



1.0 GENERAL DESCRIPTION

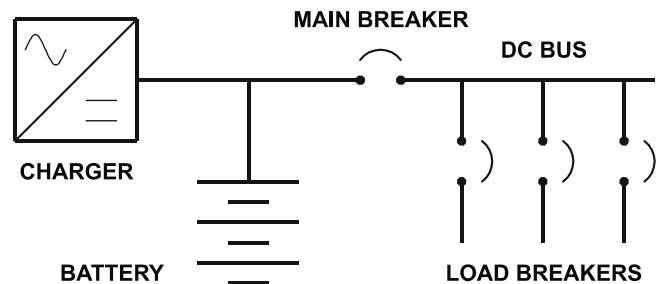
- 1.1 This assembly is a panel board designed for use with battery chargers, industrial-sized batteries, and **dc load distribution**. The panel normally includes one (1) main 2-pole dc circuit breaker and multiple branch breakers.
- 1.2 The DC Distribution Panel's ordering part (model) numbers are as follows:
EJ5140-10 (100A main), **EJ5140-20** (200A main), and **EJ5140-00** (no main)
- 1.3 Site Installation Configurations:
 - 1.1.1 The main circuit breaker can serve as a disconnect for dc load branching.
 - 1.1.2 The main circuit breaker can also be used as a battery disconnect, when one (1) of the branch breakers is specially wired as a charger "back-feed".
 - 1.1.3 The panel can be supplied without a main breaker, replaced with direct dc bus connection lugs.
- 1.4 This DC Distribution Panel is an NRTL-listed product. It is certified to **UL 508A** and **CSA C22.2 No. 14-23** by ETL (Listing Constructional Data Report No **10139076NYM-001**, issued 15-Apr-2014). It utilizes branch dc circuit breakers which meet **UL 489**.

2.0 CONFIGURATION / APPLICATION

2.1 Main / Load Circuit Breakers

This configuration provides a main load circuit breaker to isolate the dc loads from the charger *and* battery. It is used to shed all loads from the common dc bus for service.

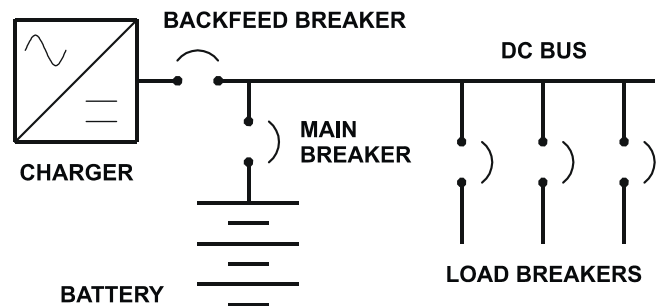
This configuration closely mimics standard panel boards, with a main and load breakers mounted together.



2.2 Battery Disconnect Circuit Breaker

This configuration provides a battery circuit breaker to isolate the charger *and* dc loads from the battery. It allows the charger to continue to provide power to the dc loads during service to the battery.

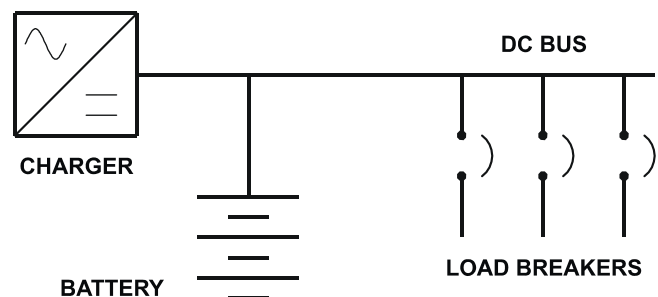
One (1) of the branch circuit breakers is configured as a "back-feed".



2.3 Load Circuit Breakers

This configuration, with *no* main breaker, connects the loads to the dc bus without a local disconnect. The battery is wired directly to the charger, or has an external battery disconnect.

Battery disconnects in these instances are typically located near the battery.





3.0 MECHANICAL ASSEMBLY / INSTALLATION

3.1 The **DC Distribution Panel** is designed for wall or EIA 23/24in rack mounting. The NEMA Type 1 Style-5050 enclosure is constructed of 16 GA steel. Finish is ANSI-61 gray epoxy powder-coat paint.

