MPM-100

Installation Instructions

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Safety Information

- Except as explained in this manual, do not attempt to service Albér equipment yourself. Opening the equipment may expose you to dangerous voltages. Refer servicing beyond that described in this manual to authorized personnel.
- Do not allow liquids or moisture to get into the equipment. If liquid does get into the equipment, unplug it immediately and contact your nearest authorized service center or Albér directly.
- Ensure equipment is provided adequate ventilation. Do not block equipment ventilation openings.
- Do not exceed equipment voltage or power ratings and capabilities.
- Make sure that equipment is properly grounded.
- Do not let unauthorized persons operate the equipment.
- Do not energize the cabinet or any component with 115VAC or battery voltage until after the installation is complete.
- Use of this product in a manner not specified could compromise the designed-in safety of this product.
- **WARNING**: High voltage or current may be present in the equipment. Only qualified personnel should perform the operations described in this manual.
- **WARNING**: High voltages exist inside the system components and on the equipment terminals. Calibration must be performed only by technically qualified persons. Observe electrical safety precautions when removing and installing equipment covers, and when connecting leads and making adjustments.

Equipment Notes

- Proper installation is essential to the correct functioning of your system. If you have any questions about installation, please contact Albér for assistance.
- In this manual, the term *cell* refers to either cell or module, where appropriate.
- This manual describes the general installation of the MPM-100 System. If your particular system has features or accessories that are not addressed in this manual, please contact Albér directly.

1. WARRANTY AND LIMITATION OF LIABILITY

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Albércorp warrants that the software product will perform in accordance with the accompanying written materials for a period of ninety (90) days from the date of receipt. Some states and jurisdictions do not allow limitations on duration of an implied warranty, so the above limitation may not apply to you. To the extent allowed by applicable law, implied warranties on the software product, if any, are limited to ninety (90) days.

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MPM-100/a Installation Instructions, P/N 4200-034R2.5, Book Revision 2.5

Printed in the United States of America

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Table of Drawings

1. System Notes

The following are notes for a typical MPM system.

1.1. Wiring

You may mount the MPM system in a 19" wide rack in a cabinet enclosure. If using such a cabinet, you must ground the cabinet and installed equipment. Make certain the cabinet is tied to earth ground.

If the cabinet has an AC cord, the receptacle for the AC cord from the cabinet must have protective earth connection (three prong). Do not defeat the use of the earth connection prong.

When connecting equipment via modem to a telephone line, use a minimum 26AWG Telco line cord.

1.2. Disconnect Device

The first load cable, which connects power from the batteries to the MPM, is considered the primary disconnect device.

1.3. Ventilation

You must provide adequate ventilation to prevent equipment overheating. If using a cabinet, allow at least 8" clearance on all sides of the cabinet for ventilation. Do not block ventilation ports, and ensure the equipment is operated within the temperature and humidity ranges in the specification sheets in the *MPM-100 and BDS-256 Monitors Product Description Guide.*

1.4. If You Have Questions

Proper installation is essential to the correct functioning of your system. If you have questions about installation, contact Albér at (561) 997-2299 or fax (561) 997-5588. Request MPM installation assistance.

2. Panel Controls and Indicators

Items on the MPM front and rear panels are described in the *MPM-100 and BDS-256 Monitors Product Description Guide*. Additional descriptions may appear elsewhere in this manual or related manuals.

2.1. Symbols

This symbol, which may appear on equipment panels and cabinets, indicates: *CAUTION. Refer to accompanying documents.* Be sure to read and understand documents that relate to the particular unit. If you do not understand the documentation, stop and contact Albér or an authorized Albér representative.

3. General Information

The intelligent MPM battery monitor can be configured to monitor different battery installations. The MPM is factory configured to customer requirements before shipment. Units that monitor more than 24 cells contain an expansion module, which is identified by the presence of rear panel connectors J3 through J7; otherwise, blank panels are installed.

Drawings BDS-1142-B655 and BDS-1144-B657 show sense lead wiring connections for various battery configurations. Sense lead wiring to connectors J1 through J7 depends on battery configuration. On all MPM configurations, J2 is for the alarm and digital connections. Determine the specific battery configuration for the installation before using the drawing. Refer to the drawing for notes about various MPM configurations.

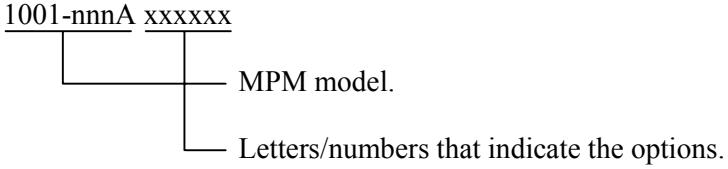
3.1. Monitor Configuration

In the Battery Monitor Data Manager (BMDM) program, select Setup|System|String. At Monitor Configuration, select a configuration from the drop-down list. To determine MPM hardware configuration, cross-reference the model number using the chart in the configuration section of the *MPM-100 and BDS-256 Monitors Product Description Guide*.

WARNING: Check this configuration before installation. If the wrong configuration is installed onto the battery, the unit could be permanently damaged.

3.2. Monitor Model Number

The MPM-100 model number is structured as follows.



Refer to the *MPM-100 and BDS-256 Monitors Product Description Guide* for a detailed explanation of the model number and options.

4. Locating the MPM

You may locate the MPM in the battery room near the batteries or outside the battery room. Consider the following when selecting a site.

Power – Consider how the MPM will be powered (AC or DC) and how power will be routed. Systems configured for 120V batteries are powered from AC, or from DC as a factory option; all other configurations are powered from the DC bus. For AC powered units, use a 24VDC wall plug transformer (Albér 4000-029); the power must be from a UPS protected source.

Physical Mounting – Consider where and how the MPM will be mounted.

Sense Lead Harness – Maximum wire length is 100 feet. The resistance load test wiring, however, limits this length to the maximum distance the MPM can be mounted from the battery string.

Resistance Load Test Wiring – The #12 AWG leads used for the momentary load tests have the following length restrictions: The total length of any two adjacent load leads must be from 22 to 90 feet. If these wire lengths are not feasible, consult the factory.

5. Mounting the MPM

The MPM is normally furnished as a 19" rack mount unit, 1.75" in height (1U). If a rack is not available, you may order a 19" self-supporting wall mount bracket (refer to BDS-345-C655) or brackets that mount the unit flat against the wall. Refer to BDS-154-B557, General Assembly of MPM-100.

5.1. Required Tools

You will need the following tools for MPM installation:

- Panduit CT-260 crimper (or equivalent) for crimping ring terminals and parallel splices.
- Anderson Power Products #1351G1 crimper (or equivalent) for crimping 30 amp Anderson connectors. (Available from Online Electronics at 800 335-5111 or U.S. Airmotive, Inc. at 305 885-4991.)
- Thomas and Betts WT-111-M for crimping fuse holders.
- Hand tools for mounting the MPM.

6. Routing Wires from MPM to Battery

The installer normally determines the wire routing; however, do not route the wires in the same conduit with other wires in the facility. You may use conduit to route harnesses from the MPM to the battery rack and to a wire tray to distribute the wires to each cell. Also, do not run the wires parallel to the battery bus. Some inverters emit large signal spikes that could cause induction problems through the connection cables. This is not a problem, however, in low voltage telecommunication applications.

A Panduit (or equivalent) slotted cable tray with cover is normally used to distribute wires to the cells. Suggested slotted cable trays and covers are Panduit E1X1L66 with C1L66, or E5X5L66 with C5L66.

7. Communication Connections

Connection to an MPM can be via a modem or WAN (wide area network) from a remote location or on-site using the RS-232 Local port or LAN (local area network) port. Both methods let you check all battery parameters. This section explains how to set the internal configuration DIP switch and connect the MPM, modem, computer, and multiplexer. When connecting via modem, use a minimum 26AWG Telco line cord.

