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Centrometal
HEATING TECHNIQUE

Centrometal d.o.o. - **Glavna 12, 40306 Macinec, Croatia, tel: +385 40 372 600, fax: +385 40 372 611**

TECHNICAL DATA

CE

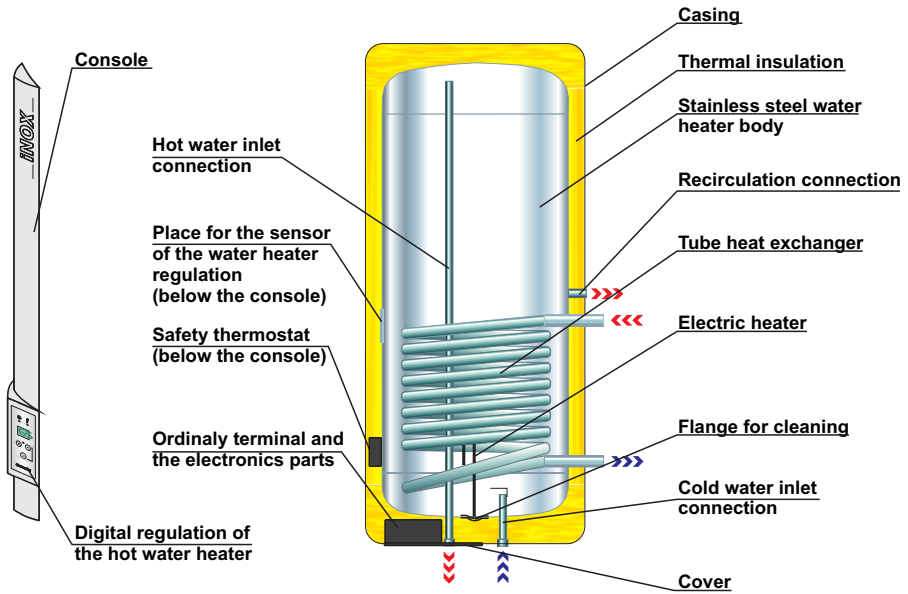
For assembling, use and maintenance
of the combined hot water heater

SKB Digi

TUSKBD-09/2008-ENG

Type		SKB Digi 80	SKB Digi 100	SKB Digi 120
Capacity	lit.	80	100	120
Water heater diameter A	mm	475	475	475
Heigth of the water heater B	mm	815	955	1095
Tube heat	m^2	0,38	0,42	0,42
exchanger	R"	3/4	3/4	3/4
Cold water inlet connection	R"	1/2	1/2	1/2
Cold water outlet connection	R"	1/2	1/2	1/2
Circulation	R"	1/2	1/2	1/2
Voltage	V~	230	230	230
Frequency	Hz	50	50	50
Type of electric current		~	~	~
Electric heater	W	2000	2000	2000
Max. additional power	W	200	200	200
Max. total power	W	2000	2000	2000
Water heater mass	kg	31	35	39,5
Max. operating pressure	bar / MPa	6 / 0,6	6 / 0,6	6 / 0,6
Ip protection		IP 24	IP 24	IP 24

Image 1. - Essential parts of the combined water heater SKB-Digi



8.0. Combined water heater maintenance

8.1. Cleaning of the combined hot water heater

At least once in two years it is necessary to check and clean it from the scale and sediment. Before the cleaning it is obligatory to disconnect the combined hot water heater from the power supply and discharge it (through the cock for drainage on the cold water installation). Then take off the safety lid of the ordinaly terminal and the opening for cleaning which is located on the lateral side of the combined hot water heater (the lid is attached with one screw), take off the electrical supply from the electric heater, then take off the regulation (first take off the plate which is placed over the regulation, and then take off the box with the regulation). Then unscrew the nut on the flange and take off the flange, seal and opposite flange with electric heater. After the cleaning of the boiler it is necessary to attach the electric heater with the flanges and seal back to position, connect the power on the electric heater and placed the safety lid back to its position.

8.2. Electric heater replacement

Before the replacement of the electric heater it is necessary to disconnect the combined hot water heater from the power supply and discharge it (through the drainage cock on the cold water installation). Then removed the safety lid of the ordinaly terminal and the opening for cleaning which is located on the lateral side of the combined hot water heater (the lid is attached with one screw), removed the electrical supply from the electric heater, then take off the regulation (first take off the plate which is placed over the regulation, and then take off the box with the regulation). Then unscrew the nut on the flange and removed the flange, seal and opposite flange with electric heater. After this replace the electric heater with the flange, seal and opposite flange, attach it back to its place into the combined hot water heater, connect and put back the safety lid.

