

Electric wall hung boiler

ELECTRA MINI



Instruction manual

Dear customer,

You have bought a modern product – the direct heated electric boiler ELECTRA MINI from the company BRANO a.s., Czech Republic. We believe that our product will serve you good and for long time. It is necessary for you to study whole instruction manual and hold all the principles. The declaration of conformity was issued by the producer according to directives 2004/108/EC, 2006/95/EC,

Basic features

- Boiler Electra Mini is electric hot water boiler. EK MINI is a suitable heat source for conventional heating systems and for use as a backup source for sophisticated (modern) heating systems with a heat pump or solar heating. This boiler is also an ideal supplementary heat source for heating with a fireplace or fireplace insert.
- Boiler EK MINI is manufactured with a heat output of 6; 9; 12 and 15 kW.

Advantages of your boiler

QUALITY - used exclusively verified european components

DIMENSIONS - your new boiler is really small regarding its dimensions. You can place it anywhere where is impossible to place another type of boilers.

- Easy to Use - simple choice of temperature and power boiler using the boiler thermostat,
- Low internal resistance - Input and output are G1 ",
- Saving installation cista - drain / fill valve, a vent valve are already in the boiler.
-



REMINDER!

Your new boiler is not stay alone to be useful for your comfort, use good outside insulation of your flat or your house, use the room thermostat for economical consumption of electric energy.

1. General information

1.1 Description and use

The wall hung electric boiler ELECTRA MINI is convenient for heating in heating systems with forced circle and for heating of service utility water (sanitary water).

The heating of heating water takes place in a boiler drum by heaters of a power output of 4,5 kW, 6 kW or 7,5 kW. Each heater consists of three heating rods of a power output of 1,5 kW, 2 kW or 2,5 kW each. Heating operation is controlled by boilers thermostat.

1.2 Advantages of boiler

- Smallest dimensions on the market.
- Simple and reliable electromechanical steering.
- Modular solution - if necessary can easily install replenish pump and expansion vessel.
- Quality components.
- Choice partial / maximum performance.
- The ability to operate at 1, 2 and 3 phases (depending on the power embodiment).
- Low internal resistance - input / output G1 ".
- Integrated refill / drain valve.
- Simple to install and easy to use.
- Blocking HDO.
- High efficiency 99%.
- Protective features:
 - Against overheating
 - Against a loss of pressure
- Connectivity to a room thermostat.
- Automatic venting.
-

1.3 Important instructions and advices

- Regarding installation, putting the boiler into operation and maintenance it is necessary to observe instructions according to concrete norms and regulations and instructions from the producer. It is also necessary for you to read carefully instruction manual and guarantee conditions.
- Control if the boiler in the box is completed regarding accessories etc.
- Control if the boiler type is in accordance with your request for use.
- The data stated on the type label has to be compatible with conditions for boiler connection and mounting.
- It is not allowed for user to manipulate with parts plumbed.

1.3.1 Installing, mounting of the boiler

- Safety and economic operation of the boiler requests a technical project made by authorized heating or civil engineer for whole heating system.

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Meaning of abbreviations and used symbols

OV - heating water



Notice pay attentioni

- Mounting of the boiler could be carried out only by authorized company or persons.
- On the boiler and 100mm before the boiler there is not allowed a placement of things from flammable materials.
- The boiler mounted on the wall is not able to be moved or placed to another place..
- Boiler connection is allowed only with nut with flat ring sealing.
- It is necessary to put heating water inlet with a filter and shut off valves.
- It is necessary to leave a free space on both side walls of the boiler 100 mm and minimally 400mm from the top for after sales service. In case that you will not observe this request for free space you have to pay dismantling and mounting the boiler back to the wall and to heating system, it is not a repair paid in guarantee period!

1.3.2 Putting into operation

- Putting the boiler into operation has to be carried out only by authorized professional company or service person that has a valid agreement signed with the producer. The list of these companies is enclosed.
- The company or person who will put the boiler into operation has an obligation to assure repairs of breakdowns or defects in guarantee period. In case that this company doesn't exist anymore, the guarantee repair will be assured by any company from the list closed to you.
- By putting the boiler into operation the authorized person is obligated to:
 - control connections of the boiler to electric supply network and to heating system
 - control tightness of the boiler
 - control all functions of the boiler
 - inform the user about boiler operation, its control and maintenance
 - inform the user about safety dimensions from sides of the boiler from flammable walls and its protection according to ČSN 061008 and ČSN 730823.
- To fulfil requests for boiler safety and economic operation it is necessary to observe below mentioned conditions:
 - For boiler mounting and installing the user has to get the permission from the company who is a distributor of electricity in your region, control the input of the boiler if it is in accordance with the input stated in the permission
 - For mounting of the boiler it is necessary to have an authorized technical project for heating system and for connection of electric boiler
 - The boiler is able to be mounted only in an environment according to its determination and according to the project
 - Manipulation, operation, using, control and

maintenance of the boilers are forbidden if it is not in accordance with rules and directions of this instruction manual. It is forbidden mainly to disconnect any of safety units or elements in the boiler!!!

- If the guarantee list is not filling fully, it is not valid



If you take the boiler from the colder environment to the warmer one (for example if the outside temperature is below 0° C or 0° C and you want to mount it inside), please wait approximately 2 hours.

