threatening injury.

5. TRANSPORT AND MOUNTING

5.1 Transport

The heater is protected against transport damage. During transport, loading and unloading, protect the device against shocks, damage, crushing, and unfavourable weather conditions, as they may damage the device. If transport damage is noticed on the device (the shipment must always be checked on receipt), send the device to the service to have the defects repaired. On receipt, please make sure that the shipment is complete. Any claims or problems must be reported immediately to the supplier who is responsible for the insurance of the goods.

WARNING: Risk of injuries due to lifting heavy objects and their improper securing during transport!

- **Ensure that the device is lifted and transported by enough people.**

- **Use adequate means of transport, e.g. a truck for sack transport with a mounting strap or a lift truck.**
- **Secure the device against fall.**

INFO: Observe the regulations of the construction supervision, especially the regulations on furnaces, on the construction requirements pertaining to the places of installation and their ventilation.

5.2. Mounting

INFO While mounting and operating the device, follow the regulations and national standards!

The heater Orte Power is supplied (if not otherwise at the customer's request), depending on the power and the chosen type of the bunker, on one or two wooden pallets. The burner is already fixed in the device. The supplied bunker is assembled, or it may be delivered in parts, if the customer wishes so, and then it must be assembled on site. The feeder and the spiral pipe have to be connected to the control unit and put into the feeder. The supplied set includes also a cable (to connect the heater to the pellet tank) for grounding the tank.

Make sure that in the burner chimney (knee to the fireplace made of stainless steel), the feeder overheat sensor is put inside a thin pipe mounted to the burner chimney on the underside. Connect the burner chimney with the flexible pipe, and then connect the pipe to the outlet of the feeder. The burner feeding pipe (hole Ø in the upper part of the burner) must be connected with a ring (pipe Ø 64mm length about 10 cm) with a bent joint (bent pipe Ø 63mm). Put the feeder overheating sensor into the bent joint, or more precisely, into a thin pipe attached to the underside of the bent joint. Connect the bent joint with the flexible pipe, to be connected to the feeder outlet.

The feeder must be mounted in the tank. The feeder should be fitted at an angle of no more than 35 degrees from the front wall of the tank.

DANGER: Risk of injuries!!! Putting anything into the tank during the operation of the device may cause disability.

The bunker should be covered with a cover on the top. It is forbidden to put anything into the bunker when the feeder is operating, as this may cause serious injury. Remember to fill the bunker with the pellets before igniting the burner.

After fitting the feeder in the bunker and filling the latter with pellets, it is recommended that that the flexible pipe should be disconnected from the burner and the feeding operation should be checked. To determine the right amount of fuel, use the following formula: power of the device in Watts x 3.6 / calorific value of the fuel (most frequently 18 000 kgJ/kg). The result is the amount of fuel in kilograms per hour that

is necessary for the required thermal power in kW. When the feeder works in the required cycle, it should provide the amount of fuel per hour equal to the result of the calculation. It is recommended that the operating cycle of the feeder should not exceed 75%.

5.2.1. Installation of the tank grounding

There is a cable in the set (with which you have to connect the heater to the tank) which is used for grounding the tank.

The grounding cable goes out on the side of the device and it must be connected with a screw with the tank.

DANGER: Mortal danger caused by electrical shock!!! The device must be connected by a qualified electrician. The tank must be connected to the device through a bridge and individually grounded.

Heater Tank

6. INSTALLATION

Connecting and commissioning of the heater must be done by a certified fitter indicated by the seller, who has all the necessary qualifications.

During the installation, all local regulations and all applicable EU norms concerning the installation and operation of the device must be observed. The device must be put on even, hard ground and it must be levelled, as required by the regulations. Maintain the required distances from flammable materials and walls. Connect the device to the intake and exhaust system, which has been prepared in accordance with applicable regulations. Connect the heater to the smoke flue in accordance with applicable regulations. The exhaust pipe leading into the chimney should be as short as possible and have an adequate diameter (in accordance with applicable norms), and it must be inclined upwards. The diameter of the pipe must fit the exhaust pipe of the heater. Each device must be connected to the flue separately. The flue must conform to the applicable norms and regulations. The electric supply must be grounded.