7.1. Modem Connection

To communicate with an MPM from a remote location, connect the MPM rear panel Telco connector to a telephone line. Connect the Central computer modem to the phone line according to the computer manufacturer's instructions.

7.2. Local Port Connection

There are two 9-pin RS-232 local ports (MPM front and rear panels). You may use only one port at a time. The front panel Local Port switch selects the front or rear port. When the switch is lit, the front port is selected. Use the rear port for connecting to a permanent Local computer or on-site Central computer; use the front port when using a portable Service computer. NOTE: As an option, the rear panel RS-232 may have been factory replaced with a fiber optic or LAN connector.

Connect a 9-pin female to female cable (pin to pin construction) to the MPM Local Port and to an available port on the computer.

7.3. Ethernet Port Connection

There are two MPM options for Ethernet connection: The MPM can have a network interface and a rear panel RJ-45 connector installed. If the RJ-45 is not installed, you may purchase an Albér conversion unit that connects to the DB-9. Refer to *DIP Switch Configuration* if installing the network interface and RJ-45. No DIP switch change is needed for a DB-9 conversion kit.

7.4. Telco Serial Port Multiplexer

Multiple monitors on one telephone line - When only one telephone line is available for multiple MPMs at the same location, use the Albér Telco Serial Port Multiplexer. This optional accessory is available in six configurations that can connect up to eight or sixteen MPM monitors with different power requirements.

When using the Telco Serial Port Multiplexer, the MPM requires an optional factory-installed fiber optic interface that replaces the modem and connects to the multiplexer. With this option, the RJ-11 modem port is disabled but still present. Refer to *DIP Switch Configuration*.

Each unit connected to the multiplexer requires a unique MUX ID. This setting is under Setup|System|Link on the BMDM program. Refer to the BMDM manual and the *Serial Port Multiplexer User's Guide*.

Part Number	Description
1000-292	8 channel Telco multiplexer 12V
1000-293	16 channel Telco multiplexer 12V
1000-296	8 channel Telco multiplexer 24V
1000-297	16 channel Telco multiplexer 24V
1000-300	8 channel Telco multiplexer 48V
1000-301	16 channel Telco multiplexer 48V

7.5. DIP Switch Configuration

Telco Multiplexer - For the MPM to function with a Telco multiplexer, you must set the configuration DIP Switch 1, Position 8 inside the MPM. Only change this switch when using the MPM with a Telco multiplexer. If the MPM has a factory-installed fiber optic Telco port, the DIP switch is correctly set.

Ethernet Interface - If the MPM has a factory-installed network interface and RJ-45, the DIP switch is correctly set. If you install a network interface and RJ-45, you must set the configuration DIP Switch 1, Position 7 inside the MPM. No switch change is needed for a DB-9 conversion kit.

To verify the switch setting without opening the MPM, select Diagnostics|DIP Switch from the BMDM String View screen. The diagnostic box indicates each switch position. Refer to *DIP Switch Diagnostics* in the BMDM user's guide. If the switch must be changed, do the following.

WARNING: Do not use a pencil to change the DIP switch settings. Graphite residue may harm the internal MPM components.

1. Power off the MPM.
2. Remove the MPM cover by removing four screws on the top edges of the cover, two on the top edge of the rear panel, and one screw at the top center of the front panel.
3. To enable the Telco multiplexer option: Set DIP Switch 1, Position 8 to On, or
4. To enable the Ethernet network interface: Set DIP Switch 1, position 7 to On.
5. Replace the MPM cover.
6. The new switch setting takes effect when power is applied.

Telco Modem Call Out	DIP Switch 1 - Position 8
Enable Multiplexer Support	ON
Disable Multiplexer Support	OFF - default

Ethernet Network Interface / RJ-45	DIP Switch 1 - Position 7
Network Enable	ON
Network Disable	OFF

Figure 1. DIP Switch Settings

7.6. RS-232 Serial Port Multiplexer

Multiple monitors on one Local computer - When only one Local computer is available for multiple MPMs at the same location, use the RS-232 Serial Port Multiplexer. This optional accessory is available in six configurations that can connect up to eight or sixteen MPM monitors with different power requirements.

When using the RS-232 Serial Port Multiplexer, the MPM requires an optional factory-installed fiber optic interface that replaces the rear RS-232 Local port and connects to the multiplexer. With this option, the MPM front panel Local port is still available; however, if you connect a Service computer to this port for servicing or setup, disconnect the fiber optic cables.

Each unit connected to the multiplexer requires a unique MUX ID. This setting is under Setup|System|Link. Refer to the BMDM manual and *Serial Port Multiplexer User's Guide*.

Part Number	Description
1000-290	8 channel RS-232 multiplexer 12V
1000-291	16 channel RS-232 multiplexer 12V
1000-294	8 channel RS-232 multiplexer 24V
1000-295	16 channel RS-232 multiplexer 24V
1000-298	8 channel RS-232 multiplexer 48V
1000-299	16 channel RS-232 multiplexer 48V

7.7. MPM Serial Port

Connection Note There are two 9-pin RS-232 local ports (MPM front and rear panels). You may use only one port at a time. The front panel Local Port switch selects the front or rear port. When the switch is lit, the front port is selected. Use the rear port for connecting to a permanent Local computer; use the front port when using a portable computer. Cable construction details are elsewhere in this manual or order the cable (2025-117) from Albér.

7.8. Serial Port and Fiber Optic Interface

Connection Note When using the RS-232 Serial Port Multiplexer, the MPM requires an optional factory-installed fiber optic interface. The fiber optic interface replaces the rear panel RS-232. With this option, the MPM front panel Local port is still available. The front panel Local Port switch selects the front or rear port. When the switch is lit, the front port is selected.

7.9. Modem and Fiber Optic Interface

Connection Note When using the Telco Serial Port Multiplexer, the MPM requires an optional factory-installed fiber optic interface. With this option, the RJ-11 modem port is disabled but still present. Also, the MPM internal DIP switch must be set.

8. Power Connection

This section describes DC and AC power connection.

8.1. DC Power Connection

MPMs designed to monitor batteries of 48 volts or less are powered from the DC bus. MPMs that monitor 120V batteries can have an optional DC to DC converter installed at the factory. The battery being monitored supplies power to the MPM via the load cables. This connection is internally configured at the factory. The MPM rear panel 24VDC IN connector is not used and is internally disconnected.

The most-positive battery connection must always be to Load Connection #1 on the MPM rear panel. The negative connection is determined by the battery configuration being monitored. See drawing BDS-156-B562.

CAUTION: To ensure uninterrupted power to the MPM when the battery powering the MPM is offline, the above connections must be to the bus side of the battery disconnect switch.

8.2. AC Power Connection

MPM units that monitor battery strings above 48 volts are powered from an AC wall plug transformer (included). (Albér 4000-029. 24VDC nominal output at 1.5A max.). Connect this power supply to the 24VDC IN rear panel connector. Transformer power must be from a UPS protected source capable of supplying 16 watts for the desired length of time.

9. Connecting to a Building Management System

The MPM-100 system can be connected to building management systems. This integration requires writing software that can communicate with the MPM. The communication protocol is MODBUS ASCII. You may obtain a register map from Albér or download it from the Albér Web site technical library at www.alber.com. The connections are made via the RS-232 DB-9 connectors on the MPM rear panel. Either the Local port or LAN connection can be used. The only connections made are Tx-Pin 2, Rx-Pin 3, and GND-Pin 5.

10. Load Cable Connection

Build each load cable using BDS-1141-A510, observing length restrictions. The load delivered during a resistance test may be degraded if the load cable is too long. Therefore, when building the load cables, maintain an overall length from 22 to 90 feet round trip. Round trip consists of, for example, a connection from Load Connection 1, out to the battery, and back from the battery to Load Connection 2. If connection length is not maintained, the load will be too low or high, and resistance test results may be affected.

CAUTION: Do not wrap excess load cable into a coil. A tight coil will result in induction that can adversely affect equipment operation. Leave excess cable in loose, flat lengths.

