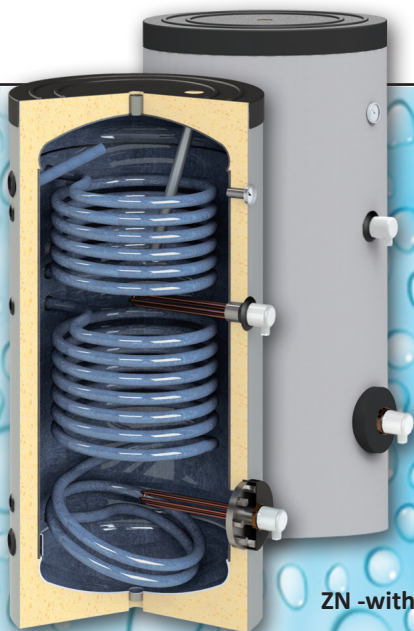


SOLAR WATER HEATERS

series ZN

Vertical Modifications

**150L, 200 L, 250 L, 300 L, 400 L, 500 L,
750 L, 1000 L, 1500 L, 2000 L**



ZN -with two coils

INSTALLATION and OPERATION MANUAL

Version 0.8

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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 manual contains important information for the safe and correct installation, start-up and trouble-free operation and maintenance of the water heater.

The water heater can be used for producing of domestic hot water (DHW) only in the manner described in this manual.

The application and any other was the area of operation is not recommended by the manufacturer and is not responsible for the occurrence of defects or failures.

1. INSTRUCTION TO INSTALLER



The preparation, installation and commissioning must be performed by an authorized installer / service.

During installation and operation, the country specific requirements and regulations must be observed:

- local construction regulations on installation of water tank; weight of the boiler to comply with the stability of the floor of the room where it will be installed.
- regulations and norms concerning the fitting of the installation with safety devices.
- safety during installation - personal protective equipment



Use only original parts

1.1. Requirements to water tank installation room

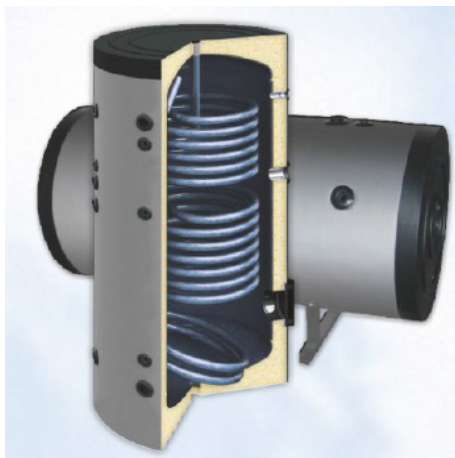
When choosing a room for tank installation observe the following requirements:

- to have a drainage channel. Some maintenance procedures require draining of all water from the tank.
- Thermal insulation of the room. This provides efficiency of the appliance and prevents the water from freezing.

1.2. Requirements for installation

- The length of connecting pipes between the water tank and consumer must be as short as possible.
- Before connecting the boiler to the installation, check all screw connections (bolt inspection cover flange, plug and anode). In very rare cases - during transportation, loading and unloading operations - the screw connections may be loosen.
- The tightening torque for flanges is around 160-190 Nm.
- Before commissioning, check the installation for leaks
- Do not exceed the working pressure of 10 bar.
- If there is a risk of freezing of water in the tank - drain the tank completely or let the water heater works continuously.

2. DESCRIPTION OF WATER TANK.



The water heaters ZN series are used for producing of domestic hot water (DHW).

ZN models have two built-in heat exchanger (coil type) for connection to the solar system and boiler. Option for installation of an electric heating element.

Product features:

- Floor standing
- Vertical or Horizontal modifications
- High efficiency insulation and outer casing of PVC
- Complex corrosion protection realized by means of titanium enamel and anode protection
- All threads are internal
- Convenient inspection opening
- Outlet / Outlets for installation of one or more electric heating elements
- The heat exchanger/s enables the tank to utilize an external

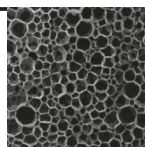
- sources of renewable energy, such as a solar system and a biomass boiler
- Easy installation

2.1. High efficiency insulation and outer casing

The quality of the insulation of a water heater is a key factor for its heat conservation capability and energy efficiency.

