ATTACK DP - Wood gasifying boiler

- Assembly, pre-heating and training of the attendance is perfomed by an assembly technician trained by the manufacturer, who also fills in a document on the installation of the boiler.
-During wood gasifying, tar and condensates (acids) are created in the fuel bin. Therefore behind the boiler the mixing appliance regumat must be installed to keep the minimum temperature of return water of 65°C into the boiler.
- Operation temperature of water in the boiler must be of 80-90°C.

- The boiler must not be permanently operated with the output lower than 50%.

- When a circulation pump is used, it must be controlled by a separated thermostat in order to keep the prescribed minimum temperature of return water.
- Ecological operation of the boiler is during nominal output.
- We recommend to install the boiler with storage reservoirs and Regumat which guarantees economy in fuel in 20 to 30% and longer service life of the boiler as well as comfortable attendance.

- If the boiler cannot be attached to the accumulation, we recommend to connect it at least with one equalisation basin with the volume of about 25l for 1 kW of the boiler output.
- During the mode with decreased output (summer mode and water heating) it is necessary to star t burning daily.

- Fuel must be used only dried of 12 - 20% moisture content (with a higher moisture content of fuel the output of boiler decreases and its consumption increases)

- The choice of the right boiler size, that is its heating output, is a very important condition for economic operation and right function of the boiler. The boiler must be chosen so that its nominal output responds to heat loss of the heated object.

The guarantee does not apply for the boiler if:

- it is operated with wood exceeding 20% moisture content or with fuel not prescribed by the manufacturer.
- if a proper mixing appliance Regumat is not installed in the system, which provides for return water the temperature of 65°C.
- a functional thermostatic valve (WATTS STS20) is not installed on the cooling circuit of boiler and connected to the source of cooling water.

This appliance is not suitable for using by those persons (including children), whose physical, mental and sense- disability or the lack of skills obstucts the safe operation, if they are not under restraint, or they were not trained by the responsible person for using the appliance. It is necessary to look after the children to assure, that they will not play with the appliance.

Content:

Introduction:

Dear customer,

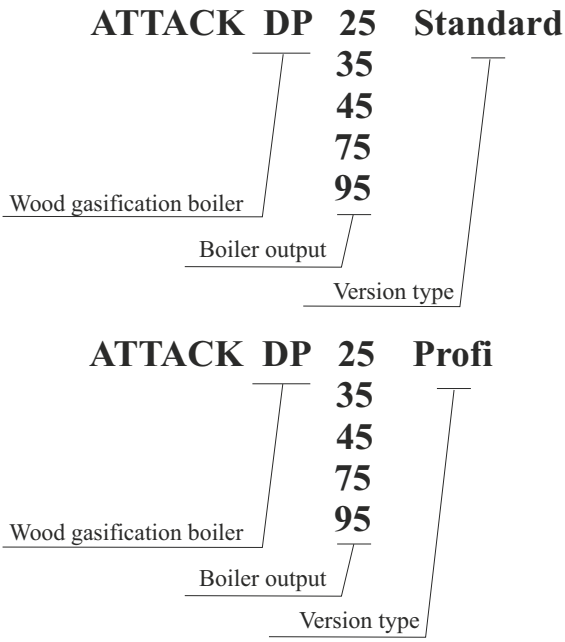
Thank you for confidence that you showed us by purchasing our product - ATTACK wood gasifying boiler. We wish you long and reliable operation. Proper attendance of the boiler is one of the conditions for reliable and right operation, so please read this instruction for use carefully. The manual is written in the way to respect the right operation of the boiler in central heating system.

The conditions of right boiler operation:
- to choose the right type and output of the boiler
- impeccable putting into operation
- sensitive attendance
- regular technical maintenance
- reliable service

General description:

ATTACK DP wood gasifying boiler is designed for economic and ecological heating of family houses, bungalows, small plants, workshops and similar objects.
Specified fuel for ATTACK DP boilers is dry wood, e.g. logs of lengths, depending on the type of boiler. The wood gasifying boiler is the holder of CE 101 5 certificate.

Description of ATTACK DP brand:



Technical parameters:

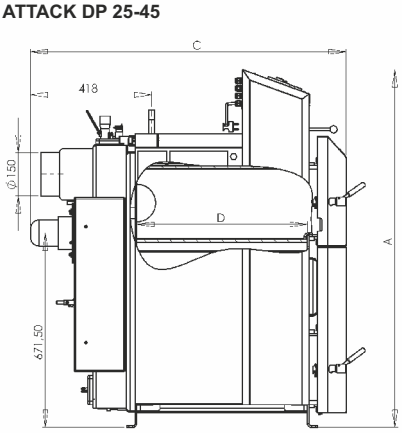
Type of boiler		DP25	DP35	DP45	DP75	DP95
Boiler output STANDARDversion)	kW	25	35	45	75	95
Output range (PROFIversion)	kW	10-25	14-35	18-45	30-75	43-95
Heating surface	m^2	1,52	1,74	1,95	3,60	5,60
Feed hopper capacity	dm^3	96	112	128	305	440
Dimensions of feeding opening	mm	235x445	235x445	235x445	292x542	292x542
Prescribed chimney drought	Pa	23	23	23	23	25
Max.operating pressure of water	kPa	250	250	250	250	250
Weight of boiler	kg	370	405	430	650	800
Diameter of the flue connection	mm	150	150	150	219	219
Boiler height - "A"	mm	1235	1235	1235	1320	1535
Boiler width - "B"	mm	690	690	690	750	766
Boiler depth - "C"	mm	1090	1190	1295	1600	1750
The depth of the chamber - "D"	mm	590	690	790	1100	1100
Shield of the electric parts	IP	21	21	21	21	21
Electrical input	W	50	50	60	60	90
Boiler efficiency	%	85	85	86	86	81
CO emission class		3				
Flue gas temperature in nominal output	°C	230	225	220	262	287
Flow of flue gas in nominal output	kg/s	0,019	0,021	0,027	0,045	0,059
Maximum noise level	dB	65	65	65	65	65
Prescribed fuel		Dry wood of 15-17 Mj/kg-1 calorific value,water content min. 12% - max. 20% diameter 80-150mm				
Average fuel consumption	kgh^{-1}	7,75	9,75	11,75	18,7	29,2
Consumption per season		1kW = $1m^3$				
Max. length of wood logs	mm	550	650	750	1000	1000
Burning time in min. output	hod.	3	3	3	3	3
Volume of water in the boiler	l	68	78	87	164	250
Min.volume of equalisation basin	l	600	900	1200	1800	2375
Connection voltage	V/Hz	230/50				
Range of temperature of heating water	°C	65-90				
Range of room tempereature (PROFIversion)	°C	10-27				
Current carrying capacity of boiler regulator contacts (PROFI version)	V/A	230 / 2				

