

VIADRUS

VIADRUS CLAUDIUS K 2 MANUAL FOR BOILER OPERATION AND INSTALLATION

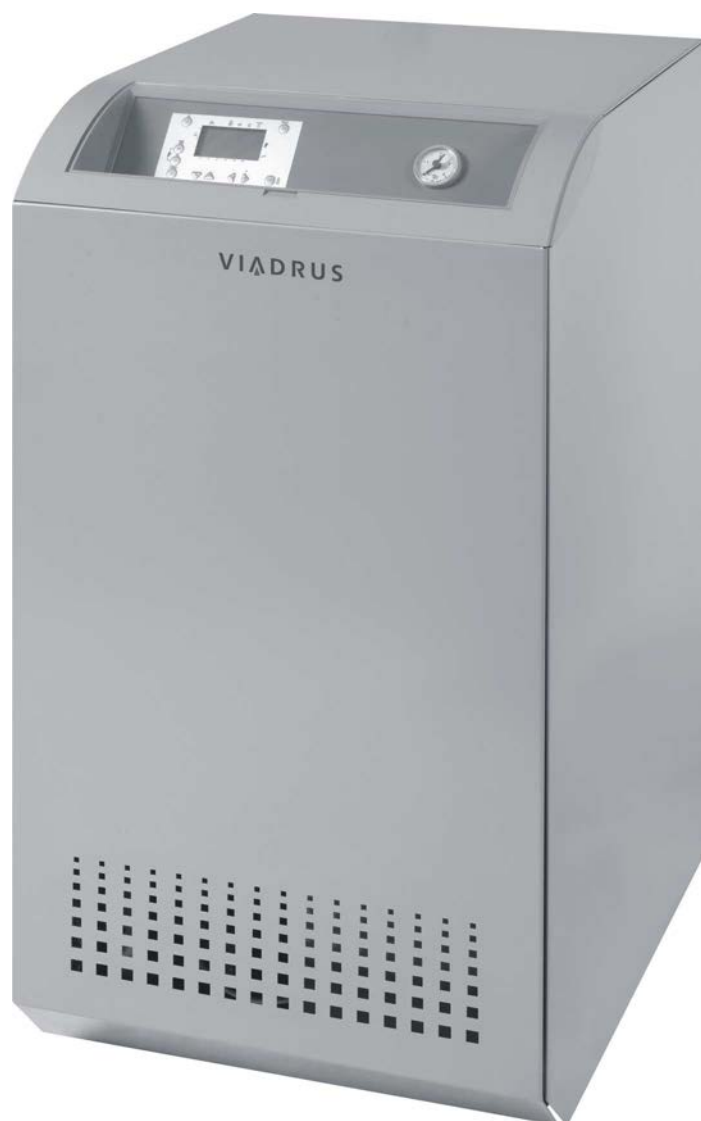


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Dear Customer

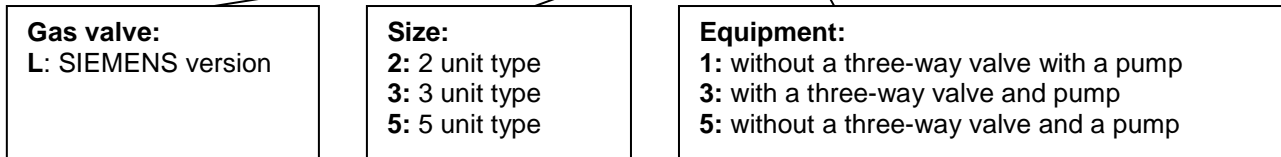
Thank you for your purchase of the VIADRUS CLAUDIUS K 2 boiler and trust shown to the firm VIADRUS a.s.

To become familiar with a proper operation of your new product since the beginning, please read carefully the presented user's manual particularly the Chapter No. 7 – Boiler Attendance by user and Chapter No. 10 – IMPORTANT CAUTIONS. We ask you to follow further presented information, particularly regarding the required annual inspections to be performed by an authorized technical firm, which guarantees a long-term boiler operation free of failures to both your and our satisfaction.

1. Produced Variants of Boilers

An order should specify the following:

Order specification code
VIADRUS CLAUDIUS K 2 X X X



2. Boiler Application and Benefits

The condensation boiler VIADRUS CLAUDIUS K 2 is intended for combustion of low pressure natural gas. The size of the condensation boiler is suitable for heating of family houses, recreational facilities as well as to reconstruction of heat sources in individual flats. The condensation heat output is 3,5 – 16 kW (2 sections), 5,3 – 24 kW (3 sections) and 11,5 – 49,5 kW (5 sections)

It consists of castings made from special aluminium alloy. Individual sections are connected by the means of silicon rings and tightened by threaded bars. The maximum working overpressure of the boiler is 250 kPa (2,5 bar). The body is tested by 600 kPa (6 bar) test overpressure.

The combustion mixture is mixed in the mixer in a preset air-gas ratio in its whole regulation range.

The water volume of the three section boiler body is 9 l. The water volume of a 2 section boiler body is 6 l. The water volume of a 5 section boiler body is 13 l.

The boiler body efficiency at 50/30 °C temperature gradient varies in a range of 101,5 – 108 % depending on the required output.

Boiler Priorities:

- Low consumption of gas
- High efficiency of combustion
- Smooth modulation of output
- Easy service and maintenance
- The boiler enables connection to a reservoir of hot service water heater and ensures its preferential heating
- Reliability of regulation and safety elements
- Low weight
- Automatic defects detection
- Separate time program also for hot service water
- Equithermal boiler regulation

3. Technical Data

Tab. No. 1 Sizes, operation temperature and electrical variables

Number of sections	[pcs]	2	3	5
Fuel type	[-]	ZP	ZP	ZP
Category of appliance	[-]	I _{2H}	I _{2H}	I _{2H}
Type		B ₂₃ , B ₅₃	B ₂₃ , B ₅₃	B ₂₃ , B ₅₃
Weight	[kg]	60	69	95
Water area volume	[l]	7	9	13
Boiler size - width (L2)	[mm]	485	485	570
- depth	[mm]	560	560	560
- height	[mm]	934	934	934
Ø of combustion air connection	[mm]	80	80	80
Diameter of smoke socket	[mm]	80	80	100
Maximum working water overpressure	[kPa] [bar]	250 (2,5)	250 (2,5)	250 (2,5)
Test water overpressure	[kPa] [bar]	600 (6)	600 (6)	600 (6)
Maximum operation water overpressure in hot service water circle	[kPa] [bar]	600 (6)	600 (6)	600 (6)
Loss factor	[-]	12,7	11,37	6,85
Maximum permitted working temperature	[°C]	80	80	80
Maximum connecting overpressure of fuel G20	[mbar]	20	20	20
Noise level	[dB]	≤ 55	< 55	≤ 55
Boiler connection				
- heating water output	[Js]	3/4"	3/4"	3/4"
- heating water input to heater	[Js]	3/4"	3/4"	3/4"
- reversible heating water input	[Js]	3/4"	3/4"	3/4"
- reversible water input from heater	[Js]	3/4"	3/4"	3/4"
- condensate outlet	[mm]	Ø 16	Ø 16	Ø 16
- safety valve output	[Js]	3/4"	3/4"	3/4"
- gas inlet	[Js]	3/4"	3/4"	3/4"
Connecting voltage		1/N/PE 230 VAC 50 Hz TN-S		
El. power input including pump		110	110	110
El. covering		41	41	41

Tab. No. 2 Thermal – technical parameters

Comparison conditions 15°C and 1013,25 mbar, dry gas

Number of sections	[pcs]	2	3	5
Boiler output range	[kW]	3.5-16	5.3-24	11.5-45
Nominal output 80/60°C	[kW]	14.48	21.72	41.5
Nominal output 50/30°C	[kW]	16	24	45
Minimum output 50/30°C	[kW]	3.5	5.3	11.5
Boiler efficiency at the nominal output 80/60°C	%	Up to 98	Up to 98	Up to 98
Boiler efficiency at the nominal output 50/30°C	%	101,4	106,6	106,0
Boiler efficiency at the nominal output 50/30°C	%	Up to 108	Up to 108	Up to 108
Volume flow rate of fuel	[m ³ h ⁻¹]	0.375-1.755	0.426-2.532	1.174-4.52
Mass flow rate of flue gas	[kg.h ⁻¹]	3.43-26.13	5.2 –39.2	12.26 – 80.85
Nox class	[-]	5	5	5
Temperature of flue gas	[°C]	30 - 70	30 - 85	40 - 65

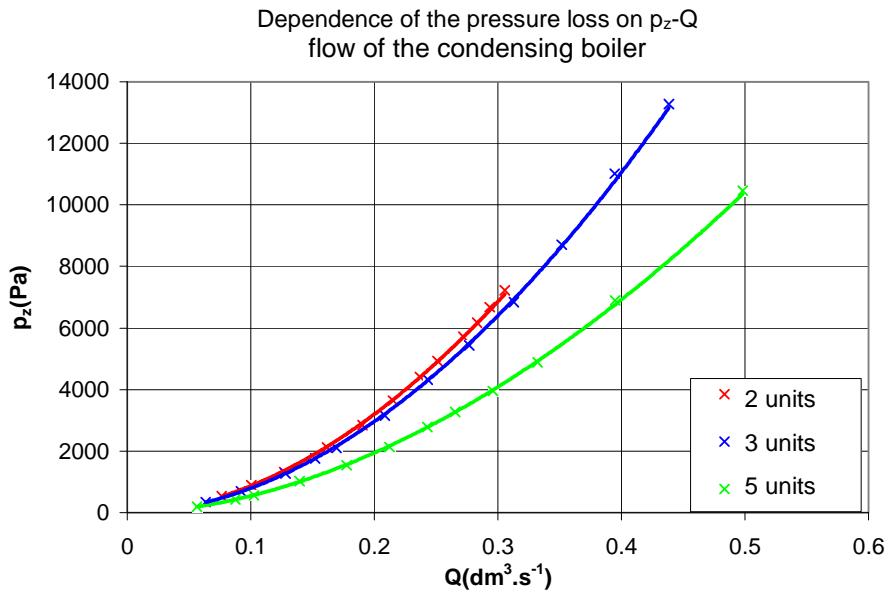


Fig.no.1 Pressure loss dependence on the flow

4. Description of a Boiler

4.1 Boiler Construction

The exchanger of a condensation boiler consists of a front, medium (3sect., 5sect.) and the back sections. These castings are connected by the means of silicon rings and tightened by threaded bars. Then this boiler is equipped with a premix burner. The combustion mixture is mixed in the mixer in a preset air- gas ratio in the whole performance range. The air is brought to the mixer via a modulation ventilator. The boiler is constructed for heating with preferential heating of hot service water. The manufacturer recommends the combination with a water heater for hot service water heating.