All water heaters ZN series have a high efficiency insulation (DIN 4753, part 8) and outer casing of PVC with RAL 9006

Water tank Capacity, L	Insulation type
150, 200, 250, 300, 400, 500,	rigid, PPU 50 mm
750, 1000, 1500, 2000	soft, PPU 100 mm removable

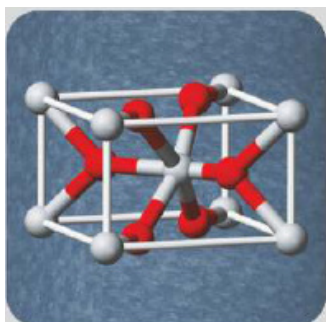


A microscopic view of hard polyurethane

2.2. Water tank.

Water tank is made of low-carbon steel S235JR, tightly covered with titanium enamel on the inside. It is then baked to produce a smooth and uniform deposition - free glazing. Thus the domestic hot water remains clean, and the water tank is protected against corrosion.

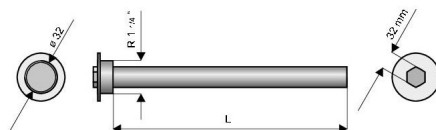
All threads are internal (see technical parameters).



2.3. Cathodic Corrosion Protection of Enamelled Steel tanks for domestic hot water (DIN 4753, part 6)

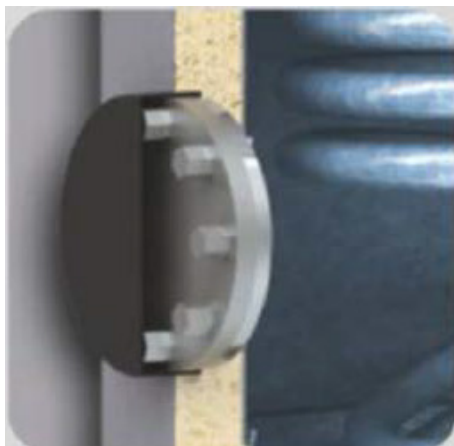


Magnesium anode - connection size and length:



Water tank Capacity, L	Anode connection size, mm	Anode length, mm	Anode Pcs.
150	1 1/4"	230	1
200	1 1/4"	300	1
300	1 1/4"	400	1
400, 500	1 1/4"	600	1
750, 1000	1 1/4"	700	1
1500, 2000	1 1/4"	700	2

2.4. Inspection opening.



Water tank Capacity, L	Flange diameter, mm	Opening diameter, mm
150	180	110
200	180	110
300	180	110
400	180	110
500	180	110
750	280	200
1000	280	200
1500	280	200
2000	560	400

Large and convenient inspection opening located in the lower part of the tank gives access for maintenance and cleaning. The opening is closed by an enameled flange cover which may have a sleeve for fitting electric heater if necessary.

 Do not reuse the gasket of flange. Replace the gasket at each inspection (opening).

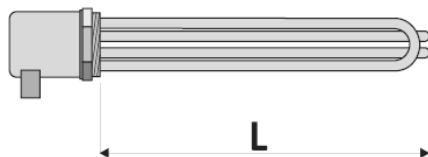
2.5. Thermometer.



2.6. Electric heating element.

Outlet connection of electric heating element 1 1/2" :

3000W/230V; 4500W/230V;
6000W/230V; 7500W/400V.

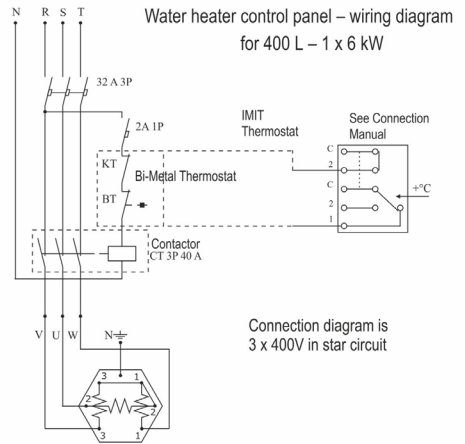
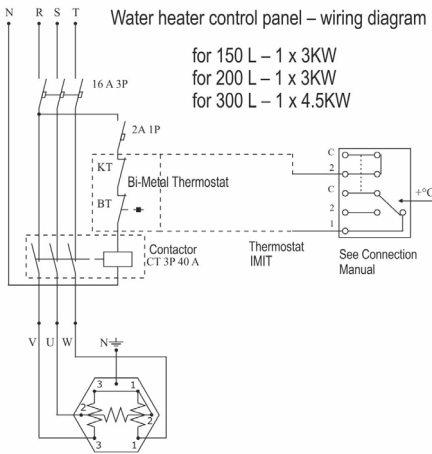


