

# Operation and Installation Manual



## ELECTRIC ACCUMULATION WATER HEATER

# TO - 20



**Družstevní závody Dražice – strojírna s.r.o.**  
**(Works Cooperative - Dražice – Machine Plant, Ltd.)**

**Dražice 69**

**29471 Benátky nad Jizerou**

**Tel.: 326 370911, fax: 326 370980**

**[www.dzd.cz](http://www.dzd.cz)**

**[dzd@dzd.cz](mailto:dzd@dzd.cz)**

Heater types	Energy efficiency class	Heat losses Wh/24hr/l	Nominal capacity (l)	Time of content heating (hours)	Electricity consumption for heating of the contents from 15°C to 65°C in kWh	Heat losses kWh/24hr
TO - 20	F	14	20	0,5	1	0,28

**Dear Customer,**

The Works Cooperative of Dražice – Machine Plant, Ltd., would like to thank you for your decision to use a product of our brand.

With this guide, we will introduce you to the use, construction, maintenance and other information on indirect water heaters.

Product’s reliability and safety is proven by tests implemented by the Engineering Test Institute in Brno.

**The manufacturer reserves the right for engineering modification of the product.  
The product is designed for permanent contact with drinkable water.**



Guide Contents

1. PRODUCT ACCESSORIES.....	2
2. MESSAGE FOR CUSTOMERS.....	3
3. TECHNICAL DESCRIPTION.....	3
4. GENERAL TECHNICAL DATA.....	3
5. PRINCIPLE OF OPERATION.....	3
6. OPERATING ACTIVITY.....	4
7. WALL MOUNTING.....	4
8. PLUMBING FIXTURE.....	4
9. ELECTRIC INSTALLATION.....	4
10. PUTTING THE HEATER INTO OPERATION.....	5
11. IMPORTANT NOTICES.....	5
12. FUNCTIONAL DEFECTS.....	6
13. FIRE-FIGHTING REGULATIONS FOR INSTALLATION AND USE OF HEATER.....	6
14. HEATER CLEANING AND ANODE ROD EXCHANGE.....	6
15. INSTALLATION REGULATIONS.....	6
Pictures.....	7

**1. PRODUCT ACCESSORIES**

The product is attached with a safety valve, 2 spiral dives 6x70 and 2 plastic wall plugs 12x60. The above parts are packed and placed in the packaging together with the heater. It is in your own interest to check the completeness of the accessories.

## 2. MESSAGE FOR CUSTOMERS

The electric heater is designed for preparation of hot water in households, cottages and various welfare facilities. It allows installation of multiple hot water withdrawal points for taking shower, bath or other usual needs. Its benefit is that it heats up water by power in an unlimited all-day time range. The time of heating service water to the recommended temperature of 60°C is about 31 minutes.

With its design, the electric accumulation heater TO – 20 is suitable for installations in bathrooms, lavatories, kitchens or near sanitary units of panel flats, and complies with the requirements of ČSN 332000-7-701 and ČSN 332000-5-51, with the IP 45 protection class.

### Environment Type:

It is recommended to use the product in an indoor environment with air temperatures from +2°C to 45°C and maximum relative humidity of 80%.

## 3. TECHNICAL DESCRIPTION

The heater tank is made of a steel plate and tested by 0.9 MPa overpressure. The inner surface of the tank is provided (except the stainless coil) with anticorrosion protection of enamelled glaze.

In the bottom part of the tank there are wells for placing the heating, regulation and safety element of the water heater (heating element with right thread G 5/4“, thermostat sensor and thermal fuses). A thermometer is installed in the top part of the heater that transmits information on heating the volume of service water. The heater tank is provided with a highly valuable polyurethane insulation which ensures minimum heat losses.

Electric wiring is placed in the bottom part of the heater, under an easily removable guard of the heater (by loosening two screws on that guard). Temperature of water can be set by a thermostat within the range between 0°C and 77°C, using the symbols on the thermostat selector button (Fig. 1). Cold water inflow is indicated with a blue ring, hot water outflow is indicated with a red ring. All steel parts are protected against corrosion with paint and galvanic coating. To ensure anticorrosion protection, the heating element head is provided with an anode rod that dissolves when the heater is in operation, and has to be replaced after 3 years of operation (depending on the aggressiveness of water).