Before using the device (after connecting the device to the flue), the installation must be checked and approved by a chimney master. For safety reasons (risk of explosion) chimney inspections must be

performed at least every 3 months (unless required otherwise by the local regulations). The acceptance and the follow-up inspections should be recorded at the back of this operation and maintenance manual, at an appropriate place. Cleaning the chimney (inspection) should be confirmed with an appropriate inspection report. The chimney must have a draught of Pa, at least as indicated in the technical specifications in this operation and maintenance manual.

The Orte Power device must be installed in a way that ensures access to the device, the connecting element, and the chimney for cleaning purposes. Ensure the **passability of the ventilation grille** of the intake and exhaust ventilation and of the duct that supplies the air for combustion.

INFO: The device sucks the required air from the surroundings.

- ***Mount and use the device only in the premises with sufficient and continuous ventilation.***

INFO: The device must be connected to a chimney in accordance with the local construction regulations and in consultation with a chimney sweep.

NOTICE: System damage due to insufficient chimney draught!

- **Provide the required chimney draught**
- **To limit the maximum chimney draught, mount a draught limiter.**
- Mount a flue gas connection with a revision opening for cleaning purposes.
- Rivet or bolt the exhaust pipe to the boiler using the holes provided. The exhaust pipe must be as short as possible and it must run upward between the boiler and the chimney.
- The exhaust pipe, mounted on the chimney and put onto the exhaust stub pipe, must be fixed very well so that it does not slide off.
- Pipes that are over 2 m long must be fixed additionally. All parts of the exhaust pipe must be made of non-flammable materials.

INFO: The draught depends on the diameter, height, unequal surface inside the chimney, and the temperature difference between the products of combustion and the air outside. It is recommended that you use a chimney with an insert.

- ***Have a fitter or a chimney sweep calculate the chimney precisely.***
- ***Obtain a chimney sweep's approval.***

DANGER: Mortal danger due to lack of oxygen in the room where the device is mounted!

- **Ensure the supply of enough fresh air through the holes going outside.**

DANGER: Risk of injuries/damage to the system due to the lack of air for combustion!

An insufficient amount of air for combustion may cause the build-up of tar and low-temperature furnace gases.

- **Provide enough fresh air through the holes going outside.**
- **Tell the user that the holes providing fresh air must always be open.**

DANGER: Mortal danger caused by electrical shock!!! The device must be connected by a qualified electrician. The tank must be connected to the device through a bridge and individually grounded.

DANGER: Mortal danger caused by electrical shock if the tank is not grounded and the device is not connected by a properly licensed electrician!

- **The Orte Power device must be connected through a bridge to the tank, thanks to this the tank will be grounded.**

After mounting and commissioning the device, the fitter must train the user how to use the device correctly, set the basic parameters independently, and react in emergency (e.g. when there is no fuel), fill the tank, etc.

7. OPERATION

7.1. Commissioning

DANGER: Risk of injuries when opening the cleaning device and by the opened cleaning device!

- **Do not open the door of the cleaning device during the operation of the heater.**

DANGER: Risk of injuries due to high temperatures!

DANGER: Mortal danger caused by chimney fire!

- **Before commissioning, order an appropriate supervisory body to inspect the exhaust system.**
- **Hand the inspection report to the user.**
- **Check the tightness of the exhaust pipe.**
- **Do not change the structure of the heater.**

DANGER: Mortal danger caused by electrical shock!!! The device must be connected by a qualified electrician. The tank must be connected to the device through a bridge and individually grounded.

WARNING: System damage or risk of injuries due to incorrect commissioning!

- **The device must be mounted only by a qualified company.**

WARNING: System damage due to incorrect operation!

- **Explain the operation of the device to the customer or user.**

To ensure that there are no manufacturing defects or defects related to improper connection, it is recommended that the first two or three runs are made by the fitter in the user's presence.

After the correct installation done only by the certified fitter, you may start the heater. To do this, use the temperature regulator as described in the operation manual of the burner under **Starting** (a separate appendix). An additional description of functions is provided in the operation manual of the burner under **Functions** (a separate appendix). The full description of how to use the temperature regulator is provided in the temperature regulator manual (a separate appendix).

