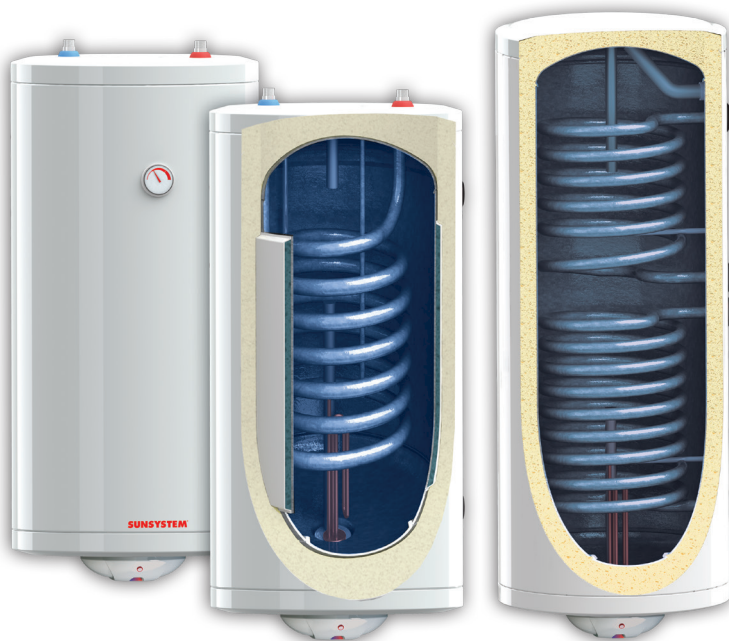


SUNSYSTEM®

WALL-HUNG WATER HEATERS

Vertical and Horizontal Modifications

50 L, 80 L, 100 L, 120 L, 150 L, 200 L



TECHNICAL PASSPORT. INSTALLATION and OPERATION MANUAL

EN

Version 3.0

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INTRODUCTION

NES Ltd. with Head Office in Shumen, Bulgaria, is specialized in manufacturing of alternative energy sources. Two hundred highly qualified employees work for this company. The company has production facilities of its own which take an area of 30,000 square meters. Many times our products have been awarded with gold medals at the International Fair Plovdiv. In 2004 our production was certified under the Quality Management System ISO 9001:2000, and in 2005 it got certificates CE and TUV.

For several years now the company has been manufacturing and selling sun systems with the trademark **SUNSYSTEM**. These products find better and better realization both on Bulgarian and international markets. The company has a distribution network all over the country which consists of 52 distributors and 100 retailers. At that moment **NES Ltd.** has subsidiaries in Italy, Spain and Romania. We sell our products in many countries in Europe, Asia and Africa.

Dear Customers,

We strongly hope that the appliance you have bought from us will contribute to creating comfort at your homes and decreasing the energy expenditure. This User Manual includes technical description of the unit you have bought and operation instructions. It has

been prepared to make you familiar with the installation, operation and maintenance of the water heater. Observing the instructions of this Manual is in the interest of the customer, and it is one of the guarantee terms and conditions. These water heaters are used to provide hot water at home. They shall be combined with solar panel collectors or a boiler. They provide hot water for a great number of consumers in case of central distribution of the hot water.

Wall-hung water heaters Model MB NL S1/ BB NL S2 are respectively with one or two built-in heat-exchanger coil/coils for connection to solar system and/or heating boiler.

All products are manufactured in compliance with all safety and quality directives of European Union.

Advantages:

- Highly effective insulation:
Rigid PPU with thickness **20 mm** for models MB NL.
Rigid PPU with thickness **32 mm** for models BB NL.
- Great heat exchange surface of the coils, which provides quick and effective heat transfer.
- These water heaters combine two independent heat sources (boiler and sun system) in a low capacity water container.

1. REQUIREMENTS FOR INSTALLATION

1.1. Installation of the boiler in a room

- The temperature in the room where the appliance is installed must always exceed 0 °C.
- There must be a siphon on the wastewater installation.
- The position of the appliance must be in accordance with its degree of protection against water penetration, marked on the plate with its technical data. The boiler must not be directly sprayed or flooded with water.
- The length of the connecting pipes from the boiler to the consumer should be as short as possible in order to reduce heat losses.
- It is obligatory to leave a distance between the appliance and the surrounding walls in order for it to be unobstructedly inspected and tied to the

installation.

- The orientation for mounting the water heater contained in the model name - V - vertical and H - horizontal mounting, should not be changed. Horizontal models are always mounted with the electrical part on the left.
- The boiler is fixed to the wall of the room by means of steel bolts (studs) with a diameter of 10-12 mm, which are firmly fixed in the wall. It is forbidden to install the water heater to decorative walls.

1.2. Connecting the boiler to the plumbing.

- The installation to which the boiler is connected and the elements included in it must withstand a continuous temperature of 85 °C and a pressure twice as high as the operating temperature of the appliance.
- It is MANDATORY to install a safety valve (included in the product set) on the cold water pipe, observing the arrow on its housing, showing the direction of water flow through it.



IMPORTANT! There must be no shut-off or non-return valve between the safety valve and the boiler. Do not block the side opening and / or block the valve lever. Failure or incorrect installation of the safety valve is grounds for voiding the appliance's warranty.

• Drain connection (hose) of safety valve.

When the boiler is running, in some cases it is possible to release a small amount of water from the relief valve as a result of a linear expansion of the water. For this reason, it is necessary to build a diversionary connection, which is to be comply with local and European standards and safety provisions! It must be of sufficient inclination for water drainage. Both ends must be open to the atmosphere and be provided with anti-freeze. At pipe installation, take safety measures from valve firing burns.

- Do not exceed the working pressure of 0,8 MPa (8 bar).
- If the pipes of the plumbing system are made of copper or other metal, other than steel, as well as when using brass connecting elements, it is mandatory to install dielectric fittings at the inlet and outlet of the water heater.

- If there is a risk of water freezing in the water tank: drain the water tank completely or let the boiler run continuously.

- **Pressure regulator.** If the pressure in the water supply network exceeds 0.5 MPa (5 bar), it is desirable to install a pressure regulator at the cold water inlet. We recommend that the regulator be set to 0.4 MPa (4 bar), thus ensuring the correct operation of the product and its optimal service cycle.

- **Expansion vessel.** We recommend installing an expansion vessel to absorb water expansion when heated.

The volume and type are determined by a qualified designer in accordance with the technical data of the boiler, the system in place and the local and European safety standards! Installation is carried out by a qualified technician in accordance with his operating instructions.

- **Pipe insulation.** In order to optimize the efficiency of the appliance, we recommend that all its pipe terminals and the elements connected to them be covered with a suitable thermal insulation material.

- Before filling the boiler with water, check all screw connections (bolts on the inspection cover for flange, plugs and anode). In very rare cases - during transport, loading and unloading operations, it is possible for the bolted joints to loosen. The tightening torque of the inspection cover bolts is 160-190 Nm.

• Filling the boiler with water.

- The hot water tap on the farthest mixer tap opens.
- The tap of the water entering the boiler is opened.
- The system is expected to be deaerated, an indicator of which is a dense and strong jet of water from the open mixer.
- Make sure that there are no leaks in the piping connections of the installation and the bolted connections on the cover of the boiler flange. If necessary - tighten.
- Check the safety valve by lifting its lever - a thick and strong jet of water must flow through its side opening for about a minute.

Such a check for the serviceability of the

valve is recommended to be done periodically every 2 weeks or at each stop and start of the central water supply of the installation. If, at normal pressure in the installation, no water flows out of the valve orifice or the flow is weak, it must be replaced.

• **Draining the water from the boiler.**

- The appliance is disconnected from the power supply.
- The tap of the water entering the boiler is closed.
- Open the hot water tap of the mixer or demonstrate the fitting of the hot water outlet of the boiler.
- Raise the safety valve lever and wait until water stops flowing from its side opening.