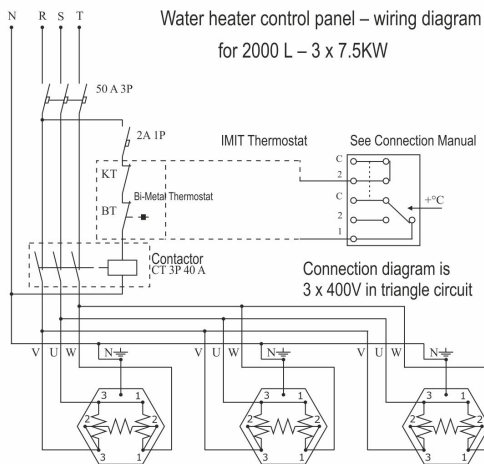
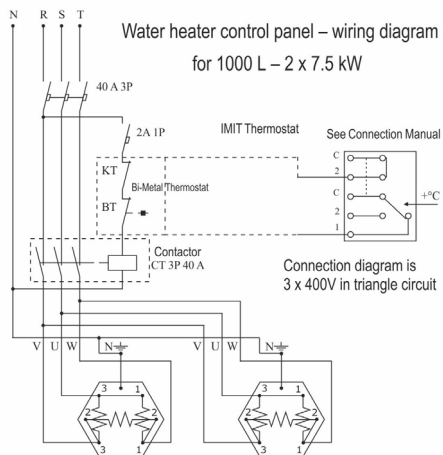
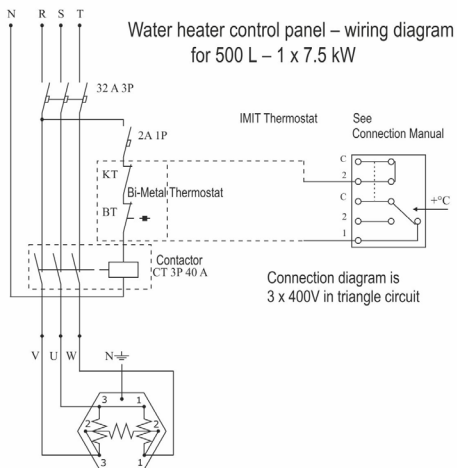
 The connection of the electric heating element to the electric power supply must be done by a qualified electricians. When connect the heating element to the electric network, make sure that it is properly grounded.

In the table of technical parameters is specified location for installation of electric heating element.

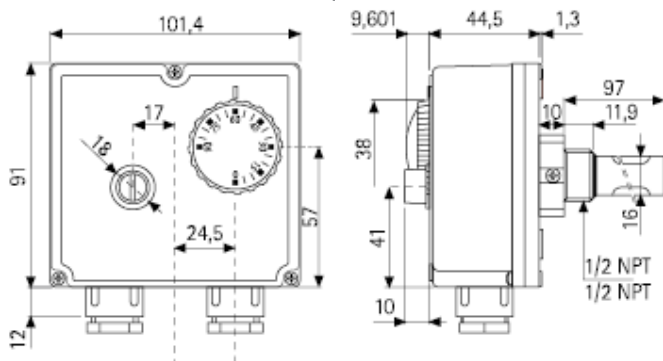
Water tank Capacity, L	Connection	Length L, mm	Current, W	Voltage, V
150 ÷ 2000	1 1/2"	210	3000	230/400
300 ÷ 2000	1 1/2"	320	4500	230/400
400 ÷ 2000	1 1/2"	410	6000	230/400
500 ÷ 2000	1 1/2"	590	7500	230/400

Wiring diagrams





2.7. Thermostat



Scheme 1

CONFORMITY TO STANDARDS

This product is in conformity with:

- EN 60730-1 and subsequent editions;
- EN 60730-2-9

CONFORMITY TO REGULATIONS

This product complies with:

- Low Voltage Directive 73/23 EEC
- Electromagnetic Compatibility Directive 89/336/EC



TECHNICAL CHARACTERISTICS

Temperature range – regulation- $0^{\circ}\text{C} \div 90^{\circ}\text{C}$;
 limit - $90^{\circ}\text{C} \div 110^{\circ}\text{C}$;
 Tolerance

Regulation $\pm 5\text{k}$,
 limit – 15k ; -6k (depends on the type)

Temperature differential
 Regulation $6 \pm 2\text{k}$; $4 \pm 1\text{k}$ (depends on the type)
 Limit $25 \pm 8\text{k}$; $15 \pm 8\text{k}$ (depends on the type)

Automatic adjustment (TLSC/A) and
 manual adjustment (TLSC).

