

# Water Circulation Pumps & Circulators



## Viridian™ Circulators

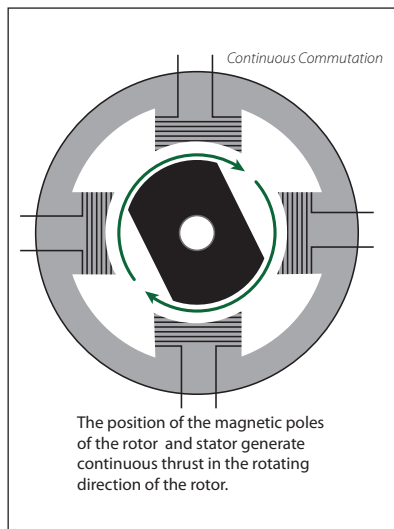
The Taco Viridian is a web-enabled, high efficiency, wet rotor, variable speed commercial pump product line for chilled and hot water applications. All settings and pump access can be done over an internet connection making installation, setup and service easy. The ECM motor saves up to 80% of the electrical energy compared with conventional pumps and its multiple operating modes fit most applications.



## Efficiency as the Basis of Design

The ECM based design combines a brushless electronically commutated synchronous motor with a strong permanent magnet rotor. An ECM motor does not consume 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 precisely drive the rotor as fast as the rotating flux, significantly reducing motor efficiency losses while greatly increasing starting torque.

**Up to 80%  
Electrical  
Savings**



## Full Variable Speed Control Matches System Requirements

The electronics continually change the power adjustment (speed) to match the requirements of the system. Because the electrical motor is being driven by an on-board frequency converter with an integrated PFC filter the supplied electric current is rectified and converted into the appropriate

shape 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 systems requirement without the need for external regulators or sensors.

Ready-to-go out of the box, the Viridian 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), RPM regulation or power limitation control.

The Viridian pumps can be operated as single or parallel variable speed pumps. The onboard electronics allows the user to choose to run dual pumps in parallel, standby or alternating modes. The built-in normally open, common and normally closed relay contacts can be used to activate or deactivate a primary or secondary pump contact, actuate a damper for combustion air or switch another piece of equipment. In addition, the Viridian comes standard with 2 external digital inputs and 1 external digital output to be available for additional mechanical room control.



# Technology; Taco introduces a new generation of wet rotor circulators

## Heating, Air Conditioning or Chilled Water Systems

Taco Viridian pumps are built around exacting specifications to meet 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 and VR20 can accept 110-240 volts and the VR25 and VR30 operate on 230-240 volts supply power.

## Lower Installation, Commissioning and TCO Costs

A simple ethernet connection on the pump gives instant remote control, monitoring and adjustment without requiring highly skilled network IT or commissioning personnel. Any Viridian pump can be accessed directly through a common cross-over cable from a connected laptop or through a web enabled computer or smart phone.

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 quite, maintenance free operation.

To protect your investment in the Viridian it provides overcurrent, line surge and current limit protection, thermal monitoring, heat sink status and over temperature protection.



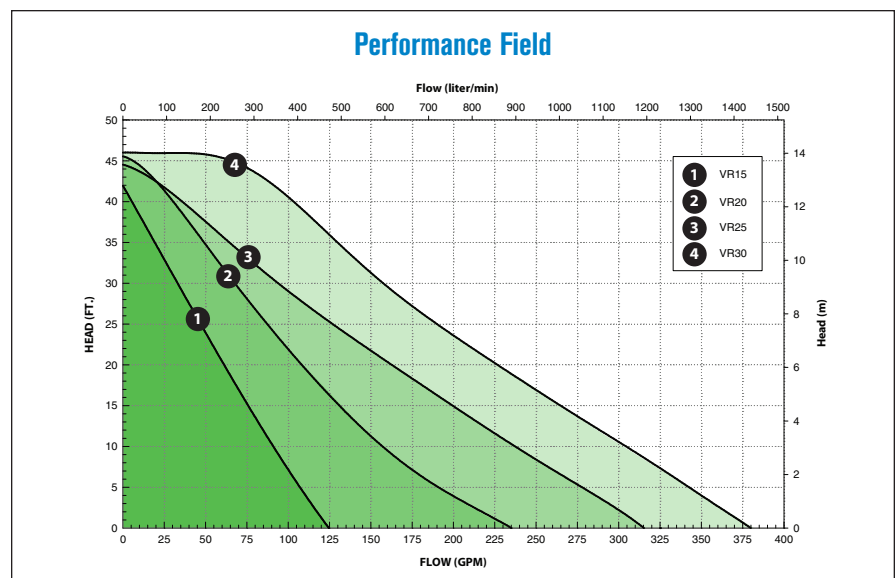
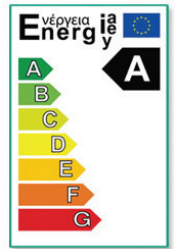
Given all the advantages stated above, the total cost of ownership (TCO) of a Viridian pump is by far the lowest for its performance range.

## Web Based Simplicity

Simply launch any common browser, like Internet Explorer or Firefox, type in "VIRIDIAN" 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 80% 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. For instance all of the magnets used in the Viridian are time stable, non-toxic ceramic magnets as opposed to the more widely used rare earth Neodmium compounds which are sourced only from Chinese mines.



# Submittal Data Information Viridian™ Circulator (VR15-30)

Submittal Data # 301-2100

Effective: 12/15/11

Supersedes: New

## Pump Specifications

Max. Operating Pressure:  
175 PSI (12 bar)  
Water Temperature Range:  
14° - 230°F (-10° - 104°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

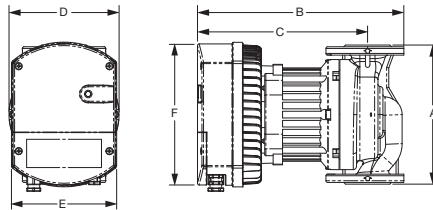
## Operating Modes

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)

*NOTE: The sensorless pump control doesn't need  
or accept a remote reference signal to operate  
in any of the modes.*

## Electrical Specifications

Pump Ratings	1 phase, 110 - 240V, 47 - 63Hz (VR15 & VR20)
	1 phase, 230 - 240V, 47 - 63Hz (VR25 & VR30)
Power Consumption (HP)	VR15 = 0.027 - 0.68 HP
	VR20 = 0.035 - 1.088 HP
	VR25 = 0.054 - 1.496 HP
	VR30 = 0.054 - 2.175 HP
Power Consumption (W)	VR15 = 20 - 500 W
	VR20 = 26 - 800 W
	VR25 = 46 - 1100 W
	VR30 = 40 - 1600 W
Rated Current (1 phase, 230V)	VR15 = 2.2A
	VR20 = 3.5A
	VR25 = 4.5A
	VR30 = 6.9A
Current Limit (Max.)	VR15 & VR20 = 6 A
	VR25 & VR30 = 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	lbs.	Kg		
VR15-1	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
VR20-1	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
VR25-1	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
VR30-1	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



**FOR INDOOR USE ONLY**



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