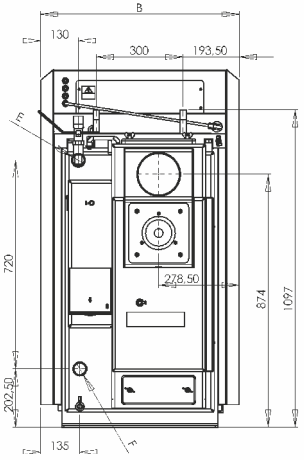
Specified min.temperature of returnable water in operation is 65°C.
Specified temperature of water during operation in the boiler is 80-90°C.

ATTACK, s.r.o. producer reserves the right to change technical parameters and dimensions of boilers without previous warning.

Dimensions of ATTACK DP boilers

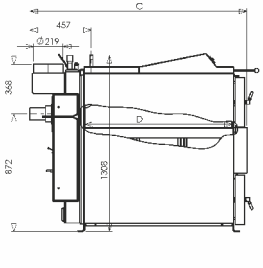
ATTACK DP 25-45

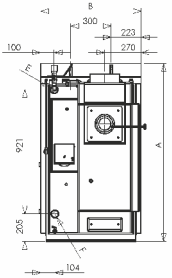




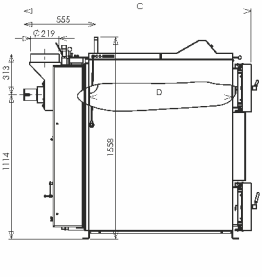
	DP25-35	DP45-95
Rising pipe - "E"	G6/4"	G2"
Return pipe - "F"	G6/4"	G2"

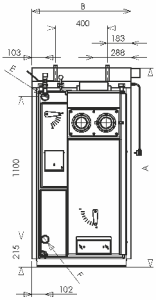
ATTACK DP 75

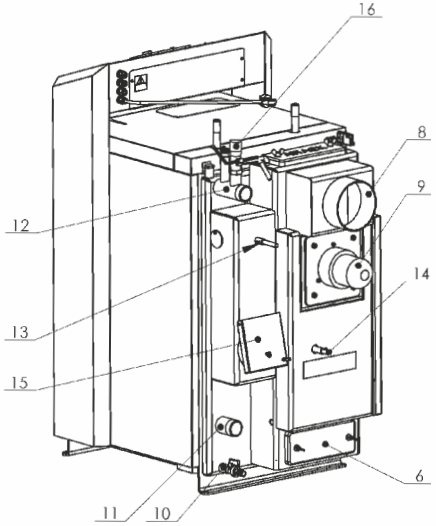


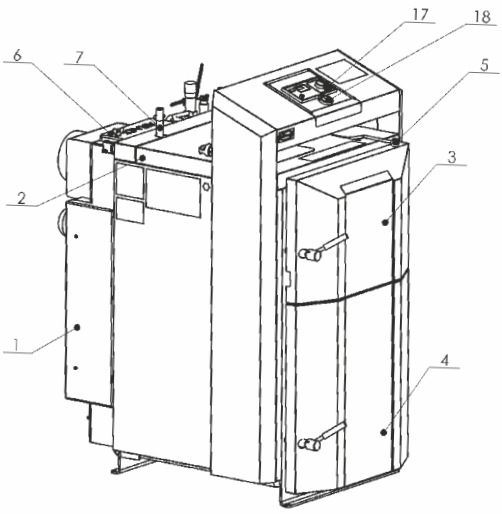


ATTACK DP 95









Key:

1.Boiler body
2.Upper cover
3.Feeding door
4.Ashtray door
5.Pull rod of the heat up flap
6.Cover of cleaning opening
7.Aftercooling circuit
8.Chimney
9.Suction fan
10.Outlet valve
11.C.H. return connection
12.C.H. flow connection
13.Primary air flap
14.Secondary air flap
15.Regulation door
16.Output regulator
17.Control electronics - PROFI version
18.Pressure gauge

Required boiler temperature [C 80] - is temperature that the regulator tries to reach in the operation mode. It is set by direct turning of button of the boiler thermostat and it is indicated by short displaying.
Set temperature of the flue gas / room thermostat [100C] - this parameter indicates temperature set by additional flue gas / room thermostat. In accordance to installation of heating and setting of parameter FC (1 or 0) it represents the flue gas temperature (at lower actual temperature, the regulator switches into the fuel shortage mode) or the room temperature.
Actual flue gas temperature or room temperature **[180°]** - this parameter indicates actually measured flue gas temperature or room temperature.

Setting of parameters – service menu

When the OK button is held for longer than 3 seconds, it is switched to the service mode, where you can see and change programmed parameters. Service mode is indicated by flickering of the additional thermostat´s control light. It is possible to browse parameters by the + and - buttons. After selection of the required parameter you can switch into the mode for parameter change by pressing of the OK button - this mode is indicated by flickering of the parameter value. To change the value, use the + and - button. New setting can be confirmed by the OK button. Then it is possible to select next parameter (by + and -). If you wish to close service mode, select **[END]** by + and - and press OK or wait for 1 minute. Devices finishes service mode and starts to display boiler temperature.
First column in the schedule represents display indications and in the next columns are: parameter description, minimum value, maximum permitted value of setting, step of parameter setting during adjustment, production settings to which it is possible to come by selecting of the **[Prod]** option..

