

Operation and installation manual

STORAGE WATER HEATERS WITH INDIRECT HEATING



MORA-TOP 100 NTR/HV

MORA-TOP 125 NTR/HV

MORA-TOP 160 NTR/HV

Read this manual carefully before installation of the heater!

Dear customer,

MORA-TOP s. r. o. would like to thank you for deciding to use a product from made by our brand.

By means of this manual we will familiarise you with the use, positioning, construction, maintenance and other information about the pressurised storage water heaters. The reliability and safety of the product is confirmed by tests performed by the Engineering Test Institute in Brno, certificate number B-30-00732-02 and also ITI TÜV, certificate number 35/03/07/02/0. **We hope that our product will serve to your complete satisfaction.**

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Type of environment:

We recommend use of the product in an internal environment with air temperature +2°C to 45°C and relative humidity of max. 80%.

Positioning:

The heater is positioned on the floor next to the source of heating water or in its close vicinity. All connection pipes are to be neatly fitted with thermal insulation.

1. DESCRIPTION OF FUNCTION

Indirect heating stationary heaters from the NTR and NTRR ranges are used for preparation of hot utility water in connection with another source of heating water, most frequently a gas boiler. In the case of NTRR types heating is ensured via a combination of two sources of heating water (gas boiler + solar system or heat pump). The nominal outlet ensures sufficient amounts of hot utility water even for large flats, business premises, restaurants and similar facilities **In the event of increased consumption of hot utility water, the storage heaters additionally heat water continuously and work in a similar manner to a flow heater.**

The producer reserves the right to make technical changes to the product.

The product is intended for permanent contact with drinking water.

2. INFORMATION FOR THE CONSUMER

Consumption of hot water

Consumption of hot water in the household is dependent on the number of people, amount of sanitary equipment, length, diameter and insulation of water main pipes in the flat or house and on the individual habits of the users.

Energy savings

The hot utility water storage vessel is insulated with high-quality polyurethane foam with no CFCs. Only set the temperature on the heater thermostat to the level you really need for operation in the household. In doing so you will decrease consumption of electrical energy, the amount of lime scale on the walls of the vessel and on the exchanger.

Advantages of using an indirect heater

- Simple installation and connection to the source of heating water.
- Very fast heating of hot utility water
- The enamelled steel vessel ensures all hygiene requirements for quality of hot utility water.
- The built-in Mg anode increases resistance to corrosion.
- The high-quality polyurethane insulation ensures minimum heat loss.
- Fluently settable temperature of hot utility water up to 80°C
- Connection of several consumption points.
- In the case of types with two exchangers, the option to use two sources of heating water or through their interconnection, to gain double the exchange surface of the exchanger.
- Light signalling of heater operation.
- Precise control of the temperature of the hot utility water.
- Option for connection to hot utility water circulation

3. TECHNICAL DESCRIPTION

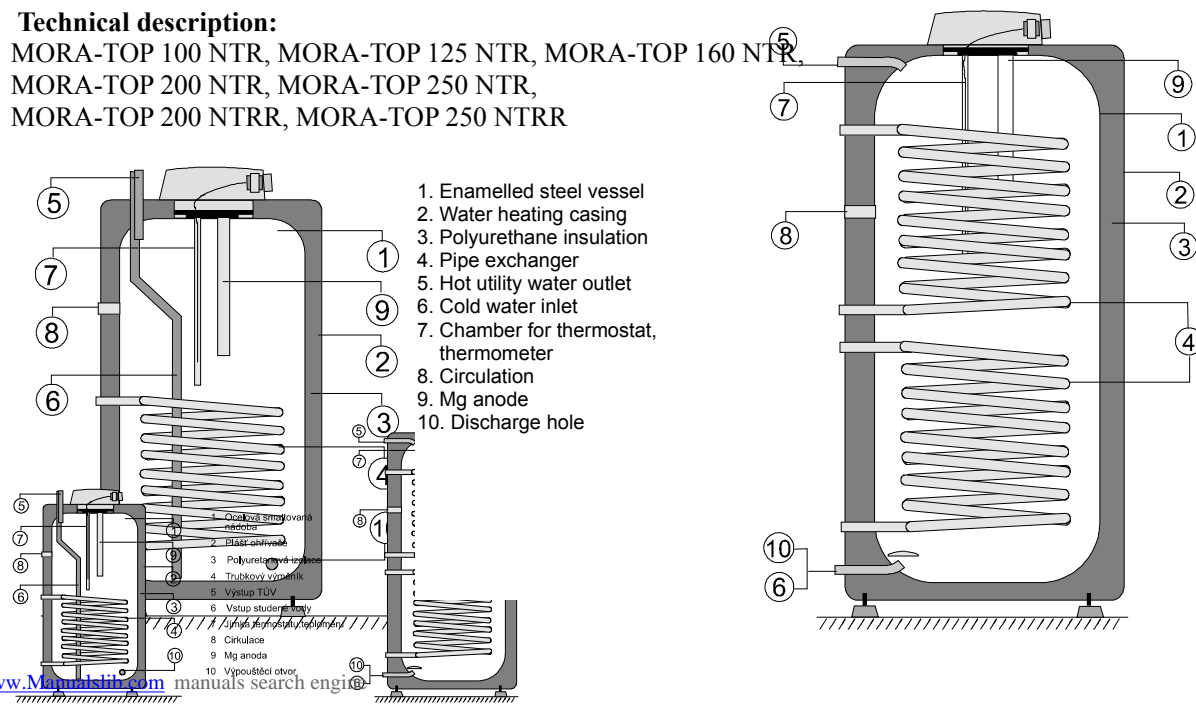
The heater vessel is made of steel sheeting and tested for overpressure of 0.9 MPa. The inside of the vessel is enamelled. A flange is welded to the bottom of the vessel to which a flange lid is screwed. There is an o-ring between the flange lid and the flange.

The flange lid contains chambers for positioning of sensors for regulation of the thermostat and thermometer. An anode bar is mounted on an M8 nut. The water heater is insulated with stiff polyurethane foam. The electrical equipment is located under the removable plastic cover. Water temperature can be set using the thermostat.

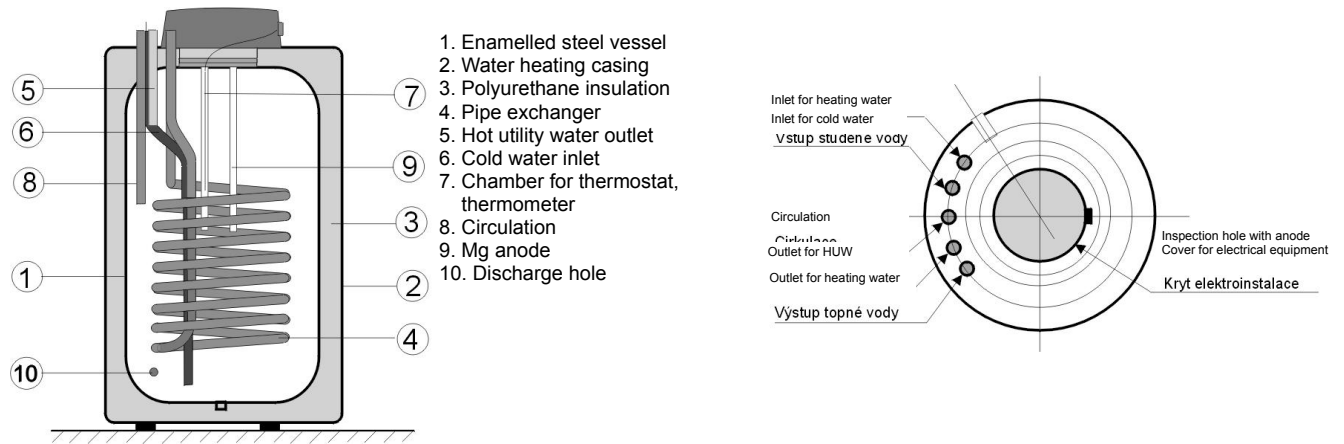
A heat exchanger (exchangers) has been **prepared** in the pressure vessel.

