

Operating manual

Wood gasification boiler at 18- 80 kW



Dulan®

ISO 9001



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1. Boiler's use

Wood is the main fuel for the Eko-Vimar Orlański boilers. Lignite or minced coal could be an alternative fuel.

Wood at 15-20% humidity and length at about 5 cm smaller than the loading chamber should be used as the main fuel (billet's diameter - 15-25 cm - check „technical data“).

Some alternative fuel is acceptable:

- lignite as 10-15 cm diameter blocks
- wood at different quality parameters (humidity) and mince range (shavings, furniture waste and so on) is acceptable as the mix for the main fuel (50%/50%).



NOTICE!

Using different than ordinary fuel doesn't guarantee boiler's right operating - as it was featured in technical data and it can influence the boiler's way of working and its long-lasting.



NOTICE!

Using different type of fuel that the main one (including alternative one) is treated as wrong boiler's using and its effects can not be the reason for any complaint to the producer.



NOTICE!

Wood boiler should be installed in open system together with an expansion tank (it assures boiler's working with nominal pressure - look "technical data").



NOTICE!

Wood boiler is equipped with a regulator which assures its working in right temperature's range and protects the boiler against its overheating by fan's turning on.

2. Procedure rule

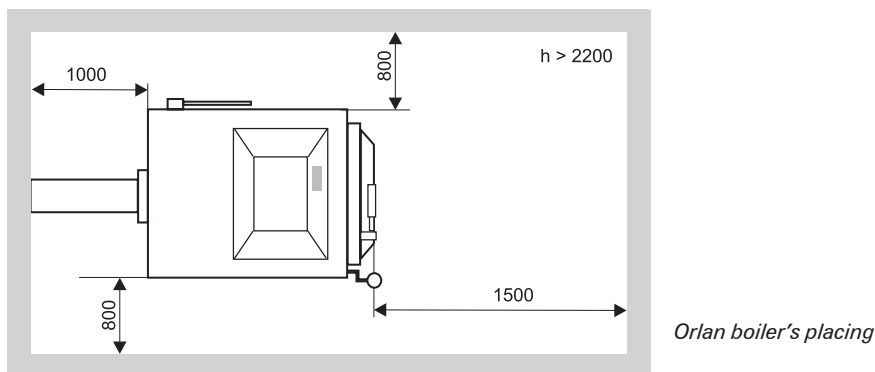
Wood gasification boilers work in pirolitic wood distillation process. When the air is limited wood changes into charcoal while burning up. In the same time wood gas appears, which next relocates to burner's nozzle and there it is burnt at the bottom part of the boiler. Such method of wood burning allow for its effective using as fuel. Orlan boilers are made for burning wood billets (use minced wood only as an addition - it should be mixed with bigger wood parts as not to allow for burner's nozzle littering).

3. Installation

Wood boilers are to be installed according to the present norms and rules. The requirements of norm PN 87/B 02411 according building of solid fuel boiler room and the norm PN-91/B-02413 according open system boilers' producing should be taken into account.

Eko-Vimar Orlański company prescribes using chimney inputs which preserve against the chimney permeating. The company doesn't take responsibility in case of faults resulting from not using chimney inputs.

1. Chimney flue should correspond to the parameters of „DIAGRAM OF CHIMNEY CHOSING ACCORDING TO THE DIN 4705 NORM”.
2. Boiler room should be large enough to enable boiler's cleaning (>2,2 m).
3. The distance between the boiler and the partitions should enable right access for all of the boiler's parts - it shouldn't be less than - look at “Orlan boiler's placing”.

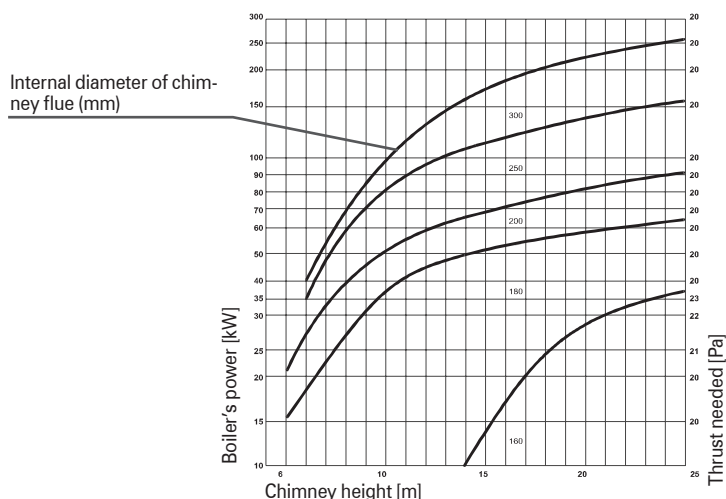


4. There shouldn't be any cables nor electric installations which aren't for boiler's room using.

Before smoke outlet's connecting to the chimney flue, there should be a chimney sweep's approval.

