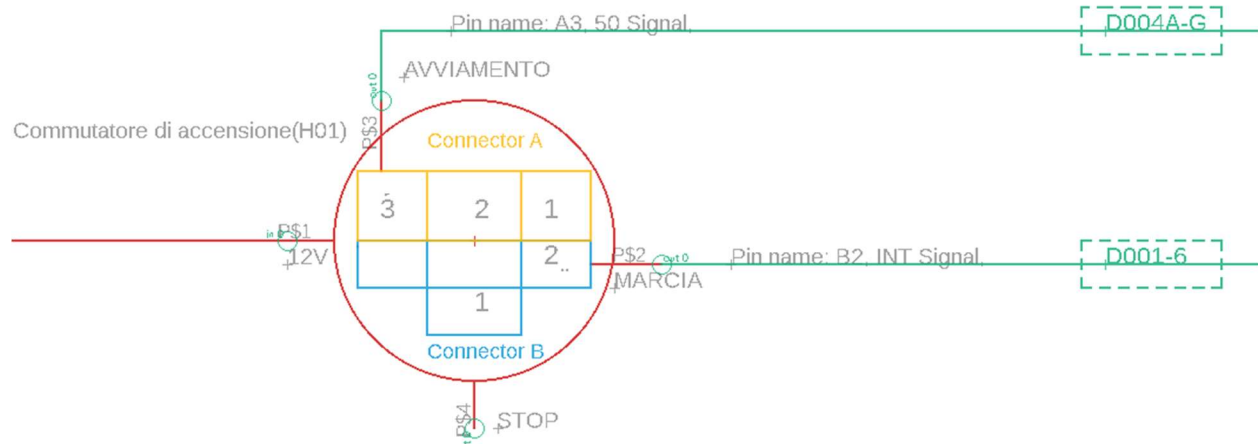


# ELECTRICAL SCHEMATIC VERSION\_4.3 REPORT

This is the Version\_4.3 report of Electrical Schematic. The difference from previous versions is that in this version, the Alpha Inverter is used and for that new Battery Pack AUG 144V 117Ah NCM is used and the complete Electrical Schematic is presented on a single sheet and complete PCB schematic in 2<sup>nd</sup> sheet. Component names and pins are done according to original manual. And also, connectors used to connect with Powerbox, PCB and intermediate connectors are also shown in the schematic. Legends used for Schematic are defined on top of sheet.

### Key Block:



The Key Block (Commutatore di accensione H01) has 5 terminals and 2 connectors i.e Connector A and B. Pin A3 with Signal ID 50 is used for Key Crank( Avviamento) and intermediate connector D004A-G used and Pin B2 with Signal ID INT is used for KEY ON(Marcia) and intermediate connector D001-6 used for it. The intermediate connector where the signals are intercepted from the original cabling to the PowerBox are explained in the following document;

<https://www.dropbox.com/s/9hq10423fb2lmra/20210927%20EVERGRIN%20-%20Vehicle%20-%20Impianto%20Elettrico%20-%20Tabelle%20segnali%20V2.pdf?dl=0>

Pins are named according to original service documentation of vehicle,

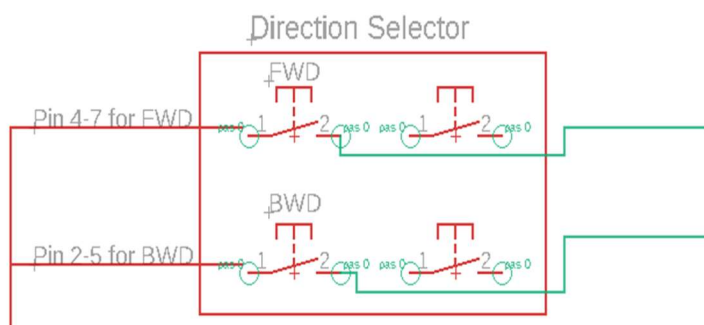
<https://www.dropbox.com/sh/sexrh0ikzz0lrsh/AACr8RVv-QU8iQzJLBGXS7e3a?dl=0>

Signals for Key Block are used according to HMI component characterization report on page 22 available as,

[https://www.dropbox.com/s/an8q4n71fw65vwx/20220518%20EVERGRIN-Vehicles-Panda169-HMI\\_characterization%20V1.1.pdf?dl=0](https://www.dropbox.com/s/an8q4n71fw65vwx/20220518%20EVERGRIN-Vehicles-Panda169-HMI_characterization%20V1.1.pdf?dl=0)

P.N: 571-DRB16-60SAE-L018 and P.N: 571-DRBF-2A Connector used to connect signals to PowerBox. The male part will be mounted from inside powerbox.

