

## OWP-BL93-300 SERIES brushless DC water pump

Boosting/circulation/Variable-frequency/Low-noise/shield pump/PWM control/ Fault feedback



## ■ Applications

Widely used in hybrid bus, hybrid passenger car, electric vehicles, trains, and ships and other heating and cooling circulation system.

## ■ Features

- ◆ Centrifugal pump
- ◆ Magnetic force transmission (shield pump structure)
- ◆ High efficiency brushless DC motor, low power consumption, high efficiency, long service life.
- ◆ With wide range operating temperature
- ◆ PWM signal speed controlling
- ◆ With constant flow controlling
- ◆ Reverse polarity protection
- ◆ Dry running protection
- ◆ Over Voltage, over current protection
- ◆ Overload, over temperature protection

## ■ Technical description (related parts in contact with the liquid)

Pump head housing: PPS+GF

Impeller: PPS+GF

Shield cavity: PPS+GF

Shaft sleeve: Carbon resin composite materials

Shaft: stainless steel shaft

Magnet housing: nylon plastic capsulation

Seal ring: EPDM

## ■ Driving device (Including motor)

Driving electromagnet: nylon plastic capsulated magnet

Screws and nuts: SUS 304 stainless steel

Driving Motor : brushless motor

Motor wire frame :PPA GF

Pump housing: Die-casting aluminum case with sandblasting and impregnation treatment

Bracket: Steel with powder coating

Bracket hoop: US 304 stainless steel+ Damping rubber ring

Waterproof based on IP68 rating (en60529)

Connector model: AMP282106-1(matched Plug AMP282088-1)

Nozzle diameter:22.4mm (inner diameter:16mm)

## ■ Model Specifications

**OWP-BL93-300-(12VDC)**

**OWP-BL93-301-(24VDC)**



### ■ Mounting instruction

OWP-BL93-300 series pumps are centrifugal pumps which require pre-filled, The pump installed in the lowest position of the system to ensure that the impeller is always immersed in the liquid, or pre-filled the pump before power on .

1: Pump should not be dry-running, even though it can dry-running for 30 seconds (after 30 seconds dry-running, it will automatically stop), Dry running will makes noise, also increasing abrasion to the shaft and shaft sleeve.

2:Use the recommended diameter pipe connecting the pump inlet, if you use a smaller diameter hose pump inlet, Due to the negative pressure in the pump, the outside air easier enter to the pump through the pipeline, it will make the pump performance degradation, and also the air bubbles make damage to the pump.

3: As viewed from the pump inlet direction, the impeller rotates clockwise (see the arrow on the outlet port).

4: The pump can be installed vertically or horizontally mounted (see figure 1 ) When installed vertically, the outlet port should be upward .

5:In order to avoid the dry- running (air get stuck in impeller),the water pump outlet port should be vertical or in the upper of the impeller. (see figure 1 )

6: The connected pipe should be vertically mounted (or no elbow in 20cm )to make the air discharged easily, the outlet pipe should not be used less than 90 degrees Elbow (see figure 2).

7: Can't use the seawater or other heavy pollution with big grain impurity liquid as the liquid medium .

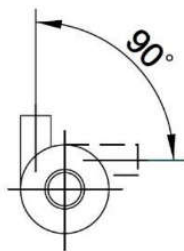


figure 1

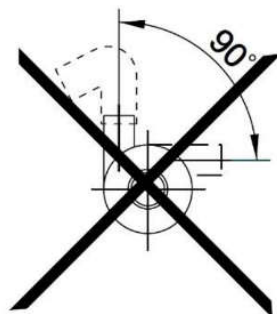


figure 2

■ **Temperature parameter**

Medium liquid temperature: -40°C to +85°C (-40°F to +185°F)

Working ambient temperature: -40°C to +85°C (-40°F to +185°F) Humidity ≤90%

Storage temperature: -40°C to +70°C (-40°F to +158°F) (up to 100 °C, but it will shorten the service life)

■ **System pressure**

-0.2 to 2.5 bar (100°C (212°F)).

The service life is more than 20,000 hours based on the rated voltage and 36°C(86°F) ambient temperature.