1.3.3 Operation of the boiler

- The boiler has to be controlled and used only according to advices and instructions stated in this instruction manual, only by adult person who was posted in maintenance of the boiler. Putting the boiler into operation will made by authorized service person during the heating test..
- Any manipulation, operation, using and maintenance of the boiler, which is not in accordance with instructions and advices stated in this instruction manual, is inadmissible. The producer is not responsible for damages caused by wrong using and maintenance of the boiler.
- The producer recommends periodical service controls of the boiler 1x per year before heating season. The service control could be done only by a professional authorized service company or person. The list of service control steps recommend to be controlled before heating season you will find in the chapter "maintenance".
- The producer allows only room thermostat connection, if the room thermostat has with potential-free outlet connection. The authorized service person is responsible during putting the boiler into operation to fill and sign guarantee card.
- If you find any breakdown or any defect on an electrical part of the boiler, please, don't repair it by yourself, disconnect the boiler from the electric supply network and ask for after sales service person.
- It is not allowed to use the boiler Electra MINI for another purposes than is stated in this instruction manual.

1.4. Main dimensions

The boiler is supplied in a basic version without expansion tank and pump

A - dimensions

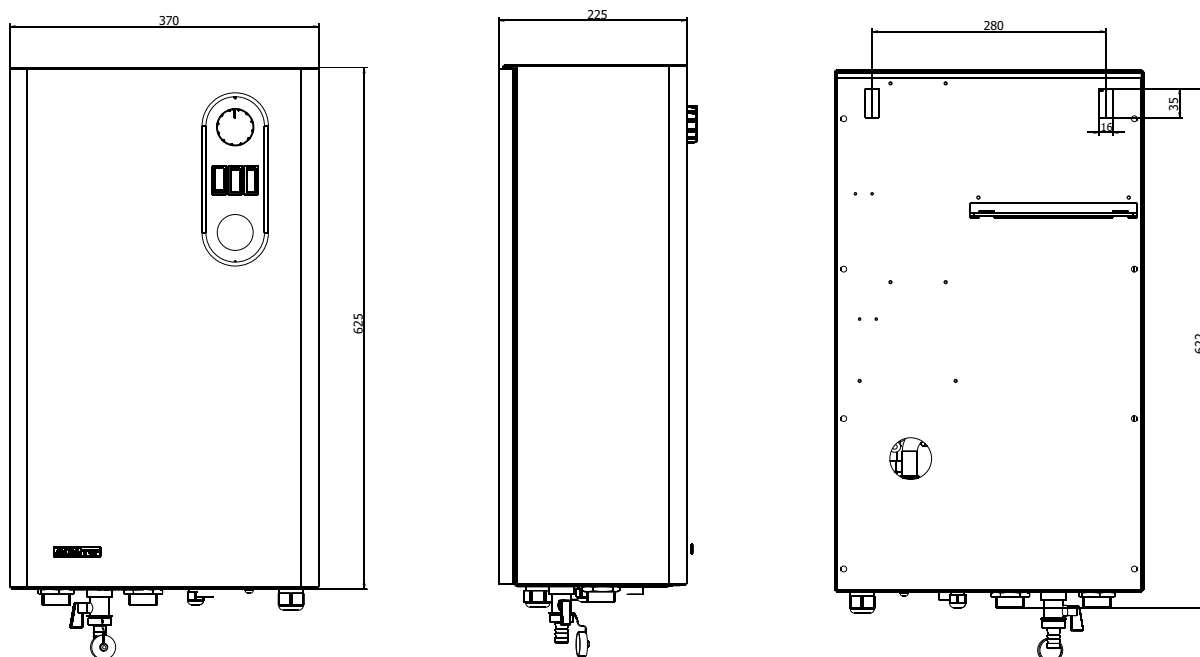
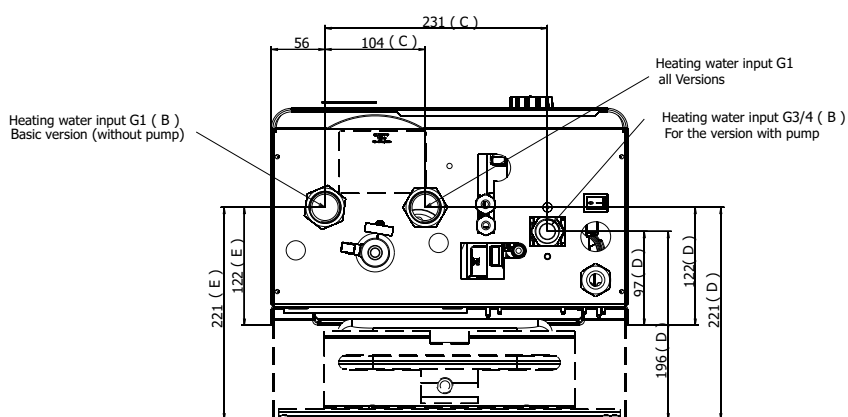
B - entry of heating water

C - spacing of input, output

D - entry location of heating water

E - Output location of heating water

Option	A	B	C	D	E	Weight
boiler	225	1"	104	122	122	20,5
boiler + pump	225	3/4"	231	97	122	23,5
boiler + expansion vesel	323	1"	104	221	221	27,5
Boiler + pump + expansion vesel	323	3/4"	231	196	221	30,5