Technical description:

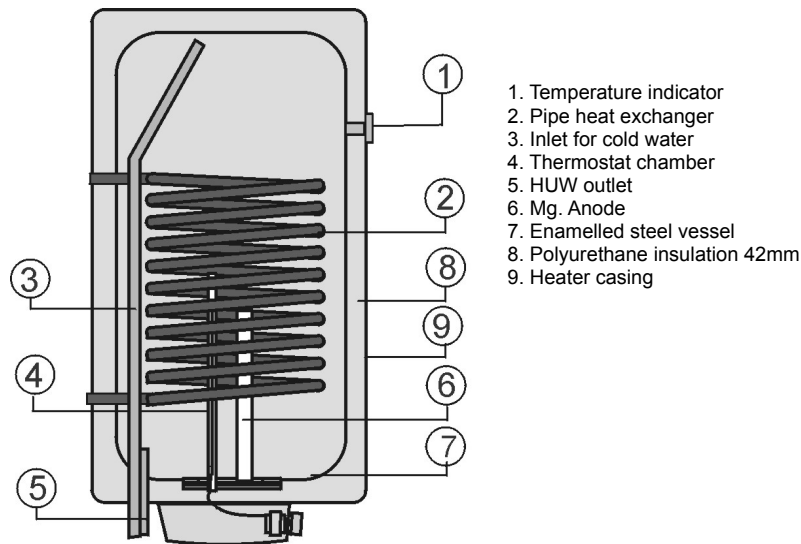
MORA-TOP 100 NTR, MORA-TOP 125 NTR, MORA-TOP 160 NTR,
MORA-TOP 200 NTR, MORA-TOP 250 NTR,
MORA-TOP 200 NTRR, MORA-TOP 250 NTRR



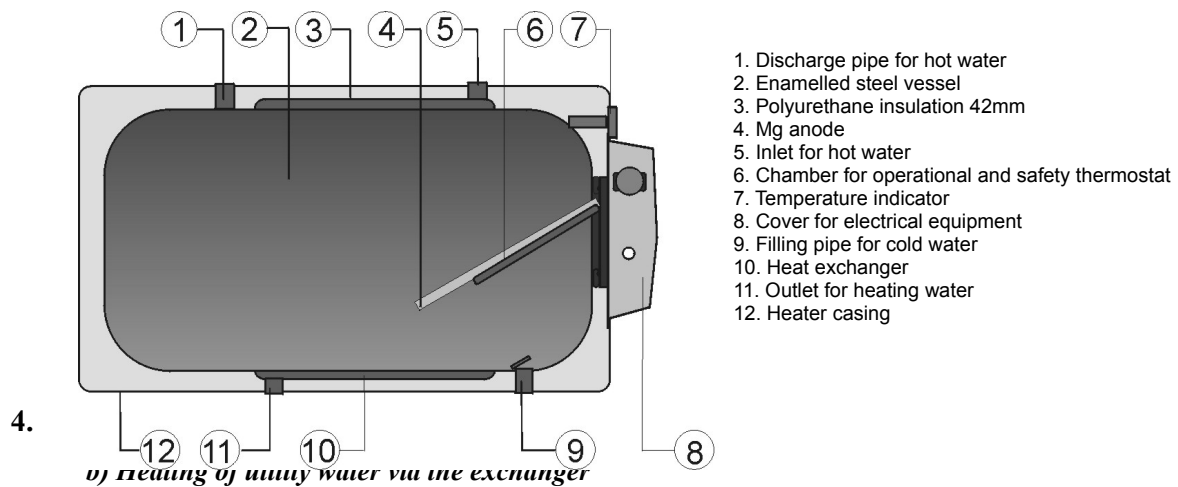
Technical description: MORA-TOP 100 NTR/HV, MORA-TOP 125 NTR/HV, MORA-TOP 160 NTR/HV



Technical description: MORA-TOP 100 NTR/Z, MORA-TOP 125 NTR/Z, MORA-TOP 160 NTR/Z, MORA-TOP 200 NTR/Z



Technical description: MORA-TOPV125 NTR, MORA-TOPV 160 NTR, MORA-TOPV 180 NTR, MORA-TOPV 200 NTR



The shut-off valve by the exchanger must be open and thus the flow of heating water ensured from the hot water heating system.

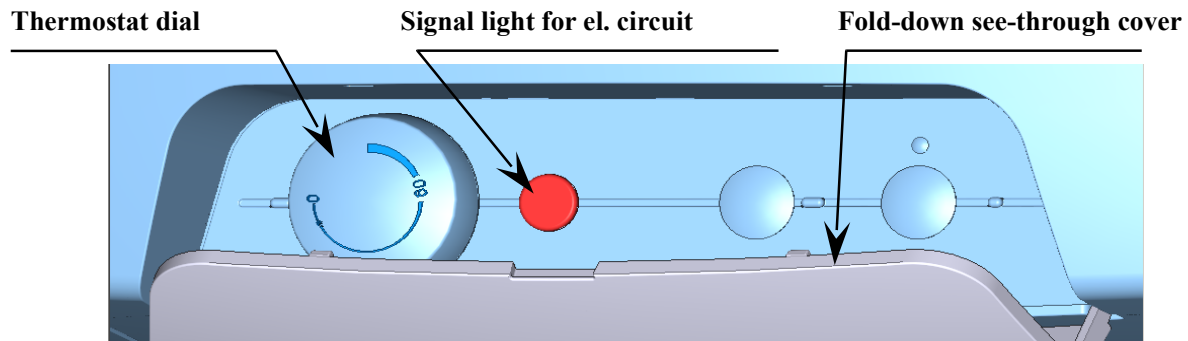
It is recommended that an air release valve is fitted together with the shut-off valve on the inlet to the exchanger, which according to requirement, especially at the beginning of the heating season, can be used to vent the exchanger (fig. 1).

The period for heating required by the exchanger is dependent on the temperature and flow rate in the hot water heating system. The combined heater is produced in a universal design – fitting of a shut-off valve to the heating insert from the right or the left (fig. 1).

