

## 00e<sup>®</sup> Series VR ECM High-Efficiency Circulators

The 00e<sup>®</sup> series — These are browser accessible, high-efficiency, wet rotor, variable speed, sensorless commercial pumps for chilled and hot water applications. Available in four sizes (VR 15-3, 20-3, 25-3 and 30-3), the sensorless 00e VR line provides differential head pressures up to 42 ft. and flows up to 360 GPM. The ECM motor provides up to 85% electrical energy savings compared with conventional pumps and its multiple operating modes fit most applications.



Web connections are a snap.



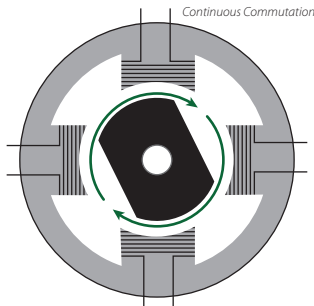
- Simple user interface to enable setting changes on the face of the pump, eliminating the need for laptop setup
- Real-time performance readouts for flow, power consumption, speed and head values
- Self Sensing Dynamic Auto (factory default), Proportional & Constant Pressure plus Manual Variable Speed modes provide for extremely extensive application flexibility
- On board 0-10Vdc two way control adjusts speed or head to meet system demands from external control inputs
- ModBus control and performance feedback for advanced Building Management / Building Automation Systems
- RJ 45 input / output for ease of networking
- Relay outputs for remote monitoring of pump status and digital inputs for external enable / disabling
- Simple Main / Standby and Parallel Pump operation (parallel pumps run together as needed) via standard ethernet cabling



# A convergence of efficiency, simplicity & technology.

## Efficiency as the basis of design

The ECM based design combines a brushless Electronically Commutated Motor with a strong permanent magnet rotor. An ECM motor does not waste any energy in order to magnetize the rotor and the position of the magnetic poles of the rotor and stator generate continuous thrust in the rotating direction of the rotor. The integral electronics



The position of the magnetic poles of the rotor maintains ultimate motor EFF over the speed and load range of the unit.

**Up to 85% Electrical Savings**

precisely drive the rotor as fast as the rotating flux, significantly reducing motor efficiency losses while greatly increasing starting torque.

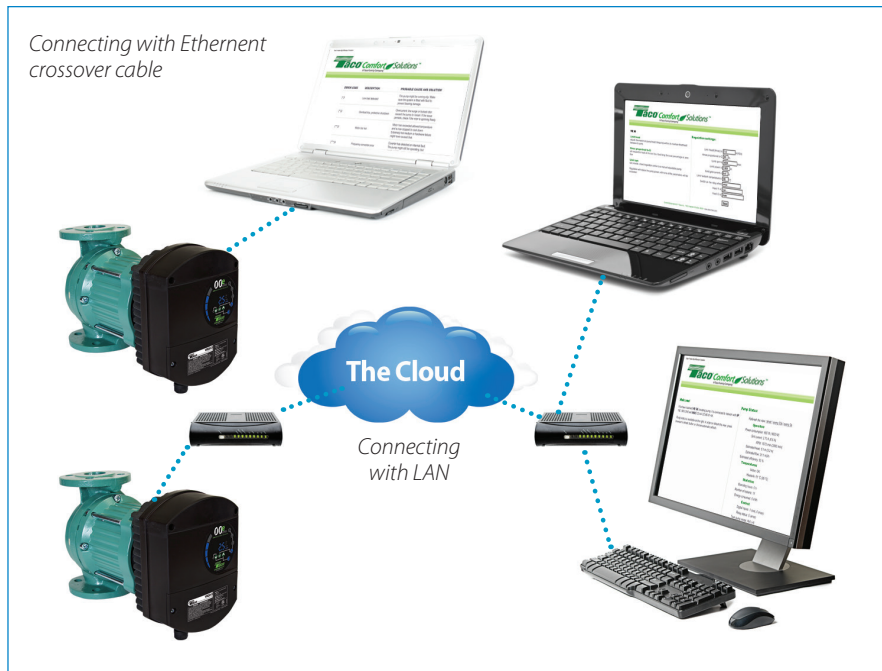
## Full variable speed control matches system requirements

The electronics continually adapt the speed to match the requirements of the system. Because the electrical motor is being driven by an on-board frequency converter the electric current is rectified and converted into the appropriate phase angle to maximize energy efficiency, even when operating at hydraulic partial load conditions. The superior motor efficiency, optimized speed control, and intelligent sensorless variable speed pump control delivers dramatic cost savings over the life of the system.

