

**Bulletin Number:** 1-09-01

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**Date:** May 12, 2009

**Title: ALPHA™ Pump – The next generation of circulators**

To: Grundfos Partners

Grundfos is proud to introduce the next generation of circulators – the Grundfos **ALPHA**. Please take a few minutes to review the following information list below.

**Model Reference Table:**

Description	Part Number	Voltage	Watts	Amps	List Price
ALPHA 15-55 F/LC	59896832	1 x 115V	5 – 45W	0.65A	\$487.00
ALPHA 15-55 FR/LC	59896833				\$487.00
ALPHA 15-55 SF/LC	59896834				TBD

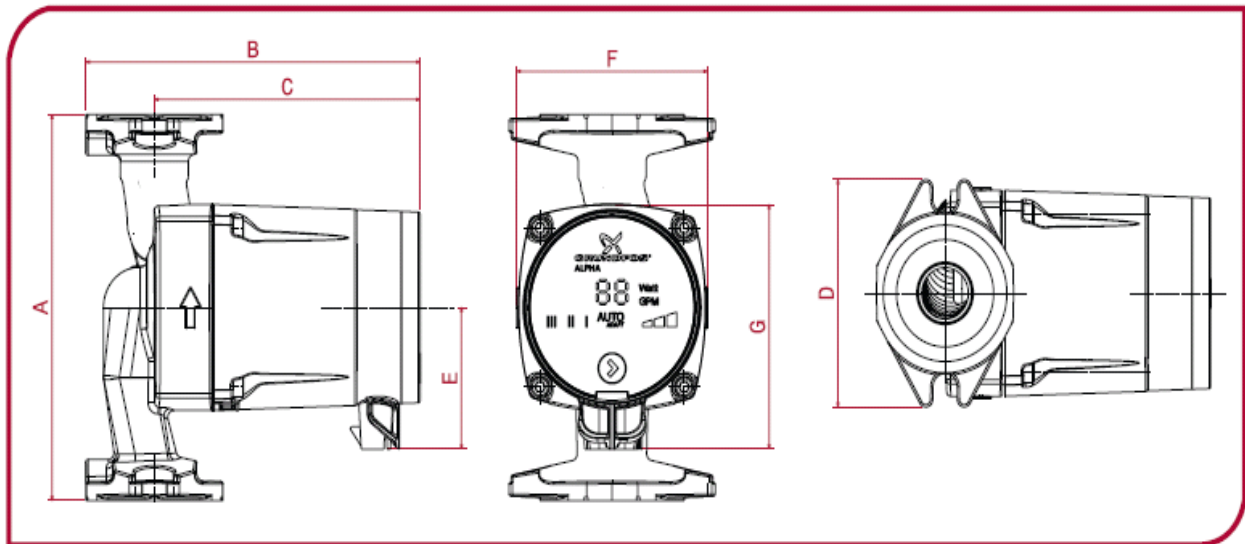
**Service Kit:**

Models	Description	Part Number	List Price
ALPHA 15-55	Line Cord	91130247	\$39.00

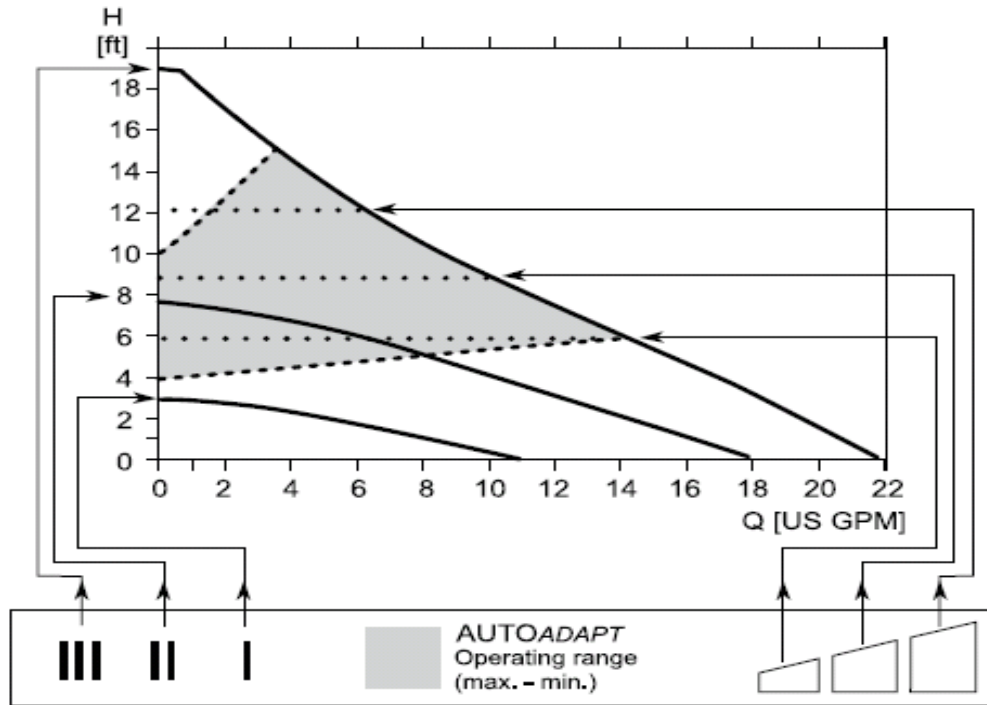
Feature – Benefits	
<p><b>Seven operational modes</b></p> <ul style="list-style-type: none"> <li>Patented <i>AutoAdapt™</i> Automatically adjusts to your system demands</li> <li>Three fixed speeds</li> <li>Three constant pressure settings</li> </ul>	<p><b>Easy-to-use operation</b></p> <ul style="list-style-type: none"> <li>One touch operation mode navigation</li> <li>Real time LED displays Power consumption (Watts) Flow indication (GPM estimation)</li> </ul>
<p><b>Simple plug connection</b></p> <ul style="list-style-type: none"> <li>No field wiring required</li> </ul>	<p><b>Standard 2-Bolt flange</b></p> <ul style="list-style-type: none"> <li>built-in nut capture feature</li> </ul>
<p><b>Materials Options</b></p> <ul style="list-style-type: none"> <li>Cast iron</li> <li>Rotated flange cast iron</li> <li>Stainless steel</li> </ul>	<p><b>Installation and operating instructions</b></p> <ul style="list-style-type: none"> <li>English</li> <li>French</li> <li>Spanish</li> </ul>
<p><b>Permanent magnet motor design</b></p> <ul style="list-style-type: none"> <li>4-times higher starting torque over standard induction motors</li> <li>Zero motor slip</li> <li>5 to 45 Watts</li> </ul>	<p><b>Integrated controls</b></p> <ul style="list-style-type: none"> <li>Compact drop-in design</li> <li>Electronics fully integrated</li> </ul>
<p><b>Removable optional check valve</b></p>	<p><b>Field tested for North America</b></p>








**Dimensional Data:**



A	B	C	D	E	F	G
