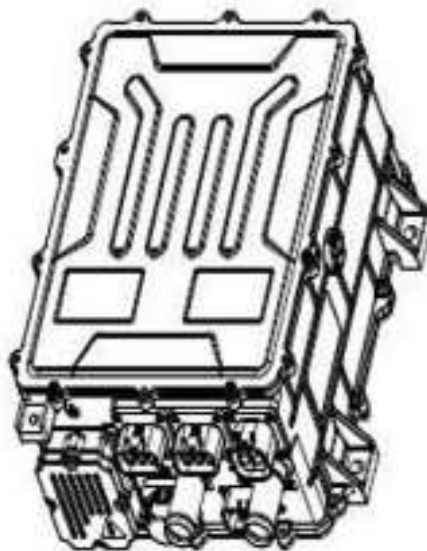




3in1 5.5kw inverters 3kw DC/DC Converter Liquid Cooled System

Model No. : ATV3-V6H4D5.5G



Features

1. Output Power: DC/AC inverters: 5.5KW, DC/DC converter: 3KW
2. Input Voltage: 350~750VDC
3. Output Voltage: 24VDC
4. Dimensions(mm): 362x290x166
5. Weight: ≤ 13.5 KG
6. Cooling System: flow ≥ 10 L/min , capacity : 0.4L
7. IP Protection Rating: IP67
8. Communication Method: CAN-BUS
9. Enclosure: Aluminum alloy
10. Software: Digital software design



1. 產品執行標準 Product standard :

- 符合 GB/T18488.1-2015 《電動汽車用電機及其控制器技術條件》

conform to GB/T18488.1-2015 《Technical specifications of motor and controller for electric vehicle》

- 符合 GBT 18655-2010 車輛、船和內燃機 無線電騷擾特性 用於保護車載接收機的限值和測量方法 conform to GB 18655-2010 Vehicle, ship and internal combustion engine, radio disturbance characteristics, Limits and measurement methods for protecting on-board receivers

- 符合 GB/T18488.2-2015 《電動汽車用電機及其控制器試驗方法》

conform to GB/T18488.2-2015 《Experiment method of motor and controller for electric vehicle》

- 符合 GB4942.2-1993 《低壓電器外殼防護等級》

conform to GB4942.2-1993 《Enclosure protection level for low-voltage electrical》

2. 產品基本技術參數 Basic technical parameters of the product

項目 Item	要求 Requirement	備註 Remark
直流供電電壓範圍 DC supply voltage range	DC 350V—750V	支援高壓平臺 Support high Voltage platform
集成單元 Integrated Unit	DC/AC+DC/AC+DC/DC	DC/DC 支援 24V 系統 DC/DC Support 24V System
控制箱防護等級 IP Protection Rating	IP67	
冷卻方式 Cooling mode	液 冷 liquid cooling	乙二醇混合溶液或其它冷卻液 Ethylene glycol mixed solution or other coolant
水嘴外徑 Nozzle outer diameter	25	mm
控制器通訊方式 Controller communication mode	CAN 2.0	支持 : 250kbps/500kbps Support : 250kbps/500kbps
水道參數 Water channel parameter	進水流量 $\geq 10\text{L/min}$ ，容量： 0.4L flow $\geq 10\text{L/min}$ ， capacity : 0.4L	進水 inflow $\leq 60^{\circ}\text{C}$ ， 水壓 hydraulic pressure ≤ 0.6 Mpa
系統低壓控制電源 System low voltage control power supply	範圍 Range : DC 18-36V	
低壓功耗 Low power consumption	$\leq 25\text{W}$	額定工況 Rated operating condition
散熱功耗 consumption of the heat dissipation	0.48KW-0.51KW	額定工況 Rated operating condition
控制箱外形尺寸 Control box dimensions	362*290*166	mm (含接外掛程式和水嘴尺寸 Including connector and nozzle size)

控制器重量 Controller Weight	約 13.5 ≤ 13.5	kg
----------------------------	------------------	----

2.1 具體技術規格：Specific technical specifications：

2..1.1 DC/AC 控制模組DC/AC Control Module:

名稱 Name	規格參數 Specification and Parameter	備註 Remark
額定功率 Rated Power(kW)	5.5KW	
峰值功率(kW) Peak Power(kW)	7.5KW	
適用電機 Applicable motor	永磁同步電機/三相交流非同步電機 Permanent magnet synchronous motor/Three-phase AC asynchronous motor	
額定輸出電流 Rated output current	13A	
峰值輸出電流 Maximum output current	19A	60S
效率 Efficiency	≥93%	額定工況Rated operating condition
速度控制範圍 Speed Range	1:100	開環速度模式Open loop speed mode
其它功能 Other function	回饋、速度控制、力矩控制、速度/力矩控制切換、速度限制、力矩限制、自學習、故障重定，上位機軟體功能。 Feedback, speed control, torque control, speed/torque control switching, speed limit, torque limit, self-learning, fault reset, PC software function.	
保護功能 Protection function	過溫、超載、相間短路、對地短路、過電流、過電壓、欠電壓、缺相、失速、工作時負載突變等即時停機保護本體不受損壞功能。 Over-temperature, overload, phase-to-phase short circuit, short circuit to ground, over current, over voltage, under voltage, phase loss, stall, sudden load change during operation, etc.	

2.1.2 DC/DC 電源模組：（24V、3KW）

DC/DC Power Module：（24V、3KW）

名稱 Name	規格參數 Specification and Parameter	備註 Remark
額定功率 Rated Power(kW)	3KW	
輸入電壓 Input Voltage	300V-750V(輸入電壓低於 450V 時，輸出電流進行降額) 300V-750V(When the input voltage is lower than 450V, the output current will be derated)	
峰值功率(kW) Peak Power(kW) 額定輸出特性 Rated output characteristics	3.6KW DC 27.5±0.5V /110A	開機後保持時間 6 分鐘 Keep 6 minutes after power-on
效率 Efficiency	≥95%	額定工況 Rated operating condition
輸出範圍 Output Range	D C≤18V 欠壓保護（可恢復）；31---33V 過壓保護（關機鎖定） D C≤18V under-voltage protection (recoverable); 31---33V overvoltage protection (shutdown lock)	
輸出過流保護 Output over-current protection	132±5（限電流 Limit Current）	6min
穩壓精度 Stabilization accuracy	≤±1V	
紋波電壓 Ripple voltage	≤300mV（PK-PK）	
過溫保護 Over temperature protection	溫度超過 100±5℃，關機；溫度低於 90±5℃，可自恢復 Temperature exceeds 100±5℃, shut down; Temperature is lower than 90±5℃, self-recover	

2.2 外形圖（見附件） Outline drawing example (refer to attached diagram)

3. 產品使用條件

3.1 運行環境 Operating ambient

- 工作環境溫度 Working Temperature : $-40^{\circ}\text{C}\sim+55^{\circ}\text{C}$
- 運行相對濕度 Relative Humidity : 5%~95% , 不允許凝露 without condensation 。
- 海拔 Altitude : 最高工作 maximum 4000米 meters
- 允許存儲環境溫度 Allow storage temperature : $-40^{\circ}\text{C}\sim+85^{\circ}\text{C}$
- 允許存儲相對濕度 Allow storage of relative humidity:5%~95% , 不允許凝露without condensation

4. 產品性能說明 Product performance description

4.1 鹽霧 salt fog :

電機及其控制器按GB/T2423.17規定試驗48h後，恢復（1~2）h，電機及控制器通電測試，能正常工作

After the motor and its controller are tested for 48h according to GB/T2423.17, recover (1~2)h, the motor and controller are energized and tested, and can work normally.

4.2 防水、防塵 Waterproof and dustproof

應滿足GB/T 4942.1-2006和GB 4208-2008規定的IP67或更高等級的防護要求

Should meet the protection of IP67 or higher specified in GB/T 4942.1-2006 and GB 4208-2008

4.3 耐電壓 Withstand voltage

動力端子與外殼、動力端子與信號端子之間應能耐受GB/T 18488.1-2015所規定的試驗電壓；信號端子與外殼之間應能承受3000V的工頻耐電壓試驗；耐電壓試驗持續時間為1min，無擊穿現象，漏電流限值符合產品技術檔要求，不高於10mA.

