
	Pump Specification Vortex BWO 355 PWM 2-speed 12VDC_Rixen's	April 2022
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Product	Circulation Pump Vortex BWO 355 PWM 2-speed 12VDC
Date	04-22-2022
Customer	Rixen's Enterprises Inc., Sandy, OR 97055, USA
Version	7.3

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1 Introduction

1.1 Objective of this Specification

This technical specification defines the major characteristics of the Vortex BlueOne BWO 355 PWM 2-speed 12VDC pump for Rixen's (**new prototype pump**)

1.2 References

The pump will be used for heating water circulation in recreational vehicles. It can be attached to Rixen's heaters as a component part. The pump will be installed inside and outside of the vehicle's body. This specification is valid for the following pump:

Brand	Pump type	Product Number	Pump description
Vortex	BlueOne BWO 355 PWM 2-speed 12VDC_Rixen's	424-212-202-996	permanent magnet wet rotor circulation pump for heating-water circulation

2 Function

2.1 Overall Function

The pump is a wet rotor circulator, built according to the spherical motor principle. It is powered by an electronically commutated permanent magnet drive (EC-motor), operated by 12VDC.



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2.2 Performance

The pump operates according to the graphs shown below. Two speeds can be selected by attaching the white PWM signal wire either to the positive or to the negative pole of the power source:

Speed 1 (3.400 rpm): Attach the white PWM wire to the **positive pole** (as the red wire).

Speed 2 (4.400 rpm): Attach the white PWM wire to the **negative pole** (as the brown wire).

