



Instruction for use
Gerkros KT/KST Boiler

Technical Manual

Putting the boiler into operation:

ATTACK KT, KST - CONDENSATION WALL GAS BOILERS

The boiler must be put into operation by a service worker trained by producer!

The boiler is set by the producer to natural gas G20, inlet gas pressure 20 mbar, or to LPG gas G31, inlet gas pressure 37 mbar.

Before installation and putting the boiler into operation it is necessary to get acquainted with the instruction for use.

The boiler is of II_{2H3P} category.

The KT boiler is of B₃₃, C₁₃, C₃₃, C₄₃, C₅₃, C₈₃ type.

Before first putting into operation it is necessary to take following steps:

1. Check whether the heating system is filled with water and the boiler is deaired properly.
2. Make sure if all the valves are open.
3. Open the gas valve installed prior to the boiler and test the sealing of the gas piping in the boiler.

Procedure of the first boiler burning:

1. Plug the feeding flex into the 230V/50 Hz socket.
Test the socket with another appliance.
2. Set the heating temperature and switch a room thermostat (if connected) on.
3. Put the mode switch to the position winter.
4. Check the proper operation of all the thermostats and control elements.
5. Set the boiler output by the request of heated place.

Contents:

- 4 Introduction
- 4 General description
- 5 Purpose of use
- 5 Technical description
- 6 Conditions of attendance
- 6 Control front board of the boiler
- 7 Special symbols
- 8 Putting the boiler into operation
 - Setting the temperature of heating water
- 9 Setting the summer mode
 - The way of regulation. Boiler operation with external hot water tank
- 10 Information mode
 - History of breakdowns and operation conditions
 - Error report
- 11 Equithermal regulation of the boiler
- 13 Outside dimensions of the KT boiler
- 14 Outside dimensions of the KST boiler
- 15 The main parts of the KT boiler
- 16 The main parts of the KST boiler
- 17 Supervision over operation
 - Spare parts
 - Guarantee, reclamation
 - Service
- 18 Maintenance
 - Wrapping, transport, storing
 - Accessories, documentation
- 19 Technical parameters

Technical manual

- 20 Installation, conditions of installation
- 21 Localization and mounting of the boiler on the wall, condensate outlet
- 22 Installation mode of the boiler, testing mode
- 23 Connecting the boiler to the heating circuit. Connecting to the central heating system and gas pipe-line.
- 24 The chart of connecting the boiler to water and gas.
- 25 Connecting to the mains
- 26 Waste gas exhaust
- 27 ATTACK KT and KST accessories
- 28 Connecting a room thermostat. Connecting a coaxial pipe for waste gas exhaust and putting the boiler into operation
- 29 The chart of ATTACK KT connecting
- 30 The chart of ATTACK KST connecting
- 31 Setting the gas valve
- 32 Other settings, circulation pump characteristics
- 33-34 Notes
- 35 Record on putting the boiler into operation and obligatory service inspection

Introduction

Dear customer,

Thank you for confidence expressed by purchasing our product ATTACK KT, KST wall gas 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 operation of the boiler:

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

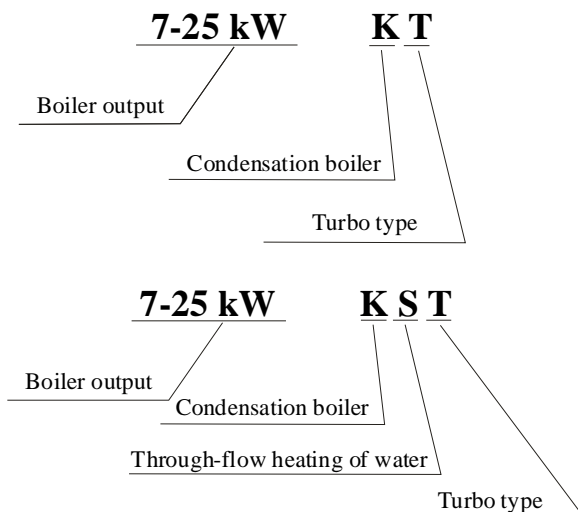
General description

The latest produced range of condensation wall gas boilers is designed as an appliance with maximum effectivity and minimum emissions into atmosphere, saving environment considerably. Maximum output of the boiler is 25 kW. High technical level of boilers is supported by used top components from world producers. ATTACK boilers are produced according to requests of ISO 9001 and are properly tested by technical and standardization institute which issued the CE certificates to the boilers.

NOTICE:

For the right operation of the boiler it is necessary to keep a minimum water pressure of 1 bar (measured when the water is cold) in the heating system.

Description of ATTACK KT and KST boilers brand:



Purpose of use:

The type range of ATTACK KT, KST condensation wall boilers is produced with modulating output of 7-25 kW, which means that by the instant need for heat in the object the boiler chooses optimal heating output. ATTACK boilers are used for central heating of family houses, flats, shops and similar places where the fuel is natural gas.

As to use, the boiler is built to operate with heating water to maximum hydrostatic pressure of 0,3 Mpa (3 bar) and operating temperature to 85°C with connection to heating circuits with forced flow of water in the closed system. Water in the heating circuit must suit to standards by STN 07 7401 (it must not be sour in any case, which means that it must have the pH-value higher than 7 and minimum carbonate hardness, max. 3 mval./l-1) Filling pressure in cold system is of 1 1,5 bar. Filling must be done slowly for air bubbles to escape through proper deaerating valves. For adjusting the water hardness in the heating system it is necessary to use recommended agents. **In the case of not following the rules above there is no guarantee for damaged components.**

Technical description

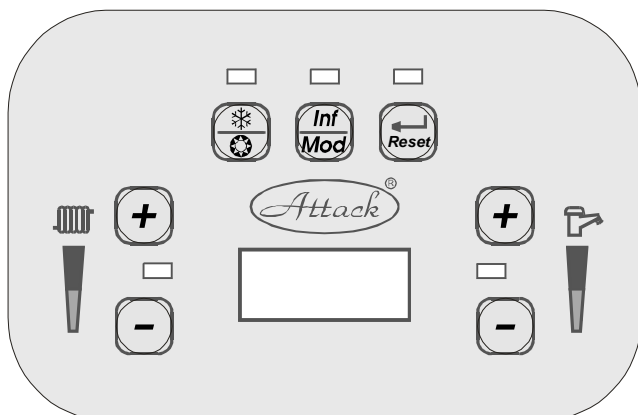
Condensation wall gas boiler ATTACK KT is a modern source of thermal energy suitable for heating and preparation of hot water in an external tank. The condensation KST boiler is equipped with a special secondary board heat-exchanger where hot water is prepared by through-flow heating. ATTACK condensation boilers are equipped with a special steel two-chamber heat exchanger. In the first chamber (non-condensation chamber) waste gas transfers heat but does not condensate. In the second one (condensation chamber) waste gas condensates and transfers so called condensation heat present in waste gas to heating water. In this process, a condensate is produced which is collected by condensate collector and led through a siphon away from the boiler. The heat exchanger is equipped with two electrodes. One of them serves for burning, the other one for ionization flame guarding in the heat exchanger. On the heat exchanger there is also an automatic deaerating valve and heat sensor for outgoing heating water. Removable wall of the heat exchanger is equipped with a ring burner and pipe bringing a mixture of gas and air to a burning space. Gas is mixed with air in a device consisting of gas valve and a Venturi tube.

Inlet of air for burning is enabled by a fan with continuously controlled revolutions which allows output modulation of the boiler in a wide range. Waste gas is drawn by a coaxial or double waste gas exhaust. Circulation of heating water is done by a Grundfos circulation pump. In the case of higher pressure in the heating circuit (when, for example, all the heads of heating bodies are closed), in the boiler there is a by-pass valve that opens a short circuit in the boiler and the output is modulated without any negative consequences. For measuring temperature and pressure there are sensors which show the values on the display of the boiler. Control of ATTACK KT, KST condensation boilers provides an extremely comfortable attendance. The remote control of the boiler is done by all the accessible peripheral device that is compatible in communication with OPENTHERM. Equithermal regulation provides economy of fuel and diminished wear of single components. This regulation takes care of proper temperature of heating water by the calculation according to outside temperature. The display as well as control buttons are laid out on the control board. For the right operation of the boiler there is a microprocessor unit that monitors and evaluates instantaneous conditions of the boiler to reach optimization and economy of fuel for maximum utilization of the appliance.

Conditions of attendance:

The attendance of the boiler must be carried out by the rules described in this manual which is a part of delivered consumer documentation. Except attendance, the user must not carry out any repairs on the appliance nor adjustments or unmounting and cleaning the inside parts of the boiler. The boiler can be operated only by an adult. After leaving home in winter (on holiday...) a supervision by a trained person is needed. If there is a danger of approach of inflammable (combustible) gases or fumes to the boiler, it must be put out of operation soon. The user is has to take care of right use of the boiler according to this instruction which is also a condition for acknowledgement of guarantee. When putting the boiler to operation, the service worker must instruct the user how to operate the boiler. The user with his or her signature in the letter of guarantee confirms having been instructed in the boiler attendance.