1.5 Technical data

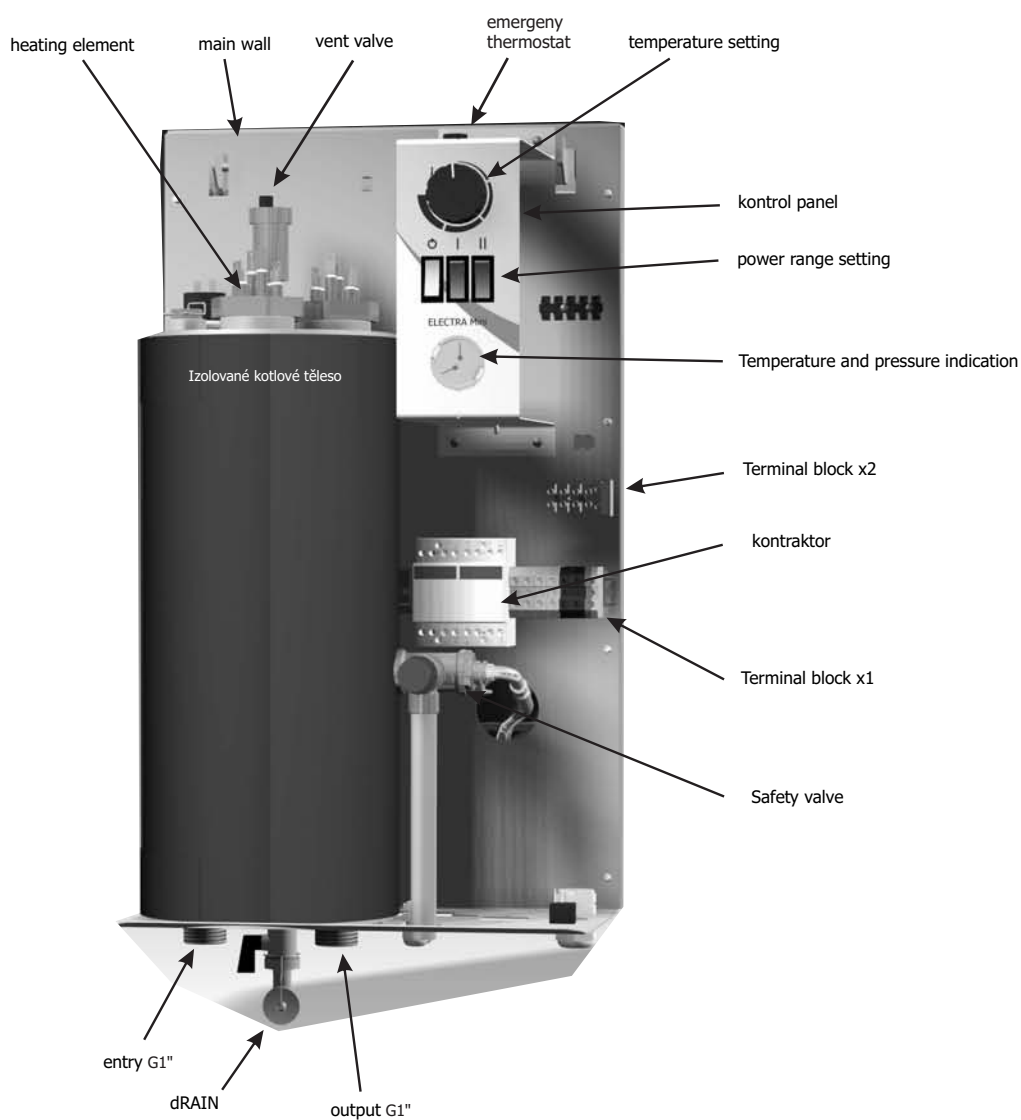
	Unit	ELECTRA MINI 6	ELECTRA MINI 9	ELECTRA MINI 12	ELECTRA MINI 15
Rated heat output (stage I + II)	kW	6	9	12	15
The output of stage I		3	4,5	6	7,5
The output of stage II		3	4,5	6	7,5
Rated current	A	1x28/3x10/2x19**	3x14 / 2x21**	3x19/2x18**	3x23
Ingress protection	IP	40			
electricity network		3x230/400+N+PE/50 Hz**	3x230/400+N+PE/50 Hz**	3x230/400+N+PE/50 Hz	3x230/400+N+PE/50 Hz
		1x230+N+PE/50 Hz	NELZE	NELZE	NELZE
protection of the boiler	A	1x30/2x20/3x12**	3x16 / 3x25**	3x20/3x30**	3x25
fuse control	A	2A, pomalá			
Input / output of heating water		G1" (G1" - G3/4")*			
Min. Working overpressure of heating system	bar	0,4			
Max. Working overpressure of heating system	bar	3			
Min. Water temperature	°C	30			
Max. Water temperature	°C	85			
Water volume of the entire boiler	l	10,6			
Efficiency at rated power	%	99			
Expansion vessel	l	8*			
Pump		Grundfos 15-50*			
modular solutions		Ano			
weight	kg	20,5 / 30*			
Dimensions (height / width / depth)	mm	625/370/225 / 323*			

* Boiler set (pump, expansion vessel)

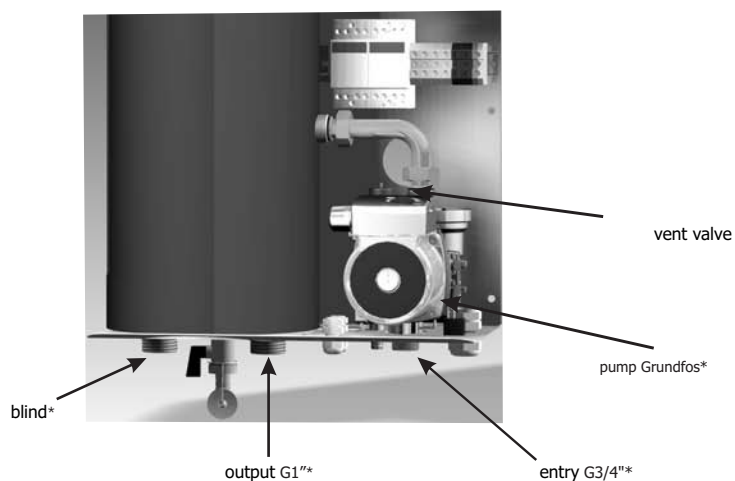
** Connection to 2 phases

1.6 Main parts

Basic version (without pump and expansion vessel)



With pupm




1.7 Description of function

1.7.1 Technical description

The boiler is designed according to valid norms and rules ČSN EN and IEC. The safety of the boiler, energy saving and sound was important matter during the boiler designing.