WARNING: Before making any connections to the battery, verify the fuses have been removed from the fuse holders. Do not install the fuses until the time that the entire system is commissioned.

WARNING: In hazardous voltage applications (where battery voltage is greater than 60VDC), remove the load cable fuse before disconnecting the load cable connector from the MPM.

When making connections from the MPM to the battery, connect the first load cable to the positive post of the first cell. If monitoring multiple strings, connect this lead directly to the DC bus, to bypass the disconnect switch and maintain MPM power when the string is not online.

Connect the remaining load cables to positive posts, except for the last cell, where the connection is to the negative post. See BDS-156-B562 to identify cells that will have load lead connections. Refer to *Making Connections* on this drawing to identify which set of connections to use. Again, verify the fuses are removed before making connections.

CAUTION: When a load cable connects to the same point as a voltage sense lead, the load cable must be the closest to the cell's post. See BDS-123-A380 or BDS-127-A381 for connection details.

11. Voltage Sense Lead Connection

Cell/Jar voltage sense leads connect from J1 (J3, J6 and J7 are on units with the expansion module) to the individual cells/jars. The sense lead harness supplied has every wire available for all possible configurations. Remove the wires not required for the configuration. Disassemble the DB-37 connector housing and cut the unneeded wires as close as possible to the connector.

On some models, certain DB style connectors are not installed. Determine which drawing to refer to by examining the connector arrangement on the rear of the unit.

- Use drawing BDS-1142-B655 for connectors J1 and J2. All models have these connectors. Refer to *Making Connections* on this drawing to determine which wires are required and which set of connectors to use.

- Use BDS-1144-B657 when connectors J3 through J7 are installed. These units have the 100 channel expansion module installed.

Regardless of the model, only J1, J3, J6 and J7 are used for voltage sense leads.

After removing unneeded wires, cut the required wires to the appropriate lengths and crimp them onto the sense lead resistors, for connection to the battery terminals. (See BDS-120-A373.) For ease of future cell maintenance, leave some slack in the wiring to the cells.

The sense lead resistor assemblies include a 10KΩ 1% flameproof resistor that reduces the risk of a short circuit during installation and maintenance. The hardware for battery connection is included in the installation kit.

CAUTION: When a load cable connects to the same point as a voltage sense lead, the load cable must be the closest to the cell's post. See BDS-123-A380 or BDS-127-A381 for connection details. However, if a square post is available, the post clip connection scheme is better. See BDS-163-A424.

12. Intertier Sense Lead Connection

The MPM has one standard channel for monitoring intertier connection. MPMs with 60 channel expansion modules can monitor three additional intertier connections. MPMs with 100 channel expansion modules can monitor seven additional intertiers. Identify the modules as follows.

- In a 60 channel expansion module, connectors J3 and J4 are installed, and J6 and J7 are covered. J5 may or may not be installed.

- In a 100 channel expansion module, connectors J3 through J7 are installed.

The intertier cable connects one part of the battery to another, and typically goes from one row to another row. Albér recommends you monitor the intertier connections because, during a discharge, the MPM corrects the voltage reading of the cell connected before the intertier jumper. The MPM also corrects the internal resistance of this same cell. If intertier measurement is not made, during a discharge, the cell before the intertier will measure the cell voltage minus the intertier voltage drop, and the cell resistance will be the internal cell resistance plus the intertier resistance.

The supplied harness has connections terminated at the DB-37 connector end. If not making connections, disassemble the DB-37 connector housing and cut the unneeded wires as close as possible to the connector. Refer to connector J1 on BDS-160-A422.

The standard intertier connection is made to J1, pins 36 and 18. Connect the most-positive point of the intertier to the plus connection (pin 36), and the most-negative point of the intertier to the negative (pin 18) connection. Each wire must have a 10KΩ flameproof resistor with the same construction as the voltage sense lead. See BDS-120-A373 for construction details. For additional intertier channels, the expansion module is required; these connections connect to J4. Refer to BDS-160-A422 for additional intertier connections.

CAUTION: If a current lead connects to the same point as the intertier sense lead, the current lead must be closest to the battery post. See BDS-123-A380 or BDS-127-A381 for connection details. Although these drawings show voltage sense leads, they apply to the intertier sense leads as well. Also, if connecting a voltage sense lead and an intertier sense lead on the same post, make these connections as close together as possible.

13. Overall Voltage Measurement

The overall voltage monitoring connections are made through the load cable connections. No additional wiring is necessary.

14. Temperature Sensor Connection

The MPM has one standard channel for monitoring temperature. MPMs with 100 channel expansion modules can monitor seven additional temperature channels. To identify if an expansion module is installed, refer to the *Intertier Sense Lead Connection* section.

Two types of probes are available. One probe hangs free for ambient temperature measurement or mounts on a cell post surface. The other, a Teflon coated probe, may be immersed in a flooded cell. You may order these probes for monitoring either ambient or electrolyte temperature.

The probe is wired to connector J1, and the wires exist on the DB-37 for termination. If not using the temperature probe, disassemble the DB-37 connector housing and cut the unneeded wires as close as possible to the connector. Refer to BDS-159-A421.

15. Discharge Current Sensor Connection

Because the MPM can monitor up to four battery strings in parallel, four discharge current channels are standard with the MPM. The current measuring device can be either a shunt or a current transducer (CT). The transducer (ordered separately) must be the appropriate size for the load requirements.

The CT only needs to be clamped around any battery string conductor carrying the full load. The shunts may require special adapters for installation. Install the shunt in series with the battery string, ensuring that, after installation, no additional stress is applied to the battery post. Depending on the type of transducer used, refer to the appropriate drawings for termination. For a shunt connection, refer to BDS-158-A420. For a CT connection, refer to BDS-1120-A483. If not monitoring discharge current, disassemble the DB-37 connector housing and cut the unneeded wires as close as possible to the connector.

16. Float Charging Current Sensor Connection

Because the MPM can monitor up to four battery strings in parallel, four float current channels are available as an option. Refer to BDS-1145-A511 for termination details and to section 6.3 of the *Float Charging Current Probe User's Manual*.

17. Telephone Line Connection and Setup

The MPM can connect to a telephone line using the Telco connector on the MPM rear panel. Pins 2 and 3 of the RJ-11 connector are for the tip and ring connection. When connecting equipment via modem to a telephone line, use a minimum 26AWG Telco line cord.

The MPM has a built-in modem that automatically calls out to report status to a Central computer. If you are not using the system with a remote Central computer, disable the automatic call out feature as follows.

CAUTION: Do not use a pencil to change the DIP switch settings. Graphite residue may harm the internal MPM components.

1. Power off the MPM.
2. Remove the MPM cover by removing four screws on the top edges of the cover, two screws on the top edge of the rear panel, and one screw at the top center of the front panel.
3. Disable the automatic call out feature by setting DIP switch 1, position 8 inside the MPM to On.
4. Replace the MPM cover.
5. The new switch settings take effect when the power is applied.

Modem Call Out	DIP Switch 1 - Position 8
Enable Multiplexer Support	ON
Disable Multiplexer Support	OFF - default

18. RS-232 Connection

For continuous viewing of battery data, connect a cable from the MPM front or rear panel RS-232 connector to a Local computer. The front and rear connectors are in parallel and may not be used simultaneously. Before connecting a Service computer to the front RS-232 Local port, disconnect any cable on the RS-232 rear connector.

The connection between the MPM and the computer must not exceed 25 feet. For close connections, use the serial cable included with the system. For longer distances, build a cable using BDS-162-A423. You may order parts from Albér using the part numbers on the drawing.

19. Alarm Contacts and Remote Alarm Reset

Two sets of dry Form C alarm contacts are available on connector J2. The alarms are identified as Parameter Alarm and System Alarm. The parameter alarm indicates threshold violations of all monitored parameters. The system alarm indicates system power loss or monitor hardware failure.

WARNING: Disconnect power by removing J2 from its socket before making any connection to the alarm circuits. See BDS-1142-B655 for wiring details.