Enclosure Overall Dimensions:

- 31.88"** (809.6mm) **H**
- 20.00"** (507.8mm) **W**
- 5.20"** (132.1mm) **D**

Outline Drawing:

<http://www.ATSeries.net/PDFs/JE5227-00.pdf>

3.2 The DC Distribution Panel is to be surface-mounted, using the four (4) rear mounting holes.

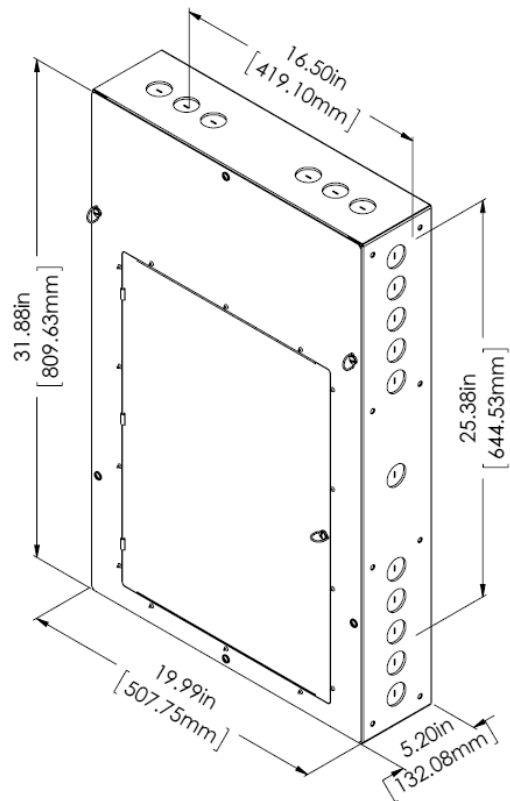
Rear Mounting Dimensions:

- 25.38"** (644.5mm) **H**
- 16.50"** (419.1mm) **W**

3.3 If the DC Distribution Panel is to be rack mounted, separate 23/24in (584/610mm) EIA mounting brackets (p/n **EI0193-23**) can be supplied from the factory, or field-installed.

3.4 The Style-5050 enclosure features twenty-four (24) pre-fab 1.00in / 2.54cm conduit knockouts on all sides for external wiring. External wiring of the main breaker can be brought through the top of the enclosure. If larger conduit knockouts are required, enclosure should be field-modified by installer.

3.5 The DC Panel shipping weight is approximately 110 lb / 50 kg, depending on number of branch breakers.



4.0 EXTERNAL WIRING



4.1 **Shut down and lock-out all external power** to the DC Distribution Panel before making charger, battery & dc load user connections.

4.2 Refer to the supplied standard drawings for component identification and internal specifications.

4.2.1 100A - <http://www.ATSeries.net/PDFs/JE5228-10.pdf>

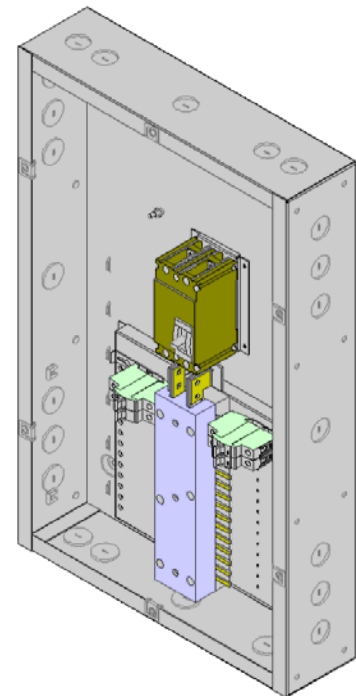
4.2.2 200A - <http://www.ATSeries.net/PDFs/JE5228-20.pdf>

4.3 For user grounding, the DC Distribution Panel features a CU-AL compression lug, accepting #14 - 1/0 AWG wire, mounted to a 1/4-20 ZPS stud terminal. The ground lug and stud are clearly labeled on back panel of the enclosure, to the left of the main breaker. An optional copper ground bus bar (p/n **EI0195-50**) may also be provided.