■ **Voltage range**

Rated 12V water pump, workable range 9V - 16V

Rated 24V water pump, workable range 18V - 30V

Although the motor can be used in a wide range of voltage and temperature, but excessive or too low voltage and temperature will affect the service life of the motor, the pump can not be exposed to thermal radiation ambient.

**Medium liquid: pure water, liquid mixture (Water with below 60% glycol)**

■ **Electrical parameter**

Connector model and the corresponding electrical properties (see figure 3):

AMP282106-1 (matched Plug AMP282109-1)	<b>1 (Black)</b>	<b>2 (Yellow)</b>	<b>3 (Blue)</b>	<b>4 (Black)</b>
	<b>GND</b>	<b>Fault feedback</b>	<b>PWM</b>	<b>+12V/24V</b>

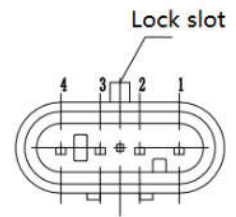
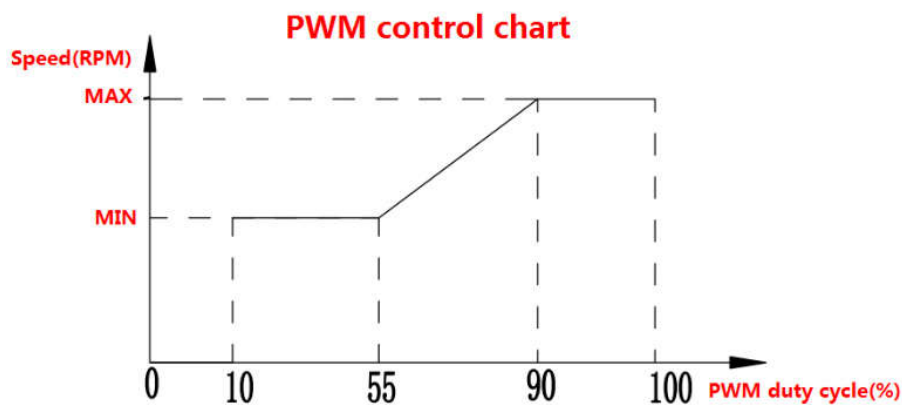


figure 3

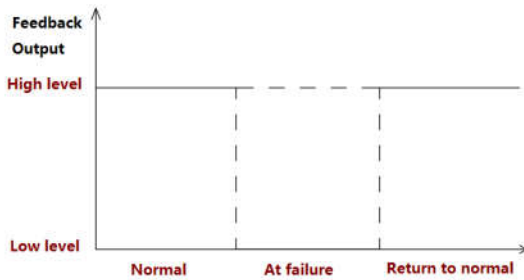
Working Voltage (VDC)	Rated power (W)	Rated flow (L/H)	Dimensions (mm)	Weight (g)
9V-16V(12V) 18-30V (24V)	100W	Q=1800L/H H=9M	148*90*132	1.12KG

■ **PWM character**



Duty Cycle	Description	Remark:
$0\% \leq \text{duty} \leq 10\%$	Stop state	1: PWM duty cycle metrical error 2%
$11\% \leq \text{duty} \leq 55\%$	Min speed running	2: PWM voltage: 24VDC/12VDC (same as pump voltage)
$56\% \leq \text{duty} \leq 90\%$	PWM mode (Linear speed control range)	frequency: 50-1000KHz
$91\% \leq \text{duty} \leq 100\%$	Max speed running	3: Recommended PWM stop duty: 10% 4: Recommended 0% duty as PWM disconnect