The power terminal and the outer casing, the power terminal and the signal terminal should be able to withstand the test voltage specified in GB/T 18488.1-2015;The signal terminal and the casing should withstand 3000V withstand voltage test under power frequency;Withstand voltage test duration of 1min, no breakdown phenomenon, leakage current limit meets the requirements of product technical documents, not higher than 10mA.

4.4 絕緣 Insulation

動力端子與外殼、信號端子與外殼、動力端子與信號端子之間冷態絕緣均應不小於1MΩ; 動力端子與外殼、信號端子與外殼、動力端子與信號端子之間絕緣電阻穩態 $\geq 20\text{M}\Omega$

The cold insulation between the power terminal and the outer casing, the signal terminal and the outer casing, the power terminal and the signal terminal shall be not less than 1MΩ; the insulation resistance between the power terminal and the outer casing, the signal terminal and the outer casing, the power terminal and the signal terminal is $\geq 20\text{M}\Omega$.

4.5 振動 vibration

電機控制器應能經受“Z”方向上8h的1.2mm,10~25Hz; 30m/s², 25~500Hz; 對於“X”和“Y”方向，振幅和加速度可以除以2。掃頻振動後，零部件應無損壞，緊固件應無松脫現象，能正常工作。

The motor controller shall be capable of withstanding 1.2 mm, 10 to 25 Hz, 30 m/s², 25 to 500 Hz for 8 h in the "Z" direction; for the "X" and "Y" directions, the amplitude and acceleration may be divided by 2. After sweeping vibration, the parts should be free from damage, and the fasteners should be free from looseness and work properly.



4.6 電磁相容要求 Electromagnetic compatibility requirements :

電磁相容性符合GB/T 18655-2010

Electromagnetic compatibility conform to GB/T 18655-2010

具體要求為 Specific requirements are:

1. 傳導騷擾 GB/T6113.102-2008 無線電騷擾抗擾度測量設備和測量方法規範和，第1-2部分。

Conducted disturbances GB/T6113.102-2008 Specification for radio disturbance and immunity measuring equipment and measuring methods, part 1-2

2. 輻射騷擾 GB/T6113.104-2008 無線電騷擾和抗擾度測量設備和測量方法規範，第1-4部分。

Radiated disturbances GB/T6113.104-2008 Specification for radio disturbance and immunity measuring equipment and measuring methods, part 1-4

3. 輻射騷擾 GB/T6113.203-2008 無線電騷擾和抗擾度測量設備和測量方法規範，第2-3部分

Radiated harassment GB/T6113.203-2008 Specification for radio disturbance and immunity measuring equipment and measuring methods, part 2-3

4.7 產品低壓介面 Product low-voltage interface

	插針號 Pin number	用戶端介面定義 User side definition	控制器側定義 Controller side definition	備註 Remark
控制線束介面 X1 (整車側端子型號： AMP770680-1 整車側端子插針 Control harness interface X1 (The vehicle side terminal model:	1	VIN+	油泵氣泵供電電源（油泵 24V+&X3，氣泵 24V+&X3&RA Power supply for oil pump and gas pump (oil pump 24V+&X3, gas pump 24V+&X3&RA)	DCAC 供電電源 DCAC Power supply
	2	VIN-	油泵氣泵供電電源 (油泵24V-&PLC，氣泵 24V-&PLC) Power supply for oil pump and gas pump (oil pump 24V-&PLC, gas pump 24V-&PLC)	
	3		DCDC 供電電源正 DCDC Power supply +	DCDC 供電電源
	4	DCDC 電源- DCDC Power -	DCDC 供電電源負 DCDC Power supply -	DCDC Power supply



