PRODUCT / MODEL NUMBER	AFB2
DOCUMENT TITLE	Installation and Operation Manual, DC Battery
DOCUMENT NUMBER	SPC00138
DOCUMENT LIFECYCLE	ISSUED
REVISION	004
TOTAL # of PAGES	27

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1.0 Introduction

The Avalon AFB2 Vanadium Flow Battery is an integrated energy storage system designed for power and energy management. The AFB2 is comprised of Avalon's vanadium flow battery, electrical and controls system that provide a DC Battery source for DC coupled, grid interactive or microgrid energy provision and management.

Figure 1 – AFB2 Vanadium Flow Battery.

1.1 Abbreviations

AC	Alternating current
AHJ	Authority having jurisdiction
AWG	American wire gauge
BMC	Battery management controller
BMS	Battery management software
DC	Direct current
EMS	Energy management system
HVDC	High voltage direct current
NEC	National Electrical Code
NFPA	National Fire Protection Association
NPT	National pipe taper
PC	Personal computer
PCS	Power conversion system
PE	Protective earth
PPE	Personal protective equipment
PSU	Power supply unit
SDS	Safety data sheet
SOC	State of charge

1.2 Product Specifications

Battery Specifications

Model	AFB2.10	AFB2.5
Energy Storage Capacity, Rated	30 kWh	
Continuous DC Power, Max	11 kW	5.5 kW
DC Power, Rated	10.5 kW	5.25 kW
Energy Storage Duration, Nominal	3 hours	6 hours
Energy Storage Ampacity, Nominal	55 Ah	
Operating Voltage, Nominal	550 DC V	
Energy Storage Capacity, Annual Degradation[1]	< 0.5% per year	
Battery Energy Efficiency, Round-Trip (DC)	> 75%	
Energy Efficiency, Annual Degradation[1]	< 0.1% per year	
Discharge Voltage Range	440 to 600 DC V	
Charge Voltage Range	500 to 600 DC V	
Continuous Discharge / Charge Current, Rated	20 DC A	10 DC A
Internal Fuse Rating	30 DC A	15 DC A

Physical

Battery Dimensions (L x W x H), not including Power Converter	1.77 m x 1.07 m x 1.79 m [69.7” x 42.3” x 70.4”]
Mass (flooded)	3000 kg [6600 lbs]
Electrolyte Volume, Nominal	1460 L

Environmental

Ambient Operating Temperature Range	–5 to 45°C
Extended Ambient Operating Temperature Range, with Optional Cold Weather Kit	–25 to 45°C
Storage Temperature Range	–25 to 50°C
Cooling	Integrated, forced air

Certification / Standard Compliance

Safety	UL 1973[2]

[1] On the basis of 130 full depth-of-discharge cycles per year
[2] Pending

1.3 Description

Avalon's AFB2 is a direct current (DC) energy storage system composed of components that comprise two key functions: the battery function which provides electrochemical energy storage and the electrical and controls function that responds to external power requests and provides the requested DC power.

1.3.1 Battery Function

Housed within the enclosure of the system are all components of the battery, including the cell stack(s), electrolyte processing system, electrolyte storage (including the electrolyte) and the thermal management system. Integrated as part of the enclosure is a secondary containment vessel, lined with an electrolyte-resistant coating to prevent electrolyte from escaping the system in event of any internal leak.

These components are accessed behind the removable plastic front Avalon cover and the internal metal access panel. Given the presence of potential hazards within the battery enclosure, only authorized personnel should ever access the inside of the battery enclosure.

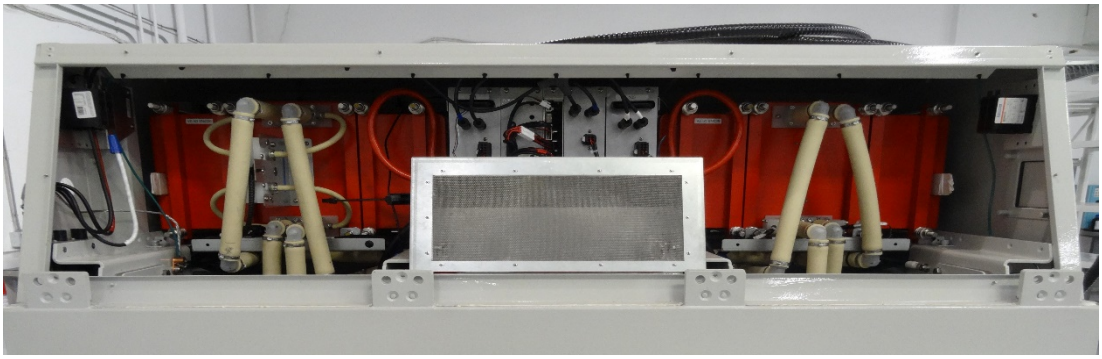


Figure 2 – Inside view of AFB2 battery compartment.

1.3.2 Electrical and Controls Function

Within the battery enclosure and located between the two stacks is a panel frame that houses the electrical and controls components. This panel frame houses two bi-directional DC-DC converters, the battery's power supply unit (PSU) and the battery management controller (BMC).

Given the presence of high voltage components within the enclosure, only authorized personnel should ever touch or service these components.

Figure 3 – Internal view of electrical components.