## 4. GENERAL TECHNICAL DATA

Electric heater	TO - 20	
Rated pressure	MPa	0,6
Capacity	l	20
Voltage / frequency	V / Hz	230/50
Power input	W	2200
Diameter of the heater	mm	500
Height of the heater	mm	592
IP Protection		IP 45
Weight	kg	15
Time of el.heating from 10°C to 60°C	min	31
Heat losses/energy efficiency class	kWh/24h	0,28/F

## 5. PRINCIPLE OF OPERATION

The heater operates on pressure principle which means that there is constant water pressure from the water supply conduit in the tank. If the combination faucet hot water valve is opened, water from the water supply conduit pressed out by cold water pressure flows out of the heater.

The pressure principle allows multiple withdrawal points (Fig.4) but we recommend as short distribution as possible in order to reduce heat losses.

## 6. OPERATING ACTIVITY

After the heater is connected to electric network, the heating element starts heating water. The element is turned on and off by a thermostat.

Thermostat can be set as per your need within the range from 7°C to 75°C. We recommend setting service water to max temperature of 60°C. This temperature ensures the optimal operation of the heater. After reaching the temperature set, the thermostat switches off the electric circuit and thus discontinues water heating. The control light signals if the element is in operation (light is on) or if it is off (the light goes out). In case of longer operation without using the heated volume the thermostat has to be set to position 5°C to 12°C (set the “snowflake” symbol on the thermostat selector) to avoid its freezing.

## 7. WALL MOUNTING

Prior to mounting check the loading capacity of the wall. If needed, reinforce it. The water heater shall only be mounted in vertical position so that the lower edge of the heater was placed at least 600 mm above the floor. The fastening screws must have guaranteed spacing of 180mm. Mounting dimensions are specified on Fig. 3.

## 8. PLUMBING FIXTURE

Connection to plumbing fixtures is illustrated on Fig.4. For potential disconnection of the heater, the service water inlets and outlets must be provided with screw coupling G1/2“. The safety valve can be mounted both in vertical and horizontal position in the indicated direction of cold water flow. Safety valve is mounted on the cold water inlet identified with a blue ring.

**The heaters must be equipped with a drain valve.**

Each hot service water pressure heater must have a safety valve with a membrane spring. The safety valve must be easily accessible, as close to the heater as possible. The input pipes must have at least the same clearance as the safety valve. The safety valve is placed high enough to secure dripping water drain by gravity. We recommend mounting the safety valve onto a branch pipe. This allows easier exchange without having to drain the water from the heater. Safety valves with fixed pressure settings from the manufacturer are used for the assembly. Starting pressure of a safety valve must be identical to the maximum allowed heater pressure, and at least 20% higher than the maximum pressure in the water main. If the water main pressure exceeds such value, a reduction valve must be added to the system. No stop valves can be put between the heater and the safety valve. During the assembly, follow the guide provided by the safety equipment manufacturer. It is necessary to check the safety valve each time before putting it into operation. It is checked by manual moving of the membrane from the seat, turning the make-and-break device button always to the right. After being turned, the button must click back into a notch. Proper function of the make-and-break device results in water draining through the safety valve outlet pipe. In common operation, such a check needs to be implemented at least once a month, and after each heater shutdown for more than 5 days. Water may be dripping off the drain pipe of the safety valve; the pipe must be open into the air, pointed down; environment temperatures must not drop below zero.

When draining the heater, use a recommended drain valve. First, close water input into the heater.

Find necessary pressure values in the following table.

For proper safety valve operation, a backflow valve must

be mounted on the inlet pipes, preventing spontaneous heater draining and hot water penetrating back into the water main.

**When assembling the security equipment, follow ČSN 06 0830.**

Safety valve starting pressure (MPa)	Admissible operating water heater pressure (MPa)	Max. pressure in the cold water pipe (MPa)
0.6	0.6	do 0.48
0.7	0.7	do 0.56
1	1	do 0.8

## 9. ELECTRIC INSTALLATION

The electric wiring scheme is attached to the water heater on the inner side of the removable front guard (Fig. 2). The heater has to be connected via a separate supply with a front-end main switch.

