Owners Manual

ACCUMULATION TANKS with immersed DHW tank

DUO-E 600/150, DUO-E 750/200, DUO-E 1000/220, DUO-E 1500/300

CE

Regulus®

EN
v. 1.4

CONTENTS

1 - Description

DUO-E Accumulation Tanks are intended for accumulation and subsequent distribution of thermal energy of heating water with an immersed DHW tank and a steel heating coil (e.g. for connecting a solar system) from solid-fuel fired boilers, heat pumps, solar collectors, electric boilers etc. The accumulation tank shall always be connected to a closed heating circuit. In its bottom part there is a heating coil with 1” connection. The tanks are further fitted with two G 6/4” sleeves for connection to heat sources, four G 1/2” sleeves to accommodate probe sheaths and six sleeves for other heat sources. The G 6/4” sleeves can be used for direct installation of el. heating rods.
In order to reach proper working of the tank, it is necessary to design optimum hydraulics of the whole system, i.e. position of circulation pumps for both heat sources and heating circuits, valves, clack valves etc. When more heat sources shall be combined, it is recommended to use an intelligent controller, e.g. Regulus IR09 KTP, for both the source and consumer sides of a heating circuit, i.e. also for charging and discharging an accumulation tank.

1.1 - Models

Four models of 600/150, 750/200, 1000/220 and 1500/300 l enabling installation of an electric heating rod and other heating sources.

1.2 - Tank protection

The inner surface of the DHW tank is enameled according to DIN 4753. Further improvement is ensured by a magnesium anode fitted in the tank. The accumulation tank has no inner surface finish, the outer surface is lacquered in gray.

1.3 - Thermal insulation

For easy handling, the tanks are supplied with a detachable soft insulation 100 mm thick, with a zippered outer leatherette mantle.

1.4 - Connection points on the tank

2× sleeve with G 6/4“ inner thread
6× sleeve with G 1“ inner thread
4× sleeve for installation of lateral sensor sheaths, G 1/2“ inner thread
2× sleeve for connecting a heating coil, G 1” inner thread

1.5 - Packing

Tanks are delivered standing, each screwed to its pallet, packed in bubble wrap. It is forbidden to transport and/or store them in a horizontal position.

2 - General Information

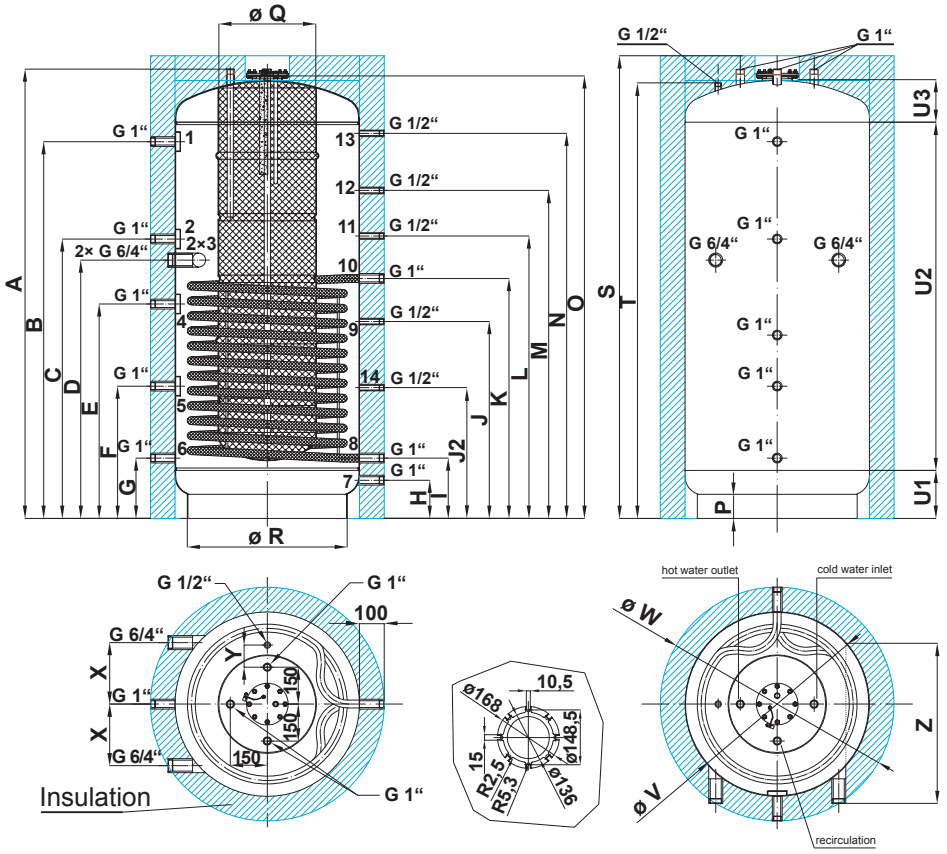
This Owners Manual is an integral and important part of the product and must be handed over to the User. Read carefully the instructions in this Manual as they contain important information concerning safety, installation, operation and maintenance. Keep this Manual for later reference. The appliance shall be installed by a qualified person according to valid rules and Manufacturer‘s Instructions.