It should be borne in mind that the above actions do not ensure complete drainage of water from the vessel. This can only be done by a specialist, because it involves removing the cover of the boiler flange.

	It is forbidden to turn on the power supply and / or circulation of the heat carrier through the heat exchangers of the boiler while its water tank is partially or completely empty.
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1.3. Connecting a built-in heat exchanger to the installation of an additional heat source.

The connection is made when all the requirements of the company that designed the installation are met. It is forbidden to install shut-off valves at both the inlet and outlet of the heat exchanger. To increase the efficiency of the heat exchanger, it is mandatory for the heat carrier to be driven by a circulation pump. An aqueous solution of propylene (ethylene) glycol in liquid phase with composition and values of the indicators in the admissible norms, determined in the regulations related to the water legislation, or a special aqueous solution, which is not aggressive to the material of the heat exchanger, is used as a heat carrier. It is necessary for the heat carrier to have a temperature not higher than 85 ° C and for a control device with a suitable temperature setting to be installed in its circuit, which does not allow the activation of the thermal

protection of the thermostat during normal operation of the appliance.

If the heat exchanger will not be used temporarily and is not connected to the installation of the additional heat source, it must be filled with a propylene glycol solution suitable for heating systems.

The connection of a boiler with a heat exchanger to the additional heat source is performed only by qualified persons in accordance with the project developed by a company specialized in this field.

1.4. Connection to the electrical installation.

	IMPORTANT! Before connecting the boiler to the electrical installation, make sure that its water tank is full of water!
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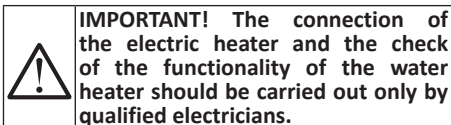
This appliance must be connected to the ground circuit of the electrical installation. The water heater is supplied by a separate circuit, filled with a three-core insulated cable with a cross section of 2.5 mm² per core.

	IMPORTANT! It is mandatory to install an electrical fuse (10 A at a heater power of up to 2 kW and 16 A at a power of 3 kW) in the electrical circuit supplying the water heater, which provides complete disconnection of all poles in the case of overvoltage category III.
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It is recommended, in case the current norms do not oblige him, to have a fault current protection installed in the current circuit.

The phase wire of the power cable is connected to the terminal marked L of the thermostat, the neutral - to the terminal with N, and the protective - to the stud of the flange cover. To secure the power cord against displacement, it is necessary to tighten it in the bracket located right next to the cable hole on the plastic cover of the boiler.

The complete disconnection of the water heater from the electrical installation is done by an external switch (not included), installed in the electrical circuit between the electrical fuse and the boiler.



2. PREVENTION AND MAINTENANCE

This appliance is not intended for use by people (including children) with physical, sensory or mental disabilities, or people without work experience, unless they are operated by someone responsible for their safety or have been instructed in advance. to work with the device.

Children should not be allowed to play with the appliance.

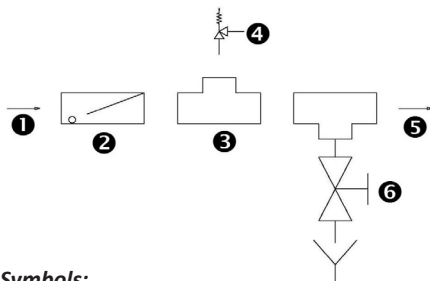
- Periodically open the safety valve to check its functionality.

- For reliable operation of the boiler in areas with calcareous water, it is recommended to treat it with softener.

- The water tank of the boiler is recommended to be cleaned of limestone at least every 2 years, and this period can be shortened depending on the hardness of the water. When cleaning, it is desirable to inspect the anode protector and replace it if necessary.

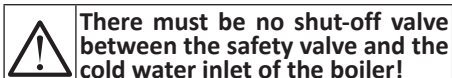
This procedure should only be performed by a specialist.

3. CONNECTING A BOILER SAFETY VALVE



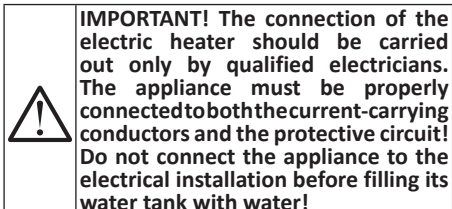
Symbols:

1. Inlet cold water - network
2. Check valve
3. Tee
4. Pressure relief valve
5. Inlet cold water - boiler
6. Shut-off valve (drainage)



4. ELECTRIC HEATING ELEMENT

The solar water heater SUNSYSTEM is equipped with an electric heater: 1500W, 2000W or 3000W / 230 V. They are equipped with a double-protected thermostat with a control range from 30 °C to 80°C/operating temperature 95°C; 3 + 2 contacts 10(2.5) A - 230 V; protection IP 40, differential 8 °C ± 3 °C.



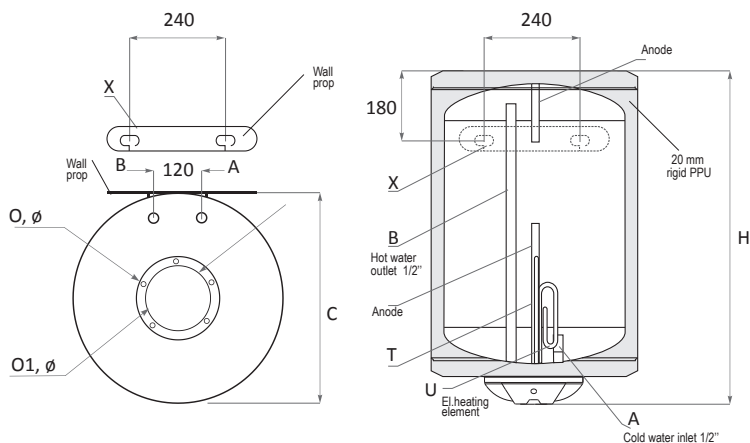
5. ANODE PROTECTOR

The magnesium anode protector protects from corrosion of the inner surface of the water tank.

Over time, limestone is deposited during the operation of the product under the influence of high temperature (so-called scale). Therefore, we recommend that the product be serviced by an authorized service center every two years. The prophylaxis must include inspection and cleaning of the anode protector, which is replaced with a new one if necessary. The performed prophylaxis is reflected in the warranty card of the product.

6. ELECTRIC WATER HEATER MB NL2 V/EL - 50 L, 80 L, 100 L, 120 L

Electric (without coil). Vertical models.