According to the PN-EN 303-5 norm accumulation tank should be assembled together with wood boiler - its capacity is listed in reference to the . 4.2.5. point in the norm

3.1. Diagram of chimney choice according to DIN 4705 norm

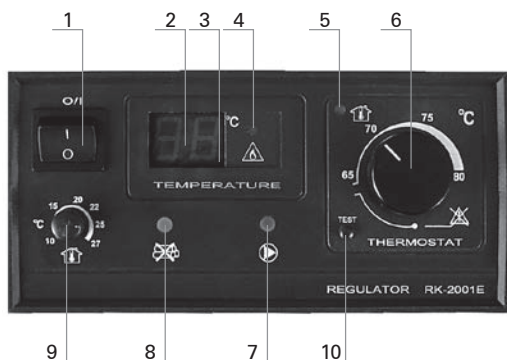


4. Regulator's description

Since the 30.06.2006 wood boilers were equipped with RK 2001 regulator. In 01.07.2006 new ones were brought out - EKOSTER 2. Main functions of both regulators are similar, but there is a difference in parameters' modification (EKOSTER 2).

4.1. Technical data of RK 2001 regulator

Power	230V +/- 10%
Rate supply voltage (with no fan)	< 4VA
Temperature measurement range	0 do 99 +/- 1 °C
Temperature measurement sensors	KTY 81 210
Temperature regulation range	60 - 80 °C
Electrical protection (fuse)	1A/220V



1. Power cut-out
2. Boiler's temperature display
3. Burning up indicator
4. Overheating indicator
5. Room thermostat indicator
6. Boiler's thermostat knob
7. Pump's operating indicator (the green one)
8. Fuel shortage indicator (the green one)
9. Room thermostat knob (the green one)
10. Boiler's temperature setting knob

Rys. 2 Front panel of the RK 2001 regulator

4.2. Regulator system functions (RK 2001)

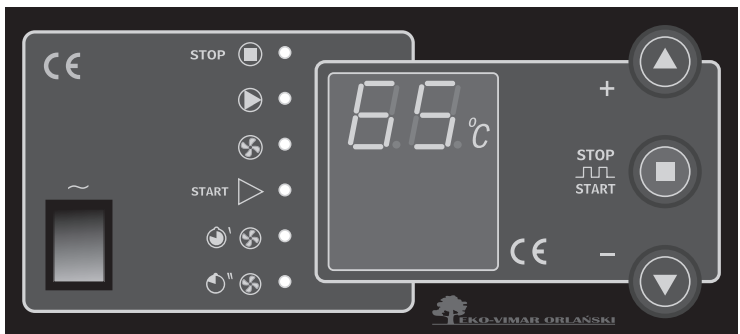
Boiler's temperature setting at 60 up to 80°C	We set the boiler's temperature with a knob (6). Current temperature is displayed on the screen (2).
Boiler's overheating signalling	The indicator (4) tells about boiler's temperature exceeds to 90°C. In the case the fan switches off.
Lack of fuel signalisation	If in 30 minutes temperature doesn't reach 60°C, the indicator (8) and the fan will turn on.
Wrong burning up signalization	If the boiler doesn't reach 60°C during burning up (up to 2 hours) , the indicator (8) will light up and the fan will turn off. NOTICE! In the case wood can remain in the boiler.
Fan's operating controlling	Regulator modulates fan's operating and it upholds its depending on boiler's temperature.
Pump's operating controlling	If pump is connected to regulator: <ul style="list-style-type: none"> • while burning up pump is turned off till the time when boiler reaches 65°C • when here is more than 65°C the pump still works till the time of temperature decreasing (60°C) then it stops. Next time it activates when temperature reaches over 65°C
Room temperature controlling	Boiler comes together with the sensor which can be placed in the room. Regulator control with the boiler's work in such a way that it keeps temperature needed in the room.
Cooperation with room thermostat	Boiler can cooperate with any room thermostat* which should be connected instead of a room thermostat * NOTICE! If there is a room sensor or room thermostat connected to the boiler then the boiler will stay in watching stage and then its continuous temperature is 60 - 65°C. If temperature decreases under the needed one , boiler starts working again.
Scavenging	Regulator can flush of the loading chamber in order to get rid of gathered wood gas. The function activates while boiler's lay over after reaching the temperature configured. When the boiler reaches the temperature 10% higher from the one setted on regulator, flushing function will turn off till the time of the temperature's decreasing to the level underneath. Flushing time is 5 seconds , timing interval between next flushes depends on the regulator settings and it is 1 up to 9 minutes. NOTICE! Technical service should deal with flushing regulation.

4.3. Pump's and room sensor's connecting

There is a connecting board at the back side of regulator where pump and room sensor can be connected. The access for connecting board is possible only after the regulator's disconnecting and safety lid unscrewing. At the back panel there are some graphic markers and descriptions featuring right elements' connection placement.



4.4. Front panel of EKOSTER 2 regulator



- STOP STOP
- PUMP'S OPERATION
- FAN'S OPERATION
- START FIRING-UP MODE
- BLOW-THROUGH - INTERNAL TIME
- FLUSHING - OPERATING TIME

Description of the regulator's panel

4.5. Technical data of the regulator EKOSTER 2

1. Temperature range	-9°C do +99°C	
2. Temperature setting	+60°C do +80°C	
3. Temperature of the pump's connecting	+65°C or controlled with the thermostat	
4. Blowdown regulation	seconds	0-90
	break	1-15 minutes
	possibility of full blushing turning of	P-0
5. Hysterezis (the difference turn on- turn off)	From 2 up to 9°C	
6. Maximum switching power	fan	100 W
	pump	100 W
7. Mains supply voltage / Frequency	230 V AC, 50 Hz	
8. Maximum power consumption	275 VA	
9. Fan's regulating power in % x 10	(regulation range from 20 - 100%)	
10. Outside humidity	≤ 95%	
11. Protectionrating	IP 40	
12. Insulation class	I	

13. Surrounding's temperature	0 – 40°C
14. Disconnecting type	full
15. Over current protection	2 x 1.25 A (fuse)



NOTICE!