Each set of alarm contacts is labeled COM=common, NC=normally closed, and NO=normally open. The contacts may be connected directly to a facility's alarm reporting system. If more than one MPM is at a location and only one set of contacts can be monitored, you may wire the contacts in parallel as a normally-open circuit or in series as a normally-closed circuit.

The alarm reset must be a normally-open dry contact that connects between J2, pins 21 and 3. The alarm reset only resets the parameters alarm. The only way to clear a system alarm is to correct the problem.

20. Charger Control

A contact is provided that can remotely disable the battery charger upon command. This connection is made to J2, pins 5 and 24, and is a normally-open dry contact. See drawing BDS-1142-B655.

21. Digital Inputs

Eight digital inputs are provided on J2 of the MPM. Eight additional digital inputs are on J4 of units with the expansion module. You may use these inputs for monitoring door switches, facility alarms or other such contacts.

WARNING: Disconnect the power by unplugging J2 and/or J4 before making any connection to the digital input circuits.

Complete each input by connecting the protected +48V to the specific digital input. Inputs are labeled on BDS-1142-B655 and BDS-1144-B657.

22. MPM System Specifications

Specification sheets for the discreet components that comprise a typical MPM system are in the *MPM-100 and BDS-256 Monitors Product Description Guide*.

23. Preventive Maintenance

Visual Inspection - Visually inspect all MPM system components for damaged or frayed power cords and cables, and damaged MPM system component panels, controls, and connectors. If you detect any damage, remove the equipment from service until the damage is repaired.

WARNING: Before cleaning equipment, ensure the system is disconnected and power to the units has been shut off. You must disconnect system components and the MPM system cabinet, if a cabinet is being used, from any DC voltage sources and from any AC power sources.

Cleaning System Components - The MPM system will provide years of service if properly maintained. Clean system components using a soft cloth, slightly moistened with water. Do not use commercial or industrial cleaners that may attack the computer display and housing. Never expose the computer or any system component to water, high humidity or dampness.

Fans and Vents - Remove dust from fans and vents using a small brush or hand held vacuum. If fans or vents have dust filters, clean the filters according to manufacturer's instructions.

Sense Leads - Clean the sense leads as required. The acid to which the sense lead clips are exposed during testing should be neutralized often, using a water and baking soda mixture. Brush this mixture onto the sense lead clip, then rinse well with clean, cool tap water. Before cleaning the sense lead clips, ensure the system is disconnected and power to the system has been shut off. Dry with a clean, soft cloth.

Internal Components - The MPM system has no user-replaceable components. Because high voltage exists in the unit, only knowledgeable users should remove the covers or cowling from system components (MPM, UPS, etc.) when required. Failure to comply with this restriction could pose a safety hazard and/or void the system warranty.

WARNING: High voltages exist inside the MPM system components and on the terminals. Calibration must be performed only by technically qualified persons. Observe electrical safety precautions when removing and installing equipment covers and when connecting leads and making adjustments.

UPS (Uninterruptible Power Supply) - If you are using an optional UPS with the MPM system, be certain the UPS internal battery is functional. Follow instructions in the UPS manufacturer's manual.

Shipping - Protect the MPM system from bumps and bangs during normal use or storage, and provide protection during shipment between test sites.

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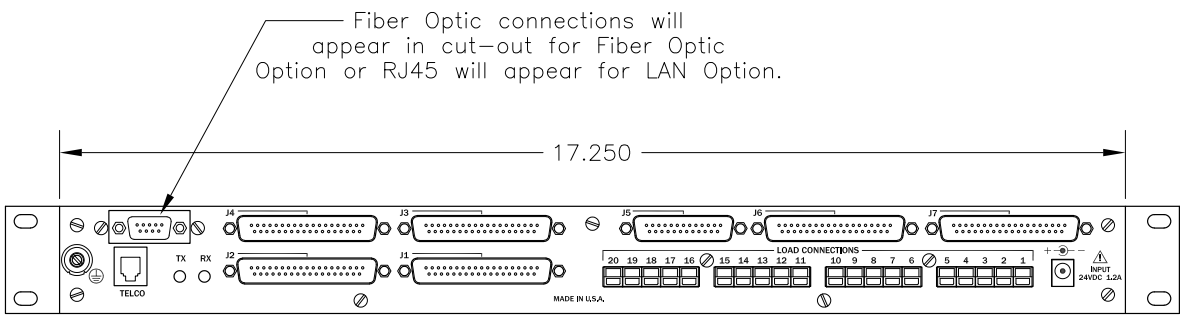
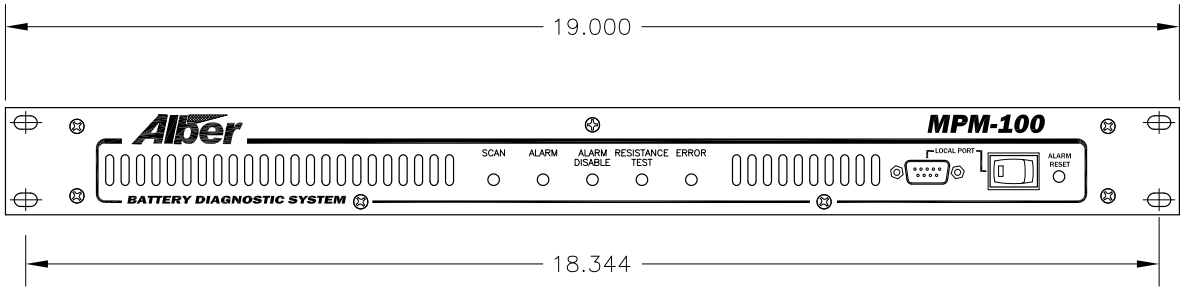
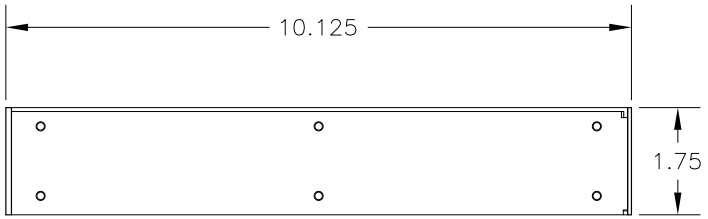


REAR VIEW





FRONT VIEW

REV	DATE	CHANGE RECORD
D	7/03	New Front Panel – Logo
C	12/01	UL Production Rev.
B	10/00	Production Rev. I I
A	2/99	Production Rev. I

UNLESS OTHERWISE SPECIFIED. ALL DIMENSIONS ARE IN INCHES
TOLERANCES:
ANGLES: ± 0 15'
FRACTIONS: ± 1/32
DECIMALS: x ± 05 xx ± 01 xxx ± 005

SUB ASS'Y or PART No. :

MATERIAL:

SCALE: Half Size

DRAWN BY: J. Jones

DATE: 7–1–98

CHECKED BY: Ed Deveau

ALBÉR CORP.
BOCA RATON, FL. 33487-2813

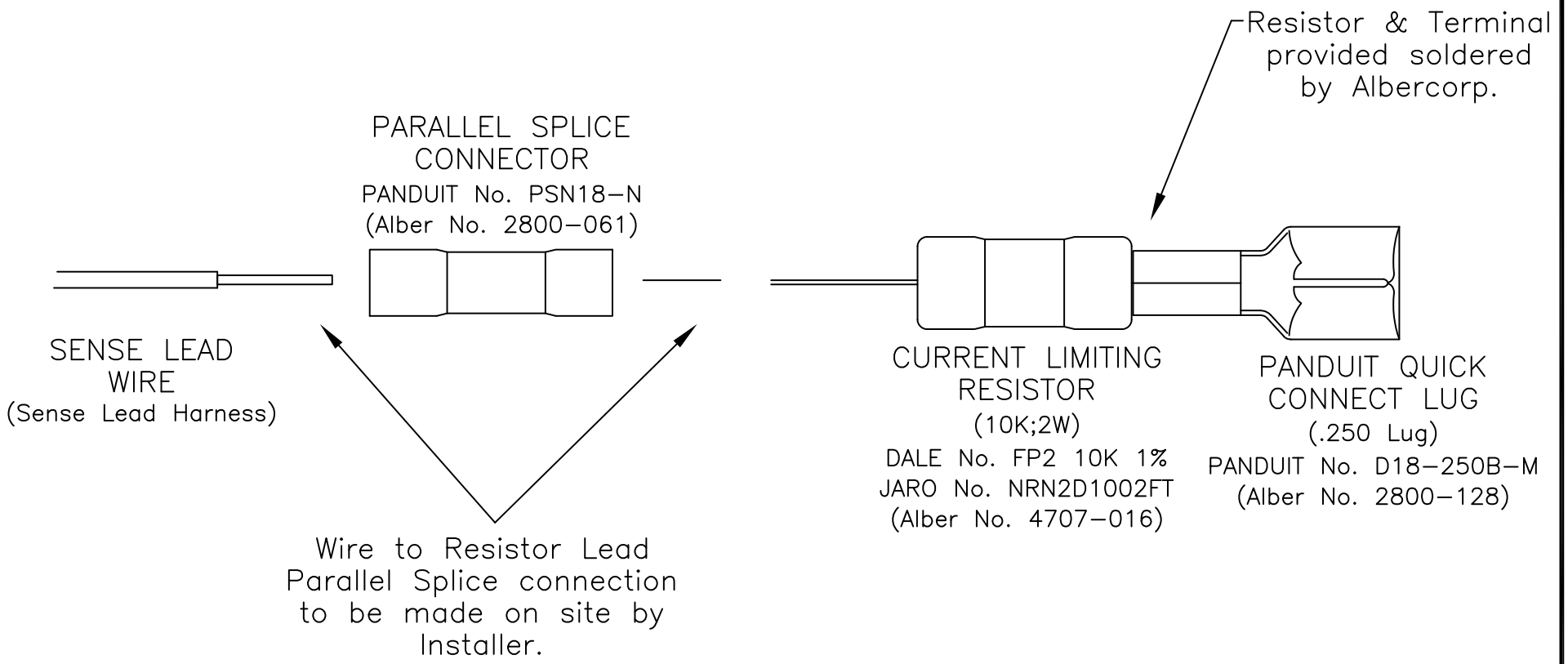
GENERAL ASS'Y

MULTI–PURPOSE MONITOR–100

SHEET 1 OF 1

DRAWING NUMBER BDS–154–B557

REV. D



Alber

Boca Raton, FL 33437-2813

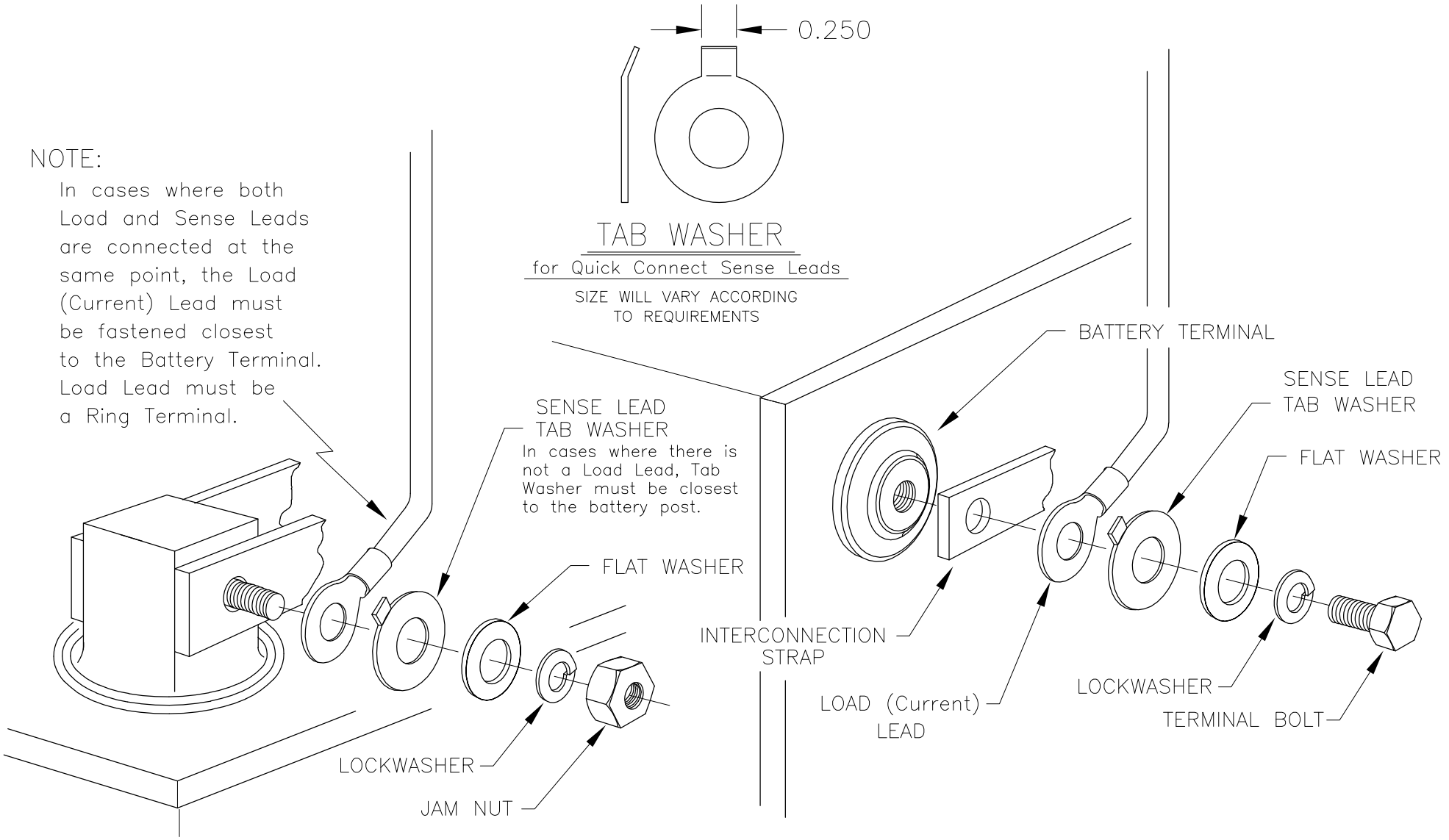
SUB ASS'Y No.	1100–437
SCALE: 2X	DRAWN BY: J. Jones
DATE: 4–14–97	CHECKED BY: Ed Deveau

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.
TOLERANCES: FRACT ± 1/32
.x ± .05 .xx ± .01 .xxx± .005

REV.	DATE	CHANGE RECORD
E	11/01	Removed AWG
D	5/00	Added Mfgr/Alber P/N
C	4/00	Quick Connect Only

SUB ASS'Y
SENSE LEAD CONNECTION DETAILS
BATTERY DIAGNOSTIC SYSTEM

SHEET	DRAWING No.	REV.
1 OF 1	BDS–120–A373	E



Alber

Boca Raton, FL 33437-2813

MATERIAL:

SCALE: N.T.S.	DRAWN BY: J. Jones
DATE: 5–20–97	CHECKED BY: Ed Deveau

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.
TOLERANCES: FRACT ± 1/32
.x ± .05 .xx ± .01 .xxx± .005

REV.	DATE	CHANGE RECORD
C	5/03	Added Tab washer note.
B	9/98	Removed strap nut
A	1/98	Added Jam Nut