## Flexibility to fit the job

The hydraulic characteristics of the pump can be set at will. Pump regulation can be done by pressure, speed, electrical power or a combination of these, so it can be adapted to different hydraulic system requirements without the need for external regulators or sensors.

Ready-to-go out of the box, this pump will automatically adjust its speed based on internally sensed variable differential pressure control, providing optimal energy savings across the industry's largest operating range. Additional modes of control can be selected to provide constant pressure control, proportional pressure control, constant curve duty (uncontrolled pump), multiple speed, RPM regulation or power limitation control.

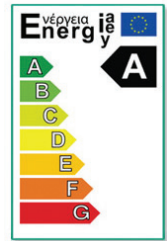


These pumps can be operated as single, parallel or series variable speed pumps. The onboard electronics allows the user to choose to run two pumps in parallel, standby or alternating modes. The built-in normally open, or normally closed relay contacts can be used to activate or deactivate a primary or secondary pump contact, provide external operation or overload feedback or switch another piece of equipment. In addition, this pump comes standard with 2 external digital inputs and 1 external digital output to be available for additional mechanical room control and pump monitoring.

# Taco; the new generation of wet rotor pumps.

## Heating, air conditioning or chilled water systems

These pumps are built to exacting specifications meeting the widest range of closed loop hydronic heating and cooling applications. They are suitable for use with fluids at temperatures from 14°-230°F (-10° - 110°C), feature 175psi working pressure and have a stainless steel impeller and shaft. Continuous duty rated with a built-in soft start-up circuit the VR15-3 & VR20-3 can accept 110-240 volt and the VR25-3 and VR30-3 operate on 230-240 volt supply power.



## Lower installation, commissioning and total cost of ownership

A simple ethernet connection on the pump gives instant remote control, monitoring and adjustment without requiring highly skilled network IT or commissioning personnel.

Adjustments for Proportional Pressure, Constant Pressure and Fixed Speed can now be made directly on the pump.

The in-line design and standard ANSI class 125 flanges make for a technician friendly installation. The pump and motor form an integral unit without a mechanical seal. The bearings are lubricated by the pumped fluid, ensuring years of quiet, maintenance free operation.

To protect your investment in the pump it provides dry run, overcurrent, line surge and current limit protection, thermal monitoring, heat sink status and over temperature protection. Given all the advantages stated above, the total cost of ownership of the pump is by far the lowest for its performance range.



## Web-based simplicity

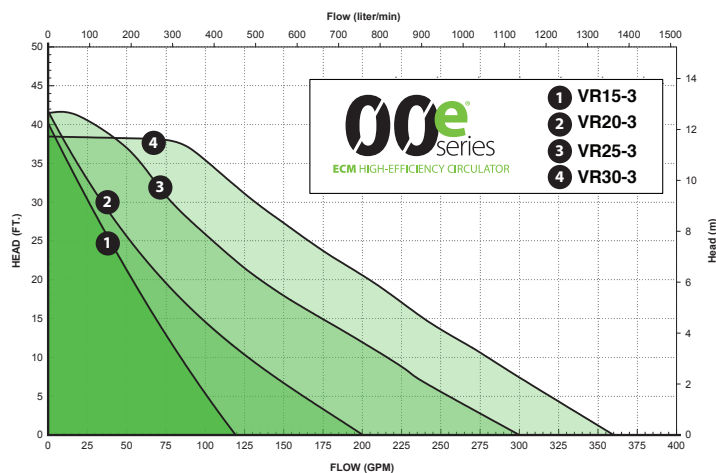
Simply launch any common browser (*Internet Explorer®* or *Firefox®*) type in "00e" or the pump's IP address in the browser's address line and you have instant, automatic and full control over the pump(s).

The HTTP or FTP protocol ensures a user-friendly, commonly used environment.

## The environment is always a consideration

Not only do these pumps use 85% less energy (*Meeting EU legislation with "A" class energy rating*) than a standard commercial pump but we also made the choice to use components, processes and manufacturing capabilities which keep the environment in mind.