If the "Er" appears on the screen it means that temperature either raised over 99°C, it decreased below -9°C or the sensor got damaged. To secure together the boiler and installation up to the time of the sensor replacing pump should be continuously on till that time.

4.6. The functions of EKOSTER 2

Use

The microprocessor temperature regulator for central heating boiler is designed to control the air blow in wood-fired boiler and to actuate the circulating pump in central heating system

The regulator performs the following functions:

- maintaining the set temperature of boiler by controlling air blow,
- smooths start-up of blower,
- setting the blower power (service mode),
- programmable boiler "blow-through",
- automatic control switch-off after boiler burnout (extinguishes),
- blower disable when feeding the boiler,
- control of central heating circulating pump depending on its set operating temperature,
- „COMFORT SYSTEM“,
- protection against freezing or overheating of boiler,
- signalling of temperature sensor's damage,
- regulating the brightness of display - increased during read out and change of regulator settings,
- control panel connecting possibility,
- room thermostat cooperation,
- automatic turning off in case of wrong burning up in the boiler.

Regulator's working description


After switching on, the regulator passes into **STOP** (●) state signalled by switching on of corresponding lamp. Operation commences after pressing **START** (▶) button or automatically when boiler's temperature rises above operating threshold - that is, difference between set boiler temperature and factory-set temperature difference "dt". Automatic transition into **STOP** (●) state occurs 30 minutes after boiler temperature drops below operating threshold. CONTROL receptacle is for connecting remote control.

Pushbuttons (⊕) and (⊙) serve to change the settings. During normal operation, pressing them causes display and change of set boiler temperature. Pressing and holding pressed causes increase in speed of temperature setting change.



Pressing the **START** (●) button causes:

- with temperature below operating threshold: switching on or switching off control, signalled by **START** (▶) or **STOP** (●) indicators respectively,
- with temperature above operating threshold: blower disable signalled by pulsation of **STOP** (●) indicator, enabling feeding of fuel into the boiler. Automatic return to operation **START** (●).










COMFORT SYSTEM facility

The COMFORT SYSTEM function built into the regulator prevents against stone deposition between pump rotor and stator. The regulator automatically actuates the pump after the heating season for about 30 seconds, every 14 days. Operation of the pump in this mode is signalled by pulsation of **PUMP**  indicator. The system begins to operate 1 minute after regulator's switching on. Actuation of the pump in automatic mode causes re-counting of the 14-day period from the beginning.

Antifreeze and overheating protection system.

When the temperature decreases below 4°C regulator secures the installation against its freezing by the pump's turning on. Temperature's rising to more than 90°C causes the fan's turning off and the pump's turning on. The button **STOP**  beating alarms of the boiler's overheating. In the case reasons for overheating should be found, eliminated and as it follows boiler should be engaged again by the button **START**  pressing. Pump is continuously on in case of the temperature's sensor breaking down.

Programming of blow-through

- Press **START**  and hold for about 3 s until the OPERATING TIME   indicator switches on,
- set the blow-through time in seconds with pushbuttons , ,
- Press **START** 
- set the blow-through interval in minutes with pushbuttons , ,
- Press **START** .

If the temperature excess over the set one, regulator will turn the fan off from time to time.



NOTE!


- setting the blow-through time to "0" causes blow-through switching off,
- above temperature of 85°C, blow-through is switched off to prevent overheating of the boiler.




Remote control

Regulator is accommodated for the remote „EKOSTER Control“ connecting, which enables to control and change current boiler's temperature, preview of the pump connection and START-STOP mode, in the same time sonic gauge alarms when the boiler's temperature abruptly increases to hazardous level. Remote control with 10 m wire doesn't go as a standard set - they are to be bought separately.

Service mode

It is for regulator's settings changes. To work on the mode you should:

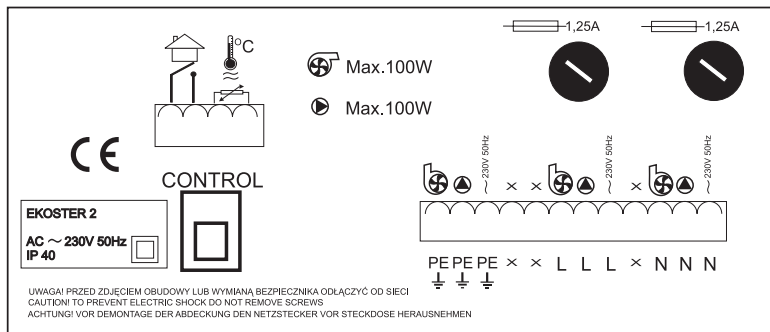
- Switch off the power,
- Switch the power back and in the time of some regulator's version displaying (for example 2.2) press the **START**  button and hold it up to the moment of "HI" appearing on the screen. Since the time screen alternately shows the symbol and value of regulation task.

With ,  buttons the value can be changed and **START**  button causes moving to the next regulation settings.