AMP770680-1 Vehicle side terminal pin model: AMP770520-1)	5	氣泵使能 Gas pump enable	高電平有效 (氣泵 X1) High level active (gas pump X1)	9≤U≤36V
	6	油泵使能 oil pump enable	高電平有效 (油泵 X1) High level active (oil pump X1)	9≤U≤36V
	7	DCDC 使能 DCDC enable	高電平有效 EN High level active EN	9≤U≤36V
	8	整車 CAN H Vehicle CAN H	整車 CAN H (油泵、氣泵、DCDC 的 CANH) Vehicle CAN H (oil pump, air pump, CANH of DCDC)	120Ω終端電阻 (可選) 120Ω terminal resistance
	9	整車 CAN L Vehicle CAN L	整車 CAN L (油泵、氣泵、DCDC 的 CANL)	(optional)
			Vehicle CAN L (oil pump, air pump, CAN L of DCDC)	
	10-11	空腳 Empty	/	/
	12	調試 CANH2 Commissioning CANH2	調試 CANH (油泵 CANH2、氣泵 CANH2) Commissioning CANH (oil pump CANH2, gas pump CANH2)	120Ω終端電阻 (可選) 120Ω terminal resistance (optional)
	13	調試 CANL2 Commissioning CANL2	調試 CANH (油泵 CANL2、氣泵 CANL2) Commissioning CANH (oil pump CANL2, gas pump CANL2)	
	14	氣泵風扇控制信號 Gas pump fan control signal	氣泵 RC Gas RC	輸出為高電平，最大負載電流 1A (可選) The output is high level, the maximum load current is 1A (optional)



	15	氣泵溫度感測器 PT100+ Gas pump temperature sensor PT100+	打氣泵溫度檢測正（氣泵 PTA Gas pump temperature detection + (Gas pump PTA)	溫度檢測（可選） Temperature detection (optional)
	16	氣泵溫度感測器 PT100- Gas pump temperature sensor PT100-	打氣泵溫度檢測地（氣泵 GND4） Air pump temperature detection ground (Gas pump GND4)	
	17	油泵溫度感測器 PT100+ Oil pump temperature sensor PT100+	油泵溫度檢測正（油泵 PTA） Oil pump temperature detection + (Oil pump PTA)	溫度檢測（可選） Temperature detection (optional)
	18	油泵溫度感測器 PT100- Oil pump temperature sensor PT100-	油泵溫度檢測地（油泵 GND4 Oil pump temperature detection ground (Oil pump GND4)	
	19-23	空腳 Empty	/	/

備註 Remark：

1、X3為鑰匙信號。X3 is the key signal.

2、DC/AC及DC/DC均支援CAN及硬線控制（CAN控優先、支持（自主切換）硬線控制，具體以控制策略為準）。Both DC/AC and DC/DC support CAN and hard-wire control (CAN control priority, support (autonomous switching) hard-wire control, the specific control strategy shall prevail).

3、低電平有效（ $0 \leq U \leq 1V$ ）、高電平有效（ $9 \leq U \leq 36V$ ）。Low level is valid ($0 \leq U \leq 1V$), high level is valid ($9 \leq U \leq 36V$).

4.8 高壓介面定義 High Voltage Interface Definition

名稱 Name	型號 Model	用戶端對接端子 型號Client docking terminal model	腳位定 義 Pin definition	功能 Function	備註 Remark
高壓輸入 High Voltage Input	HVSL362022A	HVSL362062A006 I-1PCS	1	DC-DC 輸入 Input+	6mm ² 電 纜Cable
		C3100235021-2 PCS (整車側—安費 諾) (The vehicle side-Amphenol)	2	DC-DC 輸入 Input—	6mm ² 電 纜Cable
DC+	ACTB142-D-N4-Z2 OG	M8 螺栓 bolt SC25-8	1	DC-DC 輸出 output+	建議採用