This appliance is designed to accumulate heating water and distribute it subsequently. It must be connected to a heating system and heat sources. This appliance is also suitable for accumulator heating of domestic hot water.

Using the accumulation tank for other purposes than above described is forbidden and the manufacturer accepts no responsibility for damage caused by improper or wrong use or filling procedure.

Before filling the accumulation tank, fill the inner tank first!!!

3 - Technical Data and Dimensions of DUO-E Models



Tank code ..... **a**
Total tank volume ..... **b**
Empty weight ..... **c**
Max. working pressure - tank ..... **3 bar**
Max. working temperature - tank and heat exchanger ..... **95 °C**
Heating coil surface ..... **d**
Heating coil volume ..... **e**
Max. working pressure of the heating coil .... **10 bar**
Volume of the inner DHW tank ..... **f**
Max. working pressure - inner DHW tank ..... **8 bar**

Model		DUOE 600/150	DUOE 750/200	DUOE 1000/220	DUOE 1500/300
Tank code	a	7322	7323	7324	7325
Total tank volume [l]	b	600	750	1000	1500
Empty weight [kg]	c	191	220	257	318
Heating coil surface [m²]	d	2,4	2,5	2,8	3,9
Heating coil volume [l]	e	14,5	15,5	17,5	24,5
Volume of the DHW tank [l]	f	150	200	220	300
Dimensions [mm]	A	1570	1825	2035	2070
	B	1315	1780	1700	1700
	C	1035	1570	1150	1500
	D	900	1050	1075	1200
	E	750	745	900	940
	F	475	468	600	665
	G	235	235	270	390
	H	155	155	170	205
	I	245	245	270	380
	J	520	730	800	875
	J2	-	-	-	630
	K	835	975	1000	1125
	L	960	1115	1200	1310
	M	1110	1262	1400	1500
	N	1315	1565	1700	1710
	O	1525	1780	2010	2045
	P	97,6	97,6	125	125
	ø Q	400	400	400	500
	ø R	650	650	700	900
	S	1625	1880	2090	2100
	T	1515	1770	1980	1990
	U1	195	195	220	265
	U2	1160	1415	1600	1500
	U3	170	170	190	235
	ø V	750	750	790	1000
	ø W	950	950	990	1200
	X	250	250	250	300
	Y	90	90	90	125
	Z	650	650	700	900