INSTALLATION DETAILS

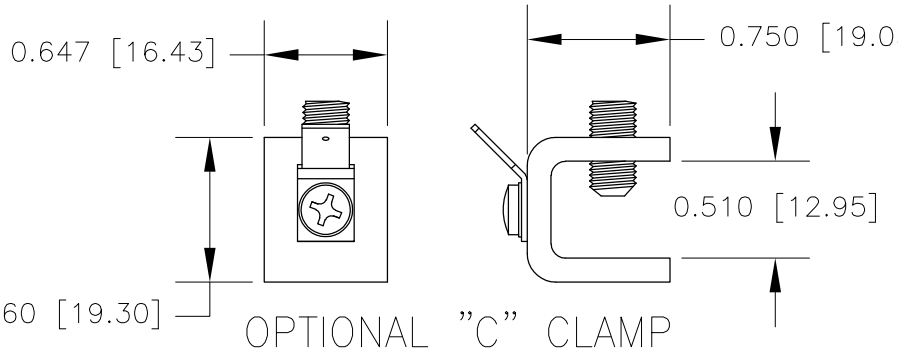
FULL WASHER QUICK CONNECT SENSE/LOAD LEADS

BATTERY DIAGNOSTIC SYSTEM

SHEET 1 OF 1

DRAWING No. BDS–123–A380

REV. C

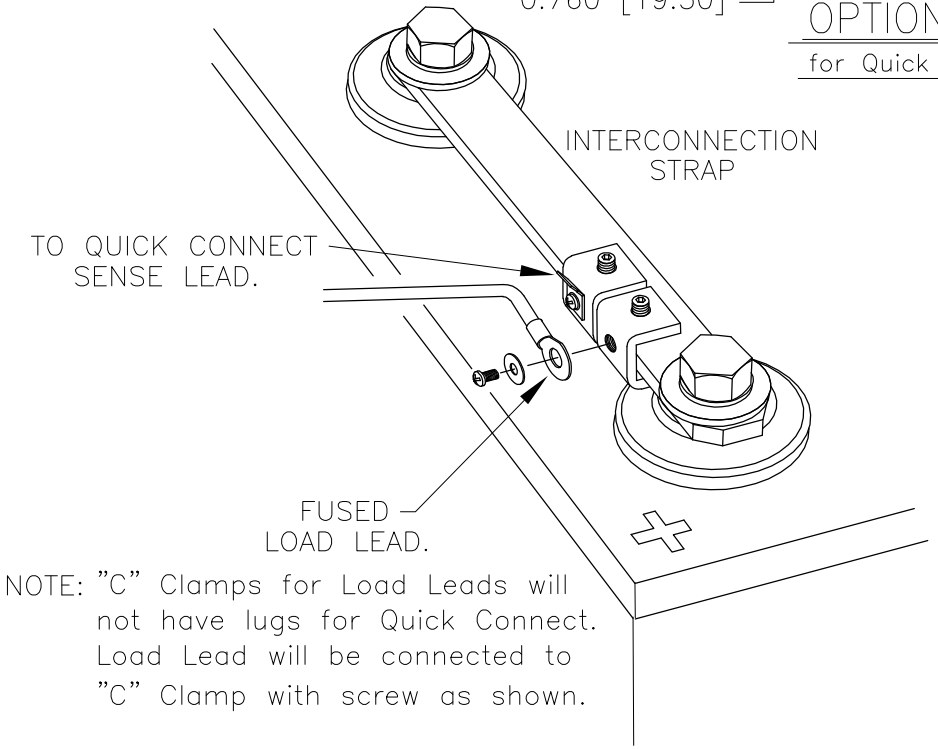


OPTIONAL "C" CLAMP

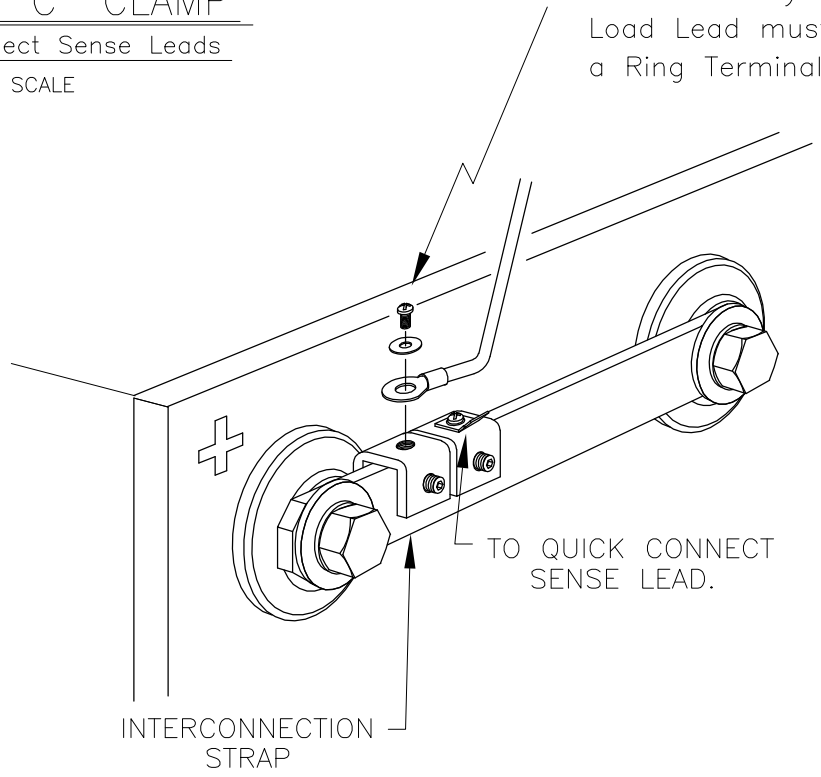
for Quick Connect Sense Leads

FULL SCALE

NOTE: In cases where both Load and Sense Leads are connected at the same point, the Load (Current) Lead must be fastened closest to the Battery Terminal. Load Lead must be a Ring Terminal.



NOTE: "C" Clamps for Load Leads will not have lugs for Quick Connect. Load Lead will be connected to "C" Clamp with screw as shown.



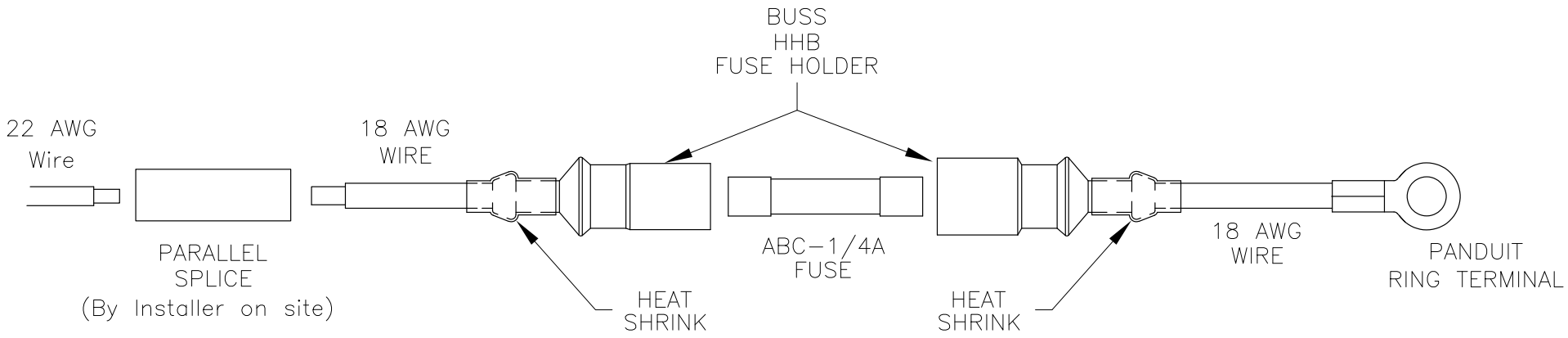
Alber Boca Raton, FL 33437-2813	UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES. TOLERANCES: FRACT ± 1/32 .x ± .05 .xx ± .01 .xxx± .005		
MATERIAL:	B	5/03	Added Optional Notes.
SCALE: N.T.S. DRAWN BY: J. Jones	A	11/98	Removed No-Ox Note
DATE: 5-20-97 CHECKED BY: Ed Deveau	REV.	DATE	CHANGE RECORD