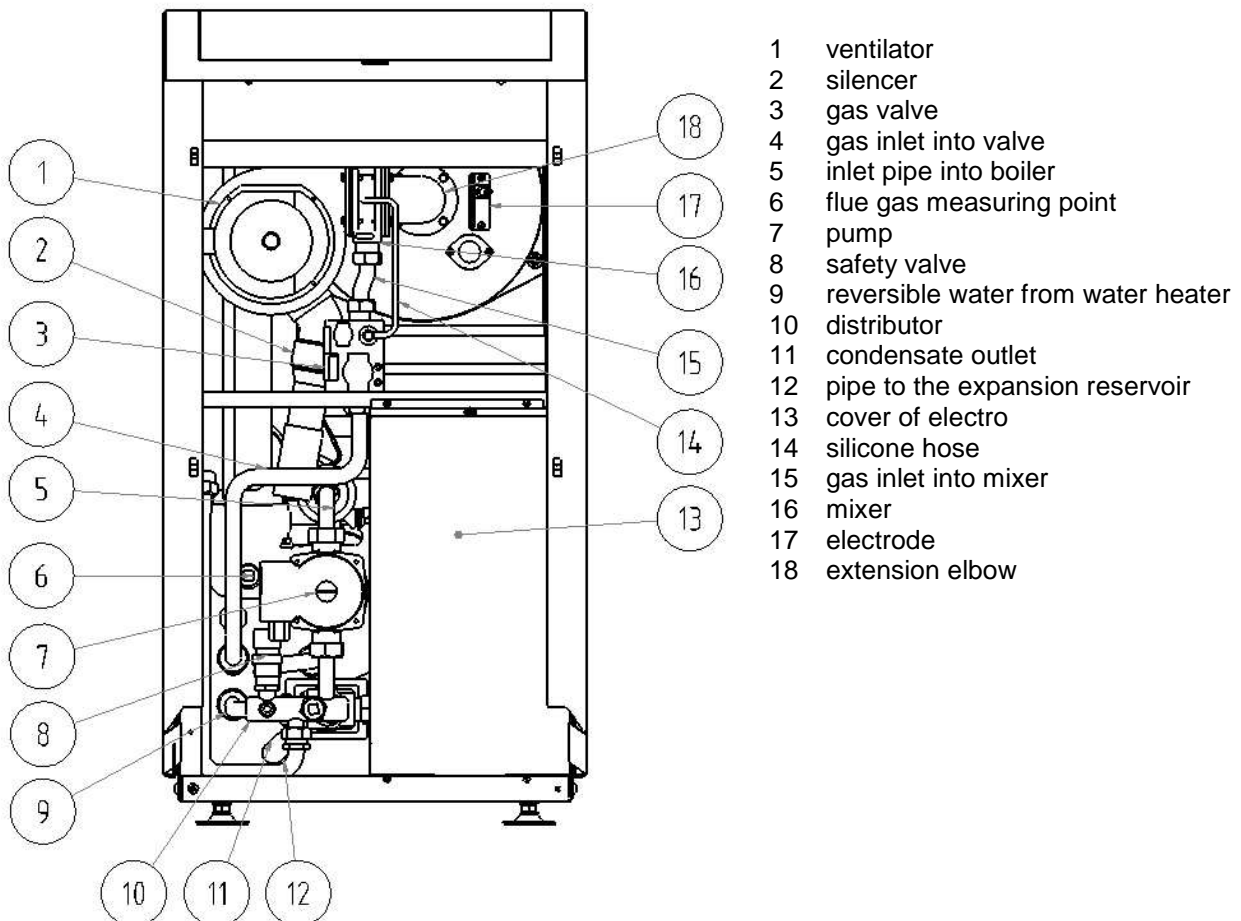


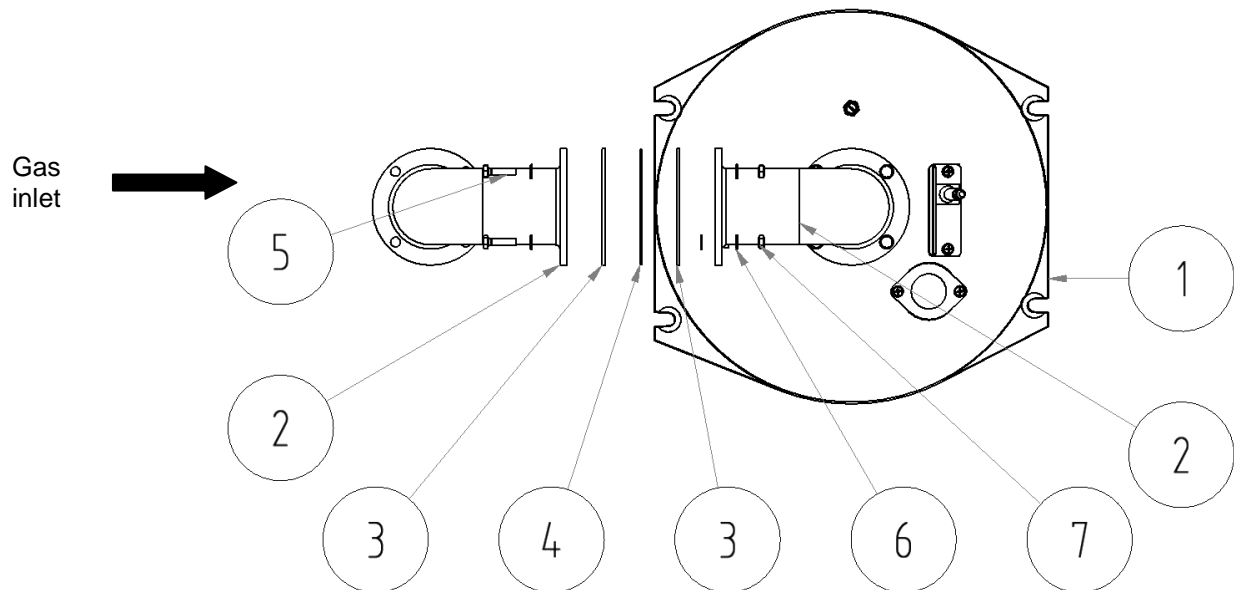
Fig. no. 2 VIADRUS CLAUDIUS K 2 assembly

Then the boiler is equipped with LMU 64 automatics and a gas valve. LMU 64 automatics is an electronic control and ignition automatics designed for the gas boilers for central heating with a modulated ventilator and a burner with the premix system. If we want to control the boiler equithermally we recommend the use of QAA 73 equithermal regulator with an outdoor sensor. The QAA 73 equithermal regulator supports the Opentherm control system. In case QAA 73 is not used the boiler can also be controlled by a room thermostat. If in this case we require the equithermal control it is necessary to use an outdoor sensor. In order to increase the number of heating circuits there can be used ClipIn based on the extended project documentation.

The combustion air inlet and the flue gas outlet can be carried out in several ways:

- into a chimney,
- through a wall

The boiler is an appliance in version B i.e. an open appliance.



1. Complete burner
2. Extension tube
3. Sealing Ø 83
4. Mix strainer
5. Screw M5
6. Washer 5,3
7. Nut M5

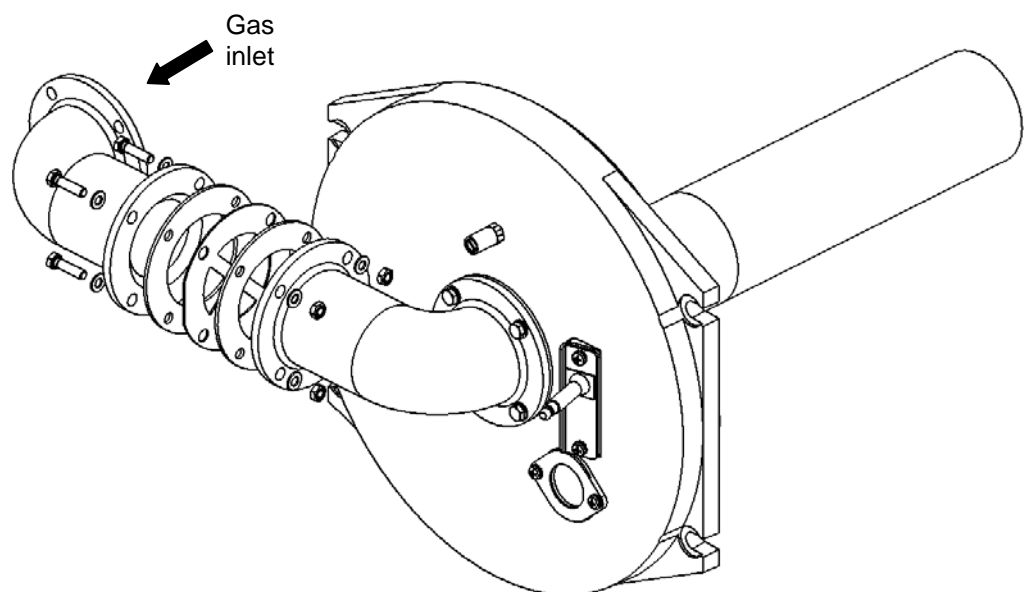


Fig. no. 3 Mix strainer positioning in the gas branch of burner K 2 L 5 section

4.2 Control Features

VIADRUS CLAUDIUS K 2 L version – Siemens automatics.