Degree of protection = IP 40

Insulation class = I

Temperature change rate = $<1\text{K}/\text{min}$.

Maximal temperature point: 80°C

Maximal temperature for electric lamp:
 125°C

Accumulation temperature: $15^{\circ}\text{C} \div 55^{\circ}\text{C}$

Maximum pressure of the cartridge:
 10 bar

Constant time: $< 1''$

Electric connection:

C-1 ADJ.: $10(2,5)\text{A}/250\text{V}^{\circ}$;

C-2 ADJ.: $6(2,5)\text{A}/250\text{V}^{\circ}$;

C-1LIM.: $0,5\text{A}/250\text{V}^{\circ}$;

C2LIM.: $10(2,5)\text{A}/250\text{V}^{\circ}$;

Terminal – circuit breaker or
 switch-on contacts

Switch-on action – 2B

Place of installation – normal

Type of wire – M20 x 1.5

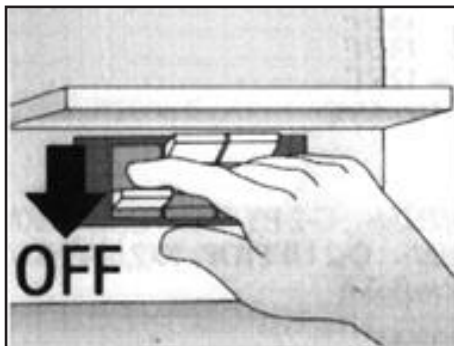


WARNING !
All installation operations, including manual adjustments, must be fulfilled by a qualified specialist following all safety conditions.

INSTALLATION AND CONNECTION .

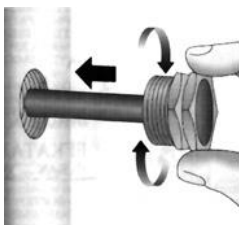
Safety instructions:

Before connecting the thermostat, make sure that THE UNIT TO BE THERMALLY CONTROLLED (water heater, pump, etc.) IS NOT CONNECTED to the power supply network, and is in compliance with the instructions in Figure

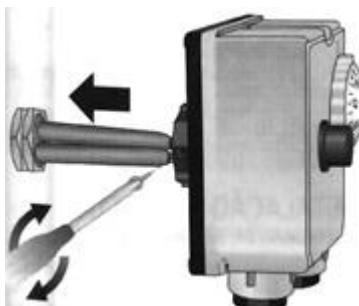


Scheme 2

a)) See scheme 3 and scheme 4.

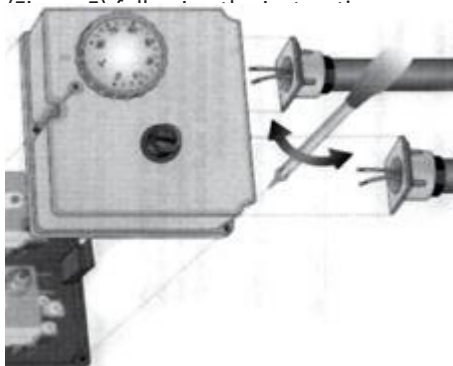


Scheme 3

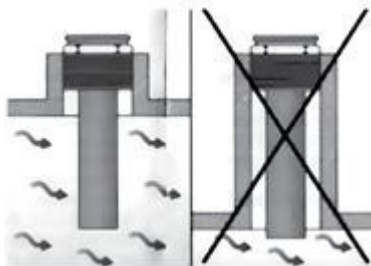


Scheme 4

b) Unscrew the three bolts and remove the front part of the thermostat. Unravel the power supply wires and connect them to the terminals of the thermostat



Scheme 5



Scheme 6

NOTE: See Scheme 6.

To close the front part, the cartridge opening must align with the coupling of the adjustment knob.