2.0 Important Safety Instructions

	SAVE THESE INSTRUCTIONS! This manual contains important instructions related to the installation, operation and maintenance of Avalon Battery's AFB2. This manual should be retained throughout the life of the product. Product failures or decreases in performance resulting from an act in contravention of the operation manual shall be excluded from the product warranty.

	Hazard voltages are present within the AFB2. Installation and maintenance should only be conducted by qualified personnel familiar with this manual and with proper precautions in place.

	Hazardous voltages can remain on the battery even when fully disconnected. Proper precautions MUST be taken to avoid direct contact with HV & LV DC components AT ALL TIMES. A service event that requires potential exposure to one more DC components, shall only be undertaken by specially-training personnel with proper PPE.

 	Electrolyte is corrosive and acutely toxic. Avoid all contact with skin and eyes. When working with or conducting a procedure that results in potential exposure to electrolyte, all necessary personal protective equipment must be worn. This includes safety glasses, sleeves, gloves, lab coat or apron and may include boots and respirator.

	During the course of charging and discharging or in a fault condition, flammable gases can be generated within the battery. Gas ventilation system must be properly installed where required. All necessary precautions MUST be taken when attempting to service within the battery or electrolyte tanks, this includes: • personal flammability meters to safe gas levels – do not access or continue service if gas concentration above 25% LFL • proper ventilation and purging • non-sparking tools

The following precautions shall be followed at all times:

- Installation shall conform to federal, state and local regulations regarding hazardous material.
- All personnel (installers, operators, etc.) that may come into contact with electrolyte must be trained and have read and are familiar with the safety data sheet (SDS) for electrolyte. Electrolyte SDS can be found in appendix of all manuals.
- All wiring connections to system shall be compatible with specifications identified in this document and completed in accordance with local codes and NFPA 70 (NEC).
- Electrical grounding shall be in accordance with code requirements & NFPA 70 (NEC).
- External electrical systems must be operated within the stated voltage, current and power limitation as stated on the product specs. The system is intended to be installed with a field installed Manual DC Disconnect.
- The system shall not be connected to any electrical equipment that is not explicitly called out in the manual or sales agreement. This includes installations or connections that in any way deviate from the procedures and connections explicitly allowed in the manual.
- System shall only be operated in accordance with this manual.
- The system shall not be operated outside of the stated environmental conditions.
- Air flow path shall be unrestricted, ensuring sufficient air flow to the system.
- The battery shall not be operated with any external enclosure panels removed. The enclosure panels protect against rain, dust and debris ingress, electric shock and electrolyte egress in the unlikely event of a leak.
- No person shall attempt to service, modify or alter the product (including software) in a way not explicitly allowed by this installation and operation manual or the service manual.
- Only authorized personnel should attempt to service the system. Personnel should be familiar with all product documentation prior to conducting service.
- Do not bypass or make any changes to plumbing or any electrical connections.
- Use extreme care when servicing the unit with tools to avoid accidental shorts.
- In the event of an electrolyte leak the system should be powered down via the DC disconnect. If uncontained, i.e. outside of secondary containment, measures must be taken to control and contain leak. Refer to site specific emergency response instructions completed in accordance with local, state and federal regulations.
- The system is not intended to be installed in a marine environment.
- Systems intended for outdoor use shall be mounted on a non-combustible surface, such as a concrete pad, that extends a minimum of 91.4cm (3ft) on all sides.

3.0 Internal Protections

The AFB2 includes primary self-protection functions described in the following sections. These functions are embedded with the battery internal hardware and protects the battery from mis-operation and potential damage.

3.1 Over-Current / High Voltage DC (HVDC) Fuse

A fuse is located at the first connection point to the battery on the positive wiring to act as over-current protection on the high-voltage line. This is a replaceable midget-style fuse.

Voltage Rating	Min. 600 DC V
Size	10 x 38 mm
Type	Fast-blow
Current Rating	30 A (AFB2.10) 15 A (AFB2.5)
Examples	Littlefuse SPF030 / SPF015 Mersen HP10T30 / HP10T15

Figure 4 – Fuse details and location, adjacent to the landing distribution block for external HVDC wiring

3.2 Over-voltage

The AFB2 possess multiple levels of overvoltage protection, with ultimate protection integrated within the DC-DC converters.

3.3 Over-charge

Hardware protection has been built into the battery management controller (BMC) to prevent ensure over-charge.

3.4 Current Limiting Devices on Sub-components

The motor drives and fan power supplies have current limiting hardware protection built into the controller for protection in the event of shorting of the pump motor or fan power cable harness.

3.5 Secondary Containment

The AFB2 has integrated secondary containment built into the lower enclosure of the system, in the event of an internal system leak in the plumbing, stacks, or primary tanks. This containment consists of an internal coating of an elastomeric polyurethane coating on

the inside of a continuously welded steel enclosure. This coating has proven chemical resistance to continuous exposure of concentrated acids including 50% sulfuric acid. The capacity of the secondary containment (including the primary tanks), is capable of holding in excess of 130% of AFB2 electrolyte capacity. In addition, all of the plumbing, stacks, and primary containment tank are designed within the footprint of the secondary containment so any leak is designed to remain within the secondary containment.

In the event of an internal system leak (tanks, stack or plumbing), the tank level will eventually drop below the pump supply hose from the tank (nominally 5% electrolyte loss), at which point, the pumps will stop operating and a fault will be generated by the system.