Schedule: List of service parameters

Display	Parameter	Min	Max	Step	Production settings
∏100	Max. Operation output of ventilator or max. output, when ∏r 0-10	50	100	1%	100
n 40	Minimum output of ventilator	20	40	1%	40
∏h 10	Ventilator speed, decrease of coefficient	2	40	1	10
∏r 1	Automatic control of fan rotations and time of fan start	- -, 0	10	1	1
∏n 5	Time of ventilator operation	- -, 5	60	1s	5
∏u 6	Time of ventilator pause	1	99	1min	6
∏d 3	Time of ventilator operation in manual mode	- -, 1	99	1min	3
P 65	Temperature of C.H. pump start-up	60	70	1°C	65
Ph 5	Hysteresis of C.H. pump	1	10	1°C	5
Pr 1	Operation mode of C.H. pump 0- Automatics 1- Pump operation depends on room temperature or on contacts of the room thermostat. 2- Pump operation depends on operation mode of regulator	0	2	1	1
Pc --	Pause of C.H. pump	- -, 1	99	1min	--
Pd 2	Delay to stop the C.H. pump	- -, 1	99	1min	2
L 65	Minimum boiler temperature	60	65	1°C	65
H 90	Maximum boiler temperature	80	95	1°C	90
h 5	Hysteresis of boiler temperature	1	10	1°C	5
A 105	Temperature of boiler overheating	95	105	1°C	105
Fc 1	Testing method of fuel shortage: 0- increase of temperature of water in the boiler 1- measuring of flue gas temperature	0	1	1	1
Fd 60	Time of measuring of fuel shortage during boiler start-up	- -, 1	99, 4h	1min	60
Fb 30	Time of measuring of fuel shortage during operation	- -, 1	99, 4h	1min	30
Ar 0	Operation mode of exceptional output: 0- output of start of separate boiler 1- alarm output 2- output controlling mixing valve 3- output controlling emergency after cooling system 4- output controlling next devices starting during the operation of the fan	0	4	1	0
Prod	Reset of production settings				
outP	Control of the C.H. pump	outP	out1		
out∏	Control of fan output	out∏	out2		
outr	Control of additional output	outr	out3		
End	Exit from service menu				

Operation parameters of flue gas fan

Fan output [П100] - this value defines fan output. When the "Пr" is on "0-10", it is max. fan output that can be reached during automatic fan operation.
Minimum fan output [n 40] - the lowest fan output, that can be used, when are the fan rotations controlled automatically and when the fan rotations continually increase during boiler start-up.
Coefficient of the fan speed decreasing [Пh10] - this parameter influences way of the fan speed decreasing, when the boiler temperature is near to required value. For example, setting of this parameter to the value of 2 means, that when is regulator in the operation mode and boiler temperature is for 2°C lower than the required boiler temperature, fan will work at max. output [П100]. Next increasing of boiler temperature causes continual decrease of the fan output up to its minimum [n 40].
Automatic regulation of the fan rotations [Пr 1] - is active, when this parameter is set to „0-10“ and causes automatic decrease of fan rotations, when temperature of water in the boiler reaches required temperature. If is the parameter set to „-“, then is the automatic decrease of fan rotations inactive and fan works at output set by the "П" parameter. Setting of the parameter value in the range from 0 to 10 means time in minutes of the continual increase of the fan speed from 40% up to the value "П" for correct boiler start.
Operation time of ventilator [Пn 5] - time of ventilator rotation that is necessary for suction of accumulated gas before and after loading. By setting the parameter to „-“ is the function inactive. This function can be activated in the OPERATION mode.
Ventilator pause [Пu 6] - time between operation periods of the fan.
Operation time of the fan in the manual mode [Пd 3] - this parameter determines, how long will the fan work, when it was activated manually. By setting of this parameter to „--“ is the option of manual fan operation inactive.

Parameters of the central heating pump.

Temperature of the C.H. pump start [P 65] - temperature of water in boiler that causes start of the C.H. pump. Circuiting pump works independently on boiler control process, but it is started by boiler control in case of boiler overheating.
Hysteresis of the C.H. pump [Ph 5] - this parameter defines at which value of decrease of the boiler temperature under the temperature of the pump start will be the pump stopped.
Operation mode of the C.H. pump [Pr 1] – the C.H. pump, independently on the operation mode, is always inactive, when the boiler temperature decreases under value set by the **[P 65]** parameter and it is always started, when the boiler temperature exceeds 90°C, when the boiler is overheated or when the temperature sensor is damaged. In remaining cases, the C.H. pump works in the mode set by parameter **[Pr]**

- mode **[Pr 0]** - permanent operation
- mode **[Pr 1]** - pump work depends on additional thermostat work mode. In **[Fc 0]** mode central heating pump is turned on when room temperature is too low (additional thermostat connection shorted or room temperature lower than temperature set with additional thermostat knob). The pump is turned off when room temperature reaches desired value. In **[Fc 1]** mode central heating pump is turned on when measured exhaust gas temperature is higher than temperature set with additional thermostat knob. The pump is turned off when exhaust gas temperature drops below the set temperature.
- mode **[Pr 2]** – in this mode is the C.H. pump started only when the regulator is in the operation mode

Time of pause of the C.H. pump [Pc --] - when the boiler temperature exceeds the temperature set by parameter **[P 65]** and operation mode stops the pump (e.g. when the contacts of thermostat are open or when the fan is stopped), can the pump be regularly started for 30 seconds to pump water into the heating system. This parameter sets pause time in minutes between operation cycles of the pump. Setting of this parameter to „--" inactivates this function.
Delay of the C.H. pump stop [Pd 2] – too early C.H. pump stop might cause boiler temperature increase and consequently its overheating. This parameter enables to set delay of the C.H. pump stop. Setting of this parameter to „--" means, that the pump will be stopped without delay.

Setting of operation boiler temperature

Min. boiler temperature [L 65] - min. temperature, that can be set through rotary thermostat.
Max. boiler temperature [H 90] - max. temperature, which can be set through rotary thermostat.
Hysteresis of the boiler temperature [h 5] - this parameter defines, to which value should temperature of water in the boiler decrease, under value set through rotary thermostat to start the suction fan.