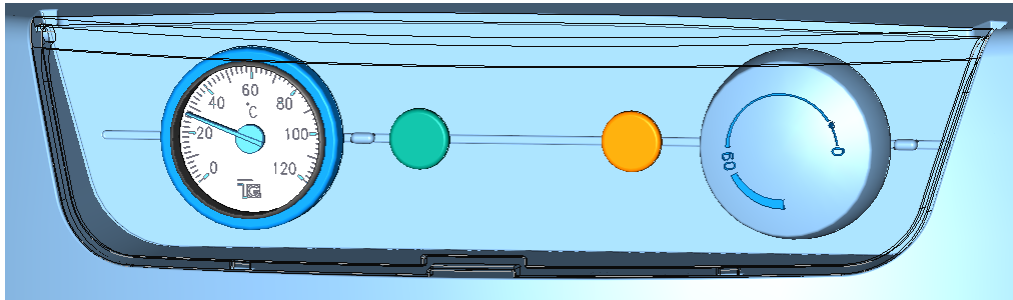
5. OPERATION

Operating controls for heaters with volumes of 50 to 160L are located under the see-through cover of the control panel.

HEATER PANEL FOR MORA-TOP NTR / Z and MORA-TOPV NTR with volumes of 50 to 160L

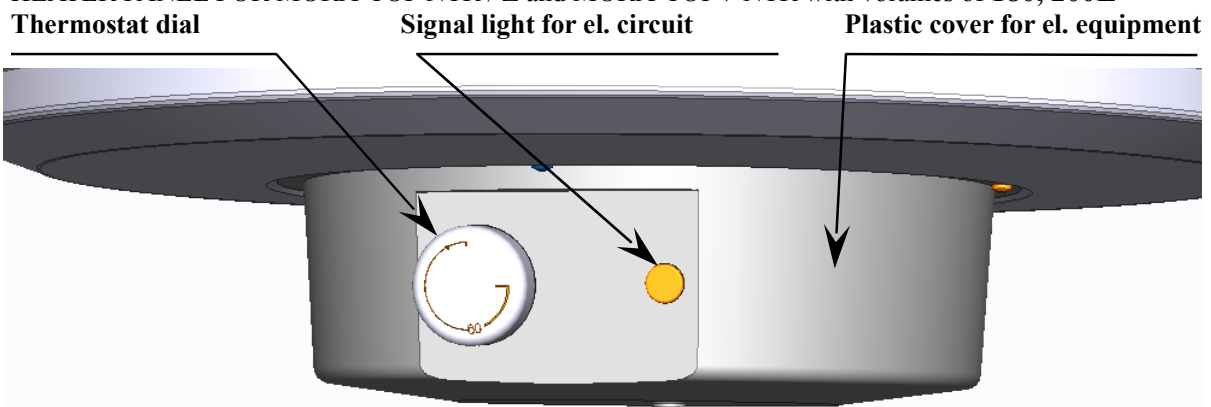


HEATER PANEL FOR MORA-TOP NTR and MORA-TOP NTR / HV with volumes of 50 to 160L

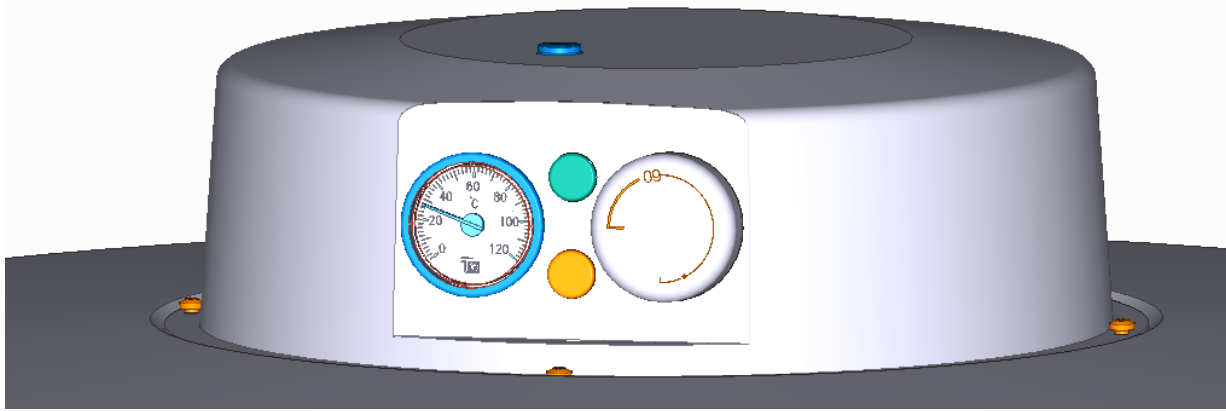


Operating equipment for heaters with volumes of 180, 200 and 250L

HEATER PANEL FOR MORA-TOP NTR / Z and MORA-TOPV NTR with volumes of **180, 200L**



HEATER PANEL FOR MORA-TOP NTR **200 and 250L** and MORA-TOP 160 NTR / HV



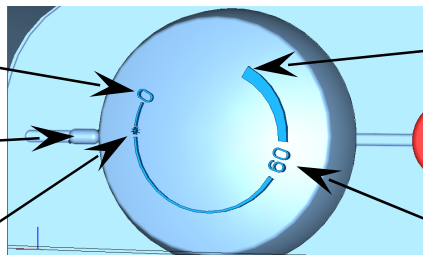
Setting the temperature

The water temperature is set by turning the thermostat dial. The required symbol is set in relation to the fixed point on the control panel.

Lower border of heat range (around 5°C)

Fixed point on control panel

Temperature “anti-freeze” (around 12°C)



Upper border of heat range (approx. 76 to 80°C)

“Optimum” temperature (around 60°C)

Warning: setting the thermostat dial as far to the left as possible does not mean that the heating element is permanently switched off.

On operation of the heater without blocking of the daily rate, we do not recommend the temperature being set above the level of 65°C.

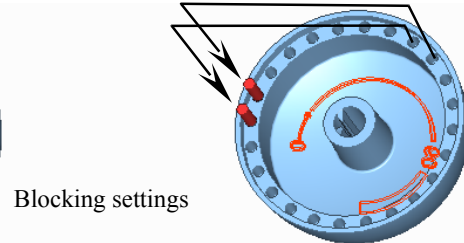
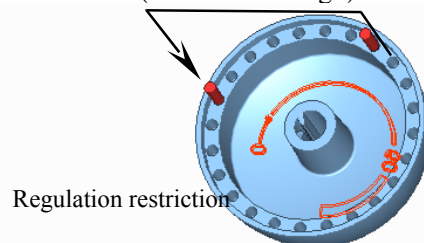
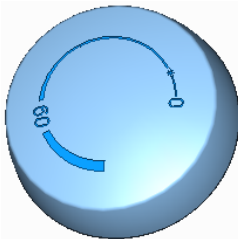
Select the maximum symbol “60”.

Restriction of the regulation range; blocking settings (only applies to volumes 50 to 160L).

Due to various safety reasons (unwanted scalding, prevention of manipulation by children or an unauthorised person) the range of regulation can be **restricted** or **blocked** by setting the thermostat.

Restriction of regulation – pull off the thermostat dial (this will be quite difficult the first time),

- You will find two $\phi 2.15\text{mm}$ cylindrical pegs on the reverse side
- Pull out one peg and insert it into the appropriate hole for the selected maximum temperature.
- Refit the dial (as far as it will go).



Blocking settings - Set the selected temperature
Pull off the dial without changing the setting, you will find two pegs on the reverse side, pull both of these out and insert them into the holes corresponding to the selected temperature in such a way that there is no hole in the space between the pegs and the position is opposite the set temperature.