4.0 Unpacking

Upon receiving the battery, the packaging shall be carefully inspected and any damage shall be noted and reported to the shipper and Avalon Battery before continuing with installation. All packaging materials shall be removed and properly disposed. All equipment shall be inspected for signs of damage. Avalon Cover panels are typically shipped on top of system and should be carefully removed and set aside until ready for installation.

If received as components, components should be unpacked carefully and inspected for any signs of damage. Personal protective equipment (PPE), including eye protection and gloves should be worn while unpacking any electrolyte containing components (e.g. cell stacks) in event of any electrolyte leakage that may have occurred during transport. If any leaked electrolyte is found, installation shall be stopped and reported to Avalon Battery.

4.1 Shock & Tilt Detectors

If installed on packaging or equipment, the state of the shock and tilt indicators should be recorded at the time of receiving the equipment from the shipper. A photo should be taken of each indicator and associated with the position of each. Any indication of excessive shock or tilt shall be immediately reported to Avalon Battery.

5.0 Handling

The AFB2 is designed to be handled with a fork lift using the pockets in the bottom of the enclosure or via an overhead crane using the lifting points shown in Figure 5.

The AFB2 is shipped in upright position and MUST remain in an upright position while being moved or handled.

5.1.1 Overhead Crane

To lift and/or move with a crane, the plastic cover panels shall be removed and attached to the roof of the unit. Lift the system by utilising four M10 hoist rings installed into the designated lifting lugs. Install four 2m (72') lifting straps at each corner to hoist the battery.

⚠	The AFB2 is designed to be lifted and handled either via the fork lift pockets at the base or via the lifting points located at the mid-point of the battery. The top of the enclosure is **NOT** rated for lifting or strapping down and **MUST NOT** be used as lifting point.

Figure 5 – Overhead lift points and example lifting arrangement.

5.1.2 Forklift

To lift and/or move with a forklift there are two jack pockets that must be used at the bottom of the enclosure. Ensure the battery is centered over the fork lift.

⚠	Never attempt to lift or jack at any point that is not the hoist hook mounts or jack pockets and always ensure lifting equipment is in good condition and sufficiently rated to carry the desired load

Figure 6 – Example of battery being handled via fork lift pockets.

5.2 Components

5.2.1 Cell Stacks

If shipped as a separate component, cell stack(s) will be shipped in a crate and designed to be moved using a fork lift or pallet jack. To minimize potential handling damage, stacks should remain on the pallet they are shipped upon while being handled. Please see the service manual for information on stack installation or exchanges.

	Flooded cell stacks weigh 120 kg each. Attempting to manually lift is NOT recommended.

5.2.2 Electrolyte

If shipped as a separate component, electrolyte will be shipped in one or more UN recognized intermediate bulk container (IBC) totes. Proper precautions and equipment should be used to handle and move the totes. Please see the Service Manual for more information on electrolyte loading

NOTE: The mass of a full 1000L tote is approximately 1400kg.

	Electrolyte is corrosive and acutely toxic. Avoid all contact with skin and eyes. When working with or conducting a procedure that results in potential exposure to electrolyte, all necessary personal protective equipment must be worn. This includes safety glasses, sleeves, gloves, lab coat or apron and may include boots and respirator.

6.0 Installation

6.1 Siting

Prior to installation, the installer must verify that planned installation is in compliance with local building and fire codes including necessary regulations related to hazardous material storage and batteries / flow batteries. This typically requires an approved permit from the authority having jurisdiction (AHJ).

Refer to table below for installation siting requirements for battery installation. Local installation requirements shall supersede these guidelines where any conflict exists. Installers shall always consult with local AHJ for applicable requirements.

Risk of physical damage	If system is in a high traffic location, physical protection (such as bollards, walls, etc.) shall be provided.
Surface load	Surface shall be capable of supporting a minimum 60 kPa weight load
Grade	Installation surface shall be level within 25 mm [1 in] per 2.44 m [8 ft]
Air flow	Installation location shall be such that air flow to front air intake and rear panel exhaust is not obstructed. In addition, hot exhaust streams from other equipment should not directed towards air intake.
Indoor installation	Indoor installations shall be in rooms with sufficient continuous ventilation to ensure hydrogen gas that may be evolved by the system shall not accumulate to beyond 25% of LFL. When continuous ventilation cannot be provided, an external vent line can be connected to the system to provide for direct ventilation. A minimum air exchange of 2 air changes per hour shall be provided to ensure proper cooling.
Service access	A minimum of 0.92 m [36 inches] unobstructed area shall be reserved in the front of the battery. Any battery with power conversion system (PCS) mounted to the side shall provide required service access as defined by PCS manufacturer or local codes.

Table 1 – Siting requirements.

6.2 Anchoring

The AFB2 is designed to be anchored to a concrete floor or pad. The design of the anchoring system shall be completed in advance and in accordance with applicable seismic

and civil requirements, per site location. In completing such design, an analysis shall be conducted by an authorized professional engineer; including confirming sufficient bolt strengths, concrete / floor bearing load, etc. Always refer to local building authority to confirm such requirements.

Anchoring of the system is designed to be done with typical floor anchors (such as Hilti® Concrete Anchors) or clamps. Anchors are to be drilled and installed after locating and placing the system.

Alternative anchoring solutions, including mounting on driven piers or piles may be considered at customer's discretion but should be reviewed and approved by Avalon before proceeding.

