FEEDWATER SYSTEM

Acceptance at the workshop:
according to the European Pressure Equipment Directive PED (2014/68/EU)

CE-Marking on the Pressure Vessel:
according to the European Pressure Equipment Directive PED (2014/68/EU)

Design code: EN 12953

Designation of the feedwater system

One of tasks at steam system is the selection of a feedwater system selection and its components calculation form one of tasks at steam system designing.

To ensure ease of design, ENTROPIE company, based on many years of steam systems operation experience, is ready to offer its partners solutions for feedwater systems selection for TT200 steam boilers.

Upon request, our specialists will select the feedwater system based on initial data:

- deaeration plant and its connection piping, selection;
- feedwater pumping module selection;
- feedwater module selection.

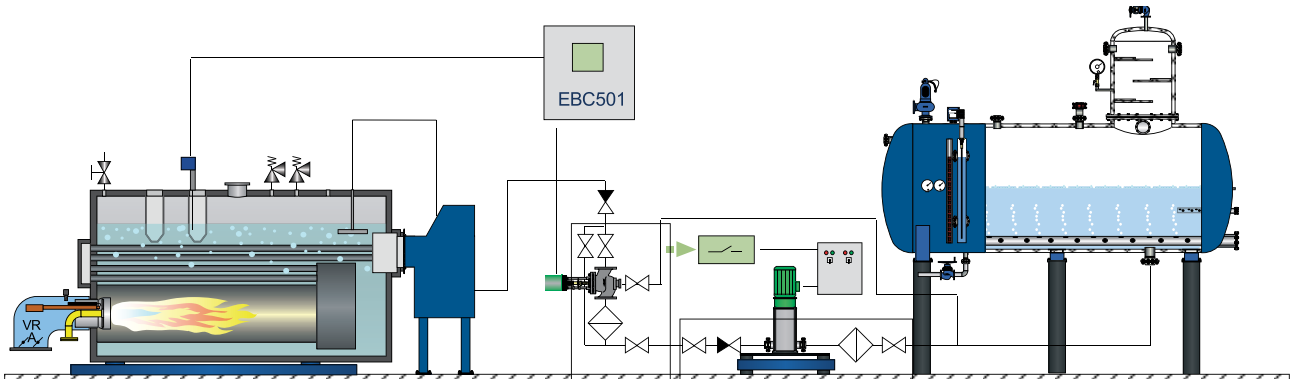
Examples of most versatile feedwater systems are presented below.

Composition of the feedwater system with recirculation line:

- deaeration plant (ETM);
- control module with discharge line (ERM-R FW);
- feedwater pumps module (EPM);
- pumps power distribution switchboard.

The boiler is fed by a three-way feedwater control valve provided with a discharge line. Control is performed based on the feedback from the level transducer nstalled in the boiler.

At feedwater supply valve closure the discharge line opens to provide water circulation through the deaerator. Forced shutdown of the pump is provided when the permissible recirculation time is exceeded.

