

# Technical service bulletin

## Boiler water chemistry and freeze prevention guidelines

### Introduction

**NOTE:**

**Please read this entire document prior to proceeding with any installation or maintenance of a Buderus boiler with an aluminum heat exchanger**

- This bulletin is a supplement to the Buderus Applications and Service Manuals, and its requirements must be met for full warranty coverage.
- Follow these guidelines to ensure a long service life and trouble free operation of the appliance.
- Any questions, please contact the Buderus Technical Service Department at 1-800-283-3787.

### Recommended steps for commissioning a new or retrofit boiler installation

1. Flush the system with clean water.
2. Isolate the boiler, fill the system with fresh water and a boiler cleaner, run for 30 minutes to 1 hour. Under no circumstances may boiler cleaner be pumped through the boiler. See a list of manufacturers and products on page 2.
3. Thoroughly flush the system with fresh water. Ensure all zones and loops are flushed. Empty out sediment traps.
4. Fill the system with fresh water and the proper amount of inhibitor.
5. Verify the pH is within the proper range.
6. Add additional inhibitor if pH is not within the proper range.
7. Check pH annually.

If using antifreeze, fill with approved antifreeze and fresh water at item 4. Recommended ratio 30% antifreeze. Never use more than 50% antifreeze. See page 2 for additional antifreeze instructions.

### Water Chemistry Guidelines

- System fluid pH must be maintained between 7 and 8.5.
- Use untreated water only to fill the system.
- Do not use TSP (tri-sodium phosphate).
- Do not use water treated with salt bedding type exchangers (ion exchanger).
- Do not use non-approved additives.
- Never introduce non-approved boiler treatment or similar additives.

- When using oxygen permeable PEX, the system must be separated from the boiler by a heat exchanger.
- Use a properly sized and working expansion vessel.
- Do not exceed the maximum permissible flow rate through the boiler. Excessive flow can cause erosion damage to the heat exchanger.

### Dielectric Isolation

- Install Dielectric Unions at the boiler supply line and return nearest the boiler or the low loss header. (On GB142, dielectric unions come pre-installed on pump manifold)

### Cleaning Requirements

- Before connecting the boiler to a new or existing heating system, clean and flush the system thoroughly. Ensure the system is free of sediment, flux and any residual boiler water additives.
- Systems containing antifreeze not approved by Buderus, must be completely flushed to ensure no old fluid remains.
- In older systems obviously discolored, murky or dirty water, or water with a pH reading outside the acceptable range (between 7.0 and 8.5) are indications that the system must be cleaned or treated. Thoroughly flush the system with fresh water to remove any sediment and contaminants. Sludge and iron oxide deposits can cause rapid breakdown of inhibitors.
- Thoroughly flush with fresh water after cleaning.
- Always follow the cleaner, antifreeze, or additive manufacturer's instructions.
- Do not mix different manufacturer's products.

### Fill Water and Chemistry

Make sure that the water used to fill the system meets the requirements:

- Maintain water hardness below 7 grains.
- Filling with chlorinated water is acceptable if chlorine levels are below 100 ppm.
- Do not use inhibitors or other additives unless listed in this document.
- Consult a local water treatment specialist for recommendations if any of the above is outside the stated ranges.

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## Eliminate System Leaks

- Continuous addition of make-up water will constantly add oxygen to the system and lead to corrosion. All system leaks must be repaired immediately.
- This boiler is designed for a closed loop hydronic heating system ONLY!
- This boiler is not suitable for natural gravity type installations, or any other open type system.

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## Aluminum safe anti-freeze guidelines

- Do not use antifreeze unless absolutely required as it reduces system efficiency. Consult antifreeze manufacturer's data for specific information on reduced capacity, and take the derating into consideration when sizing the system, pumps and expansion tank.
- Use only aluminum safe antifreeze products specifically listed in this document.
- Use the anti-freeze manufacturer's data to determine the anti-freeze ratio for the desired freeze protection temperature.
- Do not exceed 50% anti-freeze by volume, which can lead to foaming, develop sludge, and cause damage to the heat exchanger.
- Be sure to follow the antifreeze manufacturer's instructions for use, safe handling and storage of their product. Refer to the MSDS (Material Safety Data Sheet) for potential hazards and first aid procedures.
- Take a pH reading after the system has been in operation for a at least one hour, and adjust as necessary following the antifreeze manufacturer's instructions.
- Verify the frost protection on a regular basis using a refractometer and adjust or replace fluid as necessary.
- Antifreeze solutions can age and break down over time. Failure to check frost protection and pH on a regular basis may result in accelerated corrosion of boiler and other system components. Consult with the antifreeze manufacturer for recommendations.

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## Buderus Selected Suppliers

The following are selected suppliers of water treatment products for use in hydronic heating systems. Contact the manufacturers directly for further information on their product:

### Fernox Cookson Electronics

2635 Valley Creek Trail  
McKinney, TX 75070  
[www.fernox.com](http://www.fernox.com)

- Fernox F3 Cleaner
- Fernox F1 Protector (inhibitor)

### Noble Company

PO Box 350  
Grand Haven, MI 49417  
1-800-878-5788  
[www.noblecompany.com](http://www.noblecompany.com)

- Noburst-AL anti-freeze

### Rhomar Water Management, Inc.

PO Box 229  
Springfield, MO 65801  
1-800-543-5975  
[www.rhomarwater.com](http://www.rhomarwater.com)

- Rhogard anti-freeze
- Pro-Tek™ 922 inhibitor\*
- Hydro-Solv™ 9100 cleaner

\* This product may be used to adjust pH, but on occasion may not resolve the pH issue. In these cases, the system is contaminated, and must be flushed and refilled with clean water.

### Sentinel Water and Energy Solutions

[www.sentinel-solutions.net](http://www.sentinel-solutions.net)

- X100 Inhibitor
- X300 Universal Cleanser

GB312 models please refer to the GB312 Record Book for additional information.

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# Buderus

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