SMART-TANK

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SMART-TANK Installation and Operating Manual

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Tank Storage and Transportation.

Store the basins and tanks in dry and heated premises with air humidity not more than 65% and at a temperature not less than 20 degrees to prevent formation of the surface metal corrosion which may subsequently cause rust-through corrosion which may result in the equipment failure.

Transport the tanks avoiding falling or vibration to prevent the tank internal heat exchanger from being damaged. Damage to the tank internal heat exchanger may cause deformation or full depressurization of the heat exchanger tube resulting rendering the tank unsuitable for normal operation.

In addition, the falling and vibration may cause damage to the tank external insulation, thereby impairing thermal insulation properties of the product and loss of aesthetic properties.

If these rules are violated, the manufacturer is not liable for the product appearance, integrity and quality. The manufacturer also reserves the right to disclaim the product warranty.

In the case of the tank warranty claim situation, the operating service should contact the manufacturer and send the description of the tank failure accompanied by photos of the tank from all sides in full dimensions and also send the photo of the whole heating substation and its basic scheme from the project. It is prohibited to dismantle the tank without agreement with the manufacturer, since it may prevent the cause of the warranty claim situation from being found out.

Tank installation and mounting.

1.Tanks should be mounted and installed in accordance with the laws and regulations of the fire safety, electrical safety and occupational safety and in compliance with environmental standards and safety regulations of the country in which the tanks are to be mounted. If the mounting organization involved in the product mounting suspects that the situation is unsafe in terms of fire, electrical, occupational, ecological and industrial safety, or the subsequent unsafe operation of the product which may lead to loss of life, injuries or the equipment failure, it must immediately stop all works related to the equipment mounting, notify the Customer of works and then jointly find solutions of the problems emerged. If the manufacturer needs to be notified for finding the problem solution, this should be done. And once the solution has been found and agreed upon with all the persons and parties concerned, the mounting organization may resume the works.

2.The tank is to be arranged according to the design (which passed the state examination) to ensure its fire safety and electrical safety, in addition, the tank should be arranged in such a way so as to avoid its exposure to ultraviolet radiation (solar rays), as this may result in the damage (deformation) of the tank external insulation, it is prohibited to operate the tank in case of incomplete contact of a ring support with a bearing surface (the bearing surface should be flat relative to the horizon and also able to bear the weight of the tank of a respective capacity accounting the mass of fluid inside the tank according to the laws and regulations related to structural elements and metal structures). The manufacture is not liable for the improper tank arrangement that would result in detrimental consequences.

3.The tanks are to be mounted exclusively by skilled specialists the qualification of whom should be confirmed by respective certificates or diplomas allowing them to perform installation and pre-commissioning of the pressurized heating and DHW systems. In case the installation is performed by unexperienced technicians, there exists the risk of abnormal operation of the heating and DHW system resulting in the system failure due to unskilled installation. In such a situation the manufacturer shall have no equipment warranty obligations may disclaim the warrant

4.Important! The tanks need to washed with water prior to operation!

Equipment electrical safety.

1. All electrical connections should be made only by the certified personnel having respective documents confirming their competence the field of electrical installation work, electrical safety and also the work related to connection of electrical components in the heating and DHW systems.

2. All devices which are to be connected to the tanks and also tanks as such should be earthed and equipped with residual current circuit-breakers designed to protect an individual from any adverse effect of electrical currents which may result in bodily harm or be detrimental to his/her health. All tanks are fitted with a special ear or a screw for connecting the earthing (if this element is not available on the tank, please, contact us using the phone number provided below).

3. The tank earthing resistance should not exceed 3 Ohm, otherwise, you will not be

able to protect your health and ensure integrity of the equipment. Only the above specified resistance is capable of draining earth currents from the tank body and also currents that can affect a human body.

4. Important! Be extremely careful and cautious and don't confuse neutralling with earthing! It is not the same thing at all! Zero is zero, while earth is earth. Require the mounting organization to measure the earthing loop and submit an appropriate report certified by a signature and a seal of the certified organization. An access to the earthing bus is to be provided by the Customer.