1.7.2 Principle of boiler operation

The insulated boiler body with volume 10,6 l is a reservoir where water is heated by electric heating elements according to the boiler type. Depending on the actual heat requirement, The button 0/1 is for switching off the boiler out of operation. 

1.7.3 Control

To the boiler control is used control panel to set the desire power and water temperature. The control panel is also used to display current pressure and temperature values. Of the light signal is shown connected power.



If the boiler is switched off by the main switch, or if it is disconnected from the electricity network, the signaling is dysfunctional.

1.7.4 Safety function of the boiler

Protection against overheating

- The boiler has an emergency thermostat set for 110 °C. In case of boiler overheating heating elements are put out of operation independently to the control unit. Reset is performed by pressing the key according to the picture.



Protection against lost of heating water pressure

- The boiler equipped with a pressure switcher which control minimal pressure in heating system 0,4 bar, when the function reliability of deaerate valves is assured, it means that the boiler has sufficient volume of water.
- This breakdown could be repaired after the control of tightness of water ways and after water filling over 0,4

bar. After that the boiler is automatically reset and returned to normal operation

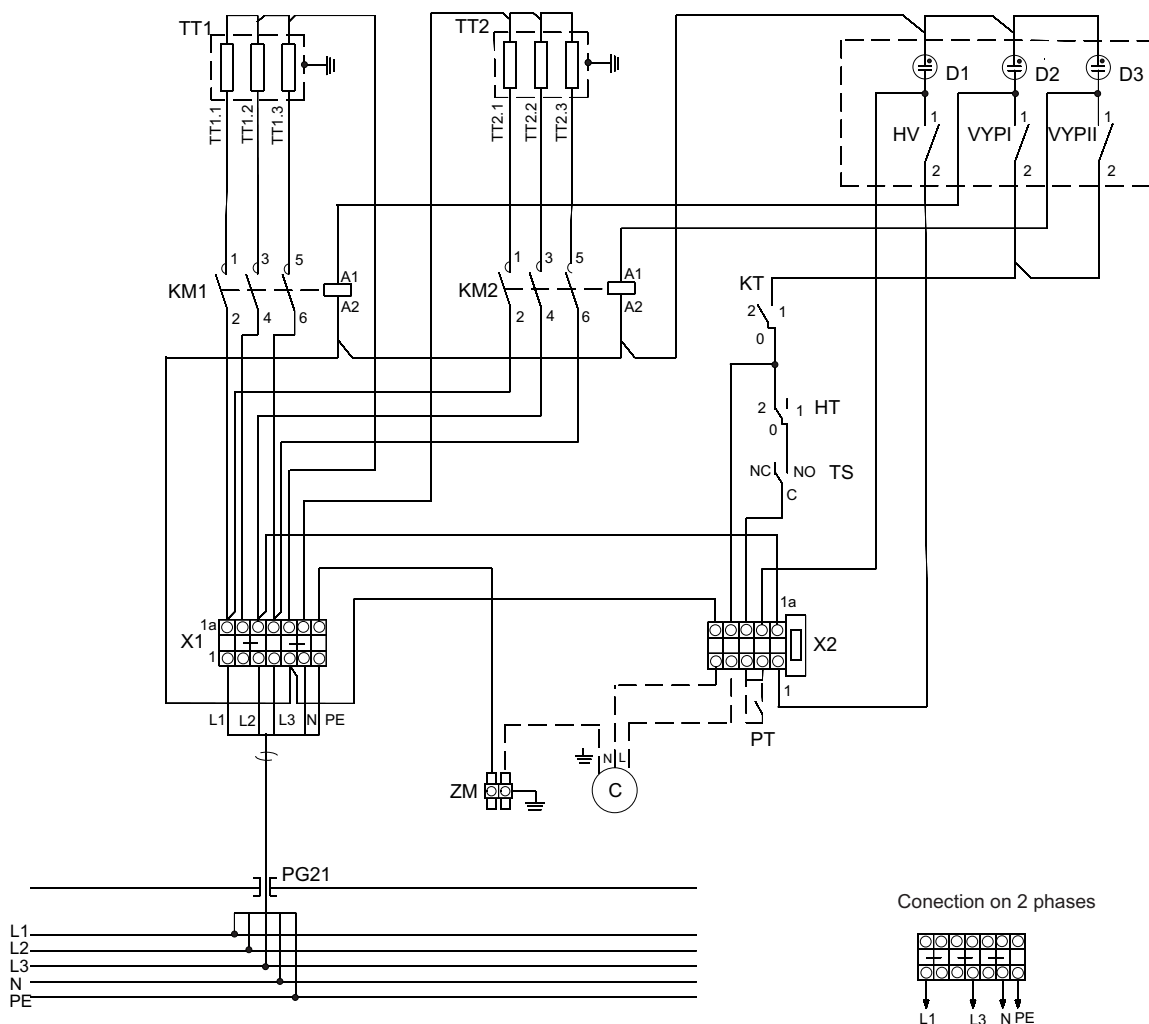
Boiler protection against over and below voltage in supply electrical net

- The control unit is equipped with function assuring putting the boiler out of operation if the voltage is below 150 V or over 250 V.

Boiler protection against overpressure of heating water

- The boiler pump is equipped with pressure safety valve set for 3 bars. In case of the overpressure more than 3 bars the leakage of water occurs from the valve till the pressure of water in heating system is not below maximal requested level. This valve is in its operation automatically.