Settings in correct order:

- „HI”: hysteresis of boiler's temperature regulation (2°C - 9°C), that is temperature's decreasing to the low enough to cause fan's turning on.
- „Po”: temperature when the pump turns on (35°C - 70°C), after room thermostat's connecting we change regulation for below 65°C till the time when „rP” appears on a display - Ekoster on basis of the signal transmitted by the room regulator will control with pump's working on its own.
- „dt”: temperatures' difference at the beginning of working, that is on what temperature's difference from the one setted by regulator will turn into **STOP** or **START** (10°C - 30°C) ex. dt=20, temperature setted = 70°C after temperature's decreasing to 50°C (temperature decreased of setted „dt” parameter from boiler setted temperature) regulator holds on for 30 minutes to burn out the rest of the fuel, after the fan turns off signalling in the same time fuel shortage with **STOP** diode.
- „□”: max power of the flower in % (2:20% - 10:100%).

Pump's, fan's temperature sensor's, room thermostat's connection scheme



Installation instructions

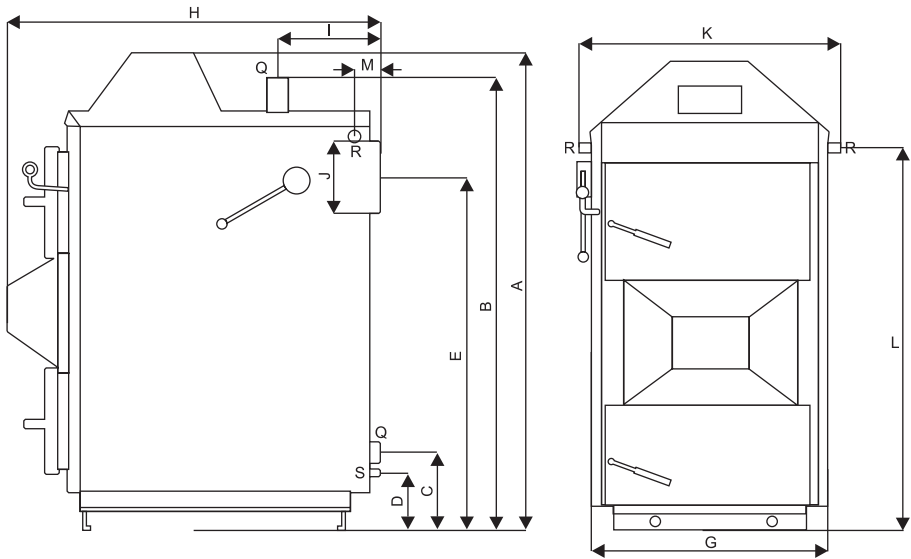
1. Temperature regulator is designed for operating with central heating boilers.
2. Regulator's connection is to be done by an authorized person only.
3. Regulator should be placed in the room enabling its warming to more than 40°C.
4. Installing should be made according to MONTAGE features.
5. The regulator must be safeguarded against spilling of water and against conditions causing condensation of vapour (e.g. sudden changes in ambient's temperature).
6. The device should be installed and operated in accordance with the principles of procedure with electrical equipment.
7. Fuse burnout does not constitute basis for warranty repair.
8. It is recommended to check the regulator settings before starting up the boiler.
9. The regulator is protected with 1.25 A fuse.
10. Sensor is to be montaged with no oil.



NOTICE!

Connecting up of the pump supply cables as well as replacement of fuse should be done with regulator supply switched off (regulator supply plug removed from the supply socket). Connecting up the pump with regulator supply plug in supply socket forms electric shock hazard.