Boiler protection against overheating

Temperature of boiler overheating [A105] – boundary value - after exceeding of this value is the suction fan indefinitely stopped and the circuiting pump is started to prevent from boiler overheating. The overheating mode is indicated by the control light of boiler overheating and error messaging **[E 2]** on display. Error can be turned off by pressing STOP button, but only when the boiler temperature decreases under the set value of the boiler overheating temperature. The suction fan is stopped also, when the boiler thermostat sensor is damaged and this error is displayed as message **[E 1]**.
Emergency thermostat – regulator has also additional protection against overheating, which is independent from processor. In case of temperature increase to 95°C , the control process is launched by ventilator stop and pump start. Ventilator and pump are included into the control process again, when the temperature reaches 89°C. Emergency thermostat enables more precise boiler regulation and eliminates possibility of overheating.

Fuel shortage testing

If central heating installation is equipped with exhaust gas temperature sensor (**[Fc 1]**), then fuel shortage testing starts when exhaust gas temperature falls below temperature set with additional thermostat knob. If there is no exhaust gas temperature sensor (**[Fc 0]**), then fuel shortage testing starts when boiler water temperature falls below value of **[L 65]**. If temperature tested during fuel shortage testing stays below threshold for specified time, the controller will stop regulation process and will show **[FUEL]** message on the display. This alarm can be erased with STOP button.
Fuel shortage control during the boiler start [Fd 60] - the time set by this parameter is used for fuel shortage control during the boiler start. Boiler is considered as started, when the regulator is switched from the STOP mode to WORK mode and finishes, when the boiler temperature exceeds minimum temperature set by the parameter **[L 65]**. Setting of parameter **[Fd 60]** to „--" inactivates fuel shortage control during the boiler start.
Time of fuel shortage control in the operation mode [Fb30] – the time set by this parameter is used, when the fuel shortage control starts after the boiler was started. Setting of this parameter to „--" inactivates fuel shortage control in the operation mode.

Additional output.

Mode of additional output [Ar 0] - regulator is equipped with the multi-purpose output that can work under one of the following outputs:
Mode [Ar 0] – can control oil or gas boiler, if it is connected into the heating system. When the regulator is started by the main switch, the additional boiler is stopped and it is started again, when there is already no fuel in the solid fuel boiler. This function is useful in the heating systems, where the solid fuel boiler is used to decrease the heating costs. When the fuel shortage alarm is removed by the STOP button, the additional boiler is stopped again and the regulator works again.

- **Mode [Ar 1]** - the outlet can control next system that signalizes alarm. Error of the boiler temperature sensor, overheating or in case of the fuel shortage is the next alarm started.
- **Mode [Ar 2]** - the outlet can control emergency cooling circuit of the boiler (e.g. pump). In this mode, the next outlet is started in case of the boiler overheating or of the boiler temperature sensor error alarm.
- **Mode [Ar 3]** - the outlet can control devices that are cooperating with compression fan.

ATTENTION - Devices should be connected to the next outlet by the UM-1 module (not included to delivery). Connection of the UM-1 module is described on the Pic.1.

Regulator outputs testing

To simplify the regulator control, it is possible to control the output circuits that regulate ventilator and pump and the circuits that control next boiler. By selection of [outP] on display and by pressing the OK button you can start the circuiting pump for a short time. By selection of [outΠ] and pressing OK you can start the fan. By selection of [outr] and pressing OK you can start the additional boiler, system signalizing alarm or the servo-motor of the mixing valve. (if the next module is connected).

Production setting

Regulator offers possibility or reset the standard settings defined by producer by the **[Prod]** option in the service mode and by pressing the OK button. After activation of this function, device sets every parameter given in the schedule to the production setting.

Exit from menu

By selection **[End]** on display and by pressing of the OK button you can exit the service menu. Device closes the service menu also, if no button is pressed within 1 minute.

Additional functions

Regulator is equipped with additional thermostat and terminal for its connection. This thermostat is used from production to connect the flue gas thermostat. The **[Fc 1]** parameter – when the flue gas temperature decreases under the set value, regulator switches boiler into the mode of the fuel shortage control.
This thermostat can be used also as the room thermostat. Parameter **[Fc 0]**. In this case should be the sensor of the room temperature connected to the terminal of additional thermostat. The RK-2001AT2 compares measured room temperature with temperature set by additional rotary thermostat. When is the room temperature lower than the temperature set by thermostat,

control light of the room thermostat will shine, because the boiler should keep the temperature set by the boiler thermostat. When the room temperature exceeds the set temperature, control light of the room thermostat expires and the boiler switches into the mode of fire keeping at minimum boiler temperature.
Device is designed to enable connection of alternative external thermostat instead of the room temperature sensor. Short circuit of contacts in case of low temperature starts the heating process described above. When contacts are open, the regulator will keep the minimum boiler temperature.
Attention! If the external thermostat is connected at the place for connection of the room temperature sensor, temperature set by the room thermostat button has no influence on regulation process and the room temperature will depend only on the temperature set by the external temperature.
Parameter **[Fc 1]** - means that exhaust gas temperature sensor is connected to the additional sensor connection. In this case the value set with additional thermostat knob specifies desired exhaust gas temperature. If the controller is in WORK mode and boiler water temperature has reached value set with **[P 65]** parameter, then exhaust gas temperature drop below temperature set with additional thermostat knob will stop the fan. If central heating pump is in **[Pr 1]** mode, the pump will also stop in this case. Additionally, if exhaust gas temperature is below desired temperature, this will also be signalled with quick blinking of thermostat indicator.

Error messages

Boiler regulator permanently tests correct function of the internal systems and of the boiler temperature sensor. When the error is detected, regulator stops flue gas fan, C.H. pump and at the same, the appropriate error message is displayed. In case of accident it is necessary to stop the boiler by the main switch. Ensure permanent operation of the circuiting pump by direct connection to the electricity mains. Ensure proper fuel combustion in the boiler and contact contracted Service Company.

When the error **[E 1]** is displayed, it means fault (short circuit) in the circuit of the boiler temperature sensor or temperature under -9°C. The **[E 2]** is displayed, if the boiler is being overheated. The **[E 3]** means error and overheating at the same time. When the **[E 1]** error is displays without possibility to remove it by pressing the STOP button, despite the boiler temperature is under 90°C, it might mean permanent damage of the boiler temperature sensor (e.g. in case, that the boiler was overheated to the temperature over 150°C). Error **[E 8]** indicates flue gas sensor failure. In this case, the regulator will not control fuel shortage.