1.8 Circuit diagram

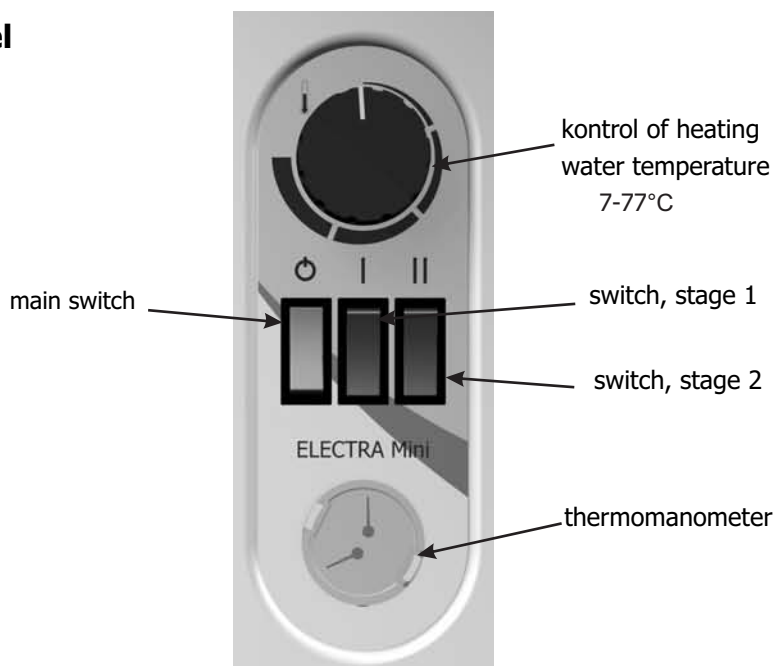


Legend:

- HV** - main switch
- TS** - pressure switch
- HT** - emergency thermostat
- KM 1, KM 2** - contactors
- TT1, TT2** - heating rods
- KT** - boiler thermostat
- VYP.I, VYP.II** - Switches
- D1, D2** - neon
- X1, X2** - terminal block
- C** - pump (optional)
- ZM** - grounding bridge
- PT** - room thermostat

2. Control

2.1 Control panel



2.2. The boiler switching ON/OFF

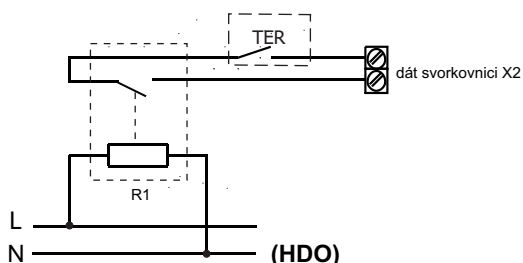
Use the switcher 0/1 placed on the main panel.



Switchboard of the boiler and inlet conductors and clamps of the contactor and inlet conductor of the switcher are under voltage! Disconnect the boiler from the main electric inlet supply!

2.3. Boiler operation with signal HDO

The boiler is not equipped with input for HDO signal, so it is necessary to secure control of serially connected with a potential-free relay contact in the control cabinet according to the following schedule:



TER - room thermostat

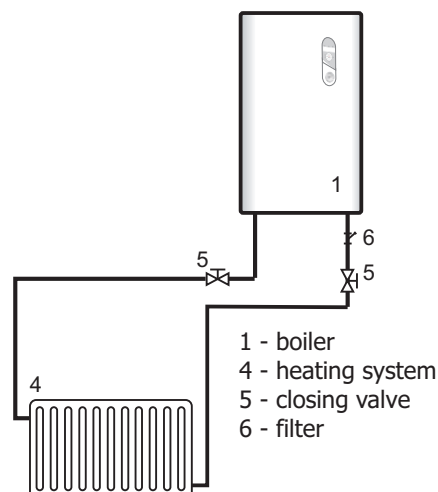
R - with potential-free relay contact (part of electrical switchboard)



The equipment must be operated only in the locked state, ie. Only when switched signal HDO.

2.4 Operations modes

Without the room thermostat connected

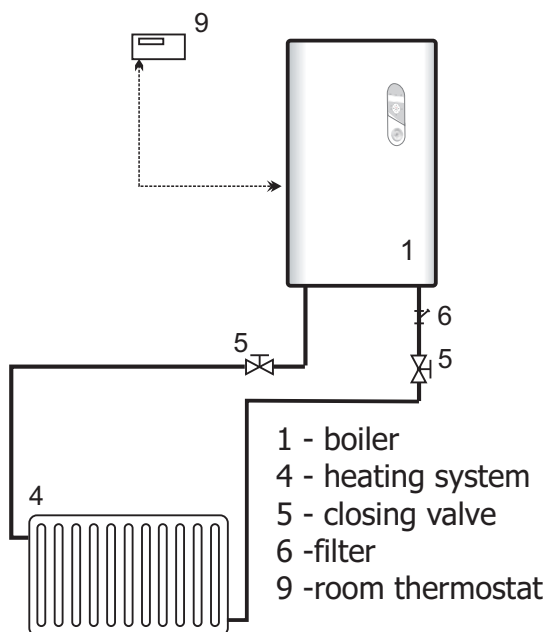


CAUTION - terminals of the room thermostat are powered by 230V !!!

Regulation is running on basic of sets temperature heating water.

Steps of setting needed temperature heating water.
Using swith of temperature set needed temperature betweene 7-77°C. Curent temperature is showing on thermomanometru.

With the room thermostat



In case that the room thermostat is connected the regulation of temperature is the same as in case without the room thermostat connected till the moment when the request for heating is stopped by the room thermostat.