CONNECTION (Scheme 7)

LIMITATION

TERMINAL 2 – opens the circuit when the temperature rises.

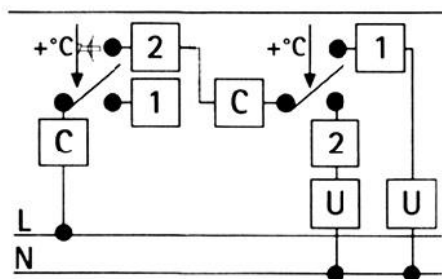
TERMINAL C – common contact.

THERMOSTAT

TERMINAL 1 – opens the circuit when the temperature rises.

TERMINAL 2 – closes the circuit when the temperature rises

TERMINAL C – common contact

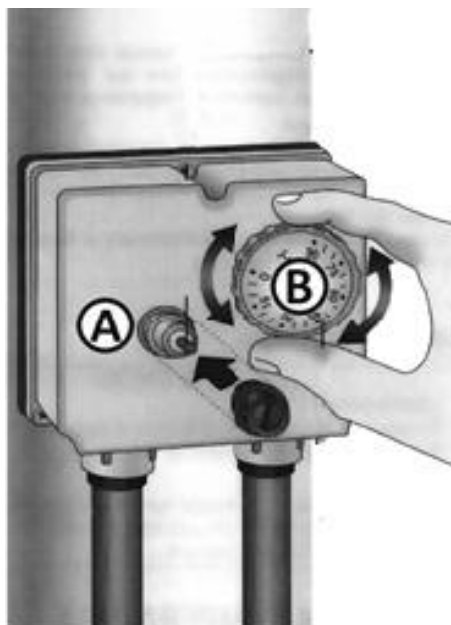


Scheme 7

TEMPERATURE ADJUSTMENT (see Scheme 8)

A – Reset button (only for TLSC)

B – Knob for temperature adjustment

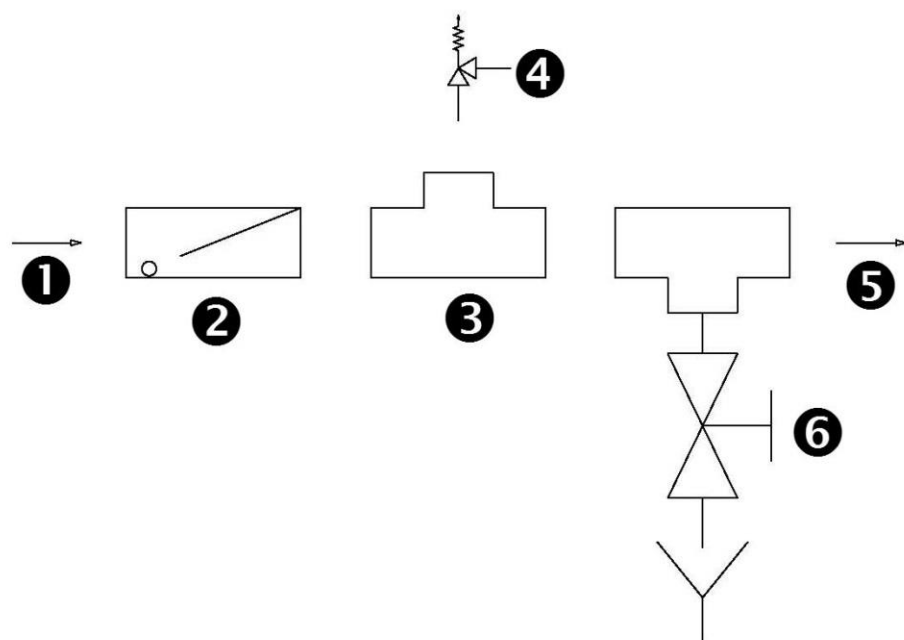


scheme 8

2.8. Screws with rubber head

Screws with rubber heads are mounted at the bottom of the vertical water tank / 150 to 500 l / - use to level the tank.

