

# Water quality instructions



LTALPER000153a

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# 1 Preface

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## 1.1 General

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In most cases, the boiler and the central heating installation can be filled with normal tap water and no water treatment will be necessary. To avoid problems with the boiler and installation, the limiting values in the tables below must be used for the composition of the heating water. If one or more conditions cannot be met, we recommend that you treat the heating water. Any installation must also be thoroughly flushed before it can be filled and used. If an installation is not flushed and/or if the water is not of the right quality, it may invalidate the guarantee.

## 1.2 General points to consider about water quality

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Our boilers are most efficient with clean, good quality tap water. The most prevalent factors with a negative impact on the quality of heating water are: oxygen, calcium, sludge, chlorides, minerals and acidity. The quality of the heating water is measurable through the acidity, hardness, conductivity, chloride content, iron content, iron oxide content and content of other components. For example, residue of a water treatment product used in the past. Apart from the quality of the heating water, the installation also plays a significant role. When using materials that are sensitive to oxygen diffusion (such as certain floor heating hoses, connection hoses, etc.), quite a lot of oxygen may end up in the heating water during operation. This must be prevented at all times. Even when the installation is regularly topped up with fresh tap water, more oxygen and other components (including calcium) end up in the heating water. So avoid the system being topped up with fresh tap water without checking. Do not top up with more than 5% of the installation's water content in any one year. A water meter and a log book for recording information will be needed for this.

### 1.2.1. New installations

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For new installations, the entire installation (without the central heating boiler) must be thoroughly flushed before the central heating installation can be commissioned. This is absolutely crucial. The flushing helps to remove residue from the installation process (weld slag, fixing products, etc.) and preservatives (such as mineral oil). The flushing process can be boosted, if required, by using a cleansing agent (only to be used by an appropriately trained professional). Do not soften the water to below 0,5°dH (1°f), since decreased softness is bad for the installation. Water softeners must be used in combination with an inhibitor.

## 1.2.2. Existing installations

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Take appropriate measures if the quality of the central heating water in an existing installation turns out to be inadequate. Installing a filter is one option to remove the pollution. Several types of filters are available for the purpose. Use a screen filter to trap larger dirt particles. This filter is usually installed in the full flow. Use a cloth filter to filter out finer pollution. This type of filter is installed in a partial flow, with an additional pump to provide the circulation over the filter. Another option to remove the dirt is to flush the entire installation thoroughly. An existing installation can be flushed before a new boiler is installed. The flushing procedure must be carried out by a trained professional, since the procedure carries some risk if it is not performed with due care. Loose dirt can only be removed provided the flow is strong enough. Each section will need to be tackled separately. Complications may occur if there is no guarantee that the sections to be cleaned are sufficiently circulated. The user influences before and after the cleaning operation must also be properly controlled. "Special attention must also be paid to ""blind spots"", where there is only a small amount of flow and a greater amount of dirt can accumulate.". When the installation is flushed with the aid of chemicals, these become even more crucial. Any chemicals left behind can also have negative consequences.



Dirt deposits or limescale are by far most likely to settle at the warmest point of the installation, which is in the central heating boiler.

In those cases, the central heating boiler must be cleaned by an expert with a product that is especially designed for the purpose.

## 2 Application

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### 2.1 Water treatment

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Any water treatment product must be appropriate for all the materials used in the central heating installation. Consult the supplier of the water treatment product for further details. Always comply strictly with the guidelines and operating instructions provided by the supplier of the water treatment product. This may involve periodic checks and periodic replacements. Since different water treatment products are available, it is impossible for us to examine every single product available in the market. Reputable manufacturers and their products include:

- ▶ **Fernox**
- ▶ **Sentinel Performance Solution Ltd**

Products from other manufacturers may also be used, provided that the relevant manufacturer guarantees that they are suitable for all materials used and corrosion-resistant..



#### **WARNING**

Applying water treatments requires great care and attention. If the instructions for the water treatment product are not followed in full, are interpreted incorrectly and/or if the product is not dosed properly, this may result in health risks, or damage to the environment, the central heating boiler or the central.

# 3 Values

## 3.1 Limiting values for heating water

### 3.1.1. Aluminium heat exchangers

<b>Acidity level (water non-treated)</b>		7 - 9 pH	
<b>Acidity level (water treated)</b>		7 - 8,5 pH	
<b>Conductivity</b>		≤ 800 μS/cm (25 °C)	
<b>Chlorides</b>		≤ 150 mg/l	
<b>Other components</b>		< 1 mg/l	
<b>Water hardness</b>	Maximum total water hardness of the installation water and the top-up water <sup>(1)</sup>		
Total installed heat output kW <sup>(2)</sup>	mmol/l	°dH	°f
≤ 70	0,1 - 3,5	0,5 - 20	1 - 35
70 - 200	0,1 - 2,0	0,5 - 11,2	1 - 20
200 - 550	0,1 - 1,5	0,5 - 8,4	1 - 15
> 550	0,1 - 0,5	0,5 - 2,8	1 - 5
(1) Up to a maximum annual top-up of 5% of the water content of the installation			
(2) For installations that are heated at constant high temperatures with a total installed heat output: up to 200 kW a maximum total water hardness of 8,4°dH (1,5 mmol/l, 15°f) applies and for above 200 kW a maximum total water hardness of 2,8°dH (0,5 mmol/l, 5°f). applies			

### 3.1.2. Stainless steel heat exchangers

<b>Acidity level (water non-treated)</b>		7 - 9 pH	
<b>Acidity level (water treated)</b>		7 - 8,5 pH	
<b>Conductivity</b>		≤ 800 μS/cm (25 °C)	
<b>Chlorides</b>		≤ 150 mg/l	
<b>Other components</b>		< 1 mg/l	
<b>Water hardness</b>	Maximum total water hardness of the installation water and the top-up water <sup>(1)</sup>		
Total installed heat output kW <sup>(2)</sup>	mmol/l	°dH	°f
≤ 70	0,1 - 2,0 <sup>(3)</sup>	0,5 - 11,2 <sup>(3)</sup>	1 - 20 <sup>(3)</sup>
> 70	0,1 - 0,5	0,5 - 2,8	1 - 5
(1) Up to a maximum annual top-up of 5% of the water content of the installation			
(2) For installations that are heated at constant high temperatures, a maximum total water hardness of 2,8°dH (0,5 mmol/l, 5°f) applies.			
(3) Up to a maximum water content of the installation of 6 litres per kW of potential heat output. For higher water content, the maximum total hardness is 8,4°dH (1,5 mmol/l, 15°f)			

# 4 General regulations

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## 4.1 Additional note

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The water quality of a central heating installation must be checked regularly, particularly if it is regularly topped up. With treated water, assistance can be sought from the supplier of the water treatment product. The user of the installation is responsible for insuring that the installation water is always of a high quality. If the user wishes to obtain the required water quality by using water treatment products, he must take responsibility for the treatment. We would advise the user to record all water treatments carried out in a good log book. Any work that was started or completed on the central heating boiler and installation should also be recorded in the log book.











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