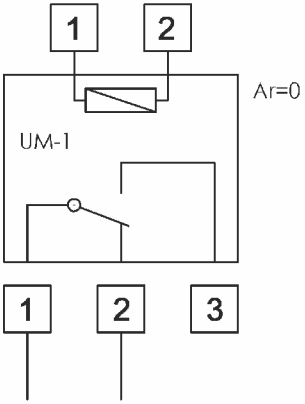
Disassembly of appliance

In case of need, disassembly regulator from system:
- turn the main switch off
- disconnect boiler from electricity mains
- unmount cover of the boiler´s control panel
- disconnect all connectors with cables from regulator
- unmount regulator from opening on the control panel of the boiler

WARNING: TO PREVENT FROM INJURY BY ELECTRICITY, DO NOT UNMOUNT THE COVER BEFORE DISCONNECTION FROM ELECTRICITY MAINS.

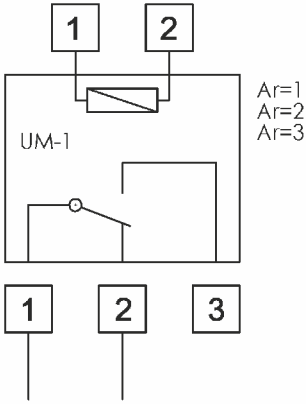
Connection of module UM-1

Regulator



Gas boiler, electric boiler

Regulator



Alarm, other devices

Purpose of use

Ecological hot-water boiler Attack DP is designed for heating of family houses and similar objects. The boiler is designed for burning wood only. Any dry wood can be used for burning, mainly logs. Also wood of bigger diameter, blocks, can be used, which reduces nominal output but prolongs burning time. The boiler cannot be used for burning filedust and small wooden debris. This can be burnt only in small amount together with logs (max. 10%). Due to its large feed hopper you can avoid the most demandable operation of preparation and cutting the wood into smaller pieces.

Location of the boilers in living spaces (including halls) is inadmissible!

Technical parameters

The boiler is designed for combustion of wood on the principle of wood gasifying using a flue gas fan sucking flue gas from the boiler.

The body of the boiler is a weldment of metal steel plates of 6 mm thickness. It includes a feed hopper with a heatproof shaped piece that has an oblong opening for transition of flue gas and gas. Under it in the after-combustion space there is an ash pan. In the rear part of the boiler there is vertical flue channel with a fuel cut-off flap in the upper part. There is also a suction branch for connection to the flue.

In the front wall in the upper part there is a feeding door and in the bottom part there is an ash door.In the front part of the upper cover there is a pull rod of fuel cut-off flap. The body of the boiler is from the outside insulated by mineral fleece put under the covers of outside jacket.In the upper part of the boiler there is a control board for electromechanical regulation. .

In the rear part of the boiler there is a channel for inlet of primary and secondary air with a regulation flap where the air is heated to a high temperature.

Description of the STANDARD version

- Thermometer indicates outlet temperature of the boiler
- If it is necessary, the boiler can be switched off by main switch
- Electric circuit is protected by a fuse
- Fan can be switched off by a flue thermostat after burning down fuel.

ATTENTION! For heating up, set this thermostat to 0°C. After fuel starts burning, set the flue thermostat to "Operation".If the temperature of flue gas drops below set up temperature the flue thermostat is switched off. If you want the fan start again, you have to set up a lower temperature.The optimum condition for operation must be tried.

- Regulation thermostat controls the operation of the fan by the outlet temperature of water from the boiler. Safety non-returnable thermostat serves as a protection against overheating in case of breakdown of the regulation thermostat or as an alarm of device for overcoming safety temperature. After overcoming the temperature of 110°C it is necessary to press it. (in the PROFI version turn the boiler thermostat to the left point of "RESET")

Operation rules

Preparing the boiler for operation

Before putting the boiler into operation make sure whether the system is filled with water and deareated. The boiler can be operated only in accordance with these instructions in order to work properly. It can be operated only by an adult. When installing the boiler, lay something under the rear part to elevate it in 10 mm for better flushing and deareating.

Note

Logs of bigger dimensions is necessary to cut into halves or quarters (because of the requirement of operation to nominal output). You can burn hard as well as soft wood. Wood must be dried! **Boiler output depends on the moisture content of wood. Output and function of the boiler is guaranteed for maximum moisture content of 20%.**

Calorific values of the most used kinds of wood

Wood	*Heat energy for 1kg*		
	kcal	MJ	kWh
Spruce	3900	16,25	4,5
Pine	3800	15,80	4,4
Birch	3750	15,50	4,3
Oak	3600	15,10	4,2
Beech	3450	14,40	4,0

Location of the boiler:

For the installation it is necessary to keep safe distance of its surface from flammable materials by the degree of flammability and combustibility:

- materials B, C1 and C2 200mm
- materials C3 400mm
- materials with the degree not tested by STN 73 0853 400mm

Examples of building material devided by the degree of combustibility:

- A degree- noncombustible (bricks, blocks,ceramic linings, morter, plaster)
- B degree- very difficult to ignite (heraklith, lignos, boards from bazalt felt)
- C1 degree - difficult to ignite(broadleaves- beech, oak; plywood, werzalit, hard paper)
- C2 degree - normal combustibility (coniferous species -wood, pine, spruce pulpboard, solodur)
- C3 degree - easily ignited (wood pulpboards, polyurethane, PVC, foam rubber, styrofoam)

Non-combustible board or protecting fire- screen (on the protected subject) must exceed the boiler dimensions at least 300mm. All the other subjects from combustible materials, which are situated near the boiler, have to be protected by non-combustible board or fire-screen, if it is impossible to keep the safe distance.

If the boiler is located on the floor from combustible materials, the flor must be covered with the non-combustible, thermal insulating pad exceeding the boiler planview at least 100mm on the side with feeding door and ash door . All the solid materials of "A" degree of combustibility can be used for thermal insulation.

