ELECTRICAL SCHEMATIC VERSION\_3 REPORT

This is the Version\_3 report of Electrical Schematic. The difference between Version\_2 and Version\_3 is that in 3rd version, from VMU we sent Enable signal for one of the Input and Analog Torque signal to Throttle Input of Inverter to meet requirements to unlock CAN network control of Inverter.

**Diagram, schematic

Description automatically generatedSheet1:**

R6 12V relay with 9.2mA rated current used to enable charging. When the signal from VMU at ACCHG\_EN\_OUT/6.2B applied at the coil of relay, relay enables Battery charger for charging. At 12V+ pin 10 of Battery Charger, ACCHG\_12V/2.1D signal when applied means Battery is at charging state which stops the inverter working as, R4 relay of inverter with 33.3mA rated current is also, attached with ACCHG\_12V/6.2B signal which at the time of battery charging, stops inverter. Battery charger +- terminals are connected to HV Battery Box for charging. HV Battery Box +- terminals are also connected to High voltage terminals B- and B+ of Inverter and to the Inputs of DC/DC converter. The other pins of High voltage HV battery Box like, Wake\_On for enabling purpose, CAN\_H,CAN\_L etc are connected to VMU through BUS\_HV\_Battery to control HV Battery.

Diagram, schematic

Description automatically generated**Sheet2:**

SME Inverter is used in this schematic. R5 12V relay with 9.2mA rated current and R4 12V relay with 33.3mA rated current are parts of PCB. Coil of R4 is attached to ACCHG\_12V/6.2B and NC of relay is connected to the Inverter\_PWR/6.2C which is further connected to the coil of R5 relay. So, these connections stops working of Inverter at the time of Charging of battery and continue supplying 12V\_IN\_AUX pin of Inverter when Inverter\_PWR/6.2C signal applied at R4 from VMU. Then, Can\_L and CAN\_H pins of Inverter connected to CAN network. Inverter\_Enable/6.2C is connected to one of the Input of Inverter, from VMU we sent Enable signal for the Input and Analog Torque signal to Throttle Input of Inverter to meet requirements to unlock CAN network control of Inverter. Then, U,V,W are 3- phase output terminals connect to motor. B- and B+ are for Inverter’s high voltage connections to HV battery controlled by Main Contactor relay whose coil is connected to Main\_contactor\_output pin of Inverter to control connection to HV battery. And according to inverter’s standard configuration, Encoder\_1\_sin, 12V\_out, Encoder\_1\_cos, motor\_thermal\_probe pins of inverter connects to Motor through Bus\_Inverter.

**Diagram, schematic

Description automatically generatedSheet3:**

Direction switches connects to FWD/6.2B and REV/6.2B to apply signal to Forward and Reverse pin of VMU. Similarly, Brake pedal connected to DECEL/6.2B of VMU. +12V is given for FWD, REV and Brake from Accelerator pedal. And same +12V\_PCB\_KEYON/5.2C is applied for 12V\_In\_Aux of inverter through R5. And to Liquid heater pump to control Liquid heater R8 relay coil. Analog signal\_1&2 from accelerator pedal goes to Throttle\_1&2 of VMU to inform VMU about how much pedal is pressed.

Output of DC/DC converter gives 12V which is further connected to 12V battery and +12V\_PCB/6.1B for VMU to apply +12V at SW\_Heater pin of VMU.

Diagram, schematic

Description automatically generated**Sheet4:**

High voltage from HV\_Battery is applied at the inputs of DC/DC Converter to convert to 12V which will be provided to 12V pin of Ignition Lock(Key) etc. R7 12V relay with 9.2mA rated current is part of PCB. At the coil of this relay DCDC\_PWR/6.2C signal when applied from VMU, enable pin applies High voltage at enable signal to do DC/DC Conversion.

Diagram, schematic

Description automatically generated**Sheet5:**

F12(15A) and F8(2A) fuses, R8\_A and R8 12V relays are parts of PCB. Rated current of R8 is 66.6mA and of R8\_A is 9.2mA. When Heater\_PWR/6.2B signal is applied from VMU to the coil of R8\_A, the +12v \_PCB\_KeyOn/3.5C connects which goes to Liquid heater pump and also, it goes to the coil of R8 which connects the Liquid Heater to high voltage supply.

**Diagram, schematic

Description automatically generatedSheet6:**

On the VMU, Key\_On and Key\_Crank connected to On and Crank and +12V applied from battery. Throttle\_1\_In & Throttle\_2\_In used to get analog signal from Accelerator pedal informing about, how much pedal pressed. Decel\_In, FWD,REV signals applied for Forward, reverse direction switches and brakes. ACCHG\_12V signal is used at the time of Battery Charging, stops the inverter from working by turning off the relay. SW\_Heater and 12V bus\_sense\_In are connected to +12V\_PCB/3.6A. Heater\_PWR is output type which turns on the coil of R8\_A relay and controls the +12V\_PCB\_KeyOn/3.5C connection to Liquid Heater pump and also, this controls the further R8 relay which, when the signal at the coil applied, connects the high voltage to Liquid heater. Inverter\_PWR, DC/DC\_PWR, VAC\_PWR signals controls the relays used for inverter, DC/DC convertor and Vacuum pump. And from VMU we sent Enable signal for one of the Input and Analog Torque signal to Throttle Input of Inverter to meet requirements to unlock CAN network control of Inverter. +12V\_PCB supply and 12V\_GND\_PCB for VMU applied from PCB.

R3 12V relay is part of PCB with rated current 9.2mA. When HVBat\_PWR\_Out signal applied at coil of relay, it sends 12V for HV battery box. HVBat\_WKON\_Out, HVBat\_WKCHG\_Out etc applied to HV Battery box through Bus HV\_battery according to configuration for enabling battery and fault checking in case of any issue. Then Can\_L and Can\_H used for Can Network.

Diagram, timeline

Description automatically generated**Sheet7:**

In this sheet, F1(30A), F2(20A) fuses and R1,R2,R2\_C 12 V relays are parts of the PCB. With R1,R2 rated currents are 133mA and rated current of R2\_C is 9.2mA. When signal from Key\_On applied at coil of R1, it applies +12V\_PCB which passes through fuse to reach the Vacuum\_Pump\_+/3.4D. Relay R2’s coil is controlled by R2\_C which operates when VAC\_PWR/6.2C signal applies from VMU.

This is the report of Electrical schematic version 3 and last version will be uploaded soon.