4 - Operation

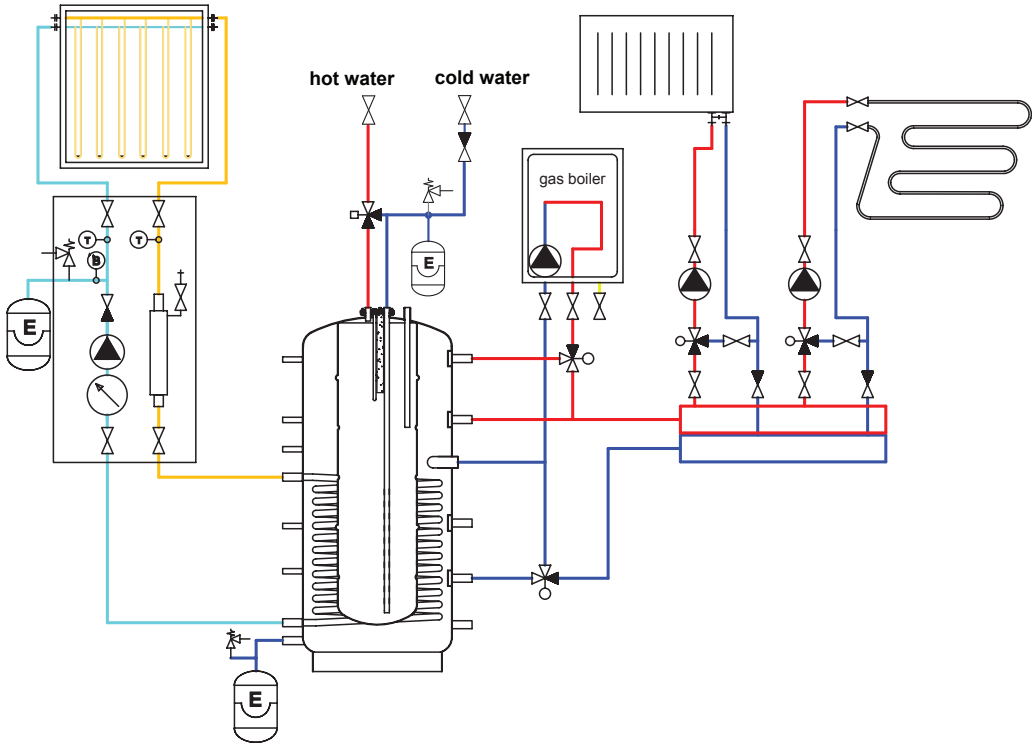
This tank is designed for heating and accumulation of heating water in household or industrial applications, however always in closed pressure circuits with forced circulation. Hot water is heated inside the accumulation tank from several possible heat sources like various kinds of heating boilers, renewable energy sources (heat pumps, solar collectors), or also electric heating elements.
The immersed DHW tank is heated from heating water inside the accumulation tank. The immersed DHW tank shall be connected to cold water with threaded fittings, and to outlet points with threaded fittings for hot water. When hot water is drawn from the outlet point, cold water flows into the immersed tank and heats up from the heating water in the accumulation tank to the temperature set by the thermostat placed in the DHW tank sheath. Hot water temperature should be set to 60-65 °C. This temperature guarantees the best operation and at the same time, it it prevents formation of Legionella bacteria.
The accumulation tank shall be connected to a heat source through G 6/4" and G 1" threaded fittings. A solar system connects to the connection points of the heating coil through G 1" threaded fittings.
Individual connection points are assigned according to the circuits to be connected. There is a wide choice of combinations, the following chapter describes just some examples.