When locating the boiler in the boiler room, there must be a free space of min. 1 meter in front of the boiler and of 0,5 m from the side walls and the rear. Above the boiler there must be a free space of min. 1 meter. This space is necessary for basic operation, maintenance and service of the boiler. Location of the boiler in the dwelling spaces (including halls) **is not allowed!** The cross of opening for air inlet to the boiler room is recommended to be at least 200cm^2 depending on the boiler output.

ATTENTION!

The objects from easily combustible materials cannot be placed on the boiler or the nereby in the distance shorter than the safe distance.

If there is a danger of fire or blow up during the work (p.e. the work with texture materials, sizing materials, etc.) the boiler must stand off operation.

Chimney

Attachment of the appliance to the flue must be always done with approval of authorized chimney-sweeping company. There must always be sufficient draft in the flue and flue gas must be draught to the atmosphere in all possible operation conditions. For the right operation of the boiler the independent flue must be dimensioned in the right way, **because combustion, output and service life of boiler depends on the draught.** The draught is influenced by the section of flue, height and roughness of the internal wall. Into the flue where the boiler is attached, no other appliance can be attached. **The flue diameter must not be smaller than the outlet on the boiler.** Flue draught must have the specified values. But it must not be too high so as not to decrease the efficiency of boiler and interrupt burning. If the draught is too strong, install a throttle valve between the flue and boiler.

Informative values of flue section:

For DP25, DP35, DP45		DP75, DP95	
20x20 cm	min. height 7 m	Ø25 cm	min. height 9 m
Ø20 cm	min. height 8 m	Ø30 cm	min. height 7 m
15x15 cm	min. height 11 m	25x25 cm	min. height 8 m
Ø16 cm	min. height 12 m		

Flue draught is specified in technical parameters.

Exhaust pipe

Exhaust pipe must have the outlet into the chimney. If the boiler can not be attached to the chimney directly, the exhaust pipe must be **as short as possible and not longer than 1m** without heating surface and it must rise to the flue. Exhaust pipes must be tight and resistant against flue gas leakage and cleanable from inside. Exhaust pipes must not come through home and utility spaces and the internal section of the exhaust pipe must not be narrowing to the flue. Using bents is not suitable.

Connecting the boiler to the mains net

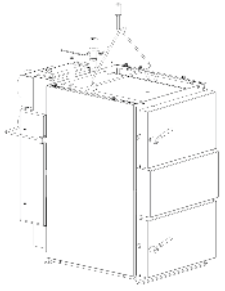
The boiler is connected to the mains of 230 V, 50 Hz by a supply cord and plug. The voltage is of M type and when replaced, the same type must be used by a service oragnization.The appliance must be located in such a way that the plug was within the reach of the attendance.
(according to STN EN 60 335-1 + A11:1997).

Installation of the boiler to the heating system

The ATTACK DP boiler only by a company certified for the installation and assembly of heating equipment. Before the installation there must be a project responding to valid regulations. Before installing the boiler to the old heating system, the installing company must sluice out the whole system to clean it. The heating system must be filled by the water of quality according to STN 07 7401:1991, especially the hardness of water cannot be more than 1 mmol/l and the ia Ca^{2+} cannot be more that 0,3 mmol/l. If these conditions are not kept, the warranty cannot be accepted.

Boiler transport

Producer enables better manipulation with the boiler by the eyes welded on the exchanger. They ensure better clamping of chain or rope that can be used to place the boiler as it is required. Before beginning of transport, put down the upper covers. Place the boiler by using of eyes and rope to the required location and put the upper covers back. To ensure safe manipulation with the boiler, it is necessary to leave appropriate space. For manipulation, use only devices that are technically in conformity with technical norms and control them in adequate way, not to threaten safety of the people. Special machineries have to be attended by trained staff. Producer takes no responsibility for damages caused by incorrect manipulation and by breaking instructions given in this manual. Producer also takes no responsibility for bodily injuries caused by breaking safety instructions.



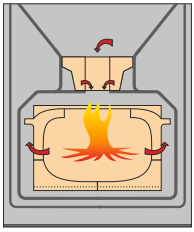
Attachment of regulation and control elements

The boiler is delivered to a consumer equipped with basic regulation and control elements. Attachment of these elements is indicated on the chart of connection. We recommend to extend the regulation of boiler with other regulation elements which enable more comfortable and economic operation. Each pump in the system must be controlled by an individual thermostat so as **the boiler was not undercooled on the inlet of returnable water under 65°C**. Attachment of these elements can be suggested by a designer due to specific conditions of the heating system. Electric installation together with the proper equipment of the boiler must by done by a specialist in compliance with valid standards. The basic version of boiler (Standard) does not have a thermostat for pump built in.

Protection of boiler against corrosion

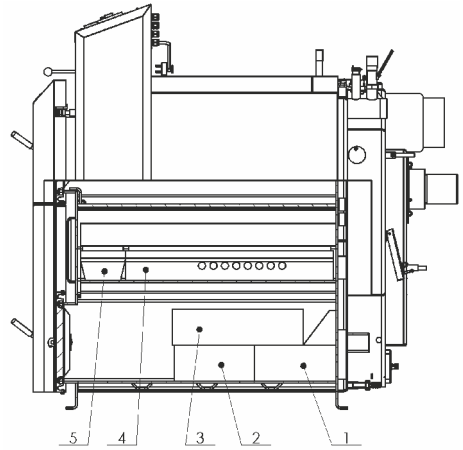
Suitable solution to this problem is mixing appliance Regumat ATTACK-OVENTROP, which enables separated boiler and heating circuit. This way you can prevent undercooling of boiler under 65°C and also decrease condensation of steam, acids and tars in the feed hopper.
The mixing system Regumat keeps the constant temperature of return water flowing into the boiler on 65°C by setting the thermostatic head to 5 - 6 degree. Water in the boiler must be permanently of 80-90°C.