6.3 External Gas Vent

The system requires air flow and ventilation in all installed locations. If the system is installed in a confined space with insufficient or non-continuous ventilation or otherwise requires an external gas vent, one can be installed and connected via the gas vent on the rear panel.

	Care must be taken when routing any external gas vent lines to avoid liquid traps or other blockages from external material. Vent must also be routed away from sources of ignition or building air intakes.

6.4 Mounting the Antenna

NOTE not all batteries will be shipped with an antenna installed. This is defined by the factory configuration.

The antenna mount is shipped external to the battery in an upside-down orientation so that it does not stick above the top of the enclosure. Prior to installation of the antenna – the mounting bracket should be removed and turned around so that the antenna, when it is attached to the top of the bracket, as shown in Figure 7, sits above the highest point of the enclosure, and the bracket can be secured to the battery using the same two bolts it was shipped with.

The antenna will either ship separately or be already mounted to the bracket. If shipped separately, the antenna should be mounted to the two screw-hole placements at the top of the antenna bracket. The antenna cable should be pulled through the cable gland and the cable gland should be tightened. The BMC controller has a connection for the antenna at the back of the controller. It is important to not that the antenna cable should be routed and secured such that the lowest point of the cable is below the cable gland, reducing the possibility that water will run along the cable, into the battery enclosure.

Figure 7 – Antenna shown in shipping position (left) and in operating position (right).

If the PCS mounting bracket is also installed on the system then the antenna bracket should sit on-top of the PCS bracket and utilise the same bolts.

6.5 Access & External Cover Panels

⚠	The AFB2 must **NOT** be left unattended without the access panel installed. This is for electrolyte egress containment in the event of failure and rain/dust ingress protection.

The exterior plastic access panels (aka “Avalon Cover Panel”) is shipped and uninstalled and is to be installed when battery is left unattended. Identical panels are installed on both the front and back of the battery.

The sheet metal access panel (aka “access panel”) is the removable panel installed on the front of the battery. This panel serves many functions, including safety critical functions and must be fully installed before operating the battery. The access panel is secured via security screws to avoid tampering.

6.6 Mounting External Equipment

⚠	Do not attach components to the lower portion of the battery enclosure. The lower section of the AFB2 enclosure serves as secondary containment. This surface MUST NOT be perforated, drilled into, or damaged in any way. Any modification to the lower enclosure will void product warranty.

External equipment including inverter / PCS, DC disconnect and/or antenna may be mounted directly to the AFB2 and depending configuration ordered may already be factory mounted and installed.

In event field installation requirements mounting one or more piece of external equipment, a location to mount a bracket for the DC Disconnect and the recommended Ideal Power Converter (if required by project) is provided on the left side of the battery enclosure. There are eight M8 threaded bolt connection points (max 16mm length) provided for this purpose.

If necessary, components may be mounted on the upper portion of the enclosure. This may only be done under the written approval of Avalon Battery. Care must be taken to ensure not to penetrate into components located within the battery. Any penetrations must be sealed completely with a sufficiently weather resistance component, rated NEMA Type 3R or higher.

7.0 Equipment Wiring

7.1 Pre-install Requirements

Prior to commissioning the AFB2, local code compliant conduit should be run to the final installation location. A watertight conduit hub or cable gland, of NEMA Type 3R or higher, shall be installed in each of the knockouts in the enclosure that are used for cable passage.

Knockout Location	Trade Size	Number of Knockouts	Sheet Metal Thickness	Intended for Passage of
Left-Hand Side	1-1/4”	1	0.060” [1.5mm]	Main DC + Ground Cables
Left-Hand Side	3/4”	1	0.060” [1.5mm]	PCS Comm. cables and 24V supply
Right-Hand Side	Drilled as required	N/A	0.060” [1.5mm]	DC connections for unit 2 through 6 within string of up to (6) batteries.

Table 2 – Electrical knock-out details.

An external DC disconnect shall be installed with the battery in some jurisdictions to be able to disconnect the battery from the DC supply or load or external inverter. Disconnect must open all ungrounded conductors and must be readily available and accessible without need of special tools to access or operate. A mounting location is located external to the battery for this purpose as it is recommended that this disconnect be located near to the battery.

Figure 8 – Knockout locations on the AFB2 battery. 1-1/4” and 3/4” knockouts shown on the left, and panel allocated on the right shown in the middle for any required pass throughs, and the same panel modified to connect with additional batteries shown on the right.

7.2 Mounting the Inverter/PCS

Depending upon the battery configuration ordered, it may be required to install the inverter/PCS in the field. In such case, an inverter specific mounting bracket must be first installed on the battery, either ordered as part of a factory configuration or field installed. Refer to PCS and AC battery installation for detailed instructions on installation.

Figure 9 – PCS mounting bracket, installed.

7.3 Power / HVDC Connection

If required by configuration, main HVDC and protective earth (PE) connections to the AFB2 are made thru the distribution blocks located at the lower left side of the upper enclosure. The HVDC landing distribution block is shown in Figure 10, where the positive connection is shown passed through to the fuse of the battery.

Figure 10 – Main HVDC landing Distribution Block.

