EV DC Fast Charger
Liquid Cooling Pump Solution



TOPSFLO
Excellence in Micro Pump,DC Pump



EV CHARGING

Industry Overview

"2021 China Electric Vehicle User Charging Behavior White Paper" released by the Charging Alliance shows that 99.3% of electric vehicle users prefer fast charging. And how can the charging pile realize faster charging? One is to increase the output power (need to add module liquid cooling), the second is to increase the current (need to add cable liquid cooling). At present, the liquid cooling system is the best solution for DC supercharging charging station in the market, and water pump, as an important part in liquid cooling system, plays a key role in the cooling effect.

TA70E

TMG317-DM



EV Fast Charging Liquid Cooling Pumps

STATION OVERVIEW

Market Pain Points

Charger Power Module Liquid Cooling

1) Superchargers generally consist of multiple DC:DC or AC:DC modules stacked on top of each other, and require a large flow rate to deliver coolant to each module for uniform heat dissipation;

2) EV Charging stations are equipped with intelligent management systems, which need to realize remote management, monitoring and data analysis, etc., and therefore cannot be subject to electromagnetic interference from other components.

Cable Liquid Cooling

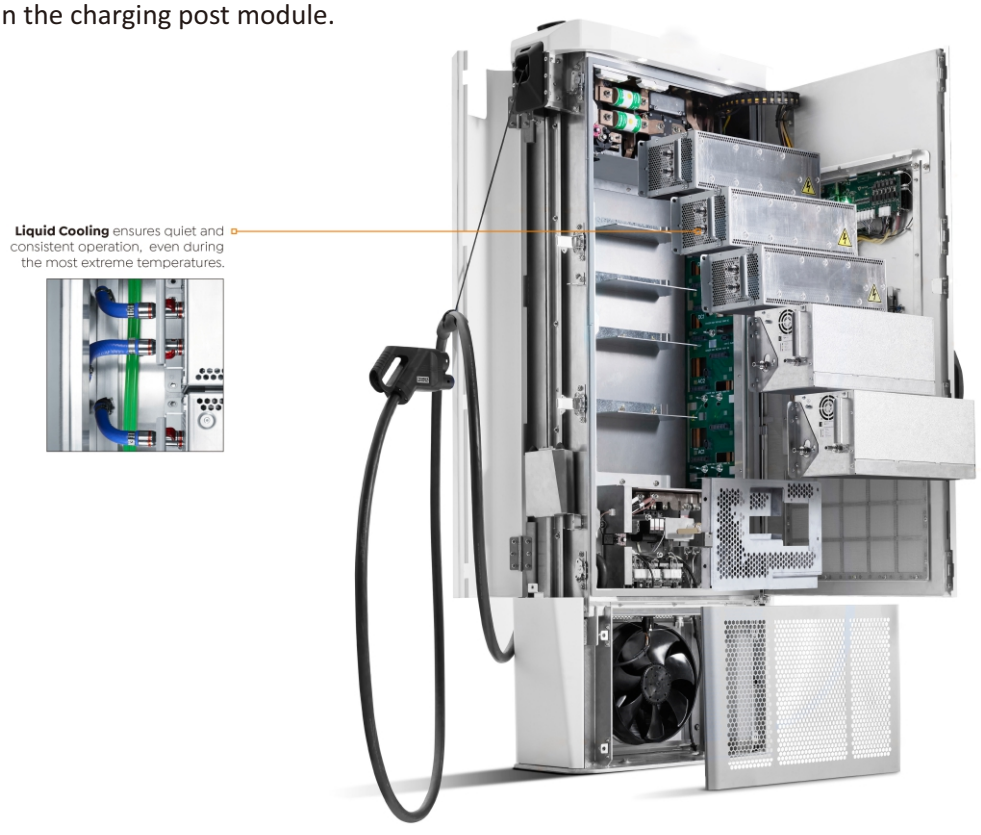
1) Liquid-cooled charging cables are often thinned and lengthened to be more lightweight, thus adding a very large amount of drag to the liquid-cooled system;