5 - Examples of Assigning Connection Points

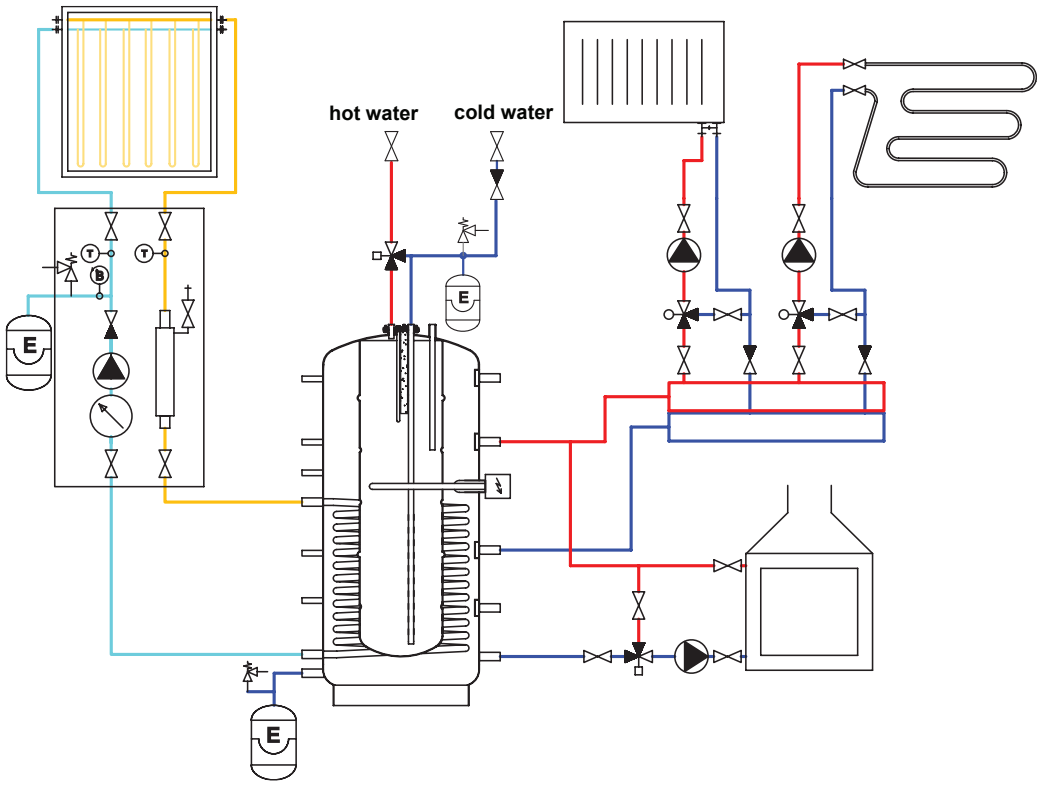
Connecti-on point	Example I. Solar collector + gas boiler	Example II. Solar collector + fireplace + el. heating rod	Example III. Solar collector + gas boiler + solid fuel boiler
1	inlet from a gas boiler	plug	inlet from a gas boiler
2	outlet to a manifold	outlet to a manifold, inlet from a fireplace	inlet from boilers, outlet to a manifold
3	outlet to a gas boiler	electric heating rod	outlet to a gas boiler
4	plug	inlet from a manifold	plug
5	return line	plug	return line
6	plug	outlet to a fireplace	outlet to a solid-fuel boiler
7	expansion vessel, drain valve	expansion vessel, drain valve	expansion vessel, drain valve
8	outlet to a solar system	outlet to a solar system	outlet to a solar system
10	inlet from a solar system	inlet from a solar system	inlet from a solar system
9, 11, 12, 13, 14	plug, sheath, thermostat … controller dependent	plug, sheath, thermostat … controller dependent	plug, sheath, thermostat … controller dependent
flange	CW inlet and HW outlet, anode, recirculation	CW inlet and HW outlet, anode, recirculation	CW inlet and HW outlet, anode, recirculation

Connections depend on the circuit to be connected, the a.m. examples are informative only.

Example I.
Solar collector and a gas boiler.



Example II.
Solar collector + fireplace + el. heating rod.



Example III.
Solar collector + gas boiler + solid fuel boiler.