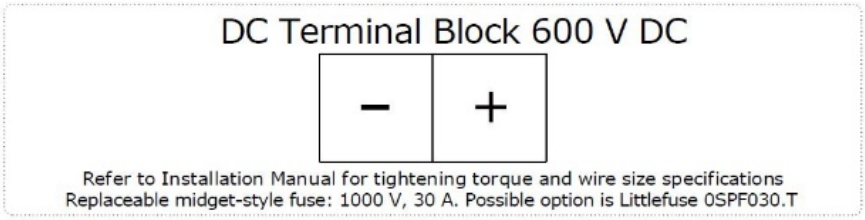


Figure 11 – Main DC connection label to system

The PE wiring is to land on the ground terminal on the stack rail, as shown in Figure 12. The PE wire is to be routed behind the stack rail, as shown in the left image of Figure 12, in order to allow the stack to be removed without having to disconnect the PE wire. These same connection points are where battery 2 through 6 will have their HVDC and ground wiring landed for multi-battery arrays of up to 6.

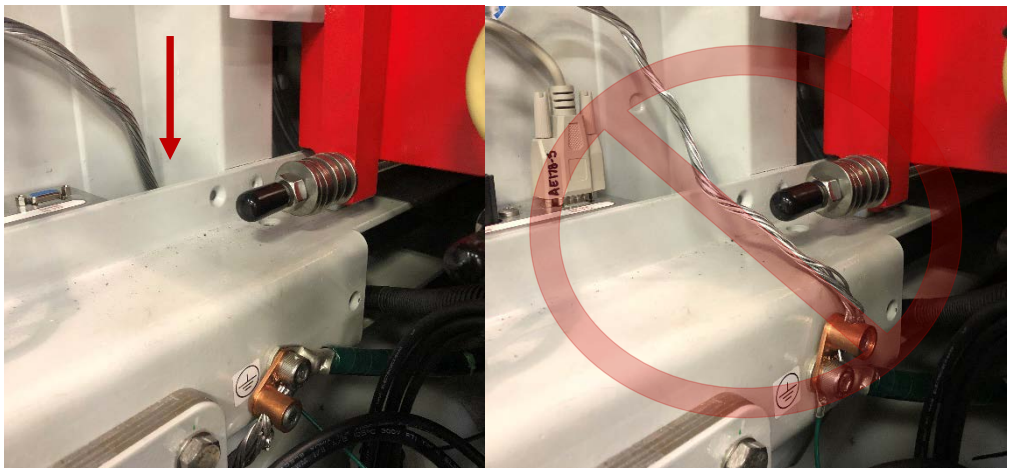


Figure 12 – Groud terminal for PE wiring. Note correct routing of PE wire is behind the stack rail (shown on left), in order to allow stack to be removed for servicing. Routing the PE wire over the stack rail (shown on right) will require removal of PE during stack servicing, posing a potential safety risk.

Wire	Cable Size	Wire Type	Torque	Tightening Tool
HVDC (+)	4 to 10 AWG	75°C, Copper	4 to 6 AWG: 45 lb-in 8 to 10 AWG: 35 lb-in	Flat head screwdriver
HVDC (-)	4 to 10 AWG	75°C, Copper	4 to 6 AWG: 35 lb-in 8 AWG: 25 lb-in 10 AWG: 20 lb-in	Flat head screwdriver
PE	8 AWG	Copper	125 lb-in	8 mm hex drive

Table 3 – DC connection wire details.

7.4 Service Bracket

The service bracket provides connection points for the following:

1. Battery enable switch; must be in enabled position to operate battery
2. PCS 24V input power supply connection; required for battery directly connected to a PCS/inverter
3. PCS RS-485 communication connection; also required for battery directly connected to a PCS/inverter
4. RS-232 service connection

Items 2 and 3 are available as a single optional connector from Avalon Battery (PN 00357).

7.5 Communication

The AFB2 has two methods of communication for external control and monitoring: Wirelessly over a Zigbee connection, or over a RS-232 wired connection.

The primary connection for control and monitoring purposes is wirelessly via Zigbee (note: this requires a Zigbee-enabled battery configuration). A service and commissioning connection is provided through a standard RS-232 D-sub 9 cable. Connection for this communication port is at the battery service access panel shown in Figure 13. Refer to Avalon Communication Specification for more details on communicating with the battery over these interfaces.

There are two examples of communication interconnections shown in Appendix B.

Figure 13 – Service bracket showing the RS-232 Communciation port connection point.

7.6 Batteries in Parallel

A battery bank is defined as one to six batteries connected to the same inverter.

Battery banks are intended to be wired in parallel via passing wires from a common landing point thru the enclosure of adjacent batteries. The benefit of this method is a reduced requirement for external conduit. The positive, negative and ground wires for batteries 2 through 6 will be sourced from the HVDC distribution block and the PE landing points from battery 1, as discussed in section 7.3. Alternatively, external conduit can be run if so desired.

A schematic of this arrangement is available in Appendices B and C.

8.0 Installation Checklist

The following items are to be inspected and checked during the installation of the AFB2.