The heater is connected to the 230V/50Hz electric network using a fixed moving conductor with a switch that turns off all network poles and the circuit breaker (protector).

Connection, repairs, and wiring inspections may only be implemented by a company (person) authorised to such activity. Expert connection must be confirmed on the warranty certificate.

Electric installation must comply with valid electrotechnical standards. Connection of the heater to electric network shall be executed following the plumbing fixture. In order to enhance the protection of connection in bathrooms

and shower inserts pursuant to ČSN 332000-7-701, the appliance is provided with a grounding terminal for connecting with a yellow-green protective conductor on minimum section 4 mm<sup>2</sup>.

Access to the electric part of the heater is enabled only upon disconnecting the heater from power supply and unscrewing the guard of the heater.

The degree of protection of electric parts of the heater is IP 45.

Respect rules of protection against electrical injuries in accordance with ČSN 33 2000-4-41.

## 10. PUTTING THE HEATER INTO OPERATION

Once connected to the water and power supply, the heater can be put in service.

Procedure:

- a) check the wiring and water supply;  
check correct position of the thermostat sensors, they have to be inserted all the way. The sensors must be inserted all the way in; first the operating and then the safety thermostat.
- b) open the hot water valve on the combination faucet;
- c) open the cold water inlet valve to the heater.
- d) As soon as the water starts running through the hot water valve, the heater is filled and the valve closes.
- e) Prior to putting the heater into operation, screw on the front heater guard which closes the access to the electric compartment of the heater.
- f) Turn on electricity using the front-end main switch which will activate the heater.

## 11. IMPORTANT NOTICES

- Without a confirmation of performed electrical and plumbing fixture issued by an authorised company the warranty certificate shall be void.
- You have to apply for approval of a local power supplier to connect the heater.
- All hot water outlets must be provided with a combination faucet.
- It is not allowed to handle the thermostat in any manner whatsoever, aside from temperature resetting with a control button.
- All electric installation handling, setting, and regulation feature exchange, may only be implemented by an authorised service company.

The thermal fuse must not be turned off. In case of thermostat defect, the thermal fuse interrupts electric power input to the heating element if the water temperature in the heater exceeds 99°C.

### **Disposal of packaging material and functionless product**

A service fee for providing return and recovery of packaging material has been paid for the packaging in which the water heater was delivered

was paid pursuant to Act No. 477/2001 Coll., as amended, at EKO-KOM a.s. The client number of the company is F06020274. Take the water boiler packages to a waste disposal place determined by the town. When the operation terminates, disassemble and transport the discarded and unserviceable heater to a waste recycling centre (collecting yard), or contact the manufacturer.



## 12. FUNCTIONAL DEFECTS

Defect			Failure
1.	Water in the tank is cold	LED is on	– Heating element failure
2.	Water in the tank is not warm enough	LED is on	– Heating element failure
3.	Water in the tank is cold	LED is not on	– thermostat failure – the safety fuse turned off electricity supply – power supply outside the heater discontinued
4.	Water in the tank does not correspond with temperature set	LED is on	– thermostat failure

Do not try to repair the failure yourselves. Seek either expert or service help. It does not take much for an expert to remove the defect. When making a repair appointment, report the type and serial number you find on the performance plate of your water heater.

## 13. FIRE-FIGHTING REGULATIONS FOR INSTALLATION AND USE OF HEATER

We would like to emphasise that the heater must not be connected to power supply if work involving flammable liquids (petrol, spot remover) or gases, etc., is performed nearby.

## 14. HEATER CLEANING AND ANODE ROD EXCHANGE

Repetitive water heating causes limestone sediment on both the enamelled tank walls and chiefly the flange lid. The sedimentation depends on the hardness of water heated, its temperature, and amount of hot water consumed.

**We recommend checking and cleaning the tank from scale and eventual replacement of the anode rod after two years of operation.** The anode life is theoretically calculated for two years of operation; however, it changes with water hardness and chemical composition in the place of use. Based on such an inspection, the next term of anode rod exchange may be determined. Have the company in charge of service affairs clean and exchange the anode. When draining water from the heater, the combination faucet valve for hot water must be open, preventing occurrence of under-pressure in the heater tank which would stop the water from draining.