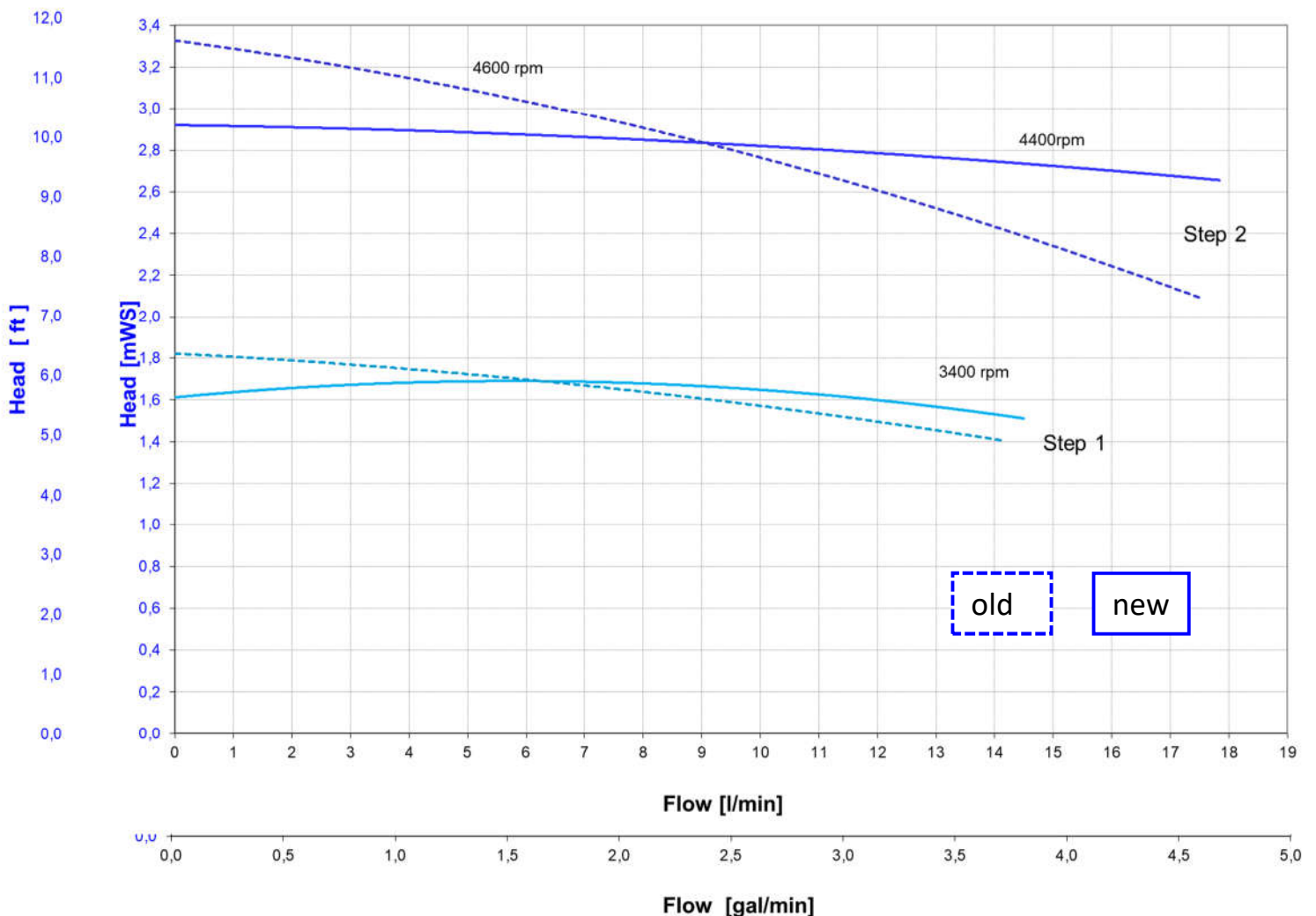


Fig. 1: Q/H graph of the Vortex BWO 355 PWM 2-speed 12VDC pump