Control front board of the boiler



used for switching on and off and for changing the mode (summer-winter)



used for parameters of the control board (temperature of hot and heating water, water pressure, outside temperature, K factor)



Enter, Reset









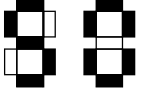
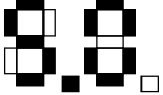
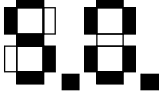



used for increasing temperature of hot and heating water



used for decreasing temperature of hot and heating water

Special symbols and their explanation:



Symbol	Meaning	Explanation
	Central heating	Symbol for central heating
	Hot water	Symbol for hot water
	Testing mode	
	Degree of Celsius	
	Index	
	Error (E)	
	Error (r)	
	Paramater	
	50	Normal inication of value 50
	150	Point indicates value 100
	250	Two points indicate value 200
	Flame	Point indicates flame detection

Putting the boiler into operation:


First putting the boiler into operation can be done only by a trained authorized service partner of the ATTACK company. When operating the boiler, a user can manipulate only with control elements and a filling valve. This valve is not a part of the boiler, but the heating circuit must be equipped with it. When starting the operation, it is necessary for all the connecting lines (connection of heating system, of natural gas and condensate outlet) to be sealed and tested by revisions. For filling the heating circuit it is recommended to use soft, filtered rain water. Water hardness in the heating circuit cannot be higher than 3mval/l. When putting the boiler into operation, check whether all the closing valves are open. Plug the cable into the socket.


After plugging in the display of the control front board shows the information on the software type of the product for 2 seconds.


If there is no request for heating and no breakdown registered, the display shows current outlet temperature of heating water. The boiler is in the STAND-BY mode, ready for operation. If the pressure of heating water is lower than 0,8 bar, E 37 error is indicated. Current pressure of heating water in the circuit can be displayed in the information mode (see the part Information mode). If the displayed value of pressure is lower than 0,8 bar, it is necessary to increase the system to 1 1,5 bar using the filling valve. After increasing the pressure, the valve is to be closed. The filling valve should be equipped by a non-return flap valve to prevent contamination of drink water by water from the boiler. This could happen if the filling valve was not closed properly and pressure in the heating circuit was higher than pressure of water in piping.

The boiler can be set into winter mode by the button . Operation of the boiler in the winter mode is signalized by LED diode over the button , which is not shining. In this mode the boiler is ready for heating in the heating system.


If the request for heating comes from the thermostat or from contacts of the OPENTHERM communication, the boiler is put into operation within a few seconds. The display shows current temperature of heating water. A small red light in the right lower corner of the display signals that the boiler has started correctly and the main burner is operating.


The LED diode at the symbol  is shining, signalizing the request from the thermostat for heating. When the request is at the end, the diode goes out.

The ATTACK KT boiler is also equipped with anti-cycling function. After the request for heating, anti-cycling time is activated during which the boiler will not respond to the request for heating. After this time the boiler is restarted. Anti-cycling time is signalled by flickering of the LED diode at the symbol .



If there is a request to heat water, the LED diode on the front board at the symbol  lights up and current temperature of hot water coming out of the boiler is displayed.

Setting up the temperature of heating and hot water

The temperature of heating water can be changed by the buttons +/- at the symbol . With the help of the button + the required temperature is risen and with the help of the button - the temperature is lowered. The temperature is showed on the display of the boiler. The required temperature is confirmed and saved into the memory automatically if in 5 seconds the value is not changed.

The temperature of hot water can be also changed with the buttons +/-, but at the symbol , while the temperature is being displayed. The required temperature is saved if the temperature is not changed in 5 seconds.

Setting up summer mode

Summer mode is set up by the button . The operation of the boiler in the summer mode is displayed by the light of LED diode over the button . The boiler in summer mode ignores any request for heating from the room thermostat or OPENTHERM contacts.

The boiler in summer mode can only prepare hot water. Summer mode of the boiler is also a standby mode for activating anti-freezing function and protection of the pump.

Anti-freezing function protects the boiler as well as the heating circuit. If the temperature of heating water drops under 6°C, the boiler starts working to minimum heating output and turns off after having reached 15°C temperature of heating water.

Automatic protection of the pump prevents blocking the pump, so if it is not working more than 24 hours, the pump is activated for 30 seconds.

The ways of regulation of the boiler

1. Operation without a room thermostat in this case it is necessary to have a connection on the terminal board between T1 and T2 contacts. This connection is made from the production unit. The boiler prepares heating water to the chosen temperature.

2. Operation with a room thermostat the boiler is regulated by the room thermostat and keeps the set up temperature of heating water. The room thermostat is connected to the T1 and T2 contacts on the terminal board instead of a disconnected jumper. Or, instead of the room thermostat, a regulator such as HONEYWELL CX 51, CR 11010 which apart from other functions also serves as a room thermostat, can be connected through OPENTHERM contacts.

Note: The contact room thermostat cannot be used on the OPENTHERM contacts. These are for connecting the regulator that is compatible in communication with OPENTHERM.

3. Operation of the boiler by the outside temperature. The boiler has an outside sensor of temperature (Honeywell SO 10075) and an equithermal curve is chosen. To the boiler can be also connected a room thermostat which influences switching on and off of the boiler and the temperature of heating water is set automatically by the real outside temperature.

Operation of the boiler with the through-flow heating of water (KST).

For the operation of the boiler with a through-flow heating of water (KST), the demand for heating is recorded by the through-flow sensor of hot water responding to hot water withdrawal. The maximum connecting pressure of hot water can be of 6 bar. In the areas with higher hardness of water it is necessary to soften the water entering the boiler to prevent incrustation of the board heat exchanger for hot water.

In case of incrustation of the board heat exchanger caused by operation on hard water there is no guarantee.


Operation of the boiler with the external hot water storage tank

For the operation with the external hot water storage tank it is necessary to connect to the L, N, R contacts on the terminal board the drive of a three-way valve without a microswitch and to the S1, S2 contacts a sensor for hot water temperature. The boiler prepares hot water in winter as well as in summer mode while hot water is a priority to the request for heating. If the boiler works without hot water preparation, the S1 and S2 contacts are connected with a connection equipped with a 2,2 kΩ resistor.

Accessories for connection of the external hot water storage tank:


1. Three-way valve Honeywell 1" + VC6013MP6000 drive
or the alternation three.way FUGAS 1" valve + drive (code RZ18+RZ19)
2. Honeywell SO10045 hot water sensor used for the sleeve with 1 m cable.

Information mode




Information mode can be activated by pressing the button . By repeated pressing it is possible to scan these indexes:

Index

- 1 Current intensity of the flame
- 2 Current temperature of outlet heating water
- 3 Current temperature of returning heating water
- 4 Current temperature of hot water
- 5 Pressure in the heating system
- 6 Application type
- 7 Current temperature of waste gas
- 8 Current flow rate expressed by the frequency of the sensor (Hz)
- 9 Current calculated value of outlet heating water by the outside temperature (in the mode of equithermal regulation)
- 10 Current value of outside temperature

The information mode can be finished by pressing the button . The mode is automatically finished if in 1 minute no change is done.

History of breakdowns and operation conditions

By keeping the button  for the time longer than 3 minutes the history of boiler breakdowns is activated. On the display there is symbol E with relevant error code (see chart of error reports). Searching in the list of breakdowns is made by the button  and serial number of the error and symbol E are displayed alternately. This mode can be stopped by pressing the button  again. The history of breakdowns ends automatically after 30 seconds since last change.

Error reports

In case of any error on the display appears the symbol E with relevant error index. Chart of error reports:

Index

- 01 Flame blocking after some unsuccessful attempts
- 02 False flame signal
- 03 Safety thermostat open
- 05 Error in communication between control electronics and ventilator
- 07 High temperature of waste gas, TTB sensor
-
- 08 Error in the flame circuit
- 09 Error in the gas valve circuit
- 10 Error in the communication with the memory of EEPROM control electronics
- 11 emperature of return heating water is higher than temperature of outlet heating water
- 21 ADC Hup error (Internal error of CVBC electronics)

- 22 ADC Lup error (Internal error of CVBC electronics)
- 25 Inconsistency between Hup and Lup CRC (Internal error of CVBC electronics)
- 30 Temperature of heating water is out of working range (closed circuit short-circuit)
- 31 Temperature of heating water is out of working range (open circuit not connected)
- 32 Temperature of hot water is out of working range (closed circuit short-circuit)
- 33 Temperature of hot water is out of working range (open circuit not connected)
- 34 Low feeding voltage (less than 185 VAC, if the voltage reaches 190-250 VAC, the error is eliminated)
- 35 Frequency of feeding voltage is in the range higher than +/- 5%
- 36 Big range of bottom and top value of feeding voltage
- 37 Low pressure of water in the heating system
- 41 Temperature of waste gas is out of working range (closed circuit short-circuit)
- 42 Temperature of waste gas is out of working range (open circuit not connected)
- 43 Temperature of heating water is too high

Errors from 1-43 are recorded in the memory of boiler. Elimination of the errors 1,2,3,5,7,11 happens after re-establishing conditions in working range, without using



Equithermal regulation of the boiler

When the outside sensor of outside temperature to the terminal board is connected (OT1 and OT2 contacts) and equithermal curve C is determined (parameter 15 Installation mode of the boiler), the boiler starts working in the mode of equithermal regulation of temperature of heating water by the C curve. The temperature of heating water in this case is automatically adjusted to the outside temperature by this formula:

$T_{hw} = K + C1 * (20 - \text{outside temperature}) / 4$ K-constant (parameter 10 installation mode of the boiler)

$T_{hw} = 30^{\circ}\text{C} + C1 * (20 - \text{outside temperature}) / 4$

C1 is derived by C curve in this way:

If C = 1.....7 then C1 = C

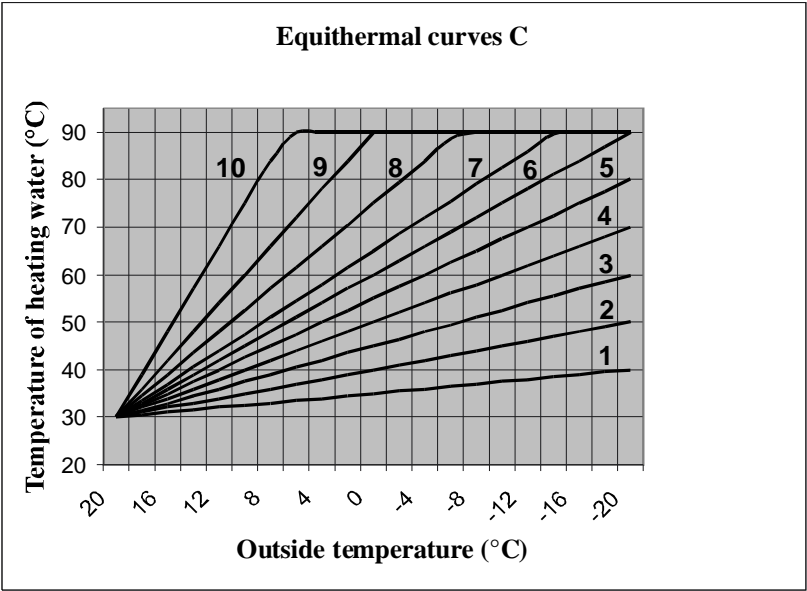
If C = 8 then C1 = 9

If C = 9 then C1 = 12

If C = 10 then C1 = 18

C	C1	20	10	0	-10	-20
1	1	30	32.5	35	37.5	40
2	2	30	35	40	45	50
3	3	30	37.5	45	52.5	60
4	4	30	40	50	60	70
5	5	30	42.5	55	67.5	80
6	6	30	45	60	75	90
7	7	30	47.5	65	82.5	90
8	9	30	52.5	75	85	90
9	12	30	60	85	85	90
10	18	30	75	85	85	90

This graph shows temperature of heating water in dependance on the C curve and outside temperature. Setting the C curve is made in the installation mode described in details in the part *Installation mode of the boiler*.



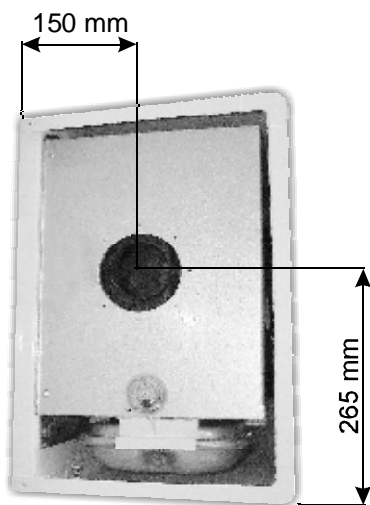
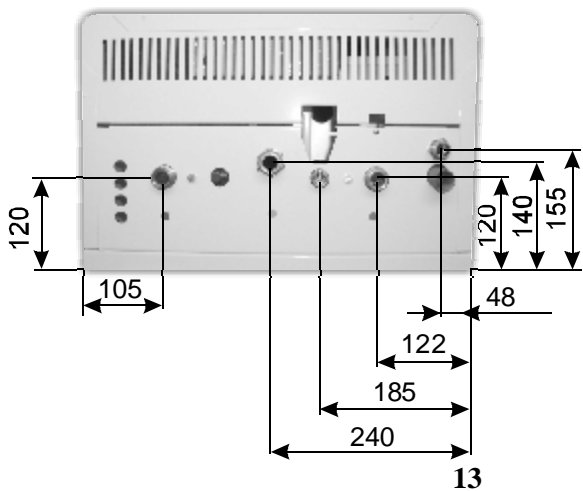
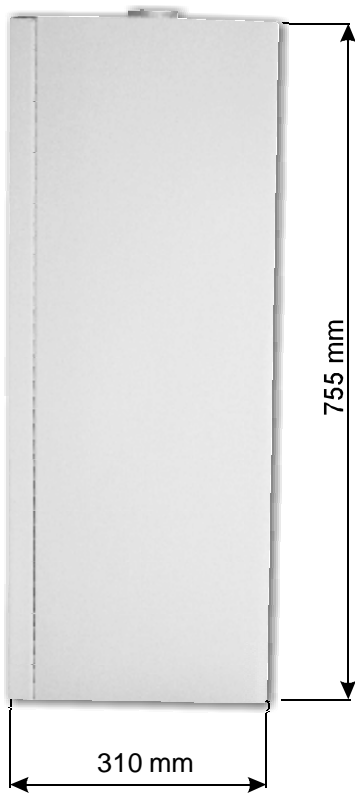
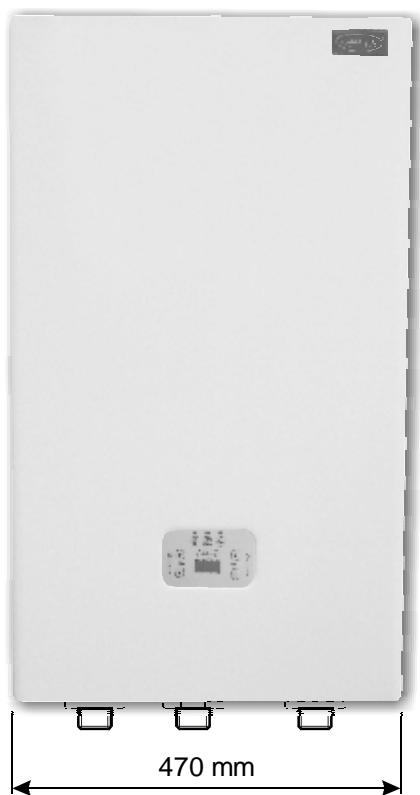
For setting up, various entering values are important e.g. heating loss of heated building, heating temperature of the building, etc.

When deciding for the suitable C curve, it is necessary to realize that if the curve is too steep, the building will not be heated by equithermal regulation but the regulation will be done by room thermostat, so the advantages of the equithermal regulation will be lost and the system will react only to the temperature of the surroundings. If the curve is too shallow, the temperature of heating water will not be high enough to ensure comfort inside the heated building.

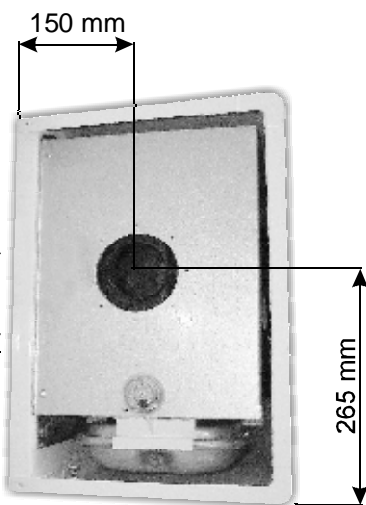
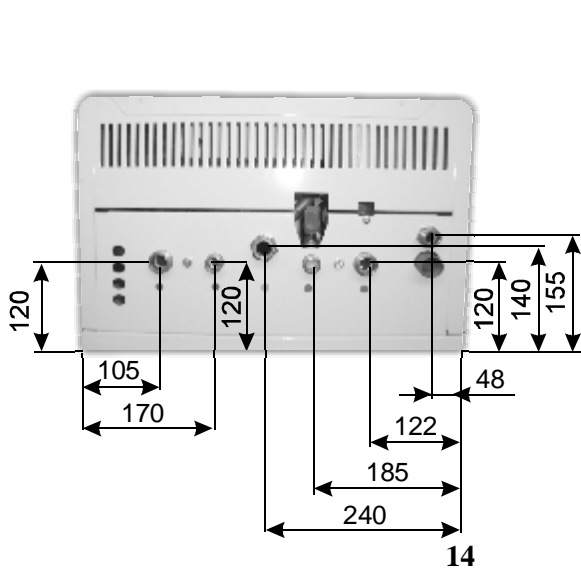
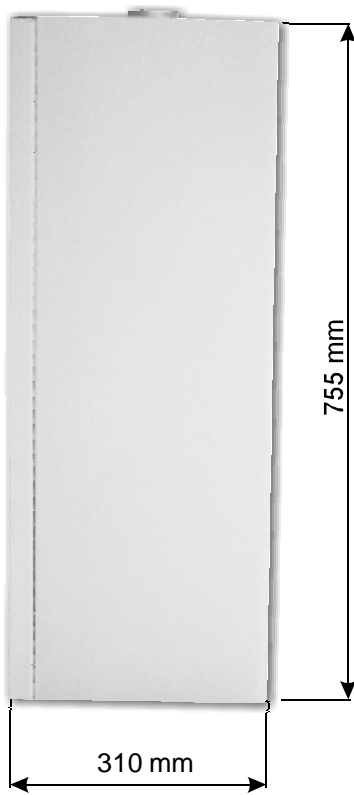
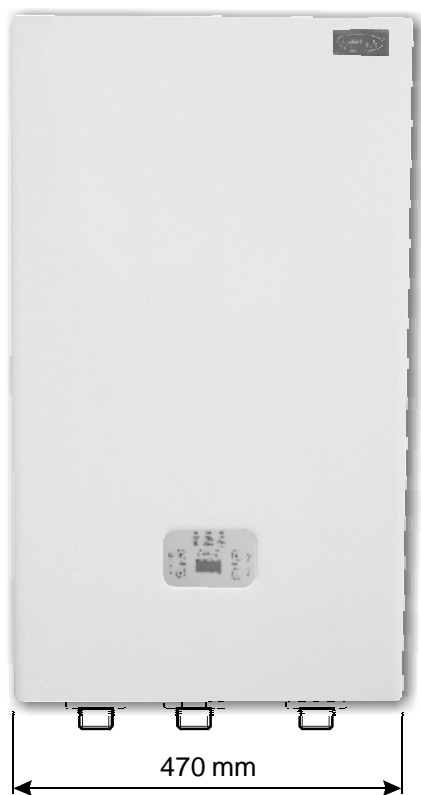
For initial setting up, we choose the curve C = 5 and afterwards change it properly by the respond of the heated building. The result of setting up is that the room thermostat switches the boiler off very rarely and the boiler is operating in the longest possible intervals. The general rule is that a shallow curve is suitable for well insulated buildings (C = 1, 2, 3) and for buildings with higher thermal losses a steeper curve is suitable (C = 6, 7, 10).