6. MOUNTING ON A WALL (only applies for NTR/Z and MORA-TOPV NTR)

Before mounting the product, the load bearing capacity of the wall must be checked and a suitable mounting bracket must be chosen according to the type of wall, or if necessary, the wall may need to be reinforced. Water heaters from the NTR/Z range are only to be mounted in a vertical position in such a way that the bottom edge of the heater is positioned at least 600mm above the floor (figs. 4 and 5). Only install water heaters from the MORA-TOPV NTR range in a horizontal position so that from the front view the right edge of the heater is positioned at least 600mm from the opposite wall (figs. 4 and 5).

In the case of combined heaters, it is necessary before mounting onto the wall, to fit a bend to the inlet and outlet for heating water and to determine mounting from the right or from the left by turning this (fig. 1).

With a view to the different types of supporting brickwork and wide range of special brackets available on the market, **we do not supply** the heater with this material. Mounting systems must be selected individually subject to the conditions. We recommend **mounting on the wall** and to leave mounting **to a specialist company** or to **discuss mounting with a specialist**.

7. PLUMBING INSTALLATION

Connection of heaters to plumbing fittings is illustrated in figs. 1 and 2. In the event of disconnection of the heater, 3/4" screw connections must be fitted to the inputs and outlets for utility water. If the hot utility water distribution mains is equipped with a circulation circuit, the "return" is connected to the inlet marked CIRCULATION.

Types 100, 125 NTR and 100, 125, 160 NTR / HV are equipped with a discharge outlet. In the case of type 160, 200 and 250 NTR(R) a "T" fitting must be attached to the hot utility water inlet with a discharge valve.

For operation, the heater must be equipped with a pressure relief valve. The pressure relief valve is fitted on the input for cold water marked with a blue circle. There must be no stop valve fitted between the heater and the pressure relief valve. **On fitting, follow the instructions of the manufacturer of this pressure relief equipment.**

The pressure relief valve must be checked every time it is set into operation. The check is performed by manually pulling away the membrane from the valve seat. Correct functioning of the make-and-break device is displayed by water flowing out via the waste water spout on the pressure relief valve. During regular operation, this check must be carried out at least once a month and always after the heater has been put out of operation for longer than 5 days.

Water may drip from the pressure release valve via the discharge pipe, the pipe must be freely opened to the atmosphere, positioned end to end facing downwards and must be in an environment free from temperatures below the freezing point.

If there is greater excess pressure in the input pipe (even temporarily) than 0.6 MPa, a reduction valve must be fitted before the pressure release valve.

Hot utility water is taken off via the mixer tap from the discharge pipe marked with a red circle. For longer hot water distribution pipes, it is suitable to insulate the pipes in order to decrease heat loss. All outlets must be fitted with mixer taps for the option of setting the required temperature. **The heater must be fitted with a discharge valve** at the input for cold utility water to the heater (fig. 1) for possible dismounting or repair.

Installation must correspond to valid regulations and ČSN.

For correct **setting of the pressure control valve** we recommend that the pressure in the valve is **20% lower than the opening excess pressure in the pressure relief valve.** (i. e. 0,48 MPa) .

We recommend the shortest possible hot water pipe from the heater so as to minimise heat loss.

8. CONNECTION OF THE INDIRECT HEATER TO A HOT WATER HEATING SYSTEM (fig. Examples of connection... + fig. 1)

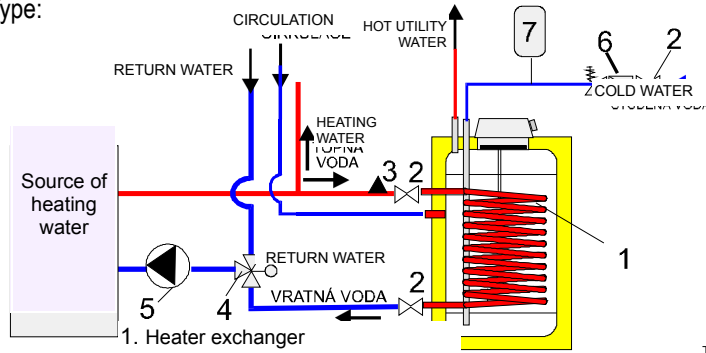
It is advisable to fit cut-off valves to the inlet and outlet for heating water (for possible disassembly of the heater). The valves should be as close to the heater as possible in order to preclude larger levels of heat loss. The heating circuit is connected to the marked inlets on the heater exchanger and an air relief valve is installed in the highest position. A filter must be installed into the circuit for protection of the pumps, the three-way valve, the backflow valve and to stop the exchanger becoming clogged. We recommend that the heating circuit is flushed out before installation. All connection mains should be properly equipped with heat insulation.

If the system is to be operated with priority heating of hot utility water with the aid of a three-way valve, always proceed during installation according to the instructions of the manufacturer of the three-way valve.

Examples of connection of the heater to a water mains and heating system

TYP: OKC 100 NTR, OKC 125 NTR, OKC 80 NTR/Z,
OKC 100 NTR/Z, OKC 125 NTR/Z

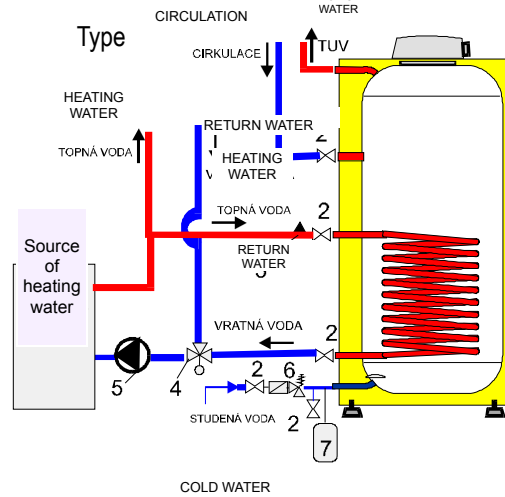
Type:



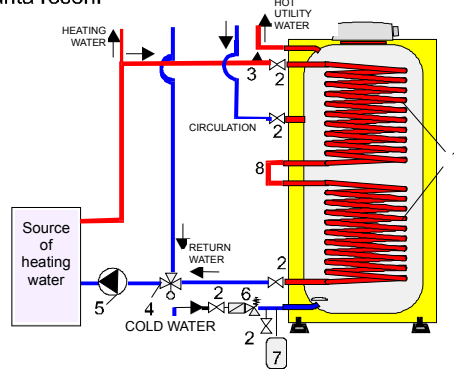
1. Heater exchanger
2. Cut-off valve
3. Bleeder valve
4. Three-way valve
5. Circulation pump
6. Pressure relief valve with backflow valve
- 7.* Expansion vessel

* Use of an expansion vessel is not a condition for correct connection, only an alternative solution.