5. Boiler's technical data



Boiler's dimensions scheme

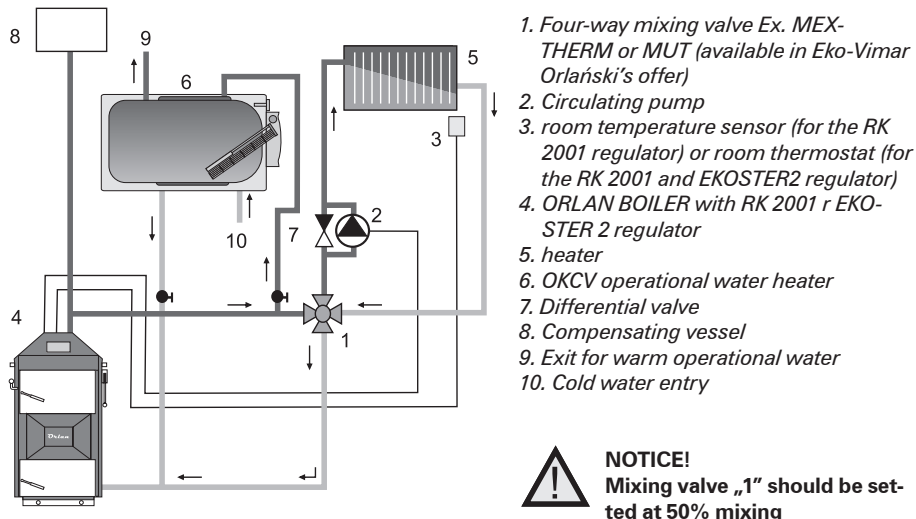
Boiler type	j.m.	ORLAN 18	ORLAN 25	ORLAN 40	ORLAN 60	ORLAN 80
Power	kW	4÷18	5÷31	8÷40	15÷60	25÷80
Efficiency	%	85	91	91	91	91
Weight - STANDARD *	kg	395	510	580	910	1115
Weight - SUPER *	kg	425	525	595	975	1165
Casing height	A - mm	1220	1325	1570	1535	1575
Heating water outlet height	B - mm	1210	1305	1560	1575	1625
Heating water inlet height	C - mm	215	235	220	210	245
Waste outlet height	D - mm	145	145	130	145	175
Chimney conduit height	E - mm	870	960	1220	1170	1210
Casing width	G - mm	545	600	600	740	740
Depth	H - mm	960	1040	1020	1340	1700
Heating water outlet	I - mm	340	320	330	575	600
Chimney conduit diameter	J - mm	180	200	200	210	210
Width with a coil	K - mm	660	720	720	860	860
Height of coil connection	L - mm	990	1100	1330	1310	1300
Coil outlet	M - mm	260	150	260	365	315
Diameter of feeding and return ferrule	Q - inch	2"	2"	2"	2 1/2"	2 1/2"
Diameter of the coil's ferrule	R - inch	3/4"	3/4"	3/4"	3/4"	3/4"
Diameter of a drain valve	S - inch	1/2"	1/2"	1/2"	1/2"	1/2"
Water capacity	dm3	55	75	93	180	205
Loading chamber capacity (gasification)	dm3	85	120	185	310	465
Power consumption	W	50	50	50	100	100
Billet's length	cm	50	50	50	75	100
Wood humidity:	- recommended	15÷25				
	- admissable	15÷35				
Voltage / frequency	V/Hz	230/50				
Chimney flue needed	Pa	15 - 20				
Electric protection range		IP 40				
Max pressure	bar	1,8				
Average fumes' temperature	°C	240	160			

* The parameters above are net values, for transport pallet's sizes and packing should be added.

6. Connecting and exploitation

6.1. Connection

Four-way mixing valve is essential for any installation. Its role is to mix hot water (contribution water) with the one returning from the system. Water mixing is necessary as to avoid „cold return of the water” and to keep the same temperature of the boiler. What follows the temperature of heating system’s feeding can be lowered to the temperature of satisfactory warmth in the house. Mixing valves should be used both in gravity system and with extorted flow (pump).



Rys. 4 An exemplary scheme of the Orlan boiler, four-way mixing valve and water heater's connecting.

6.2. Wood and gasification

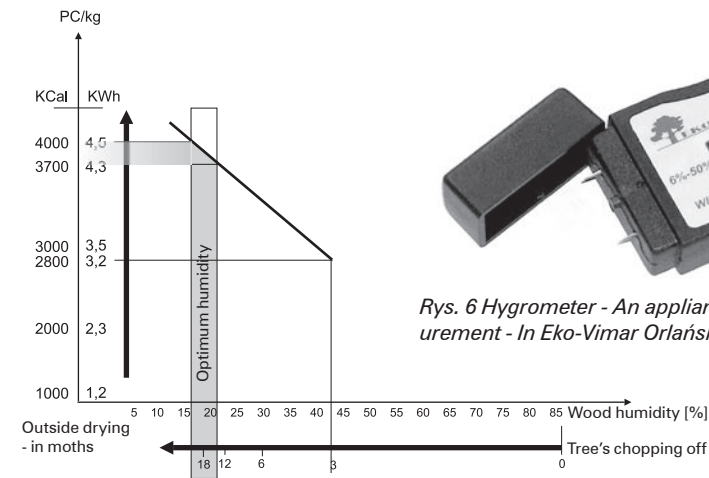
It is important that wood gasification boilers worked in specific conditions. Boiler's temperature accounts for 70 - 80°C. At lower temperatures gasification process doesn't proceed in a correct way and what follows - wood intake is relatively higher. Wood drying in a loading chamber is an essential stage in gasification process - wood doesn't have adequate temperature at lower temperatures and all of the process is inadequate. Main warmth source in Orlan boilers is gas flame arising during gasification, if main conditions according correct burning process aren't taken, then both quality and quantity of released gas won't be sufficient.

Very important are: quality, humidity and kind of burned wood. Hard wood is the best - (beech, oak, hornbeam etc.) at 25 up to 15% humidity. Using different kind of wood, such as pine, spruce etc. is possible but there will be more burning waste at the sides and it will be necessary to load the chamber more often. Hygrometer is for humidity measuring - it helps to select wood at best quality (there is a guideline diagram of wood's humidity on the next page).

Right quality of wood warranties proper boiler’s working. Using the fuel at different parameters doesn’t guarantee correct boiler’s operating.