CAUTION - terminals of the room thermostat are powered by 230V !!!

2.5. Errors/breakdowns

They may encounter the following error states

Name	Meaning	Intervention	Foult reset
Overheat	Overheated - the boiler is shut down by a safety thermostat	Find fault, call service	Remove unblocking the emergency thermostat (need users to look at the cause of overheating)
Pressure loss	Pressure loss - decreased pressure in the heating systém	Check heating system for leaks	Automatically



In case that the boiler has an error/breakdown and it is necessary to call service, don't try to remove the breakdown by yourself. There is a dangerous of a threat of electric shock!

3. Installation

3.1. Norms and regulations

For safety operation, projection, mounting, operation and service of boiler is valid below mentioned norms and regulations:

- ČSN 06 0310:2006 - Heating systems in buildings projection and mounting.
- ČSN 06 0830:2006 - Heating systems in buildings safety and protection equipment.
- ČSN 06 1008:1998 -Fire safety of heating appliances.
- ČSN 07 0240:1993 -Water and low pressure steam boilers basic rules..
- ČSN 07 7401:1992 - Water and steam for heating energetic equipments.
- ČSN 33 1310:1990 - Electrotechnical rules. Safety rules for electric equipments used by person without electric qualification.
- ČSN 33 2000 -...Electrotechnical rules. ...
- ČSN 33 2130:1985 - Electrotechnical rules. Inside electrical distribution system.
- ČSN 33 2180:1980 - Electrotechnical rules, connection of electric appliances.
- ČSN EN 50110-1:2005 -Service and work with electrical appliances.
- ČSN EN 55014:2001 - Electromagnetic compatibility requirements for home appliances, electric tools and similar appliances.
- ČSN EN 60335-1+A55:1997 - Safety of home electric appliances and for similar purposes..
- ČSN EN 61000 -...Electromagnetic compatibility (EMC)
- Technical requirements for products.

- Government direction No. 178/1997 defined technical requirements for construction products + enclosure No. 1 basic requirements.
- Notice No. 48/1982 basic requirements to assure labour protection and safety of technical equipments.

3.2 Placement of the boiler in the room

Room where the boiler will be placed and mounted on the wall has to be in accordance with normal environment AA5/AB5 according to ČSN 33 2000 3.

It is not allowed for boilers to be installed in bathrooms, wash rooms, shower rooms in place 0, 1, 2, 3 according to the rule ČSN 33 20007701.

Concerning fire protection and safety the rule ČSN 06 1008 is valid and there is stated minimal distance from flammable objects.

We recommend enlarging these distances to have minimal space easier service and manipulation:

- 500 mm from the front side
- 600 mm from the top
- 200mm from the side

3.3. Mounting of the boiler on the wall

Mounting is carried out by 2 screws or hooks which the boiler is hanged on through 2 inlets with spacing of holes on the frame of the boiler.

3.4. Electroinstallation

3.4.1 Boiler connection to electric supply net

For boiler connection to electric supply net it is necessary for user to have a license from the local energetic distribution organization. Boiler input is not allowed to be bigger than the input stated in the license.

Before mounting of the boiler it is necessary to be installed supply electric cable with main switcher and with over current circuit breaker including starting inspection revise and to have confirmed application for electric power take-off.

Electric boilers Electra Comfort are ranged in appliances continuously connected to electric circuit of network voltage. In the fix supply cable of the boiler there has to be in-built main switcher with distances of all disconnected cables min. 3 mm. The boiler is connected by corresponding cables to switch board X1 according to the diagram 1.7. Inlet of cables through the cover of boiler is carried out with bushings. The bushing PG21 is for main supply inlet of the boiler. Other bushings PG9 is for other signals of the room thermostat and the 3-ways valve.

Recommended size of circuit breakers and cross

Type of boiler	EK 06 MINI			EK 09 MINI			EK 12 MINI			EK 15 MINI		
Type of connection	circuit breaker A	Cu-cable mm ²	Cu-wire mm ²	circuit breaker A	Cu-cable mm ²	Cu-wire mm ²	circuit breaker A	Cu-cable mm ²	Cu-wire mm ²	circuit breaker A	Cu-cable mm ²	Cu-wire mm ²
1x230V+N+PE	1x32	3x6	3x10	Can not			Can not			Can not		
3x230/400V+N+PE	3x16	5x1,5	5x2,5	3x16	5x2,5	5x4	3x20	5x2,5	5x6	3x25	5x4	5x6

Circuit Breaker and Wire Size

Lead wire must be designed in accordance with ČSN 33 2000-5-523 a ČSN 33 2000-5-52. Max. cross section for connection to terminal EK je 10 mm².

3.4.2 Installation of the room thermostat

- Connection of the room thermostat is necessary to do with twin core cable with recommended diameter min. Cu 0,5 mm² and length to 25 m
- Terminals for connecting room thermostat (230V) are factory-fitted with Klemm



CAUTION - terminals of the room thermostat are powered by 230V !!!

3.5 Heating system

The pipe system of heating system has to be made to avoid forming of air bubbles and to make easy the process of deaeration. Deaeration valves have to be placed on each highest heating system place and on all radiators. We recommend making the heating pipe from copper. Plastic pipes have to fulfill requests of heating resistance and have guaranteed heat resistance have not to loose parts in the heating water to avoid paralysation of regulation and safety function components, including the pump.

The boiler has to be installed in opened or closed heating system according to the normative conditions (overpressure of heating system, maximal volume of heating system).

The boiler could be used for underfloor heating, minimal temperature of heating water is 30°C. The boiler has not equipped by the sensor of maximal temperature of heating water for underfloor heating,, it has to be carried on by external thermostat connected by its clamps to the electric boiler.