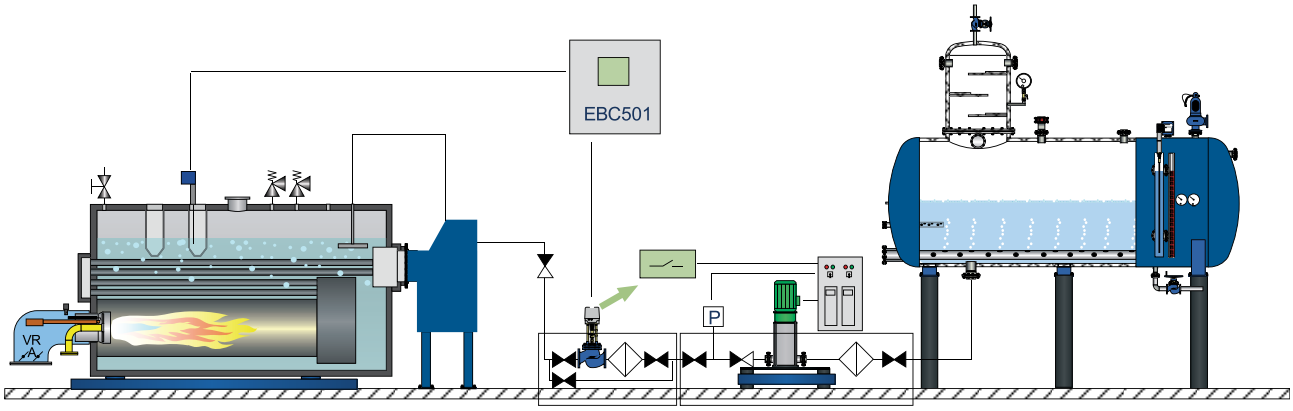


Feedwater system components with frequency regulation automatics:

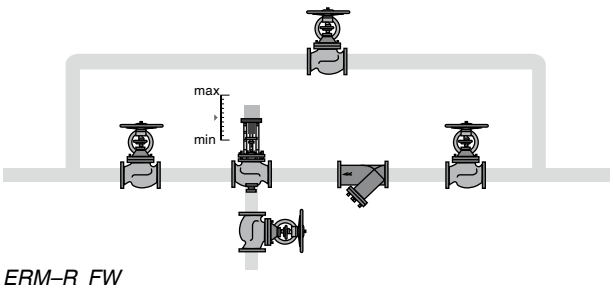
- deaeration plant (ETM);
- control module (ERM FW);
- feedwater pumps module (EPM);
- power distribution switchboard with pumps frequency regulation.

The pumping module equipped with a frequency converter maintains specified pressure (usually this is the working pressure plus excess allowance) upflow to the control valve. Frequency control is performed as per the PID-law and is realized with the aid of the frequency converter based on the pressure transducer feedback.

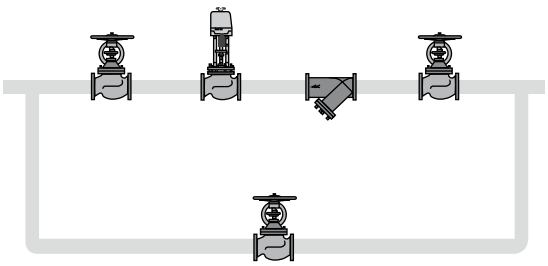
Make-up valve is operated according to the PID law in the three-position mode based on the boiler level transmitter feedback.



Feedwater system components ERM regulation module



ERM–R FW



ERM FW

Control module is the main component of the boiler feedwater system. For ease of design, control modules are selected individually for each steam boiler.

Control module consists of the following main components:

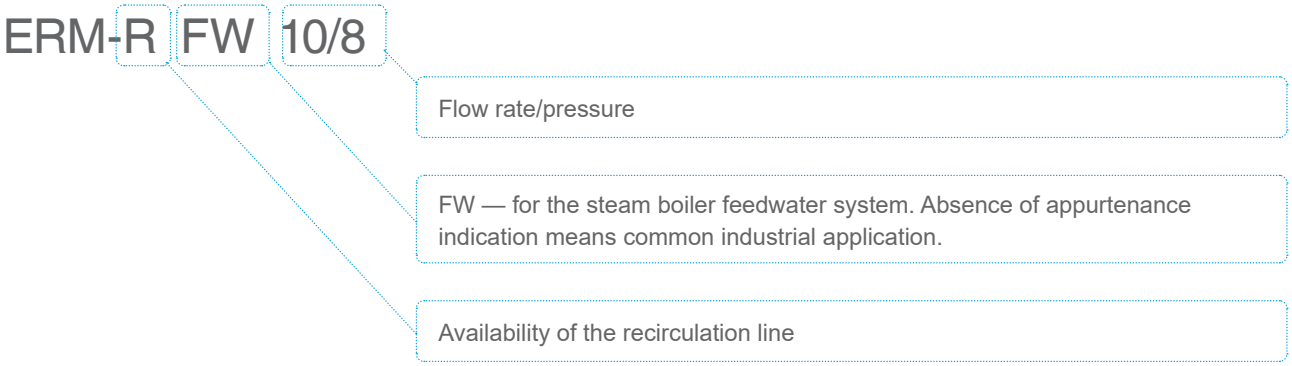
- control valve;
- shutoff valves;
- filter.