## Direction Selector:



The Direction selector is the Joystick XD2PA24 and its detail is available in the [Datasheet](https://www.dropbox.com/s/an8q4n71fw65vwx/20220518%20EVERGRIN-Vehicles-Panda169-HMI_characterization%20V1.1.pdf?dl=0). It has 4 NO switches. Out of the 8 pins of direction selector, Pin 2-5 NO Switch used for Backward and Pin 4-7 NO switch used for Forward. This component is new and all connections are wired to the PowerBox pins are used according to HMI characterization report Page 19:

[https://www.dropbox.com/s/an8q4n71fw65vwx/20220518%20EVERGRIN-Vehicles-Panda169-HMI\\_characterization%20V1.1.pdf?dl=0](https://www.dropbox.com/s/an8q4n71fw65vwx/20220518%20EVERGRIN-Vehicles-Panda169-HMI_characterization%20V1.1.pdf?dl=0)

Also, Reverse signal of Reverse switch (I020) connection ends at VMU(M001) with connector code C – 1 according to,

<https://www.dropbox.com/s/9hq10423fb2lmra/20210927%20EVERGRIN%20-%20Vehicle%20-%20Impianto%20Elettrico%20-%20Tabelle%20segnali%20V2.pdf?dl=0%20%20>

Connector used to connect signals to PowerBox is P.N: 571-DRB16-60SAE-L018 and P.N: 571-DRBF-2A. The male part will be mounted from inside powerbox.

## Brake Switch:



The Brake pedal( Interruttore pedale freno I030) has 2 switches: one is NO and other is NC. Brake signal of Brake switch (I030) connection ends at Body computer (M001) ABS control unit (M050) with Connector Code-pin B-5 20 and intermediate connector code D097C – 1. Pin 2 and Pin 4 are used and connections done according to HMI characterization report page 9,

[https://www.dropbox.com/s/an8q4n71fw65vwx/20220518%20EVERGRIN-Vehicles-Panda169-HMI\\_characterization%20V1.1.pdf?dl=0](https://www.dropbox.com/s/an8q4n71fw65vwx/20220518%20EVERGRIN-Vehicles-Panda169-HMI_characterization%20V1.1.pdf?dl=0)

D097C-1 connector-pin is used for Brake Signal as an Intermediate connector according to,

<https://www.dropbox.com/s/9hq10423fb2lmra/20210927%20EVERGRIN%20-%20Vehicle%20-%20Impianto%20Elettrico%20-%20Tabelle%20segnali%20V2.pdf?dl=0%20%20>

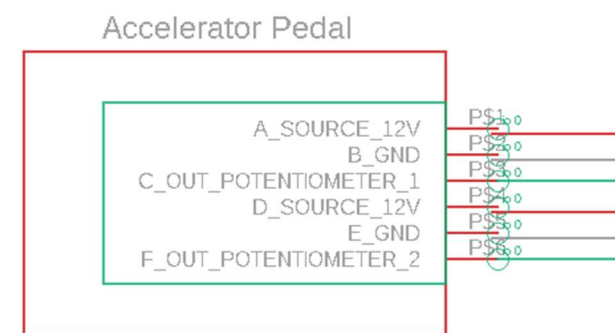
## Hand Brake:



The handbrake has component ID I040 according to Panda 169 manual. Pinout is followed according to HMI characterization report page 27,

[https://www.dropbox.com/s/an8q4n71fw65vxw/20220518%20EVERGRIN-Vehicles-Panda169-HMI\\_characterization%20V1.1.pdf?dl=0](https://www.dropbox.com/s/an8q4n71fw65vxw/20220518%20EVERGRIN-Vehicles-Panda169-HMI_characterization%20V1.1.pdf?dl=0)

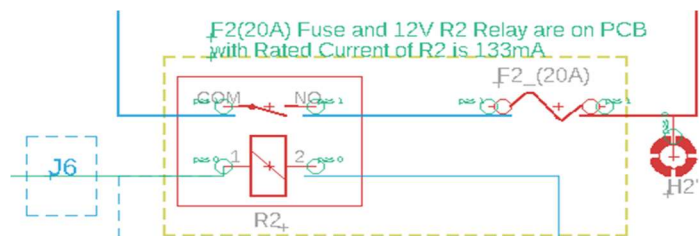
## Accelerator Pedal:



Accelerator Pedal is supplied 12V from a stable voltage source (VMU). There are 6 pins and numbering of pins from top to bottom is done according to workshop manual. The Pinout for schematic followed according to the HMI characterization report Page 3,

[https://www.dropbox.com/s/an8q4n71fw65vxw/20220518%20EVERGRIN-Vehicles-Panda169-HMI\\_characterization%20V1.1.pdf?dl=0](https://www.dropbox.com/s/an8q4n71fw65vxw/20220518%20EVERGRIN-Vehicles-Panda169-HMI_characterization%20V1.1.pdf?dl=0)

## Vacuum Pump:



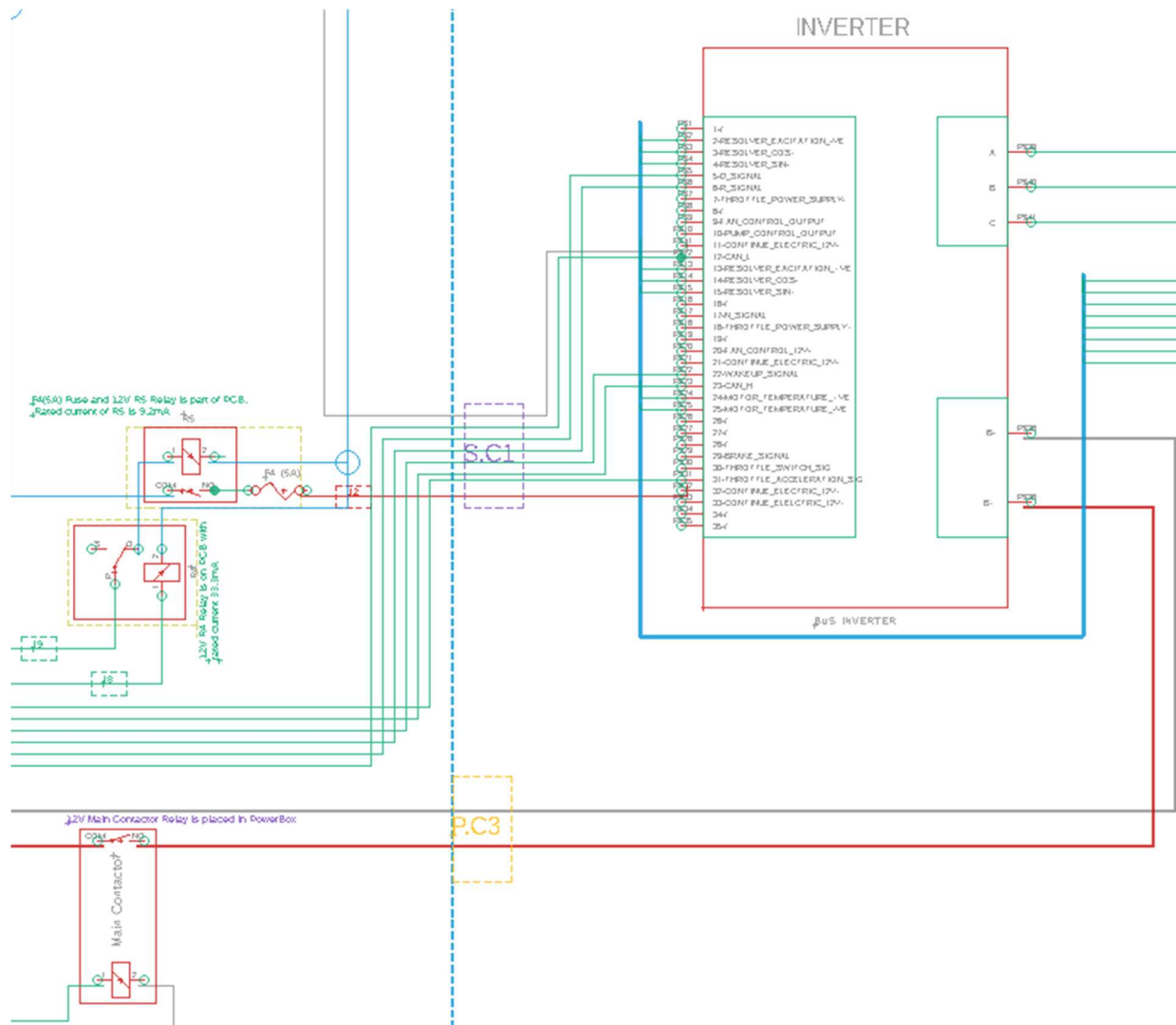
Vacuum Pump is controlled by VMU through VAC\_PWR signal and R2 relay of PCB is used. J6 2 pin PCB Signal connector P.N: 87427-0242 fixed on PCB. And P.N: 39-01-2020 to connect from other side to

connect signal to VMU. H2 mounting hole used to supply to Vacuum pump. This is done according to the technical specifications report page 11 SW009 specification,

[https://www.dropbox.com/home/Attivit%C3%A0/Retrofit%20Kit/Integration/Extended%20V-Cycle/V2/2.0%20Technical%20Specifications?preview=20220524+-+EVERGRIN+-+RetrofitKit+-+Integration+-+Panda+G2\\_Technical\\_specifications\\_V2.1.pdf](https://www.dropbox.com/home/Attivit%C3%A0/Retrofit%20Kit/Integration/Extended%20V-Cycle/V2/2.0%20Technical%20Specifications?preview=20220524+-+EVERGRIN+-+RetrofitKit+-+Integration+-+Panda+G2_Technical_specifications_V2.1.pdf)

2 pin connector P.N: 571-2103124-4 fixed on PowerBox for Vacuum Pump. And P.N 571-4-2103177-2 to connect from other side.

## Inverter:



All connections for Alpha-inverter are done according to the datasheet page 15,16 ;

<https://www.dropbox.com/home/Attivit%C3%A0/Retrofit%20Kit/Suppliers/ZHEJIANG%20ALPHA%20-%20Motor%20%26%20Inverter?preview=ACA03-SJ-CPJSSJGF-A03-40kw+motor+controller+specification+.pdf>

The Inverter is connected to the PowerBox using 35 pins Signal Connector for Inverter P.N:571-776164-4 fixed on PowerBox with P.N: 571-770520-1-CT Inverter signal connector pin. R4 and R5 relays are on PCB inside PowerBox, R4 relay is used for Interlock and R5 to supply 12V to Inverter from +12V\_Key\_ON controlled by R1 relay. J2,J8,J9 are 2 pins PCB Signal connectors P.N: 87427-0242 fixed on PCB. And P.N: 39-01-2020 to connect from other side to connect signal to VMU for Inverter\_PWR and ACCHG\_12V used for Interlock.

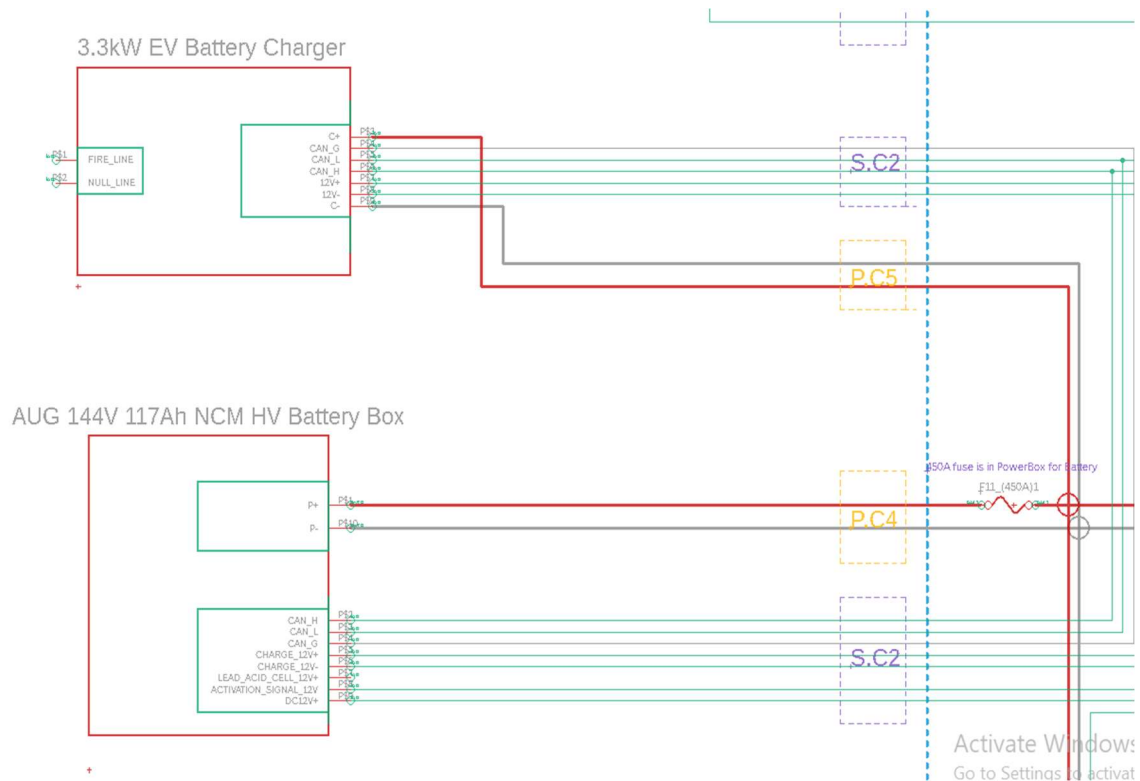
Main\_Contactor used to control high voltage supply for Inverter, is mounted inside the PowerBox according to the technical specification page 10 HW019 specification,  
[https://www.dropbox.com/home/Attivit%C3%A0/Retrofit%20Kit/Integration/Extended%20V-Cycle/V2/2.0%20Technical%20Specifications?preview=20220524+-+EVERGRIN+-+RetrofitKit+-+Integration+-+Panda+G2\\_Technical\\_specifications\\_V2.1.pdf](https://www.dropbox.com/home/Attivit%C3%A0/Retrofit%20Kit/Integration/Extended%20V-Cycle/V2/2.0%20Technical%20Specifications?preview=20220524+-+EVERGRIN+-+RetrofitKit+-+Integration+-+Panda+G2_Technical_specifications_V2.1.pdf)

Inverter connector 2 pin P.N: 829-35254402 fixed on PowerBox for high voltage connection And P.N 829-35254366 to connect from other side.

For harness installation according to datasheet, see the connector specifications,

Part Name	Connector Name	Part Side Connector		Mating Connector (wiring harness)	
		P/N	Supplier	P/N	Supplier
Motor controller assembly	Controller low-voltage signal line and vehicle	Socket 776231-1	AMP	Sheath: 771644-1 Terminal: 770520-1	AMP

## HV\_Battery and 3.3kW Charger:



All Connections for HV battery and Charger are done according to ,

[https://www.dropbox.com/home/Attivit%C3%A0/Retrofit%20Kit/Suppliers/SHENZHEN%20AUG%20ENERGY%20-%20Battery%20Pack?preview=SCHEMATIC\\_HV+battery+draft.pdf](https://www.dropbox.com/home/Attivit%C3%A0/Retrofit%20Kit/Suppliers/SHENZHEN%20AUG%20ENERGY%20-%20Battery%20Pack?preview=SCHEMATIC_HV+battery+draft.pdf)

2 pin connector P.N: 829-35254402 fixed on PowerBox and P.N 829-35254366 to connect from other side for High voltage from HV Battery. 450A fuse for battery is inside PowerBox. 3.3kW AC Charger 2 pin connector P.N: 571-2103124-4 fixed on PowerBox. And P.N 571-4-2103177-2 to connect from other side. For connecting signals to PowerBox, Signal Connector 2 is used which is 60 pins connector P.N: 571-DRB16-60SAE-L018 and P.N: 571-DRBF-2A for other side. The male part will be mounted from inside powerbox.

## InterLock:

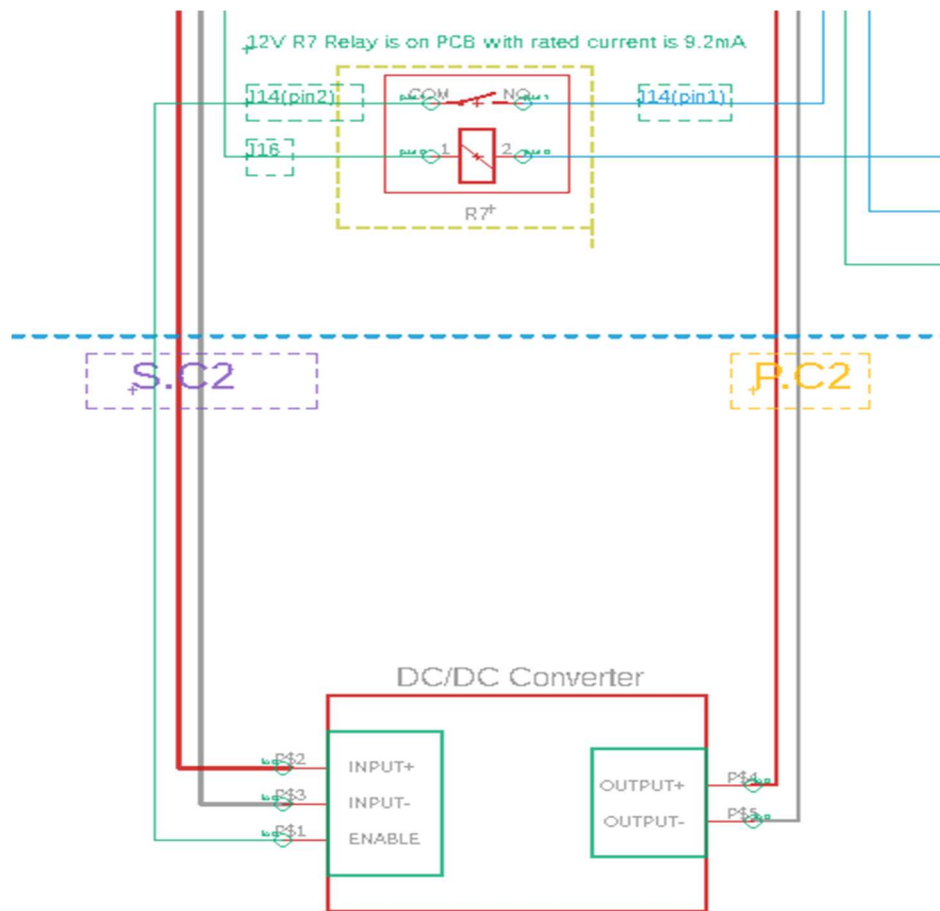
Hardware needed: R4 Relay on [PCB](#) and ACCHG\_12V signal

When ACCHG\_12V signal applied at 12V+ pin of Battery Charger, means Battery is at charging state which stops the inverter working as, R4 relay of inverter is also, attached with ACCHG\_12V signal which at the time of battery charging, stops inverter and hence, protects the inverter to run at the time of Battery

Charging. R4 relay and R5 relay are on [PCB](#). ACCHG\_12V signal of R4 controls the relay to connect Inverter to +12V\_PCB\_KeyOn. It is done according to technical specification report page 10 HW015 specification,

[https://www.dropbox.com/home/Attivit%C3%A0/Retrofit%20Kit/Integration/Extended%20V-Cycle/V2/2.0%20Technical%20Specifications?preview=20220524+-+EVERGRIN+-+RetrofitKit+-+Integration+-+Panda+G2\\_Technical\\_specifications\\_V2.1.pdf](https://www.dropbox.com/home/Attivit%C3%A0/Retrofit%20Kit/Integration/Extended%20V-Cycle/V2/2.0%20Technical%20Specifications?preview=20220524+-+EVERGRIN+-+RetrofitKit+-+Integration+-+Panda+G2_Technical_specifications_V2.1.pdf)

## DC/DC Converter:

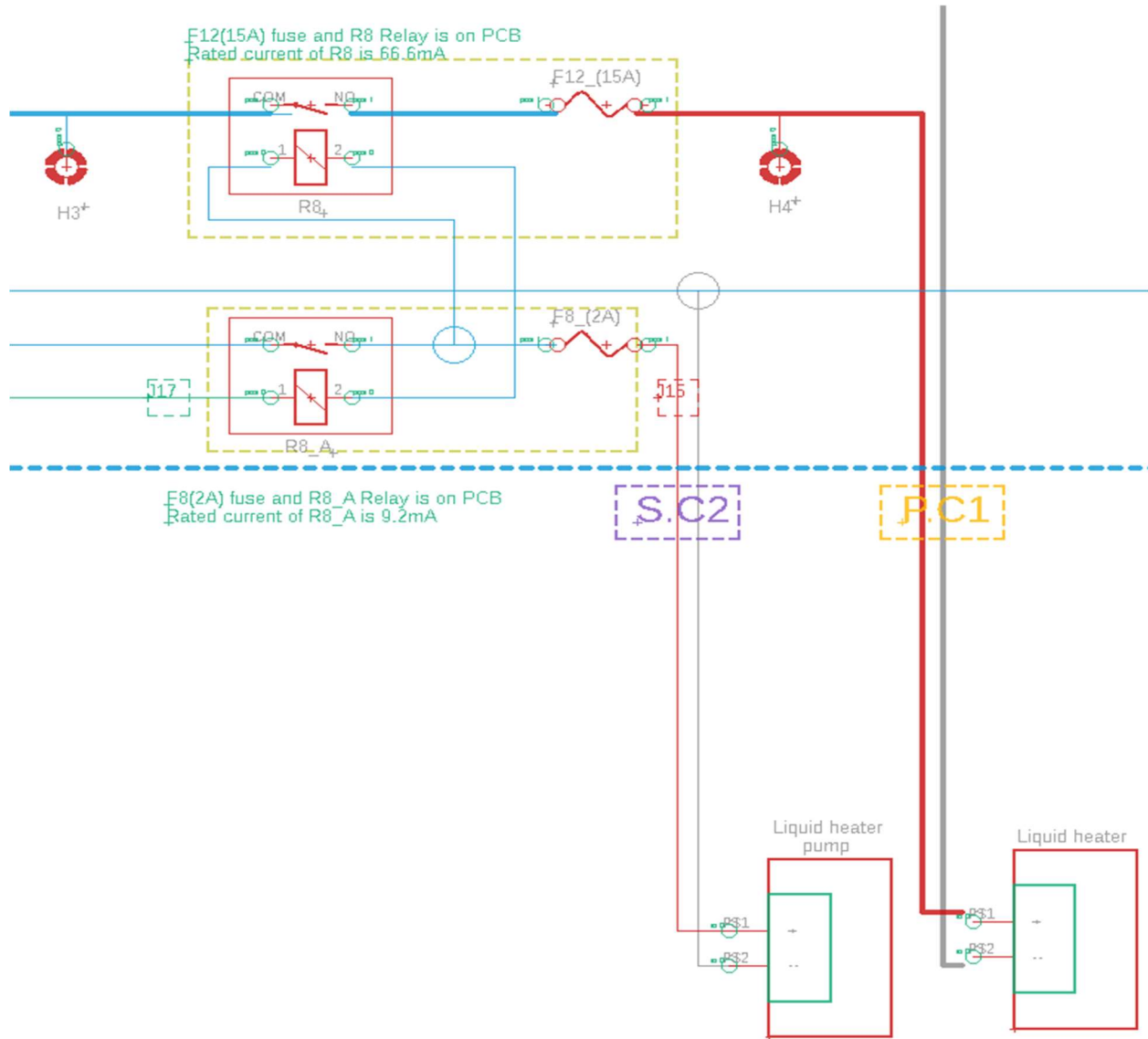


DC/DC Converter is controlled by R7 relay of PCB . J16, J14 connectors used with it. J14, J16 are 2 pins PCB Signal connectors P.N: 87427-0242 fixed on PCB. And P.N: 39-01-2020 to connect from other side. Signal Connector P.N: 571-DRB16-60SAE-L018 and P.N: 571-DRBF-2A used to connect with PowerBox. The male part will be mounted from inside powerbox. DC/DC Converter output connector 2 pin P.N: 571-2103124-4 fixed on PowerBox. And P.N 571-4-2103177-2 to connect from other side. It is done for the technical specification report page 11 SW019 specification,

[https://www.dropbox.com/home/Attivit%C3%A0/Retrofit%20Kit/Integration/Extended%20V-Cycle/V2/2.0%20Technical%20Specifications?preview=20220524+-+EVERGRIN+-+RetrofitKit+-+Integration+-+Panda+G2\\_Technical\\_specifications\\_V2.1.pdf](https://www.dropbox.com/home/Attivit%C3%A0/Retrofit%20Kit/Integration/Extended%20V-Cycle/V2/2.0%20Technical%20Specifications?preview=20220524+-+EVERGRIN+-+RetrofitKit+-+Integration+-+Panda+G2_Technical_specifications_V2.1.pdf)

Further information on DC/DC Converter is available in [Datasheet](#).

## Liquid Heater & Liquid Heater Pump:



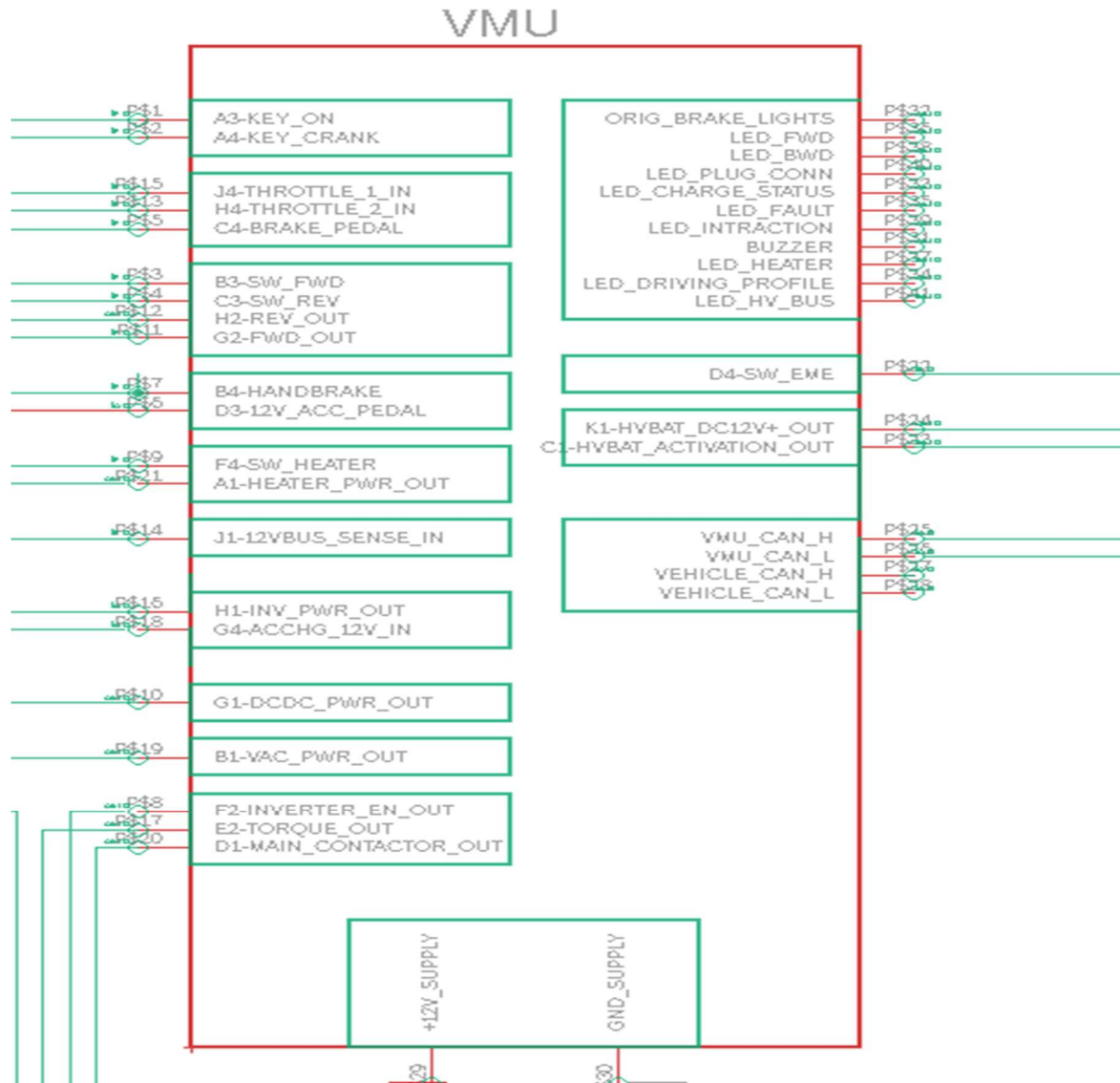
Liquid heater connector 2 pin P.N: 571-2103124-4 fixed on PowerBox. And P.N 571-4-2103177-2 to connect from other side. Signal Connector P.N: 571-DRB16-60SAE-L018 and P.N: 571-DRBF-2A used for Liquid Heater pump. The male part of connector will be mounted from inside PowerBox. Mounting hole H3 used to supply high voltage and H4 used to connect Liquid Heater. R8 and R8\_A relay of PCB used for Liquid heater and Liquid Heater Pump. J17 connector of PCB used to connect Heater\_PWR signal and J15 used to connect Liquid Heater Pump.

It is done for the technical specification report page 11 SW020 specification,

[https://www.dropbox.com/home/Attivit%C3%A0/Retrofit%20Kit/Integration/Extended%20V-Cycle/V2/2.0%20Technical%20Specifications?preview=20220524+-+EVERGRIN+-+RetrofitKit+-+Integration+-+Panda+G2\\_Technical\\_specifications\\_V2.1.pdf](https://www.dropbox.com/home/Attivit%C3%A0/Retrofit%20Kit/Integration/Extended%20V-Cycle/V2/2.0%20Technical%20Specifications?preview=20220524+-+EVERGRIN+-+RetrofitKit+-+Integration+-+Panda+G2_Technical_specifications_V2.1.pdf)

Further, Information from Supplier on Liquid Heater is available in [Datasheet](#). Information from Supplier on Liquid Heater pump is also available in [Datasheet](#).

## VMU:



VMU datasheet is available here,

<https://www.dropbox.com/home/Attivit%C3%A0/Retrofit%20Kit/Suppliers/TTControl%20-%20VMU?preview=TTControl-HY-TTC-32S-Datasheet.pdf>

Signal Connector P.N: 571-DRB16-60SAE-L018 and P.N: 571-DRBF-2A used for VMU. The male part of connector will be mounted from inside powerbox. Also, connect HY-TTC30 to the connector interface board with the provided 1-1 cabling harness according to VMU Manual page 7 as,

[https://www.dropbox.com/home/Attivit%C3%A0/Retrofit%20Kit/Suppliers/TTControl%20-%20VMU?preview=HY-TTC\\_30\\_Family\\_Quick\\_Start\\_Guide\\_V1.1.1.pdf](https://www.dropbox.com/home/Attivit%C3%A0/Retrofit%20Kit/Suppliers/TTControl%20-%20VMU?preview=HY-TTC_30_Family_Quick_Start_Guide_V1.1.1.pdf)

Indicators and buttons are added in VMU schematic just for the purpose of representation using the technical specifications page 10, in the HW\_specs as,

[https://www.dropbox.com/home/Attivit%C3%A0/Retrofit%20Kit/Integration/Extended%20V-Cycle/V2/2.0%20Technical%20Specifications?preview=20220524+-+EVERGRIN+-+RetrofitKit+-+Integration+-++Panda+G2\\_Technical\\_specifications\\_V2.1.pdf](https://www.dropbox.com/home/Attivit%C3%A0/Retrofit%20Kit/Integration/Extended%20V-Cycle/V2/2.0%20Technical%20Specifications?preview=20220524+-+EVERGRIN+-+RetrofitKit+-+Integration+-++Panda+G2_Technical_specifications_V2.1.pdf)

But, pins for VMU are not assigned yet, as current version of VMU doesn't have enough available pins.