3. CONNECTING OF SAFETY RELIEF VALVE TO WATER TANK

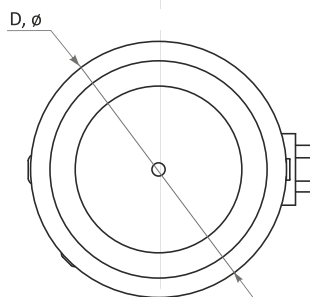
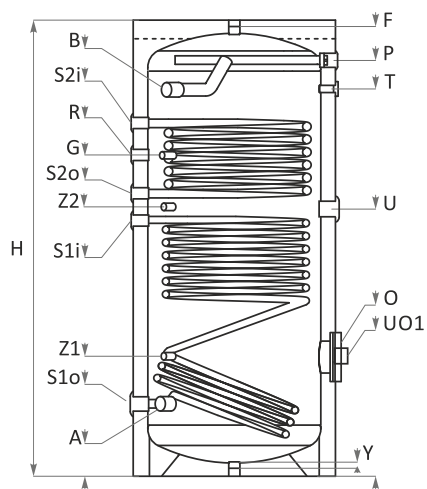
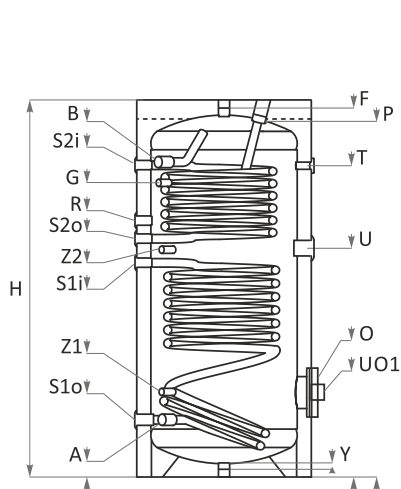


Legend:

1. Cold water inlet-water supply
2. Check (return) valve
3. Tee
4. Safety (relief) pressure valve
5. Cold water inlet - water tank
6. Stopcock (drainag

	Stop (Shut-off) valves should never be installed between a safety (relief) valve and the tank. It is recommended once a year to check the operation of the safety valve.
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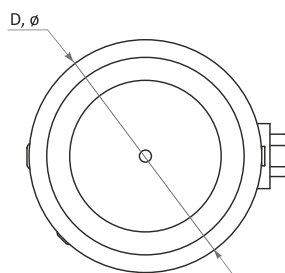
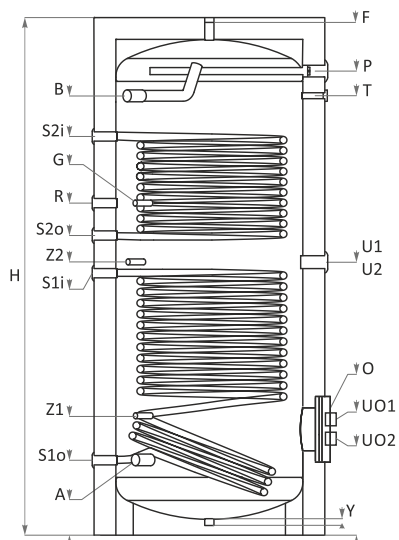
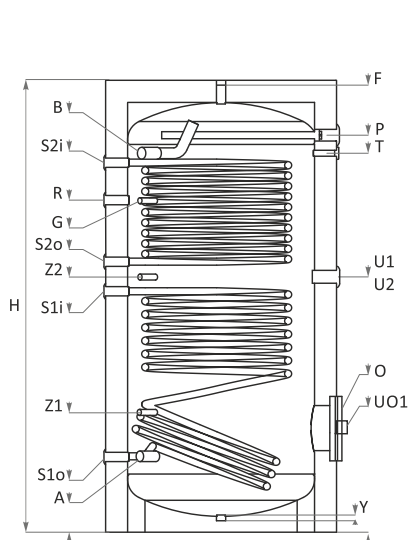
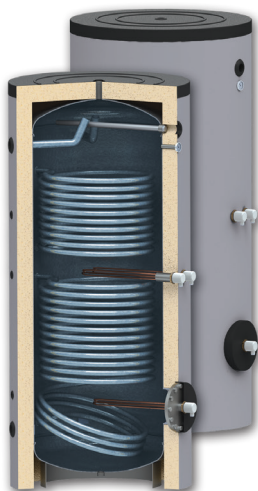
4.1. ZN - with two coils.





