

# GRUNDFOS

## ALPHA and AUTOADAPT: It's not Magic, it's Math!

Grundfos' ALPHA circulator and its AUTOADAPT functionality are the products of 65 years of hydronic experience in countless applications and operating environments. Its advanced technology, combined with innovative functionalities and incredible simplicity, make the ALPHA the most energy efficient, easiest to install and intelligent circulator available today. In fact, more than four million ALPHA circulators are currently in service around the world. Yet ALPHA and AUTOADAPT remain one of the most misunderstood offerings. Let's clarify this functionality:

ALPHA provides seven operating modes and changing these modes is as simple as pushing a button on the face of the control head. The options include three fixed speeds, three constant pressure modes, and AUTOADAPT, which is the preferred operating mode in more than 80% of today's residential hydronic applications.

### But, what is AUTOADAPT?

AUTOADAPT is the intelligent adaptive control that continuously adjusts the circulator's proportional pressure curve based on system demands, and automatically adjusts to the most efficient duty point. Whenever there is a change in system demand, AUTOADAPT's software detects the change in power consumption at the circulator's rotor. This can be illustrated as a shift on the circulator's brake horsepower curve (bhp).

There is a direct mathematical correlation between the circulator's bhp curve and the heating system curve. When there is a change in the system curve, there is a corresponding shift on the pump curve and bhp. There lies the duty point where the circulator should be

AUTOADAPT adjusts the motor speed and flow to meet the system's demand automatically. The ECM motor technology uses up to 80% less energy than a typical asynchronous motor available.

operating at this moment in time.

AUTOADAPT's software uses advanced math and algorithms to adjust the motor speed and flow needed to meet the system's demand. It does this automatically and continuously throughout the lifetime of the system.

By continually adjusting to the most efficient operating speed, AUTOADAPT can provide 50% fuel savings. And because ALPHA uses advanced ECM motor technology,

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The ALPHA is the most energy efficient circulator on the market and ships from the Fresno, Calif. facility.

it uses as much as 80% less energy than a typical asynchronous motor.

There is a lot of discussion in the market on which control functionality is best for today's hydronic systems. ALPHA and AUTOADAPT use delta-P, pressure differential, to detect system changes. Delta-P controls measure a change in system pressure typically caused by opening or closing a valve.

Delta-T is a simple control mode maintaining an arbitrary set point based on a designer's system design and pump sizing. It's common to use 20F delta-T when designing today's systems. Grundfos once used a more conservative 10F delta-T. Using 20F vs. 10F delta-T doesn't really improve efficiency. The shift to 20F is probably due to the fact that it makes the math easier when calculating flow — one simply needs to divide BTUs by 10,000. With a larger delta-T, the application needs less flow which can mean a smaller circulator. Today, with the popularity of condensing boilers, a 20F delta may not be enough for the boiler to enter the condensing mode.

AUTOADAPT's set point is not arbitrary. It is a dynamic set point based on actual demand changes in an operating system. AUTOADAPT constantly adjusts the control curve to deliver the correct amount of heat as comfortably and efficiently as possible.

ALPHA and AUTOADAPT are innovative, advanced technologies integrated into intelligent control. They are simple, easy-to-install solutions providing unmatched comfort, system efficiency, and fuel and energy savings. ●