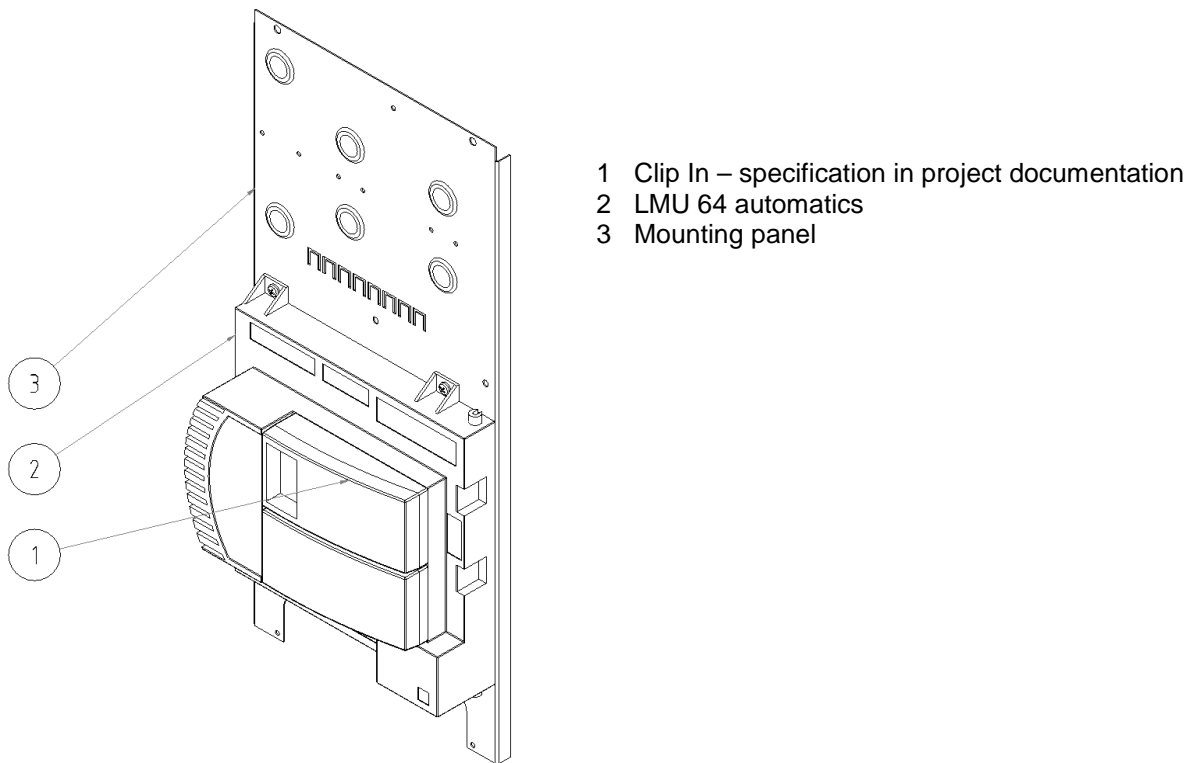


Fig.no. 4 LMU 64 automatics place

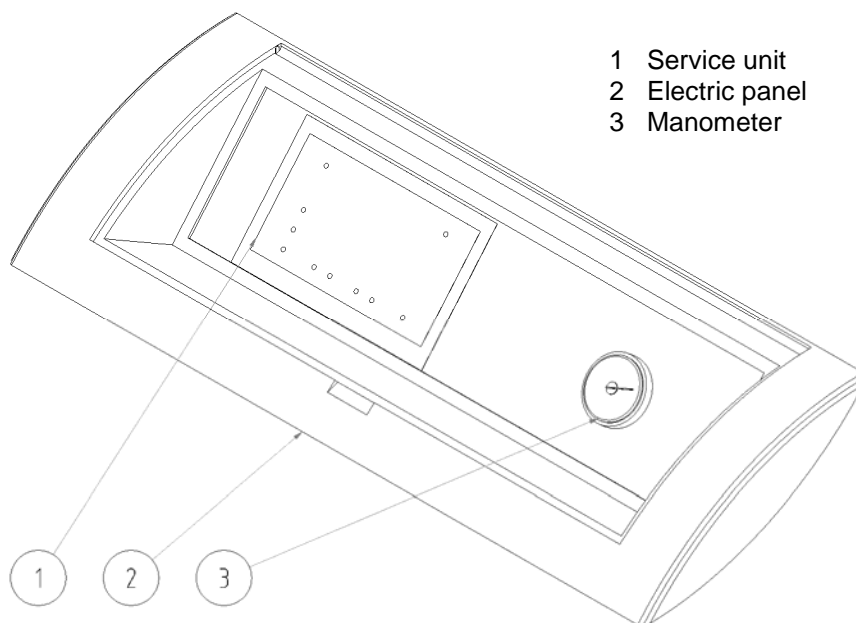


Fig.no. 5 Electric panel assembly

4.3 Wiring diagram

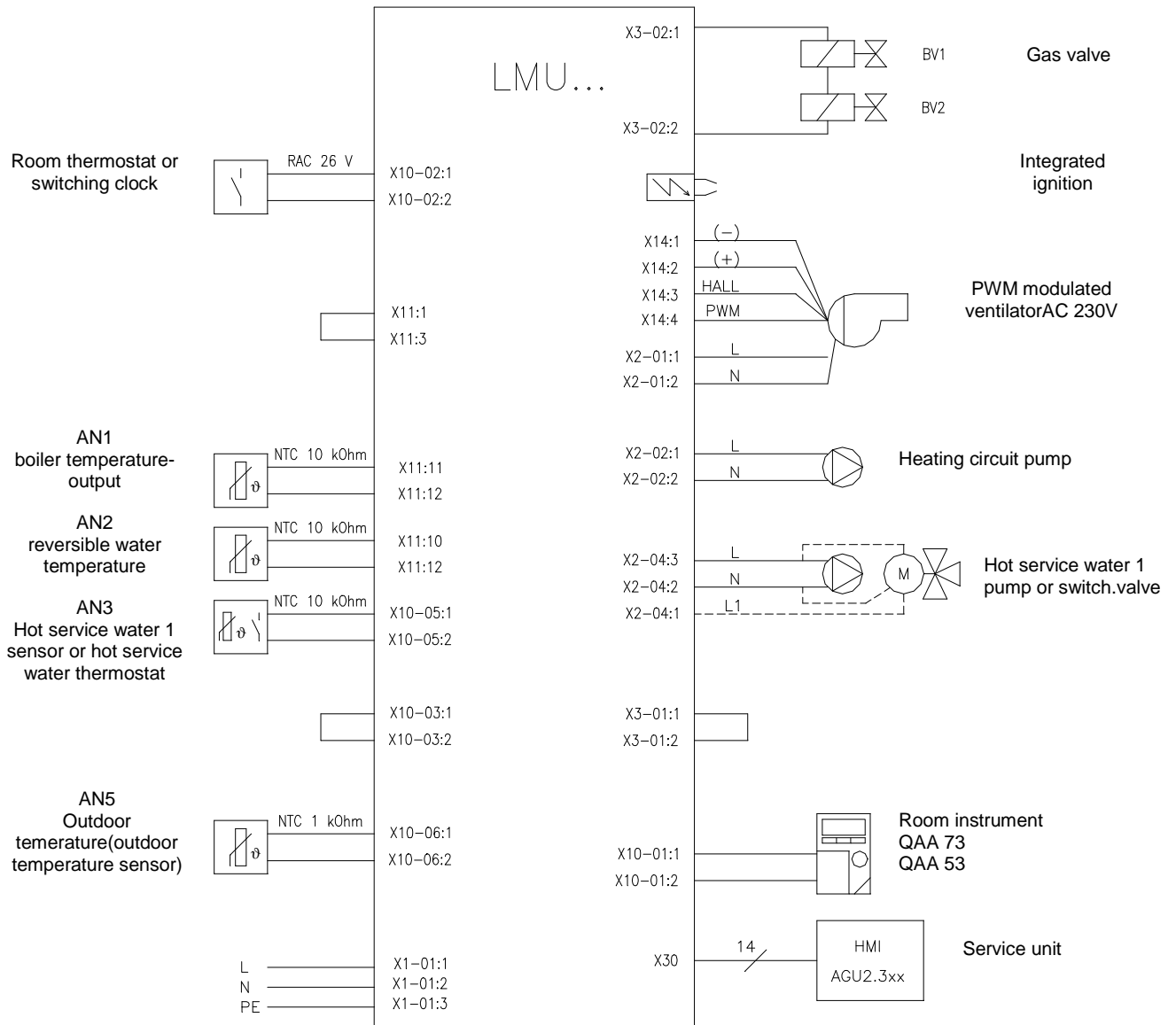


Fig. No. 6 A wiring diagram of VIADRUS CLAUDIUS K 2 L

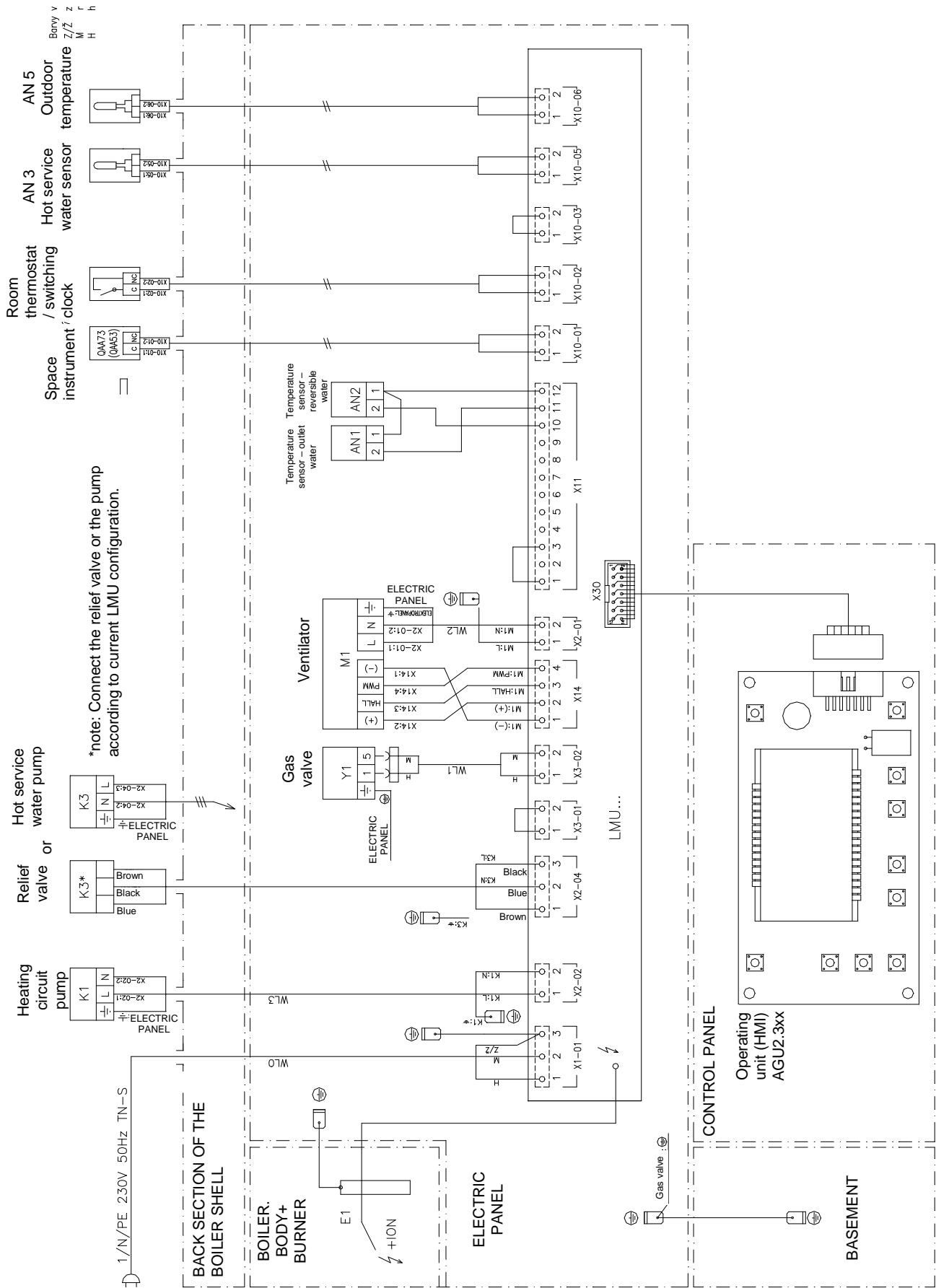


Fig.no. 7 Wiring diagram of VIADRUS CLAUDIUS K 2 L

5. Location and Installation

5.1 Regulations and Directives

a) to the heating system

ČSN 06 0310	Heating systems in buildings – Designing and installation
ČSN 06 0830	Heating systems in buildings – protecting device
ČSN 07 7401	Water and steam for thermal energy equipments with working pressure up to 8 MPa
EN 677	Gas – fired central heating boilers – Specific requirements for condensing boilers with a nominal heat input not exceeding 70 kW

b) to the gas distribution

EN 1775	Gas supply - Gas pipework for buildings - Maximum operating pressure less than or equal to 5 bar - Functional recommendations.
EN 12007-1	Gas supply systems – Pipelines for maximum operating pressure up to and including 16 bar – Part 1: General functional recommendations
EN 12007-2	Gas supply systems – Pipelines for maximum operating pressure up to and including 16 bar – Part 2: Specific functional recommendations for polyethylene (MOP up to and including 10 bar)
EN 12007-3	Gas supply systems – Pipelines for maximum operating pressure up to and including 16 bar – Part 3: Specific functional recommendations for steel
EN 12007-4	Gas supply systems – Pipelines for maximum operating pressure up to and including 16 bar – Part 4: Specific functional recommendations for renovation
ČSN 07 0703	Boiler room with gas fuel –operated equipments
ČSN 38 6405	Gas equipments. Operating principles
Act no. 222/94 Coll.	on the conditions of enterprise and public service performance in power industry sector and on the state energy inspection

c) to the electrical network

ČSN 33 0165	Electrical regulations. Marking the conductors with colours or digits. Implementing regulations.
ČSN 33 1500	Electrical regulations. Electrical equipments revision
ČSN 33 2000-3	Electrical regulations. Electrical equipments Part 3: Setting the basic characteristics.
ČSN 33 2000-4-41	Electric equipments: part 4: Safety chap. 41: Protection against electrical accident.
ČSN 33 2000-5-51 ed. 2	Electrical regulations. Electrical equipments construction.
ČSN 33 2000-7-703 ed.2	Electrical regulations. Electrical equipments, part 7-703: Single-purpose equipments and in special buildings. Rooms and cabins with sauna stoves
ČSN 33 2130	Electrical regulations. Internal wiring.
ČSN 33 2180	Electrical regulations. Connection of electrical devices and appliances.
ČSN 34 0350	Electrical regulations. Regulations for mobile connections and cord extension sets.
EN 60 335-1 ed.2	Household and similar electrical appliances – Safety – Part 1: General requirements.
EN 60 335-2-102	Household and similar electrical appliances – Safety – Part 2-102: Particular requirements for gas, oil and solid-fuel burning appliances having electrical connections.
EN 60445 ed. 3	Basic and safety principles for man – machina interface, marking and identification – Identification of equipment terminals and conductor terminations
EN 60446	Basic and safety principles for man – machina interface, marking and identification – Identification of conductors by colours or numerals

d) to the chimney

ČSN 73 4201	Chimneys and flue gas ducting– designing, implementation and connection of fuel consumers.
TPG 80001	Outfall of smoke outlet from gas fuel- operated appliances on the façade.

e) regarding the fire regulations

ČSN 06 1008	Fire safety of heat installations.
EN 13501-1 + A1	Fire classification of construction products and building elements – Part 1: Classification using test data from reaction to fire tests.
§ 8 and 9 of the Act No. 634/1992 Coll.	Act on consumer protection
§ 8 and 9 of the Act No. 634/1992 Coll.	Act on protection of consumers
§ 18 and 1 9 of the Act No.125 1997 Coll..	Act on wastes

f) to the system of HWS heating

- ČSN 06 0320 Heating systems in buildings – Hot water preparation – Designing and planning
- ČSN 06 0830 Heating systems in buildings – Safety devices.
- ČSN 73 6660 House water plumbing

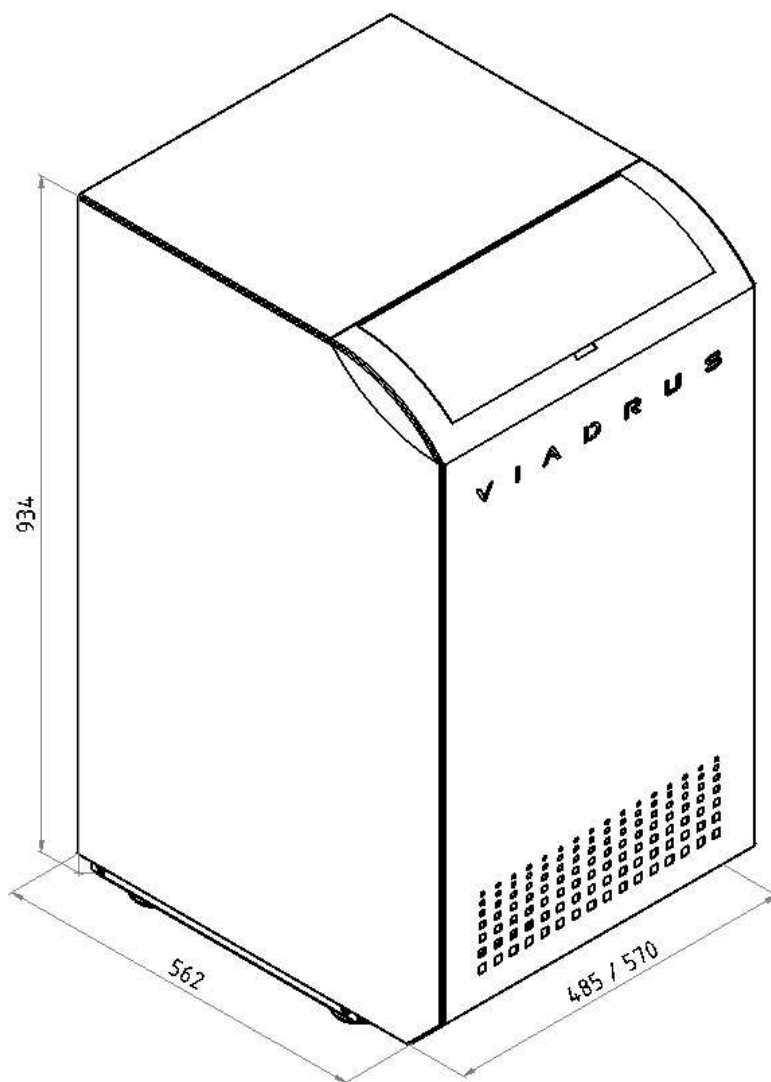
5.2 Potential Location

The installation of the boiler must comply with all requirements of ČSN 06 1008.