Using of defrost mixture

We don't recommend to use defrost mixtures due to their characteristics, some of them are not convenient for the boiler operation, concretely reducing of heat transmission, big volume elasticity, ageing, breakdowns of rubber parts. It is necessary to think about to use them inevitable. Regarding inevitable situation it is allowed to use the defrost mixture Alicol Termo according to experience of the producer that the boiler operation is not reducing.

If you are not able to use this defrost mixture and you will protect your heating system with another defrost mixture then guarantee claim will not be accepted

3.6 Expansion vesel installation

Expansion tank is not installed in the boiler, it must be installed separately into the system by a professional company, or can be connected to the boiler original set of expansion vessel.

This kit includes

8 liters expansion tank, frame, connecting hose, connection material (EK15SB.N040-P001).

Installation is carried out at the suction branch of the pump

Velikost

8 liters expansion tank, frame, connecting hose, connection material (EK15SB.N040-P001).

Installation is carried out at the suction branch of the pump

The expansion vessel eliminates warm elasticity of heating medium (water) in the heating system therefore it is necessary to have its sufficient volume. The size of expansion vessel is projected by a responsible person technician of heating system project. Below mentioned is a graph for your basic orientation knowledge of dependency.

The graph is determined for thermal drop 80/60 °C and there are 3 curves with pressures of system in cold stage 0,5 and 1 and 2 bars.

Curves are valid for using of safety valve set on 3 bars..

Filling overpressure of expansion vessel

For right function of expansion vessel it is necessary to keep the overpressure of nitrogen filling, which is stated for 1,2 x of the heating system overpressure in cold stage.

$$P_{ex} = 1,2 * P_{ov}$$

Notice: gas filling adjustment of expansion vessel has to be provided only by responsible service person to do it.

Obligation for user is to assure the operation revision/control 1time per year and the pressure control of the built-in expansion vessel maximally 1 time per 9 years, it means also of an additional expansion vessel if it is mounted to the heating system, only by responsible service person to



do it.

Minimal overpressure of heating water

Value of minimal overpressure is stated in the table 1.5. Minimal overpressure requested has to be signed on the thermomanometer by a responsible service person who is putting the boiler into operation. It is not allowed to drop the pressure of heating water below the margined signed on the thermomanometer. For right boiler and heating system operation is necessary to control the overpressure value sometimes and in case that the value is on requested value to fill the system on the overpressure value requested.

Filling overpressure of heating water

It is necessary to observe it in the case of the first filling or also in the case of additional filling of minimal overpressure of heating water. The filling overpressure is about 0,20 bar higher than minimal overpressure requested from reason that the temperature of heating water during filling and additional filling has to be to 20° C (water is dilatible partially by this temperature).

3.7 Marking of working scale

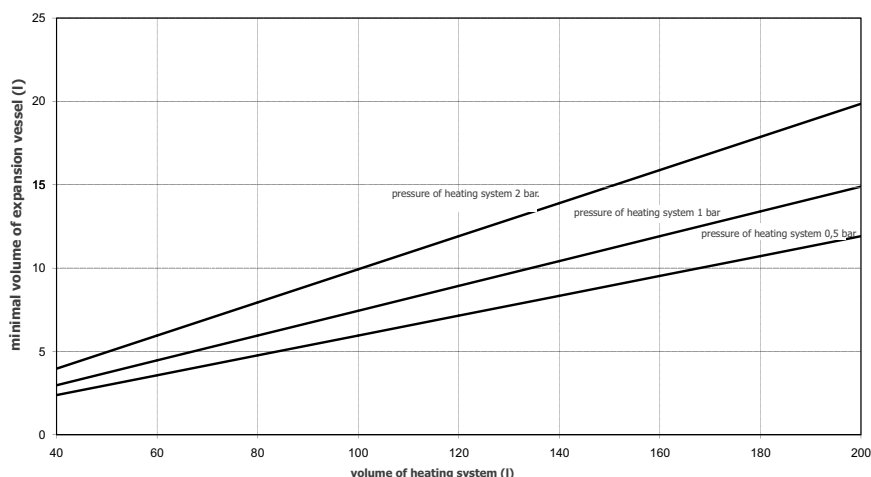
On the pressure meter placed under the boiler there is necessary to mark working scale that the pointer of pressure meter is moving in. Maximal pressure is marked by responsible person put the boiler into operation by pressure meter marking.

Maximal margin = maximal overpressure of heating water in time of reaching of maximal temperature of heating water.

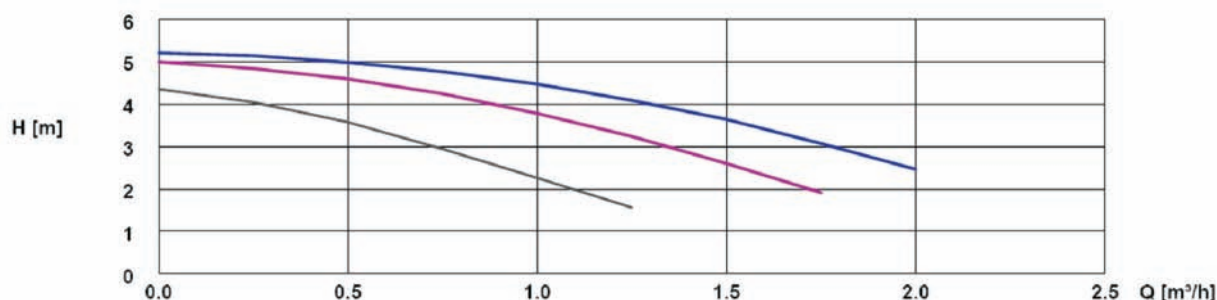
3.8 Circle pump

- The boiler can be equipped with a powerful circulation pump with three output levels - (no. EK15SB.N040 set-P002) - includes a pump, a pipe joint. material.
- The pump operation is controlled by a room thermostat.