4.4 User-supplied wiring from the DC Distribution Panel to the battery and/or dc loads should be typed per NEC, local and site codes, and sized per equipment specifications. The main and load circuit breakers feature compression screw terminals for user-installed I/O connections.

- 4.4.1 100A main breaker will accept #12 - 1/0 AWG wire
- 4.4.2 200A main breaker will accept 3/0 - 300 MCM wire
- 4.4.2 5-63A branch breakers will accept #18 - 4 AWG wire

4.5 Check and confirm the polarity of cabling connections from the battery and dc loads.





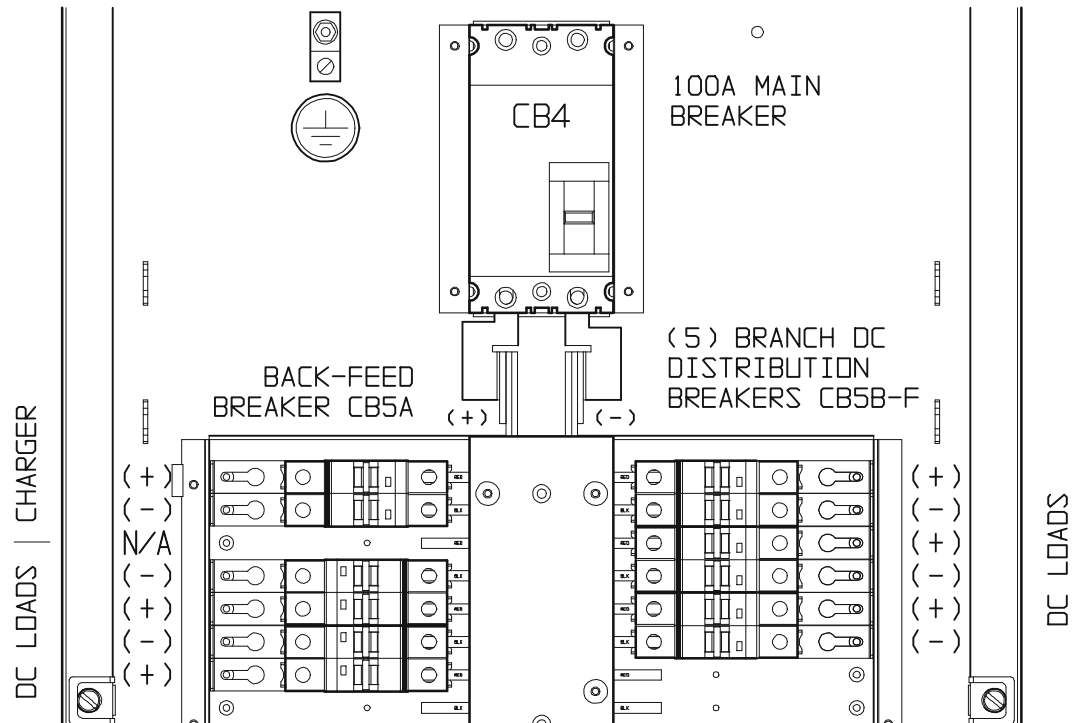
4.6 External (Main) Wiring Configurations:

4.6.1 Main / Load Circuit Breakers (see Configuration 2.1 on Sheet 1 of 4)

Connect the user-supplied main battery wiring to the **top** of the main breaker (CB4). The panel manufacturer recommends connecting charger dc output directly to the battery, and **not** the DC Distribution Panel, since the main breaker (CB4) compression lugs do not easily accept two (2) wires per pole. This installation is often required when two (2) chargers are connected in forced load sharing.

4.6.2 Battery Disconnect Circuit Breaker (see Configuration 2.2 on Sheet 1 of 4)

Connect the user-supplied main battery wiring to the **top** of the main breaker (CB4). Connect the charger dc output to one (1) of the distribution breakers, specifically oriented and installed as a "back-feed" breaker. This leaves positions for up to fourteen (14) branch breakers to connect to dc loads.



Refer to the image above for a sample DC Distribution Panel arrangement, featuring a 100A Main Breaker (CB4) as battery disconnect, a charger "back-feed" breaker in the top-left (CB5A), and five (5) two-pole branch dc distribution breakers (CB5B-F).