The highest efficiency of the feedwater system is achieved by the combined use of two pre-matched systems consisting of the control module (ERM) and the feedwater pump module (EPM).

Advantages:

- enhancing steam boiler economizer efficiency;
- ensuring supplies of minimum water amounts required for feedwater pumps cooling;
- maintaining constant water level in the boiler;
- reducing the number of pumps starts.

The control module is marked as follows:



Feedwater system components. Feedwater pumps

Feedwater devices shall be selected by an organization specializing in boiler houses design to ensure reliable and safe boiler operation in all modes, including emergency shutdowns.

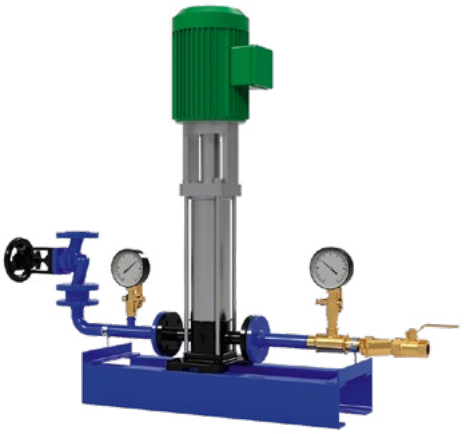
Pressure created by the pump shall ensure water supply into the boiler at operating pressure downflow the boiler with account for the hydrostatic head and pressure losses in the boiler circuit, in the control device and in the feedwater train.

The supply from feedwater devices shall be defined based on boilers rated steam-generating capacity with account for the flow rate of water for continuous or periodic blowdown and the potential for water or steam loss.

Automatic boiler power supply shall be provided.

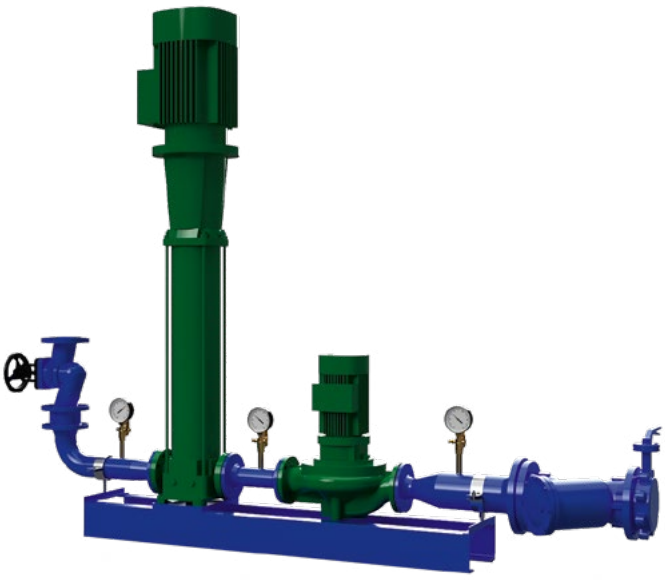
Use of the EPM module manufactured by ENTROPIE is recommended for feedwater supply from the deaerator to the boiler. These moduli are specially designed for use in feedwater systems of TT200 steam boilers.

Water flow rate through the boiler is defined by the steam flow, i.e., by steam-generating capacity of the boiler at specified feedwater temperature and steam pressure at the outlet with account for continuous blowdown and potential water and steam losses.



Pump module EPM2. “COMPACT” version

Pump module EPM1. “MODULE” version for two pumps



EMP3 pump module for systems with low net positive suction head “Lo-NPSH”