		ZN 150	ZN 200	ZN 300	ZN 400	ZN 500
Capacity	L	150	200	300	400	500
Height / Min. vertical clearance	H, mm	1070/1210	1340/1460	1420/1580	1470/1670	1720/1890
Diameter	D, mm	Ø 560	Ø 560	Ø 660	Ø 750	Ø 750
Insulation		50 mm rigid PPU				
Oper. pressure / max. temperature	bar/°C	10/95	10/95	10/95	10/95	10/95
Test pressure of tank	bar	15	15	15	15	15
Electric heating element (optional)	kW	2 x (3÷6)	2x (3÷6)	2 x (3÷6)	2 x (3÷7.5)	2 x (3÷7.5)
Weight	kg	65	82	118	160	185
Cold water inlet	A, mm	Rp1"/202	Rp1"/202	Rp1"/215	Rp1 1/4"/270	Rp1 1/2"/270
Hot water outlet	B, mm	Rp1"/1070	Rp1"/1168	Rp1"/1182	Rp1 1/4"/1240	Rp1 1/2"/1453
Recirculation	R, mm	Rp 3/4"/788	Rp 3/4"/987	Rp 3/4"/957	Rp1"/1105	Rp1"/1206
Operating pressure / Max.Coils temp. S1/S2	bar/°C	16/110	16/110	16/110	16/110	16/110
Test pressure S1/S2	bar	25	25	25	25	25
Coil capacity S1/S2	L	4.56/2.47	5.55/3.70	7.40/5.55	9.25/6.17	11.10/7.40
THeat exchange surface S1/S2	m²	0.74/0.4	0.9/0.6	1.2/0.9	1.5/1	1.8/1.2
Lower coil inlet S1	S1i, mm, Rp1"	592	692	805	850	960
Lower coil outlet S1	S1o, mm, Rp1"	202	202	215	270	270
Upper coil inlet S2	S2i, mm, Rp1"	874	1112	1170	1210	1350
Upper coil outlet S2	S2o, mm, Rp1"	674	812	894	952	1062
Prolonged power acc. to DIN 4708; 80°C/60°C/45°C S1	kW (m3/h)	25(0.61)	29(0.71)	53(1.30)	62(1.52)	72(1.77)
Prolonged power acc. to DIN 4708; 80°C/60°C/45°C, S2	kW (m3/h)	15(0.37)	18(0.44)	21(0.52)	27(0.66)	34(0.84)
NL – power coefficient at 60°C, S1/S2	NL 60°C	2.5/1	4.5/1.5	11/2	13/2.2	18/2.8
Pressure drop Δp, S1/S2	Δp, mbar	65/48	75/55	120/70	180/80	210/90
Sensor sleeve for thermostat	G, mm, Rp1 1/2"	788	1037	1104	1054	1206
Air vent sleeve	F, mm, Rp1"	1070	1340	1410	1480	1710
Inspection opening/Flange	O, mm, Ø, mm	180/309 Ø 110	180/309 Ø 110	180/320 Ø 110	180/450 Ø 110	180/450 Ø 110
Drain sleeve	Y, mm, Rp1"	30	30	30	30	30
Thermometer	T, mm, Rp1 1/2"	892	1138	1170	1152	1453
Anode	P, mm, Rp1 1/4"	1070	1340	1410	1337	1568
Sleeve for Electric element on water tank body	U, mm,	Rp1 1/2" /752	Rp1 1/2" /645	Rp1 1/2" /852	Rp1 1/2" /901	Rp1 1/2" /1111
Sleeve for Electric element on inspection opening flange	Uo, mm,	Rp1 1/2" /309	Rp1 1/2" /309	Rp1 1/2" /320	Rp1 1/2" /450	Rp1 1/2" /450
Additional sensor sleeve	Z, mm, Rp1 1/2"	352/631	302/752	320/852	450/901	450/1011