6-1/2	6-3/16	4-15/16	3-13/16	2-3/8	3-7/16	4-1/8



• Hydraulic performance without check valve

Pos.	Description
	<ul style="list-style-type: none"> <li>• Push-button for selection of pump setting</li> <li>• Every time the push-button is pressed, the circulator setting is changed</li> </ul>
	<p><b>High Fixed Speed</b></p>
III	<ul style="list-style-type: none"> <li>• Runs at a constant speed and consequently on a constant curve. In Speed III, the pump is set on the maximum curve under all operating conditions. Quick Vent of the pump can be obtained by setting the pump to Speed III for a short period.</li> </ul>
	<p><b>Medium Fixed Speed</b></p>
II	<ul style="list-style-type: none"> <li>• Runs at a constant speed and consequently on a constant curve. In Speed II, the pump is set on the medium curve under all operating conditions.</li> </ul>
	<p><b>Low Fixed Speed</b></p>
I	<ul style="list-style-type: none"> <li>• Runs at a constant speed and consequently on a constant curve. In Speed I, the pump is set on the minimum curve under all operating conditions.</li> </ul>
	<p><b>Constant Pressure I</b></p>
	<ul style="list-style-type: none"> <li>• The duty point of the pump will move left and right along the lowest constant-pressure curve depending on water demand in the system. The pump head (pressure) is kept constant, irrespective of the water demand.</li> </ul>
	<p><b>Constant Pressure II</b></p>
	<ul style="list-style-type: none"> <li>• The duty point of the pump will move left and right along the middle constant-pressure curve depending on water demand in the system. The pump head (pressure) is kept constant, irrespective of the water demand.</li> </ul>
	<p><b>Constant Pressure III</b></p>
	<ul style="list-style-type: none"> <li>• The duty point of the pump will move left and right along the highest constant-pressure curve depending on water demand in the system. The pump head (pressure) is kept constant, irrespective of the water demand.</li> </ul>
	<p><b>AutoADAPT (Factory Setting)</b></p>
	<ul style="list-style-type: none"> <li>• This function controls the pump performance automatically within the defined performance range (shaded area). AutoADAPT will adjust the pump performance to system demands over time.</li> </ul>