2) The cable liquid cooling system generally uses glycol antifreeze or insulating oil as the medium. The viscosity of the liquid is different at different temperatures, especially the silicone oil, and the viscosity of the liquid will increase exponentially at low temperatures;

Pump Solution

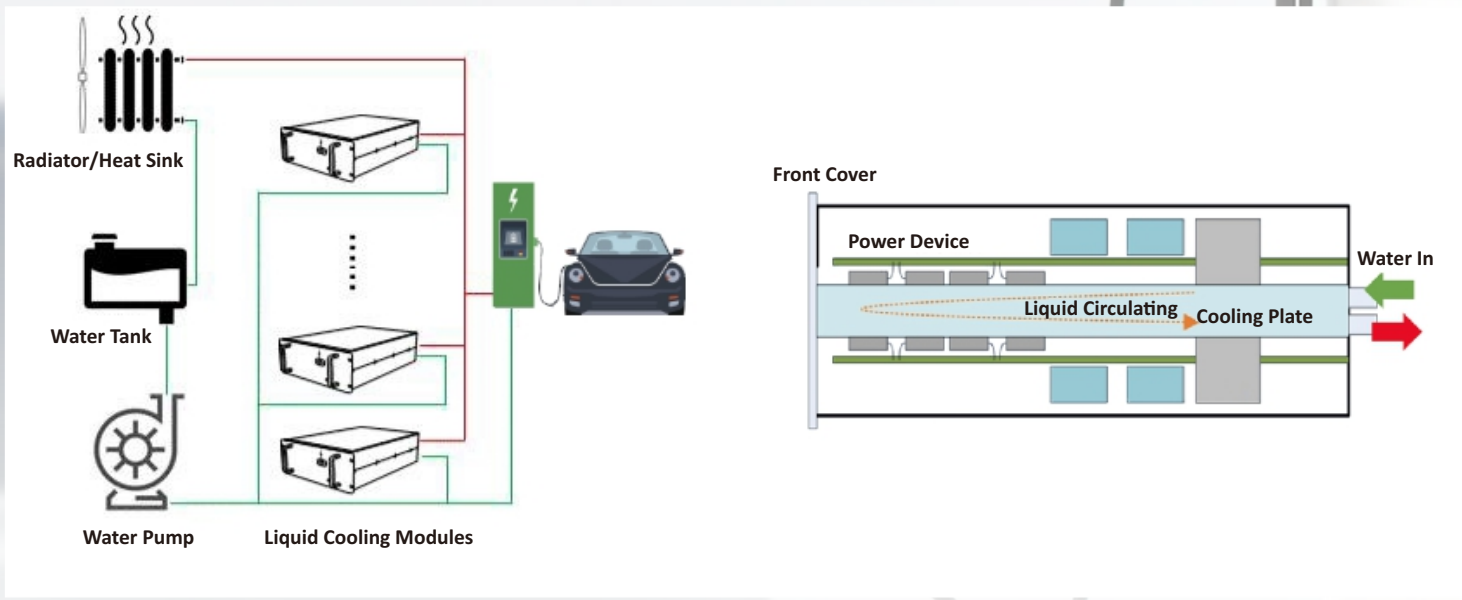
1) Charger Power Module Liquid Cooling

TOPSFLO water pump TA60/TA70 series is designed to meet the needs of charging staion's multi-power module cooling, through the motor and fluid simulation, special design of high-efficiency motor and structural solutions, while minimizing power consumption, the maximum flow rate up to 60L/min, faster and better cooling so that there is no risk of overheating in the charging post module.



Charging station liquid-cooled water pump is specially designed for low-temperature startup, and PWM intelligent speed regulation function. It can withstand low temperature -40℃, and adjust the motor speed according to the different viscosity of the liquid under different temperature conditions, which can solve the technical problem of not discharging liquid under low temperature due to excessive viscosity of the liquid.