Error feedback state chart

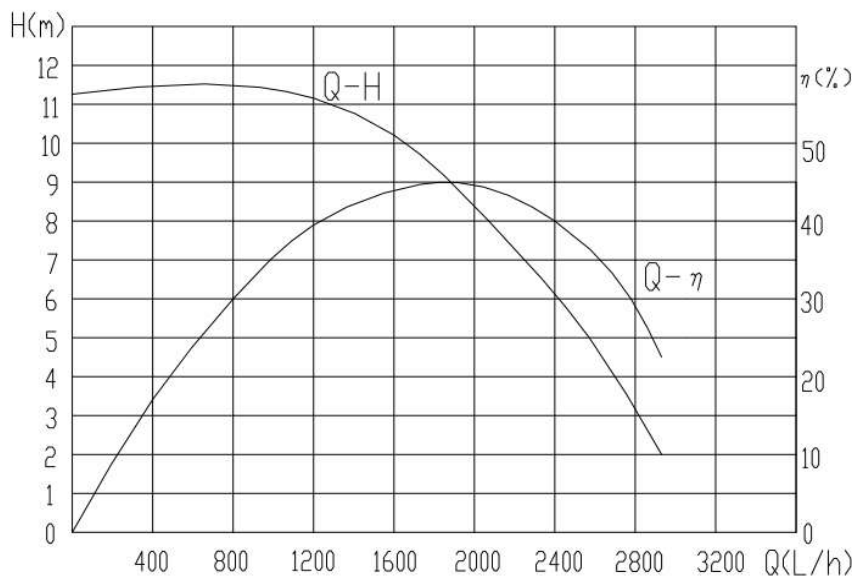


■ **Attentions**

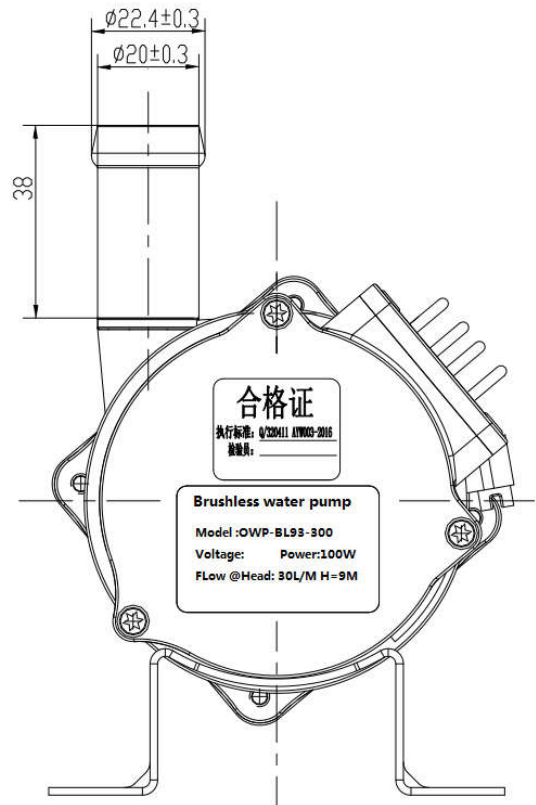
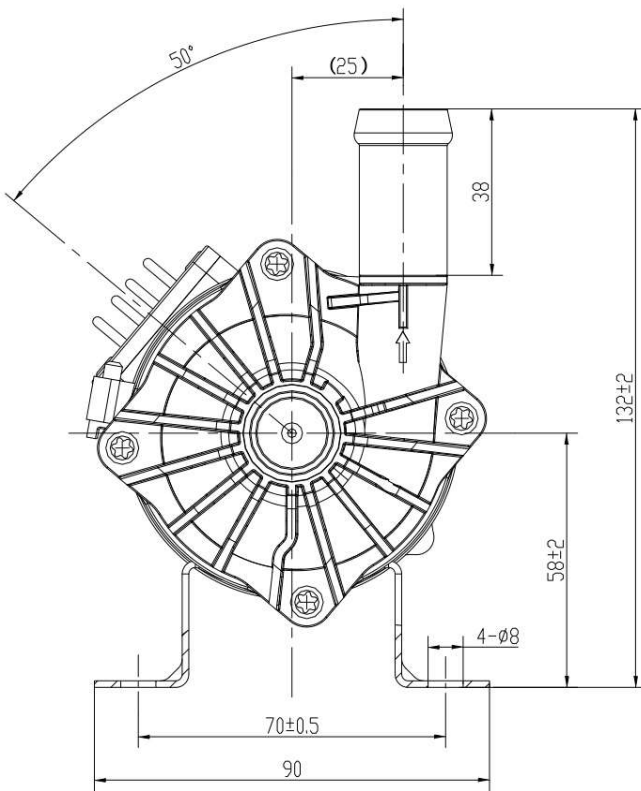
1. Working ambient temperature:  $-40^{\circ}\text{C}$  --  $85^{\circ}\text{C}$ , should try to avoid close to three-element catalytic, gas discharge pipe system and engine during the installation, ensure the working environment temperature.
2. The installation position of the water pump should as much as possible close to the low water level, to extend the service life of the pump.
4. Please use the pump far from the dusty environment, the dust is harmful to reduce the service life
5. Pay attention to the purity of the water, avoid to jam and impeller-blocked to reduce the service life of pump