By pushing the button ⊕ or ⊖ You change the type of operating which is marked with the blinking of the GREEN LED diode below the certain symbol. On the display is print out value of the propound temperature. After the choosing the type of heating, after 5 second value on the display go back to the value of instantaneous temperature in the combined hot water heater, and the new set type of heating is recorded in the regulation memory.

- **Option against freezing:**

If the combined hot water heater is heating through the circulation pump it is possible to switch on/off the option against freezing of the combined hot water heater. When temperature in the combined hot water heater fall down below 6°C and if the option against freezing is switch on the regulation switch on the electric heater.

If You simultaneously push the button ⊖ and button ⊕ ; after 5 second RED LED diode will start to blink and on the display is print out the mark 1 or 0. Mark 1 represent that the option against freezing is switch on, while mark 0 represent that the option against freezing is switch off. By pushing the button ⊕ and ⊖ You are able to change if this option is switch on or switch off. After the choosing the way of operating, after 5 second value on the display is gone back to the value of the instantaneous temperature in the combined hot water heater and the new set option against the freezing is record in the memory of regulation.

REMARK: if You empty the combined hot water heater, option against freezing is obligatory to be switch off.

7.2. Preadjusted regulation parameter

- the propound temperature in the combined hot water heater is set on to: **55°C**
- the way of heating the combined hot water heater is set on to: **circulation pump**
- option against freezing: **switch off (0)**

7.3. Indication of the possible errors

If the display shows (☰+ number) it means that some errors accures during the operation of the regulation.

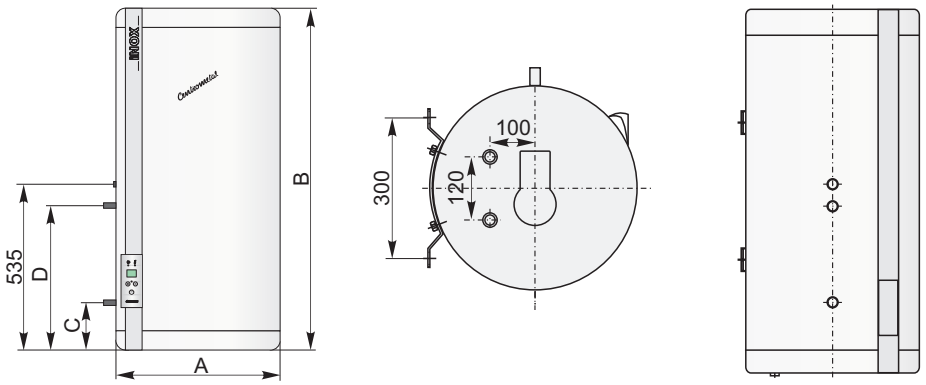
By the mark on the display, the possible errors are:

- (☰0) temperature sensor of the regulation feel the temperature over 90°C
- (☰1) the temperature sensor is wrongly installed
- (☰2) unaccurate temperature sensor or the scan value over the measured area
- (☰3) wrong value in the memory (EPROM)

For the reset of the memory it is necessary to push the button ⊖ and after this the error has to be removed. If the errors appear again please contact the qualified person.

At every error both relays output are switched off until the error is removed.

Image 2. - Essensial dimensions of the combined water heater SKB-Digi (left version)



SKB-Digi		80	100	120
Water heater diameter A	(mm)	475	475	475
Length of the water heater B	(mm)	815	955	1095
Heigth C	(mm)	180	180	180
Heigth D	(mm)	450	450	450

1.0. Introduction

Combined hot water stainless steel heater SKB-Digi produced by Centrometal d.o.o. is constructed by applying of most modern robots welding technology and is made out of high quality material, which is a guarantee for its high performance and generally high quality of the product.

Combined hot water heater SKB-Digi are manufactured in three type of capacity 80,100 and 120 liter with the connections on the left or right side (SKB-Digi right version, SKB-Digi left version).

They are made out of high quality stainless steel (INOX) and was water tested with probe pressure of 12 bar, the combined hot water heater has an in built tube heat exchanger made of smooth stainless steel tube, an in built electric heater 2 kW and modern digital regulation which control the operating of the hot water heater. They are delivered together with thermal isolation made by stone wool covered by steel casing.

This instructions have to be carefully studied, to learn about correct assembling, handling, use and maintainance. This is necessary in order to enable your combined hot water boiler to operate according to its purpose and produce heat for your home for many years.