DC-	/	M8 螺栓 SC25-8	2	DC-DC 輸出 output—	25mm ² 遮罩 電纜 ; Suggest use 25mm ² shielded cable;
油泵 Oil pump	HVSL633023B	HVSL633063B104I --1pcs C310003623-- 3PCS (整車側—安費 諾) (The vehicle side- Amphenol)	1	油泵控制器 U 相 Oil pump controller U phase	4mm ² 電 纜 Cable
			2	油泵控制器 V 相 Oil pump controller V phase	4mm ² 電 纜 Cable
			3	油泵控制器 W 相 Oil pump controller W phase	4mm ² 電 纜 Cable
氣泵 Gas pump	HVSL633023A	HVSL633063A104I --1pcs C310003623-- 3PCS (整車側—安費 諾) (The vehicle side- Amphenol)	1	氣泵控制器 U 相 Gas pump controller U phase	4mm ² 電 纜 Cable
			2	氣泵控制器 V 相 Gas pump controller V phase	4mm ² 電 纜 Cable
			3	氣泵控制器 W 相 Gas pump controller W phase	4mm ² 電 纜 Cable

5. RAMS 要求 RAMS Require

5.1 可用性說明 Availability statement

- 所提供的產品可靠、技術成熟、性能優良，能很好的滿足用戶需求及現場運用要求The products provided are reliable, mature in technology and excellent in performance, which can meet the needs of users and the requirements of on-site operation.

5.2 可維護性說明 Maintainability statement

- 零件盡可能在不需專用工具的條件下容易拆裝
Parts can be easily disassembled as much as possible without special tools
- 用於車輛上的零部件及模組元件均應具有良好的互換性
Parts and module components used in vehicles should have good interchangeability
- 在最大可能範圍內使設備安裝模組化並與有關要求相一致
Modularize the equipment installation and meet the relevant requirements within the maximum possible range

5.3 安全性說明 Safety instructions

5.3.1 總成必須保證在系統帶電情況下，各類人員不能接觸到高壓帶電部分



The assembly must ensure that all types of personnel are not exposed to the high voltage live parts when the system is live.

5.3.2 總成用塑膠燃燒性能符合GB/T 2408-2008標準中垂直燃燒V-0級，水準燃燒HB-移去引燃源後，材料沒有可見的有焰燃燒級別的要求

The plastic burning performance of the assembly conforms to the vertical burning V-0 level in GB/T 2408-2008 standard, and the horizontal burning HB- removes the ignition source, the material has no visible flaming burning level requirements.

6. 標識、包裝、儲運要求 Labeling, packaging, storage and transportation requirements

6.1 標識 mark

標識要求如下 Requirements on mark are as follows:

- 標識內容應包括品名、序號、型號、基本參數、出廠日期及廠家等

The content of the mark should include the product name, serial number, model number, basic parameters, date of manufacture, and manufacturer.

- 如果部件屬於高壓部分，應具有明顯觸電危險的安全標識

If the part belongs to high pressure part, it should have an apparent safety sign that shows risk of electric shock.

- 所有的標識文字（廠名除外）應採用標準簡體中文

All signs (except the name of the manufacturer) shall be in standard simplified Chinese

6.2 儲運 storage and transportation

儲運要求如下 Requirements on storage and transportation as follows :

- 應提供安全可靠的儲存場地或庫房，

產品放在通風乾燥的環境內，以防止產品的損壞，防止待用或待發運的產品腐蝕，各部件應規定貨物 在庫房的接收以及發放的恰當方法

Safe and reliable storage site or warehouse should be provided. The products should be placed in a ventilated and dry environment to prevent product damage and prevent corrosion of products to be used or to be shipped. Each component should specify the appropriate method for receiving and distributing the goods in the warehouse.

- 產品在運輸過程中，不應有劇烈振動、撞擊和倒放

The product should not be subjected to severe vibration, impact and rearrangement during transportation.

- 產品應能適應海運、空運條件；在海運或空運時，應進行密封包裝和其他防護措施，以免造成不必要的損壞 The product should be able to adapt to sea and air transportation conditions; when shipping or air, it should be sealed and other protective measures to avoid unnecessary damage.

7. 環保要求 Environmental requirements

甲、 不使用燃燒後產生有毒氣體的材料，如使用“低煙無鹵”電纜

Do not use materials that produce toxic gases after combustion, such as using “low-smoke halogen-free” cables.