TOPSFLO pumps are designed with vehicle-grade electronic solutions, which can well meet the EMC specification requirements for charging stations. It will not cause interference to the electronic system of the charging pile, and at the same time, it can also resist electromagnetic interference from other equipment.

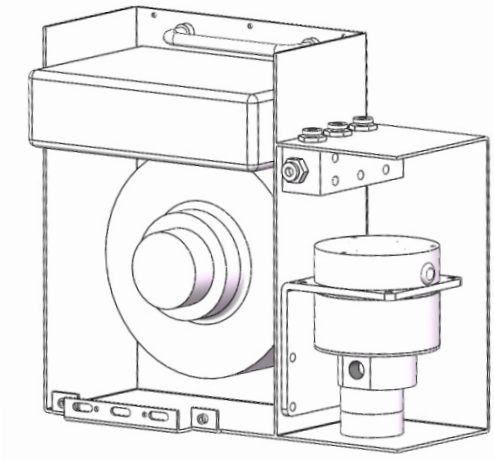


2) Cable Liquid Cooling

Cable Liquid cooling for coolant (≤ 400A)

Depending on the cable length and diameter, the resistance will vary and the cooling solution will be different. The smaller cable diameter, the higher the resistance, and the longer the cable, the higher the resistance. For low resistance, it is recommended to consider **TOPSFLO centrifugal pump TA60E-B24-3521**

For high resistance, it is recommended to consider **TOPSFLO gear pump TMG317**



Cable Liquid cooling for dimethyl silicone oil (> 400A)

For high current cables of more than 400A, silicone oil is usually chosen as the cooling medium, which has relatively higher resistance. For this kind of high resistance cable cooling application, TOPSFLO newly developed a **high pressure liquid cooling gear water pump TMG317**, the **maximum water pressure up to 10bar**, can meet **500-600A** cable cooling of charging connector.

EV Charger Cooling Pump

TA60E/TA70/TMG317

TA60E-R



TA60E-B



TA70E



TMG317-DM



Centrifugal Water Pump Specifications

Model	Product Code	Max Flow Rate(L/min)	Max Water Head(M)	Rated Voltage (VDC)	Rated Current (A)	Rated Power (W)	Dimension (mm)
TA60E-B	TA60E-B24-3521	35	21	24	2.5	86	107.5×57.09×94.5
TA60E-R	TA60E-R12-3408	34	8	12	4.5	54	117×62.1×94.5
	TA60E-R24-3709	37	8.5	24	2.5	60	
	TA60E-R24-4018	40	18	24	2.95	70	
TA70E	TA70E-A24-4020	40	25	24	5.0	120	126.5×83×119
	TA70E-A24-4230	42	30	24	6.25	150	

Customization: 1. /PWM speed control 2. /FG (RPM) signal

- The data in the table is the measured performance when pure water is delivered at normal temperature.
- The maximum flow rate is the flow rate when water head is 0 meter, and the highest head is the head when water flow is 0 L/min.
- Noise: 55dB(A)@1m
- IP level: IP67
- Coil Insulation class: Class H/F
- Ambient temperature: -40°C ~ 50°C
  Liquid temperature: -40°C~85°C
- TA60E-R24-4018 & TA60E-B24-3521: -40°C ~70°C ;
- Do Not Run Pumps Dry.
- Pump doesn't have self-priming function, needs to be installed below the liquid plane.