The boiler positioning and connection must comply with the project documentation. The flue gas exhaust must comply with the valid regulations (Technical Regulations TP G 800 01) and the project documentation.

Min. 0.2 m must be left beside the boiler and above the boiler and **min. 1 m** in front of the boiler for assembly and repairs. **The manufacturer recommends that these products are placed in closed heating systems.**

The boiler also can be placed in residential rooms. It can be situated in the basic environment according to EN 33 2000 – 3.



Number of sections	2	3	5
L1 (mm)	485	485	570

Fig. No. 8 Main sizes of the boiler VIADRUS CLAUDIUS K 2

The boiler location with respect to the fire regulations:

A safe distance from flammable materials:

- when installing and operating the boiler it is necessary to keep a safety distance of 200 mm from the materials of combustibility grade A1, A2, B and C (D);
- for easily combustible materials of combustibility grade E (F), which quickly burn and burn themselves even after removal of ignition source (such as paper, cardboard, asphalt and tar paper, wood and wood-fiber boards, plastics, floor coverings) the safe distance has to be doubled, i.e. to 400 mm;
- safe distance should be doubled as bulb where the grade of reaction to fire has not been proved.

A safety distance from surfaces of materials with individual degrees of flammability and information of the flammability degree of common building materials; if necessary, at appliances which can be operated in the immediate vicinity of walls made of flammable materials will be defined the maximum permissible temperatures of surface or walls temperature increase according to EN 13501-1.

Tab. no. 3 Grade of reaction to fire

Grade of reaction to fire	Examples of building materials and products included in the reaction to fire (Extract from EN 13 501-1 + A1)
A1 – incombustible	Granite, sandstone, concrete, bricks, ceramic tiles, mortars, fireproof plasters, ...
A2 – combustible with difficulty	acumin, izumin, heraklit, lignos, boards and basalt felt, fibreglass boards,...
B – hardly combustible	Beech and oak wood, hobrex boards, plywood, werzalit, umakart, sirkolit,...
C (D) – medium combustible	Pinewood, larch, whitewood, chipboard and cork boards, rubber flooring,...
E (F) – easily combustible	Asphaltboard, fibreboards, cellulose materials, polyurethane, polystyrene, polyethylene, PVC,...

5.3 Delivery and Accessories

The boiler VIADRUS CLAUDIUS K 2 is supplied as assembled on a pallet, packed in a carton cover and protected with foil.

Standard accessories to any boiler variant:

Boiler operation and installation manual, which includes also a Warranty Certificate

A summary of contractual service organizations

A boiler sensor at VIADRUS CLAUDIUS K 2 LX3 variant

Recommended accessories to any boiler variant:

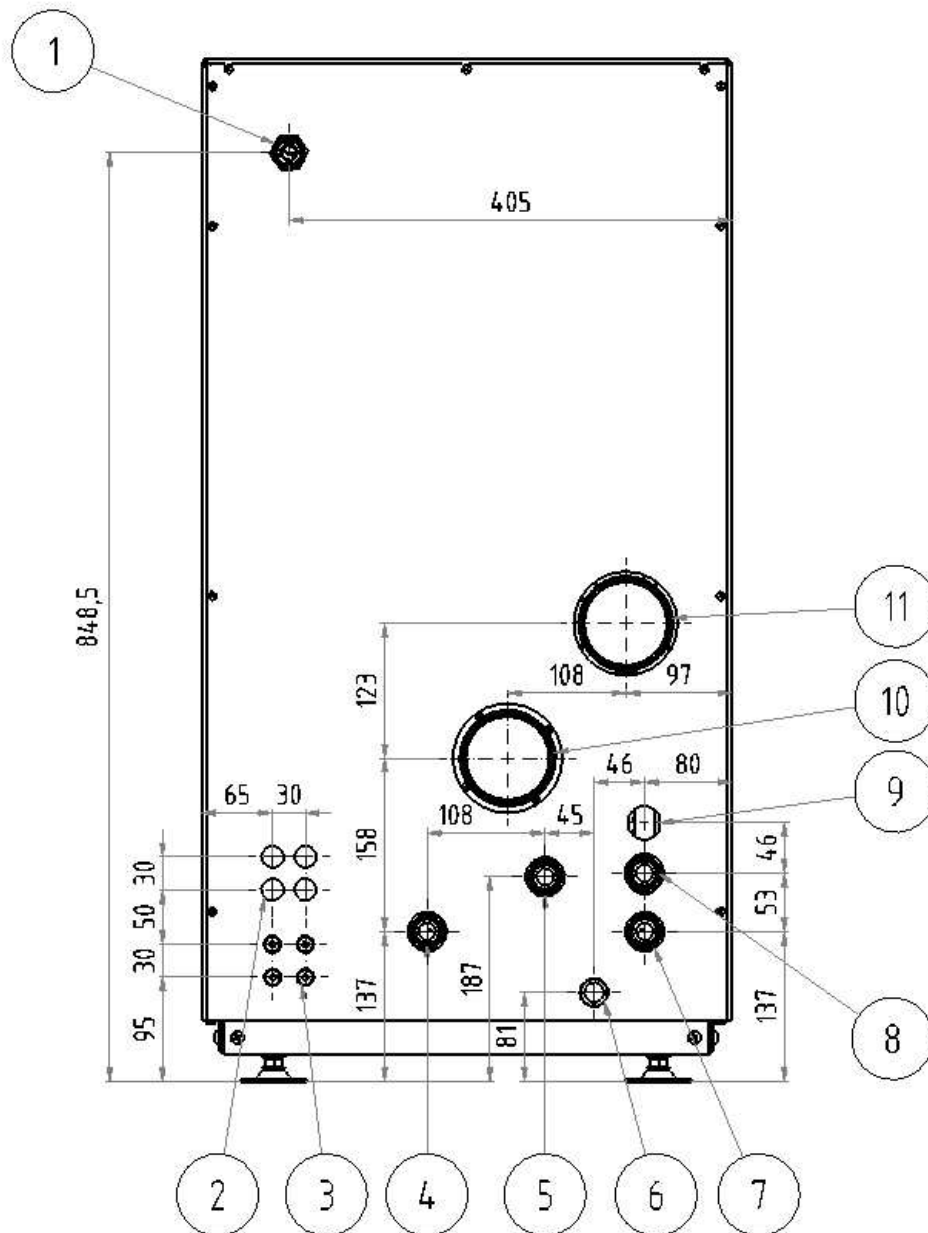
Equithermal regulator QAA73 (Siemens) 1 pc

Outdoor sensor QAC 34/101 1 pc

The recommended accessories is not included in the boiler standard price.

5.4 Boiler Assembly

According to the marked outlets the boiler is connected to the heating system incl. hot service water (if used) and gas distribution according to Fig. no. 9. The connection of condensate outlet should be in compliance with valid ČSN and EN standards. Then the flue gas exhaust is connected according to the project.



- 1 Heating water outlet from the boiler (if there is connected a water heater it is necessary to make an interconnection by means of a T-piece)
- 2 Cable bushings
- 3 Sensor bushings
- 4 Reversible water from CH
- 5 Outlet from safety valve
- 6 Condensate outlet
- 7 Reversible water from water heater
- 8 Gas inlet
- 9 Reversible water (for version without pump and 3-way valve)
- 10 Air inlet (80 mm diameter)
- 11 Flue gas outlet (according to the table)

Fig.no. 9 Rear view of VIADRUS CLAUDIUS K 2 condensation boiler

6. Putting in Operation

6.1 Connection to a Heating System and Water Filling

Prior to water filling in the heating system, the system should be duly cleaned, i.e. it should be at least twice filled with clean water followed by discharge.

Water for filling the boiler and the heating system must be clear and colourless, with no suspended substances, oil or chemically aggressive substances. The heating system must be filled with water, that meets the ČSN 07 7401 requirements, especially its hardness must not exceed the required parameters.

The parameters of circulating and refilling water must correspond to:

The highest permissible heating water values according to ČSN 07 7401

Hardness	(mmol/l)	1
Ca ²⁺	(mmol/l)	0,3
Concentration of total Fe + Mn	(mg/l)	(0,3)*

*a recommended value

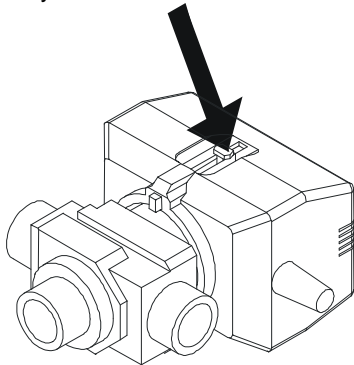
WARNING!!! The use of anti-freeze mixture is not recommended by the manufacturer.

In case the water hardness does not suit it must be treated. Several times reheated water with a higher hardness does not prevent the soils from precipitation on the walls of the boiler body. The precipitation of limestone decreases the heat transfer from metal to water at the particular point by 10 %.

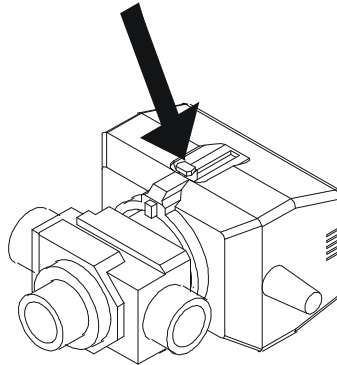
During the heating season it is necessary to keep a constant volume of heating water in the heating system and be particular about bleeding the heating system. The water from boiler and heating system must never be discharged or taken for some other use except the cases of emergency like the repairs etc. By discharging the heating water and filling new water there is increased the danger of corrosion and scaling. If it is necessary to **refill water in heating system then we only refill the cooled down boiler** to avoid the sections disruption.

Before filling the system with water you must reset the lever for operating the three-way valve into an intermediate position by means of a screwdriver or your hand by pulling it slightly to you and downwards (if the boiler is with the possibility of hot service water preparation) Fig. no. 10. After filling the heating system you must dismantle the water valve drive by pushing the metal push button and turning it to the right. After you have put back the water valve drive the lever comes back to the position of heating the heating system.

Lever shifted in the intermediate position when filling the heating system and the water heater



Lever in the position of heating HWS



Lever in the position of heating the heating system

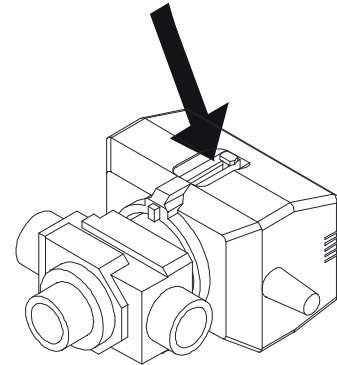


Fig. no. 10 Three-way valve VC 4013

When filling the boiler with water the system must be disconnected from the el. network. An air-relief valve on the heating system should be open and functional. The pressure in the expansion reservoir should be set to pressure by 100 mbar higher than the pressure required in the heating system (only in case of VIADRUS CLAUDIUS K 2 LX1, VIADRUS CLAUDIUS K 2 LX3 2 section and 3 section versions). The system is pressurized to the required approx. 1 bar and de-aerated again. When filling the water a filter is recommended to be used in the heating system.

The heating system must be equipped with a sufficient number of vents. A drain valve must be installed at the lowest point of a heating system.

The expansion tank volume is 8 liter and it is not mounted at VIADRUS CLAUDIUS K 2 LX5 and VIADRUS CLAUDIUS K 2 L5X versions. This volume is sufficient for approx. 150 l of water in the heating system.

The system should be designed for a temperature gradient of 55/45°C with respect to use of condensation. A condensation boiler can be used also for old self-load systems which used to be over-designed and thanks to it there is possible to use efficiently the condensation also at this system, but the system must be supplemented with a corresponding expansion tank.

The condensation boiler is equipped with a three-speed Grundfos UPS 15 – 60- 130 type pump. The pump speed setting must meet the requirements of the heating system so that the hydraulic system is balanced. The connection to the heating system, hot service water and gas will be carried out through the ball valves.