2.0. Purpose

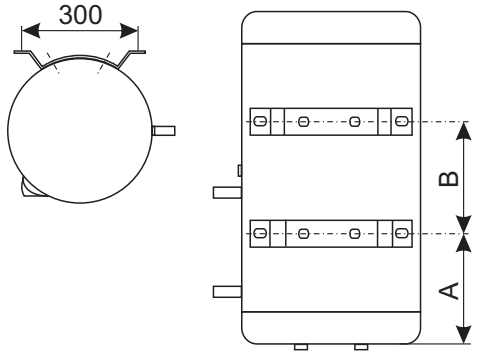
The SKB-Digi is assigned for sanitary hot water production with the tube heat exchanger or/and electric heater. The tube heat exchanger can be connected with oil, gas, electric power or solid fuel firing or can be alternatively connected to the solar collectors (with additional regulation).
Digital water heater regulation steers the operating of the circulation pump of the boiler circuit or starts, if necessary the electric heater in the water heater in dependence of propound parameters of the hot sanitary water temperature and available heat sources.

3.0. Wall mounting

Combined hot water heater SKB-Digi is foreseen to be wall hanged in the **vertical position**. For this reason on the backside of the water heater porter are placed which enables an easy installation (Image 3.).
With the combined hot water heater is also placed 2 pieces of hermetto coupling which are foreseen for the connection of the tube heat exchanger on the installation of the central heating. The mounting set is packed in the plastic bag and placed near the combined hot water heater in the cardboard box. We recommend the installation of the combined hot water heater by a qualified person.

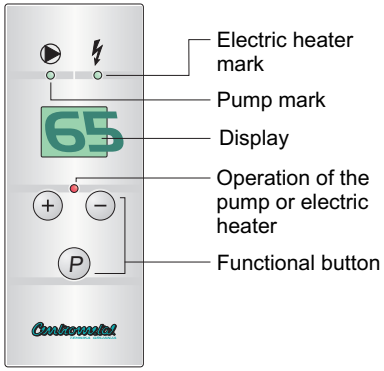
Image 3. - Wall mounting of the combined hot water heater SKB-Digi

TYPE	A	B
SKB-Digi 80	262	300
SKB-Digi 100	262	415
SKB-Digi 120	262	563



7.0. Temperature regulation in the combined hot water heater

Image 5. - Digital regulation



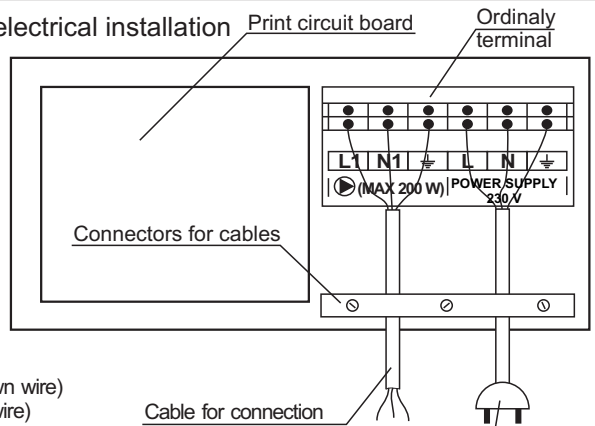
Combined hot water heater SKB-Digi has factory installed digital regulation which lead the heating of the hot water through the boiler with circulation pump (through the tube heat exchanger) or through the electric heater installed in the hot water heater (Image 5.). Regulation is operating in that way that it measure instantaneous temperature in the combined hot water heater and compare with the desired (propound) temperature. Regulation has difference set at 2°C, which means if the propound temperature is 55 °C, electric heater or circulation pump will operate as long as the hot water heater achieve propound temperature i.e. at the 55°C the electric heater or circulation pump will shut down.

When temperature drop below 53°C in the hot water heater they will switch on again. Display during the operation of the combined hot water heater show the instantaneous temperature in the combined hot water heater. When the switch Ⓟ is pushed on the display is shown the propound (the number has behind them the dots). On the upper part of the regulation panel there are two green LED diode which represent the type how the combined hot water heater is heated: LEFT green led diode: heating the combined hot water heater with the boiler through the circulation pump; RIGHT green LED diode: heating the combined hot water heater with the install electric heater. Below the display is placed the RED LED diode which signalize the operation either the electric heater or circulation pump, which can be seen by the symbol below which the green diode light.