The heater may work with 5 fan rotation speeds (a separate appendix).
After the device has been started and the burner gone from the „ignition" mode into the „maximum power" mode, only the burner works for several minutes. When the temperature of the air blown out reaches over 40°C, the blower fan turns on.

During the commissioning, be particularly cautious:
- Check if the device is connected to a power supply.
- If the burner works in the „maximum power" mode, and the temperature on the display has not increased for over 19 seconds, press STOP on the control unit – a message „EXTINGUISHING" (or „AFTERBURNING" depending on the device version) will show. If the control unit does not react, disconnect the power supply. In both cases contact the service technician.
- If the burner works in the „maximum power" mode, and the temperature on the display is increasing, the fan should start at 42°C indicated on the display.

If for some reason the fan does not start in the circumstances described above, disconnect the power supply and contact the fitter.

The fan should automatically turn off a few minutes after the burner goes into the „EXTINGUISHING" mode (or „AFTERBURNING" depending on the device version). The decrease in the ambient temperature below the set temperature will cause the burner to start again. If the temperature of the heated air exceeds 90°C, the burner turns off immediately and it goes into „EXTINGUISHING" mode (or „AFTERBURNING" depending on the device version).

7.2. Turning on

If the device was mounted correctly, it is enough to press START. While mounting the device, the service technician must train the user how to operate the device.

The information to be provided to the user by the fitter:

- Explain to the customer how the device works and how to operate it.
- Tell the customer not to make any changes or repairs.
- Tell the customer that children must not be let near the system without supervision of an adult.
- Fill in the commissioning report in this document and hand it over to the customer.

- Hand the technical documentation over to the customer.

7.3. Messages

Pressing START – the main switch on the control panel – starts the burner. The control lamps light up and the fan starts (to ventilate the combustion chamber). After the preparation of the combustion chamber, the start dose of the fuel (pellets) is supplied and the igniter starts. The igniter needs 90 to 120 seconds to ignite the fuel.
After the flame is detected (after the set threshold of brightness is exceeded) by the photoelement, the igniter is turned off, and the ORTE burner goes into the automatic mode. This is signalled by the MAXIMUM POWER appearing on the display of the control unit.

If the brightness in the combustion chamber drops to the lower threshold, the igniter is started again to ignite the fuel.

The operation status can be assessed based on the messaged displayed:

Operation mode	Description
TEMPERATURE 67°C STOP	The controller is switched off. Press START in order to continue work.
TEMPERATURE 67°C IGNITION	Controller carries out automatic ignition.
TEMPERATURE 67°C STAND-BY	Desired temperature has been achieved.
TEMPERATURE 67°C EXTINCTION	No heat demand. Controller shuts down heater/boiler operation.
TEMPERATURE 67°C MAX POWER	The burner operates to reach the max. power (it hasn't reached desired temperature yet).
TEMPERATURE 67°C MIN POWER	The burner is working in automatic mode with minimal power (desired temperature has been achieved).

7.4. Safe turning off

DANGER!!! Mortal danger of an explosion!

- **IF YOU WANT TO SWITCH OFF THE DEVICE – DO IT WITH A STOP BUTTON ON THE CONTROL PANEL, DO NOT DISCONNECT THE POWER SUPPLY BECAUSE THAT MAY CAUSE AN EXPLOSION.**

7.5. Suggested settings

It is recommended that the threshold temperature is set between 38°C and 85°C. The temperature is set by turning a knob that is then pressed to confirm. The information on the temperature regulator is provided in a separate manual (USER MANUAL – Temperature regulator for heaters fired with solid fuel and fitted with a fuel feeder). The device is started by pressing START. It is turned off by pressing STOP.

Suggested settings for Orte Power	Orte Power 24	Orte Power 35	Orte Power 45	Orte Power 80	Orte Power 130		Orte Power 250
Ignition off at brightness	6						
Min. fan speed heating up	20 %						
Max. fan speed heating up	50 %						
Fan speed during ignition	50 %						
Fan speed at max power	40 %	40 %	40 %	40 %	40 %		98 %
Fan speed at min power	20 %	20 %	20 %	20 %	20 %		40 %
Fan speed during extinction	85 %						
Fan scavenge pause time	off						
Fan speed during scavange	off						
Fuel dose during ignition	7 %						
Fuel dose for max power	17 %	20 %	24 %	65 %	For feeder 15 W	85%	85 %
					For feeder 25 W	45%	
Fuel dose for min power	10 %	10 %	15 %	30 %	30 %		30 %
Stocker work time	10 s						
Auger ignition temperature	45°C						