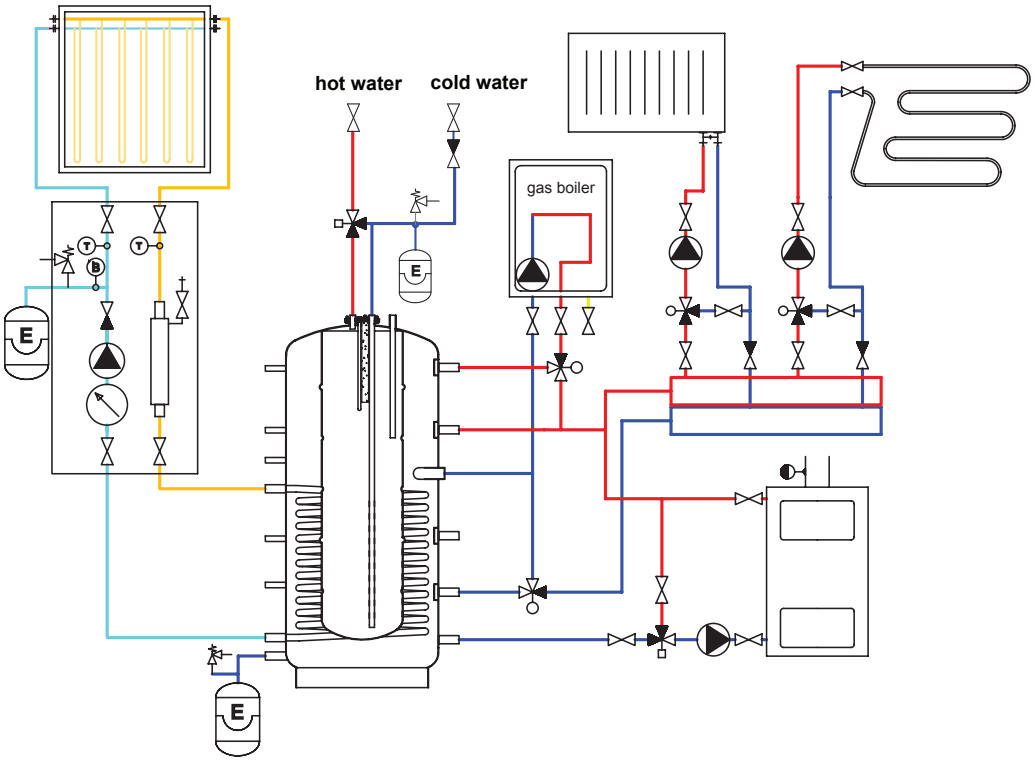


Table of limit values for total dissolved solids in hot water

Description	pH	Total dissolved solids (TDS)	Ca	Chlorides	Mg	Na	Fe
Max. value	6.5 - 9.5	600 mg/l	40 mg/l	100 mg/l	20 mg/l	200 mg/l	0,2 mg/l

6 - Installation and Commissioning

Installation must meet valid rules and may be done only by qualified staff.
Installation of an el. heating rod may be done by qualified staff only.
Defects caused by improper installation, use or handling are not covered by warranty.

6.1 - Connection to heat sources

Place the tank on the floor, as close to your heat source as possible. Mount the insulation, cf. Installing Insulation on the Tank. Connect the heating circuit to inlets and outlets respecting the thermal stratification in the tank. Install a drain valve at the lowest point of the tank. Install an air vent valve at the highest point of the system. Insulate all the connecting piping.
The tank may be fitted with electric heating rods up to 12kW output. They can be powered either directly (elements with built-in thermostat) or via a controller for the entire heating system.
All electric heating elements shall be protected by a safety thermostat.

6.2 - Connection to a solar system

The tank can be used with a solar system. In such a case, the inlet for hot heat-carrying liquid coming from the solar system shall be connected to the upper sleeve of the heating coil G 1" and the lower outlet to the return piping to the solar system. Insulate all the piping between the tank and the solar system.

6.3 - Heating rod installation

The G 6/4" side sleeve is designed to accommodate an electric heating rod. Heating rods of output up to 6 kW can be used (depending on the tank diameter and rod length), connected either directly to the mains (thermostat-equipped rods), or to a heating system controller. The installation may be done by qualified staff only.
Warning: Electric heating elements shall be protected by a safety thermostat.

