



Water quality requirements for

Logamax plus GB162-80 kW/100 kW

For heating contractors

Please read carefully prior to
commissioning and servicing

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1 About this document

This document contains important information regarding the quality of water for boilers containing aluminium materials and shows you how to keep a log of the water quality.

An operator's log (→ chapter 3, page 6) is included at the end of this document.

This operator's log is intended for qualified heating engineers, who – as a result of their training and experience – are skilled in dealing with heating systems.

Warranty claims with respect to Logamax plus GB162-80 kW/100 kW boilers are only valid in conjunction with the requirements specified herein and properly completed annual service records in the operator's log and the servicing and maintenance log (part of the installation and service manual).

Additional symbols

Symbol	Explanation
▶	Sequence of steps
→	Cross-reference to other points in this document or to other documents
•	Listing/list entry
–	Listing/list entry (2nd level)

Table 1

2 Requirements

The quality of the system water is very important. Poor water quality can damage heating systems due to scale formation and corrosion.

2.1 System requirements

- Installing a dirt trap like a y-strainer and a desludging device is required. This must be installed in the heating system in the immediate vicinity of the boiler, in an easily accessible position between the boiler and the lowest point in the return of the system.
- Clean the dirt trap at every annual service.
- Never use salt bedding type exchangers (ion exchangers) to soften the water.
- The low loss header and boiler connection set must be installed (supplied with the boiler).
- When using oxygen-permeable pipes (plastic), e.g. for floor heating systems, you must separate the system using secondary heat exchangers.

2.2 Cleaning of the heating system



NOTE:

If the appliance is installed in an existing heating system, dirt may accumulate in the boiler.

- ▶ Leading to localized overheating, corrosion and noise.

- Flushing ensures trouble free operation of your boiler. Thoroughly flush (30 minutes to 1 hour) the heating system (not including the boiler) with mains water prior to filling. The boiler **must** be isolated from the heating system.
- Close the shutoff-valves underneath the boiler so dirt and the cleaner is not flushed through the boiler. The following cleaners can be used:
 - Fernox F3 cleaner;
 - Rhomar hydro-solv 9100 cleanser;
 - Sentinel X300 cleaner.
- Install dielectric unions at the boiler supply line and return nearest the boiler or the low loss header to electrically separate the water heater from the household piping.
- It is not permitted to use well water to fill or replenish your system.
- **Do not** use inhibitors or other additives unless approved by Buderus for that purpose.
- The maximum permissible flow rate for this boiler type is 22 USgpm (83 l/min.).

2.3 Checking the water quality

The quality of water, especially when mixed with an anti-freeze (glycol), can have an enormous impact on the system performance. Marginal water quality can lead to the precipitation of scale, sediment deposits, or the accumulation of sludge in the heat exchanger, which reduces heat transfer efficiency. Poor water quality can damage the system by depleting the corrosion inhibitor and promoting a number of corrosions including general and acidic attack corrosion.

Therefore you must ensure the water complies to the following parameters:

Good quality water **without** anti-freeze contains:

- less than 300 ppm (17.5 gr/gall US) of total hardness;
- less than 100 ppm (5.8 gr/gall US) of chloride;
- less than 100 ppm (5.8 gr/gall US) of sulfate.

Good quality water **with** anti-freeze contains:

- less than 100 ppm (5.8 gr/gall US) of total hardness;
- less than 25 ppm (1.5 gr/gall US) of chloride;
- less than 25 ppm (1.5 gr/gall US) of sulfate.



NOTE:

Use the proper equipment to determine the water quality.

- ▶ Or have the water quality analyzed.

In those cases where mains water does not meet the standards of good quality, use demineralized water that has been distilled, deionized, or passed through a reverse osmosis process to remove harmful minerals and salts or separate the system with secondary heat exchangers.

2.4 pH-value

The pH-value must comply to values as stated in table 2 and must be checked once a year. If the pH-value isn't between the specified values then this must be corrected. Follow the instructions of the anti-freeze manufacturer to correct the pH-value.