TYP: OKC 160 NTR, OKC 200 NTR, OKC 250 NTR,
OKC 160 NTR/Z, OKC 200 NTR/Z



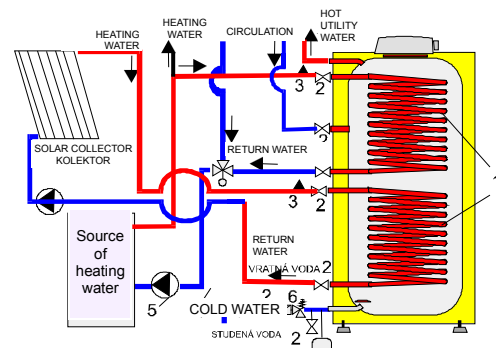
* Použití expanzního nádrže není podmínkou správné instalace, ale pouze možná varianta řešení
Connection of exchangers in series



- LEGEND
1. Heater exchanger
 2. Cut-off valve
 3. Bleeder valve
 4. Three-way valve
 5. Circulation pump
 6. Pressure relief valve with backflow valve
 - 7.* Expansion vessel
 8. Connection

* Use of an expansion vessel is not a condition for correct connection, only an alternative solution.

Two sources of heating water



* Use of an expansion vessel is not a condition for correct connection, only an alternative solution.

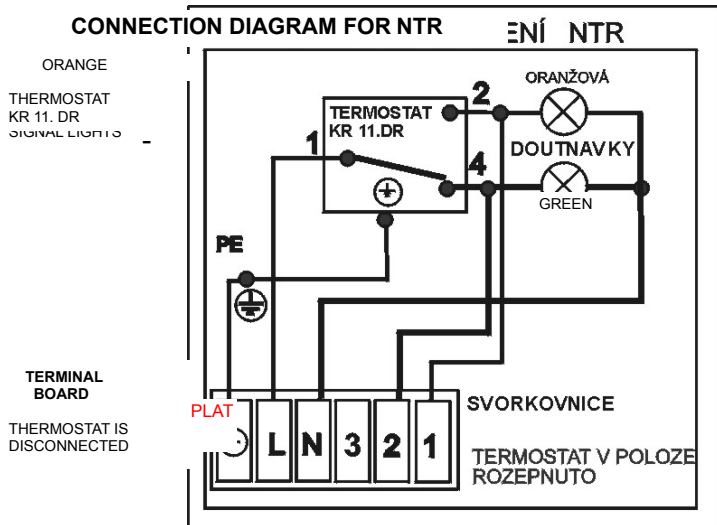
9. ELECTRICAL INSTALLATION

Electrical connection of the heater:

ale pouze možná varianta řešení

MORA-TOP 100 NTR, MORA-TOP 125 NTR, MORA-TOP 160 NTR, MORA-TOP 200 NTR,
MORA-TOP 200 NTRR, MORA-TOP 250 NTRR,
MORA-TOP 100 NTR/HV, MORA-TOP125 NTR/HV, MORA-TOP160 NTR/HV

Check that the thermostat sensors are inserted in the chamber, i.e. pushed in as far as they will go.
The heater can be connected to any boiler for hot water heating with outlet of up to 50 kW, which is controlled by a spatial thermostat with voltage 230 V/50Hz. The heater is connected electrically directly from the boiler with control voltage of 230 V/50Hz. Connection can be accomplished using a CYSY 4C x 0.75 flexible cable. Terminal clamps are marked on the terminal board on the heater.



voltage at clamp 2 when heater is heated

- voltage at clamp 1 when heater is not heated

On installation in bathrooms, showers and wash rooms, procedure must be followed according to ČSN 33 2000-7-701

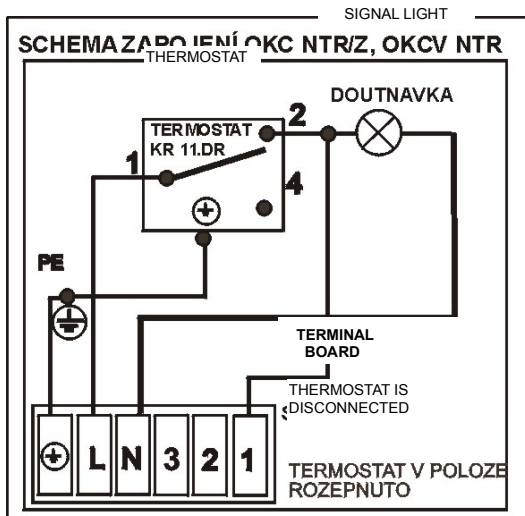
A remote bulb thermometer is located on the thermometer for checking of the water temperature, also controls for a remote bulb thermostat for setting of the required temperature

and two signal lights "green" to show that the heater is heating and "orange" to show that the heater has heated up.

Electrical connection

MORA-TOP 100 NTR/Z, MORA-TOP 125 NTR/Z, MORA-TOP 160 NTR/Z, MORA-TOP 200 NTR/Z
MORA-TOPV 125 NTR, MORA-TOPV 160 NTR, MORA-TOPV 180 NTR, MORA-TOPV 200 NTR

CONNECTION DIAGRAM FOR - MORA-TOP NTR/Z, MORA-TOPV NTR



The heater can be connected to any boiler for hot water heating with output up to 50 kW, which is controlled by a spatial thermostat with voltage of 230 V/50Hz. The heater is electrically connected directly from the boiler with a control voltage of 230 V/50Hz. A CYSY 4C x 0,75 flexible cable can be used for connection. Terminal clamps are marked on the heater terminal board.

- voltage at clamp 1 when heater is not heated

10. SETTING THE HEATER INTO OPERATION

After connection of the heater to the water mains, hot water heating system, el. network and after testing of the pressure relief valve (according to the instructions that came with the valve), the heater can be set into operation.

Procedure:

- a) Check the water mains, electrical installation and in the case of combined heaters also the installation for the hot water heating system. Check to the correct positioning of the sensors for the operational thermostats. The sensors must be pushed all the way into the chamber as far as they will go.
- b) Open the hot water valve on the mixer tap
- c) Open the valve in the inlet pipe for cold water to the heater
- d) As soon as water begins to spill out of the valve for hot water, filling of the heater is complete and the valve should be closed
- e) If any leak is apparent (the flange lid), we recommend you tighten the screws on the flange lid
- f) Screw on the cover for the electrical equipment
- g) When operating heating of utility water using heat energy from the hot water heating system, open the valves at the inlet and outlet for heating water and if necessary vent the exchanger
- h) On setting the heater into operation, flush out the heater until the cloudiness has disappeared.

11. CLEANING THE HEATER AND REPLACEMENT OF THE ANODE BAR

Through repeated heating of water, lime scale is deposited on the walls of the vessel and above all on the lid of the flange.

The level of deposit is dependent on the hardness of the heated water, its temperature and on the amount of hot water consumed.

We recommend a check and if necessary cleaning of the lime scale from the vessel after two years of operation as well as replacement of the anode bar if necessary. The life span of the anode is theoretically calculated for two years of operation although this does vary depending on the hardness and chemical composition of the water in the location where the heater is used. It is possible to determine the date for next replacement of the anode bar on the basis of this inspection. Leave cleaning and exchange of the anode to a company, which performs service work. When releasing water from the heater, the valve on the mixer tap for hot water must be open so no low air pressure is created in the heater vessel, which would restrict the water from escaping.

12. IMPORTANT NOTICE

- ☞ The MG anode must be regularly checked and replaced
- ☞ **There must be no stop valve fitted between the heater and the pressure relief valve.**
- ☞ In the event of excess pressure in the water mains in excess of 0.6 MPa a reduction valve must be fitted before the pressure relief valve.
- ☞ All outlets for hot water must be fitted with mixer taps.
- ☞ Before water is allowed into the heater for the first time, we recommend a check is made on the tightness of the nuts on the flange joints of the vessel.
- ☞ Any handling of the thermostat apart from setting of the temperature using the control dial is forbidden.
- ☞ All work on the electrical equipment, setting and replacement of regulation elements must be performed by a professional service business.

