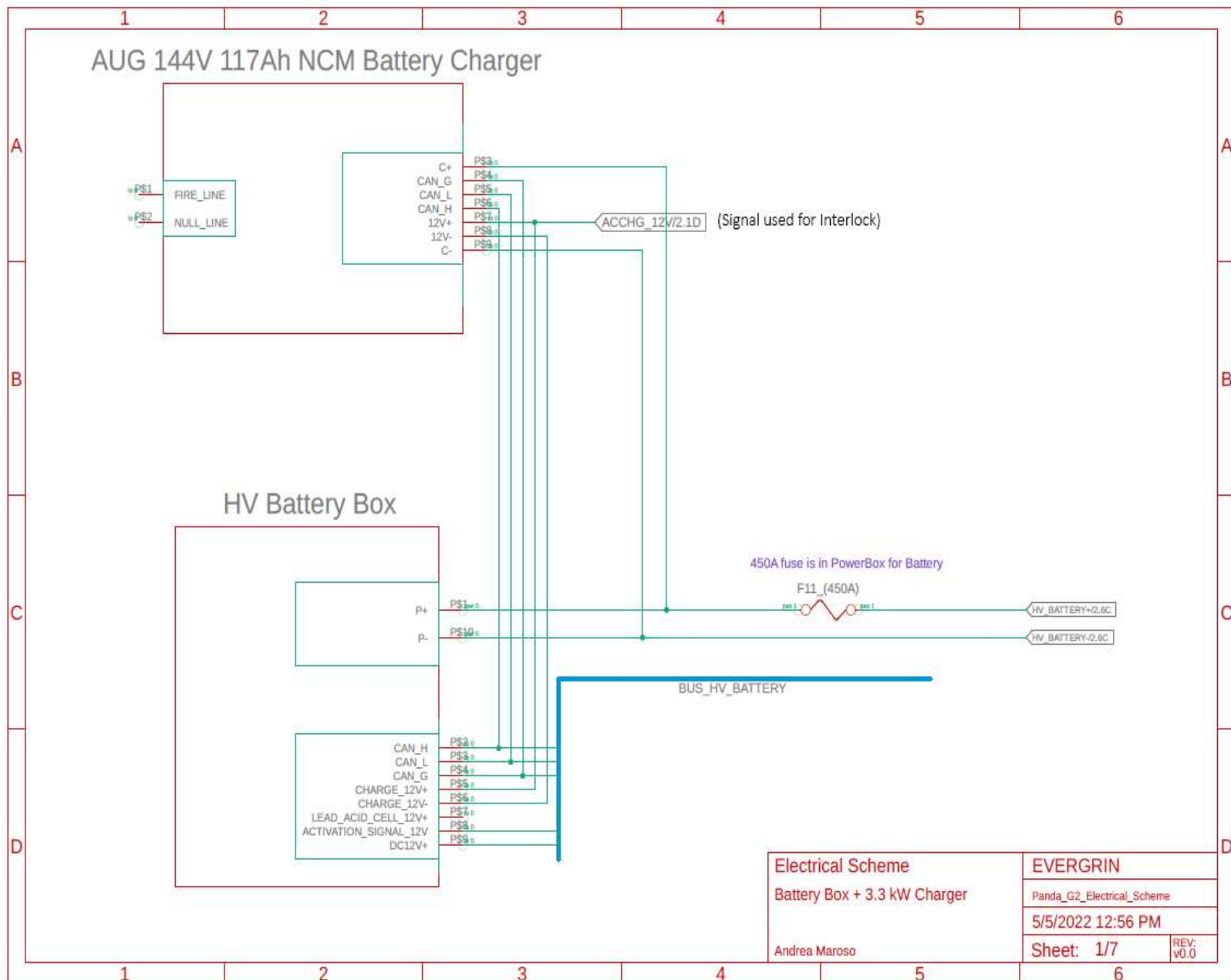


ELECTRICAL SCHEMATIC VERSION_4 REPORT

This is the Version_4 report of Electrical Schematic. The difference between Version_3 and Version_4 is that in 4th version instead of SME Inverter, the Alpha Inverter is used and for that new Battery Pack AUG 144V 117Ah NCM is used.

In the Schematic, yellow color indicates components which are on PCB, Purple colored components are in PowerBox along with all connections.

Sheet1:



According to Battery Schematic from Supplier, the pins C+, C- from Battery charger connects to P+,P- to charge battery. And 12V+,12V- from Charger connects to Charge_12V+, Charge12V- of HV battery. The

pins of High voltage HV battery Box like, Activation_Signal_12V and DC12V+ through BUS_HV_Battery connects to VMU to control Battery. CAN_H,CAN_L,Can_G connects to Can network for both charger and HV battery box. HV Battery Box terminals are also connected to High voltage terminals B- and B+ of Inverter and to the Inputs of DC/DC converter.

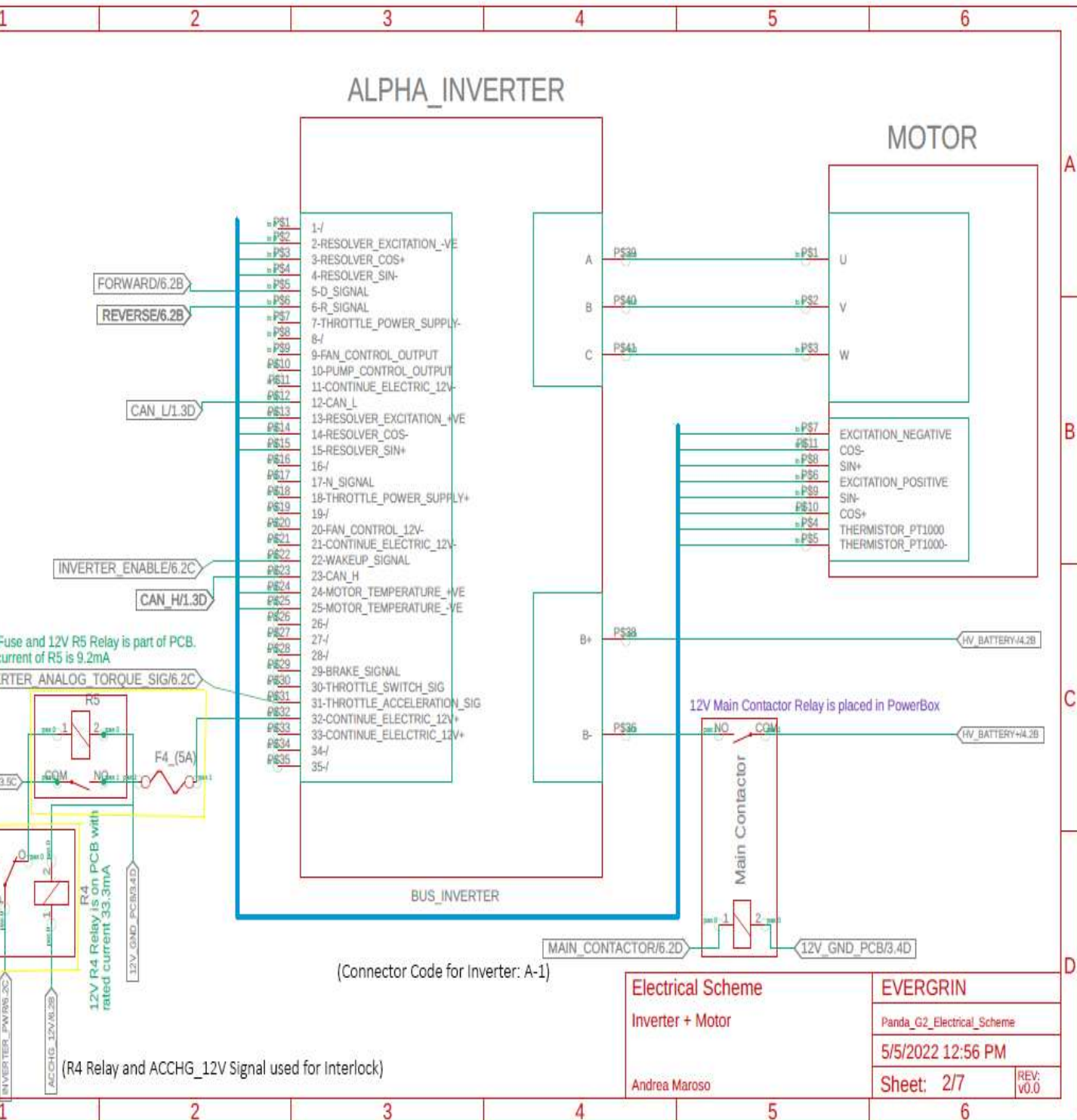
InterLock:

Software needed: No

Hardware needed: R4 Relay on [PCB](#) and ACCHG_12V signal

At 12V+ pin 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 and hence, protects the inverter to run at the time of Battery Charging. 12V R4 relay with rated current 33.3mA and 12V R5 relay with rated current 9.2mA are on [PCB](#). ACCHG_12V/2.1D signal of R4 controls the relay to connect Inverter to +12V_PCB_KeyOn.

Sheet2:

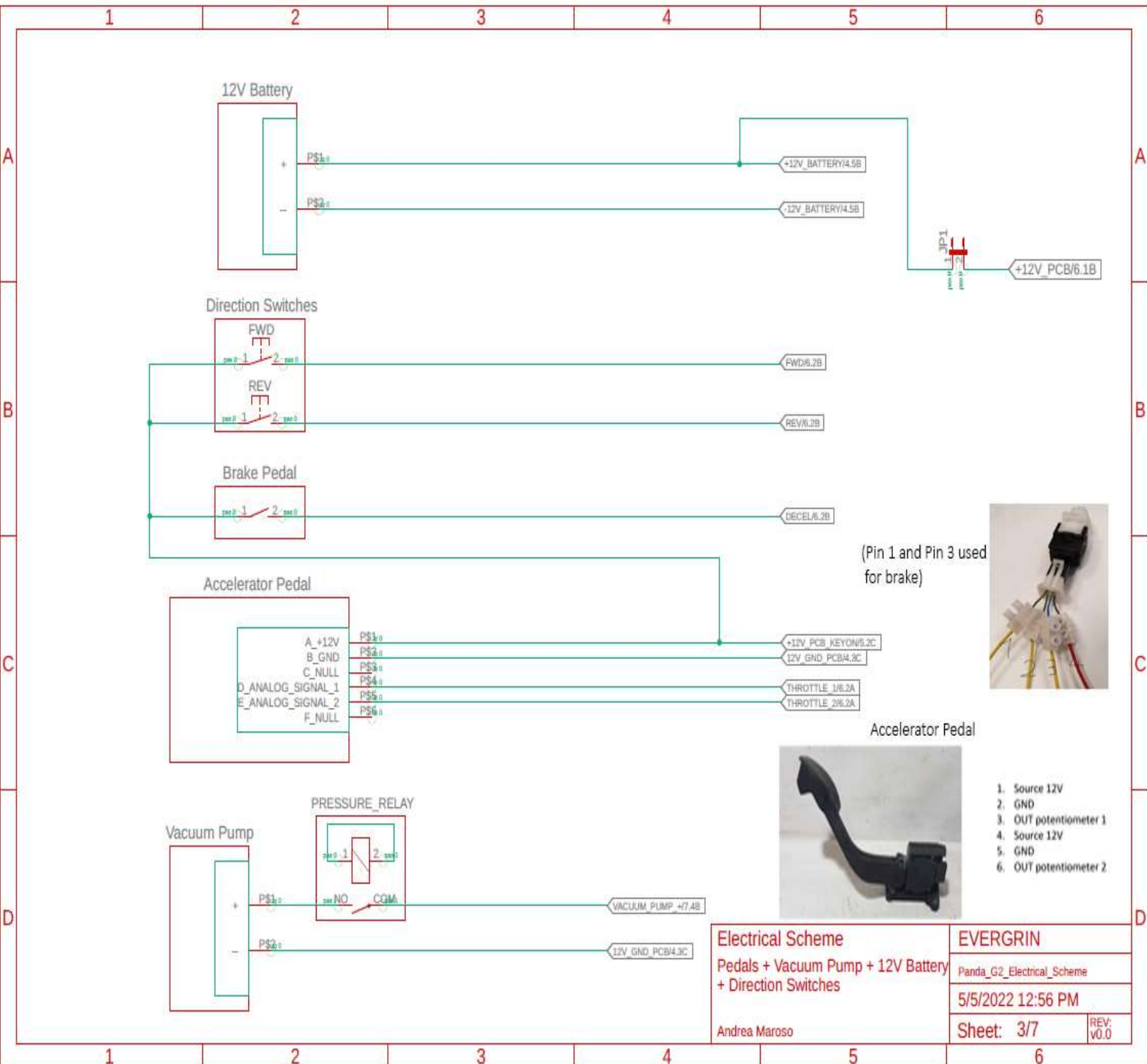


Alpha Inverter is used in this schematic. R5 12V relay with 9.2mA rated current and R4 12V relay with 33.3mA rated current are parts of [PCB](#)(sheet1). Coil of R4 is attached to ACCHG_12V/6.2B and NC of relay is connected to the Inverter_PWR/6.2C which is further connected to the coil of R5 relay. So, these

connections stops working of Inverter at the time of Charging of battery and continue supplying Continue_Electric_12V+ 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 WakeUp Signal 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, A,B,C 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 controlled by VMU. And according to inverter's standard configuration, Resolver_Excitation-ve, Resolver_Cos+ve, Resolver_Cos-ve, Resolver_Sin+ve, Resolver_Sin-ve, Resolver_Excitation+ve, Motor_Temperature+ve and Motor_Temperature-ve of Inverter connects to Motor.

Connector Code: D+ signal of Inverter (A010) with Connector A - 1 connection ends at VMU(M010) with Code C-6 and intermediate connector code-pin D004A - B

Sheet3:



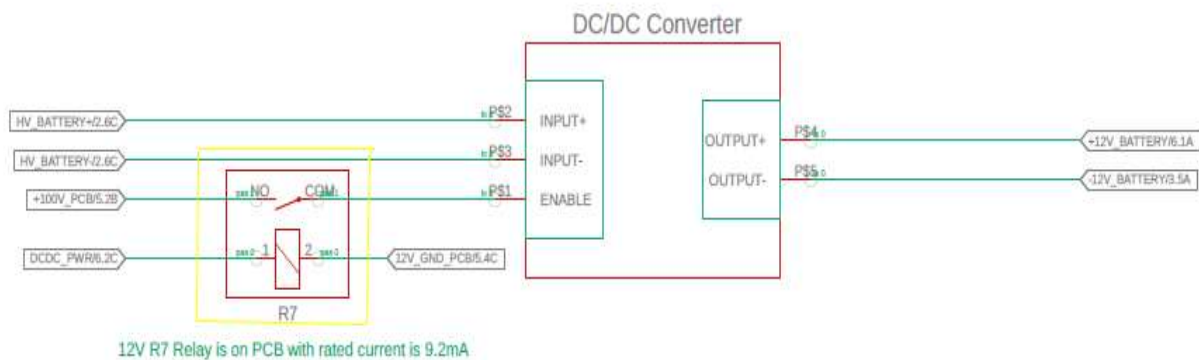
Direction switches connects to FWD/6.2B and REV/6.2B to apply signal to Forward and Reverse pin of VMU. Similarly, Brake pedal connected to DECEL/6.2B of VMU. +12V is given for FWD, REV and Brake from Accelerator pedal. And same +12V_PCB_KEYON/5.2C is applied for Continue_Electric_12V+ of inverter

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.

Connector Code: 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. Also, Reverse signal of Reverse switch (I020) connection ends at VMU(M001) with connector code C - 1

Sheet4:



Electrical Scheme
DC/DC Converter

Andrea Maroso

EVERGRIN

Panda_G2_Electrical_Scheme

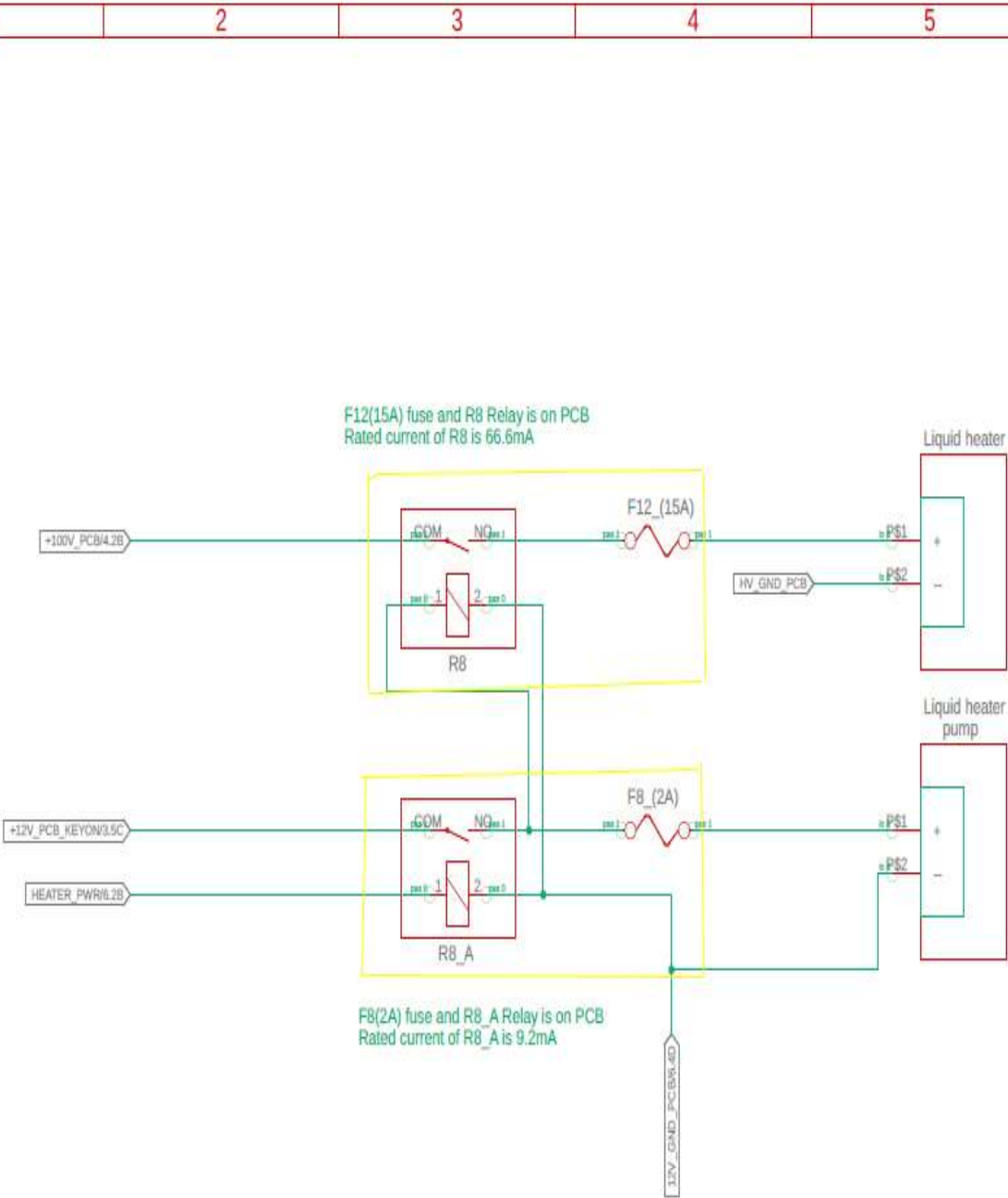
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Sheet: 4/7

REV: v0.0

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 Key Block etc. R7 12V relay with 9.2mA rated current is part of [PCB](#)(sheet2). 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.

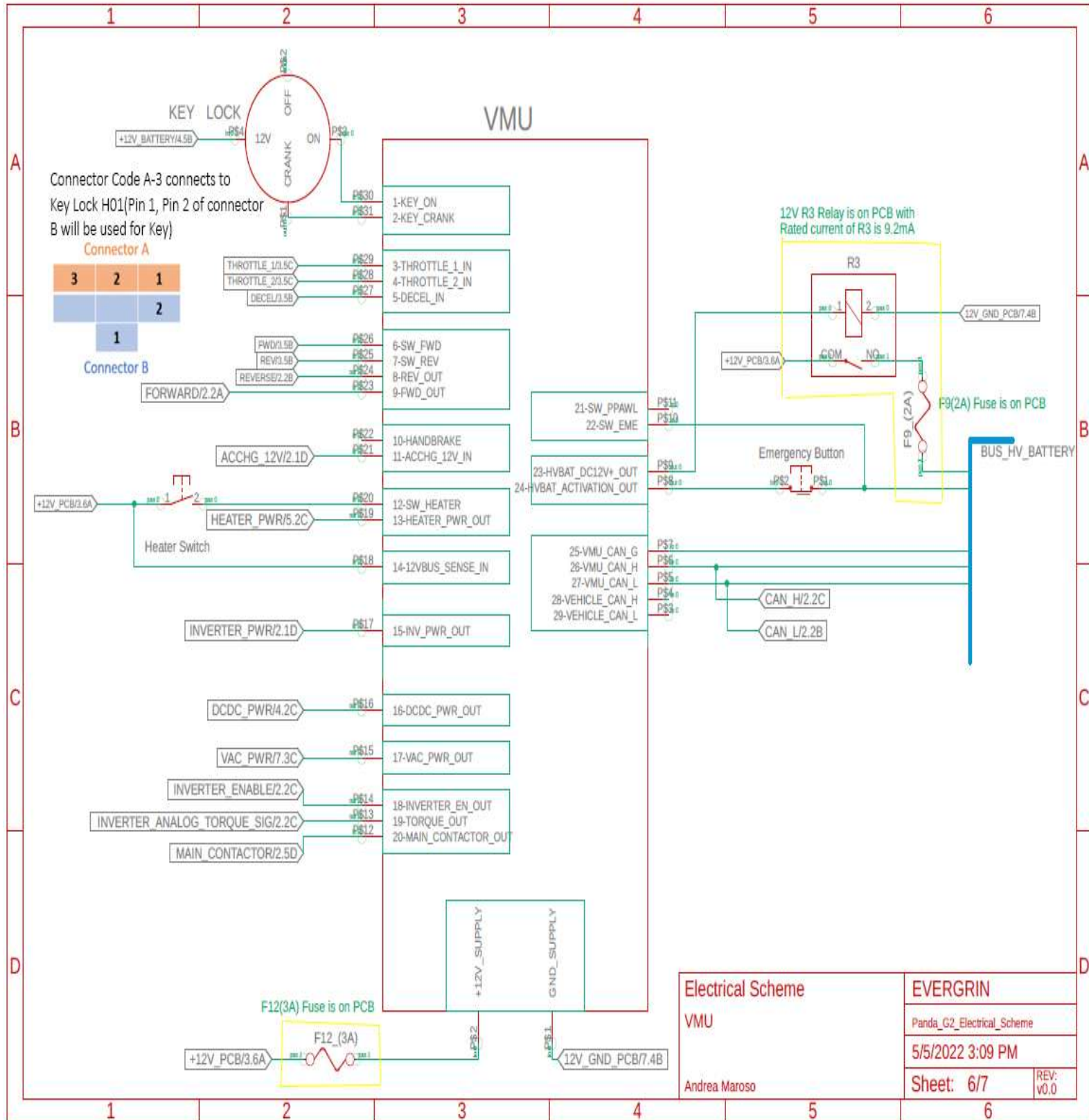
Sheet5:



Electrical Scheme Heating system Andrea Maroso	EVERGRIN
	Panda_G2_Electrical_Scheme
	5/5/2022 12:56 PM
	Sheet: 5/7
	REV: v0.0

F12(15A) and F8(2A) fuses, R8_A and R8 12V relays are parts of [PCB\(sheet2\)](#). 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.

Sheet6:



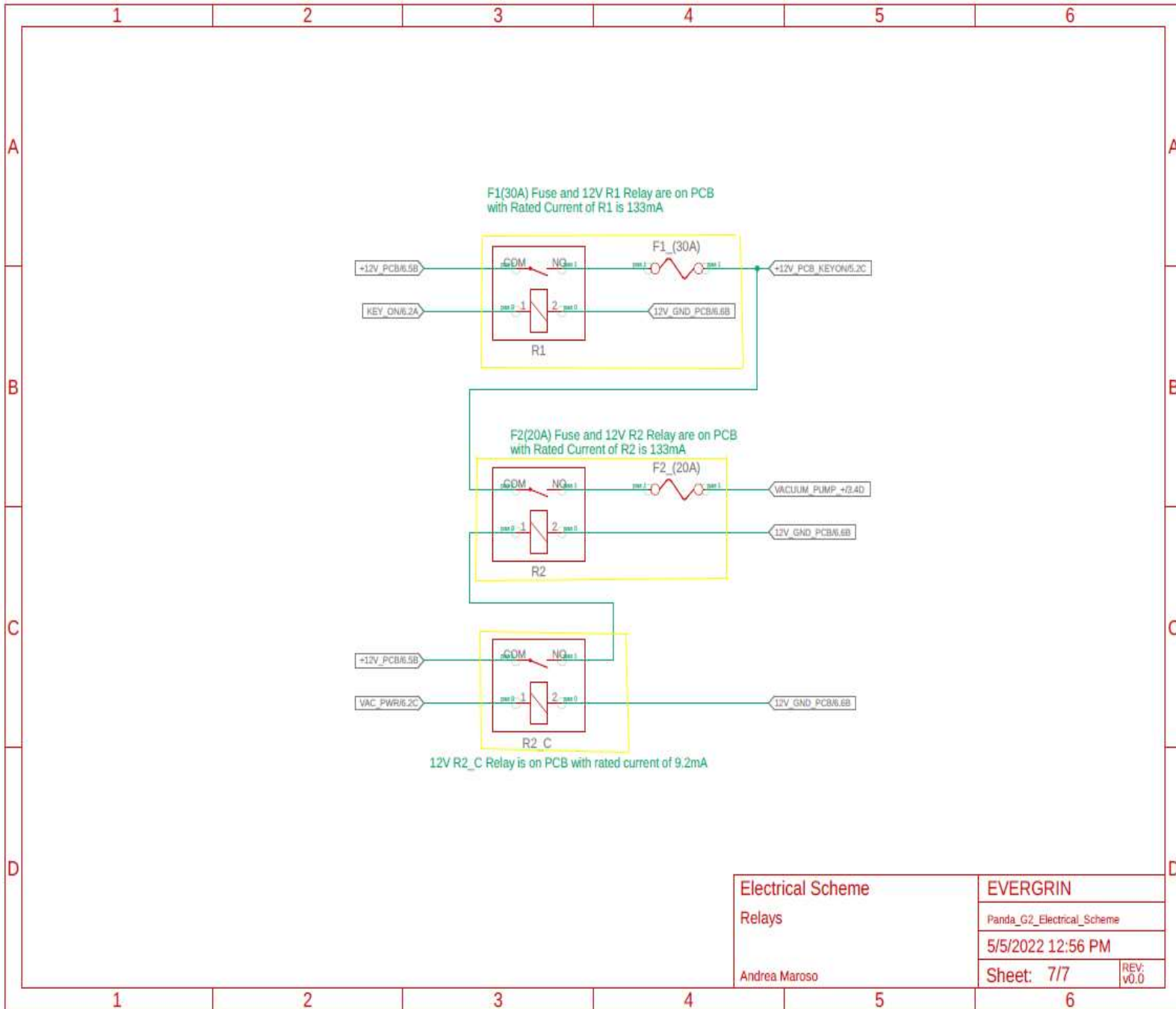
On the VMU, Key_On and Key_Crank connected to On and Crank and +12V applied from battery. Throttle_1_In & Throttle_2_In used to get analog signal from Accelerator pedal informing about, how much pedal pressed. Decel_In, FWD,REV signals applied for Forward, reverse direction switches and brakes. ACCHG_12V signal is used for Interlock 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 WakeUp 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](#)(sheet 1) with rated current 9.2mA. When HVBat_PWR_Out signal applied at coil of relay, it sends 12V for HV battery box. HVBat_Activation_Out, HVBat_DC12V+_Out etc applied to HV Battery box through Bus HV_battery according to configuration for activation of battery. Then Can_G, Can_L and Can_H used for Can Network.

Connectors: Start signal of Key Lock(H01) with Connector code-pin A-3 ends at Starter motor (A020) with connector code-pin A-1 and intermediate connector code-pin D004A-G

Also, INT signal of Key Lock(H01) path ends at Brake pedal switch (I030) with connector code-pin 4 and intermediate connector code-pin D001 – 6.

Sheet7:



In this sheet, F1(30A), F2(20A) fuses and R1,R2,R2_C 12 V relays are parts of the [PCB](#) on sheet 1 and 3. 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.