Gear Pump Specifications

Model	Product Code	Max Flow Rate(L/min)	Max Pressure (bar)	Rated Voltage (VDC)	Inlet/outlet Diameter	Rated Power (W)	Dimension (mm)
TMG 317	TMG317XK/DC24DM	6	8	24	G1/4"	150	120×80×50

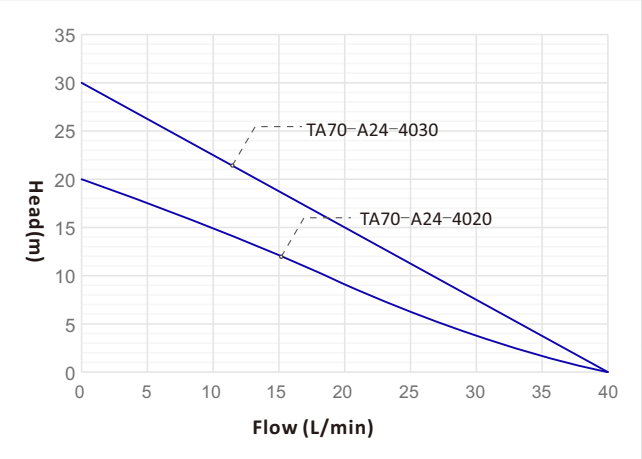
Notes:

1. Gear type : "XK" for common fluid, "YT" for fluid with rigid particles, "PK" for acid and alkali
2. Valve : "L" limited pressure valve, "R" non return valve
3. Speed control methods : standard 0~5V, PWM customized

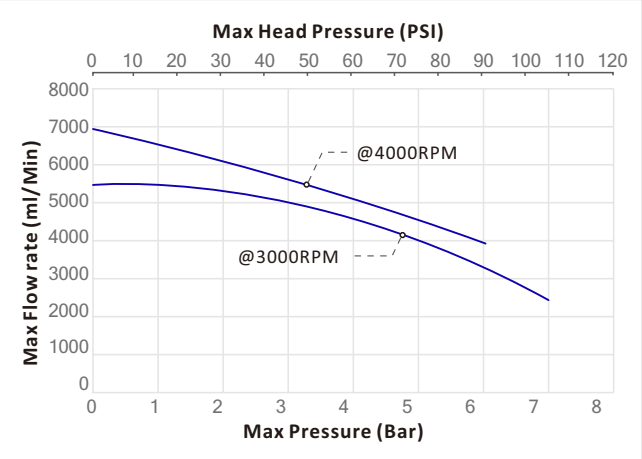
ISO 9001: 2015 | IATF 16949: 2016 | CE | REACH | RoHS | CQC