6.4 - Connection to a water pipeline

Hot water piping shall be done according to valid rules. Installation of a pressure reducing valve on the immersed tank inlet is recommended. For a water main with pressure above 6 bar a pressure reducing valve is necessary. In order to prevent water loss, installation of a min. 12l expansion tank is recommended at the cold water inlet to the immersed tank. Expansion tank installation is one of the essential preconditions for warranty extension. Should the water be too hard, install a water softener before the tank. In case the water contains mechanical impurities, install a strainer.

6.5 - Electronic anode rod installation

A so called electronic anode rod can be used instead of the magnesium one for the immersed tank. Its principle advantage is that its proper function is signaled by a control lamp while a magnesium anode rod needs to be taken out for check. In this case, just visual check of the electronic anode is sufficient. Please use a G 5/4" to G ½" reducing coupler when installing an electronic anode. In order to protect the tank properly and meet its warranty conditions, select an anode from the table below. A space of about 75 cm is needed between the tank top and ceiling to install/exchange the electronic anode rod.

Code	Anode rod length [mm]	For tanks
9172	750 (550/200)	DUO-E 600/150, DUO-E 750/200, DUO-E 1000/220, DUO-E 1500/300

6.6 - Commissioning

The DHW tank must be filled prior to filling the accumulation tank. Filling heating water first would cause damage to the protective layer of the DHW tank!!!
Fill the heating circuits with the appropriate fluids and air-bleed the entire system. Check all connections for leaks and verify the system pressure. The quality of top-up and heating water is set by ČSN 07 7401:1992.
Hot water quality must meet the conditions shown in the Table of limit values for total dissolved solids in hot water, page 7 of this Manual.

Fill the heating circuits with the appropriate fluids and air-bleed the entire system. Check all connections for leaks and verify the system pressure. Set the heating controller in compliance with the documentation and manufacturer's recommendations. Check regularly proper function of all control and adjusting elements.

7 - Installing Insulation on the Tank

Description

Thermal insulation is a component of accumulation tanks that prevents heat losses. For these types of accumulation tanks, insulation is supposed to be installed on the spot for easier handling. Insulation made of soft polyurethane foam with a zippered PVC layer is used.

Warning

Insulation installation shall be done in two or three persons, depending on its size. The zippered soft-foam insulation **must not be installed at temperatures below 20 °C**. If this cannot be avoided, the insulation shall be pre-warmed in another room to at least 20 °C. It is impossible to install insulation of lower temperature, there is a risk of damage, esp. to the zipper.
Do not use any tools for installation.
Keep away from open fire.

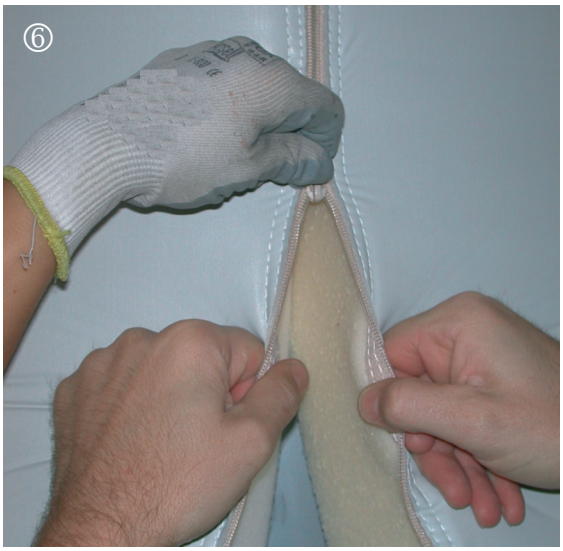
How to install soft foam insulation with a PVC layer