Disposal of packaging material

A service charge has been paid for the packaging in which the water heater



was delivered to ensure return and use of the packaging material.
The service fee was paid according to law no. 477/2001 Coll. as amended by later regulations with EKO-KOM a.s.
The company client number is F06020274.
Deposit the packaging from the water heater in the location intended for disposal of waste.

Disposal of a water heater that has come to the end of its useful life

Heaters that have been taken out of service and are non-functioning are to be dismantled when their operation has finished and sent to the waste recycling centre (collection yard). Alternatively, contact the manufacturer.

13. FIRE REGULATIONS FOR INSTALLATION AND USE OF THE HEATER

We would like to point out that the heater must not be switched on in the electricity network if work is performed with combustibles (petrol, stain removers), gasses and similar in its vicinity.

14. INSTALLATION REGULATIONS

Regulations and directives, which must be adhered to when mounting the heater

- a) Concerning the heating system
 - ČSN 06 0310 – Ventral heating, design and mounting
 - ČSN 06 0830 - Safety equipment for central heating and heating of hot utility water

- b) Concerning the electrical network
 - ČSN 33 2180 – Connection of electrical equipment and appliances
 - ČSN 33 2000-4-41 - Electronic equipment
 - ČSN 33 2000-7-71 - Areas with a tub
 - EN 297 – Regulators, temperature device

- c) Concerning the hot utility water heating system
 - ČSN 06 0320 – Heating of utility water
 - ČSN 06 0830 – Safety equipment for central heating and heating of hot utility water
 - ČSN 73 6660 – Internal water mains
 - ČSN 07 7401 – Water and steam for heat energy equipment with operational overpressure
Of steam up to 8 MPa
 - ČSN 06 1010 – Storage water heaters with water and steam heating and combined heaters with electric heating. Technical requirements and testing.
 - ČSN 73 6655 - Circulation mains

15. MOST FREQUENT FUNCTIONAL DEFECTS AND THEIR CAUSES

Water is dripping from the air relief valve – the glow lamp is not lit – defective air relief valve, high inlet water pressure

Do not try to remove defects yourself. Call in either specialists or service technicians. Specialists often require only a small amount of work to remove defects. When arranging for repair work, state the type designation and serial number, which you will find on the rating plate of your water heater.

16. PRODUCT ACCESSORIES

The product comes with a G3/4" air relief valve and in the case of types MORA-TOP 100, 125 NTR, MORA-TOP 100, 125, 160 NTR/ HV also with a discharge valve

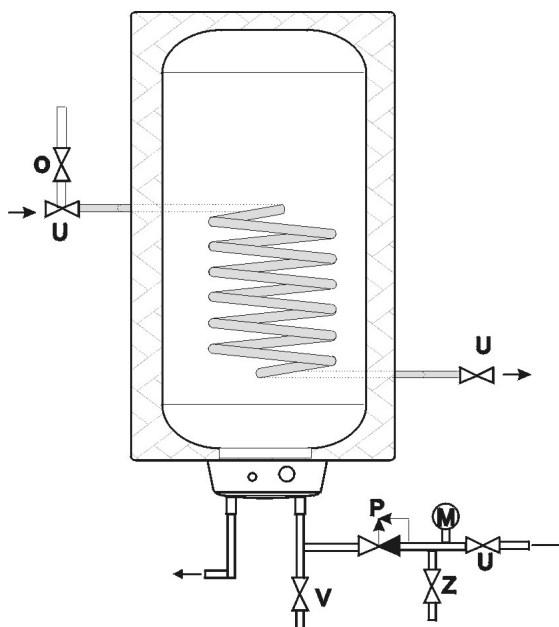
It is in your own interest to check the completeness of the delivery.

Water heater pressure and heat loss

TYPE	FLOW OF HEATING WATER (l/h)	PRESSURE LOSS (mbar)	kW/24h
OKC 100 NTR	720	33	0,9
OKC 125 NTR			1,05
OKC 160 NTR			1,4
OKC 200 NTR			1,8
OKC 250 NTR			2,1
OKC 200 NTRR	2x 33	2x 33	1,8
OKC 250 NTRR			2,1

Fig. 1

Connection of the heater exchanger (left, right) and taps for inlet of cold water

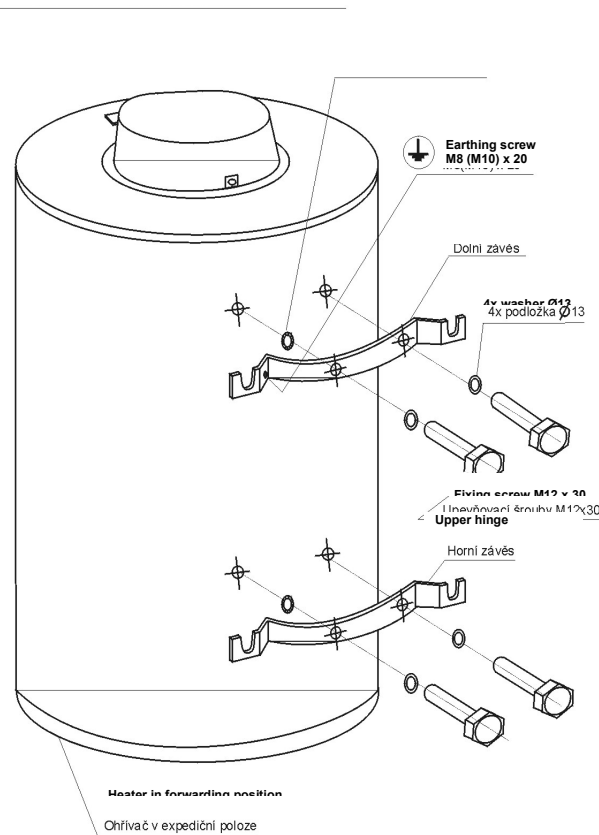


- O - Air relief valve
- U - Stop valve
- P - Pressure relief valve with backflow valve
- M - Manometer
- Z - Test valve
- U - Discharge valve

Fig. 2

Mounting of hinges and temperature indicator on the heater

Insert the indicator into the hole in the heater casing in the direction of the arrow.
(The indicator is part of the heater and can be found in the upper part of the packaging)



