Advanced pumps for advanced boilers

Our customers spend a lot of energy on research and development to create the most intelligent and innovative heating systems on the market. With Grundfos as their partner they can do so rest assured that we set the market trend with our innovative pump technology. And if we don't have exactly what they require, then we are able to develop a customised solution faster than anyone else.

The future of boilers

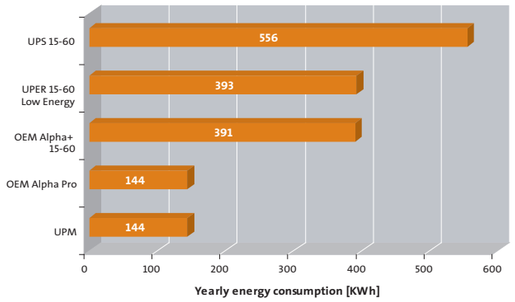
The trend is clear. Customers worldwide are moving towards even more advanced solutions that are extremely reliable and energy-efficient.

In a heating system the circulator pump is the main component with regards to energy consumption. However, E-pumps can reduce energy consumption considerably and secure optimal operation. Furthermore, the reduced pressure on the valve removes valve noise.

The next generation

The tendency is that E-pumps over time will replace traditional circulator pumps. The standard pump solution is still very popular, however, still more of our customers see the benefits of the E-pumps and build advanced heating systems that require advanced pumps.

Grundfos E-pumps are a gigantic leap into the future of increased comfort, reliability and energy savings.



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E-PUMPS
Advanced pump solutions

GRUNDFOS

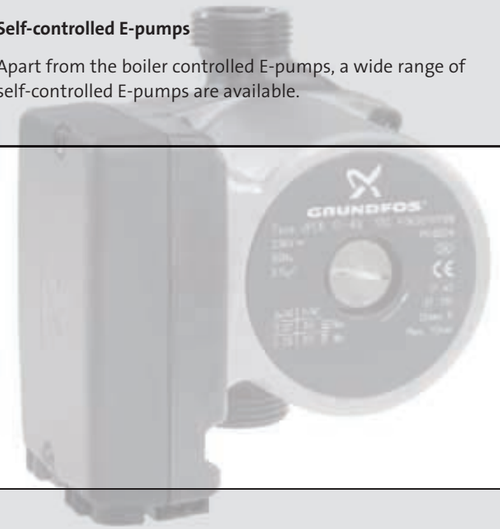
Benefits of E-pumps in boilers

There are several good reasons for speed control inside the boiler. We'll outline four of the main benefits of the E-pump:

1. Especially condensing boilers are more efficient, if the pump performance follows the burning conditions of the boiler to optimise the condensing value and reduce the start/stop intervals.
2. The circulator pump is the main influence with regards to electrical power consumption in a boiler. If the flow in the system is variable, the speed of the pump can be reduced, which means that the power input follows to less than 50 %.
3. The noise level in a pipe system and especially at the thermostatic valves is depending on the differential pressure at the outlet of the boiler. If the flow in the system is decreasing, an uncontrolled pump will produce even more pressure. A bypass can reduce this noise, however this solution is not very energy-efficient.
4. More sophisticated systems require feedback from the pump, e.g. dry running, no flow, flow rate etc. To handle these systems Grundfos provides E-pumps with KM-Bus-Communication.

Self-controlled E-pumps

Apart from the boiler controlled E-pumps, a wide range of self-controlled E-pumps are available.



GRUNDFOS OEM UPER

The speed control inside Grundfos OEM UPER ensures a very low noise level due to the toggle-switch principle of the pump control. Instead of phase-cut or pulse cascade to change the motor voltage, the UPER shifts between different stator windings to change the speed of the pump. Consequently, the pump may perform 24 different speeds. If a lower performance is required the toggle-switch mode can be combined with a voltage control and reach 30 different speeds.