Tab. 4 Wood density diagram

wood type	density of just cut wood [kg/m³]	density of dry wood [kg/m³]
coniferous tree		
pine	700	480
larch	760	600
spruce	740	430
fir	1000	450
deciduous tree		
pak	1080	710
elm	950	680
ash	920	750
beech	990	730
hornbeam	1080	830
alder	690	530
birch	650	650
maple	870	660
lime	730	530



Rys. 5 Wood humidity chart

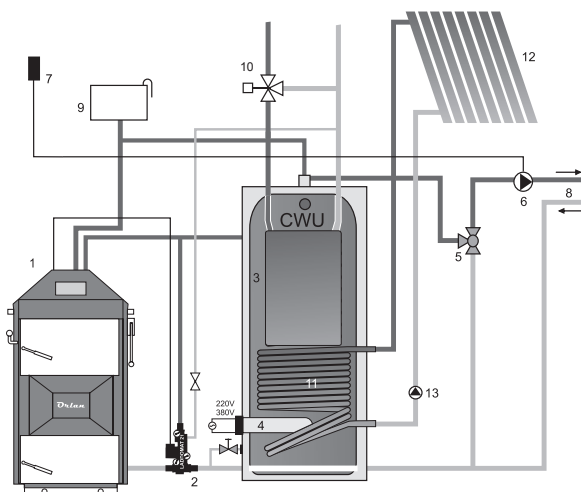


Rys. 6 Hygrometer - An appliance for humidity measurement - In Eko-Vimar Orlański's offer.

6.3. Accumulation

The best results in heating gives boiler's connecting with an accumulation tank. Such installation causes less wood's using - even up to 40%. Gasification process (if it runs in optimum way) generates large gas quantity, heating system however is characteristic for large fluctuation amplitude in warmth requirement scope. Gasification process is set only in certain way, heating system fluctuation change more often, room might get overheated or some extra gas can get through the chimney. Accumulation system allows for gas storing in an accumulation tank. Heating system is contributed by accumulation tanks for about 48 h (depending on tanks' capacity and thermal conditions - at about 50 l of water for 1 kW of power). If the boiler cooperates with accumulation tank, its long lasting is lengthened.

1. ORLAN boiler with RK 2001 or Ekoster 2 regulator
2. LADDOMAT 21 thermoregulator
3. Accumulation tank
4. Electrical heater
5. Three-way mixing valve
6. Circulating pump
7. Room temperature sensor or programmable room thermostat
8. Heating system exit
9. Opened expansion tank
10. Mixing valve of DHW
11. Coil
12. Solar panel
13. Heating medium pump



Rys. 7 An exemplary scheme of connecting an accumulation system with one of NADO tanks (with build in DHW container, coil and a solar).

6.4. Starting

Before first boiler's use there should be checked: leakproof of the threaded joints (whether there isn't any leak) installation water level, the parameters of boiler's operating are to be set as well.

6.5. Burning up

The steps to be taken to burn up in the boiler:

1. Switch off the power
2. Push the chimney flap (gas pass opened)
3. Place splinters and some bigger wood pieces to the boiler upper chamber
4. Burn the paper and close the upper door
5. Open the bottom door as to provide natural draught
6. Wait for about 15 - 20 min. for better wood burning
7. Put that much of wood to get the right quantity of embers which will cover boiler's bottom

(ca. 10 cm) (chopping of the wood in about 5 cm pieces at the first stage of burning up accelerates embers' producing)

8. Wait for 15÷20 minutes for the ember layer occurring
9. Fill up the whole combustion chamber
10. Close the upper and bottom door hermetically
11. Pull the chimney flap and switch on the fan



WARNING!

It is forbidden to switch on the fan when the upper door is opened.



IMPORTANT!

It is important to pay an attention on both depth of gasification chamber and thickness of the upper door while chamber's loading. If wood's sizes aren't adequate to the elements mentioned above it may be difficult to close boiler's door or load the chamber with wood. You must not close the door by force - it may cause door's damage.



IMPORTANT!

Wood storing for about a year ensures its right humidity (admissible humidity - 25% - look at TECHNICAL DATA section). Advisable humidity level (15%) is to be obtained after 2 years wood storing (look at the diagram no 5).

6.6. Fuel loading

If the boiler is chosen adequate to the place to be warmed up there is one loading for 8÷12 hours needed. It is advisable however to control the boiler every 5÷7 hours. To control wood quantity you should:

1. Switch off the boiler with the main switch,
2. Open the chimney flap,
3. Open the upper door and load the chamber if it's necessary,
4. Close the door, chimney flap and switch on the boiler

It is important not to let the fuel to get between combustion chamber and chimney flap as it would obstruct chimney flap's closing.

When loading (it is recommended to burn out the fuel up to embers) there is a need of taking down ash deposited on the loading chamber's sidewall.



NOTICE!

Lack of fuel is signalled with a yellow indicator "no fuel"

6.7. Boiler's putting out

Boiler puts out in two ways: after turning off button pressing or after all of the wood burning out.

6.8. Right boiler's temperature assuring

Right boiler's temperature maintaining during its exploitation is very important. To assure correct gasification process water temperature should be about 70°C.

In the time of a large warmth need returning water's temperature may lower. If returning water is about 20°C lower than contributing one, there is a risk of gasification chamber cooling and it can result in boiler's efficiency decreasing (gasification process may be limited). As a result - pitch can deposit at the boiler's sidewalls. To avoid such situation there should be „little water circulation“ build in the boiler. To build it in three or four way mixing valve should be installed at the boiler's outlet. It mixes hot water with returning one. By correct hot and cold water setting, returning water is warm enough as not to let for temperature's rapid decreasing in the gasification chamber - then gasification process correctly. Temperature's difference 15÷20°C doesn't cause large charge of material of which boiler is made of and as a consequence it lengthen boiler's exploitation time.