Section cross boiler - combustion chamber

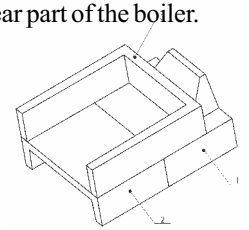


Installation and exchange of the heatproof shaped piece (version 1)

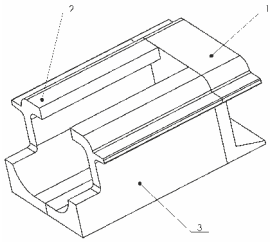
The back part of the ash pan pos. 1 insert into the lower chamber and push to stop to the back plate. Insert the front part of the ash pan pos. 2 and push to stop to the back part of the ash pan. Put the super-structure of the ash pan pos. 3 on the ash pan and push it to stop to the rear. The ash pan should be situated in the centre lime of the boiler at the front sight.When exchanging damaged jet pos. 4 or cube pos. 5 , follow the next instructions: Take out the jet and the cube / the cube in DP35 and DP 45 only/ after the elimination of the gaskets. Then insert the new jet eventually the cube and seal up with gasket backwardss. If it is necessary, change also the gaskets. The jet is inserted regarding the sign on the lower part of the jet into the rear part of the boiler.



VERSION 1

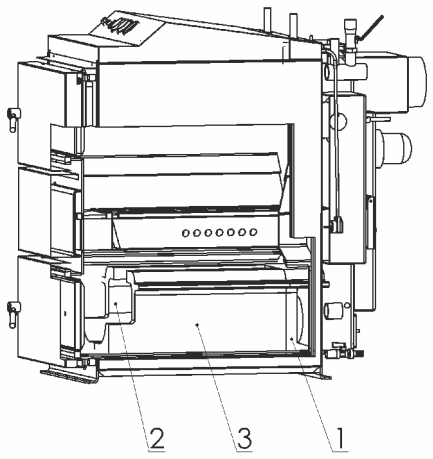


VERSION 2

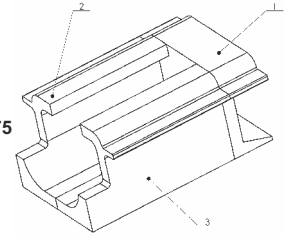


Installation and exchange of the fireproof concrete shaped peaces (version 2)

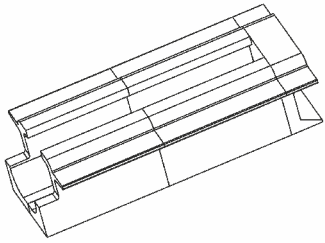
Put the rear part *pos.1* into the lower chamber, the intagliated part backwards. It is necessary to put it in horizontal possition and then turn it. Place it to the centre of the chamber and push it to stop to the rear steel plate. Insert the left front part pos.2 to lower chamber, it is necessary to insert this part horizontally and then turn it. Use the same method for the right front part of the ash pan pos. 3. Push both the parts together to stop and then pull them to the rear part of the ash pan.



VERSION DP75

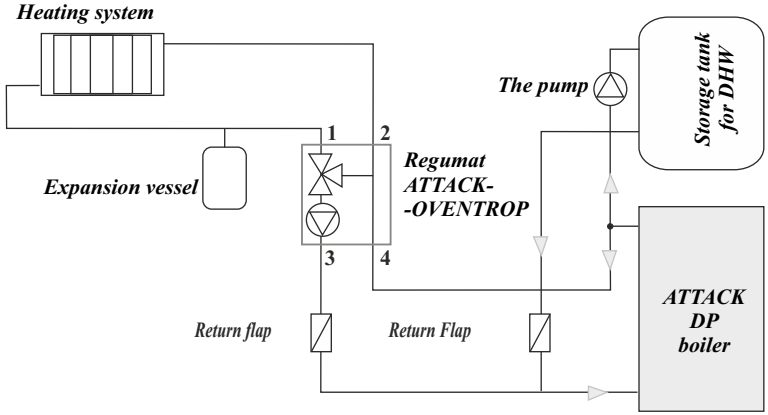


VERSION DP95

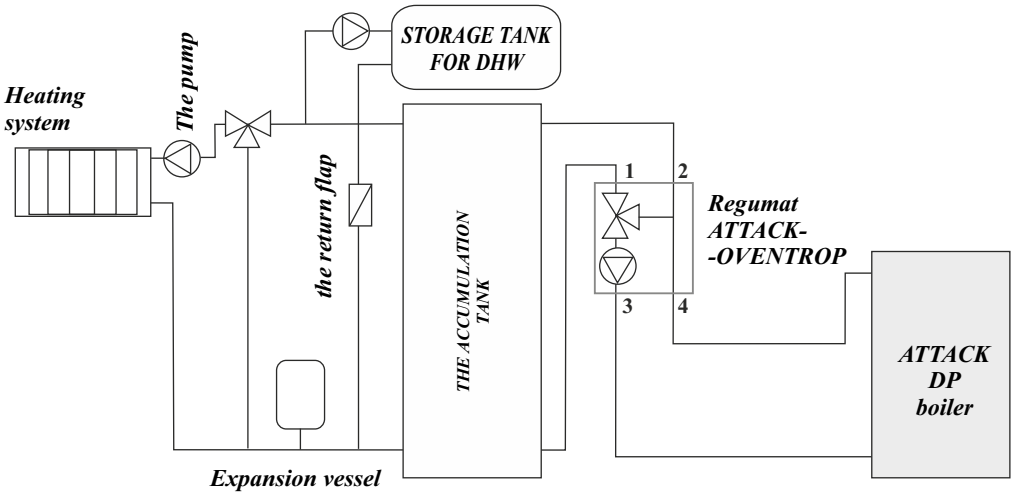


The variants of connections

The variant of connection with the regulating system REGUMAT ATTACK-OVENTROP



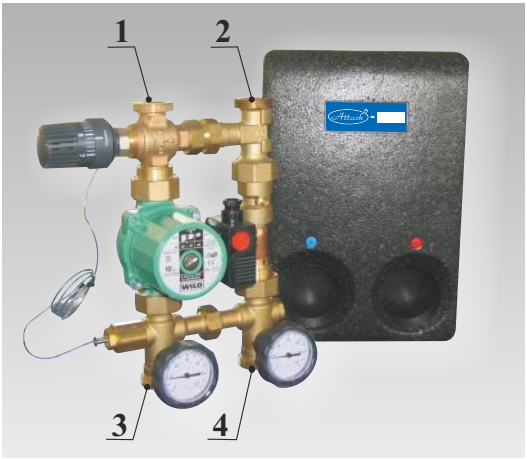
The variant of connection with the accumulation tank



The boiler has to be operated continuously in nominal output. In case of heat outlet when the boiler operates on a lower output that the nominal, it is necessary to attach the boiler to the accumulation tank of the volume of min. 460 litres (STN EN 303-5, paragraph 4.2.5).