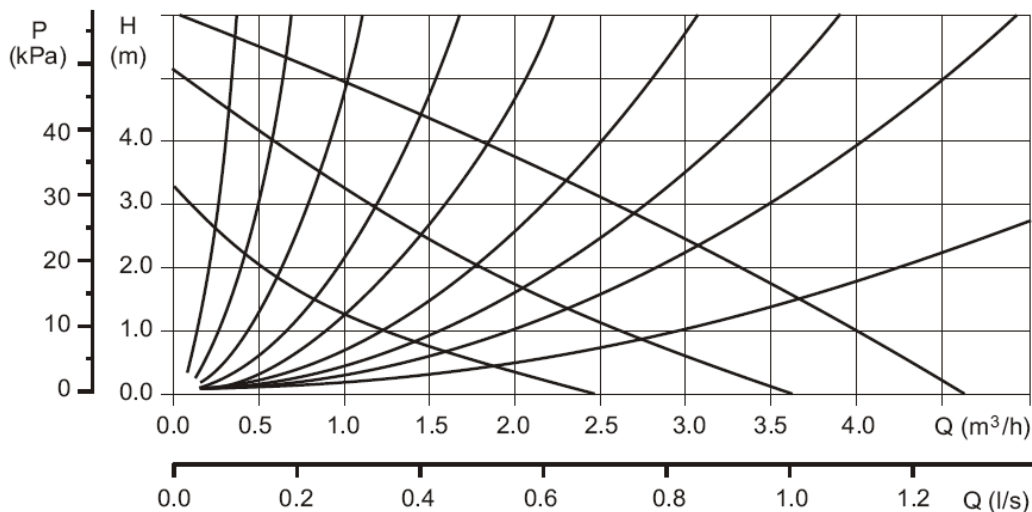


Fig. No. 11 Characteristics of the UPS 15-60-130 pump

6.2 Gas Connection

Prior to a gas pipeline connection to the boiler the gas pipeline must be tested and revised. After connection to the boiler all gas connections must be retested by a means of a detector or a foam solution. The input pressure of natural gas is 20 mbar.

6.3 Connection to the Electric Power Supply Network

The boiler is equipped with a movable mains supply and a plug. The boiler must be according to EN 60 335 – 1 ed. 2 Art. 7.12.4 positioned in a way making sure that the plug is accessible. A 230 V/50 Hz socket should be situated beside the boiler within the distance of 1.5 m. The socket must correspond to the valid regulations and it must be revised.

6.4 Condensate Discharge

A built-in siphon (trap) serves for condensate outlet. It must be connected to a sewerage overflow. Prior to putting the boiler into operation, it is necessary to check whether the condensate is being drained. The size of a PVC waste pipe is \varnothing 16mm.

This condensate pH is 4.5 and it can be drained into the sewerage system without any subsequent treatment. The boiler condensate outlet must be carried in the way of making sure it does not prevent the condensate from a fluent outlet.

6.5 Flue Gas Ducting

The boiler according to the way of flue gases removal and combustion air inlet is in version B. It means an open appliance that withdraws the combustion air from the space in which it is positioned and from which the flue gases are removed into the outside space via a chimney or just via a smoke-flue.

The boiler is supplied in a standard version. The boiler flue gas exhaust is not a part of the boiler supply. It is necessary to use only a special pipeline intended for a condensation boiler with the wall thickness of 1.5 mm. It is necessary to keep a 3 % inclination to the boiler. The pressure loss for the flue gas exhaust must not exceed **150 Pa**.

The flue gas exhaust and the air inlet including their lengths will be designed by a designer in the technical documentation.

The boiler must only be installed together with a wind protective device which meets the requirements of EN 1856-1 (See Annex N).

The boiler must be installed including the necessary accessories (pipeline for the combustion air supply and flue gas exhaust).

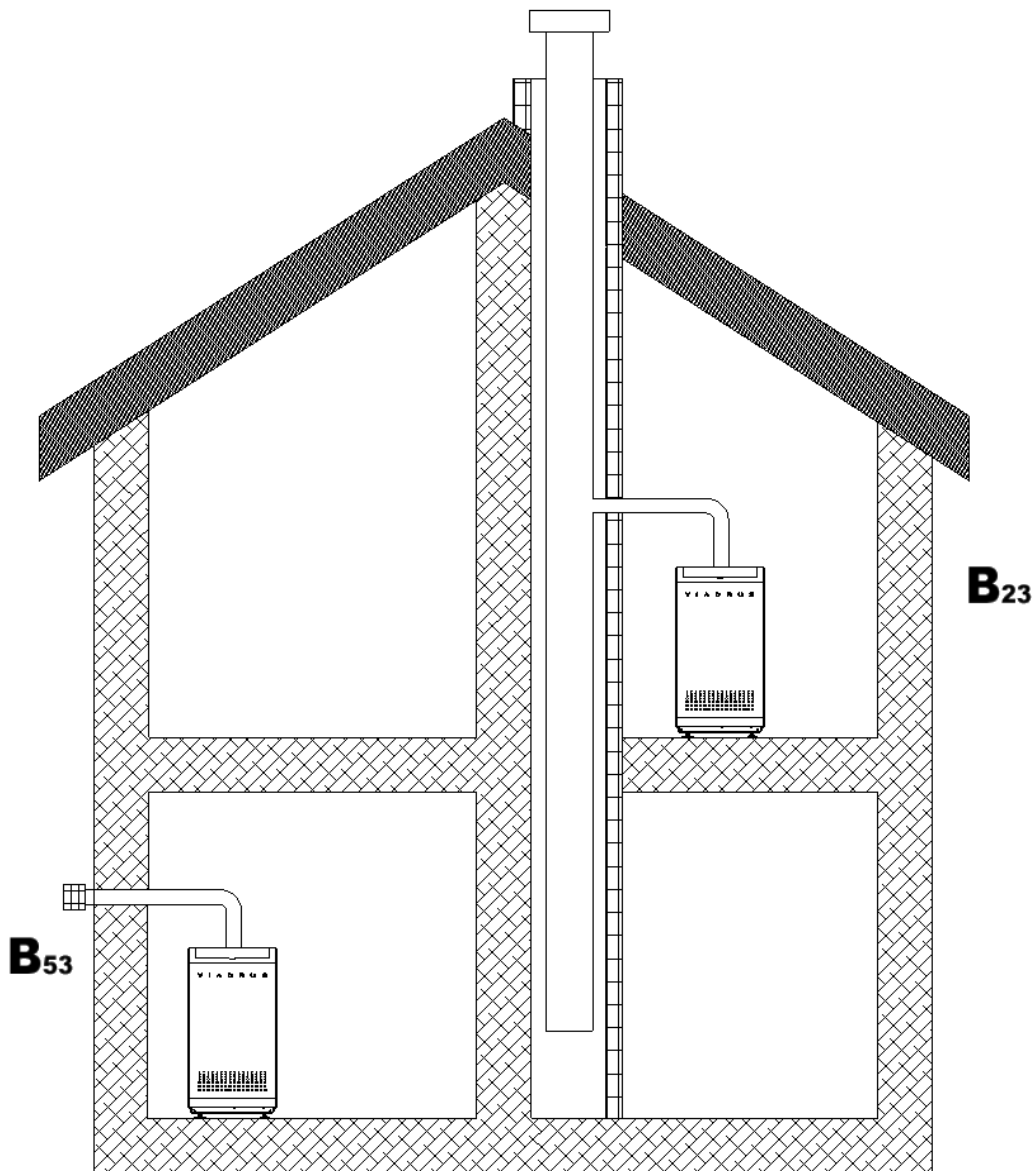


Fig. no. 12 The possibilities to connect the flue gases removal and the air inlet

The boiler in version B is specified by a double figure:

- The first figure in the index relates to the possible boiler installation with regard to the way of combustion air inlet and flue gases removal
- The second figure in the index relates to the use and positioning of the built-in ventilator in the boiler. VIADRUS CLAUDIUS K 2 is a boiler with a ventilator before the combustion chamber/heat exchanger (boiler body) and is marked with „3“, the second figure of index.

B2 Type

Boiler in version **B** without the flue gas rectifier.

B5 Type

Boiler version **B** without the flue gas rectifier designed to be connected by means of its own flue gas ducting to the protection outfall.

The chimney must be equipped with a special lining designed for the condensation boiler and a condensate outlet from the chimney.

To VIADRUS CLAUDIUS K 2 boiler it is possible to use a plastic lining with temperature resistance 120 °C.



Fig.no.13 90° elbow Ø 80 mm (Ø □100 mm)
Pressure loss: 14 Pa



Fig.no.14 Separate extension pipe horizontal Ø 80 mm (Ø □100 mm),
pressure loss: 3 Pa



Fig.no.15 Pipe for flue gas exhaust or the air inlet with an outfall through a wall Ø 80 mm (Ø □100 mm), pressure loss: 10 Pa



Fig.no.16 Flange Ø 80 mm,
pressure loss: 1,5 Pa

If we use a flange for the air inlet according to Fig. no. 16, we must remove the break-out plate in the rear boiler shell.

For VIADRUS CLAUDIUS K 2 L5X version there is the 100 mm diameter flue gas exhaust. The air inlet is left with 80 mm diameter

The boiler is intended to be connected to an individually approved and marketed system of pipeline for combustion air supply and flue gas exhaust.

- The minimum pressure loss = 17 Pa
- The maximum pressure loss = 150Pa
- Flue gas temperature for minimum output 30°C
- Flue gas temperature for maximum output 85°C

The individual types of combustion air inlet and flue gases removal:

Version B₂

Component title	Fig. no.	Minimum amount
90° elbow Ø 80 mm (Ø 100 mm)	13	2
Separate extension tube horizontal Ø 80 mm (Ø 100 mm)	14	2

Version B₅

Component title	Fig. no.	Minimum amount
90° elbow Ø 80 mm (Ø 100 mm)	13	2
Separate extension tube horizontal Ø 80 mm (Ø 100 mm)	14	1
Pipe for flue gases removal or air inlet with an outfall through the wall Ø 80 mm (Ø 100 mm)	15	1

The combustion air inlet to the boiler can be resolved by a separate piping that can be made of following components:

Component title	Fig. no.	Minimum amount
Flange Ø 80 mm	16	1
Separate extension tube horizontal Ø 80 mm	14	1
90° elbow Ø 80 mm	13	1
Pipe for flue gases removal or air inlet with outfall through the wall Ø 80 mm	15	1

Note: The number of components for individual versions depends on the boilers position.

6.6 Putting the Boiler in Operation

The whole installation must be in compliance with the regulations related to this equipment. The boiler must be compatible with the local wiring conditions (check boiler parameters for their compliance with data on production label). **Only the organizations authorized and trained by manufacturer are allowed to put the boiler into operation.** The minimum pressure in the heating system is 0,8 bar. It is necessary to open all closures and check whether gas does not leak. Wire the boiler into the electric power supply network. Since the boiler is not equipped with a main switch, the boiler operation will start. Check the gas distribution behind the gas valve. Check the functionality of the safety valve. Then it is necessary to check the pump operation. Check the 3-way valve functionality (if it is used). In the course of the boiler operation it is necessary to check the condensate outlet both from the boiler and alternatively from the chimney lining.

When the boiler is put into operation for the first time it is necessary to train the user in accordance with this manual and hand it over to the user together with a certificate of putting the boiler in operation.

Then it is necessary

- Revision prior to putting in operation
- Check of water leakage tightness
- Check of control and safety elements

6.7 VIADRUS CLAUDIUS K 2 boiler adjustment

Emission figures of the boilers VIADRUS CLAUDIUS K 2:

- CO₂ – minimum boiler output 8,3 – 8,6 %,
- nominal boiler output 8,7 – 9,5 %,

The product meets the values for „Green product “. Note. The concrete measured values depend on the type of connection of the combustion air and flue gases removal to a given appliance.