Record the findings in the operator's log on page 6.

Use a suitable and calibrated pH-measuring instrument with an accuracy of less than 0.1.

In order to obtain a correct reading of the pH-value, turn on the boiler for 15 minutes, then measure the pH-value and adjust if necessary. Contact Buderus if you have any water quality issues or questions.

	pH-value
without anti-freeze	7.0 - 8.5
with anti-freeze	8.0 - 8.5

Table 2

**NOTE:**

The water quality is an important factor in increasing the economy, operating safety, service life and operational readiness of a heating system.

- ▶ Record the values required to confirm the water quality in the operator's log on page 6.

2.5 Prevention of damage by corrosion

Corrosion damage occurs if oxygen constantly enters the heating water due, for example, to:

- undersized expansion vessels (changing pressure can accelerate corrosion);
- faulty expansion vessels.

2.6 Use of anti-freeze

**WARNING:**

When using anti-freeze in the primary circuit of the boiler.

- ▶ Do not use PVC flue material. Only use CPVC or stainless steel!

**WARNING:**

Contamination of potable water.

- ▶ Take measures, such as disconnecting the filling loop or by installing a safety valve, to ensure that cross contamination with potable water is not possible.

**NOTE:**

Any additives introduced into the heating system water

- ▶ must be approved by the boiler manufacturer for use with aluminum boilers

**NOTE:**

The boiler manufacturer only responsible for the boiler.

- ▶ **Not** for the heating system.

**NOTE:**

The use of anti-freeze has a great effect on the heat transfer to the radiators. Keep this in mind while designing your heating system.

- ▶ For example:
When using a concentration of 30% anti-freeze in your heating system, you need to increase your radiator surface with 15% compared to the radiator surface if no anti-freeze is added to the heating system.

Only the following, by Buderus approved, anti-freeze fluids and concentrations may be used:

- Noble Company Noburst AL
- Interstate Intercool Biogreen 50 AA
- Interstate Intercool NFP-50 AA

**NOTE:**

We advise not to exceed the anti-freeze concentration of 40%.

- ▶ To determine the anti-freeze concentration use a measuring instrument with an accuracy of at least 1%

**WARNING:**

Boiler damage!

- ▶ The anti-freeze concentration must not exceed 50%, this voids warranty on the boiler.

Follow the instructions of the anti-freeze manufacturer, with regard to regular annual checking of the concentration and for proper disposal of anti-freeze.

2.7 Use of inhibitors

The following inhibitors are approved:

- Sentinel X100 at a concentration of 2%
- Fernox F1 protectorat a concentration of 0.5%.

3 Operator's log

No. of installed GB162 boilers: _____	Total combined output: _____ kW (btu)
Date commissioned: _____	
Anti-freeze product used (max. 50% concentration)? _____	

Table 3

Date								
Water quality check (enclose the analysis results to this operator's log)								
Type of fill water (mains water/distilled water)								
Added water volume [gal (l)]								
Total water volume [gal (l)]								
Added anti-freeze volume [gal (l)]								
Concentration of anti-freeze in the system [%]								
pH-value								
Primary flow over the boiler ¹⁾ [USgpm (l/min)]								
Company (stamp) / signature								

Table 4 Operator's log

1) Can be determined from the ΔT while the boiler is operating at full load

No. of installed GB162 boilers: _____ Total combined output: _____ kW (btu)
 Date commissioned: _____
 Anti-freeze product used (max. 50% concentration)? _____

Table 5

Date								
Water quality check (enclose the analysis results to this operator's log)								
Type of fill water (mains water/distilled water)								
Added water volume [gal (l)]								
Total water volume [gal (l)]								
Added anti-freeze volume [gal (l)]								
Concentration of anti-freeze in the system [%]								
pH-value								
Primary flow over the boiler ¹⁾ [USgpm (l/min)]								
Company (stamp) / signature								

Table 6 Operator's log

1) Can be determined from the ΔT while the boiler is operating at full load

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