The advantage of equithermal regulation is to heat the place by the lowest possible temperature of heating water in the longest possible periods to ensure permanent temperature of heating bodies. As the heating bodies are always heated, they produce permanent heat radiation, making the user's comfort better. After setting up the equithermal curve it is necessary to wait one or two days to get the thermal response of the place and watch the room thermostat whether it does not switch off too often. In case it switches off too often, the place is heated mainly by the room thermostat and it is necessary to reduce the steepness of the equithermal curve. The outside sensor for the equithermal regulation is usually placed on the northern or north-western side of the building.

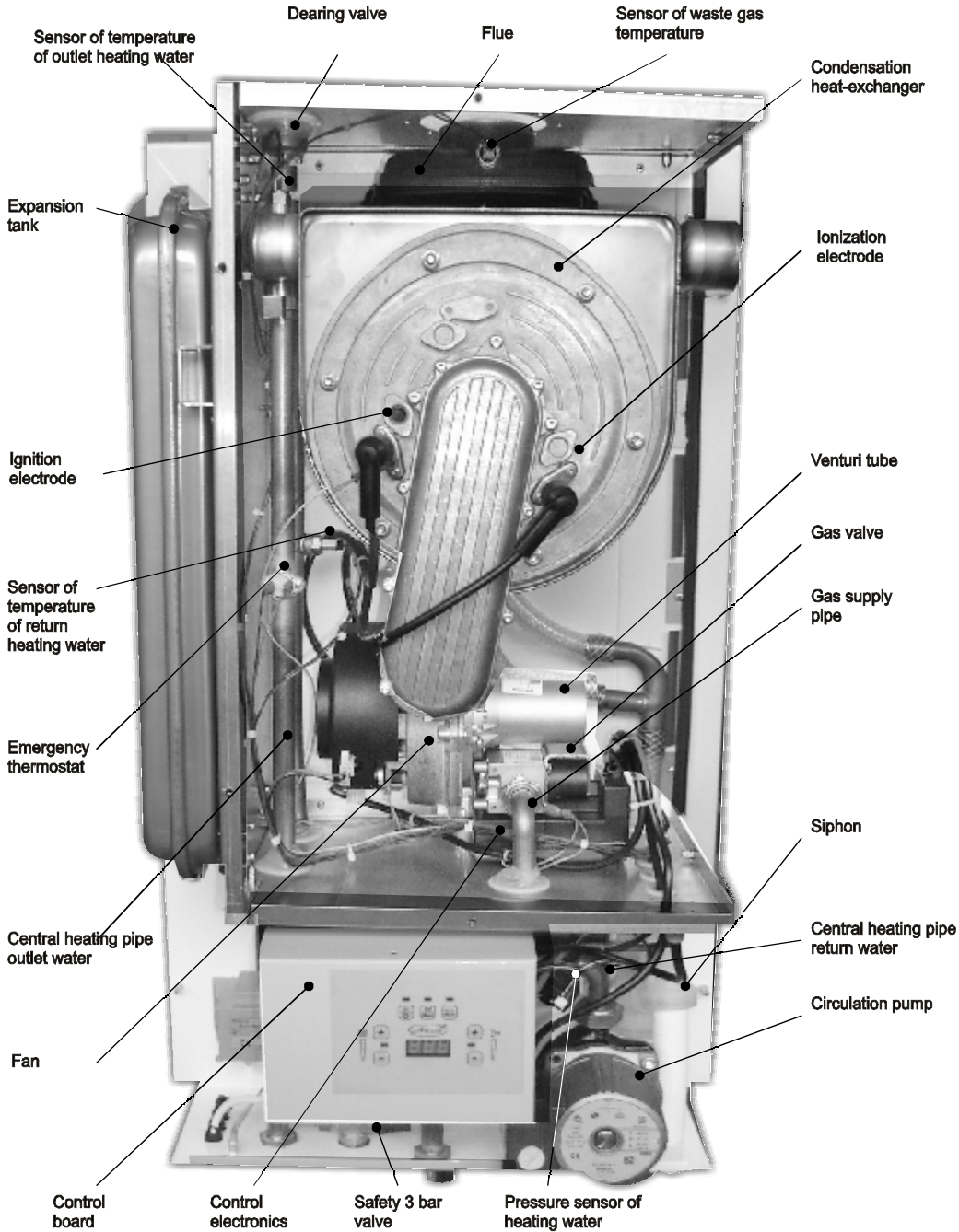
Outside dimensions of ATTACK KT



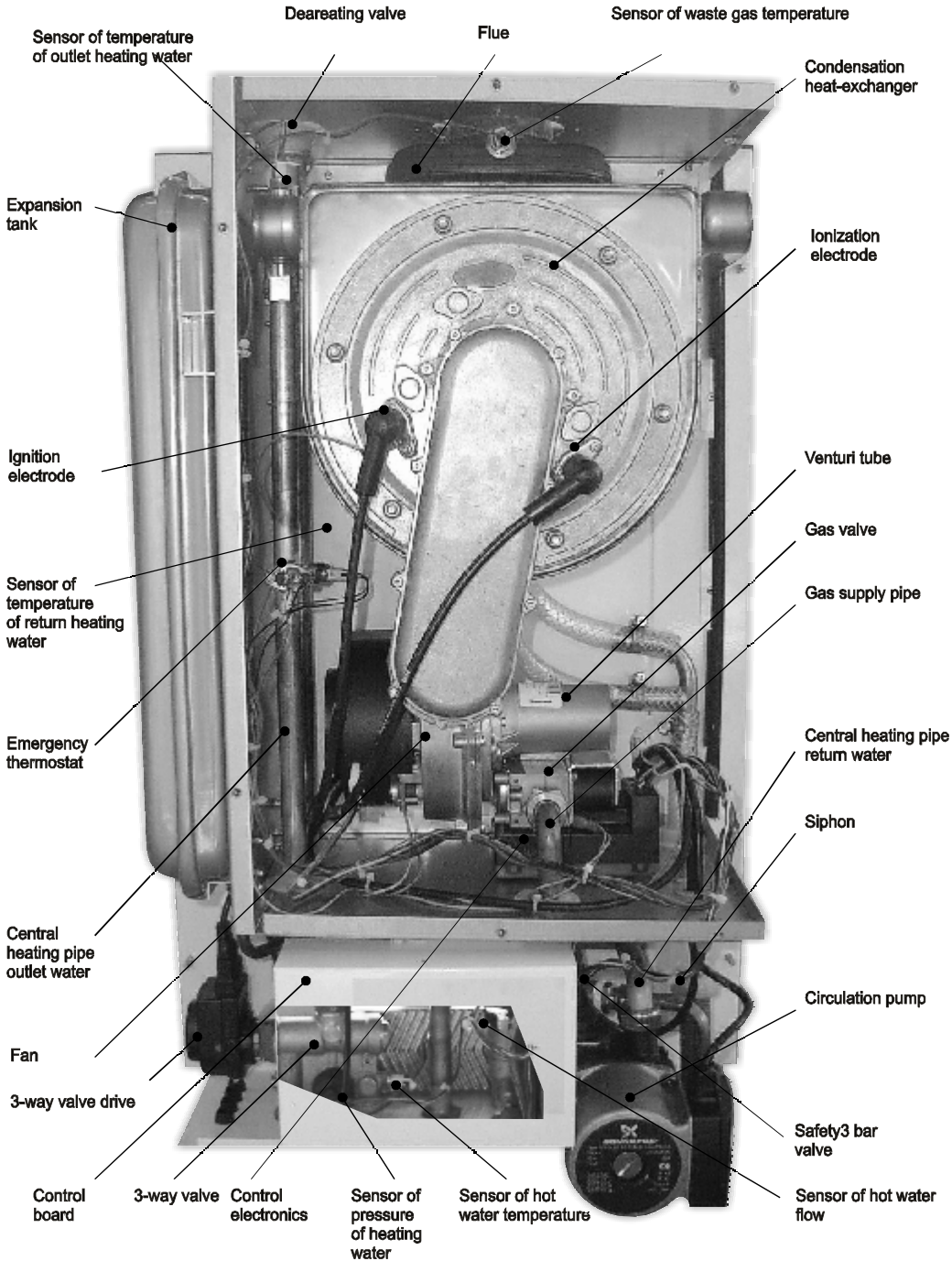
Outside dimensions of ATTACK KST



Main parts of ATTACK KT boiler



Main parts of ATTACK KST boiler



Supervision over operation

During the operation the boiler is secured against dangerous operation conditions. However, the breakdowns with the cause not included in the boiler mechanism cannot be protected to arise. Therefore it is necessary after putting the boiler to operation to examine the boiler every three days and check:

a. whether the system is filled with water and there is no leakage. If the pressure drops under 0,8 bar in the heating circuit in the cold condition, it is necessary to increase the pressure with the help of the feeding valve to 1 1,5 bar.

b. whether waste gases or gas cannot be smelled. In case of gas leakage put the boiler out of operation, close the gas supply and call service.

Found breakdowns must be reported to the service worker who put the boiler to operation. If there is a gas leakage, the gas supply must be closed. Found breakdowns must be removed immediately.

Spare parts

The producer keeps single parts of boilers as spare parts which are provided for guarantee and postguarantee service only to contract partners on the base of order or reclamation.

Guarantee, reclamation

The exact reading of guarantee and guarantee conditions and hints for reclamation are included in the letter of guarantee. Repairs in the guarantee time are performed only by contract services.