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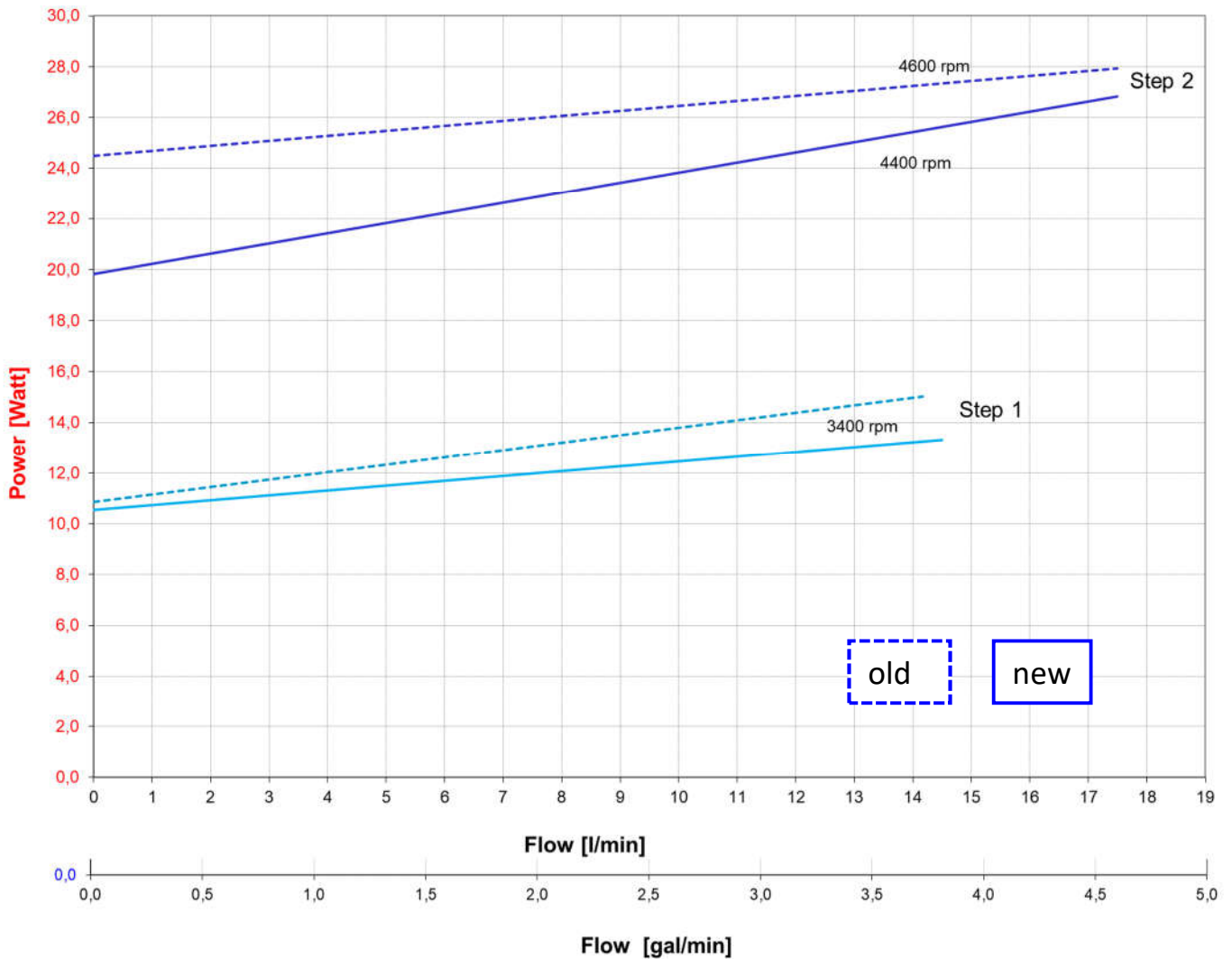