## 15. INSTALLATION REGULATIONS

### Regulations and instructions that must be obeyed if the heater is connected

a) to the electrical network

ČSN 33 2180 - Connecting of electric devices and appliances

ČSN 33 2000-4-41 - Low voltage electric installations Protective measures to ensure safety – Protection against electric shock

ČSN 33 2000-5-51 - Electric installations of buildings

ČSN 33 2000-7-701 - Low voltage electric installations Single-purpose devices and devices in special premises - Premises with tub or shower to hot service water heating system

b) to the hot water heating system

ČSN 06 0320 - Thermal systems in buildings - Hot water preparation – Design and Project Engineering

ČSN 06 0830 – Thermal systems in buildings – Protecting devices

ČSN 73 6660 – Internal water conduits

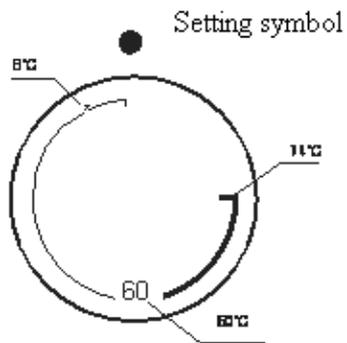
ČSN 07 7401 - Water and steam for thermal energy equipments with working steam pressure up to 8 MPa

ČSN 06 1010 - Tank water heaters with water and steam heating; and combined with electric heating Technical requirements. Testing.

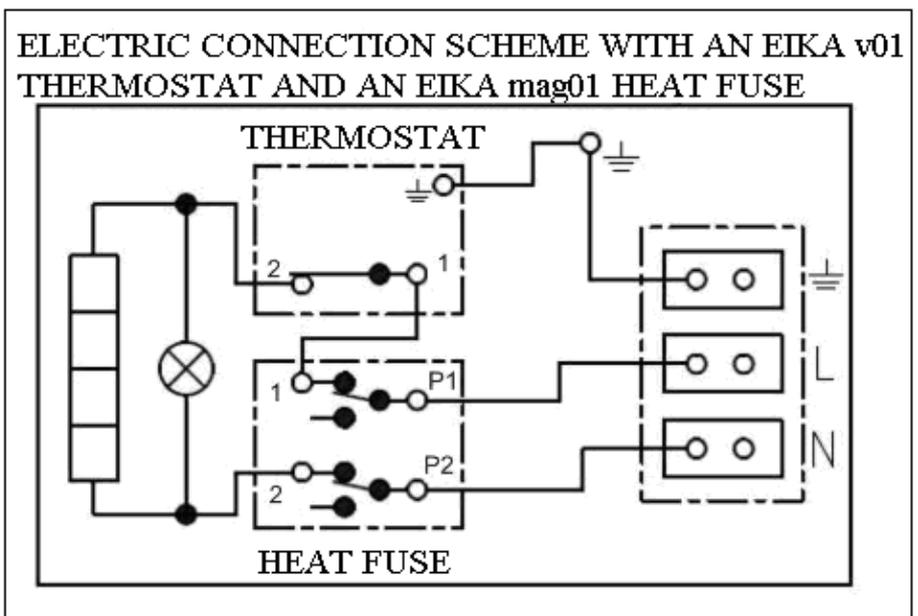
Both electric and water installation must follow and meet requirements and regulations relevant in the country of use.