Flame vanish histeresis	90					
Flame vanish delay	120 s					
Fuel ignition time	10 min					
Ignition time count	2					
Kindle fire stab. time	2 min					
Furnace extinct time	30 min					
Mechanism work time	150 s	150 s	140 s	130 s	110 s	100 s
Mechanism return time	150 s	150 s	140 s	130 s	110 s	100 s
Mechanism pause time	200 s	100 s	70 s	45 s	30 s	1 s
Mixing pump engage temp	40°C					
Minimum boiler temperature	40 °C					34°C
Maximum boiler temperature	85 °C					
Boiler overheat temperature	93°C					

8. MAINTENANCE

DANGER: Risk of injuries due to high temperature!

- **Before you start cleaning the device, make sure that the power supply is disconnected and that the device has not worked for at least 2 hours.**

The device comes with:

1) Brush for cleaning combustion tubes.
2) Ash raker - poker.
3) Chute to be mounted on the flap of the ash pit.

Ash must be removed from the Orte device. The amount of ash depends on the quality of the pellets, and on how long the burner works, and the size of the furnace. In the first few days of use, it is recommended to check the amount of ash every day. To do that, unscrew the black flap directly below the burner in the face part of the heater. On the screws on which the black flap is mounted, mount the chute. To better remove the ash, use the raker. After removing the ash, take off the chute and attach the flap back. It is recommended to disengage the burner and remove ash from the burner and the combustion chamber once a month. Once

in 6 months it is recommended to take off the face plate over the burner and clean the combustion tubes with a brush.

9. FAILURES

If the device does not work as it should, try to identify the failure using the explanations in the table below or contact the service technician or the seller.

DANGER: Risk of injuries due to high temperatures!

- **Before you start cleaning the device, make sure that the power supply is disconnected and that the device has not worked for at least 2 hours.**

	Problem	Possible reason	Solution
1.	the burner doesn't ignite	no fuel in the fuel tank – dispatch on the display: NO FUEL	- fill the fuel tank with pellet - delete the dispatch on the dispatch by pressing STOP - reset the burner by pressing START
		faulty igniter	contact your local service
		cinder in the furnace	- clean the furnace thoroughly - clear the air openings
		Igniter, stocker and conveying screw doesn't work	exchange the fuse that is placed next to the controller (fuse 5A – 5x20)
2.	the ventilator doesn't switch off during extinction of the burner	wrong selection of flame detection parameters	contact your local service
		flame detector polluted	disassemble and clean the photo cell
3.	conveying screw fire alert – dispatch on the display: HOT	excessive temperature augmentation of the burner housing caused by fire in the stocker or intake pipe	- when the extinction is finished (the ventilator will switch off and the stoker will remove the burning fuel), wait until the temperature of the burner housing sinks - delete the dispatch on the display by pressing STOP - reset the burner by pressing START

4.	overheating alarm - dispatch on the display: BOILER OVERHEAT	boiler water temperature increased up to the 'boiler overheating temperature'	- wait until the water temperature in the boiler fall below 'boiler overheating temperature' - delete the dispatch on the display by pressing STOP - reset the burner by pressing START
5.	temperature sensor failure	failure of the temperature sensor circuit or temperature beyond measuring range -9°C - 109°C	- press STOP - if the dispatch doesn't delete after pressing STOP, contact your local service
		failure of the conveying screw temperature sensor circuit	
		failure of the temperature sensor circuit automatically shuts the hot water regulations off	contact your local service
		failure of the temperature sensor of the burner	
6.	the burner fumes soot arises	- too much fuel added (in proportion to air) - burner furnace is polluted - slag in the furnace	- clean the furnace thoroughly - clear the air openings - set up the burner – fuel and air proportions for min. and max. power
7.	Soot in the furnace arises too often – the burner doesn't clean be itself	wrong fuel	find a new pellet supplier