*optional positioning of an electric heater





		ZN 750	ZN 1000	ZN 1500	ZN 2000
Capacity	L	750	1000	1500	2000
Height / Min. vertical clearance	H, mm	2000/2030	2050/2080	2310/2370	2310/2370
Diameter	D, mm	Ø 950	Ø 1050	Ø 1050	Ø 1350
Insulation		100 mm soft PPU, removable			
Oper. pressure / max. temperature	bar/°C	10/95	10/95	10/95	10/95
Test pressure of tank	bar	15	15	15	15
Electric heating element (optional)	kW	2 x (3÷7.5)	2 x (3÷7.5)	3 x (3÷7.5)	4 x (3÷7.5)
Weight	kg	263	315	423	761
Cold water inlet	A, mm	Rp1"/300	Rp1"/320	Rp1"/320	Rp1 ^{1/4} "/385
Hot water outlet	B, mm	Rp1"/1630	Rp1"/1700	Rp1"/1975	Rp1 ^{1/4} "/1885
Recirculation	R, mm	Rp1"/1405	Rp1"/1487	Rp1"/1487	Rp1"/1265
Operating pressure / Max.Coils temp. S1/S2	bar/°C	16/110	16/110	16/110	16/110
Test pressure S1/S2	bar	25	25	25	25
Coil capacity S1/S2	L	12.95/8.63	16.65/11.72	18.50/15.42	25.28/18.50
THeat exchange surface S1/S2	m²	2.1/1.4	2.7/1.9	3/2.5	4.1/3
Lower coil inlet S1	S1i, mm, Rp1"	970	1080	1180	1635
Lower coil outlet S1	S1o, mm, Rp1"	300	320	320	385
Upper coil inlet S2	S2i, mm, Rp1"	1560	1660	1790	1885
Upper coil outlet S2	S2o, mm, Rp1"	1160	1220	1350	1420
Prolonged power acc. to DIN 4708; 80°C/60°C/45°C, S1	kW (m3/h)	80(1.97)	105(2.58)	131(3.22)	180(4.42)
Prolonged power acc. to DIN 4708; 80°C/60°C/45°C, S2	kW (m3/h)	50(1.23)	62(1.52)	74(1.82)	110(2.70)
NL – power coefficient at 60°C, S1/S2	NL 60°C	32/10	42/28	64/34	80/55
Pressure drop Δp, S1/S2	Δp, mbar	210/150	260/110	310/260	420/300
Sensor sleeve for thermostat	G, mm, Rp1 ^{1/2} "	1435	1487	1487	1685
Air vent sleeve	F, mm, Rp1"	1950	2020	2320	2311
Inspection opening/Flange	O, mm, Ø, mm	280/450 Ø 200	280/460 Ø 200	280/460 Ø 200	560/484 Ø 400
Drain sleeve	Y, mm, Rp1"	30	30	30	30
Thermometer	T, mm, Rp1 ^{1/2} "	1630	1700	2089	1835
Anode	P, mm, Rp1 ^{1/4} "	1728	1798	2 x 2090	2 x 2003
Sleeve for Electric element on water tank body	U, mm,	Rp1 ^{1/2} " /1040	Rp1 ^{1/2} " /1140	2 x Rp1 ^{1/2} " /1220	2 x Rp1 ^{1/2} " /1340
Sleeve for Electric element on inspection opening flange	Uo, mm,	Rp1 ^{1/2} " /450	Rp1 ^{1/2} " /460	Rp1 ^{1/2} " /460	2 x Rp1 ^{1/2} " /484
Additional sensor sleeve	Z, mm, Rp1 ^{1/2} "	535/1040	520/1140	520/1220	745/1340

*optional positioning of an electric heater

5. 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.

6. WARRANTY

6.1. Manufacturing defects and materials guarantee

Manufacturer 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, Manufacturer will repair or replace the defective component or product

6.2. Exclusions and Limitations of Warranty Coverage

6.2.1.) 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.

- Accidents, installation on movable structures, negligence, improper care or nonconformity.

- Failure to observe the installation, use and maintenance instructions set forth in the installation manual of respective product.

- Improper installation and use as well as changes, especially if they are not made by authorized after-sale service personnel of Manufacturer.

- Testing and operation pressures greater than values established by Manufacturer 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.

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

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.

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

6.2.4.) 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.

6.2.5.) Manufacturer 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.

6.3. Claiming warranty

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

6.3.1) Immediately notify in writing:

- The installer, or the company that has sold the water heater to him, or
- The distributor firm, or
- The commercial representative of Manufacturer 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.

6.3.2.) After receiving the claim form, Manufacturer 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.

6.3.3.) The return of a product cannot be done without written authorization issued by the Quality Department. The return procedure shall be according to RMA (Re-

turn Material Authorization).

6.3..4) 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.

6.3.5) Manufacturer 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.

6.4. Limitation of liability

6.4.1) Manufacturer 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 the Manufacturer.

6.4.2.)The liability of Manufacturer under this Warranty Certificate is limited to the abovementioned 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.

6.4.3.) Abovementioned 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.

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

7. 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.





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