The variants of protection and boiler durability increase

1. Regumat is used to increase the reurn heating water temperature returning into the boiler to more than 65°C. The return water temperature below 60°C causes increasing formation of condensate and the tar, and then decreasing of boiler durability.



Technical parameters:

Clarity **DN25**
Max.pressure 10 bar
Max.temperature 120°C
Value kvs 3,9

Clarity **DN32**
Max.pressure 10 bar
Max.temperature 110°C
Value kvs 0

Regumat consists of three-way mixing valve, circulation pump, closting cock, thermometers and insulation. The advantage of this solution consists in its compactness, simplicity of attendance and in guarranteed protection of the boiler thermal exchanger.

Regumat for the boiler	Ordering code
ATTACK DP25, DP35 (DN25)	DPP25003
ATTACK DP45, DP75, DP95 (DN32)	DPP25006

2. Connection with accumulation tank

Connection system consists in heating up of water in accumulation tanks and the warmth is gradually taking away from the tanks according to the request from the heating system.
By the operation with several heating ups at full performance, accumulation tanks will be heated for the temperature of 90-100°C.
Heating with accumulation tanks in connection with the ATTACK DP boilers bring more advantages.
Among the main advantages belong enlargement of the boiler life and in the end result also lower consumption of fuel.
Recommended volumes of accumulation tanks according to boiler output:

DP25 - 1500 - 2000 l
DP35 - 2000 - 2500 l
DP45 - 2500 - 3000 l
DP75 - 4000 - 4500 l
DP95 – 5500 – 6000 l

The operation with the accumulation tanks

After making- fire phase, the boiler heats the water in the accumulation tank to 90 - 100°C by full output in 2 - 4 feedings. After next feeding the heat is taken from the accumulation tank only, through the three-way valve. The offtake period depends on the tank volume and external temperature. In heating season it can be 1 - 3 days (if the prescribed min. volume is respected). If it is not possible to use the prescribed volume of the tank, it is recommended to use at least one tank of the volume of 500l for start of operation and for afterburning of the boiler.
Minimum accumulation tank volume is described in the tabel of technical parameters.

Standardly supplied accumulation tanks

Type of tank	Volume(l)	Diameter(mm)	Height(mm)	thermal changing surface(m^2)
AK500	500	650	1650	
AK800	800	790	1730	
AK1000	1000	790	2050	
AS500	500	650	1650	2,0
AS800	800	790	1730	2,4
AS1000	1000	790	2050	2,8

The tank insulation

The accumulation tanks ATTACK AK500, AK800, AK1000, AS500, AS800 and AS1000 are usually supplied with detachable insulation from soft polyurethane with white leatherette cover.

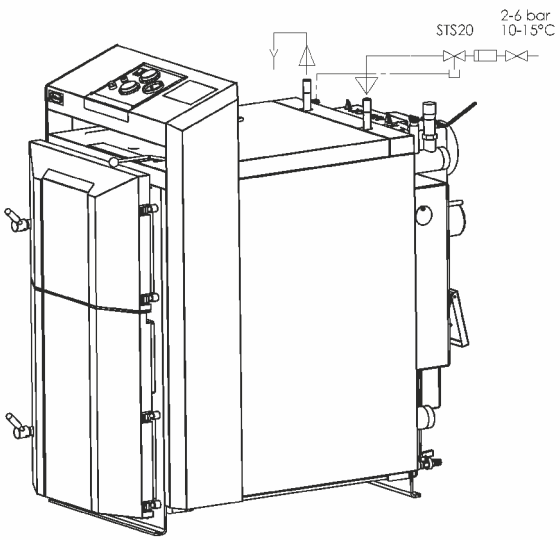
The advantages

The boiler installation together with the accumulation tank offers several advantages:

- lower fuel consumption (up to 30%). The boiler works in full output to fuel burn-up when the optimal operation is observed
- High chimney and boiler durability and minimum formation of acids and condensate
- Possibility of combination with another heating sources (solar panels...)
- conjunction of boiler and floorheating
- confortable and ecological heating

Protection of the boiler against overheating

CAUTION: Cooling circuit against overheating must not be used by STN EN 303-5 for other use than protection against overheating.
Valve on the cold water inlet to cooling circuit must be opened constantly and the heating circuit has to be connected with the functional cooling water feeder (p.e. the cold water from water supply) with the temperature of 10-15°C and the pressure of 2-6bar. STS 20 valve which has a sensor placed in the rear part of the boiler protects the boiler against overheating. If the temperature of water in the boiler overcomes 95°C, the valve lets water into a cooling circuit which overtakes excessing heat. In case of boiler overheating and STS20 valve opening the constant off-take of heated water from heating circuit to waste piping has to be assured.



Unsecured cooling circulation in the cooling circuit when the STS20 valve is opened, can cause the boiler damage! In that case the guarrantee cannot be applied.

Instructions for liquidation of the product after its lifetime
After the period of use the product has to be liquidated in a compliance with the local standards and norms.
Liquidation of wrapping
The wrapping has to be liquidated according to local standards and norms.

Scheme of dependency of resistance on the temperature of heating water by the thermal probe (DP PROFI)

Temprerature °C	Resistance kOhm		
	MIN		MAX
-55	951	980	1009
-50	1000	1030	1059
-40	1105	1135	1165
-30	1218	1247	1277
-20	1338	1367	1396
-10	1467	1495	1523
0	1603	1630	1656
10	1748	1772	1797
20	1901	1922	1944
25	1980	2000	2020
30	2057	2080	2102
40	2217	2245	2272
50	2383	2417	2451
60	2557	2597	2637
70	2737	2785	2832
80	2924	2980	3035
90	3118	3182	3246
100	3318	3392	3466
110	3523	3607	3691
120	3722	3817	3912
125	3815	3915	4016
130	3901	4008	4114
140	4049	4166	4283
150	4153	4280	4407