PWM communication
PWM control signal (Pulse-Width Modulation) has almost replaced analogue control signal and become the standard of the domestic boiler market. PWM offers communication with 15 VDC at a frequency of 100 – 4000 Hz for duty cycles of 0 – 100 %. It enables precise power and speed control of UPER pumps from stand-by up to maximum speed.

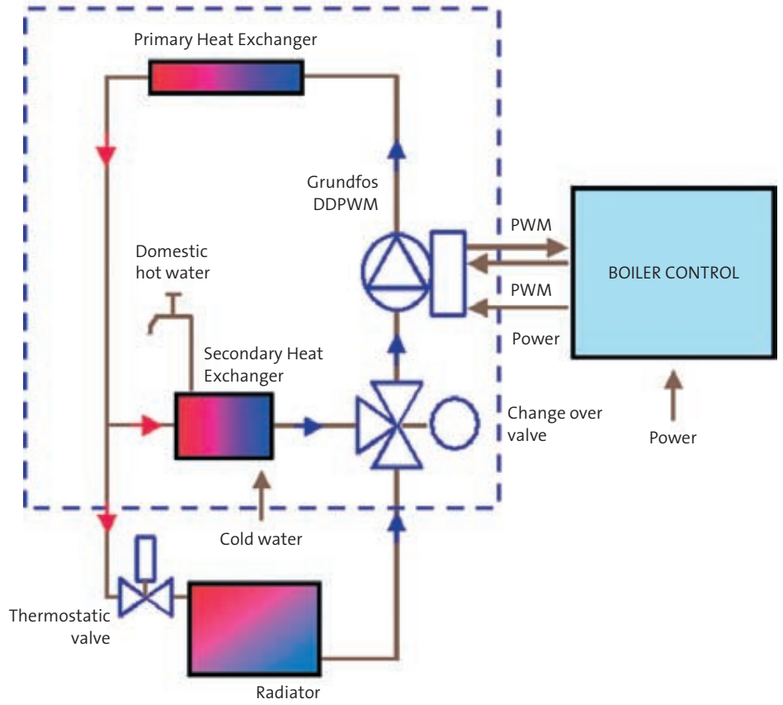
1-way PWM communication
The boiler control communicates the required speed to the pump or switches the pump off. There is no feedback signal to close a control-loop or to control to performance of the pump.

2-way PWM communication
Via an additional wire the pump sends a feedback signal back to the boiler control to communicate its actual hydraulic load to close a control-loop or to control to performance of the pump.

KM-bus communication
KM-bus (Kessel Meter-bus) communication enables the pump to communicate control and feedback signal plus additional data to the boiler control via a 2-wire connecting cable.

Electronically regulated with PWM (Pulse Width Modulation) control and return signal

- Electronic regulated UP pumps
- Remote controlled b the boiler control unit
- 2 way PWM-signal for controlling the pump
- Remote controlled by the boiler control unit
  PMW signal – both directions
  – Speed selection
  – Setpoint information of Q/H



GRUNDFOS OEM UPM

This new version of Grundfos PWM-E-pumps is a high efficiency electronic commutated AC permanent magnet synchronous motor controlled by a frequency controller. Due to this principle the efficiency is at all speeds higher compared to voltage controlled asynchronous motors.

The power range of an UPM pump is 6 W to 70 W depending on the head (1m – 7m). Consequently, the yearly power consumption can be reduced by up to 50 % in comparison with a regular pump.

Self-controlled E-pumps
OEM ALPHA+ and OEM ALPHA Pro
Instead of being controlled by the boiler control the ALPHA pumps have an internal control loop, which means that the pump changes its speed according to its hydraulic load. Depending on the settings, three constant speeds, two constant pressures, and two proportional pressure control curves can be used.

The self-controlled pumps are installed mainly outside the boiler in installation kits or on the distributor with mixing loops. OEM ALPHA pumps are required for all systems with variable flow to reduce the differential pressure in the system and the thermostatic valves noises. These pumps are also available with automatic night setback in systems with a central temperature controller.

Basically, the ALPHA PRO is combining the functions of ALPHA+ with the motor principle of the UPM, offering an extremely energy-efficient pump.