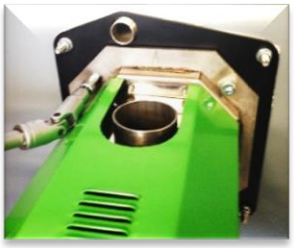
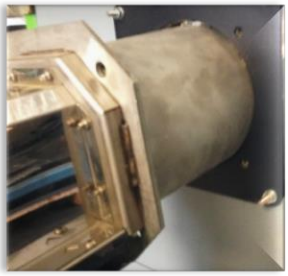
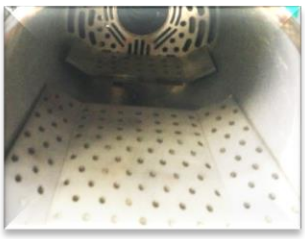
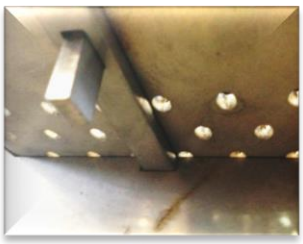
10.CLEANING THE BURNER

DANGER: Risk of injuries due to high temperatures!

- **Before you start cleaning the device, make sure that the power supply is disconnected and that the device has not worked for at least 2 hours.**

- **To clean the burner, turn it off first and wait until the temperature of the furnace drops (min. 2 hours).**
- **This can be done only by adults who proceed cautiously. While cleaning the burner, no children should be near it.**

1	Before cleaning the burner, one must turn off the device (STOP button on the steering panel) and wait for 2 hours. Turn the device off the power.	
2	Take away the feeder pipe from burners chimney.	
3	Take off the burners cover.	
4	Unplug the cables from the socket.	

5	Unscrew the screws (heaters 24-45 kW: 2 screws ø 8, heaters 80-250 kW: 4 screws ø 10).	
6	Pull out the burner and put it on table or other convenient place.	
7	Pull out the grate and remove ash. Clean the place under the grate in the tube.	
8	Insert the grate on place. ATTENTION: The grate must be placed under fixed part of the grate.	
9	Please check whether the tongue of the grate is on place.	
10	Insert and connect the burner in the reverse order to its removal.	

The burner is equipped with a mechanism for automatic ash removal. If the pellets used are of adequate quality, the burner does not have to be cleaned every day. It is recommended to inspect the furnace each time the ash is removed from the heater, to clean carbon deposit from the burner.

If the burner is designed to work in the boiler and not in the heater, it can be mounted in the doors to the boiler instead of in the body to facilitate cleaning. Then the burner is pulled out of the boiler when the door is opened.

The burner must be cleaned depending on the quality of the burnt pellets. If the fuel is highly polluted or it produces a lot of slag (for which the ash melting temperature is below 1300 °C), the burner may require cleaning every several hours. That is why it is so important to use the right pellets.

Before re-starting the burner, check all connections of the burner and the feeder. Check the screws fixing the burner to the heater and the thermal seal between the burner and the heater.

11. EXCHANGE OF SPARE PARTS

DANGER: Risk of injuries due to high temperatures!

- **Before you start cleaning the device, make sure that the power supply is disconnected and that the device has not worked for at least 2 hours.**