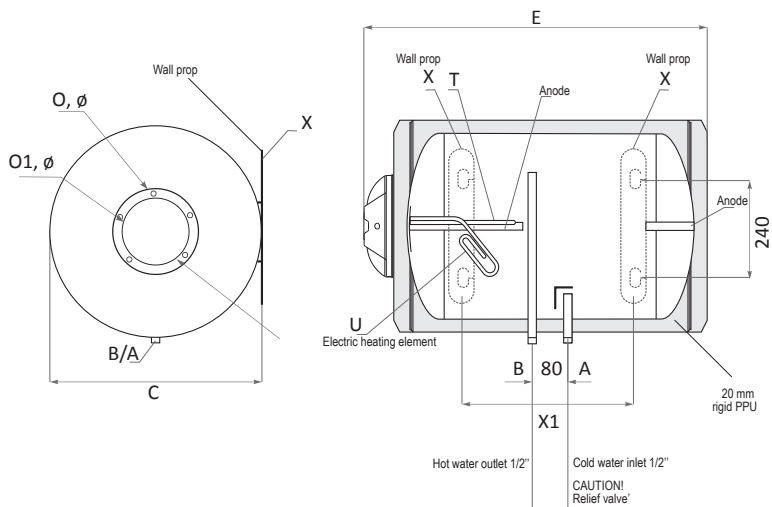


MB NL2 V/EL 50-120 L

		MB NL2 V/EL 50	MB NL2 V/EL 80	MB NL2 V/EL 100	MB NL2 V/EL 120
Capacity	L	50	80	100	120
Height	H, mm	600	800	960	1120
Diameter	D, mm	Ø 440	Ø 440	Ø 440	Ø 440
Insulation	mm	rigid PPU, thickness 20 mm.			
Oper. pressure / max. temperature	MPa(bar)/°C	0.8(8)/95	0.8(8)/95	0.8(8)/95	0.8(8)/95
Test pressure of tank	MPa(bar)	1.3(13)	1.3(13)	1.3(13)	1.3(13)
Electric heating element (optional)	kW	2/3	2/3	2/3	2/3
Weight	kg	24.6	30	35	39.4
Cold water inlet	A	Rp 1/2"	Rp 1/2"	Rp 1/2"	Rp 1/2"
Hot water outlet	B	Rp 1/2"	Rp 1/2"	Rp 1/2"	Rp 1/2"
Inspection opening/Flange	O, O1, mm,	Ø 132/90	Ø 132/90	Ø 132/90	Ø 132/90
Anode	P1, P2	✓/✓	✓/✓	✓/✓	✓/✓
Thermostat	T	✓	✓	✓	✓
Wall prop	X	✓	✓	✓	✓

7. ELECTRIC WATER HEATER MB NL2 H/EL - 80 L, 100 L, 120 L

Electric (without coil). Horizontal models.

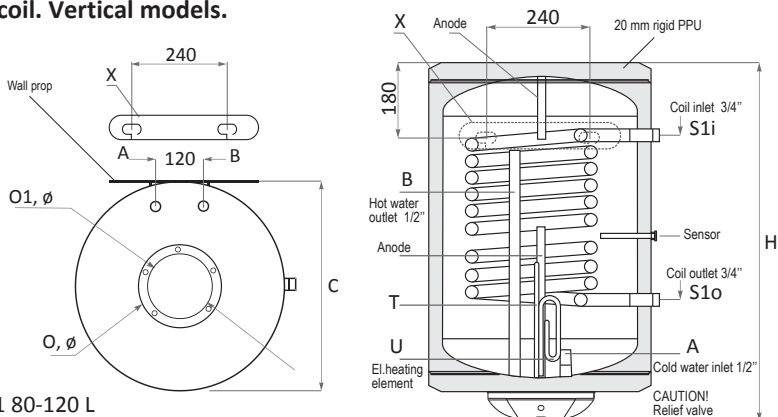


MB NL2 H/EL 80-120 L

		MB NL 2 H/EL 80	MB NL2 H/EL 100	MB NL2 H/EL 120
Capacity	L	80	100	120
Length	E, mm	800	960	1120
Diameter	D, mm	Ø 440	Ø 440	Ø 440
Insulation	mm	rigid PPU, thickness 20 mm.		
Oper. pressure / max. temperature	MPa(bar)/°C	0.8(8)/95	0.8(8)/95	0.8(8)/95
Test pressure of tank	MPa(bar)	1.3(13)	1.3(13)	1.3(13)
Electric heating element (optional)	kW	2/3	2/3	2/3
Weight	kg	30	35	39.4
Cold water inlet	A	Rp 1/2"	Rp 1/2"	Rp 1/2"
Hot water outlet	B	Rp 1/2"	Rp 1/2"	Rp 1/2"
Inspection opening/Flange	O, O1, mm,	Ø 132/90	Ø 132/90	Ø 132/90
Anode	P1, P2	✓/✓	✓/✓	✓/✓
Thermostat	T	✓	✓	✓
Wall prop/ Distance between both stands	X1, mm	380	540	700

8. WATER HEATER MB NL2 V/S1 - 80 L, 100 L, 120 L.

With one coil. Vertical models.

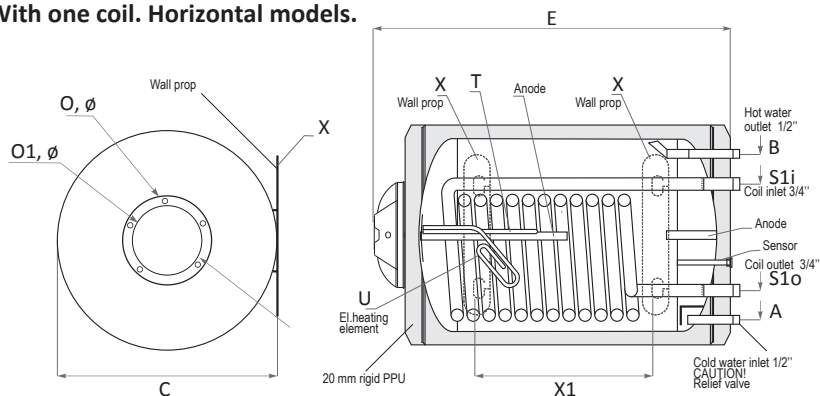


MB NL2 V/S1 80-120 L

		MB NL 2 V/S1 80	MB NL 2 V/S1 100	MB NL 2 V/S1 120
Capacity	L	80	100	120
Height	H, mm	800	960	1120
Diameter	D, mm	Ø 440	Ø 440	Ø 440
Insulation	mm	rigid PPU, thickness 20 mm.		
Oper. pressure / max. temperature	MPa(bar)/°C	0.8(8)/95	0.8(8)/95	0.8(8)/95
Test pressure of tank	MPa(bar)	1.3(13)	1.3(13)	1.3(13)
Electric heating element (optional)	kW	2/3	2/3	2/3
Weight	kg	36.4	43.6	49
Cold water inlet	A	Rp 1/2"	Rp 1/2"	Rp 1/2"
Coil water outlet	B	Rp 1/2"	Rp 1/2"	Rp 1/2"
Operating pressure / Max.Coils temp. S1	MPa(bar)/°C	1.6(16)/110	1.6(16)/110	1.6(16)/110
Test pressure S1	MPa(bar)	2.5(25)	2.5(25)	2.5(25)
Coil capacity S1	L	2.04	2.70	2.70
Heat exchange surface S1	m²	0.40	0.53	0.53
Coil inlet	S1i, mm, Rp3/4"	426	540	540
Coil outlet	S1o, mm, Rp3/4"	140	140	140
Prolonged power acc. to DIN 4708; 80°C/60°C/45°C, S2	kW (m3/h)	8.2(0.20)	9(0.22)	9(0.22)
NL – power coefficient at 60°C, S1/S2	NL 60°C	1	1.3	1.3
Pressure drop Δp, S1/S2	Δp, mbar	50	55	55
Inspection opening/Flange	O, O1, Ø, mm	132/90	132/90	132/90
Anode	P1, P2	✓/✓	✓/✓	✓/✓
Thermostat	T	✓	✓	✓
Wall prop	X, mm	✓	✓	✓

9. WATER HEATER MB NL2 H/S1 - 80 L, 100 L, 120 L.

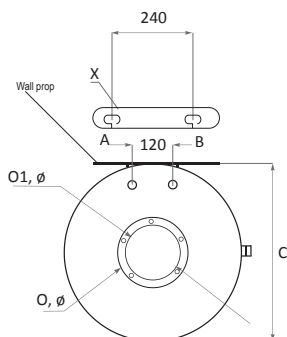
With one coil. Horizontal models.