## Technical data

### Supply voltage:

1x115V +/-10 %, 60Hz.

### Motor protection:

The pump requires no external motor protection.

### Enclosure class:

Indoor use only, IP42.

CSA Enclosure Type 2.

### Insulation class:

F.

### Relative air humidity:

Maximum 95 %.

### Maximum discharge pressure:

150 psi (10.34 bar).

### Inlet pressure:

Liquid temperature	Min. inlet pressure
167 °F (75 °C)	0.75 psi (0.05 bar)
194 °F (90 °C)	4.06 psi (0.28 bar)
230 °F (110 °C)	15.7 psi (1.08 bar)

### Sound pressure level:

43 dB (A).

### Ambient temperature:

+32 °F (0 °C) to +104 °F (+40 °C).

### Liquid temperature:

+36 °F (+2 °C) to +230 °F (+110 °C).

To avoid condensation in the control box and stator, the liquid temperature must always be higher than the ambient temperature.

Ambient temperature [°F (°C)]	Liquid temperature	
	Min. [°F (°C)]	Max. [°F (°C)]
+32 °F (0 °C)	+36 °F (+2 °C)	+230 °F (+110 °C)
+50 °F (+10 °C)	+50 °F (+10 °C)	+230 °F (+110 °C)
+68 °F (+20 °C)	+68 °F (+20 °C)	+230 °F (+110 °C)
+86 °F (+30 °C)	+86 °F (+30 °C)	+230 °F (+110 °C)
+95 °F (+35 °C)	+95 °F (+35 °C)	+194 °F (+90 °C)
+104 °F (+40 °C)	+104 °F (+40 °C)	+158 °F (+70 °C)



*In domestic hot-water system, it is recommended to keep the liquid temperature below +149 °F (+65 °C) to eliminate the risk of lime precipitation.*

**Caution**

### Maximum glycol concentrations:

50 % glycol @ 36 °F (2 °C).

Hydraulic performance change can be expected.

### Watt readings:

Accuracy +/-1 Watt.

### Flow indicator:

Provides a relative indication of flow — should not be used in lieu of a flow meter.

### Check valve:

Use of check valve may reduce pump hydraulic performance (up to -10%).

Use check valve in parallel pumping applications.

### Curve conditions:

Test liquid: Airless water.

Curves apply to a density of 983.2 kg/m<sup>3</sup> and a liquid temperature of +140 °F (+60 °C).

All curves show average values and should not be used as guarantee curves. If a specific minimum performance is required, individual measurements must be made.

Curves apply to a kinematic viscosity of 0.474 cSt.

### Approximate power usage:

Speed setting		Min.	Max.
High fixed speed		39W	45W
Medium fixed speed		15W	30W
Low fixed speed		5W	8W
Constant pressure	■	8W	45W
Constant pressure	■	14W	45W
Constant pressure	■	22W	45W
AutoADAPT	AUTO ADAPT	5W	45W

### Approvals:



### Canadian EMC Standard:

ICES-003

This Class B digital apparatus complies with Canadian ICES-003.

## AUTOADAPT™ FAQ

### What is the AUTOADAPT feature?

The objective of the AUTOADAPT algorithm is to measure and analyze the heating system during operation and adapt to the current heating pattern. The system adapts to night vs. day operations, summer vs. winter season, and heat losses or gains affecting room temperature, for example, from radiators, walls and windows, sun radiation, electrical equipment, and people.