Connection to the cold water feed must correspond to ČSN 060830

Technical data

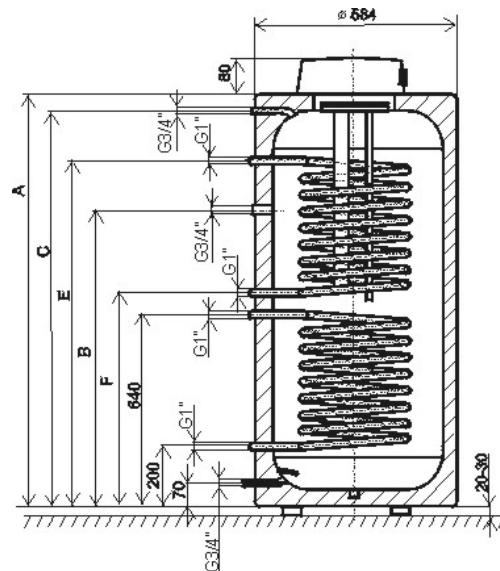
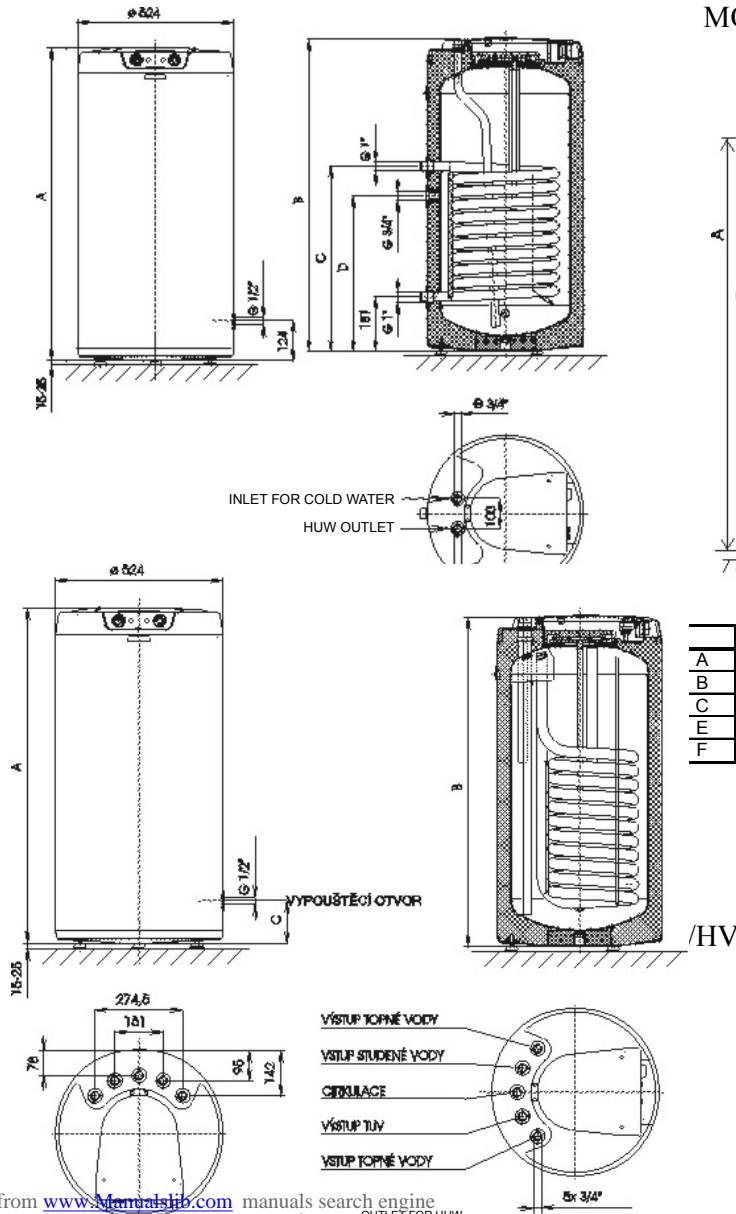
Type		100 NTR/HV	125 NTR/HV	160 NTR/HV
Volume	l	95	120	155
Max. operational excess pressure in the vessel	MPa	0,6		
Max. operational excess pressure in the exchanger	MPa	1		
Electrical connection of control elements		1 PE-N 230V/50Hz		
Electrical protection		IP 44		
Max. temperature of HUW	°C	80		
Recommended temperature of HUW	°C	60		
Max. weight of heater without water	kg	70	82	86
Heat transfer area of the exchanger	m ²	1,08	1,45	1,45
Rated useful heat at a temperature of heating water of 80°C and flow of 720 l/h	W	24000	32000	32000
Heating time with exchanger from 10 to 60°C	min	14	14	17
Heat loss	kWh/24h	0,9	1,1	1,39

Heater dimensions

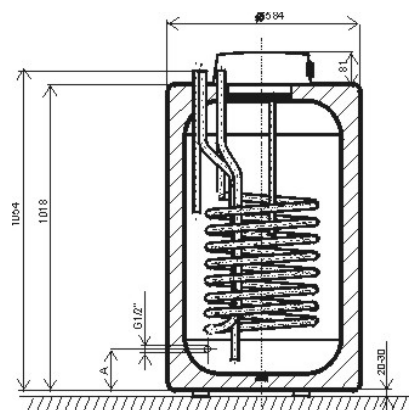
MORA-TOP 100 NTR, MORA-TOP 125 NTR
TOP 200 NTR, MORA-TOP 250 NTR

MORA-TOP 160 NTR, MORA-

MORA-TOP 200 NTRR, MORA-TOP 250 NTRR

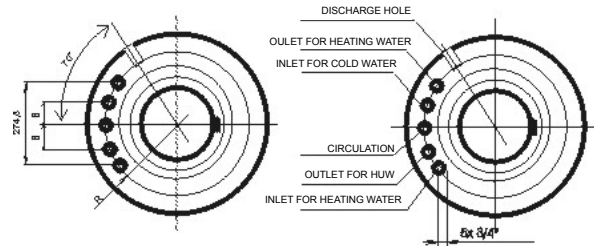


	OKC 200 NTR	OKC 200 NTRR	OKC 250 NTR	OKC 250 NTRR
A	1330	1330	1508	1508
B	940	940	1050	1050
C	1270	1270	1448	1448
E	-	1140	-	1318
F	-	700	-	878



DISCHARGE HOLE

OUTLET FOR HUW

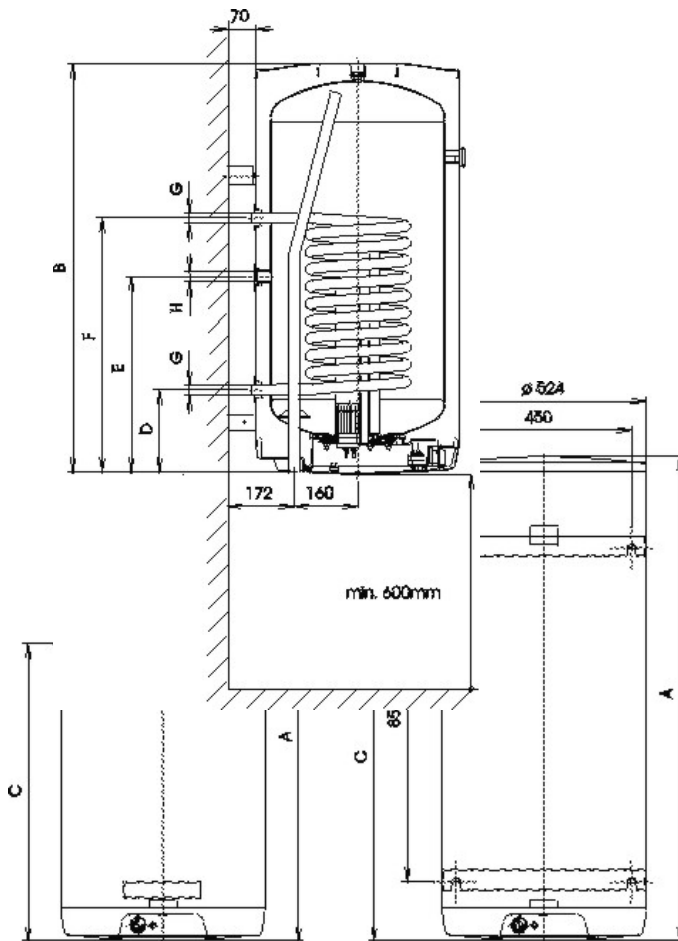


	OKC 100 NTR/HV	OKC 125 NTR/HV
A	881	1046
B*	876	1041
C	124	124

	OKC 160 NTR/HV
A	129
B	73
R	204

*Height from lower edge of the heater to the end of the water inlet and outlet pipes