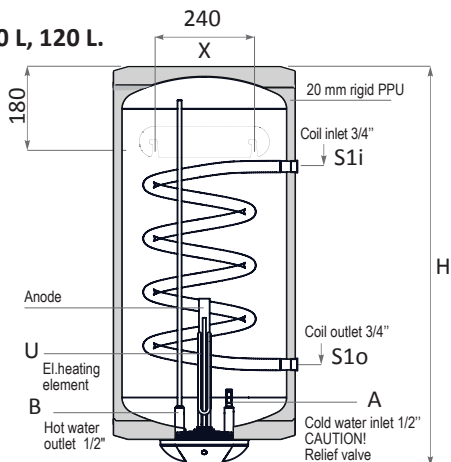
MB NL2 H/S1 80-120 L

		MB NL2 H/S1 80	MB NL2 H/S1 100	MB NL2 H/S1 120
Capacity	L	80	100	120
Length	E, mm	800	960	1120
Diameter	D, mm	Ø 440	Ø 440	Ø 440
Insulation	mm	rigid PPU, thickness 20 mm.		
Oper. pressure / max. temperature	MPa(bar)/°C	0.8(8)/95	0.8(8)/95	0.8(8)/95
Test pressure of tank	MPa(bar)	1.3(13)	1.3(13)	1.3(13)
Electric heating element (optional)	kW	1.5	1.5	1.5
Weight	kg	36.4	43.6	49
Cold water inlet	A, mm, Rp 1/2"	45	45	45
Hot water outlet	B, mm, Rp 1/2"	395	395	395
Operating pressure / Max.Coils temp. S1	MPa(bar)/°C	1.6(16)/110	1.6(16)/110	1.6(16)/110
Test pressure S1	MPa(bar)	2.5(25)	2.5(25)	2.5(25)
Coil capacity S1	L	2.04	2.70	2.70
Heat exchange surface S1	m²	0.40	0.53	0.53
Coil inlet	S1i, mm, Rp3/4"	350	350	350
Coil outlet	S1o, mm, Rp3/4"	100	100	100
Prolonged power acc. to DIN 4708; 80°C/60°C/45°C, S2	kW (m3/h)	8.2(0.20)	9(0.22)	9(0.22)
NL – power coefficient at 60°C, S1/S2	NL 60°C	1	1.3	1.3
Pressure drop Δp, S1/S2	Δp, mbar	50	55	55
Inspection opening/Flange	O, O1, Ø, mm	132/90	132/90	132/90
Anode	P1, P2	✓/✓	✓/✓	✓/✓
Thermostat	T	✓	✓	✓
Wall prop/ Distance between both stands	X1, mm	380	540	700

10. WATER HEATER MB-L NL2 V/S1 - 80 L, 100 L, 120 L. With one coil. Vertical models.

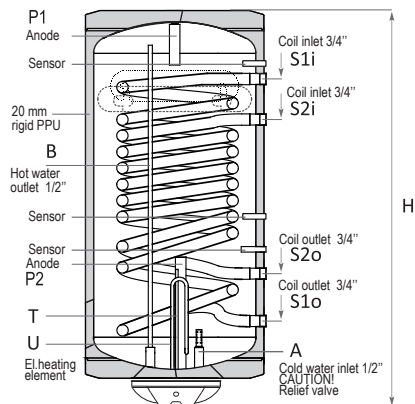
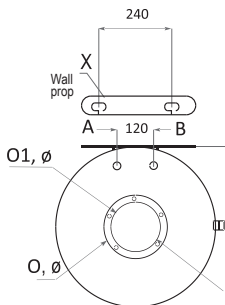


MB-L NL2 V/S1 80-120 L



		MB-L NL2 V/S1 80	MB-L NL2 V/S1 100	MB-L NL2 V/S1 120
Capacity	L	80	100	120
Height	H, mm	800	960	1120
Diameter	D, mm	Ø 440	Ø 440	Ø 440
Insulation	mm	rigid PPU, thickness 20 mm.		
Oper. pressure / max. temperature	MPa(bar)/°C	0.8(8)/95	0.8(8)/95	0.8(8)/95
Test pressure of tank	MPa(bar)	1.3(13)	1.3(13)	1.3(13)
Electric heating element (optional)	kW	2	2	2
Weight	kg	31	40	42
Cold water inlet	A	Rp 1/2"	Rp 1/2"	Rp 1/2"
Coil water outlet	B	Rp 1/2"	Rp 1/2"	Rp 1/2"
Operating pressure / Max.Coils temp. S1	MPa(bar)/°C	1.6(16)/110	1.6(16)/110	1.6(16)/110
Test pressure S1	MPa(bar)	2.5(25)	2.5(25)	2.5(25)
Coil capacity S1	L	1.1	1.5	1.5
Heat exchange surface S1	m²	0.2	0.3	0.3
Coil inlet	S1i, mm, Rp3/4"	560	660	660
Coil outlet	S1o, mm, Rp3/4"	180	180	180
Prolonged power acc. to DIN 4708; 80°C/60°C/45°C, S2	kW (m3/h)	2.9(0.07)	6(0.14)	6(0.14)
NL – power coefficient at 60°C, S1/S2	NL 60°C	1	1.3	1.3
Pressure drop Δp, S1/S2	Δp, mbar	50	55	55
Inspection opening/Flange	O, O1, Ø, mm	132/90	132/90	132/90
Anode	P	✓	✓	✓
Thermostat	T	✓	✓	✓
Wall prop	X, mm	✓	✓	✓

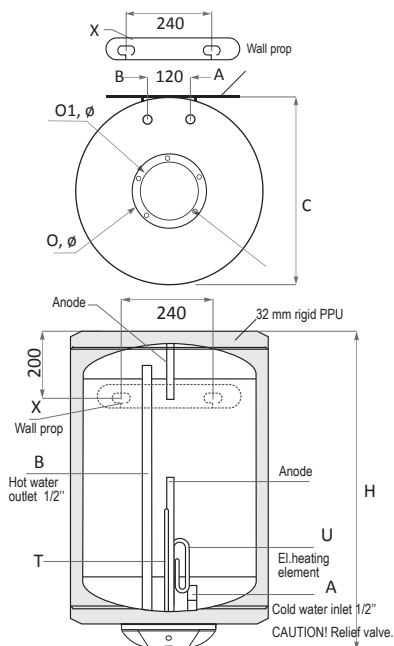
11. WATER HEATER MB NL2 PRL - 100 L, 120 L.
With two parallel coils. Vertical models.



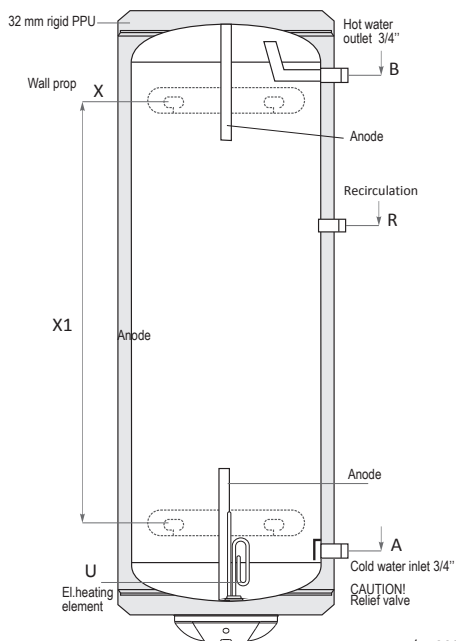
MB NL2 PRL 100-120 L

		MB NL2 PRL 100	MB NL2 PRL 120
Capacity	L	100	120
Height	H, mm	960	1120
Diameter	D, mm	Ø 440	Ø 440
Insulation	mm	rigid PPU, thickness 20 mm.	
Oper. pressure / max. temperature	MPa(bar)/°C	0.8(8)/95	0.8(8)/95
Test pressure of tank	MPa(bar)	1.3(13)	1.3(13)
Electric heating element (optional)	kW	2/3	2/3
Weight	kg	48	52
Cold water inlet	A	Rp 1/2"	Rp 1/2"
Hot water outlet	B	Rp 1/2"	Rp 1/2"
Operating pressure / Max.Coils temp. S1/S2	MPa(bar)/°C	1.6(16)/110	1.6(16)/110
Test pressure S1/S2	MPa(bar)	2.5(25)	2.5(25)
Coil capacity S1/S2	L	2.8/1.6	2.8/1.6
Heat exchange surface S1/S2	m²	0.54/0.31	0.54/0.31
Lower coil inlet S1	S1i, mm, Rp 3/4"	738	738
Lower coil outlet S1	S1o, mm, Rp 3/4"	141	141
Upper coil inlet S2	S2i, mm, Rp 3/4"	638	638
Upper coil outlet S2	S2o, mm, Rp 3/4"	258	258
Prolonged power acc. to DIN 4708; 80°C/60°C/45°C, S1	kW (m3/h)	9(0.22)/8(0.2)	9(0.22)/8(0.2)
NL – power coefficient at 60°C, S1/S2	NL 60°C	1.3/1	1.3/1
Pressure drop Δp, S1/S2	Δp, mbar	55/50	55/50
Inspection opening/Flange	O, O1, Ø, mm	132/90	132/90
Anode	P1, P2	✓/✓	✓/✓
Thermostat	T	✓	✓
Wall prop	X, mm	✓	✓