In other words, AUTOADAPT is capable of adjusting;

- To the size of the heating system
- To changes in the heating demand over time, daily and seasonal
- To instant changes in heating demand, immediate heat losses or gains

### What's in it for me!

The overall benefits are:

- Easy setup for installers
  - The installer does not need to know which pump curve to choose – AUTOADAPT does this all by itself as it analyses the heating demand and chooses the most optimal setting
- Increased comfort for the end user
  - AUTOADAPT enables better heating regulation and thereby improves the comfort
- Energy savings for end users
  - With AUTOADAPT the pump only performs at its max when there is a need. Provides considerable energy savings over standard non-regulated pumps operating at max speed.

### How does AUTOADAPT determine the heating demand?

When there is a big heating demand, there will also be a high flow requirement for the heating system. This high flow creates high pressure losses in the pipe, which is automatically accommodated via AUTOADAPT by increasing the pump pressure. Conversely, when the heat demand is small, meaning the flow is low, AUTOADAPT again automatically accommodates the situation by decreasing the pump pressure.

### How does the pump know that there is a high flow?

Based on the power consumption the pump calculates the flow.

### How is the flow calculated?

The flow is calculated based on the relations between the speed of the motor and the power consumption. The higher power consumption and higher speed of the pump the higher flow through the pump and thereby through the impeller of the pump. This relation is programmed in tabular form into the microchip of the control box.

## **How is the speed of the motor known?**

The pump is designed with a frequency converter, which means the software is able to control the speed of the pump at all times. This speed is used in AUTOADAPT to optimize the pressure delivered by the pump.

## **How is the pressure determined?**

The relationship between flow and speed is known; so the pressure can be determined based on a table lookup.

## **How does AUTOADAPT know the input power?**

The control box is equipped with a volt and current sensor. Volt x current equals the power.

## **How is AUTOADAPT optimizing?**

AUTOADAPT optimizes the performance of the heat system, and at the same time minimizes the electrical energy consumption of the pump. This is done by choosing the best pump pressure for any given situation (night/day, winter/summer). The best pressure is found by analyzing changes in the flow over a period of time. Based on the result of this analysis, the pressure value is chosen.

## **What kind of time period are we talking about?**

In fact AUTOADAPT is operating on two different time scales:

- A very short time scale (less than 1-minute), which is used for accommodating fast changes in the load conditions of the system.
- A long time scale (1-2 weeks), which is used for accommodating the size of the house and changing due the winter/summer conditions.

## **What happens when turning off the power?**

When in operation the pump stores the actual setting and duty point in the micro processor. This means that when the pump is turned off and subsequently on again, it remembers the setting and duty point and therefore starts up in the exact same position as when it was turned off.

## **What happens when there is no demand for heat?**

Depending on the application, when there is no call for heat or seasonal shut down. The ALPHA will modulate and power down to 5-Watts. At 5-Watts, only the software is energized, continually monitoring system demands while producing no pressure to the system.

**Quick Install Tips:**

- Step 1:** To ensure proper air venting of your system. Place the ALPHA in Fixed Speed III mode until all air has been evacuated. Isolating zones during this process will ensure proper air removal.
- Step 2:** Balancing manifold zone(s) applications - Utilizing Constant Pressure mode 1 or 2 and only one zone at a time during balancing, will ensure proper flow rate to each zone.
- Step 3:** In general, for maximum energy savings and comfort level leave pump in the *AutoAdapt* mode.
- Step 4:** Always review your boiler minimum flow rates if applying ALPHA as a primary pump. Select one of the fixed speeds for boiler primary pump application.

**Competitive cross-reference**

Model	Speed	TACO	Bell & Gossett	Armstrong
ALPHA	High	005, 007, 008, 0010-IFC, OOR-MSF1-IFC	NRF-22, LR-20WR	Astro 30
	Medium	005, 005-IFC, 007, 007-IFC, 008, 008-IFC, 0010-IFC, OOR-IFC, 00O-MSF1-IFC	NRF-9F/LW	Astro 25
	Low	005, 005-IFC, 006, 006-IFC, 00O-MSF1-IFC		Astro 20