Fig. 2: Q/P graph of the Vortex BWO 355 PWM 2-speed 12VDC pump

2.3 Technical Data

The following technical data apply to the pump:

Liquid:	glycol/water (max. 50%/50%)
Max. delivery head H:	2.9 mWS / 10.2 ft.
Max. delivery flow Q:	17.5 l/min / 4.6 gpm (see Q/H graph, fig. 1)
Max. Power consumption:	28 W (see Q/P graph, fig. 2)
Compressive strength:	PN6 (6 bar / 87.0 psi)
Speed range:	3.400 or 4.400 rpm
Safety class:	IP 56
Pump housing:	Noryl
Seal pump housing:	EPDM 70
Motor housing:	Ultramid
Motor nut:	Noryl
Rotor can:	Stainless Steel 1.4404

3 Installation

3.1 Dimensions

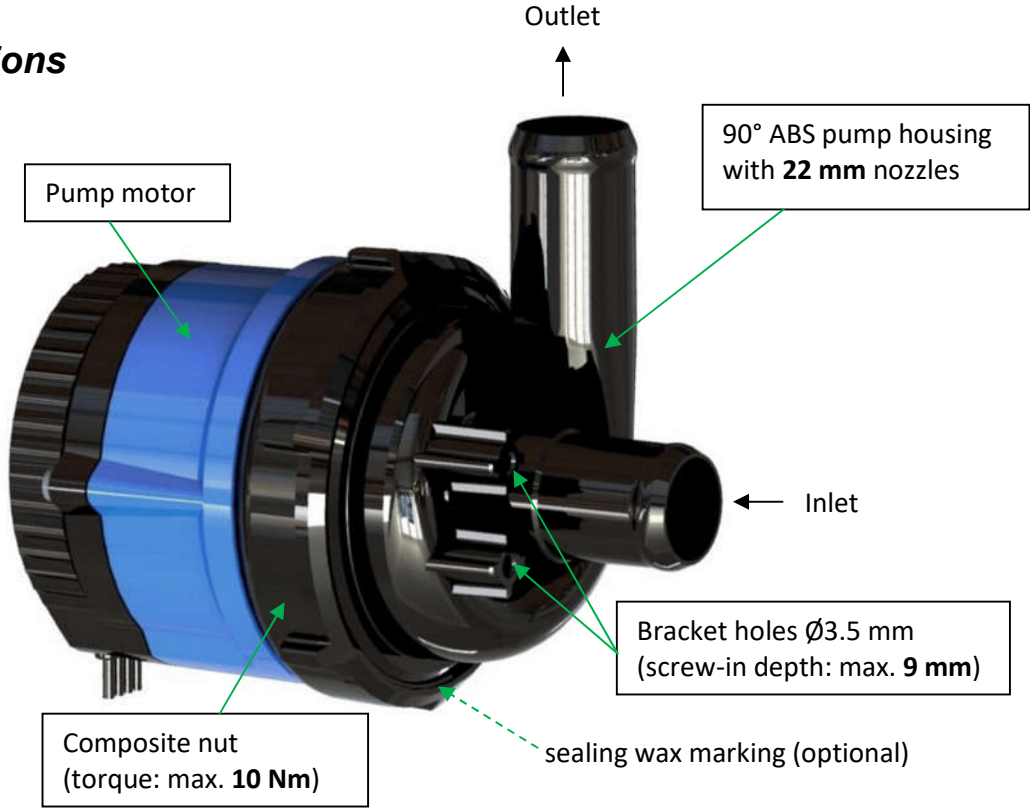


Fig. 3: Pump Vortex BWO 355 PWM 2-speed 12VDC

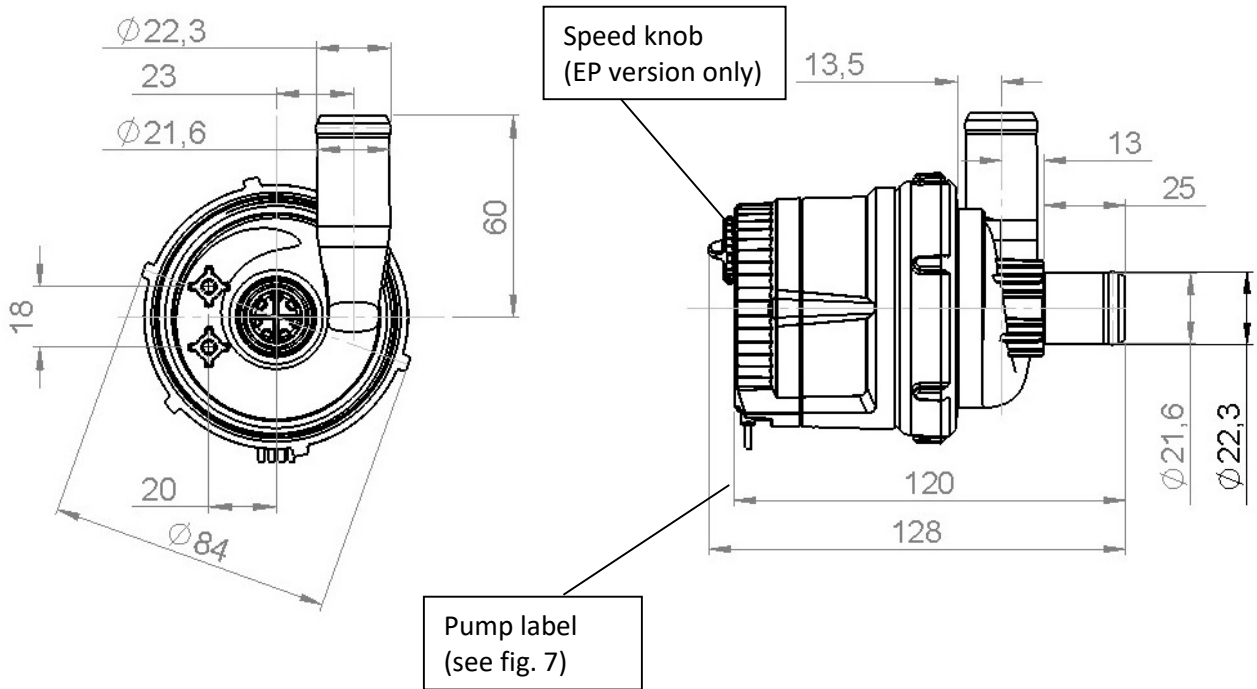


Fig. 4: Rear view

Fig. 5: Side view

CAUTION! Use bracket holes $\varnothing 3.5$ mm for fixation of the pump (fig. 3). Do not exceed screw-in depth of 9 mm.

3.2 Installation Orientation

CAUTION! Select installation orientation acc. fig. 6.

The pump inlet as well as the pump outlet must not show downwards.

The orientation of the pump housing related to the pump motor can be varied upon twisting the motor head. For that purpose the motor nut must be loosened and tightened again. The pump motor can be demounted completely from the pump housing for inspection.

The cable must not show upwards.