12. ELECTRIC WATER HEATER BB NL2 V/EL - 80 L, 100 L, 120 L, 150 L, 200 L. Electric (without coil). Vertical models.



BB NL2 V/EL 80-150 L

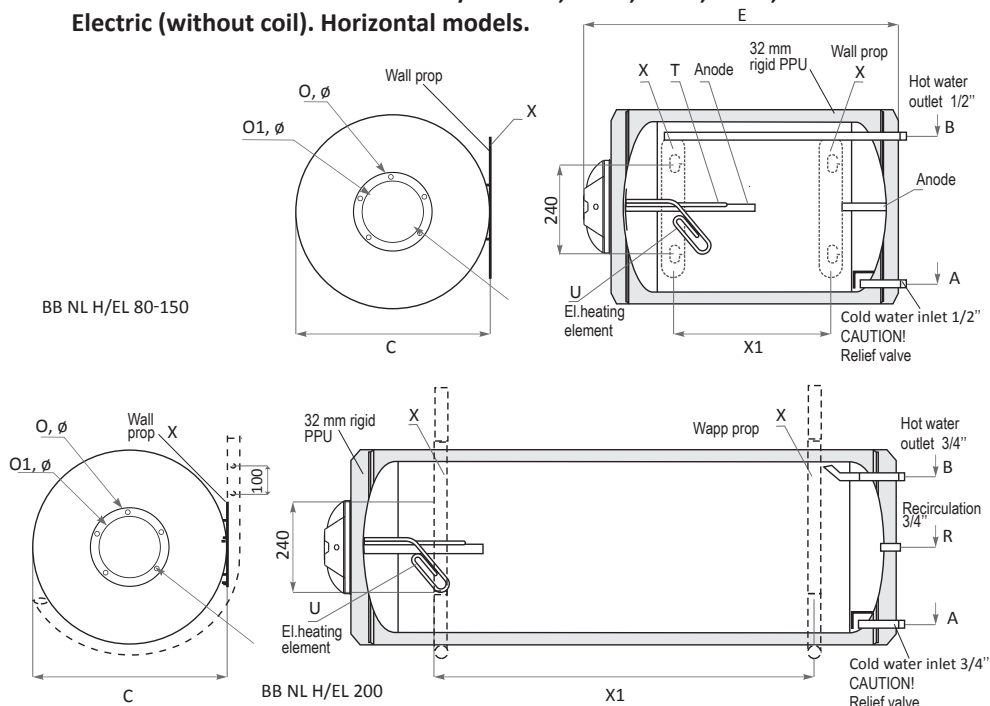


BB NL V/EL 200 L

		BB NL2 V/EL 80	BB NL2 V/EL 100	BB NL2 V/EL 120	BB NL2 V/EL 150	BB NL 2 V/EL 200
Capacity	L	80	100	120	150	200
Height	H, mm	685	815	945	1085	1355
Diameter	D, mm	Ø 520	Ø 520	Ø 520	Ø 520	Ø 520
Insulation	mm	rigid PPU, thickness 32 mm.				
Oper. pressure / max. temperature	MPa(bar)/°C	0.8(8)/95	0.8(8)/95	0.8(8)/95	0.8(8)/95	0.8(8)/95
Test pressure of tank	MPa(bar)	1.3(13)	1.3(13)	1.3(13)	1.3(13)	1.3(13)
Electric heating element (optional)	kW	2/3	2/3	2/3	2/3	2/3
Weight	kg	38	42.2	50	56	68
Cold water inlet	A, mm	Rp 1/2"	Rp 1/2"	Rp 1/2"	Rp 1/2"	Rp 3/4" 170
Hot water outlet	B, mm	Rp 1/2"	Rp 1/2"	Rp 1/2"	Rp 1/2"	Rp 3/4" 1120
Recirculation	R, mm					Rp 3/4" 877
Inspection opening/Flange	O, O1, mm	Ø 132/90	Ø 132/90	Ø 132/90	Ø 132/90	Ø 132/90
Anode	P1, P2	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓
Thermostat	T	✓	✓	✓	✓	✓
Wall prop/ Distance between both stands	X1, mm				630	900

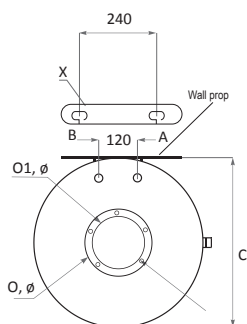
13. ELECTRIC WATER HEATER BB NL2 H/EL - 80 L, 100 L, 120 L, 150 L, 200 L.

Electric (without coil). Horizontal models.

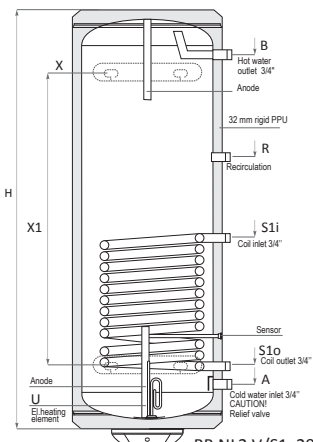
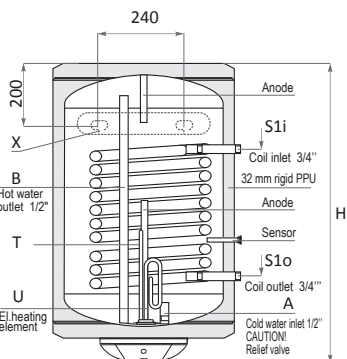


		BB NL2 H/EL 80	BB NL2 H/EL 100	BB NL2 H/EL 120	BB NL2 H/EL 150	BB NL2 H/EL 200
Capacity	L	80	100	120	150	200
Length	E, mm	685	815	945	1085	1355
Diameter	D, mm	$\varnothing 520$	$\varnothing 520$	$\varnothing 520$	$\varnothing 520$	$\varnothing 520$
Insulation	mm	rigid PPU, thickness 32 mm.				
Oper. pressure / max. temperature	MPa(bar)/°C	0.8(8)/95	0.8(8)/95	0.8(8)/95	0.8(8)/95	0.8(8)/95
Test pressure of tank	MPa(bar)	1.3(13)	1.3(13)	1.3(13)	1.3(13)	1.3(13)
Electric heating element (optional)	kW	1.5/2	1.5/2	1.5/2	1.5/2	1.5/2
Weight	kg	38	42.2	50	56	68
Cold water inlet	A, mm,	Rp 1/2" 65	Rp 1/2" 65	Rp 1/2" 65	Rp 1/2" 65	Rp 3/4" 65
Hot water outlet	B, mm,	Rp 1/2" 455	Rp 1/2" 455	Rp 1/2" 455	Rp 1/2" 455	Rp 3/4" 455
Recirculation	R, mm	-	-	-	-	Rp 3/4" 260
Inspection opening/Flange	O, O1, mm,	$\varnothing 132/90$	$\varnothing 132/90$	$\varnothing 132/90$	$\varnothing 132/90$	$\varnothing 132/90$
Anode	P1, P2	✓/✓	✓/✓	✓/✓	✓/✓	✓/-
Thermostat	T	✓	✓	✓	✓	✓
Wall prop/ Distance between both stands	X1, mm	230	360	490	630	900