Graph Dependency of expansion vessel volume on volume of heating system for thermal drop 80/60 °C.



Working features of the pump Grundfos Cesao 3



Electric data of the pump

degree	P ₁ (W)	I (A)
1	50	0,22
2	60	0,27
3	70	0,31

P1 - pump input
I - electric current

Internal pressure drop of the boiler (without pump)

Flow l / min	Pressure. Loss (kPa)
2	0,05
4	0,17
6	0,35
8	0,6
10	0,9
12	1,3

4. Termination of operation

- Concerning termination of boiler operation carry out it by switching off the switcher by switching off the main switcher on the electric supply feeding.
- Service repairs see below mentioned instructions:

Disconnect boiler from electric supply feeding by main switcher and contact your service man!

Breakdowns of the boiler have to be repair only by professional person!

Attention!
There is threat of casualty by electric current!

5. Maintenance

Regular maintenance helps you to eliminate possible defects. We recommend you to carry out complete maintenance 1 time per year before starting heating system. It is not allowed the taking off the cover. The user is able to clean surface of the cover with detergents and control operation modes or fill heating water to the system checked by water pressure down according to the value on the thermomanometer.

The service man during the regular control and maintenance carry out tightening of all electric connection, control tightness of all connection and control quantity of water in the heating system, clean the water filter, pump, control 3-ways valve control and switching relay including starting function of the boiler. Well, also the control of all safety and switching elements will be carry out by heating operation and right function of heating elements..

6. Full delivery

The electric boiler is delivered assembled

Full delivery of electric boiler consists of:

- electric boiler assembled,
- instruction manual,
- guarantee card,
- bushing,
- deaerate valve,
- bonding of switch board to electric supply connection 1 x 230 V.

Accessories whose are not part of the full delivery:

- conductors for supply connection of boiler and three ways valve (in case that you have installed the storage water tank) and for connection of the room thermostat
- fixing set.
- Expansion vesel
- Pump

7. Transport and warehousing

- The boiler is protected by its packaging during warehousing and transport. It is necessary to

eliminate effects of magnetic and other influences on the packaging.

- It is necessary to eliminate concussions and to avoid slighting out the boiler from the packaging.
- Manipulate with the boiler and put it into position according instruction marked on the packaging.
- Regarding warehousing is necessary to assure standard warehousing conditions (no aggressive environment without dust, temperature from 5° C to 50° C, humidity to 75 %, no expose to biological influences, shocks and vibration).

8. Claims

- If you have functional and face defects on your boiler, please do not repair it by yourselves.
- Please apply your claim by the company which put your boiler into operation or by guarantee repair companies stated in the list of guarantee place.
- Apply condition stated in the guarantee list.
- Your claim is not valid without fulfilled guarantee

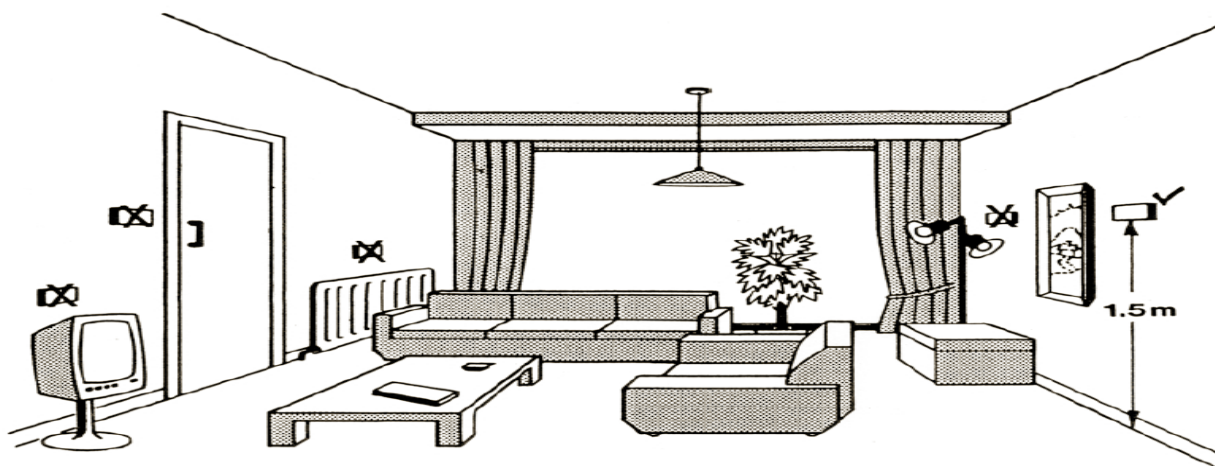
9. Way of liquidation

Solid waste recycling

- solid board
- PE bags, polystyrene, binding tapes
- Boiler 's recycling after its lifetime according to
- national normative waste recycling.

10. Enclosures

10.1 Installation of room thermostat



Safety

Fire instructions:

- Disconnect the boiler from the electric supply network and take out it out of its operation according to possibilities.
- Extinguish fire using pulverized or snows extinguish appliance flammable and explosive materials
- Don't stock any flammable and explosive things closed to the boiler (for example paper, colours, chemicals etc.)

BRANO a.s.
Hradec nad Moravicí
Výrobní závod Uničov
Šumperská 1349, 783 91 Uničov
ČESKÁ REPUBLIKA
e-mail: obchod_heating@brano.eu / <http://www.moratop.cz>
Infolinka: 588 499 916



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