■ **Performance parameter**

性能曲线图



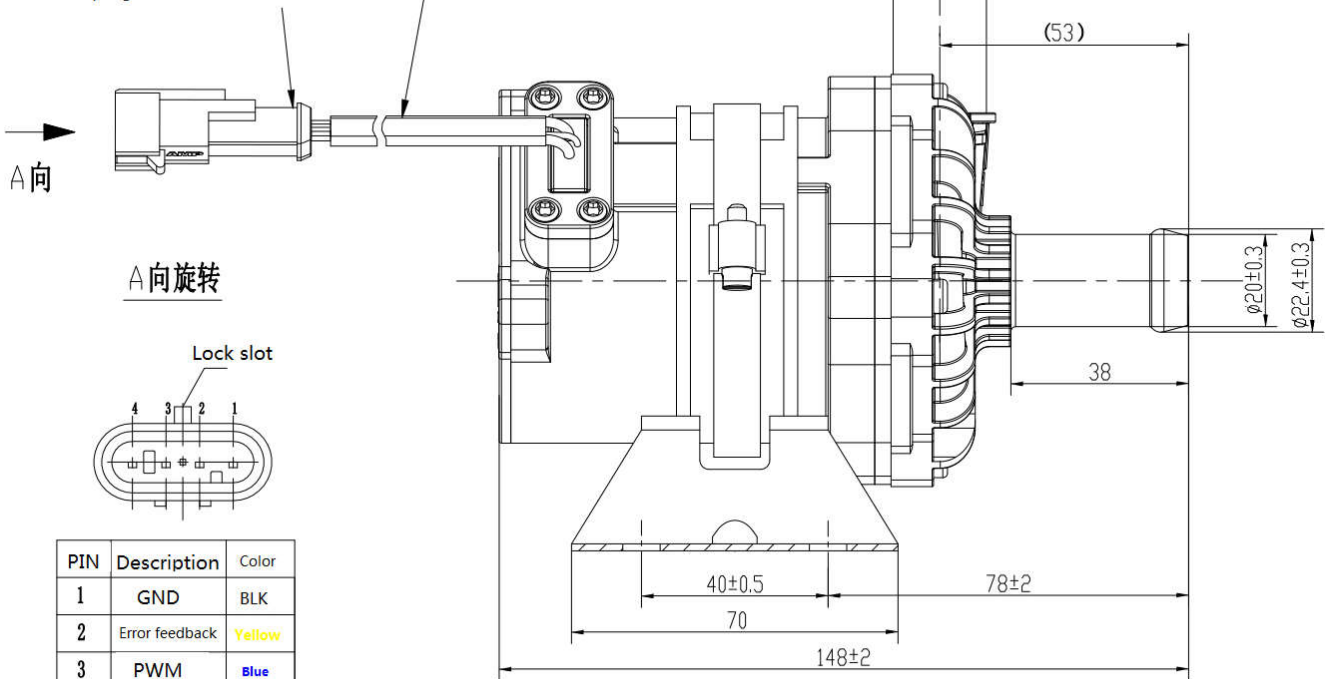
External dimension



Connector model : AMP282103-1

Matched plug model : AMP282088-1

Wires length : 560±30mm



PIN	Description	Color
1	GND	BLK
2	Error feedback	Yellow
3	PWM	Blue
4	DC24V / 12V	Red