Checklist	Section	Complete
Confirm Installation and Operation Manual was supplied and understood by installers		
Record state of shock and tilt indicators on packaging		
Remove access panel		
Confirm tank electrolyte levels are equal		
Inspect balance line for any high points more than 3cm above the flat surface of the tank.		
Inspect hose and fittings for any damage		
Confirm that the protective terminal covers on LVDC wiring at the stack and DC-DC converters		
Confirm wiring between stack and DC-DC converters are installed and properly torqued		
Check that HVDC plugs are firmly plugged into the DC-DC converters		
Confirm that HVDC wiring is installed into distribution block and fuse is properly seated		
Inspect all wiring for any foreign materials or conductive material near the terminals or wiring path, confirm no damage to installation		
Confirm continuity between grounding lug and system PE		
Battery enable switch is in ENABLE position		
Confirm Zigbee antenna is installed in the vertical position (if applicable)		
Confirm that the Electrical Safety Test & High Voltage Danger labels are installed next to the distribution block.		
Remove loose tools or debris located in the enclosure		
Install air ducting		
Install and secure access		
Install plastic Avalon cover panel		

Table 4 – Installation checklist.

9.0 Operation

The AFB2 must **NOT** be left unattended without the access panel installed. This is for electrolyte egress containment in the event of failure and rain/dust ingress protection.

For operation, the AFB2 is able to be commanded thru one of various control points. This includes a serially or Zigbee enabled PC or energy management system.

Refer to Avalon communication spec for details on what parameters and data is available via these communication ports.

9.1 Control Modes

The AFB2 possess two control modes: current source / sink and voltage source. Those modes are briefly described below but refer to detailed implementation specification for how to fully facilitate and configure the battery for optimized operation.

9.1.1 Current Mode

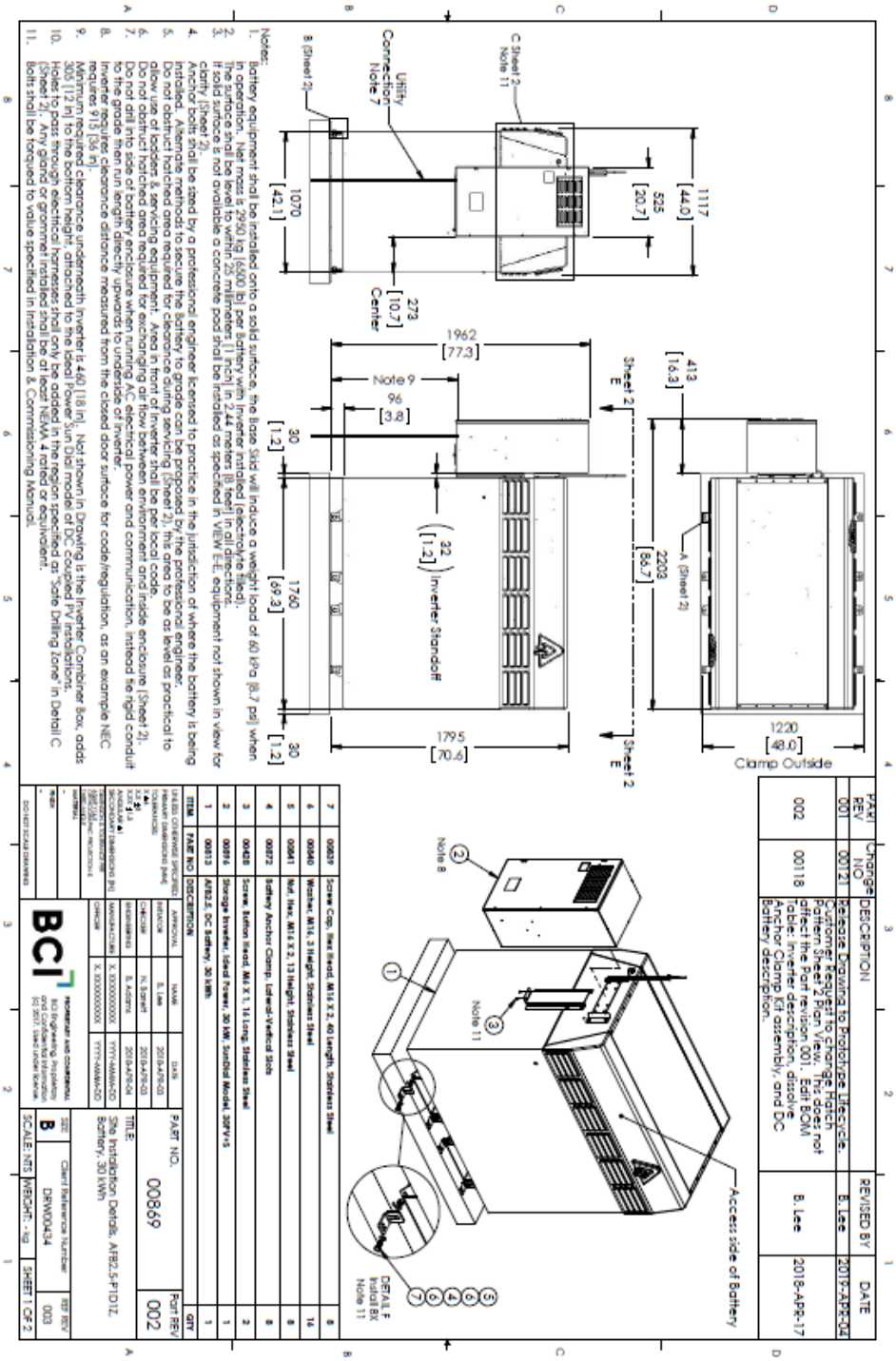
In current source mode, the battery synchronizes with the connected DC voltage, provided voltage is in accordance with specifications and can source or sink current within limits according to communicated power request. In this mode the AFB2 will actively control output to ensure target is met within present limits. In event battery cannot achieve requested set point, battery will operate at nearest acceptable power level.