Attention!

To respect the conditions of guarantee, the producer does not permit performing any repairs by a company other than a contractor service in the guarantee time.

Service

After each year of the operation during the guarantee time it is necessary to get the boiler examined and adjusted by a contract company. The guarantee will not be admitted unless this is performed. Even after finishing the guarantee time, the producer recommends any interventions aiming to repairs to be made only by a contract service partner. The activities of the boiler user in the post guarantee time are determined in the part „Maintenance“.

Maintenance

Regular maintenance is important for reliable working, long lifetime and combustion effectivity of the boiler. The user is recommended to contact a contract service organization nearby and ensure regular annual examinations (see conditions for guarantee). A service worker checks control and safety elements of the boiler, gas and water distribution sealing or cleans the burner and exchanger from burnt dust particles. In case of lower pressure it is necessary to refill water into cold heating circuit.

Approximately once a month, the user should check whether condensate runs off into sewage. Checking and cleaning of filters of the heating system should be done after first heating, first week of operation and regularly by the degree of fouling of heating circuit.

Wrapping, transport, storing

Boilers are transported in horizontal position. To prevent possible damage, they are protected by a carton wrapping. The wrapping is secured by an adhesive tape. The boiler must be stored in non-aggressive space with the temperature of +5 up to +50°C in maximum relative humidity of air of 75%, without presence of organic steams, gases and dust.

Boiler accessories and documentation

ATTACK KT, KST boilers are delivered completely assembled and tested due to operation.

The delivery includes:

- wall bracket
- instruction for use with a document of boiler testing on the back side of the instruction
- letter of guarantee, list of contract partners

Other accessories not delivered with boilers:

- coaxial pipe 60/100mm 1 m
- coaxial 90° elbow
- sealing

Technical parameters

Category of the appliance.....	II _{2H3P}
Type	B ₃₃ , C ₁₃ , C ₃₃ , C ₄₃ , C ₅₃ , C ₈₃
Type of gas	Natural gas (G 20), LPG G31
Feeding pressure of natural gas	20
Feeding pressure of LPG gas (mbar)	37
Heat input (max/min) kW	23,4 / 7,1
Thermal output temperature drop 50/30°C (max/min) kW.....	25 / 7,5
Thermal output temperature drop 80/60°C (max/min) Kw	22,4 / 6,8
Natural gas consumption (max/min) m ³ h	2,46 / 0,74
LPG gas consumption (max/min) m ³ h	0,95/0,3
Noisiness (1m from the boiler, 1,5 height) dB(A)	<50
Waste gas rate of flow (max.output) g/s	13
Waste gas max. temperature (max.output, 50/30°C/80/60°C) °C	52 / 77
NOx class	5
CO ₂ content in waste gas (%)	8,7 %
Nominal efficiency for temperature drop 50/30°C (%).....	107
Nominal efficiency for temperature drop 80/60°C (%).....	97
The range of temperature of heating water in heating mode °C	30-90
Expansion tank volume (l)	7
Max. working overpressure of heating water (bar)	3
Min. working overpressure of heating water (bar)	0.8
Max. working temperature of heating water (°C)	85
Surroundings by STN 33 2000-3	normal AA5/AB5
Hot water preparation mode (only for ATTACK KST)	
Set-up range of hot water (°C).....	35 - 65 °C.
Hot water passage thermal difference 35°C (l/min)	9
Hot water passage thermal difference 25°C (l/min)	13
Minimum hot water passage (l/min).....	2,2
Range of working overpressure of hot water (bar)	1 - 6
Electricity data	
Electrical supply/Frequency (V/Hz)	230/50
Elect. supply on contacts of room thermostat (V)	230
Output (W).....	120
Nominal fuse current (A).....	2
Electric standard	IP44
Dimensions	
Width/Height/Depth (mm)	465/800/310
Weight without water (kg)	35
Connection	
Heating Inlet/Outlet (G)	3/4" / 3/4"
Gas (G)	3/4"
Diameter of condensate exhaust (mm)	13
Waste gas exhaust	
Max. length of Ø60/100 coaxial exhaust horizontal (m)	3
vertical (m)	2,7
Max. sum of double-pipe Ø80mm exhaust lengths (m)	10

TECHNICAL MANUAL FOR ASSEMBLY AND SERVICE COMPANIES

Installation of boilers

A boiler can be installed only by a company with a valid certificate for installation and assembly. For the installation it is necessary to work out a project that suits to valid rules. Connecting of the boiler must suit to valid standards, rules and instruction for use. **The producer is not responsible for damages caused by faulty installation.**

Installation conditions:

A gas boiler can be installed only by a company authorized to carry out these works. Before installation, the installing company has to check the right choice of the boiler type with regard to the functional attributes and required parameters. The boiler has an IP 41 covering of electric parts that is resistant against water dropping vertically. Therefore it can be installed in bathrooms by the STN 33 2000-7-701 standard in zone 3 (in the distance of 60 cm from the edge of the bath or shower corner). During installation there must be protection against the injury by electricity. The room where the boiler is located must have the temperature in the range of +5 to +35°C with relative humidity to 80%.

It is not allowed to place objects clasified by the STN 73 0823 close to the boiler, in the distance shorter than

100 mm to materials of low and medium flammability

200 mm to materials of high flammability (e.g. fibreboards, polyurethane, polyethylene, expanded PVC, rubber...)

Due to fire safety the boiler must be installed and operated in accordance with the STN 92 0300.

The first putting into operation and training of the boiler operators must be done by a contract service partner of the producer that makes regular maintenance as well as guarantee and post-guarantee service of the boiler. To the supply gas piping, a handy gas valve must be installed prior to the boiler which must be accessible but is not a part of the boiler accessories. The boiler is connected to the heating system through screw joints G ¾". Gas inlet is connected through screw joints G¾". Before installing the boiler it is necessary to make sure that the chosen place fits to requirements for waste gas escape and that minimum distances before mentioned are kept. As this boiler is fast-heating, equipped with its own pump, it is possible to connect it with gravity circulation as well as to a new system for forced water circulation in the heating system. For new distributions we recommend to use small-volume heating bodies and distributions in the smallest dimensions because of fast heating of the system to the temperature and its big flexibility. Connecting outlets of the boiler should not be strained when connecting the boiler to the heating system and to the gas distribution. Before connecting the boiler to the heating system it is necessary to flush it out thoroughly to remove small impurities and mud.

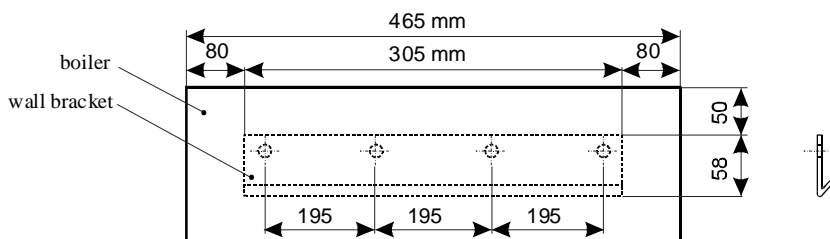
The heating system must include a proper filter. To utilize the maximum output of the boiler it is necessary to ensure minimum pressure in the heating system of 0,8 bar for right operation and long lifetime. A built expansion tank enables connecting the boiler to the closed heating circuit. The boiler is to operate on natural gas of 20 mbar nominal pressure or LPG of 37 mbar nominal pressure in the distribution net. The boiler is located so as to ensure necessary operating conditions with regard to the ways of combustion air supply and waste gas exhaust.

Localization of boilers

Localization of boilers must suit to project documentation. Boilers are to be situated in the way to ensure all the operation conditions needed and with regard to the way of combustion air supply and waste gas exhaust. From the sides of boilers there must be free access of at least 0.2 m and in front of boilers 1 m for assembly and service. Boilers must be installed at least 0,1 m over the floor.

Mounting the boilers on the wall





Mounting the boilers on the wall must be performed on the base of qualified assessment of the wall bearing capacity (by a project worker or assembly company) so as to guarantee safe and reliable hanging of boilers. The boiler hangs on a wall bracket which must be mounted to the wall with a suitable connecting material (e.g. screws and dowels) regarding the quality of the wall and weight of the boiler.




Condensate outlet

Condensate produced during the operation of the boiler must be drained off constantly. The diameter of the outlet system must be at least 13 mm. For the outlet of condensate to sewage it is necessary to follow proper local and national rules. If needed, neutralization device can be used. Condensate cannot be gathered in any case, therefore the outlet must be in min. slope of 3% to sewage downwards from the boiler.

Installation mode of the boiler

Installation mode serves for setting up various parameters of boiler operation. This mode is activated by pressing the  button on the control board for more than 3 seconds. Activated installation mode is signalled by flashing signalization LED diode above the button. Parameters are selected by pressing the button . Change of a parameter is done by pressing buttons +/- near the symbol . Record to memory of the boiler is confirmed by pressing the button  in 5 seconds from choosing the right value. This time period is indicated by flickering red LED diode above this button.




If the change is not confirmed, the value is not recorded into the memory and last value done before this change is valid.

The installation mode is finished by pressing the button  in case the red LED diode above this button is not flickering. The installation mode is also finished if there is no activity for more than 1 minute.

