



ENGINEERING BULLETIN

Subject: Smart Indirect Water Heater Water Quality

Date: 6/1/2022

EB0075

The Smart Tank Indirect Tank water heater requires both the closed loop boiler heating water and the open loop domestic water to meet certain criteria to ensure the safe and reliable operation of the unit and to maintain the warranty. The guidelines laid out below must be followed for all installations of the Smart Tank Indirect Water Heater.

Notice: Failure to follow the instructions contained in this section will void the Triangle Tube Warranty.

Potable DHW Water Quality Requirements

The domestic water supplied to the water heater must be potable water that is free from contaminants, sediment, corrosive chemicals, and debris. It is the responsibility of the installer to ensure the water meets all the guidelines laid out in this manual. Water quality that exceeds the guidelines and results in damage or failure of the indirect tank is not covered by warranty.

Table 1 DHW Water Quality Requirements

Contaminant	Maximum Allowable Level	Units
Dissolved Carbon Dioxide (CO2):	15	ppm (mg/L)
Sulfate	250	ppm (mg/L)
Corrosivity	Non-corrosive	NA
Fluoride	2	ppm (mg/L)
Foaming agents	0.5	ppm (mg/L)
Chloride	100	ppm (mg/L)
pH	6 to 8	pH
Hardness	3 – 7	Grains/gallon
	50-120	ppm (mg/L)
Total Dissolved Solids (TDS)	120	ppm (mg/L)
Iron	0.3	ppm (mg/L)
Aluminum	0.2	ppm (mg/L)
Copper	1	ppm (mg/L)
Manganese	0.05	ppm (mg/L)
Zinc	5	ppm (mg/L)
Sediment	4	microns

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If the domestic potable water quality is not within the allowable levels laid out in the document the water must be treated. Special attention should be taken in regard to sediment, hard water, pH, and chlorides.

- If sediment in the water supply is 5 microns or greater a water sediment filter must be used.
- If there is there is hard water a water softening system should be used.
- If the chlorides or pH are out of range a water treatment company should be consulted to correct all water quality issues. Any water treatment/conditioning system must be installed and maintained in accordance with the manufacturer’s specifications.

Closed Loop Boiler Heating Water Quality Requirements

To maintain efficient operation of the heat exchanger in the Smart Tank the following instructions must be followed. Failure to follow these instructions will result in poor operation of the appliance, lead to potential failure of the product, and will void the warranty.

During installation and during the annual maintenance the water quality must be checked and if found outside of the requirements, must be corrected.

A micro bubble air elimination device is required to be installed in all heating systems. An air scoop or an automatic air vent are not an acceptable substitute for a micro bubble air elimination device and may not be used as a substitute in the installation. A few examples of acceptable devices are:

- Taco 4900 Series
- Caleffi Discal
- Spirovent

If an automatic feed valve is installed in the heating system, it may not be left open indefinitely. A continuous feed of fresh water could damage the system. It is required that after a short period of time, between one to four weeks following the installation of Smart Tank Indirect water heater into a heating system, the automatic feed valve be closed and the water quality be checked.

If underfloor heating is used in the heating system with the Smart Tank indirect tank water heater it must use oxygen barrier tubing and if not, it is required to be separated with a brazed plate heat exchanger. Only oxygen barrier tubing can be used in the heating system side of a Smart Tank indirect water heater.

Table 2 Closed Loop Heating Water Quality Requirements

Contaminant	Maximum Allowable Level	Units
Conductivity	100 to 300	µS/cm
Corrosivity	Non-corrosive	NA
Chloride	150	ppm (mg/L)
pH	6 to 8	pH
Hardness	3 – 7	Grains/gallon
	50-120	ppm (mg/L)
Total Dissolved Solids (TDS)	300	ppm (mg/L)
Glycol	20-50%	%

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Glycol

Boiler water (including additives) must be practically non-toxic, having toxicity rating or class of 1, as listed in **Clinical Toxicology of Commercial Products**. A maximum 50/50 mixture of inhibited propylene glycol is allowed. Less than a 20% concentration of glycol is not permitted. Glycol will acidify because of thermal degradation overtime and could cause damage to components in the heating system. This degradation is why heating system specific propylene glycol only must be used, these glycols contain additives and inhibitors or are meant to work with specific system inhibitors. The service technician must follow the antifreeze manufacturer's instruction. Antifreeze at a minimum must be checked on an annual basis or what is specified by the manufacturer of the antifreeze. Antifreeze must be replaced at a minimum every 3-5 years or what is specified by the manufacturer of the antifreeze.

When using antifreeze in the heating system circulator sizing must be considered because of the increase viscosity of the glycol mixture, a higher head circulator may be required. The glycol will also lower the heat capacity and the btu output will be reduced by approximately 16-20% when using a mixture of 50% propylene glycol and 50% water. The reduce heating capacity at a 50/50 mixture will vary depending on the brand and makeup of the glycol. Glycol will reduce the efficiency and output of the indirect water heater because of this. When adding other additives to the heating system glycol water mixture make sure they are compatible with the brand of glycol that is being used. Not all glycol and additives are compatible.

Danger

Do not use automotive, ethylene glycol or petroleum-based antifreeze. Do not use any undiluted antifreeze. This can cause substantial property damage, serious injury, or death.

Please contact technical support at techsupport@triangletube.com (856) 228-8881 x575 with any questions.