11.1. Igniter exchange

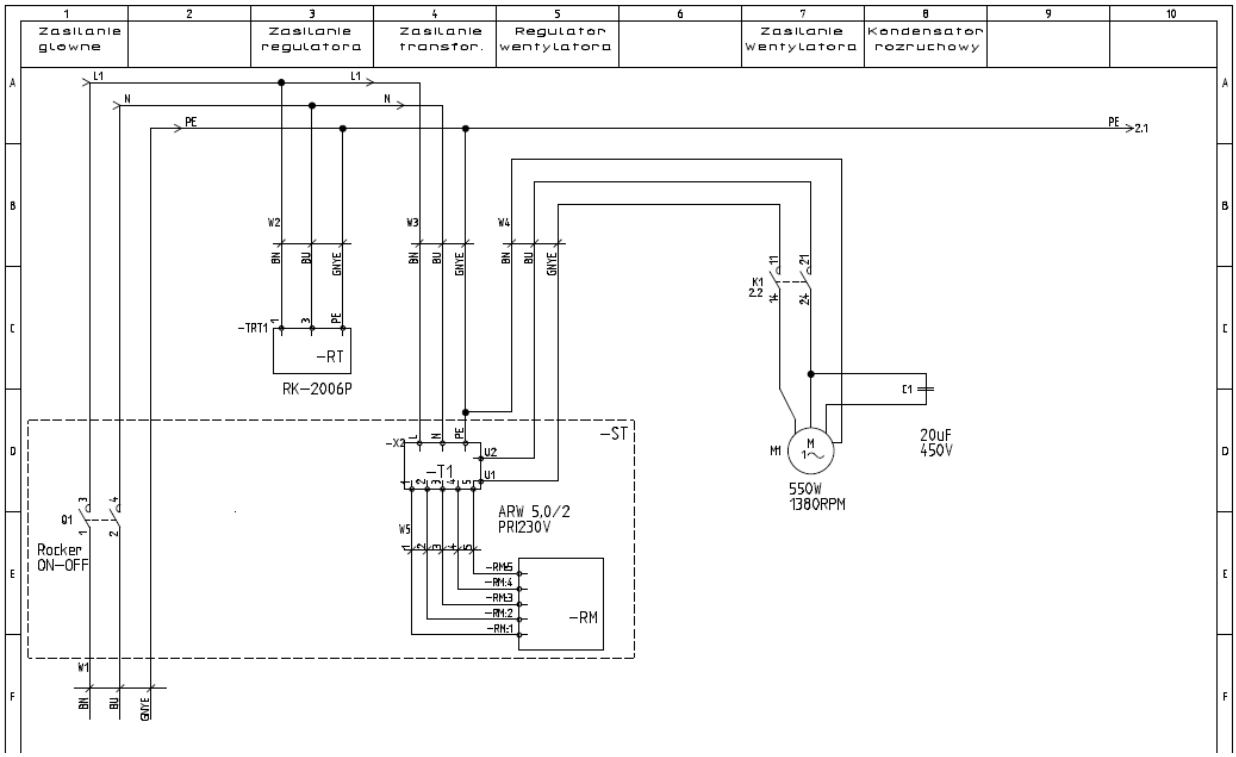
Turn off the burner by pressing stop, after the fan turns off (after 10 -30 minutes, depending on the setting) disconnect the power supply, unscrew the powder-coated cover (cap), unscrew the burner shield (element with a gear-motor), under the T-pipe you will see a metal pipe with three glass tubes inside, this is the igniter. Disconnect it from the junction box and make sure it is not hot (touching a hot igniter may cause injury). Then grab the igniter and pull it out of the socket. To do it, spread the socket with a screwdriver (see below). Now put the new igniter, and make sure it is pressed against the plate of the furnace. If it is not, it will not work properly, as the igniter will not heat the pellets enough to ignite them. The used igniter must be properly disposed of or sent to the manufacturer.