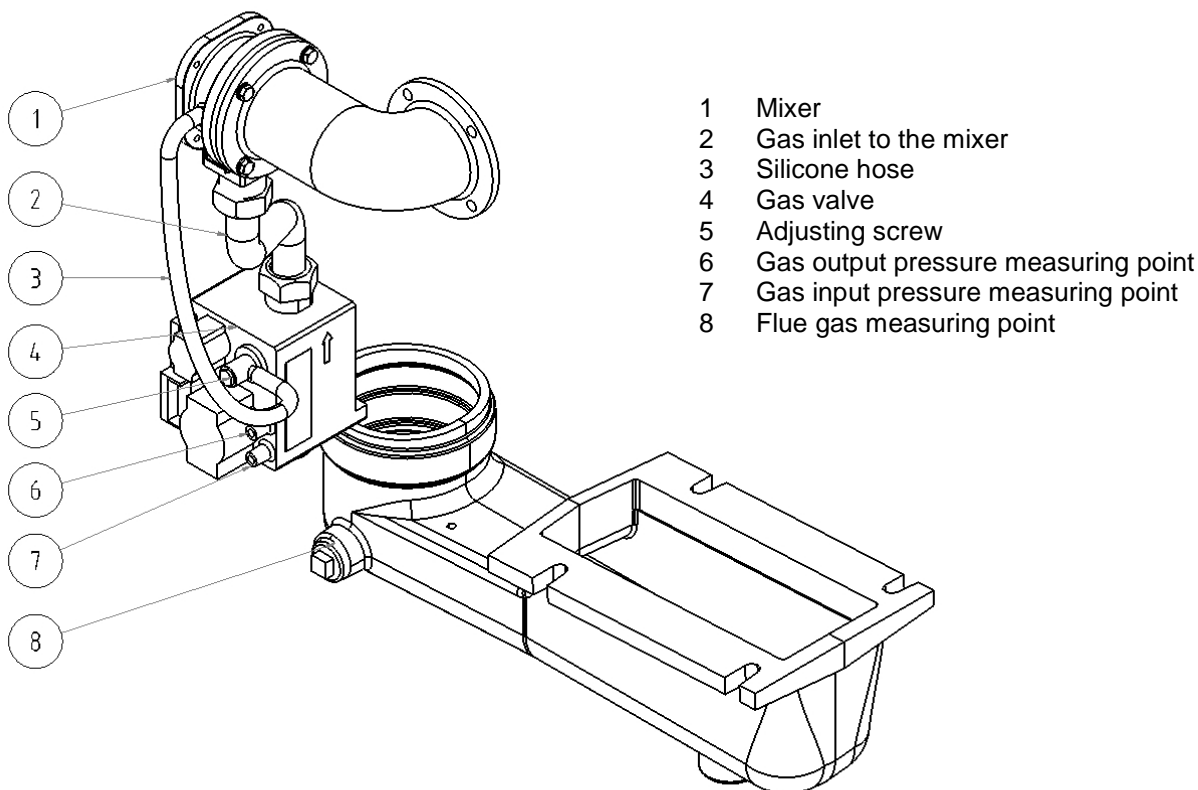


Fig.no.17 Setting of VIADRUS CLAUDIUS K 2 L

- 1) Push simultaneously the push buttons T4 and T5 for approx. 6 s. On the service unit there appears the value 100 %. If the boiler does not work the ignition is carried out at the same time.
- 2) Push the button T6. On the service unit there appears the value 0 %. The burner modulates to the minimum output.
- 3) Screw off the plug and insert the flue gas analyse probe into the flue gas measuring point.
- 4) Check the volume of CO₂ in flue gas, it must be within 8,3 – 8,6 %.
- 5) If the CO₂ value is outside the above range, screw off the cover of the adjusting screw on the gas valve and set it to the correct CO₂ value. (By turning the adjusting screw clockwise the CO₂ volume increases, by turning the adjusting screw counter-clockwise the CO₂ volume decreases.)

- 6) Push the button T7. The burner modulates to the rated output.
- 7) Wait for approx. 30 s and push the button T6. The burner again modulates to the rated output.
- 8) Wait for approx. 120 s till the boiler operation gets stabilised and check again the volume of CO₂ in the flue gas. Or re-adjust CO₂. If CO₂ volume is between 8,3 – 8,6 %, push button T3 and boiler comes back into the automatic regime.
- 9) Screw up the cover of the gas valve adjusting screw, remove the probe of the flue gases analyser and screw up the plug into flue gas measuring point (watch its tightness).













Note: CO₂ value isn't set at the rated output, because it is given by the screening at the gas valve output. The screening diameter differs according to the boiler output.

7. Boiler Attendance

7.1 Boiler operation – operating unit

Chyba! Objekty nemohou být vytvořeny úpravami kódů polí.
Fig. no. 18 VIADRUS CLAUDIUS K 2 L boiler operating unit

Operation description:

<i>Name of the button</i>	<i>Depiction</i>	<i>Meaning</i>
Button Reset T1		Reset
Button of the kind of operation hot service water T2		hot service water ZAP/VYP
Button of the kind of heating T3		Switching the kind of operation to:
		Automatic operation
		Rated permanent operation
		Damped permanent operation
Button of the required temperature for T4 heating circuit		Setting of the required boiler or space temperature
Button of the required temperature hot service water T5		Setting of required hot service water temperature
Button of line choice T6 (downwards) and T7 (upwards)		Choice of servicing lines
Buttons for setting T8/T9		Parameters reset
Info T10 button		Change in Info display
Chimney-sweeper		Chimney-sweeper function/switching off the regulator (both button pushed)

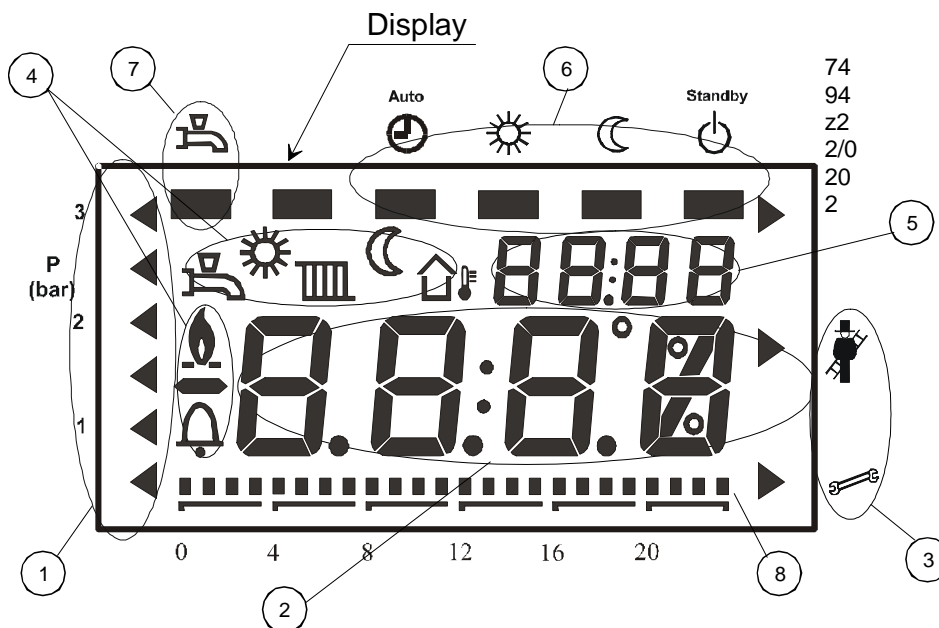


Fig. no. 19 Functions display

Number	Depiction	Function
1	Water pressure sensor signal It will be not activated, the pressure is displayed on the manometer	Water pressure display (6 indicators) in 0,5 bar steps
2	Numeric display (big)	Current value display
3	Service	Function display: Chimney-sweeper active
		Regulator switch off active
4	Display symbols	Symbols meaning:
		Display of hot service water temperature or hot service water operation active
		Display of boiler required temperature, space or operation heating active
		Outdoor temperature display
		Rated operation level
		Damped operation level
		Flame display
Breakdown display		
5	Display (small)	Display of time, parameterisation or a breakdown code
6	Kind of heating circuit operation	Kind of operation or changed for Automatic operation
		Rated permanent operation
		Damped permanent operation
		Standby
7	Kind of hot service water operation	Charging hot service water ZAP (ON) or VYP (OFF)
8	Time commas	Display of time switching programme of the heating circuit

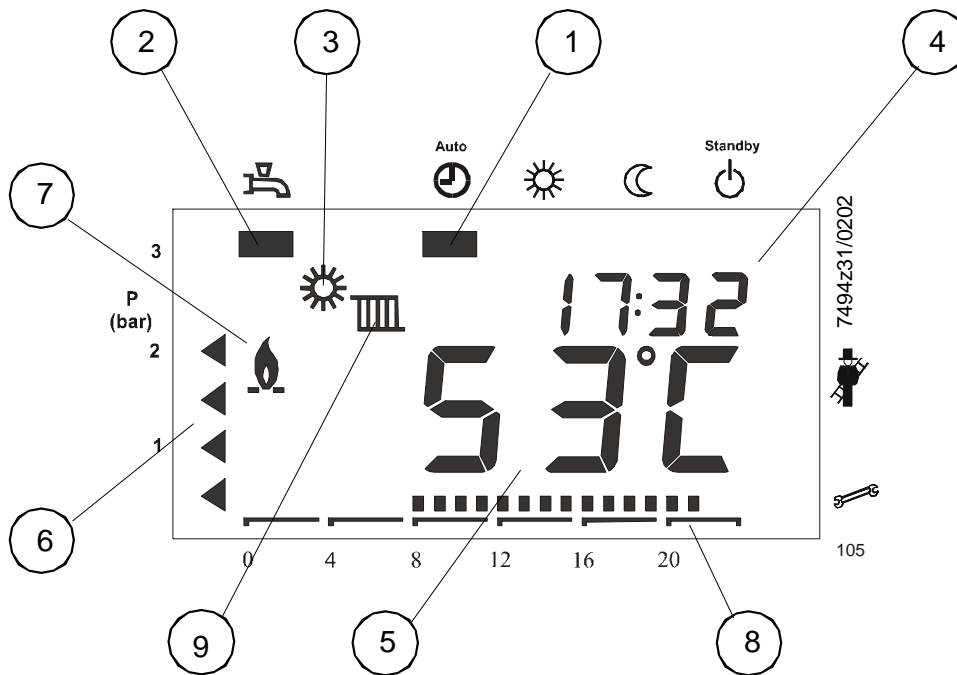


Fig. no. 20 Example of a standard display

1. kind of operation for heating circuit (*automatic regime in the example*)
2. kind of operation for hot service water (hot service water switched on in the example)
- 3 **level of heating circuit operation (*the boiler is heating to the required daily rated output in the example*)**
- 4 time (*the current time is in the example*)
- 5 the actual boiler outlet temperature (*53 °C in the example*)
- 6 water pressure (*2 bar in the example*) – in our case it will not be used, the boiler pressure is displayed on the manometer
- 7 the flame condition
- 8 time flow of the set program
- 9 kind of boiler operation (*the heating circuit in the example*)

If there is not pushed any button for 8 minutes, the operation unit automatically returns to the standard display.

Button INFO T10

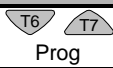

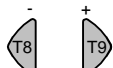
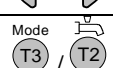
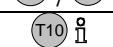
This button serves for inducing various information:

By pushing the Info button the Info level can be changed

Button T10	Meaning
	hot service water temperature
	Water pressure
X.	Operation phase
	Outdoor temperature
Ex	Albatros breakdown code
	Boiler temperature
	For return to the standard display push one of these buttons.


7.2 Setting of parameters

Setting for individual needs of the final user:

Button	Procedure
 Prog	Push one of these buttons for the line choice. So you get directly to the level of «Final user » programming
 Prog	By means of buttons you select the required line. «Pxxx» is displayed on display (1).
	Set the required value by means of this button. Setting is saved as soon as move on some other line (when resetting individual bits the parameters must be changed). The possible settings are shown in the following list of parameters.
	By pushing this button you leave the programming level. The changed values will be saved depending on setting the LMU64 parameters.
	By pushing the Info button you leave the programming level. The changed values will be saved.

- The display automatically returns to the standard display if any button isn't pushed for longer than 8 minutes. The changes will not be saved.
- After a change to another level the changed values are saved.

Setting of final user's parameters:

Line	Function	Range	Basic value
Time			
1	Time	0...23:59	---
2	Actual day in a week (1 = Monday)	1 - 7	---
Required values			
5	Damped required temperature of the space «TrSollMmiRed» or Damped required temperature of the boiler «TvSollMmiRed» (Line 5 is suppressed when using the additional space instrument)	TrSmin ... TrSollMmi TkSmin ... TvSollMmi	16.0
Time program of switching the heating circuit 1			
10	Setting of weekly Heating circuit 1 programming (0; 1-7; 1-5; 6-7)	0 ... 9	
11	Time program of heating circuit 1 switching, switching time 1 st phase	00:00...24:00	06:00
12	Time program of heating circuit 1 switching, switching time 1 st phase	00:00...24:00	22:00
13	Time program of heating circuit 1 switching, switching time 2 nd phase	00:00...24:00	--:--
14	Time program of heating circuit 1 switching, switching time 2 nd phase	00:00...24:00	--:--
15	Time program of heating circuit 1 switching, switching time 3 rd phase	00:00...24:00	--:--
16	Time program of heating circuit 1 switching, switching time 3 rd phase	00:00...24:00	--:--
Time program of switching the heating circuit 2			
20	Setting of weekly Heating circuit 2 programming (0; 1-7; 1-5; 6-7)	0 ... 9	
21	Time program of heating circuit 2 switching, switching time 1 st phase	00:00...24:00	06:00
22	Time program of heating circuit 2 switching, switching time 1 st phase	00:00...24:00	22:00
23	Time program of heating circuit 2 switching, switching time 2 nd phase	00:00...24:00	--:--
24	Time program of heating circuit 2 switching, switching time 2 nd phase	00:00...24:00	--:--
25	Time program of heating circuit 2 switching, switching time 3 rd phase	00:00...24:00	--:--
26	Time program of heating circuit 2 switching, switching time 3 rd phase	00:00...24:00	--:--
Time program of switching hot service water			
30	Setting of weekly hot service water programming (0; 1-7; 1-5; 6-7)	0 ... 9	
31	Time program of hot service water switching, time of switching phase 1	00:00...24:00	06:00
32	Time program of hot service water switching, time of switching phase 1	00:00...24:00	22:00
33	Time program of hot service water switching, time of switching phase 2	00:00...24:00	--:--
34	Time program of hot service water switching, time of switching phase 2	00:00...24:00	--:--
35	Time program of hot service water switching, time of switching phase 3	00:00...24:00	--:--
36	Time program of hot service water switching, time of switching phase 3	00:00...24:00	--:--
45	Standard time programs for heating circuit 1, heating circuit 2 and hot service water (simultaneous pushing  for 3 s)	No / yes	No

Note: These parameters can also be set from the equithermal regulator QAA 73.

