

Requirements for operation of high-pressure boiler systems without constant supervision

High-pressure steam and hot water boiler (equipped on the basis of EN 12953)

TI012
Version 4 (02/21)

1 General

According to EC agreements, the sale and distribution of CE-designated products may not be restricted or obstructed (see also Notes on "Guideline for the implementation of the Directive adopted according to the new concept and the overall concept" – also known as the "New Approach" for short – online at <http://ec.europa.eu/enterprise/newapproach/legislation/guide/index.htm>). Additional measures in individual countries aimed at the protection of employees or of the environment are allowed, but may not lead to any changes to the product.

For shell boilers, this means that, with suitable equipment and corresponding test requirements, operation without constant supervision is specified by the manufacturer. Individual countries, however, may lay down uniform, equal test requirements and test periods that are as long as possible for products which are technically the same or similar.

It should be noted that if applicable operation without constant supervision requires a permit and that this must be clarified with supervisory authorities and/or monitoring organizations.

In compliance with authoritative guidelines relating to the Pressure Vessels Directive 2014/68/EU, this Technical Information sheet describes what the requirements for operation without constant supervision are in terms of the boiler and the system.

2 Boiler-related requirements for operation without constant supervision

As the boiler manufacturer, we equip our shell boilers for high-pressure steam and hot water in accordance with EN 12953, Part 6 (equipment), Part 7 (burner) and Part 8 (safety valve). All boilers are intended and suitable for operation for a maximum of 72 hours without constant supervision.

The preconditions for operation without constant supervision are compliance with the requirements for the boiler, feed and make-up water in accordance with Operating Instructions B002 (Steam Boilers) or B004 (Hot Water Boilers) and with those for regular inspections for high-pressure boilers in accordance with the Operating Instructions B006, B009 or B011 (depending on boiler type).

Operating, maintenance and inspection work on the boiler system by the operating and maintenance staff are carried out on the basis of check lists in the Operating Instructions B001 or B007 (depending on boiler type). In accordance with operation without constant supervision, the shortest inspection periods are specified as 3 days (i.e. 72 h). In addition to these checklists for operation, the Operating Instructions for the individual components must be complied with.

In order to make the best use of the period of 72 hours for operation without constant supervision and not to have to visit the boiler more frequently for operating tasks, it is recommended that certain equipment parts are automated. For example, on the steam boiler: with manual blowdown (see Operating Instructions K005), the valve must be operated several times a day, depending on the water characteristics. If an automatic blow-down system is connected with an BCO Boiler Control, this is no longer necessary. Functional checks, however, are necessary for both versions every 72 hours.

Additional options - such as for example, in the case of steam boilers, their own electrode for maximum water level or a desalination unit - can be fitted on request.



Important! *The equipment design must be undertaken in accordance with the particular system situation and the operator's hazard and risk analysis. It may be necessary to have additional equipment parts (e.g. separate electrode for high-water level as part of the system protection).*

3 System-related requirements for operation without constant supervision

System-related requirements for operation without constant supervision depend on the national and / or local regulations.

Structural requirements such as the need for a separate boiler house or minimum opening sizes for vent and aeration openings must be taken from the local and / or national regulations. You will also find general instructions in our Technical Information sheet TI024.

Organizational requirements such as the appropriate training of the operating and maintenance staff must be taken from the local and / or national regulations.

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The following chapters describe system-related requirements for operation without constant supervision aimed at protecting the boiler, the boiler system and people. The precise requirements must be taken from the local and / or national regulations. The necessary monitoring devices must be generally suitable for this and must have all the necessary permits.



Important! The condensate/make-up water monitoring facility must be executed based on the system situation and the probability of foreign matter ingress (a risk assessment may need to be conducted here). If necessary, the condensate/make-up monitoring facility should be executed with a safety cutout (i.e. integrated into the boiler safety chain).

3.1 Monitoring of make-up water

The following measuring devices are required:

| Material | Measuring device | Remarks |
|--|---|--|
| salt-containing make-up water | Hardness measurement, e.g. via Softcontrol (see operating instructions I544) | Limit value corresponding to operating instructions B002 and B004 at 0.1 °dH or 0.02 mmol/l (see operating instructions G442 in the case of use with a SCO system control monitoring via hardness) |
| Make-up water low in salt or salt-free | Conductivity measurement e.g. via conductivity transducer CST 3 (see operating instructions I039) | Pre-set limit value from the boiler manufacturer: 75 µS/cm (see operating instructions G440 in the case of the use with a SCO system control of a foreign body monitoring device via conductivity) |
| Oil, grease, acids, leaching solutions, seawater, etc. | if monitoring is necessary: see chapter 3.2 | |

If limit values are exceeded, the flow of make-up water to the feed water container must be interrupted, for example, using a solenoid valve.

3.2 Monitoring the condensate flows

Possible leaks of oil, fat, hardness or other foreign matter, such as acids, alkalis, sea water etc. via condensate into the water circuit require automatic continuous monitoring of the condensate circuit. Separate condensate circuits with different criteria should be monitored individually and equipped with corresponding switchover devices.

If the permitted limit values are exceeded, the condensate flows must be rejected, for example, via drain-off devices.

The following measuring devices are required:

| Material | Measuring device | Remarks |
|---|---|---|
| Oil / Grease | Measurement of cloudiness | Pre-set limit values from the boiler manufacturer: Disregard for condensate streams greater than 5 ppm (see operating instructions G441 in the case of the use of a cloudiness warning device with a SCO system control) |
| Hardness Acids / leaching solutions Sea water | Conductivity measurement e.g. via conductivity transducer CST 3 (see operating instructions I039) | All the named materials have an effect on conductivity. Pre-set limit value from the boiler manufacturer: 75 µS/cm (see operating instructions G440 in the case of the use with a SCO system control of a foreign body monitoring device via conductivity) |

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These requirements are not absolutely necessary as long as there is no danger of a slump.

If the monitoring mentioned under 3.1 and /or 3.2 only takes place in or after the feed water container, the firing must be switched off and locked if the permitted limit values are exceeded.

As the boiler manufacturer, we do not implement this solution, since the whole system is contaminated if there is an incursion into individual flows, and the system is then no longer ready for operation since the complete water circuit has to be exchanged (resulting in very high costs for cleaning).

3.3 Safety shutoff device in the fuel line

- A suitable fuel safety shutoff valve must be provided in the fuel line.
- The location, in the case of gas, should be outside the boiler installation room and, with oil, in the near from the oil storage container.
- If the fuel safety shutoff valve in combination with further shutoff device encloses fuel in areas, the content of which expands with heat, these areas must be secured to prevent an unpermitted rise in pressure.
- If the fuel safety shutoff valve is located in the open air, these valves must be suitable for the stresses affecting them (freezing, moisture, etc.).
- With hand operated safety shutoff valves a fast and safe access and operation must be assured.
- Electrically headed safety shutoff valves must be closed without current.

3.4 Emergency shutdown device

- Emergency shutdown devices should be located outside the boiler installation room in such a way that they are easily accessible and easy to trigger.
- Emergency shutdown devices must switch off the power circuits of the electrical operating equipment of the firing system in the event of danger. For this, the boiler safety chain incorporates the facility to loop in an emergency shutdown contact.
- If further signals, for monitoring basic dangers in the boiler house, for example, such as fire alarms, are to be incorporated, these must be grouped together by the client into an emergency shutdown contact in accordance with the valid rules and regulations for emergency shutdown devices and looped into the boiler's safety chain.