11.2. Photoelement exchange

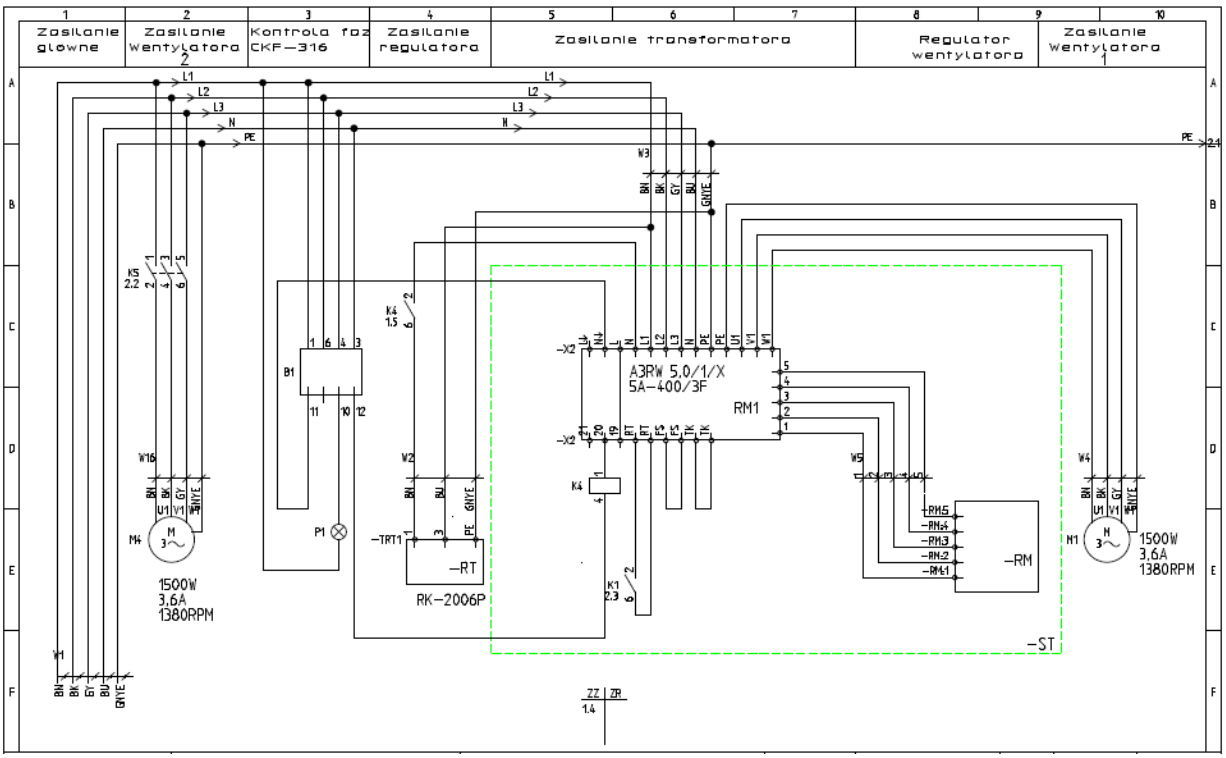
Turn off the burner by pressing stop, after the fan turns off (after 10 -30 minutes, depending on the setting) disconnect the power supply, unscrew the powder-coated cover (cap). In the burner shield (a silver element with the gear-motor mounted in the central part) on the right there is a rubber screen. Remove it and disconnect the cable that is attached to it and runs from the junction box. The cable entering the rubber screen ends with a photoelement. Take the damaged element out of the rubber screen and put in the new one the same way. The used photoelement must be properly disposed of or sent to the manufacturer.

12. WIRING DIAGRAM

12.1. Orte Power 24-80



12.2. Orte Power 130-250



13. Warranty conditions

1. The manufacturer provides the limited 2 year warranty for ORTE POWER heater starting from the date of purchase.
2. The term 'warranty' is to be understood to denote the free of charge replacement or repair of parts recognized to have been defective at the start by reason of manufacturing defects.
3. Recognized manufacturing defects will be replaced or repaired within no longer than 21 working days starting from the day written complaint has been delivered/send to the manufacturer.
4. The way and extent of the reparation as well as repairing and replacement conditions are to be determined by the manufacturer.
5. The manufacturer must be informed about each defect as soon as it has been recognized. In order to do it, please fill out the complaint report that is to be found in this booklet.
6. Documents needed for free of charge replacement or reparation of parts recognized as defective are: Installation Protocol (filled warranty sheet) and receipt / invoice proving the purchase.
7. Incorrectly filled installation protocol (lack of signatures, stamps, dates etc.) make the warranty not valid.
8. The warranty is conditional on the installation protocol being filled and returned to the manufacturer within 14 days and requires that the product be installed and commissioned by an authorized installer according to the detailed instructions given in this User's Manual supplied with the product.
9. First activation must be performed by an authorized installer.
10. The manufacturer refuses to accept any responsibility when:
    - the appliance or any other accessory has been improperly used or modified without authorization
    - the appliance has been incorrectly installed, activated or used (in consequence of the failure to observe all the prescriptions laid down in this User's Manual, especially those concerning warnings on the subject of installation, use and maintenance of the appliance)
    - damages are not being caused by the manufacturer

- in case of misuse of the product or sabotage (making changes or modifications of the burner)
- the burner has been activated without mounting it first into the heater (or boiler)
- the chimney and chimney draft diameter is to small
- reparations has been made by unauthorized personnel
- damages have been made due to false electrical installation
- the appliance have been damaged during incorrect transport to the boiler house
- the burner parameters have been incorrectly set up
- the fuel doesn't have requested quality causing snag and other tarry residues difficult to remove
- the damages are been caused due to low quality pellet or inappropriate fuel
- the reparation is not possible due to reasons independent from the manufacturer (e.g. no fuel, no access do the burner, no chimney draft etc.)