7.3 Breakdown display

In case of an unchanged blocking of LMU64... display of a breakdown is permanent. Additionally there is displayed a blinking diagnose code. The unblocking button serves for the raising the blockade. (> 2 s).

Breakdown code (displayed on display) (Info A0 level)	Possible reason	Removal of fault
0	No record in Albatros code	Call the service organisation
10	Outdoor sensor fault	Call the service organisation
20	Boiler 1 sensor fault	Call the service organisation
28	Flue gases sensor fault	Call the service organisation
32	Sensor 2 start fault	Call the service organisation
40	Sensor reverse 1 fault	Call the service organisation
50	hot service water 1 sensor fault	Call the service organisation
52	hot service water 2 sensor fault	Call the service organisation
61	Space instrument 1 fault	Call the service organisation
62	The incorrect space instrument 1 or radio clock connected	Call the service organisation
73	Collector 1 temperature sensor fault	Call the service organisation
81	Short circuit at LPB or Bus without supply	Call the service organisation
91	Data loss in EEPROM	Call the service organisation
92	Hardware electronics fault	Call the service organisation
95	Invalid time	Set the required time
100	2 time masters	Call the service organisation
105	Maintenance report	Call the service organisation
110	STB released	Call the service organisation
111	Temperature watcher released	Call the service organisation
113	Equipment for flue gases check released	Call the service organisation
117	Water pressure too high	Discharge water from the system *
118	Water pressure too low	Replenish water to the system *
119	Pressure switch released	Call the service organisation
128	Flame failure in operation	Call the service organisation
129	Wrong air supply	Call the service organisation
130	Limit flue gases temperature exceeded	Call the service organisation
132	Safety switch off (like through the gas pressure switch)	Call the service organisation
133	Without flame formation after the safety time has passed	Reset *
134	Flame failure in operation	Reset *
135	Wrong air supply	Call the service organisation
140	Inadmissible number of segment or LPB instrument	Call the service organisation
148	Incompatible interface/ LPB basic instrument	Call the service organisation
151	LMU64 internal failure..	Call the service organisation
152	Failure at setting LMU64 parameters	Call the service organisation
153	The instrument is blocked	Call the service organisation
154	The plausibility criterion disturbed	Call the service organisation
160	The ventilator rotations limit isn't achieved	Call the service organisation
161	Maximal ventilator rotations exceeded	Call the service organisation
162	Air pressure watcher breakdown(it does no close)	Call the service organisation
164	Breakdown of a Flow Switch / heating circuit pressure watcher	Call the service organisation
166	Air pressure watcher breakdown(it does no close)	Call the service organisation
180	Chimney-sweeper function is active	Annul the chimney-sweeper function
181	Regulator switch off function is active	Regulator switch off function annulment
182	Calibration at burning optimisation is active	Burning calibration annulment
183	The instrument is in the parameters setting regime	Parameters setting annulment ù
184	Modem function is active	Call the service organisation
185	Drying the floor function is active í	Call the service organisation

I case ob blocking the ignition automatics the adequate code appears on the service display and is blinking (flashing)

*** in case of a repeated breakdown after pushing button RESET Call the service organisation**

7.4 Service setting

A service manual was produced for service setting

8. Hydraulic diagrams

Basic diagram of burner automatics application LMU 64:

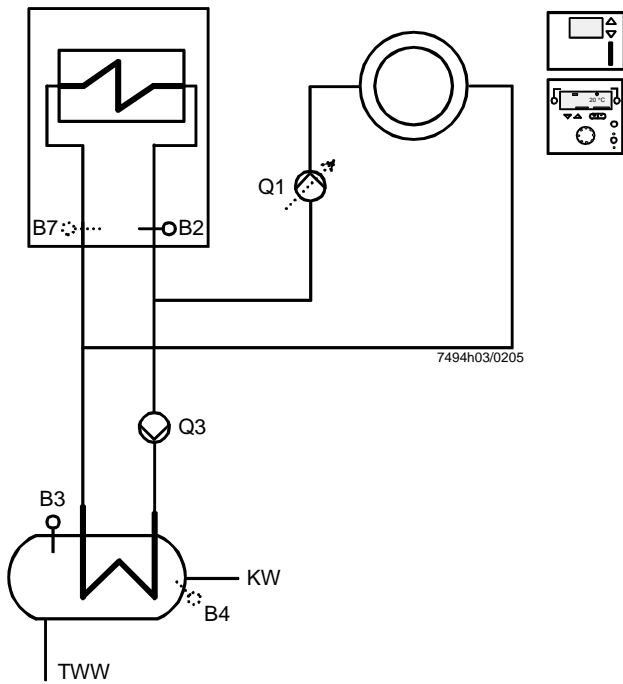


Fig. no. 21 Reservoir system with a pumping circuit (note in automatics LMU 64 hydraulic diagram no. 02)

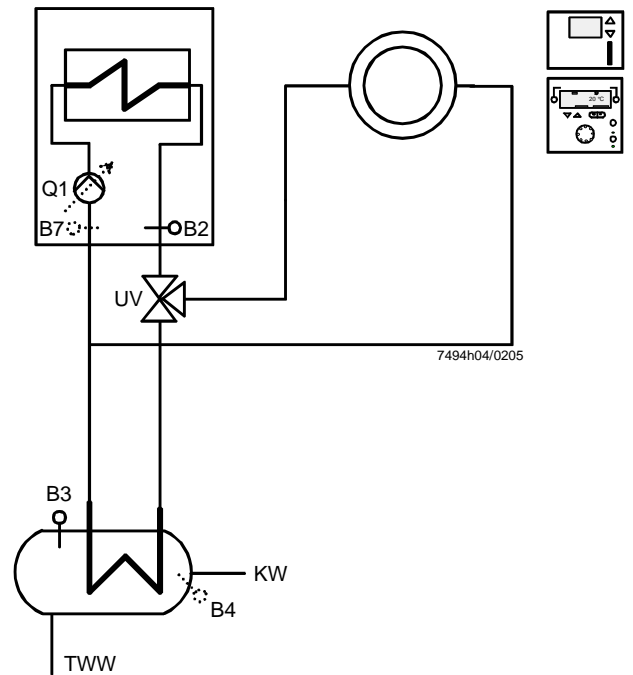


Fig. no. 22 Reservoir systems with a relief valve and pumping circuit (note in automatics LMU 64 hydraulic diagram no. 03)

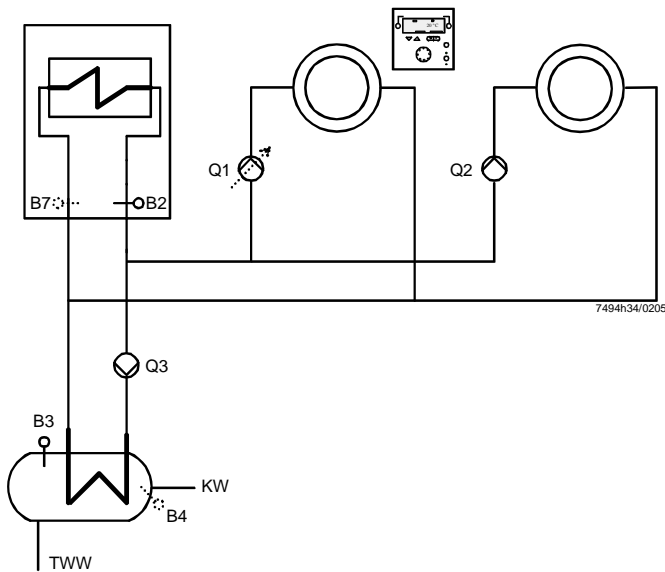


Fig. no. 23 Reservoir system with two pumping circuits (note in automatics LMU 64 hydraulic diagram no. 34)

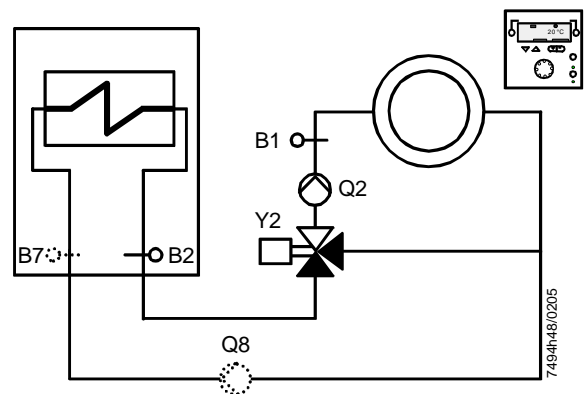


Fig. no. 24 Mixing circuit (note in automatics LMU 64 hydraulic diagram no. 49)

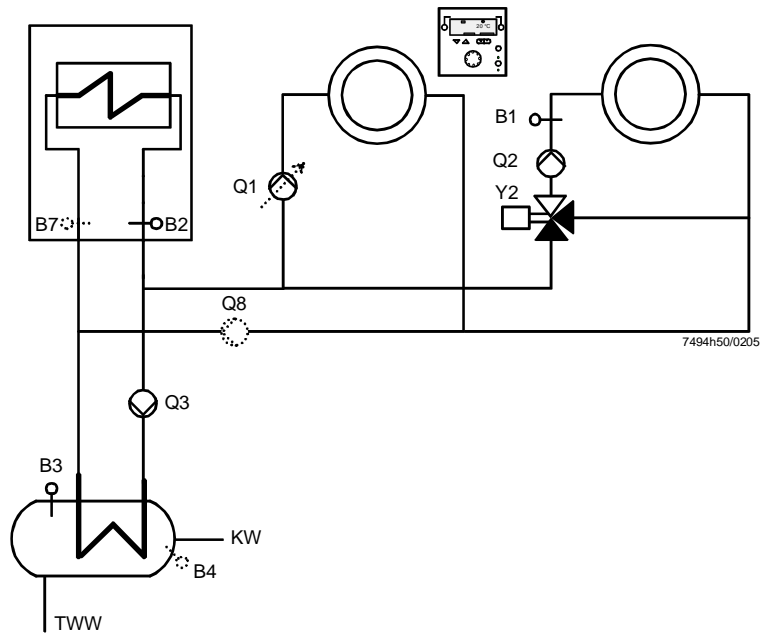


Fig. no. 25 Reservoir system with pumping heating circuit and mixing heating circuit
(note in automatics LMU 64 hydraulic diagram no. 50)

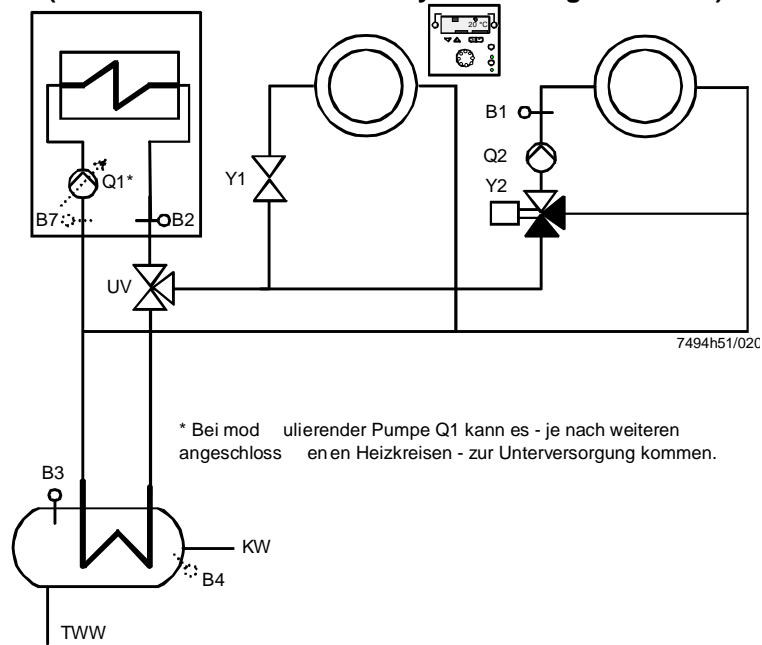


Fig. no. 26 Reservoir system with a relief valve, pumping circuit and mixing circuit
(note in automatics LMU 64 hydraulic diagram no. 51)

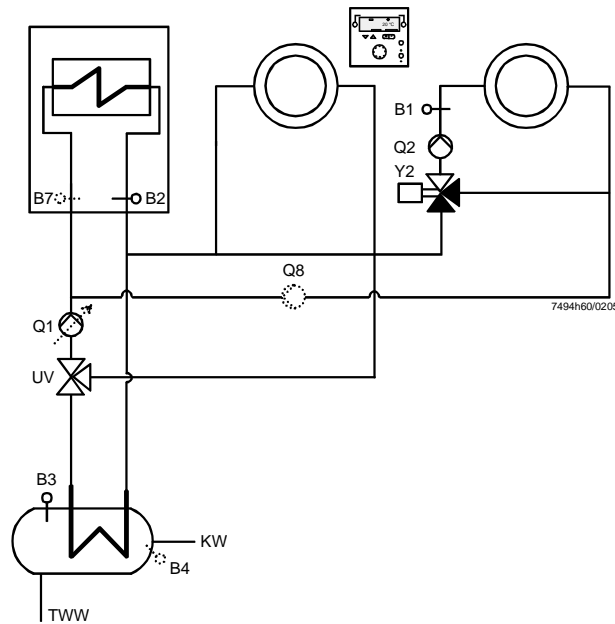


Fig. no. 27 Reservoir systems with a relief valve, pumping circuit and mixing circuit with a supply pump (note in automatics LMU 64 hydraulic diagram no. 60)

Description:

B1	Start sensor		Space thermostat e.g. REV...
B2	Boiler start sensor		
B3	Sensor TUV (HWS) 1		
B4	Sensor TUV (HWS) 2		Space regulator e.g. QAA73...
B6	Sensor of collector		
B7	Sensor of boiler reverse		
B8	Sensor of flue gases		Space instrument (QAA70...)
B9	Outdoor sensor		
	Pump PWM, obligatory		Regulator of heating (RVA...)
	Pump PWM, optional		
	Step pump, single-stage (without PWM pump)		
	Supply pump, optional (can be positioned in various positions in the hydraulic diagrams according to the parameters setting and application)		

In the hydraulic diagrams according to Fig. no. 23 – 27 it is necessary to use Clip In AGU 2.500.