1. Fix the tank following installation instructions.
2. Wrap the insulation around the tank carefully. Check that the insulation adheres to its body perfectly. This can be reached by rubbing and patting the insulation by hand from its center evenly in both directions until the insulation adheres to the tank's surface completely and no bubbles are left.
3. Use the holes for sleeves as a rest during the insulation installation.
4. At least one person presses the insulation to the tank, pulling both ends together. The other person closes the zipper, see pics.
5. Put on the upper insulation and cover.
6. Push on the covering plastic rosettes depending on the size of sleeves, or put on the flange plug(s) with insulation.
7. Finish the tank installation in compliance with the respective instructions and valid standards and rules.

Warranty on insulation

□ Warranty on insulation
- the procedure described in the Installation Manual was not respected,
- the product was used for other purposes than intended.

□ Warranty does not cover:
- usual wear and tear,
- damage caused by fire, water, electricity or a natural disaster,
- defects caused by failure to use the product in compliance with its intended purpose, by improper use and insufficient maintenance,
- defects caused by mechanical damage to the product,
- defects caused by tampering or incompetent repair.



Pictures showing how to mount soft-foam insulation with a PVC sheet on a storage water heater.

8 - Maintenance

If the tank is fitted with a heating element, disconnect it from the mains first. Clean the exterior of the tank with a soft cloth and a mild detergent. Never use abrasive cleaners or solvents. Check all connections for leaks. The tanks are equipped with an anti-corrosion sacrifice magnesium anode rod. The anode rod shall be checked within 12 months after commissioning and subsequently always not later than 12 months after the last check. In locations where water contains more ferrites or calcites, it is recommended to check the anode every 6 months. If more than 1/3 of its total volume is consumed, the anode shall be replaced with a new one. Disregarded of its state, the anode rod shall be replaced with a new one within 24 months from commissioning. In case an electronic anode is used, the above described procedures are not necessary. Then only a visual check of the indication lamp is necessary every 3 months. Proper working of the Electronic Anode is described in its User's Manual. If damage to a tank occurs due to neglected substitution of a magnesium anode rod or a non-working electronic anode, the warranty cannot be claimed.

9 - Disposal

Packing shall be disposed of in compliance with the valid rules. When the product reaches the end of its life, it shall not be disposed of as household waste. It shall be dropped off at a Local Waste Recycling Center. Insulation shall be recycled as plastic and the steel vessel as scrap iron.

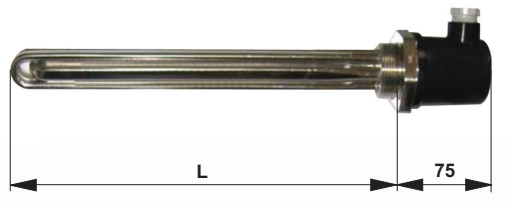
10 - Warranty

This product is covered by warranty according to the conditions described in this Manual and according to the Warranty Certificate. A Warranty Certificate is an integral part of the supply. Tank transport or storing in a horizontal position is considered a warranty violation!

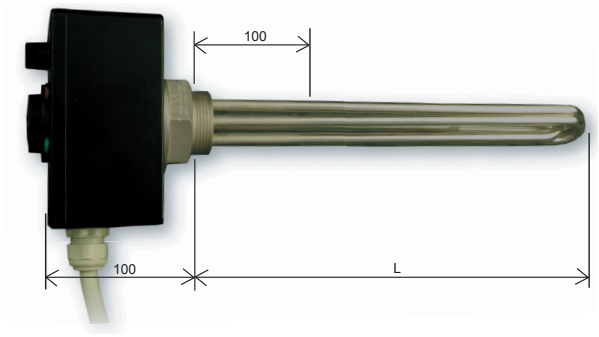
11 - Recommended Accessories

11.1 - Electric heating rods

Electric heating rods can be used in domestic storage water heaters and accumulation tanks. They can be power-supplied either by 230V or 3×230V/400V. Heating rods of output 2-12 kW can be installed into accumulation tanks, into the sleeves with G 6/4" inner thread (the right type should be selected with respect to its length and the tank diameter). Electric heating rods are currently made of nickel-plated copper. They can be also supplied in a copper or stainless-steel version. Heating rods with an integrated electronic thermostat and a safety thermostat are also available.