NOTICE Branch breakers (for dc loads) and back-feed breaker (for charger) must be installed with the orientation referenced in the image above, or equipment damage may occur. See Section 4.7.2 on Sheet 4 of 4 for user I/O connection instructions.

4.6.3 Main Lug Connection and Load Circuit Breakers (see Configuration 2.3 on Sheet 1 of 4)

Since no main breaker is supplied, connect the charger and/or battery directly to the dc input lug(s).



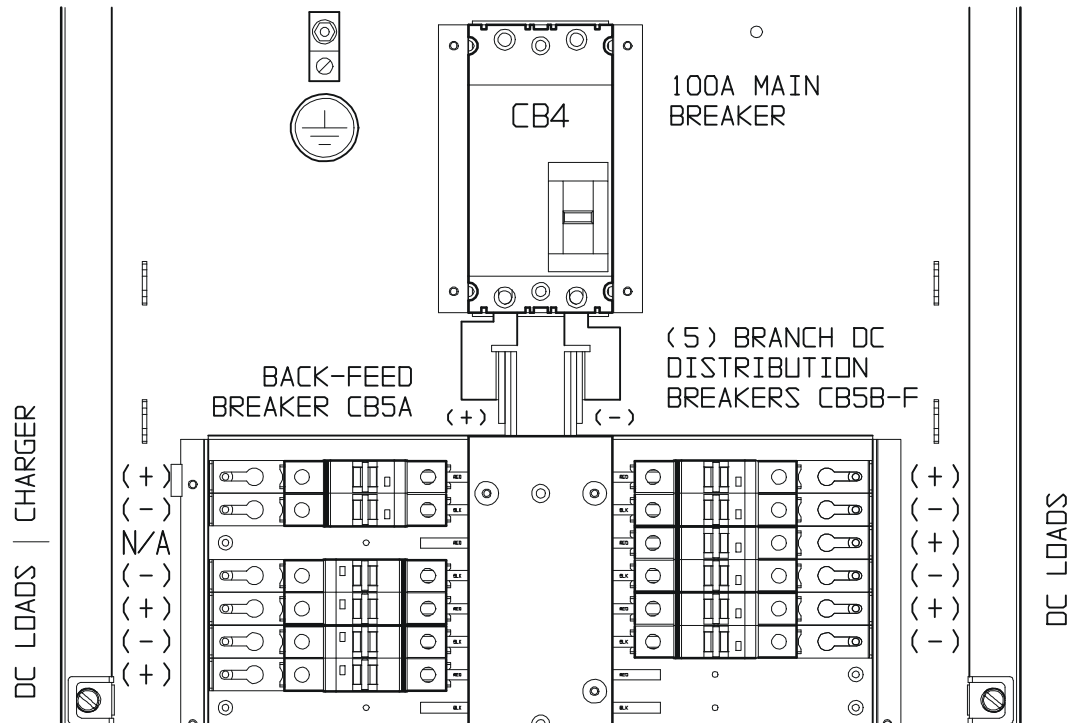
4.7 Branch Circuit Breaker Connections:

4.7.1 Single and Two-pole Branch Breakers (12/24/48 Vdc)

Connect user-supplied dc load wiring (#18 - 4 AWG) to the outward side terminals of the branch circuit breakers (CB5x).

4.7.2 Two-pole Branch Breakers (130 Vdc)

NOTICE The 130V DC Distribution Panel is specifically supplied with 2-pole "ABB S200" brand circuit breakers, which uniquely have a UL listing for 130 Vdc "branch distribution" applications. Most other breakers of similar frame are only UL-listed for 48 Vdc, which can be used in the assemblies listed in Section 4.7.1 above. The "ABB S200" brand features markings on the poles which depict **current flow** through the breaker. These breaker manufacturer markings do **not** depict polarity (+/-) of external user connections from the DC Distribution Panel "system" to the individual dc loads.



Connect user-supplied dc load wiring (#18 - 4 AWG) to the outward side terminals of the branch circuit breakers (CB5x). Carefully follow the diagram attached to the back panel of the enclosure. Match external dc load polarity pos(+)/neg(-) with the color-coded **red(+)** / **black(-)** vinyl sleeves on the bus bar terminals. Ignore the "ABB" markings on the breakers (CB5x) themselves.