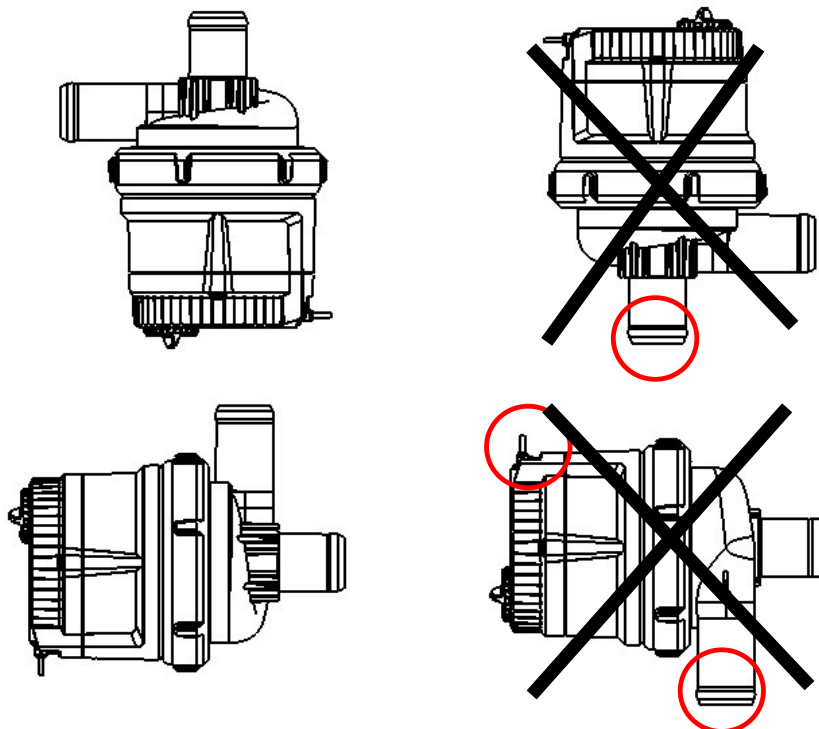



Fig. 6: Installation orientation

CAUTION! Damage to bearing caused by dirt or by dry running! Completely flush and bleed the pipework before operating the pump.

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3.3 Electrical Connection

A power cable is factory fitted to the pump. The cable resists a temperature of 105°C.

Cable type: 3x1mm², UL approved.

Cable length: 700mm

The cable ends are stripped and unprepared (without cable end sleeves).

Lead colors are red (+), brown (-) and white (PWM-signal).

The pump is protected by an in-built 3.15 A time lag fuse!

4 Operation

4.1 Pump Protection

INFO! The pump feature dry run protection is deactivated! The pump will not stop running even if used in plain air. However, the pipe system should be bled completely in order to prevent pump damages.

INFO! The pump is equipped with blocking protection. If commutation gets lost (e.g. due to blocking of rotor) the pump switches off automatically, starts again, eventually switches off again and so forth.

INFO! Speed limitation at low temperatures: At a medium temperature <0° C (cold system) the pump runs at a limited speed of **2.300 rpm** in order to maintain circulation. If the medium temperature rises to over 0° C the pump works in the usual way according to the speed set.


INFO! The pump is equipped with overheating protection. If 125° C is exceeded in the motor, the pump will switch completely off. It switches on again when the temperature falls below 105°C.

INFO! For safe starting, the pump will first run at 1.900 rpm for 10 seconds. After that it will run according the speed set.

4.2 Operational Conditions

On site ambient temperature:	-20°C ... +50°C
Temperature of medium:	-20°C ... +90°C*

*Above 85°C the motor will reduce its speed so that overheating is avoided, whereas heat flow through circulation is still given. If the temperature reaches the standard range again, the pump will operate in the original way according to the speed set.

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4.3 Electrical Ratings

Operating voltage: 12 VDC (10 ... 18 Volts)
 Electric strength: 600 V
 Power input: max. 2.5 A in the customer's system

The pump is equipped with a reverse voltage protection. However, please check electrical connection before start of pump operation!

5 Transport / Storage

Ambient temperature for transport/storage : -30° C ... 80°C

6 Standards, Certifications

The pump complies to CE and regulations EMC and RoHS. Further, the UL certification for this pump is under progress.

7 Identification and Traceability

The pump is equipped with a tag for identification and for electrical connection (**fig. 7**). The serial version of the pump may have a modified tag.

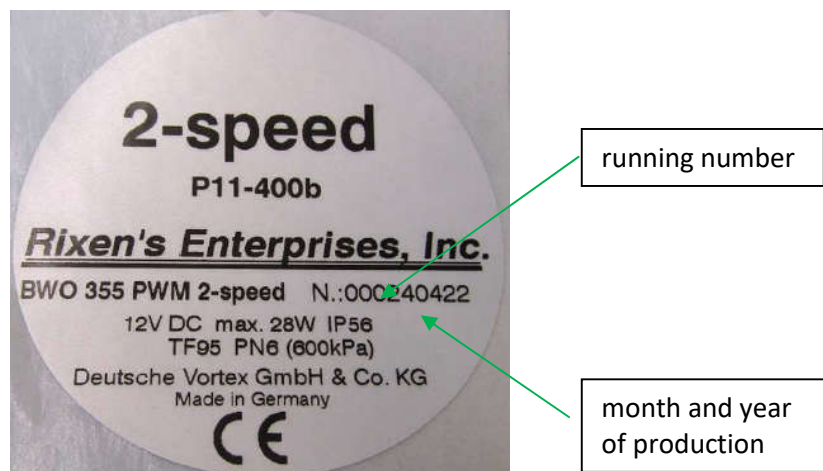


Fig. 7: Pump label