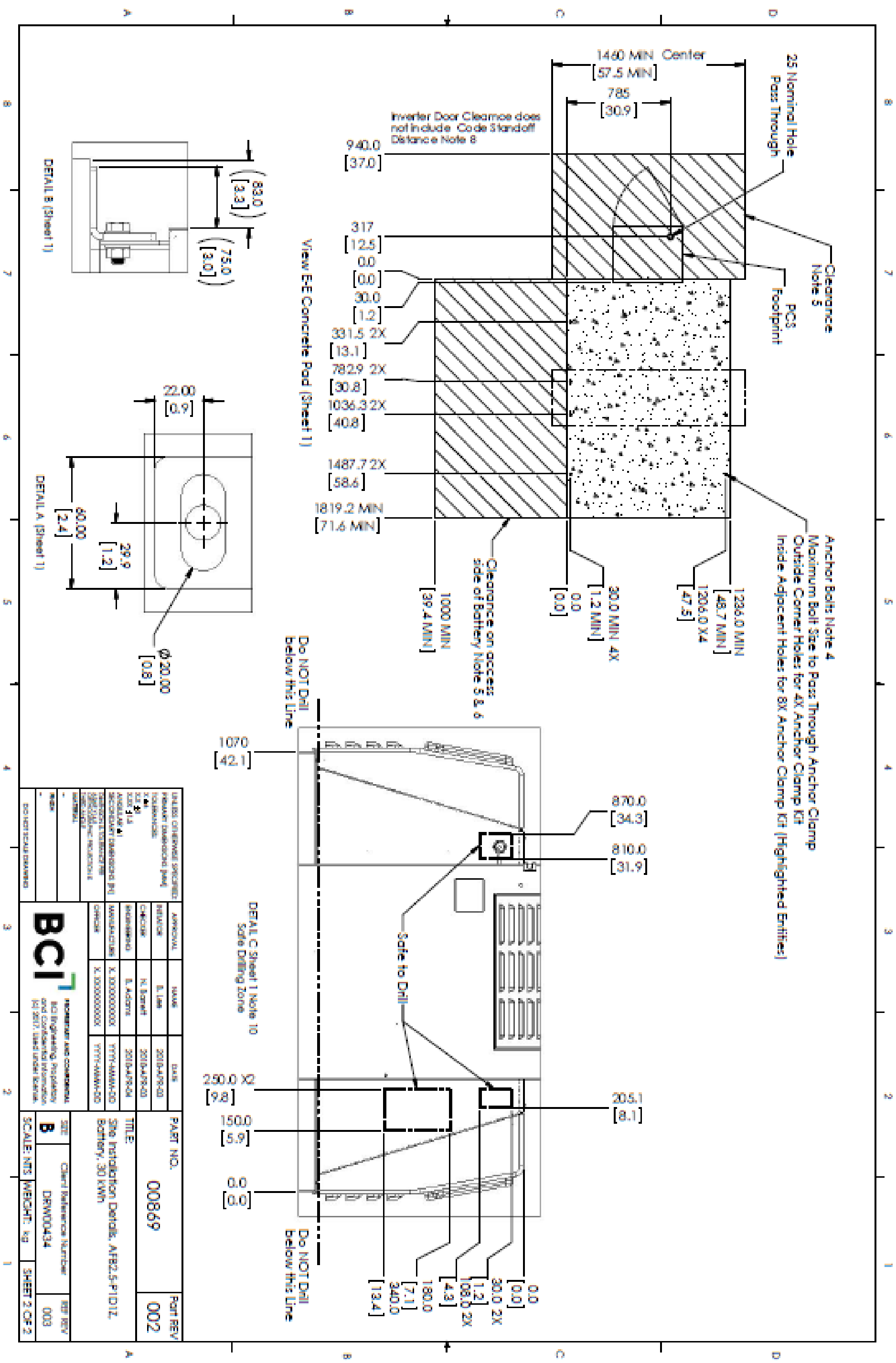
In current control mode, a default command timeout of 5 minutes will prevent continuous operation without continuous commands.

9.1.2 Voltage Mode

In voltage source mode, the battery controls its output DC voltage and will source or sink current to ensure voltage level is maintained based upon load or source connected to the same DC bus. In event load or source exceeds real time capabilities of the battery, the battery will fault and output voltage will cease from the battery.