List of parameters:

Par.No.	Description	Set-up range	Selected value
1	Raise of temperature at start (°C/min) in heating mode	(0-60)	4
2	Anticycling time in heating mode (s)	(0-255)	90
3	Kp factor in heating mode (-)	(0-255)	2
4	Ki factor in heating mode (-)	(0-255)	62
5	Kp factor in hot water mode (-)	(0-255)	3
6	Ki factor in hot water mode (-)	(0-255)	93
7	Starting output (%)	(0-70)	50
8	Kp factor of the ventilator (-)	(0-255)	35
9	Kp factor of the ventilator (-)	(0-255)	230
10	Heating-set-up parameter by outside temperature (°C)	(20-40)	30
11	Current heating temperature (°C)		
12	Run-out of the pump in heating mode (min)	(1-20)	5
13	Current hot-water temperature (°C)		
14	Maximum output of the boiler in heating mode (%)	(0-100)	100
15	Heating curve by outside temperature (-)	(0-10)	0
16	Run-out of the pump in hot-water mode (s)	(0-255)	30
17	Hysteresis in heating mode (°C)	(0-10)	3
18	Hysteresis in hot-water mode (°C)	(0-20)	5
19	Maximum value of temperature in heating mode (°C)	(20-90)	80

Testing mode

Testing mode is activated by pressing the button  for more than 3 seconds. The function of testing mode is signalled by flickering signalization LED diode at this button. During testing mode it is possible, with buttons +/-, to set up output at the symbol  which is given in percent and displayed. If you want to finish the testing mode, you can do that with the button . Duration of the testing mode can be set up or it finishes automatically if for 30 minutes there is no change.

Connecting the boiler to heating system

ATTACK boilers serve for heating systems with forced circulation. Rate of water flow can be set by the switch on the pump. Before filling the heating system with water, it is necessary to clean the system properly. Heaters and distribution must be flushed out several times. For thorough flushing and cleaning of the heating system we recommend to use cleaning agents. On the inlet from heating system to the boiler, a filter must be mounted. We recommend brass filters with side cleaning. The filters must be cleaned regularly according to fouling. Maintenance of the boiler is easier when on the inlet as well as on the outlet of heating there is a valve. Filters and valves are not delivered as boiler accessories. The heating system must also be equipped with a feeding valve with non-return flap valve connected to water piping that serves for feeding and pressurizing the heating system.

Guarantee does not apply to the cases of clogging the exchanger or pump by impurities from the system.

The hardness of water in the heating system is not recommended higher than 3 mval /l. In the boiler there is a 7-litre pressure expansion tank enabling connecting to a closed heating system. If it is required by the size of the heating system, another pressure expansion tank is to be mounted. The recommended temperature difference between outgoing and incoming heating water from the boiler is 15 - 20°C. For reconstruction of heating or a new system we recommend small-volume heaters and distributions in the smallest dimensions regarding to fast rise of the system to the temperature and quite a big flexibility of the system. Process of water filling: when filling with water, the boiler must be disconnected from electricity, deaerating valves on the boiler and heating system must be open. Set the system to the pressure of 1 bar, then deaerate and set to the pressure again.

Heating system must suit to valuable standards and measures:

STN 06 0310 Project and assembly of central heating

STN 06 0830 Equipment for central heating

The size of expansion tank by STN 06 0830 is calculated by formula:

$$V_c = V \cdot v \cdot 1.3$$

V_c = volume of the expansion tank

V = volume of heating water in the circuit

v = proportional growth of volume after heating to t_m If $t_m = 80^\circ\text{C}$, $v = 0.029$

If the volume of the expansion tank is higher than 7 litres, it is necessary to add another expansion tank with minimum size equal to calculated difference. Because of maximum utilization of condensation effect it is necessary for the heating system to be dimensioned to temperature drop of 50/30°C. The boiler is equipped with a siphon that before start must be flushed out with water of about 100ml. The outlet from the safety 3 bar valve is necessary to connect to the discharge piping.

Guarantee does not apply to the cases of incrustation of the heat exchanger or pump.

Connecting the boiler to hot water piping

Connecting the boiler to hot water piping must be done in accordance with the standard STN 06 0830. The piping must be equipped with all the determined fittings. Maximum feeding pressure of hot water is 6 bar. Hardness and composition of water must suit to valid standards for drinking water.

Connecting the boiler to gas pipeline

Before connecting a boiler to the gas pipeline, the pipeline must be tested and adjusted. After connecting to a boiler, all the gas connectors must be tested, including piping and fittings in the boiler. Bolted connections of the gas pipeline as well as those of the water piping and heating water piping must not be stressed by any additional force. Gas installation must be done according to the standard STN EN 1775.

Chart of connecting the ATTACK KT boiler to water and gas

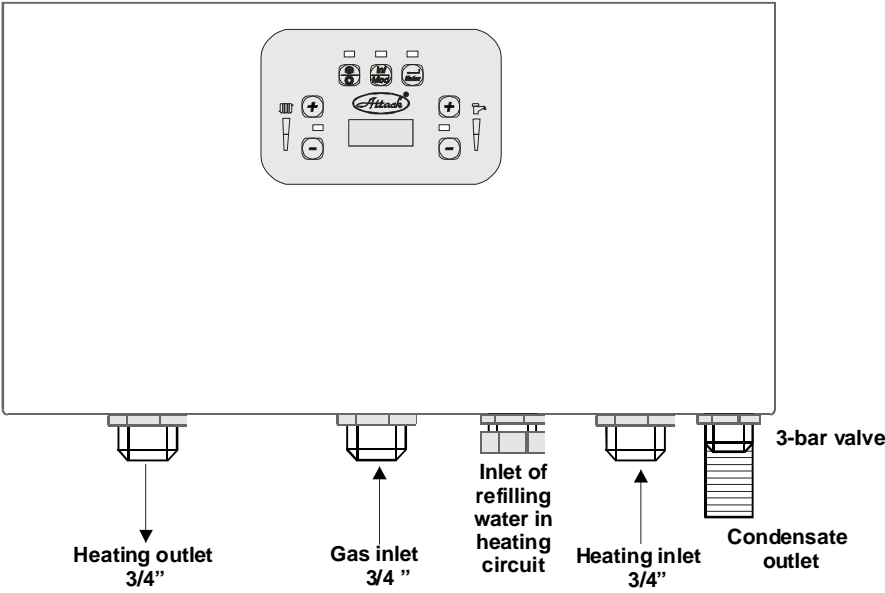
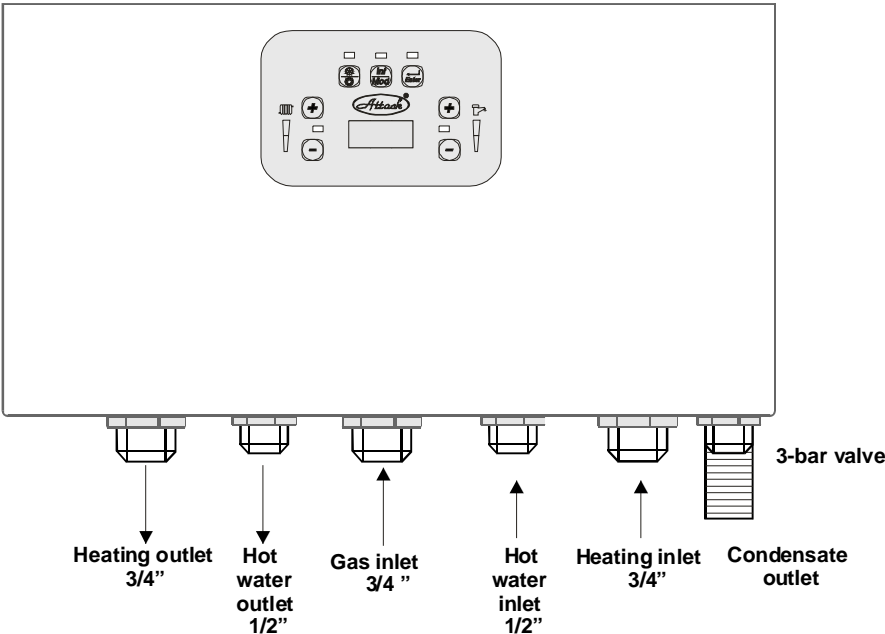


Chart of connecting the ATTACK KST boiler to water and gas

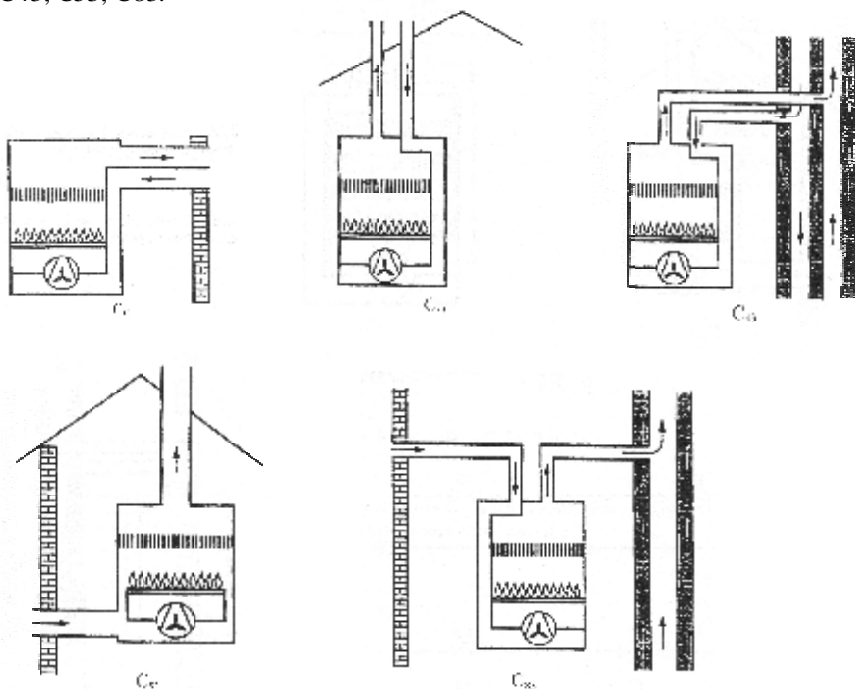


Connecting the boiler to the mains

The boiler is plugged into the socket of 230V/50Hz with a mains cable with a plug. The socket must suit to STN 33 2000-4-46 standard and it must be equipped with a centre contact pin connected to PE conductor. Various multiple sockets and lengthening cables are not allowed to use. Mains supply must be of 230V/50Hz. Installation of the socket, connecting the room thermostat and service of electric parts of the boiler can be performed only by a person with special electric qualification. Electric installation is ready for additional connection of a room thermostat and three-way valve in case indirectly heated storage tank was connected. The room thermostat must be connected by a copper conductor with 1-1.5 mm². The outside thermal sensor must be connected with a copper conductor with 0.75mm² diameter. Maximum resistance of the line is 10kΩ, total length 30m. For the OPENTHERM contacts can be used a copper conductor with 0.5-1.5mm² diameter. The conductors of the outside thermal sensor and OPENTHERM contacts cannot be conducted concurrently with the conductors of the room thermostat and mains feed.