5. Electric heating elements (thermoelectrical heaters - TEH) should be connected only by skilled specialists (specified in Item 1) with consideration for requirements (of Item 2,3,4).

Product corrosion resistance.

1. To prevent corrosion of tanks, protect the inner space of the vessel against ingress of air (oxygen). Therefore, seasonal emptying of vessels (summer/winter drainage) is prohibited - this rule applies to carbon steel vessels.

2. All tanks which are structurally fitted with magnesium anodes need to be examined for integrity of a magnesium anode at least once every 6 months. If the anode is damaged (even partially), it needs to be replaced. The damaged anode should be replaced only by the manufacturer-certified anode (avoid counterfeit products). Therefore, only SMART-TANK anodes may be used in the SMART-TANK tanks as the guarantee of quality and durability of your products.

3. If your tank is made of stainless steel and you need to mount a heating element (TEH) within it, you should be aware of the fact that this TEH should be fully made of the stainless steel (including a nut). However, if the nut is made of brass, it may cause corrosion. Such nuts in the TEH assembly, as a rule, are coated with a chrome protective layer. If this requirement is neglected, this may cause formation of rust-through corrosion resulting in the tank pressure leakage. This situation will be recognized as not subject to warranty.

4. The stainless-steel tanks require specific water quality. Violating these specifications may result in the tank failure. It should be borne in mind that prior to selecting a tank, you need to obtain the data on the quality of water to be used. If the water does not meet specifications provided in the Table, a water treatment system needs to be installed. In doing so, you will make yourself and your people safe from undesirable consequences and the equipment (electric kettles, irons, washing machines, dish-washing machines, boilers and DHW tanks) safe from premature failure.

Table of water quality for stainless steel tanks and tanks the design of which comprises stainless steel components:

Conductivity mc/cm *)	**>450**	**-**
pH	**<6**	**0**
	6-8+	**+**
	>8	**-**
Chlorides (mg/l)	**>50**	**-**
Sulfur compounds(mg/l)	**5> x <50**	**+**
	50-200 0	**0**
	>200	**-**
	<5	**-**
Nitrogen compounds (mg/l)	**<100**	**+**
Carbon dioxide (mg/l)	**<5 +**	**+**
	5-20 0	**0**
	>20	**-**
Oxygen (mg/l)	**<1 +**	**+**
	1-8 0	**0**
	>8	**-**
Amone (mg/l)	**<2 +**	**+**
	2-20 0	**0**
	>20	**-**
Ferrum and manganese (mg/l)	**>0.2**	**0**
Chlorine (mg/l)	**<0.5**	**+**

*) at 20 degrees Celsius

\+ = resistant material

0 = destruction may occur, if several substances reach the value of ‘’ 0 ‘’

\- = it is not recommended to use

x - measurable parameter

For the enamelled tanks the situation is slightly different compared to that related to stainless steel tanks. If you use the enamelled tank, the water should be hard for a reliable operation of the tank. Therefore, it should not be softened, otherwise, the enamel lining the tank will be destroyed.

Table of quality of water for enamelled carbon steel tanks:

Conductivity mc/cm *)	**>450**	**-**
pH	**<4,5**	**-**
	4,5-7	**0**
	>7	**+**
Chlorides (mg/l)	**>50**	**-**
Sulfur compounds(mg/l)	**5> x <50**	**+**
	50-200 0	**0**
	>200	**-**
	<5	**-**
Nitrogen compounds (mg/l)	**<100**	**+**
Carbon dioxide (mg/l)	**<5 +**	**+**
	5-20 0	**0**
	>20	**-**
Oxygen (mg/l)	**<1 +**	**+**
	1-8 0	**0**
	>8	**-**
Amone (mg/l)	**<2 +**	**+**
	2-20 0	**0**
	>20	**-**
Ferrum and manganese (mg/l)	**>0.2**	**0**
Chlorine (mg/l)	**<0.5**	**+**

*) at 20 degrees Celsius

\+ = resistant material

0 = destruction may occur, if several substances reach the value of ‘’ 0 ‘’

\- = it is not recommended to use

x - measurable parameter

Hydraulics.