11. The warranty doesn't include:
    - ORTE POWER parameters regulation
    - Cleaning and maintenance of the ORTE POWER
12. In cases mentioned in points 10 and 11 the user/owner of the appliance will be charged for reparation or replacement of parts.
13. The request for action under the warranty must be addressed and sent to: Orte Polska Sp. z o.o. , ul. Groblowa 1, 05-800 Pruszków, Poland or biuro@orte.pl.

14. Warranty sheet

The only ground to claim damages is the following **Warranty sheet** (filled readable and signed) together with the proof of purchase of the ORTE POWER Pellet Air Heater. The seller should obtain a copy of this document as a double warrant for the user.

WARRANTY SHEET

APPLIANCE DATA – filled by the producer or see the table at the back of this instruction

Type: …….. Serial number: …….. Year of production: …… Nr of the bill of sale: …… Date: ……	Signature and stamp of the seller

SELLER – filled by the seller

Company: …… Address: …… Phone number: …… Date of sale: ……	Signature and stamp of the seller

AUTHORIZED SERVICE – company responsible for the air heater installation- if different than the seller

COMPANY: …… Address: …… Phone number: …… Name of serviceman: …… Activating date: …… **MEASUREMENTS** Chimney draft (Pa): …… Waste gas temperature (°C): …… *) Service attestation: - the appliance has been correctly installed, according to the User's Manual and Warranty Conditions of the ORTE POWER Pellet Air Heater, - security measures has been proved, - first activation has been made following the User's Manual instructions	Signature and stamp Stamp of an authorized service*)

USER

Name and surname or company name: …… Address: …… Phone number: …… **) The user confirms: - to be instructed how to use and maintain the appliance, - receiving and getting familiar with the User's Manual of the heater together with a filled out Warranty Sheet, - that there has been no defects shown during the first activation	Date User's signature **)

CHIMNEY SWEEP ACCEPTANCE

Company name: …… Address: …… Phone number: ……	Date …… Signature Authority no:…… Stamp

COMMISSIONING REPORT OF AN INSTALLING ELECTRICIAN

<table>
<tr><td colspan="4">Seal and license no. of the fitter providing the service.</td><td colspan="3">Date and signature</td></tr>
<tr><td>I connected the device to the network L+N / L1+L2+L3+N</td><td>Directly:</td><td>YES</td><td>NO</td><td>Indirectly with a factory-made plug:</td><td>YES</td><td>NO</td></tr>
<tr><td>Is the supply network additionally secured with a residual current device?</td><td>YES</td><td colspan="2">NO</td><td colspan="3" rowspan="2"></td></tr>
<tr><td>Is the network fitted with a protection wire – yellow-green – connected to the device housing</td><td>YES</td><td colspan="2">NO</td></tr>
<tr><td>If the network is 3-phased, check the control lamp of the phase sequence sensor</td><td colspan="3">GLOWS</td><td colspan="3">DOES NOT GLOW</td></tr>
</table>

SERVICE MADE BY:

Stamp/Serviceman	**Date and signature**	**Service**

CHIMNEY-SWEEPER SURVEYS

Date……	Date……	Date……
Signature……	Signature……	Signature……
Stamp	Stamp	Stamp
Date……	Date……	Date……
Signature……	Signature……	Signature……
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Date……	Date……	Date……
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	Stamp	Stamp

15. Declaration of Conformity

CE

DECLARATION OF CONFORMITY

The **Orte Polska Sp z o.o., ul Groblowa 1, 05-800 Pruszków** declares, that the ORTE POWER Pellet Air Heater, model ORTE POWER, types 24, 35, 45, 80, 130, 250, fulfills the directives and norms (and their updates).

Directives:
2006/95/EC
2004/108/EC
89/106/EC
2006/42/EC

Norms:

EN 303-5:2012
PN- EN 14785:2009P
ISO 12100 :2012
IEC 60617
IEC 61082
IEC 61346

CE has been issued in 2015
Pruszków, 20.01.2015

Signature of the authorized person: