Legend:

Electrical:

- Discrete Signal (ENABLE/DISABLE)
- CAN Communication
- HV Bus
- HV Measurement
- Isolation Monitoring
- Sensor Data Line
- Contactor Control + Feedback
- Pyrofuse Trigger + Feedback
- Heat Pump + Fluid Pump Control
- 28 VDC Supply
- Daisy-Chain
- Valve Status Indication
- High-Voltage Interlock Line
- Electrical Interface / Connector
- Current Sensor
- Solid-State Circuit Breaker (SSCB) / Contactor
- (Pyro-) Fuse
- Cell Stack + Electrical cell Contacting System (System Cell Contacting)
- Aircraft Chassis

Mechanical:

- Mechanical Interface / Mounting Point
- Mechanical Boundary
- Sub-Component Housing
- Vent
- Venting Path

Thermal:

- Cooling Fluid Pipe
- Thermal Interface
- Hydraulic Coupling

Subsystem Responsibility:

- FHS
- UPV
- AXT
- COL
- UNOTT

Out of MODABAT scope

Aircraft Ducting System

BESS Venting System

Battery Pack 1
240x1p, 187.2 kWh
600 V - 1020 V
I_discharge = 675 A
I_charge = 225 A
923 mm x 1300 mm x 737 mm
250 kWh/kg
Definition Boundary

Continuous String Discharge: 45 A
Continuous String Charge: 15 A

Battery String 15
240x1p, 12.5 kWh
600 V - 1020 V
<25 kg
Definition Boundary

Battery Module 15.2
120x1p, 6.24 kWh
300 V - 510 V
<35 kg

TR Containment

Fuse

SSCB

Pressure Valve

Temperature Sensor

Cooling Plate

Thermal Interface

8 x Cell

Cell Contacting System

BMS-Slave Supply

12 x Cell Voltage

8 x Cell Temperature

BMS-Slave 15-20

Gas Sensor 2

Gas Sensor 1

BMS-Slave 11-14

Contactor

Battery Module 15.1
120x1p, 6.24 kWh
300 V - 510 V
<35 kg

BMS-Slave 5-10

BMS-Slave 1-5

Battery String 1
240x1p, 12.5 kWh
600 V - 1020 V
<25 kg
Definition Boundary

Battery Module 1.2
120x1p, 6.24 kWh
300 V - 510 V
<35 kg

Battery Module 1.1
120x1p, 6.24 kWh
300 V - 510 V
<35 kg

Daisy-Chain

SSCB/Contactor Control + Feedback

HV Measurement

CAN

I Sense

T Sense

Valve Status

28 VDC Supply

BMS-Master String 15

BMS-Master String 1

15 parallel cooling lines

BTMS

Distribution Unit / Manifold

Temperature Sensor

Pressure Sensor

Pump

Filter

Heat Pump

Heat Exchanger

Flow Sensor

Fluid Level Sensor

Coolant Reservoir

BTMS Control Unit

Pressure Sense

Fluid Level Sense

Internal T Sense

Flow Sense

Heat Pump + Pump control

External T Sense

28 VDC Supply

CAN + Termination

ENABLE / Disable

Additional Temperature Sensors Location and Number TBD.

Continuous Pack Discharge: 672 A
Continuous Pack Charge: 225 A

Battery Energy Control System

Precharge Resistor HV+

Precharge SSCB HV+

Note:
Different current limits for Charge and Discharge

Pyrofuse HV+

SSCB HV+

HV+

HV-

IMD

Current Sensor

Contactor HV-

Maintenance Interlock (LID BECU)

R_{iso} Sense

Contactor and SSCB Control + Feedback

BECS IL

HV IL

HV Measurement

Pyrofuse Trigger + Feedback

I Sense

EWS

28 VDC Supply

CAN + Termination

Discrete Signal I/O

Out of MODABAT development scope

Load

Discrete Signal from Avionics Control / FADEC

CAN communication to Avionics Control / FADEC

xxx VDC (TBD)

DC

AC

115 V AC Power Distribution

Contactor + Feedback

Fuse (Passive)

28 PDU Control Unit

28V Power Distribution

+28 VDC

28 V DC Aircraft LV Power Net

115 V AC Aircraft Mid Level Voltage Power Net

Aircraft Chassis