Appendix A – Example Site Interface Drawing

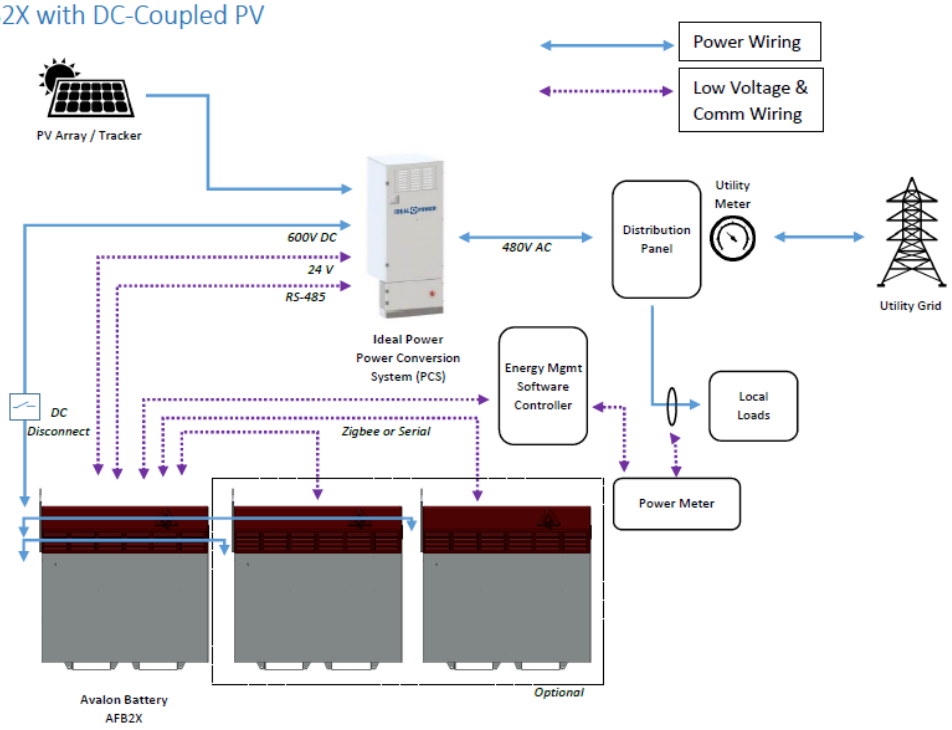




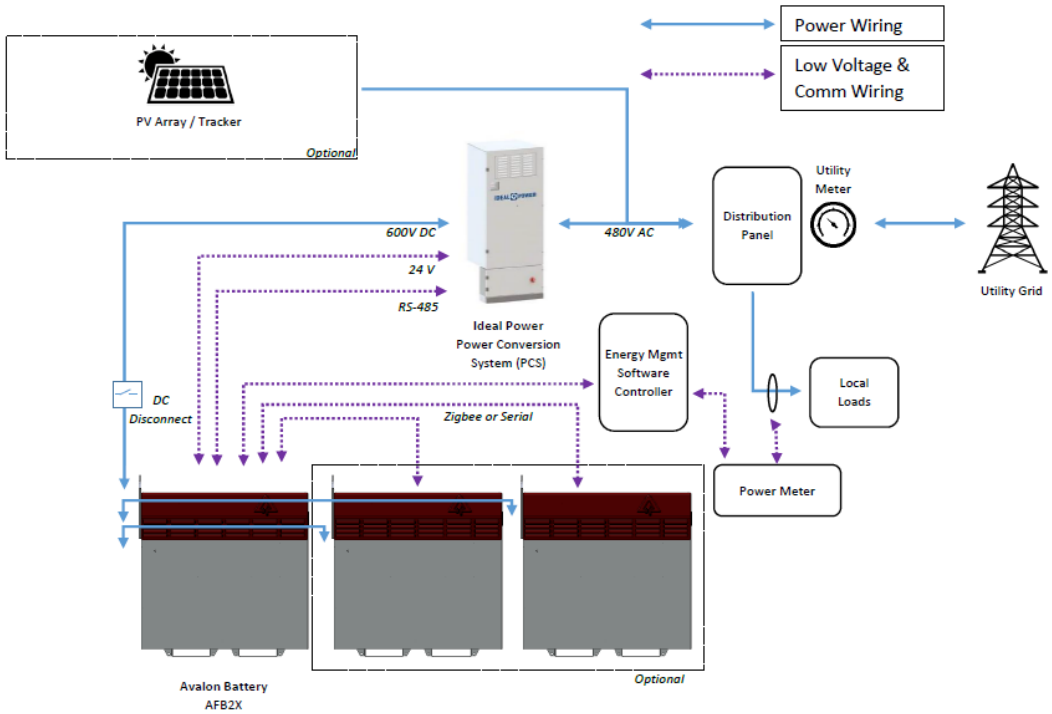
1460 MIN Center
[57.5 MIN]
785
[30.9]
25 Nominal Hole Pass Through
Inverter Door Clearnce does not include Code Standoff Distance Note 8
Clearance Note 5
PCS Footprint
View E-E Concrete Pad (Sheet 1)
DETAIL B (Sheet 1)
DETAIL A (Sheet 1)
Anchor Bolts Note 4
Maximum Bolt Size to Pass Through Anchor Clamp
Outside Corner Holes for 4X Anchor Clamp Kit
Inside Adjacent Holes for 8X Anchor Clamp Kit (Highlighted Entities)
Clearance on access side of Battery Note 5 & 6
Do NOT Drill below this Line
Safe to Drill
DETAIL C Sheet 1 Note 10
Safe Drilling Zone
PART NO. 00869
Part REV 002
TITLE: Site Installation Details, AFB2.5-P1D1Z, Battery, 30 kWh
Client Reference Number DRW00434
SCALE: NTS
SHEET 2 OF 2
BCI

Appendix B – External Power Connection Diagrams

AFB2X with DC-Coupled PV



AFB2X Stand-alone or with AC-Coupled PV



Document History and Approvals

Revision History

Rev	CO	Description	Revised by	Date
001		First release for distribution	T. Barrie	2017-Sept-29
002		Update of Power Portal screens	T. Barrie	2017-Nov-27
003		Update NX comments and engineering feedback	N. Barrett	2018-Apr-12

Approval Record

	Name	Date
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