Curves

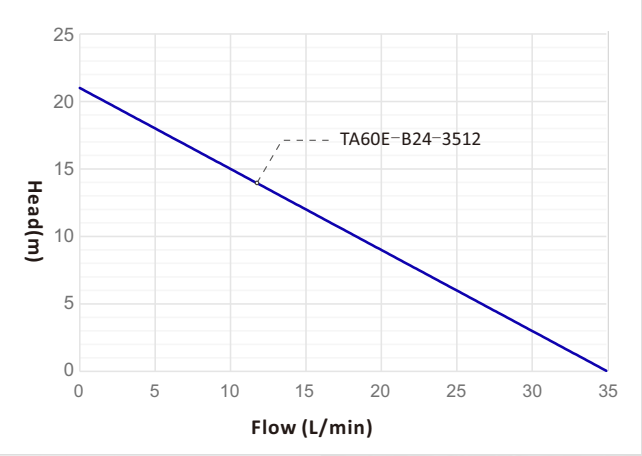
TA70E Curve



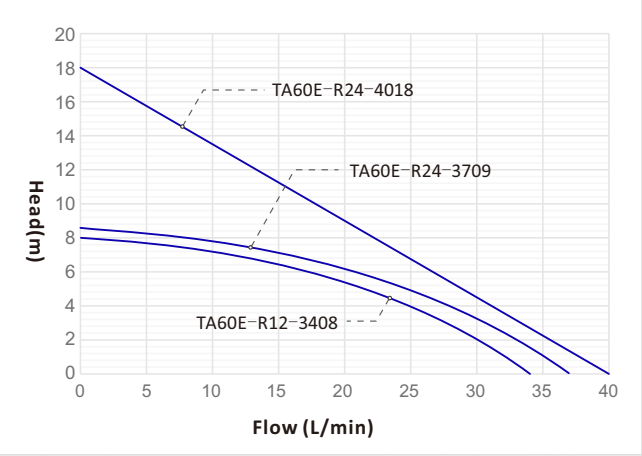
TMG317 Curve



TA60E-B Curve

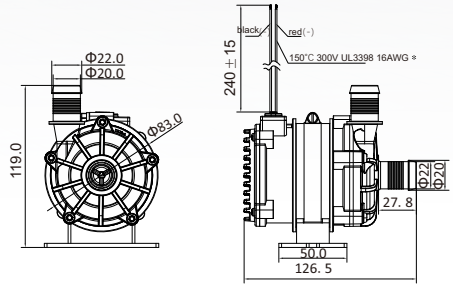


TA60E-R Curve

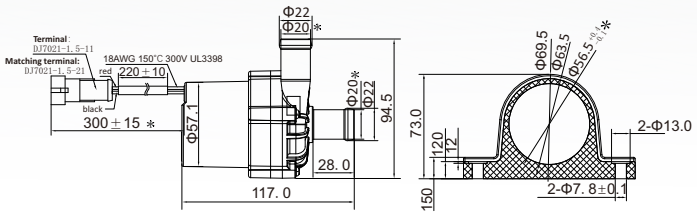


Dimension(mm)

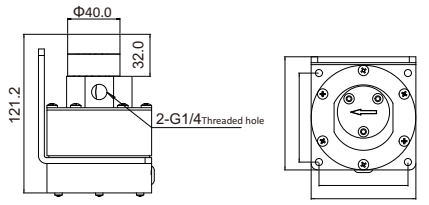
TA70E



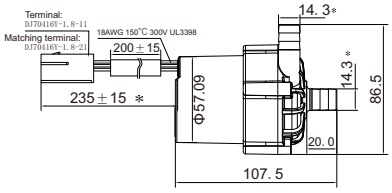
TA60E-R

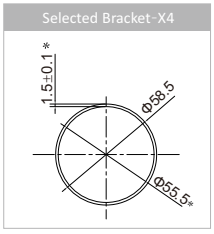


TMG317



TA60E-B





Make Every Pump with Extreme Ingenuity

- Global material selection
- German quality
- Ingenious manufacturing
- Lead the future



90% raw materials from well-known brands, international quality

- Imported plastic raw materials from Japan, never use any recycled or mixed materials, strong pressure resistance, long-term use without cracking
- International first-line brand electronic components, Long-term stable and reliable
- Core long-cycle parts reserve > 6 months, imported chip spot inventory > 1 year

German TÜV Rheinland quality system standard control

- Based on an international perspective, the entire process of TOPSFLO raw material procurement, research and develop-ment, and production is strictly controlled in accordance with the German TÜV IATF16949 system standard

Manufactured with ingenuity to ensure each pump is stable

- Professional electrostatic control digital workshop, to ensure pumps have no potential risk of electronic failure
- 6 full inspection processes stricter than national standards, to ensure "zero defect" quality
- Internationally imported automation equipment and intelligent production lines, to ensure long-term and stable batch consistency of products

R&D engineer team with 20 years' industry experience

- TOPSFLO R&D and design team members are from world-renowned enterprises, such as Gree, WOLONG, Johnson Electric, etc., with advanced concepts and rich R & D experience in the industry
- Focus on professional fields such as electronics and motors, and develop future-oriented intelligent micro water pump products

TOPSFLO has reached stable and long-term cooperation with hundreds of well-known companies around the world

TESLA · KTM · Shell · Billi · Webasto · Rheem · KOHLER · Carrier · TRITIUM · BOSCH 博世 科技成就生活之美 · 3M · Whirlpool · GE APPLIANCES · flex · KOOLANCE

TOPSFLO

Excellence in Micro Pump,DC Pump

THE LEADER OF HIGH-END MICRO DC PUMP

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