乙、必須採取措施盡可能有效降低設備的噪音 Measures must be taken to reduce the noise of the equipment as effectively as possible

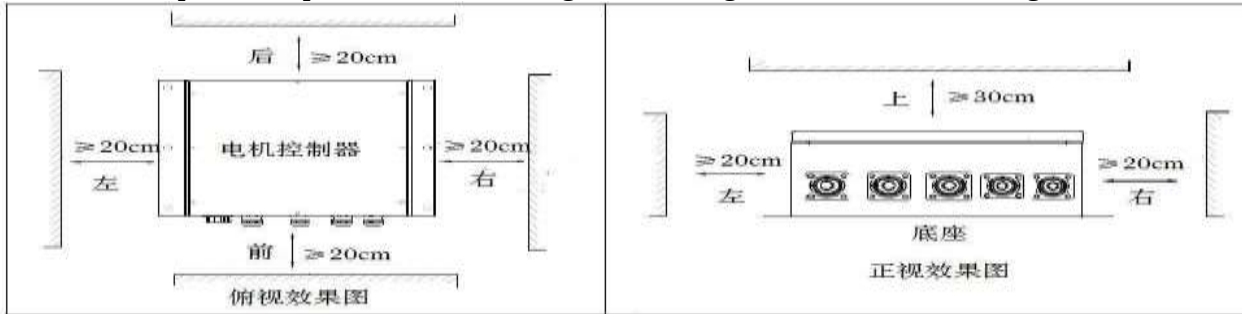
8. 安裝要求 Installation requirements

8.1 控制器需水準安裝在阻燃支架上

The controller needs to be installed horizontally on the flame retardant bracket



8.2 控制器前、後、左、右至少保留20cm的空間（在有電氣線束連接時不包含連接器佔用空間），上方應保留30cm以上的空間；務必保證維護時緊固螺栓的操作空間
Keep at least 20cm of space in front of the controller, rear, left and right of the controller(the connector does not contain space when there is an electrical harness connection), and the space above 30cm should be reserved above; the operation space of the fastening bolts during maintenance must be guaranteed.



8.3 電氣線束走向應自然整齊，強弱電務必分離，切勿將信號線與動力線並排佈局，且各連接線束易於辨識和拆裝

The direction of the electric harness should be natural and tidy, and the strong and weak electricity must be separated. Do not arrange the signal line and the power line side by side, and the connecting harness is easy to identify and disassemble.

8.4 固定時請用螺栓配彈墊固定與阻燃支架上，並請增加減震墊，整機接地標識務必有效接地，低壓信號線束需做有效遮罩。

When fixing, please use bolts and elastic pads to fix them on the flame retardant bracket. And please add a shock-absorbing pad. The grounding mark of the whole machine must be effectively grounded, and the low-voltage signal wiring harness must be effectively shielded.

附圖：外形圖 2D

表3 用户说明

名称	规格或型号	客户端对插规格或型号	供应商
直流输入	HVSL362022A	HVSL362062A0061 (插针: C3100235021)	安费诺
油泵	HVSL630227B	HVSL6306280061 (插针: C310003623)	安费诺
气泵	HVSL63023A	HVSL633063A0061 (插针: C310003623)	安费诺
DC/DC输出+	ACTB142-0-22	M8铜鼻子	康耐特
低压控制线	AMP776228-1	AMP770680-1 (插针: AMP770520-1)	AMP
水管	外径Φ25mm	选型内径为Φ25的水管	/

表1 整机信息

机型	重量 (KG)	整机外形尺寸	包装尺寸
V6-H-40S, 5G&V6-H-40S, 5G-L7	13.5	290*362*166	465*380*290

表2 水道信息

要求进水量 > 10L/min, 进水温度 < 65℃				额定流量 (L/min)	额定压力 (MPa)	额定尺寸 (mm)	一般公差	深圳市安费诺科技股份有限公司 SHENZHEN ANFEI TECHNOLOGY CO., LTD.				材料	表面处理	单位	数量	备注
要求进水量 > 10L/min, 进水温度 < 65℃				8	10	12	15	20	8	10	12	15	20	mm	1	
				5.3	7.9	12.2	19.2	33.7	8	10	12	15	20	mm	1	
				5.3	7.9	12.2	19.2	33.7	8	10	12	15	20	mm	1	