14. WATER HEATER BB NL2 V/S1 - 80 L, 100 L, 120 L, 150 L, 200 L. With one coil. Vertical models.



BB NL2 V/S1 80-150 L

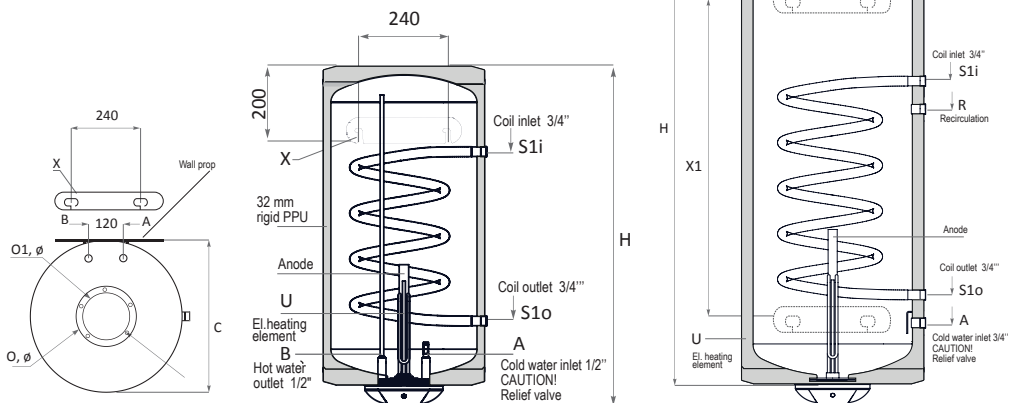


BB NL2 V/S1 200 L

		BB NL2 V/S1 80	BB NL2 V/S1 100	BB NL V/S1 120	BB NL2 V/S1 150	BB NL2 V/S1 200
Capacity	L	80	100	120	150	200
Height	H, mm	685	815	945	1085	1355
Diameter	D, mm	Ø 520	Ø 520	Ø 520	Ø 520	Ø 520
Insulation	mm	rigid PPU, thickness 32 mm.				
Oper. pressure / max. temperature	MPa(bar)/°C	0.8(8)/95	0.8(8)/95	0.8(8)/95	0.8(8)/95	0.8(8)/95
Test pressure of tank	MPa(bar)	1.3(13)	1.3(13)	1.3(13)	1.3(13)	1.3(13)
Electric heating element (optional)	kW	2/3	2/3	2/3	2/3	2/3
Weight	kg	42.2	51	55.8	70	82.4
Cold water inlet	A, mm	Rp 1/2"	Rp 1/2"	Rp 1/2"	Rp 1/2"	Rp 3/4" 170
Hot water outlet	B, mm	Rp 1/2"	Rp 1/2"	Rp 1/2"	Rp 1/2"	Rp 3/4" 1120
Oper. pressure / max. Coil temp.S1	MPa(bar)/°C	1.6(16)/110	1.6(16)/110	1.6(16)/110	1.6(16)/110	1.6(16)/110
Test pressure S1	MPa(bar)	2.5(25)	2.5(25)	2.5(25)	2.5(25)	2.5(25)
Coil capacity S1	L	2.04	2.70	2.70	4.07	4.07
Heat exchange surface S1	m²	0.40	0.53	0.53	0.80	0.80
Coil inlet	S1i, mm, Rp ^{3/4"}	436	550	550	702	645
Coil outlet	S1o, mm, Rp ^{3/4"}	150	150	150	150	250
Recirculation	R, mm	-	-	-	-	Rp 3/4" 877
Prolonged power acc. to DIN 4708; 80°C/60°C/45°C, S1	kW (m3/h)	8.2(0.20)	9(0.22)	9(0.22)	15(0.37)	15(0.37)
NL – power coefficient at 60°C, S1	NL 60°C	1	1.3	1.3	1.5	1.5
Pressure drop Δp, S1	Δp, mbar	50	55	55	60	60
Inspection opening/Flange	O, O1, Ø, mm	132/90	132/90	132/90	132/90	132/90
Anode	P1, P2	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓
Thermostat	T	✓	✓	✓	✓	✓
Wall prop/ Distance between both stands	X1, mm	-	-	-	630	900

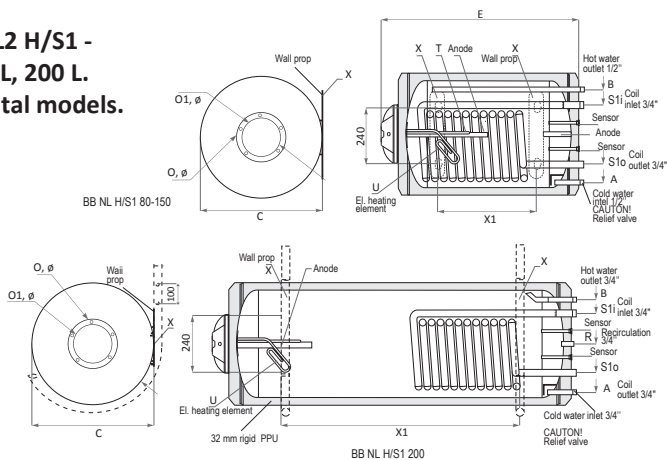
15. WATER HEATER BB-L NL2 V/S1 - 150 L, 200 L.

With one coil. Vertical models.



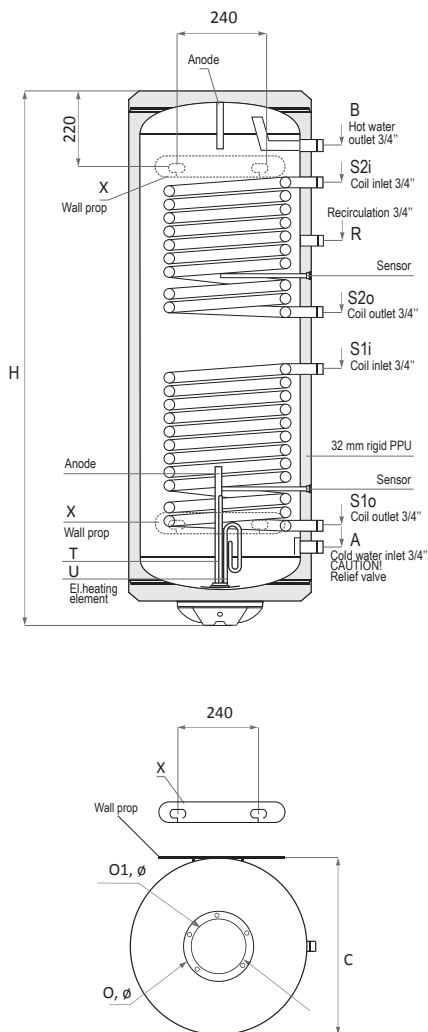
		BB-L NL2 V/S1 150	BB-L NL2 V/S1 200
Capacity	L	150	200
Height	H, mm	1085	1355
Diameter	D, mm	Ø 520	Ø 520
Insulation	mm	rigid PPU, thickness 32 mm.	
Oper. pressure / max. temperature	MPa(bar)/°C	0.8(8)/95	0.8(8)/95
Test pressure of tank	MPa(bar)	1.3(13)	1.3(13)
Electric heating element (optional)	kW	3	3
Weight	kg	55	63
Cold water inlet	A, mm	Rp 1/2"	Rp 3/4" 170
Hot water outlet	B, mm	Rp 1/2"	Rp 3/4" 1120
Oper. pressure / max. Coil temp.S1	MPa(bar)/°C	1.6(16)/110	1.6(16)/110
Test pressure S1	MPa(bar)	2.5(25)	2.5(25)
Coil capacity S1	L	2.04	2.04
Heat exchange surface S1	m²	0.4	0.4
Coil inlet	S1i, mm, Rp ^{3/4"}	760	860
Coil outlet	S1o, mm, Rp ^{3/4"}	150	250
Recirculation	R, mm	-	Rp 3/4" 780
Prolonged power acc. to DIN 4708; 80°C/60°C/45°C, S1	kW (m3/h)	82(0.2)	82(0.2)
NL – power coefficient at 60°C, S1	NL 60°C	1	1
Pressure drop Δp, S1	Δp, mbar	50	50
Inspection opening/Flange	O, O1, Ø, mm	132/90	132/90
Anode	P	✓	✓
Thermostat	T	✓	✓
Wall prop/ Distance between both stands	X1, mm	630	900