## Performance Range



# Submittal Data Information

## 00e® series — VR15-3, 20-3, 25-3 & 30-3

Submittal Data # 301-3000  
Supersedes: 05/09/17

Effective: 08/08/17

### Pump Specifications

Max. Operating Pressure:  
175 PSI (12 bar)  
Water Temperature Range:  
36° - 230°F (2.2° - 110°C)  
Ambient Operation Temperature Range:  
32° - 104°F (0° - 40°C)  
Designed for closed loop heating and  
cooling systems pumping water or a  
water/glycol mixture

### Materials of Construction

Casing ..... Cast Iron  
Impeller ..... Stainless Steel  
Shaft ..... Stainless Steel  
Bearing ..... Metal Impregnated Carbon

### Standards & Protection

Insulation: Class H  
Enclosure: Class 2, IP44  
Integrated Motor Protection  
(electronically protected)  
Continuous Duty  
UL 778, 1004-1, 508C  
CAN/CSA C22.2 #108, #100, #107.1  
EMC (89/366 EEC): EN 61000  
LVD (73/23/EC): EN 60335-1, EN 60335-2-51  
Machine Safety (98/37/EC): EN ISO 12100

### Operating Modes

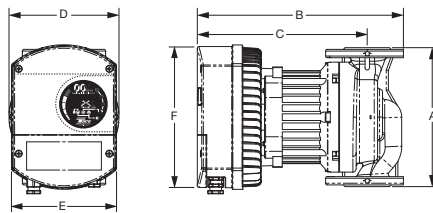
Constant Pressure Control ( $\Delta p-c$ )  
Variable Differential Pressure Control  
( $\Delta p-v$ ) - factory default  
Proportional Pressure Control  
Constant Curve Duty (uncontrolled pump)  
RPM Regulation  
Power Limitation (amps or watts)

### Control Modes

0 - 10Vdc in  
ModBus RTU

### Electrical Specifications

Pump Ratings	1 phase, 110 - 240V, 47 - 63Hz (VR15 & VR20) 1 phase, 230 - 240V, 47 - 63Hz (VR25 & VR30)
Power Consumption (HP)	VR15-3 = 0.027 - 0.68 HP VR20-3 = 0.035 - 1.088 HP VR25-3 = 0.054 - 1.496 HP VR30-3 = 0.054 - 2.175 HP
Power Consumption (W)	VR15-3 = 20 - 500 W VR20-3 = 26 - 800 W VR25-3 = 46 - 1100 W VR30-3 = 40 - 1550 W
Rated Current (1 phase, 230V)	VR15-3 = 5.6A - 2.8A VR20-3 = 7.2A - 3.6A VR25-3 = 5.3A VR30-3 = 7.2A
Current Limit (Max.)	VR15-3 & VR20-3 = 6 A VR25-3 & VR30-3 = 8 A
24V Supply Output	Max. Current up to 100 mA, Output Voltage of 24V $\pm$ 20%, Output Ripple under 1V
Relay Output:	8A, Max. Voltage 250 VAC, 48 VDC Max. Load up to 500 VA
Digital Inputs:	Max. Input Voltage = 32VDC 2 Inputs & 1 Output Logical »1« Voltage > 8V, Logical »0« Voltage < 2V
Ethernet:	Connector = RJ-45 Services = http server and client, FTP server



Minimum static inlet pressure at  
pump suction port (PSI / bar) to avoid  
cavitation at fluid temperatures

Fluid Temperatures	VR15 & VR20 (PSI / bar)	VR25 & VR30 (PSI / bar)
112°F (50°C)	7.3 / 0.5	4.35 / 0.3
176°F (80°C)	11.6 / 0.8	14.5 / 1.0
230°F (110°C)	20.3 / 1.4	23.2 / 1.6

Model Number	Flange Size (ANSI)	Power (HP)	A		B		C		D		E		F		Weight	
			in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	Kg
VR15-3	1-1/2"	0.027 - 0.680	9-13/16	250	15-3/16	386	12-5/8	321	7-13/16	198	7-7/16	189	10-1/16	255	57	26
VR20-3	2"	0.035 - 1.088	11	280	16-3/4	425	13-1/4	336	7-15/16	201	7-7/16	189	10-1/16	255	71	32
VR25-3	2-1/2"	0.054 - 1.496	13-3/8	340	17-11/16	449	14-1/2	369	8-11/16	221	7-7/16	189	10-1/16	255	82	37
VR30-3	3"	0.054 - 2.175	14-3/16	360	19-13/16	503	15-7/8	403	9-1/4	235	7-7/16	189	10-1/16	255	99	45



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A Taco Family Company

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