6.9. Power failure and pump's breakdown

There is a risk of power deficiency or pump's breaking down during boiler's exploitation. If it happens in winter time, fuel filling should be stopped. Boiler's working with a chimney flap opened is unacceptable. Boiler's working with full chimney draught may cause its uncontrollable working and as a consequence it can cause water's boiling and boiler's overheating. In case of extorted circulation installation, current flow's breakdown causes fan's and pump's turning off . The case of wrong warmth passing on from the boiler to the heaters may cause water's overheating. It's advisable to install an additional container such as water heater to avoid water's overheating. Its role is to assure min power taking from the boiler ex 5 kW for the 25 kW boiler. It protects the boiler against its overheating.



NOTICE!

To protect the boiler and its electric equipment against network's voltage exceeds it's advisable to use some constant - voltage regulator (e.g. computer strip).

7. Conservation

7.1. Boiler's conservation

Except for the elements described in „BOILER'S EXPLOITATION“ preserving it is important that the boiler was protected during its stagnation (summer time, householders' absence). Boiler's interior, hest, exchanger, chimney flap should be cleaned through - it's advisable to burn some dry softwood (ex. spruce) in the boiler before its stopping over - it will burn out the waste occurring during boiler's exploitation. After boiler's cleaning it should be left opened for aerating - in the way you will avoid humidity condensation in the boiler.

7.2. Fan's conservation

Fan is an essential boiler's part. Keeping it in clean have a bearing on its longlasting. It's advisable to disassembly fan's body from time to time and to clean it through (the waste deposited). Fan's blades can be cleaned with a soft bristle brush.



NOTICE!

Boiler's working with the bottom door opened is unacceptable because in such a case the fan can get overheated.

7.3. Boiler's cleaning

The ash arising while burning process go down to the ash pit via the nozzle. The ash pit should be cleaned every 3-5 days. Gasification chamber should be cleaned out between next burning up. Ash is to be cleaned out via the nozzle - watch out as not to damage the boiler's bottom. For cleaning there should be used original appliances (enclosed as standard equipment). During gasification process pitch occurs. Its quantity depends on wood, its humidity and contributing and returning water's temperature. It's advisable to clean out gasification chamber with a scraper (once a month). Carbon deposit subsiding at the pipes causes diminish of the exchanger's section and in the same time decreasing of the heat exchange. As a result it effects the thrust decreasing and obstructs in heat transmitting. In accordance to this the exchanger's pipes should be cleaned out every two weeks to assure their permeability.

Four steps to clean out the exchanger (except for the SUPER 1 type)

1. Take off the boiler back upper casing
2. Turn on the nuts with M13 - M17 spanners (depending on boiler type). Important! Before nuts turning on and turning off the thread should be preserved with a special anti corrosion agent; do not turn on nuts with exertion
3. Each of the pipes in the exchanger should be cleaned with a cleaning shield. They should be cleaned precisely in the whole length - it is important to avoid soot's gathering at the bottom part of the exchanger's pipe and its blocking. Clean the soot deposited at the back part of the chamber
4. It's advisable to add some potato rind from time to time (about 10l). Potato starch works as catalyst and it makes the matter of sediment burning out easier.

7.4. Leakproof securing

Leakproof of the boiler is very important especially leakproof of the door, the exchanger and chimney flap. Leakproof causes the fumes' coming out of the boiler and most of all it can cause uncontrolled burning which may cause boiler's overheating. To ensure the exchanger's door leakproof the insulation rope should be sealed with a graphite oil or some other machine oil at least once a week. It softens the rope and causes its tight adjoining to the boiler.

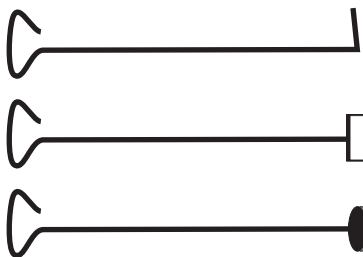
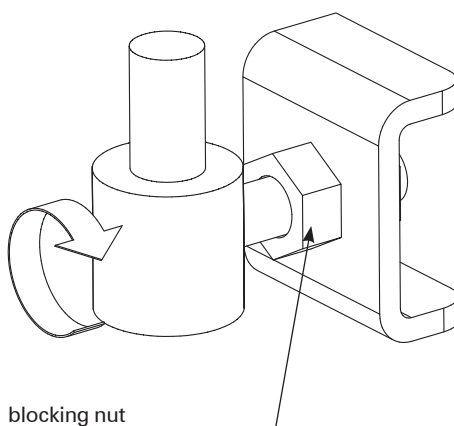
After some time of boiler's operating (1 season for example) the door rope could get flattened. To assure right rope's adjoining to the boiler's door, door's setting regulation is provided (regulation on the hinge).

Hinge door setting:

- take the door off
- Loosen the cap
- turn the hinge 360°
- turn a tap tight to block hinge's regulating screw.



NOTICE!
Upper and down hinge should be regulated in the same time.



- only for STANDARD version

Rys. 8 Cleaning elements



NOTICE!
Chimney flue's leakproof should be controlled and if such a need occurs - it should be cleaned out. All of the threaded elements before their unscrewing should be lubricated with grease. Door and hinges should be lubricated temporarily as well.