7.1. Adjusting of the parameter

- **Adjusting the combined hot water heater on the propound temperature:**
If You simultaneously push the button Ⓟ and button ⊕ , the RED LED diode will start to blink and with the buttons ⊕ and ⊖ You change the value of the propound temperature. When the propound temperature is set, after the 5 second value on the display turns back to the instantaneous temperature in the combined hot water heater, and the new set propound temperature is recorded in the regulation memory.
- **Choosing the type of heating of the combined hot water heater (pump or electric heater):**
If You simultaneously push the button Ⓟ and button ⊖ , the GREEN LED which represent the type how the combined hot water heater is currently heated (circulation pump or electric heater) will start to blink.

Scheme 4. - Connection to the electrical installation



L - Phase of power supply
N - Zero of power supply
⏚ - Earthing

L1 - Phase of the circulation pump (brown wire)
N1 - Zero of the circulation pump (blue wire)
⏚ - Zero of the circulation pump (yellow-green wire)

4.0. Connection to the water supply system

The connection of the combined hot water heater to the water supply system must be done with respect to valid technical norms by a qualified person (scheme 1.). The cold water supply has to be connected with the pipe tube (nipple 1/2") marked with blue sticker, the hot sanitary water drain has to be connected with the pipe tube (nipple 1/2") marked with red sticker. The circulation tube outlet (nipple 1/2"), marked with red sticker, is located on the lateral side of the combined hot water heater.

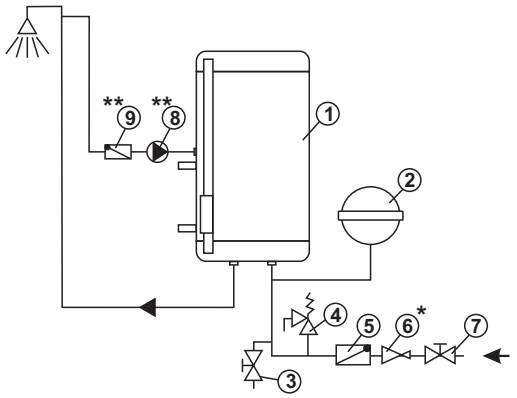
It is obligatory to install on the cold water supply tube entrance of the hot water heater:

- Safety valve with opening pressure 6 bars.
- Expansion vessel for sanitary water.
- Irreversible valve.
- Reducing valve which lowers the pressure of cold water supply pipe on the 4 Bar (if the pressure is higher than this value).
- Water drainage cock (obligatory connect through T-piece).

Drainage with drainage pipe of the safety valve is obligatory to be install in the way that the water can freely leaks from the valve and it is obligatory to install in the area where it never freeze , on the area pressure.

In order to have a long operation life we recommend to install a water softener (Atlas filters), especially in region with city water supply system (“hard” water and water with chlorine) and galvanized water tubes which have harmful effects on stainless steel materials. In order to prolongue the operating life of the electric heater, we recommend on the inlet and outlet and on recirculation of the sanitary water from the combined hot water heater to installation line install minimum 0.5 m plastic tube for sanitary water which endure minimum temperature to 90 °C.

Scheme 1. - Connection of the combined hot water heater SKB-Digi on the water supply system



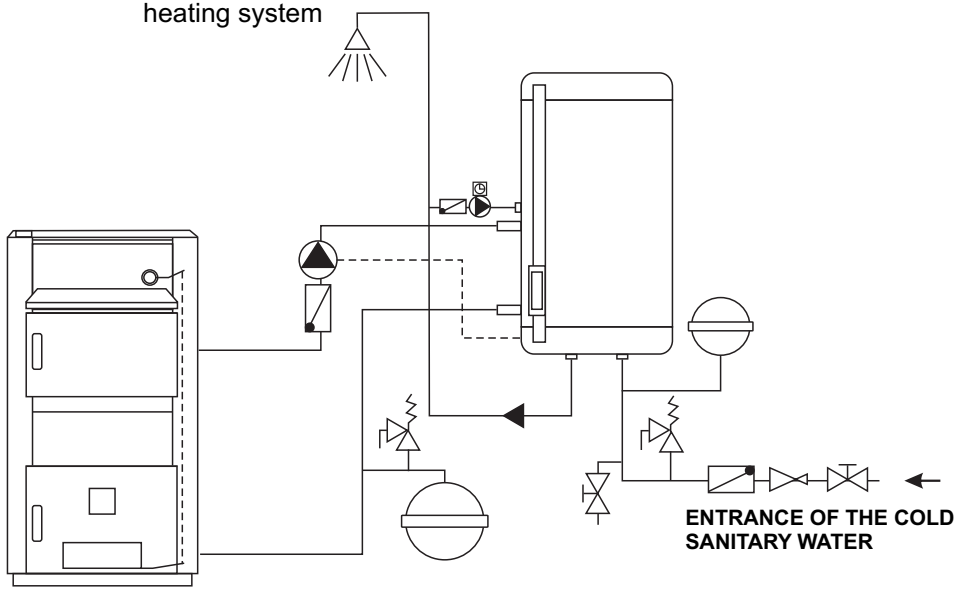
1 - Combined hot water heater SKB-Digi
2 - Expansion vessel for sanitary water
3 - Drainage cock-obligatory through the T-piece
4 - Safety valve
5 - Irreversible valve
* 6 - Pressure regulator
7 - Stop valve
** 8 - Recirculation pump
** 9 - Irreversible valve