G 6/4" thread, nickel-plated copper	power output (kW)	voltage (V)	length L (mm)	code
	2	230	245	8935
	3	230	305	8936
	4.5	3 × 230	370	8937
	6	3 × 230	495	8938
	7.5	3 × 400	585	8939
	9	3 × 400	680	8940
	12	3 × 400	815	8941

G 6/4” thread, stainless steel, thermostatic head, adjustable by a knob	power output (kW)	voltage (V)	length L (mm)	code
	2	230 V	473	10267
	3	230 V	350	8933
	2	3 × 230 V	225	8930
	3	3 × 230 V	285	8931
	4.5	3 × 230 V	382	8464
	6	3 × 400 V	478	8465
	7.5	3 × 400 V	570	8582
	9	3 × 400 V	665	8466

Flange enabling installation of an electric heating rod into the lower inspection hole.	flange diameter	flange thread	code
	170 mm	inner G 6/4“	7376

11.2 - Watersoft N electromagnetic water treatment device

The device for electromagnetic water treatment, Watersoft N, uses no chemicals. It softens water, prevents scale formation and dissolves existing sediments. It is particularly suitable for use with devices with thermally stressed spots like heat exchangers and storage water heaters. Among its advantages is a quick and easy installation, no need for plumber’s intervention and min. operation costs (consumption of el. energy 2W).

Model	WATERSOFT N
Operation indication	green LED
Version	wall mount
Power supply	230V / 50Hz
Power input	max. 2W
El. protection	IP 65
Dimensions	70 × 50 × 34 (mm)
Max. pipe diam.	1 ½“
Max. water flow	4m^3/h

11.3 - Additives for heating systems

MR-501/F

Protective liquid made of organic compounds, intended for use in heating and cooling systems, solar collectors and heat pumps. It prevents corrosion of metals (iron, copper, aluminum etc.) and their alloys by creating a film on the surface that is in touch with the heating liquid. It can be mixed with antifreeze fluids. Recommended use: after cleaning the system with M 501/R.

MR-501/96P

Liquid agent of balanced efficiency for underfloor heating, solar panels and plastic piping. It creates a protective film and prevents growth of algae and gas formation. The system is also protected against calcareous sediments. This well-balanced mixture of corrosion inhibitors and protective film creating compounds ensures max. protection of underfloor heating and solar panel circuits.

MR-501/R (1kg)

Concentrated alkaline anti-corrosion liquid removing scale and calcareous sediments from heating systems. It dissolves scale and rust and makes it possible to remove them by flushing the system. 2 liters of MR-501/R shall be added to every 80-100l of heating water and let to act for 2-3 weeks depending on the degree of sedimentation. Then the heating system shall be drained and flushed. When filling new water, it should be treated by adding the protective liquid MR 501/F.

WARRANTY CERTIFICATE

for DUO-E Accumulation Tank

Model: .....

Serial number: .....

WARRANTY CONDITIONS

1. The warranty period is 60 months from the date of purchase.
2. When claiming warranty, this Warranty Certificate must be submitted together with the purchase receipt.
3. The warranty is valid only when the technical conditions set by this Manual are maintained and installation is done by an authorized person (confirmed in the Warranty Certificate).
4. The claimed defect must not be caused by tampering, improper installation and operation, using the product for other purposes than intended, placing the product in improper environment, or by a natural disaster.
5. Claims shall be settled by your dealer at the address shown below.

Date of purchase:.....

Stamp print, signature of the salesman and address of the shop:

Date of a professional installation by plumber: .....

Stamp print, signature and address of the authorized person:

06/2010

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