Waste-gas exhaust KT, KST

ATTACK KT, KST boilers are approved by the standard STN EN 483 for the types C13, C33, C43, C53, C83.



C13 - type horizontal coaxial type, waste gas outlet and air intake are in equal pressure conditions.

C33 - type vertical coaxial type, waste gas outlet and air intake are in equal pressure conditions.

C43 - type doubled type into a common flue shaft.

C53 - type separated air intake and waste gas exhaust with the intake through the wall and waste gas exhaust through the roof. This type must not be located on the opposite walls of the building.

C83 - type separated air intake and waste gas exhaust to a separated or common flue. Waste-gas exhaust and combustion air come through double piping delivered by the boiler producer which can be ordered in required amount by the project (horizontal or vertical exhaust) including sealing collars, roof reducing pieces and so on.

Basic requirements for waste gas exhaust for the appliances with a burner and forced intake of combustion air are set by technical rules.

Maximum length of waste gas exhaust permitted by the producer:

- vertical piping $\varnothing 60/100$: 2,7 m
- horizontal piping $\varnothing 60/100$: 3 m
- when a distributor and piping for waste gas exhaust and air intake of $\varnothing 80$ mm are used, the sum of lengths of single components used in this system must not be higher than 10 m
- each 90° elbow inserted shortens the length in 0.75 m and a 45° elbow shortens it in 0.5 m
- for vertical exhaust through a roof it is necessary to use a condensate collector

Accessories of waste gas exhaust of ATTACK KT, KST boilers

Accessories of coaxial waste gas exhaust of $\varnothing 60/100$ mm

Code	Name
PR37	Prolonging piece 1m D60/100 paint
PR38	Prolonging piece 0,5m D60/100 paint
PR39	Flue 60/100 paint
PR40	90° elbow D60/100 paint
PR41	45° elbow D60/100 paint
PR42	elbow with flange + service opening D60/100
PR43	vertical flange + service opening D60/100
PR44	terminal pipe D60/100 paint

Accessories of waste gas exhaust and air suction of $\varnothing 80$ mm:

Code	Name
PR45	Exhaust and suction pipe 1m D80
PR46	Elongation piece 1m D80
PR47	Elongation piece 0,5m D80
PR48	90° elbow D80 O/M
PR49	45° elbow D80 O/M
PR50	flue D80
PR51	vertical distributor D60/100 D80/80

Connecting a room thermostat

A room thermostat is not a part of the boiler accessories but can be connected into a boiler additionally by the request of a customer. The voltage for switch contacts of the room thermostat is 230 V/50 Hz. Connecting of the room thermostat into the boiler is illustrated on the connection chart. Connecting terminals for the thermostat are interconnected by a jumper. After connecting the room thermostat to the terminals, the jumper is removed. For the function of a room thermostat can be used a room regulator which is connected to the OT1, OT2 contacts of the boiler. This regulator must be compatible in communication with OPENTHERM (Honeywell CX51, CR 11001...). The voltage on the OpenTherm contacts OT1, OT2 is unidirectional 24 V.

Connecting a coaxial exhaust pipe. KT, KST type

Combustion air supply and waste gas exhaust go through a coaxial 90° elbow and a coaxial 1-m-long pipe. These or other necessary 90° and 45° elbow or elongation pieces of 0.5 m and 1 m can be bought by request. The maximum length of coaxial waste gas exhaust admitted by the producer is 3 m horizontally and 2.7 m vertically, measured from the boiler to the outlet on the facade or to the bottom edge of the roof reducing piece. Each 90° elbow shortens the length in 0.75 m and a 45° elbow in 0.5 m. The whole pressure loss of the piping must not be bigger than 80 Pa. Coaxial piping must have a slope of 3% to the boiler downwards.

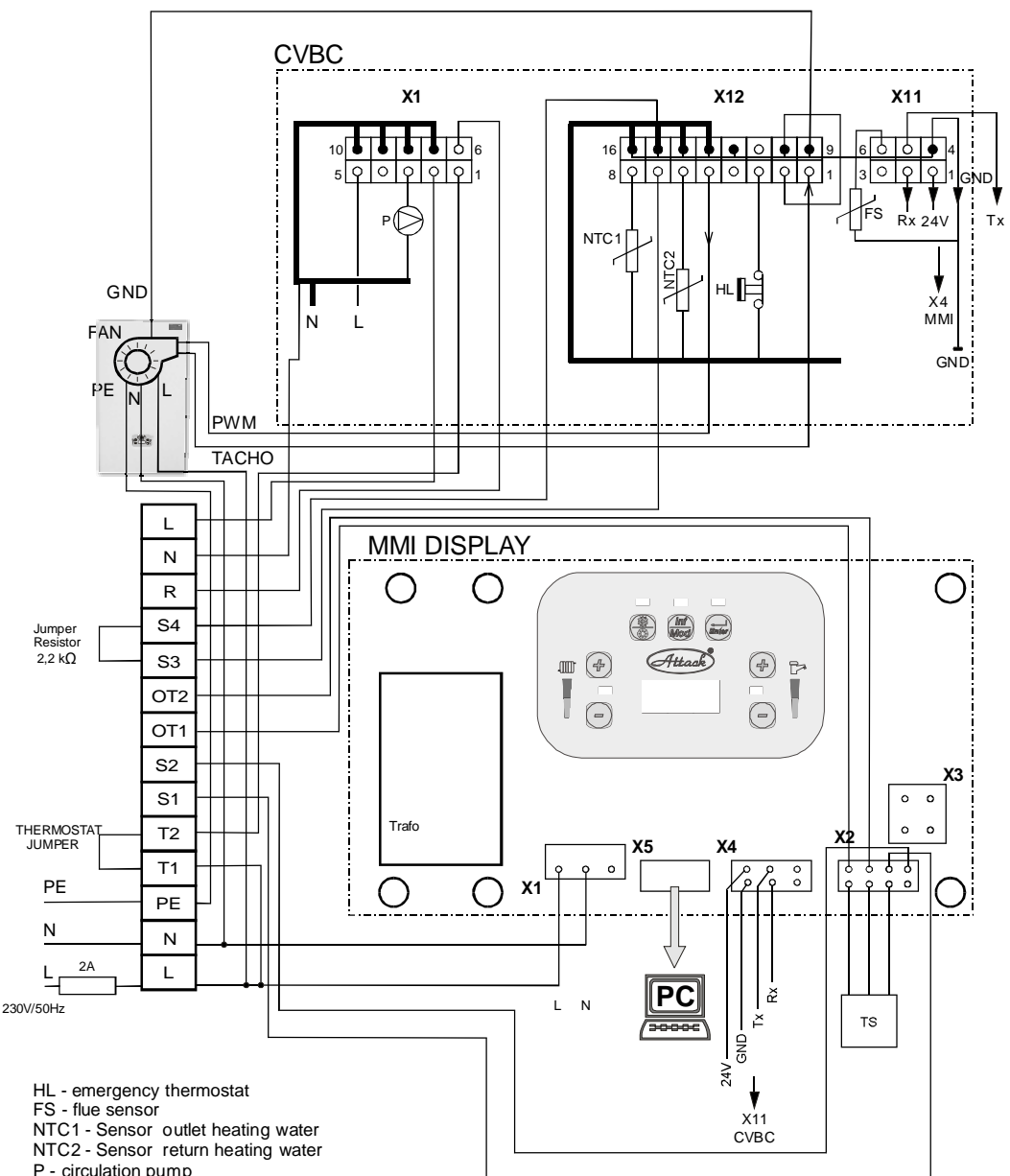
Putting the boiler into operation

Putting into operation, checking and setting minimum and maximum output of the boiler as well as the repairs can be carried out only by firms authorized to this and trained by the producer (list of the contract service partners is in the supplement).