16. WATER HEATER BB NL2 H/S1 - 80 L, 100 L, 120 L, 150 L, 200 L. With one coil. Horizontal models.



		BB NL2 H/S1 80	BB NL2 H/S1 100	BB NL2 H/S1 120	BB NL2 H/S1 150	BB NL2 H/S1 200
Capacity	L	80	100	120	150	200
Length	E, mm	685	815	945	1085	1355
Diameter	D, mm	Ø 520	Ø 520	Ø 520	Ø 520	Ø 520
Insulation	mm	rigid PPU, thickness 32 mm.				
Oper. pressure / max. temperature	MPa(bar)/°C	0.8(8)/95	0.8(8)/95	0.8(8)/95	0.8(8)/95	0.8(8)/95
Test pressure of tank	MPa(bar)	1.3(13)	1.3(13)	1.3(13)	1.3(13)	1.3(13)
Electric heating element (optional)	kW	1.5	1.5	1.5	1.5	1.5
Weight	kg	42.2	51	55.8	70	82.4
Cold water inlet	A, mm	Rp 1/2" 65	Rp 1/2" 65	Rp 1/2" 65	Rp 1/2" 65	Rp 3/4" 65
Hot water outlet	B, mm	Rp 1/2" 455	Rp 1/2" 455	Rp 1/2" 455	Rp 1/2" 455	Rp 3/4" 455
Oper. pressure / max. Coil temp.S1	MPa(bar)/°C	1.6(16)/110	1.6(16)/110	1.6(16)/110	1.6(16)/110	1.6(16)/110
Test pressure S1	MPa(bar)	2.5(25)	2.5(25)	2.5(25)	2.5(25)	2.5(25)
Coil capacity S1	L	2.04	2.70	2.70	4.07	4.07
Heat exchange surface S1	m²	0.40	0.53	0.53	0.80	0.80
Coil inlet	S1i, mm, Rp3/4"	385	385	385	385	385
Coil outlet	S1o, mm, Rp3/4"	135	135	135	135	135
Recirculation	R, mm	-	-	-	-	Rp 3/4" 260
Prolonged power acc. to DIN 4708; 80°C/60°C/45°C, S1	kW (m3/h)	8.2(0.20)	9(0.22)	9(0.22)	15(0.37)	15(0.37)
NL – power coefficient at 60°C, S1	NL 60°C	1	1.3	1.3	1.5	1.5
Pressure drop Δp , S1	Δp , mbar	50	55	55	60	60
Inspection opening/Flange	O, O1, Ø, mm	132/90	132/90	132/90	132/90	132/90
Anode	P1, P2	✓/✓	✓/✓	✓/✓	✓/✓	✓/-
Thermostat	T	✓	✓	✓	✓	✓
Wall prop/ Distance between both stands	X1, mm	230	360	490	630	900

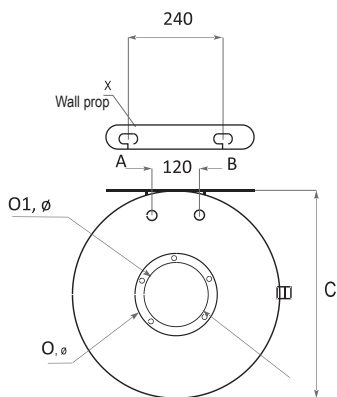
17. WATER HEATER BB NL2 V/S2 - 200 L. **With two coils. Vertical models.**



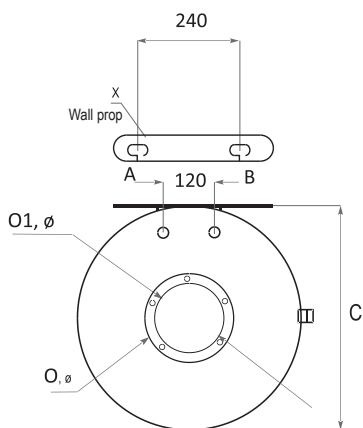
BB NL2 V/S2 200		
Capacity	L	200
Height	H, mm	1370
Diameter	D, mm	Ø 520
Insulation	mm	rigid PPU, thickness 32 mm.
Oper. pressure / max. temperature	MPa(bar)/°C	0.8(8)/95
Test pressure of tank	MPa(bar)	1.3(13)
Electric heating element (optional)	kW	2/3
Weight	kg	89
Cold water inlet	A, mm	Rp 3/4" 170
Hot water outlet	B, mm	Rp 3/4" 1120
Oper. pressure / max. Coil temp. S1	MPa(bar)/°C	1.6(16)/110
Test pressure S1	MPa(bar)	2.5(25)
Capacity of coil S1/S2	L	4.07/2.70
Heat exchange surface of coil S1/S2	m²	0.80/0.53
Lower coil inlet	S1i, mm	Rp3/4" 645
Lower coil outlet	S1o, mm	Rp3/4" 250
Upper coil inlet	S2i, mm	Rp3/4" 1025
Upper coil outlet	S2o, mm	Rp3/4" 725
Recirculation	R, mm	Rp3/4" 877
Prolonged power acc. to DIN 4708; 80°C/60°C/45°C, S1/S2	kW (m3/h)	15(0.37) / 9(0.22)
NL – power coefficient at 60°C, S1/S2	NL 60°C	1.5 / 1.3
Pressure drop Δp, S1/S2	Δp, mbar	60 / 25
Inspection opening/Flange	O, O1, Ø, mm	132/90
Anode	P1, P2	✓/✓
Thermostat	T	✓
Wall prop/ Distance between both stands	X1, mm	900

18. WATER HEATER BB NL2 PRL - 150 L, 200 L.

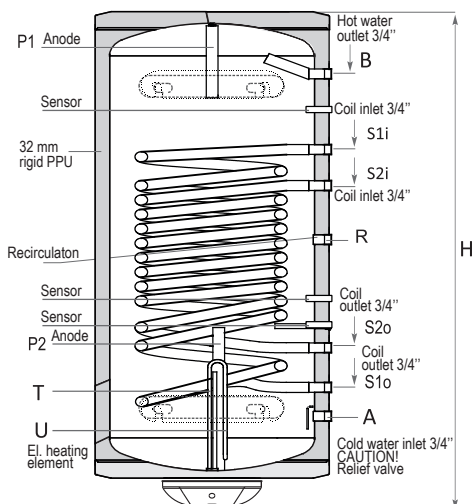
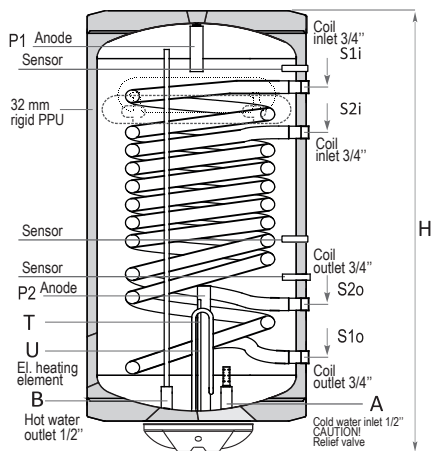
With two parallel coils. Vertical models.