9. Maintenance

A boiler jacket can be washed by a moderately warm soap solution.

! Any other maintenance may only be made by a contractual service organization trained by the manufacturer !

9.1 Facility Inspection

1. Disconnect boiler by pulling out the cord from the el. socket. Close the gas supply and remove the front cover of boiler.
2. Disconnect the ventilator connections.
3. Disconnect the gas supply to the mixer.
4. Disconnect the silicone hose from mixer.
5. Disconnect the earth wire of the electrode.
6. Remove the burner plate together with ventilator (screw off 4 nuts M6).
7. By using the steel brush clean the burner and blow through with air. Clean the possible impurities in the ignition electrode by means of the sandpaper.
8. Check the mixer visually.
9. The body must be cleaned by applying one of the following methods.
 - a) Spray the Metanotherm preparative through the burner chamber on the body convection surface.
 - b) Pour the diluted detergent solution through the burner chamber and let it work for 10 minutes and then clean with clean water. Possible impurities will flow out through the trap.
10. Mount the burner plate by means of four nuts and washers M6, connect the ventilator connectors according to the wiring diagram. Then connect:
 - silicone hose to the mixer,
 - gas inlet to the mixer,
 - earth wire to the ignition electrode.

When mounting various parts it necessary to be particular about mounting them in proper sequence and direction. All seals that are removed at the mounting must be checked and exchanged if necessary.

11. Open the gas inlet by means of the ball valve.
12. Check all el. parts that had to be disconnected, whether they are connected to the proper points according to the wiring scheme and connect the supply cord to the el. network too.
13. Find out possible gas leakage by means of a detector or a foam solution.
14. It is necessary to check whether the burner plate is tight enough and is tightened (by means of a gas detector).
15. Check the pressure in the heating system by means of a manometer on the boiler and check the safety valve functionality. If we discover a pressure drop in the system we must refill water in central heating system up to the required min. 0,8 bar value.
16. Put on the front cover
17. Check the boiler setting according to chap. no. 6.7. and check the output according to the consumption read on the gas meter.

10. IMPORTANT CAUTIONS

- The boiler only can be used for the purpose that it is destined for.
- For boiler installation, setting and putting it into operation there must be called a service organization trained by the manufacturer.
- Only the adult persons are allowed to operate the boiler in compliance with this manual.
- The boiler is not destined for the use by persons (incl. children) whose physical, sensual or mental disability or lack of experience and knowledge prevent them from a safe use of the appliance unless they are supervised or if they were not instructed on the use of appliance by a person responsible for their safety.
- Children should be supervised in order to ensure that they do not play with the appliance.
- The boiler is fully automatic therefore its disconnection from electricity is not recommended.
- The boiler is equipped with automatic anti-freezing protection (if the electricity is supplied).
- It is forbidden to intervene in any not secured parts.
- No flammable objects must be placed, built or suspended near the boiler and flue gas ducting. (A safety distance of an appliance from flammable materials in the main radiation direction is 50 mm, in other directions 10 mm).
- Keep a safety distance of the boiler and flue gas ducting from flammable materials.
- If any building reconstructions are made in the boiler surroundings, switch off the boiler in time and protect it from pollution.
- If any adaptations run in the boiler surroundings (works with paints, glues, and so on), switch off the boiler in time and protect it from pollution.
- Avoid cleaning of a boiler by flammable or explosive agents.
- In winter (if leaving for a holiday, for instance) it is necessary to arrange the necessary control of functionality of the boiler and whole heating system to avoid possible water freezing thus also equipment damage due to some external reasons (such as electricity or heating gas supply outage, and so on).
- Due to a long-term electricity outage in the heating season it is necessary to add an anti-freeze mixture to the system; this mixture must be approved by the manufacturer for this type of boilers or the system must be emptied in order to prevent the heating system and the boiler from freeze.
- In case of boilers with flue gas exhaust into the surroundings through an external building wall it is necessary to check whether the condensed water from flue gas in the exhaust basket does not freeze in a frosty weather.
- The boiler is supplied with electricity of 230 V.
- In case of a fire extinguish the boilers as an electric equipment.
- Pay attention to any gas leakage. (In case of any suspicion of gas leakage, shut off the gas intake, ventilate - call a service firm). The gas cock under the boiler must be always accessible.
- It is necessary to avoid combustion air pollution with halogen hydrocarbons (contained, for example, in sprays, solvents, paints, glues) and dust.
- During assembly, installation and operation of the appliance it is necessary to comply with standards that apply in the relevant country of destination.

If you fail to meet these conditions you cannot requisite the guarantee repairs.

11. Instructions to Product Disposal After Its Service Life

VIADRUS a.s. is a contractual partner of the firm EKO–KOM a.s., its client number being F00120649. Packages are in compliance to EN 13427.

We recommend to dispose the packages in a following way:

- Plastic foils, carton cover, use the Scrap Materials
- Metal tightening tape use the Scrap Materials
- A wood base is intended for single using and it cannot be further reused. Its disposal is subjected to the Act No. 477/2001 Coll. and 185/2001 Coll. as amended.

Since the product is constructed from common materials, it is recommended to dispose respective parts as follows:

- exchanger (aluminum alloy), use the Scrap Materials
- pipe distributions, jackets, use the Scrap Materials
- other metal parts, use the Scrap Materials
- isolation material MIRELON, through a firm dealing with waste collection and disposal

Loosing the use properties of the product, it is possible to return the product back (if applicable), in case the originator states it is a waste, the waste should be disposed according to provisions of the effective legislation in a particular country.

12. Warranty and Liability for Defects

VIADRUS a.s. provides a warranty:

- For boilers 24 months after the boiler putting into operation, but maximum 30 months after the date it was dispatched from the manufacturing factory.
- For boiler drum 5 years after the date its dispatch from the manufacturing factory.

For the warranty validity, the manufacturer requires

- **In the meaning of the Act No. 222/94 Coll. “On conditions for business activities and government administration execution in certified branches, and on Government Energy Inspection: and ČSN 38 6405 amendment 1 5/99, EN 1775, to perform periodically 1 x year a gas boiler inspection. Inspections may only be performed by an authorized organization (contractual service providing organizations), accredited by the manufacturer VIADRUS a.s.**
- **To keep documents of any and all records of performed warranty and after-warranty repairs and performance of periodic annual inspections of the boiler as required in the Annex to the Warranty Certificate herein.**

Any defect should be immediately after revealing reported, always by phone and in written form.

A failure to meet the specified instructions shall result into warranty cancellation by the manufacturer.

The warranty does not apply to:

- **Faults caused by improper assembly and improper attendance of the product and faults caused by improper maintenance see chap. 9**
- **Faults and damage caused by failure to observe water quality in heating system see chap. no. 6.1 or by using the anti-freeze mixture**
- **Faults caused by failure to observe instructions stated in this manual**
- **Product damage in the course of transport or another mechanical failure**
- **Faults caused by unsuitable storage (for example water)**

The manufacturer reserves a right to changes performed within the product innovation which are not necessarily contained herein.

Information for customer

Packaging edentification	Assessment reference
PE Plastic sacks, folie, corrugated board, iron and plastic fix line	

Identification od principál materials used. Paper, Polyethylene, iron, wood

Part 1: Summary of assessment

Standard/Report	Assessment requirement	Claim	Note
1.1 Prevention by source reduction		YES	
1.2 Heavy metals and	ensure below maximum permitted levels for components (CR 13695-1:2000)	YES	
1.3 Other noxious/hazardous substances	ensure in compliance with (CR 13695-2:2002, EN 13428:2000)	YES	
2 Reuse	ensure reusability in all terms of the standard for the functional packaging unit (EN 13429:2000)	NO	
3.1 Recovery by material recycling	ensure recyclability in all term sof the standard for the functional packaging unit (EN 13430:2000)	YES	
3.2 Recovery in the form of energy	ensure that calorific gain is achievable for the functional packaging unit (EN 13431:2000)	YES	Iron - NO
3.3 Recovery by composting	ensure compost ability in all terms of the standard for the functional packaging unit (EN 13432:2000)	NO	

NOTE Conformity with EN 13427 requires affirmative responses to sections 1.1; 1.2; 1.3 and to at least one of 3.1; 3.2; 3.3. In addition, where a claim of reuse is made section 2 should also record affirmative responses.
--

Part 2: Statement of conformity

In the light of the assessment results recorded in part I above, this packaging is claimed to comply with the requirements of EN 13427:2000.
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Warranty Certificate and Certificate of Quality and Completeness for Boiler VIADRUS CLAUDIUS K 2...

Production number of boiler Boiler capacity

Flue gas ducting connection method

User (surname, name)

Address (street, town, ZIP Code)

Phone/Fax

The boiler is in compliance with requirements of:

ČSN 070240 Warm water and low pressure steam boilers. Primary provisions.

EN 677 Gas – fired central heating boilers – Specific requirements for condensing boilers with a nominal heat input not exceeding 70 kW

VIADRUS a.s. provides a warranty:

- For boilers 24 months after the boiler putting into operation, but maximum 30 months after the date it was dispatched from the manufacturing factory.
- For boiler drum 5 years after the date its dispatch from the manufacturing factory.

An adjustment according to the boiler operation and installation manual shall be made by a contractual service organization.

The completeness including standard accessories and output adjustment according to the “Operation and Installation Manual“ is guaranteed by the manufacturer by a contractual service organization.

The Warranty Certificate is invalid if not completed.

The user confirms that:

- the boiler adjusted by a contractual service organization proved no defect in a heating test
- he received the “Operation and Installation Manual“ including a properly completed Warranty Certificate and Quality Certificate
- he has become familiar with the boiler operation and maintenance

..... Manufacture date Manufacturer’s stamp Controlled by (signature)
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..... Installation date Assembly company (stamp, signature) User’s signature
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..... Date of placing the boiler in operation Professional assembly company (stamp, signature) User’s signature
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An Annex to the Warranty Certificate for a Customer - User

A record of warranty and after-warranty repairs and regular annual product inspections completed			
Date of entry	Activity completed	Contractual service organization (signature, stamp)	Signature by customer

Warranty Certificate and Certificate of Quality and Completeness for Boiler VIADRUS CLAUDIUS K 2...

Production number of boiler Boiler capacity

Flue gas ducting connection method

User (surname, name)

Address (street, town, ZIP Code)

Phone/Fax

The boiler is in compliance with requirements of:
 ČSN 070240 Warm water and low pressure steam boilers. Primary provisions.
 EN 677 Gas – fired central heating boilers – Specific requirements for condensing boilers with a nominal heat input not exceeding 70 kW

VIADRUS a.s. provides a warranty:

- For boilers 24 months after the boiler putting into operation, but maximum 30 months after the date it was dispatched from the manufacturing factory.
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..... Manufacture date Manufacturer’s stamp Controlled by (signature)
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..... Installation date Assembly company (stamp, signature) User’s signature
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..... Date of placing the boiler in operation Professional assembly company (stamp, signature) User’s signature
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Warranty Certificate and Certificate of Quality and Completeness for Boiler VIADRUS CLAUDIUS K 2...

Production number of boiler Boiler capacity

Flue gas ducting connection method

User (surname, name)

Address (street, town, ZIP Code)

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..... Installation date Assembly company (stamp, signature) User’s signature
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..... Date of placing the boiler in operation Professional assembly company (stamp, signature) User’s signature
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VIADRUS

VIADRUS a.s.

Bezručova 300 / 735 81 Bohumín / CZ

Tel.: + 420 596 083 050 / Fax: + 420 596 082 822

www.viadrus.cz / info@viadrus.cz