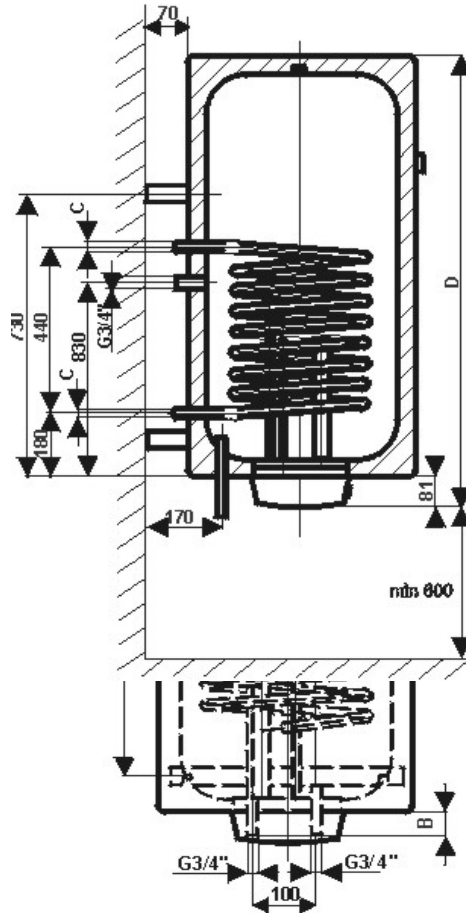
MORA-TOP 80 NTR/Z, MORA-TOP 100 NTR/Z
MORA-TOP 125 NTR/Z, MORA-TOP 160 NTR/Z



HORNI ZAVES A OPERA
Upper hinge and mounting
80l, 100l, 125l

HORNI ZAVES A SPODNI ZAVES
160l, 4 KOTEVNI ŠROUBY

MORA-TOP 200 NTR/Z



Upper hinge and lower hinge
180l, 200l
4 anchor screws

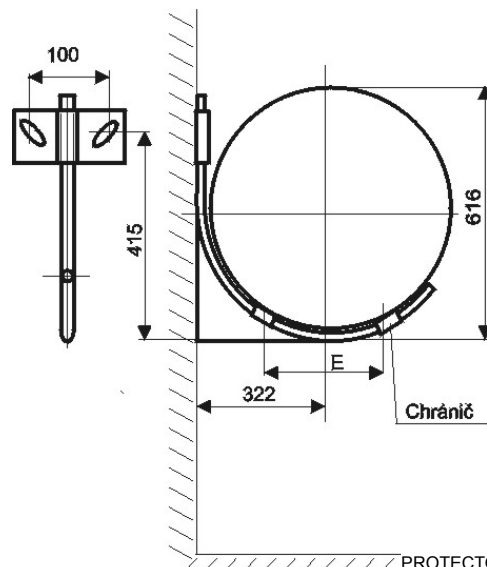
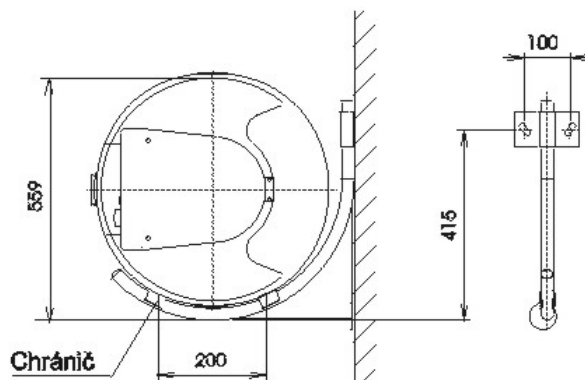
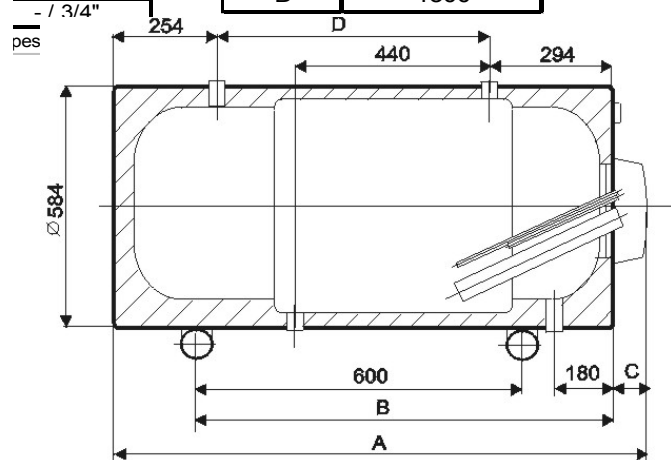
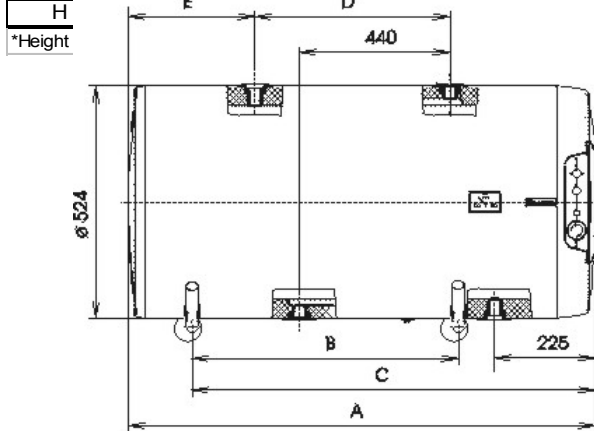
Dimensions 450 and 600 mm open before drilling

Upper hinge and lower hinge
160l, 4 anchor screws

Dimensions 450 and 600 mm open before drilling

Type	OKC 80 NTR/Z	OKC 100 NTR/Z	OKC 125 NTR/Z	OKC 160 NTR/Z
A	736	881	1046	1235
B*	731	876	1041	1230
C	615	636	801	1005
D	211	261	261	261
E	-	551	551	831
F	501	701	701	651 / 701
G	3/4"	1"	1"	3/4" / 1"
H	- / 3/4"			

Type	OKC 200 NTR/Z
A	488
B	75
C	1"
D	1300



Type	OKCV 125	OKCV 160
A	1046	1235
B	600	700
C	908	1008
D	225	225
E	281	230
F	440	671

All inlets and outlets have an internal G 3/4" thread.

Type	OKCV 180 NTR	OKCV 200 NTR
A	1200	1300
B	855	870
C	81	81
D	571	671
E	240	240

All inlets and outlets have an internal G 3/4" thread.

August 2006