BB NL2 PRL 150 L



BB NL2 PRL 200 L





		BB NL2 PRL 150	BB NL2 PRL 200
Capacity	L	150	200
Height	H, mm	1085	1370
Diameter	D, mm	Ø 520	Ø 520
Insulation	mm	rigid PPU, thickness 32 mm.	
Oper. pressure / max. temperature	MPa(bar)/°C	0.8(8)/95	0.8(8)/95
Test pressure of tank	MPa(bar)	1.3(13)	1.3(13)
Electric heating element (optional)	kW	2/3	2/3
Weight	kg	77	89
Cold water inlet	A, mm	Rp 1/2"	Rp 3/4" 170
Hot water outlet	B, mm	Rp 1/2"	Rp 3/4" 1120
Oper. pressure / max. Coil temp.S1	MPa(bar)/°C	1.6(16)/110	1.6(16)/110
Test pressure S1	MPa(bar)	2.5(25)	2.5(25)
Capacity of coil S1/S2	L	3.6/2.3	3.6/2.3
Heat exchange surface of coil S1/S2	m²	0.7/0.44	0.7/0.44
Coil inlet	S1i, mm, Rp3/4"	810	910
Coil outlet	S1o, mm, Rp3/4"	150	250
Coil inlet	S2i, mm, Rp3/4"	410	810
Coil outlet	S2o, mm, Rp3/4"	260	360
Recirculation	R, mm, Rp3/4"	-	660
Prolonged power acc. to DIN 4708; 80°C/60°C/45°C, S1/S2	kW (m3/h)	15(0.37)/82(0.2)	15(0.37)/82(0.2)
NL – power coefficient at 60°C, S1/S2	NL 60°C	1.5/1.1	1.5/1.1
Pressure drop Δp, S1/S2	Δp, mbar	65/50	65/50
Inspection opening/Flange	O, O1, Ø, mm	132/90	132/90
Anode	P1, P2	✓/✓	✓/✓
Thermostat	T	✓	✓
Wall prop/ Distance between both stands	X1, mm	630	900

19. TRANSPORT AND PACKAGING

We recommend to transport the water tank to the installation site in its packaging placed on the pallet, and stretch foil.

During transport and installation, depending on the weight, appropriate safety equipment must be used in accordance with Directive 2006/42/EC.

When transporting items weighing more than 30 kg, the use of pallet jack, fork truck or other hoisting devices is a must.

20. WARRANTY

20.1. Manufacturing defects and materials guarantee.

NES Ltd. expressly guarantees that the products it manufactures shall be free from defects in materials and workmanship which can prevent from normal operation under proper and normal use, installation and maintenance for the intended functions of the products, for a period set out in the warranty certificate of the respective water heater model you have bought. The warranty period begins from the date indicated in the purchase invoice. If a product or any component there of is determined to be defective in manufacture or materials, NES Ltd. will repair or replace the defective component or product.

20.2. Exclusions and Limitations of Warranty Coverage.

a) The customer can claim warranty during warranty period of respective product immediately after any defects have been determined, except for in case of noticeable defects at the moment of purchase, in which case the customer must make the claim at the shop immediately after noticing the defect as it is provided for in the general conditions of sale.

- 1) Accidents, installation on movable structures, negligence, improper care or nonconformity.
- 2) Failure to observe the installation, use and maintenance instructions set forth in the installation manual of respective product.
- 3) Improper installation and use as well as

changes, especially if they are not made by authorized after-sale service personnel of NES Ltd.

4) Testing and operation pressures greater than values established by NES Ltd. and set forth in product manuals, or use of water with characteristic values exceeding:

- Dissolvable salts – 500 mg/l;
- Calcium carbonate – 200 mg/l;
- Free carbon dioxide – 50 mg/l;
- ph content – minimum 5 and maximum 12.

5) Freeze, flood, natural disasters or third party actions as well as any interventions into normal functioning conditions of water heaters and the control of NES Ltd.

The customer as well should monitor the anticorrosion system (magnesium anode). He should periodically check the magnesium anode and replace it depending on the geographic location at intervals depending on the type of water (soft or hard) of the region where the water heater is being used.

b) The warranty certificate is considered void for water heaters whose serial identification number has been modified, removed or blurred, or cannot be expressly attested.

c) Damages in the appearance of products shall not be considered as defects except for those ones which cause losses during operation or change technical characteristics of water heaters set forth in brochures.

d) NES Ltd. preserves the right, in case of replacement, to deliver another model of water heater in order to fulfill approved warranty claims when the original model is not being manufactured.

20.3. Claiming warranty.

Every customer who has purchased a water heater from NES Ltd., and who has good reasons to lay a warranty claim, shall proceed as follows:

- a) Immediately notify in writing:
 - 1) The installer, or the company that has sold the water heater to him, or
 - 2) The distributor firm, or
 - 3) The commercial representative of NES Ltd. in the region.

For this purpose the claimant shall fill out a claim form; the latter shall be accompanied by

the document proving the purchase of the water heater (invoice) with the date of purchase in it.

b) After receiving the claim form, NES Ltd. considers it and makes decision whether the claim has grounds, and whether the defect is within the scope of the warranty set forth in this certificate for limited warranty; after which informs the customer as to its decision and the steps he shall do.

c) The return of a product cannot be done without written authorization issued by the Quality Department. The return procedure shall be according to RMA (Return Material Authorization).

d) If on customer's request, and when there is reason for urgency, the customer demands immediate replacement of the product he has claimed warranty for, before making the decision as to the claim, said request shall be accompanied by a Purchase requisition from the Commercial Department. After decision for satisfaction of the claim has been made, the Purchase requisition mentioned above will be annulled by issuing a receipt for returned goods; with this receipt the customer can purchase another product with the same price in case the claim has proved grounded.

e) NES Ltd. reserves the right to make in situ reports from the claims they have received for the purpose of checking every aspect that might be useful for better consideration of warranty claims; for this reason the customer shall not make any changes in installation conditions which are reasons for the claim without prior written consent of the Technical Department.

20.4. Limitation of liability.

a) NES Ltd. is not liable before the customer, neither directly nor indirectly, for any non-fulfillment

or delay at applying the warranty obligations which might originate from external pressure of other circumstances outside NES Ltd

b) The liability of NES Ltd. under this Warranty Certificate is limited to the above-mentioned obligations and up to the sum in accordance with the purchase receipt of the product to be claimed; excluded is any liability for indirect damages such as loss of data at

information applications, loss of production, thermal variations at the service, etc. which do not violate the applicable regulations of any country concerning product liability.

c) Above-mentioned warranty limitations will be applied in any cases, and when they do not violate the regulations in any country concerning product liability. If this circumstance annuls some of preceding clauses, annulment will refer only to this clause, while the others will remain valid. In conclusion, excluded is application of any Regulation pointed out in this Warranty which violates the Law 23/July 10, 2003 and Directive 1999/44/EU concerning water heaters and their use on the territory of the EU.

d) Any other warranty right that is not mentioned in this Warranty Certificate is excluded.

21. RECYCLING AND WASTE DISPOSAL

Submit all packaging material for recycling according to the local regulations and requirements.

At the end of life cycle of each product its components are due to be disposed of in conformity with regulatory prescriptions.

According to Directive 2002/96/EC regarding electrical and electronic equipment waste, disposal thereof is required separately from the normal flow of solid household waste. Obsolete equipment shall be collected separately from other recyclable waste containing materials with adverse effect on health and environment.

Expired appliances must be collected separately from other recyclable waste containing substances hazardous to health and environment.

Both metal and non-metal parts are sold out to licensed organizations for recyclable metal or non-metal waste collection. In any case they should not be treated as household waste.





NES
new energy systems

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