**Fig. 1**

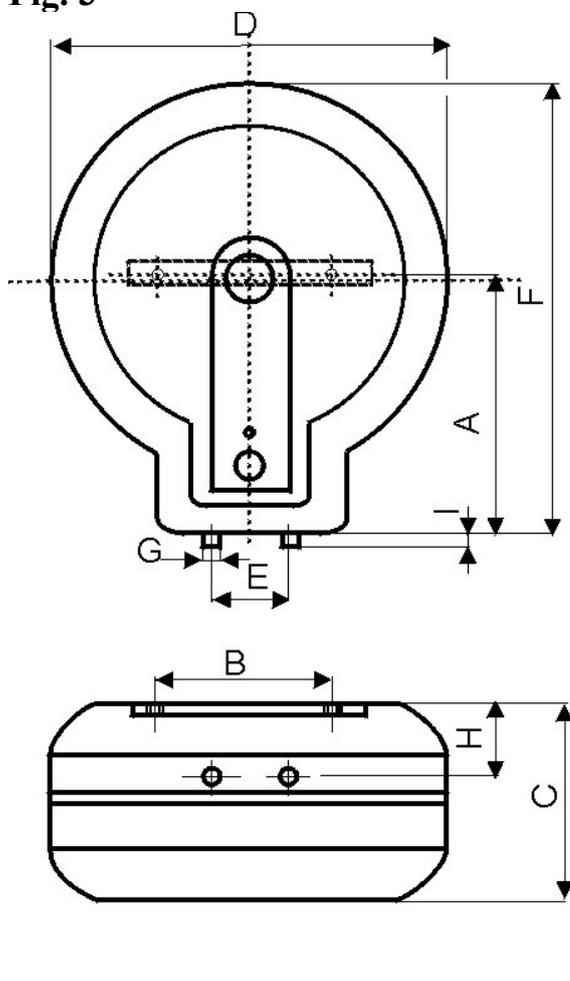
**Thermostat knob**



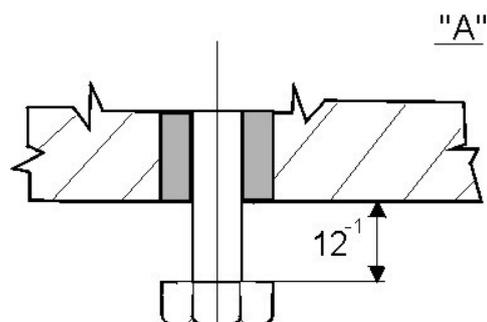
**Fig. 2**



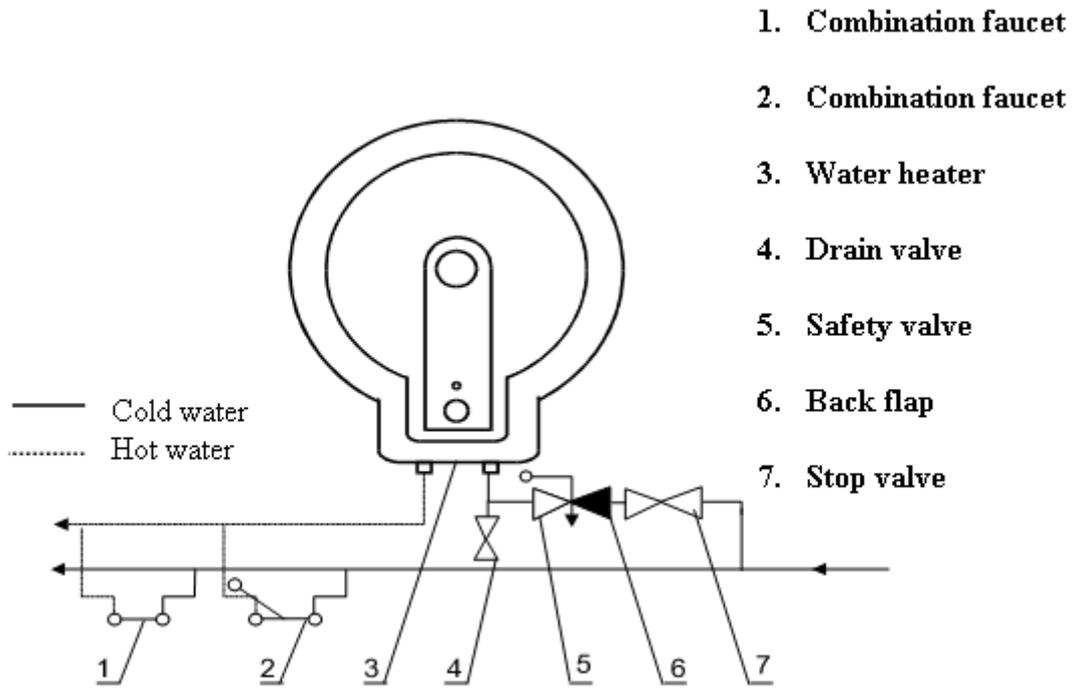
**Fig. 3**



A	335
B	180
C	246
D	500
E	100
F	581
G	1/2"
H	98
I	16



**Fig. 4**



05-2012