1. The tank installation diagram is defined by the design solution which passed the state expert appraisal. The manufacturer is not liable for the incorrect hydraulic diagram and abnormal operation of the system as a whole. The manufacturer specifies the recommended tank connection diagram, however, a final decision should be the design decision. In case of non-compliance with this requirement, the manufacturer may disclaim the tank warranty.

2. Each pressurized tank operating within the heating and DHW system should be equipped with a safety assembly (a relief valve is to be mounted in two locations: at the tank upper point to blow out vapor generated in case boiling occurs in the system and at the bottom point to drain fluid). In case of non-compliance with this requirement, the manufacturer will disclaim the tank warranty.

3. Each tank and each its loop should be provided with an appropriately adjusted expansion tank and as regards its capacity, it should be not less than 10% of the capacity of the loop in which it is integrated. In case of non-compliance with this requirement, the manufacturer will disclaim the tank warranty.

4. Important! The expansion tank of the heating and DHW circuit should be installed and connected to the coolest part of the tank (return water, make-up water). This configuration is to promote the tank durability, while an inner surface of the expansion tank will be less subjected to an aggressive overheated water exposure.

5. Important! It is strictly prohibited to fit stainless steel tanks with conventional expansion tanks in which domestic hot water contacts with an inner unpainted surface of the expansion tank. This surface is made of the carbon steel and when exposed to high-temperature water, rust particles are transported from the expansion tank to the DHW circuit. As a result, the stainless steel is contaminated by the carbon metal. In such cases, the tank warranty is disclaimed.

6. Important! Recirculation. If a recirculation circuit at your facilities is made from plastic tubes or the tank piping connection is made from plastic tubes, while the metal tank is used in the system, this may result in the electro corrosion effect. Since water initially comes into contact with a plastic surface and then with a metal surface, a potential difference is produced which results in generation of currents which, in their turn, cause accelerated corrosion. To avoid such situations, the tank should be earthed. Without earthing the tank warranty is disclaimed.

7. Important! Do not conduct pneumatic tests to the heating system tightness with a mounted tank to avoid accidents. It is only allowed to conduct hydraulic tests of the heating system tanks (series: ZK, ZKP, ZK Electro, ZK Electro Mono, PZK, HWT, HWT-2, TC, SS-TC) at a water pressure not higher than 2 bar and at a temperature not more than 30 degrees Celsius; the DHW system tanks (series: SN, SN-2, SN-SS, SN-SS ELECTRO, SN-SS ELECTRO MONO, SN-HP) at a water pressure not higher than 5 bar and at a water temperature not more than 30 degrees Celsius.

8. The magnesium anode replacement period is not later than 6 months from the start of operation. The magnesium anode examination should be performed at least once every 3 months. In case the wear exceeds 2/3, the magnesium anode should be replaced with a new one.

Not permitted! To structurally modify all tanks and also perform repair works during the warranty period without agreement with the manufacturer. In case this requirement is violated, the tank warranty will be automatically disclaimed by the manufacturer.

The List of documents for warranty registration of the product by the manufacturer:

1. Water chemical analysis for compliance with parameters specified in the Table for enamelled tanks, Item 5, (Installation and Operating Manual), for stainless steel tanks, Item 4, the analysis document should be signed and sealed by the accredited laboratory.

2. Protocol of tank earthing resistance measurement certified by the signature and seal of the accredited organization for this type of works.

3. Photo of the installed tank from four sides fitted with a safety assembly.

4. Document confirming procurement (delivery document, sales check, invoice, etc.).

5. Tank Certificate with the name of the organization which performed the installation recorded in it.

Dear partners and customers, mounting organizations and mounters, if you did not find answers to your questions in our documentation, please, do not hesitate to contact us by phone and by mail and put your questions, it does not matter if they are ridiculous or peculiar, we shall answer all your questions and the main thing for us is that the Customer is satisfies and obtains correctly installed and durable product. Yours faithfully, SMART-TANK JLLC team.

Technical Department contact phones:

Site: www.smart-tank.pl

Please, send your questions to: e-mail: Heatex.sales@gmail.com

For buyers from the Republic of Poland, EU, CIS countries, and non-CIS countries: +48 668-769-708 (Poland, English, Russian speaking)