Duties of a service worker when putting the boiler into operation:

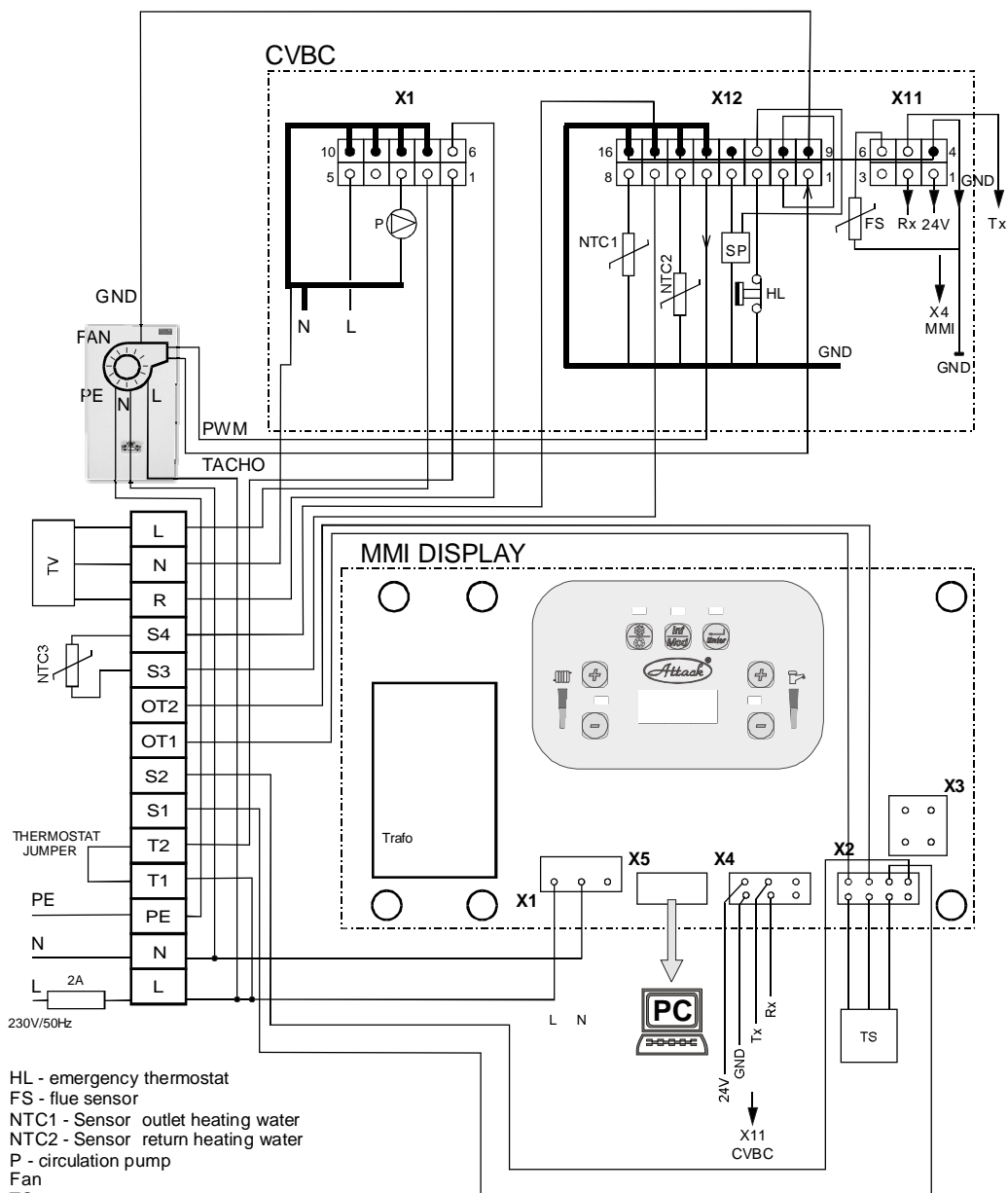
- check whether the installation of the boiler and accessories suits to the project and boiler inspection
- check the deaeration of the boiler and heating system (the bolt on the automatic deaerator must be released)
- check the water pressure in the heating system (minimum of 1 bar in the cold system)
- check if the safety valve is working
- check the connecting to the gas pipeline as well as control and safety elements and test the sealing of the gas pipeline from the main pipe seal up to the fittings in the boiler
- check electric socket connecting and electroinstallation inspection
- check the waste gas exhaust
- set up the gas valve and the right value of CO₂
- check the function of operation
 - set appropriate pump speed and pressure in the heating system
- test function of ball valves prior to the boiler
- get a user acquainted with the boiler attendance which is confirmed by the user's signature on the letter of guarantee
- write down having put the boiler into operation to the letter of guarantee and instructions for use

Chart of ATTACK KT wiring



- HL - emergency thermostat
- FS - flue sensor
- NTC1 - Sensor outlet heating water
- NTC2 - Sensor return heating water
- P - circulation pump
- Fan
- TS - pressure sensor
- S1, S2 - contacts of outside thermal sensor
- OT1, OT2 - contacts of the OPENTHERM regulator
- S3, S4 - thermal sensor of hot water
- L, N, R - contacts of three-way valve of hot water 230 V





Chart of ATTACK KST wiring



Setting-up a gas valve

Modulation output of the boiler is factory set up and suits to minimum as well as maximum rotations of the fan. Because of the right working of the boiler it is necessary to check CO₂ emissions in waste gas for maximum and minimum output of the boiler.

How to check and set up:

- turn the boiler on with the help of a cable into electrical network
- dismantle the front cover and the cover of closing chamber
- check the gas pressure in the inlet by relasing the screw of inlet pressure control. The boiler is adjusted to connecting pressure of natural gas of 20 mbar. After checking, tighten the screw up
- install the probe of waste gas analyzer into the pipe of waste gas exhaust
- start the testing mode of the boiler by pressing the button  for longer than 3 seconds. With the +/- buttons at the symbol  set up the value of 99 corresponding to maximum output of the boiler
- turning the screw with a flat screwdriver set up the value of CO₂ to 8.7%. When turning the screw clockwise, the value is lowered (fig. No 1)
- after reaching this value, with the buttons +/- at the symbol  set up the value of 00 corresponding to minimum output of the boiler
- turning the screw of the regulator set up the value of CO₂ in waste gas to 8.7% (fig. No 2). When turning the screw clockwise, the value is increased
- **When adjusting the screw on the regulator, it is necessary to use the original screwdriver TORX TX40. Otherwise the screw can be damaged and there is no guarantee for this kind of damage**
- After stabilizing CO₂ emissions at 8.7%, set up the value of 99 again with the help of +/- buttons at the symbol  and check whether the set up value has not changed
- If there is a change, the value must be corrected.

If the gas value is set up correctly, the value of CO₂ for maximum as well as minimum output is the same, 8.7 %, and this value cannot be changed during 1 minute after repeated control for maximum and minimum output of the boiler.

After setting up it is necessary to mount the dismantled parts on again.



Fig.1 Setting up CO₂ for max. output

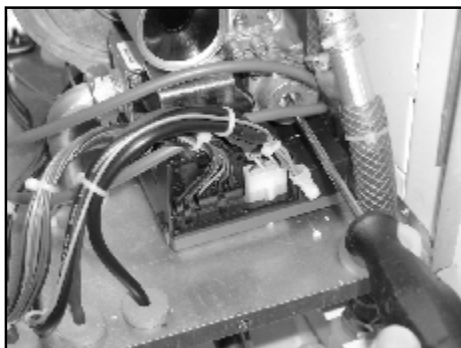



Fig.2 Setting up CO₂ for min.output

Other setting-up

Maximum output of the boiler

Maximum output of the boiler can be set up in the installation mode (see chapter *Installation mode*, parameter 14). By the buttons +/- at the symbol  set up a new maximum output of the boiler in percentage of maximum boiler output set-up in production.

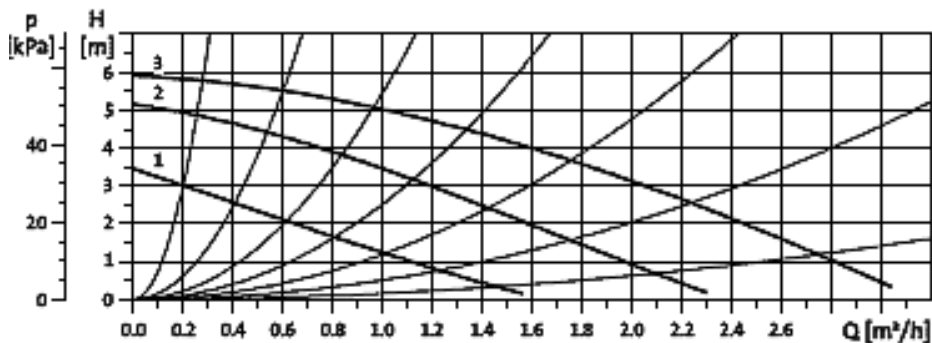
Run-out of the pump

Setting-up can be found under parameter 12 of installation mode. Time of run-out is set-up in seconds.

Starting output

Starting output is set up by parameter 12 of the installation mode and is determined by percentage of maximum boiler output.

Characteristics of circulation pump



Notes:

Notes:

RECORD ON PUTTING THE BOILER TO OPERATION

Boiler type:

Boiler output:

Production No.

Date of putting to operation:

Service company:

Stamp, signature

Obligatory service examination after the 1st year of operation

Date:

Stamp, signature

Obligatory service examination after the 2nd year of operation

Date:

Stamp, signature

Obligatory service examination after the 3rd year of operation

Date:

Stamp, signature

**DOCUMENT on testing and completeness
of ATTACK KT, KST gas boiler**

KT

KST

Boiler output: 7-25 kW

Boiler production No.:

The product delivered with this certificate suits to technical standards and technical conditions.

The product was manufactured by its drawing design in requested quality and is approved by TECHNICAL INSTITUTE FOR TESTING SKTC-104 in Piešťany under the No. of certificate 512990027.

Technical inspection

In Vrútky, date:

Stamp and signature of the final inspection:

Country of the appliance delivery :

SK	CZ	AT	CH	DK	ES	FI	FR	GB	GR	IE	IT	NL	NO	PT	SE

Producer:

**ATTACK, s.r.o.
Dielenská Kružná 5
038 61 Vrútky
SLOVENSKO**

**Tel: 043/ 4003 101
Fax: 043/ 4003 106
E-mail: kotle@attackslovakia.sk
[http: www.attack-sro.sk](http://www.attack-sro.sk)**