8. Faults caused by boiler's wrong exploitation

Problem	Cause	Remedy suggested
boiler doesn't reach the temperature needed	faulty burning up	check „Burning up“
	to moist wood	humidity control - use wood at right parameters
	primary air conduit choked	call service - facility out of the warranty
	secondary air conduit choked	call service - facility out of the warranty
	smoke tube of heat exchanger choked	clean with a cleaning shield or call service- facility out of the warranty
	wrong regulation of the air and wood gas	call service - facility out of the warranty
	nozzle damaged	replacement - out of the warranty
	fan's gasket damaged	replacement - out of the warranty
	fan damaged	replacement - out of the warranty
smoke out of the cleaning cover	leak on a seal rope	door regulation or call service – out of the warranty
	seal rope worn	rope's replacement - out of the warranty
	cover warped - overheating	cover's replacing or call service- out of the warranty
smoke coming out while loading (little smoke is acceptable)	intensive - Heavy wind blows the fumes into the chimney	consider the montage of chimney flue succouring elements, for instant the „Rotowent“ ones
	wrong chimney parameters	consult a chimney sweep, the need of new chimney flue building
smoke out of the boiler's door	leak on a seal rope	door regulation (according to the 7.4. description)
	seal rope worn	rope's replacement or call service - out of the warranty
	door damaged	door's replacement
regulator doesn't work	power shortage	check the installation's protection
	fuse damaged	fuse's replacement
	live wire conduit damaged	connection and wire's inspection
	temperature sensor damaged	call service
	regulator damaged	call service
fan out of order	thermal protection worked	check „boiler's overheating“ description
	no power in regulator	check „power shortage in regulator“
	fan damaged	call service - fan's replacement
	regulator damaged	call service
	fan blocked	inspect and clean the fan

Problem	Cause	Remedy suggested
fan's loud working	bearings damaged	call service - fan's replacement
	condenser damaged	call service - condenser's replacement
	fan montaging clips loosened	checking, turn the clips tight
	fan's blades unclean	checking, cleaning
	unneeded unit in fan's cover	checking, cleaning
poor fan's working	fan's blades unclean	checking, cleaning
	fan's cover with a pitch on the fan's cover	call Service- out of the warranty
detonation in the boiler	wrong burning up	look "Burning up"
	chimney draught to low (below 10 Pa)	chimney rebuilding. Use WKO exhaust fan
	chimney draught to intensive (over 20 Pa)	use exhaust regulator
	to tiny and to dry wood (humidity over 15%)	mix with larger humidity fuel as to increase humidity level (in about 15-35%)
	furnace flue of the exchanger uncleaned	clean the exchanger or call service- out of the warranty

9. Allowance for Orlan super boilers

Wood boilers in version SUPER are equipped with a cooling coil (preserving against overheating) and mechanical cleaning devices.

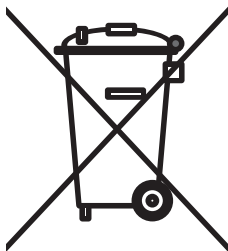
9.1. Cooling coil

In connection with thermostatic cooling valve cooling coil's function is the boiler's overheating protection. We connect a cooling coil with thermostatic valve to the cold water installation (ex. STS 20 Watts). Cooling coil outlet is to be directed into plughole installation.

9.2. Boilers' cleaning

Mechanical cleaning devices allow for smoke tube heat exchanger's keeping in clean. Cleaning elements are made of spiral elements placed in pivot in furnace flue which are moved with a pivot coming out of the boiler. It is important to use cleaning devices when boiler's loading - it will stave off their immobilizing with wood pitch.

10. Utilizing



The appliance is approved according to the European Directive 2002/96/EC in the matter of electrical and electronic devices' waste (WEEE). Ensuring right its scrapping you help to protect the environment.

Wrong utilization of the appliance may cause negative influence on the environment. To prevent it - make sure that you utilize the boiler in a proper way.

The symbol placed either on the device or in the documents enclosed means that the product isn't classified as a household waste.

The appliance should be taken to an authorized collection point in the matter of electric and electronic components recycling.

The wood boiler should be scrapped according to local regulations according waste utilization.

More informations according utilization, scrapping and recycling you can get in the local city hall, in civic waste utilization company or in the place of he machine buying.



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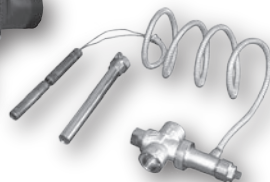
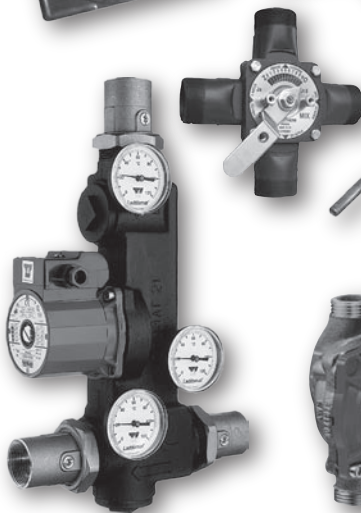
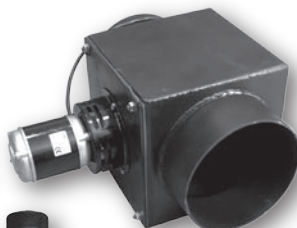
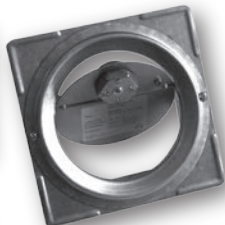
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