* installation is obligatory if pressure of the water supply system is bigger then 4 bars
** installation according to the wish of the customer

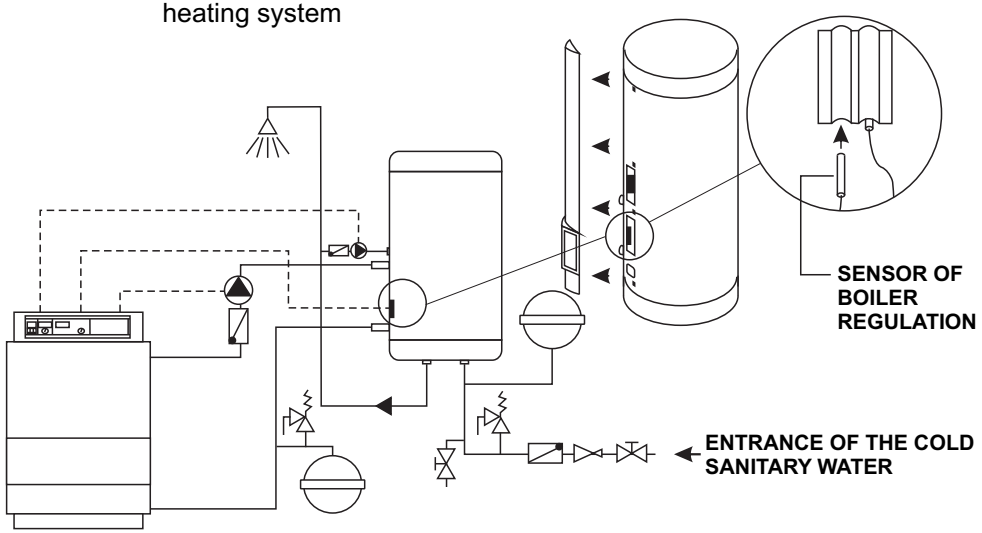
5.0. Connection to the heating system

Scheme 2. show one method how to connect the combined hot water heater to the heating system. In that case the regulation of the heating the sanitary water has a digital regulation which is in built on the hot water heater.
In case there is a boiler regulation of the sanitary water, it is obligatory to in the factory prepared porter on the combined hot water heater insert the sensor of boiler regulation (scheme 3).
The hot water boiler (collectors) supply is connected to the tube of heat exchanger marked with red sticker, then the tube of heat exchanger marked with blue sticker served for drainage of cooled boiler water (collectors). The connections of the combined hot water heater and the installation is obligatory to done **by hermetto coupling (fi 22 mm)**, and on no account with hard welded joint.
The combined hot water heater is produced in two types, with the connection tube of the heat exchanger on the left or right side which depend of the connection of the installation.

Scheme 2. - Connection of the combined hot water heater SKB-Digi on the heating system



Scheme 3. - Connection of the combined hot water heater SKB-Digi on the heating system



6.0. Electrical connection

All electrical work has to be done under valid technical norms by a qualified person. A complete electrical installation of the combined hot water heater itself was made by the manufacturer.

The circulation pump must be connected with 3-wire cable (L_1, N_1 and W).

See the electrical connection on the Scheme 4.

The power supply of the combined hot water heater is necessary to be done with the connection through the main switch outside the combined hot water heater which switch off both poles (phase and zero).

Preparation for the switching off all poles of the circuit voltage it is obligatory to be install in electrical installation according the public installation legislation.

Safety thermostat is placed below the console of the combined hot water heater (Image 1).