INSTALLATION DETAILS

OPTIONAL QUICK CONNECT "C" CLAMP LEADS

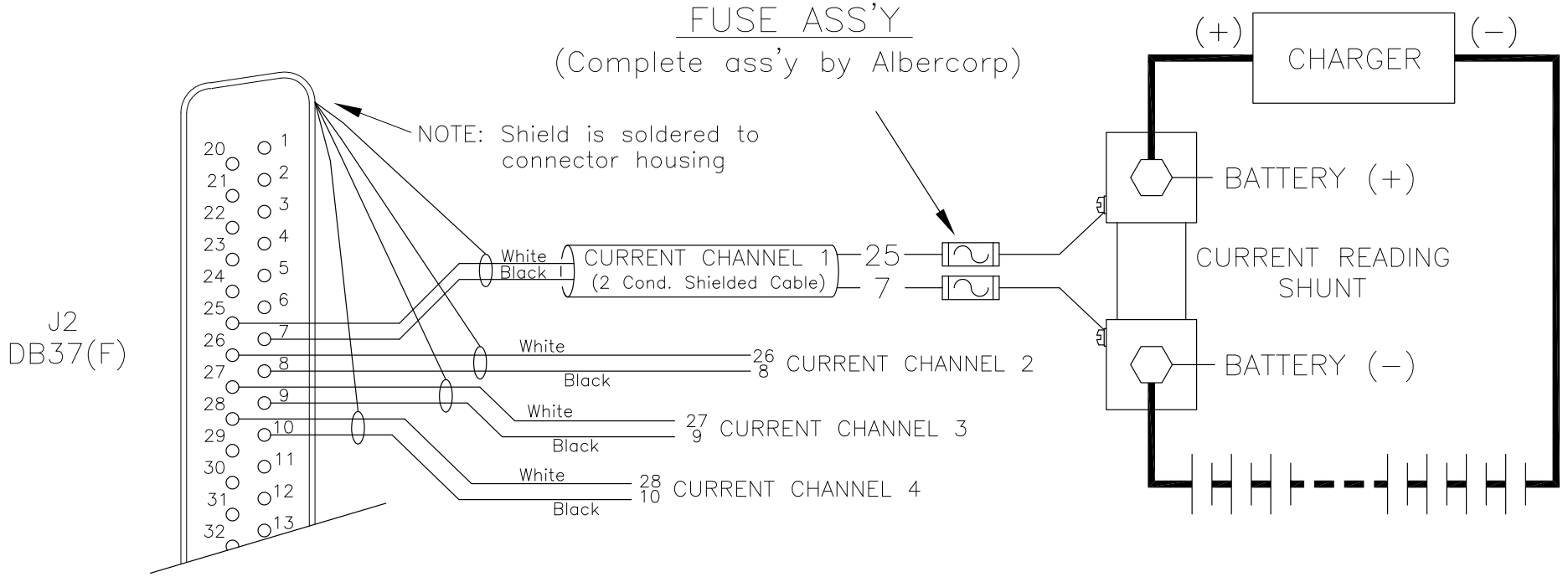
BATTERY DIAGNOSTIC SYSTEM

SHEET	DRAWING No.	REV.
1 OF 1	BDS-127-A381	B

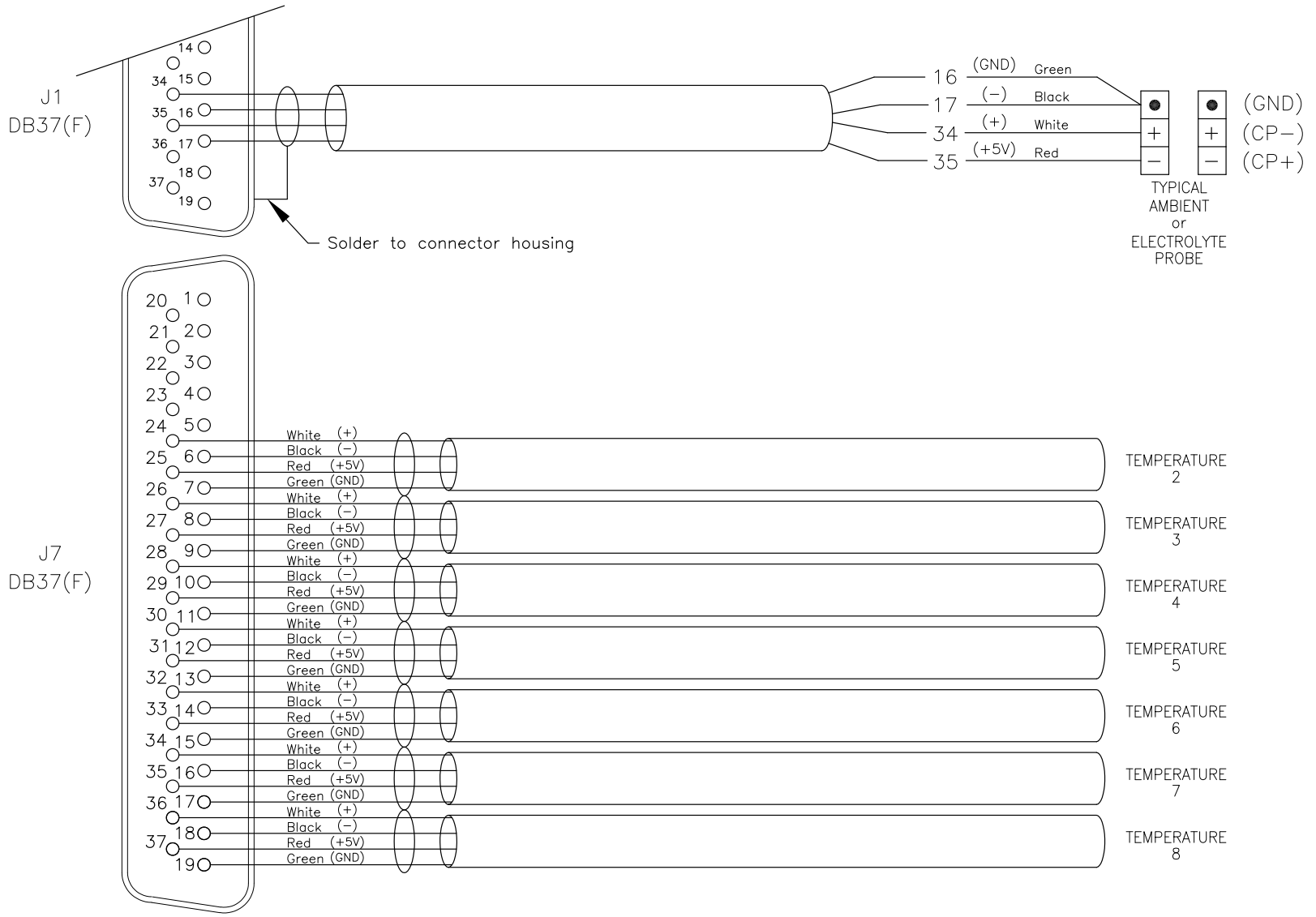


FUSE ASS'Y

(Complete ass'y by Albercorp)



Alber Boca Raton, FL 33437-2813	UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES. TOLERANCES: FRACT ± 1/32 .x ± .05 .xx ± .01 .xxx± .005		SUB ASSEMBLY CURRENT CONNECTIONS MPM−100
MATERIAL:	B	1/00	Polarity Revision
SCALE: N.T.S. DRAWN BY: J. Jones	A	3/99	Added Shield; Color Code
DATE: 2−1−99 CHECKED BY: Ed Deveau	REV.	DATE	CHANGE RECORD
SHEET 1 OF 1	DRAWING No. BDS−158−A420	REV. B	



Alber

Boca Raton, FL 33437-2813

MATERIAL:

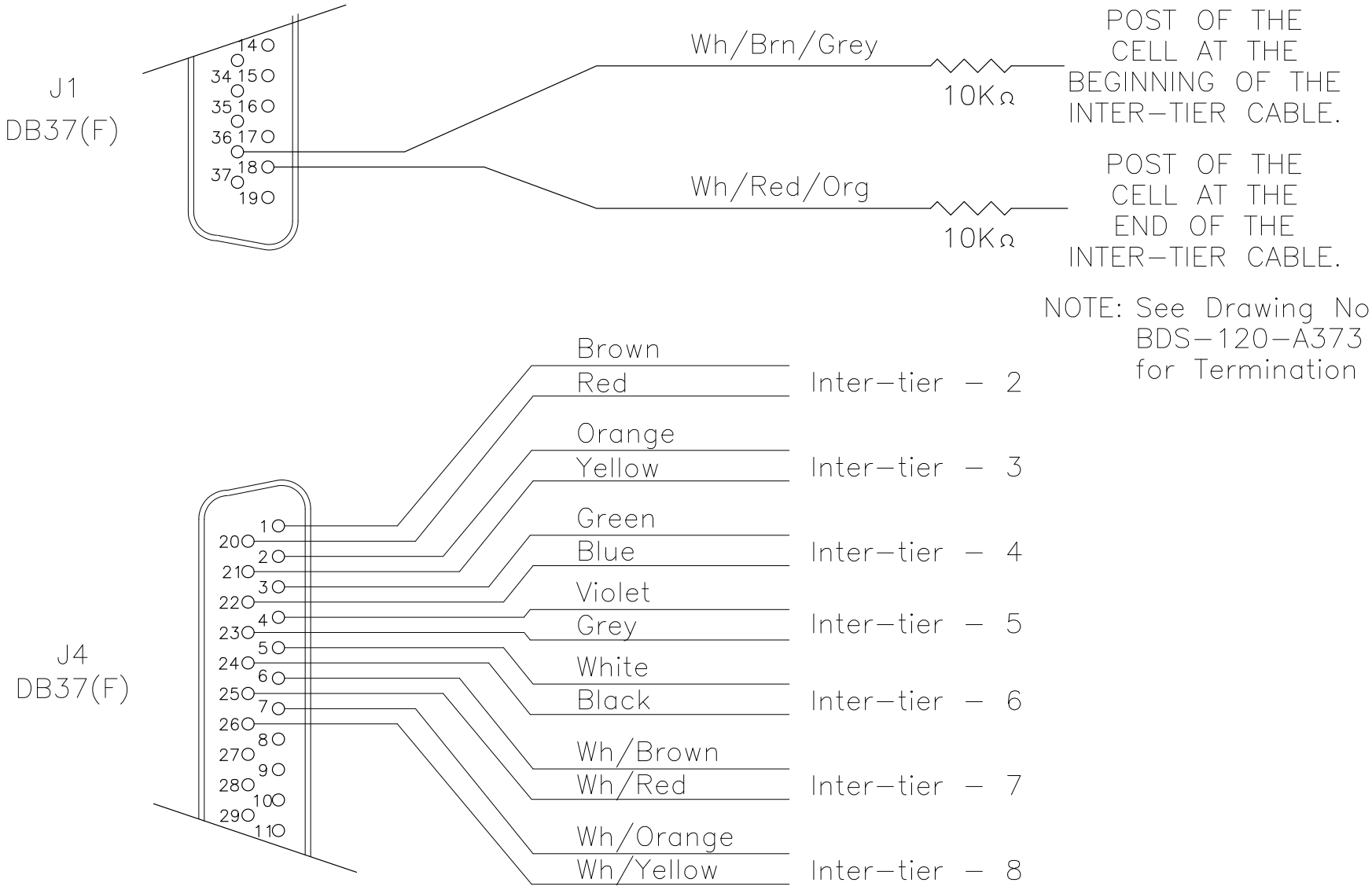
SCALE: N.T.S.	DRAWN BY: J. Jones
DATE: 2−1−99	CHECKED BY: Ed Deveau

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.
TOLERANCES: FRACT ± 1/32
.x ± .05 .xx ± .01 .xxx± .005

REV.	DATE	CHANGE RECORD
B	12/01	Added Temp. 2−8
A	3/99	Added Color Code

SUB ASSEMBLY
TEMPERATURE CONNECTIONS
MPM−100

SHEET	DRAWING No.	REV.
1 OF 1	BDS−159−A421	B



Alber

Boca Raton, FL 33437-2813

MATERIAL:

SCALE: N.T.S. DRAWN BY: J. Jones

DATE: 2-1-99 CHECKED BY: Ed Deveau

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.
TOLERANCES: FRACT ± 1/32
.x ± .05 .xx ± .01 .xxx± .005

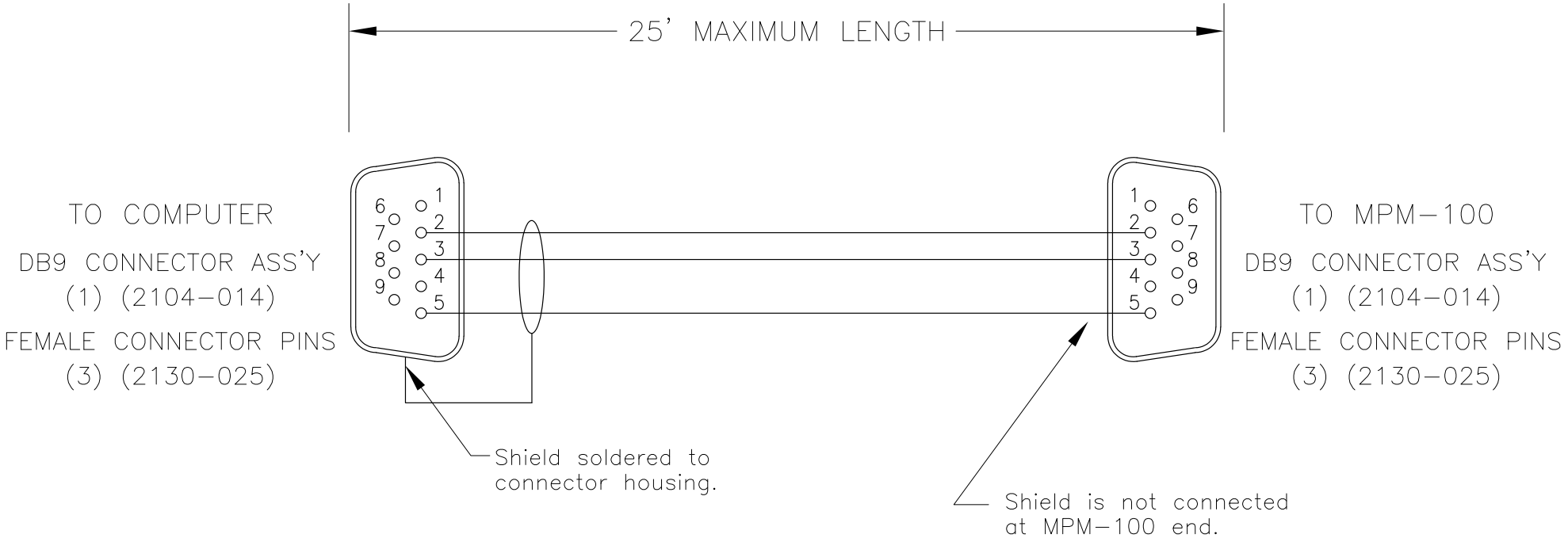
REV.	DATE	CHANGE RECORD
B	12/01	Added Ch. 5-8
A	3/99	Added Color Codes

SUB ASSEMBLY
INTER-TIER CONNECTION
MPM-100

SHEET 1 OF 1

DRAWING No. BDS-160-A422

REV. B



Alber

Boca Raton, FL 33437-2813

MATERIAL:

SCALE: N.T.S. | DRAWN BY: J. Jones

DATE: 2-3-99 | CHECKED BY: Ed Deveau

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.
TOLERANCES: FRACT ± 1/32
.x ± .05 .xx ± .01 .xxx± .005

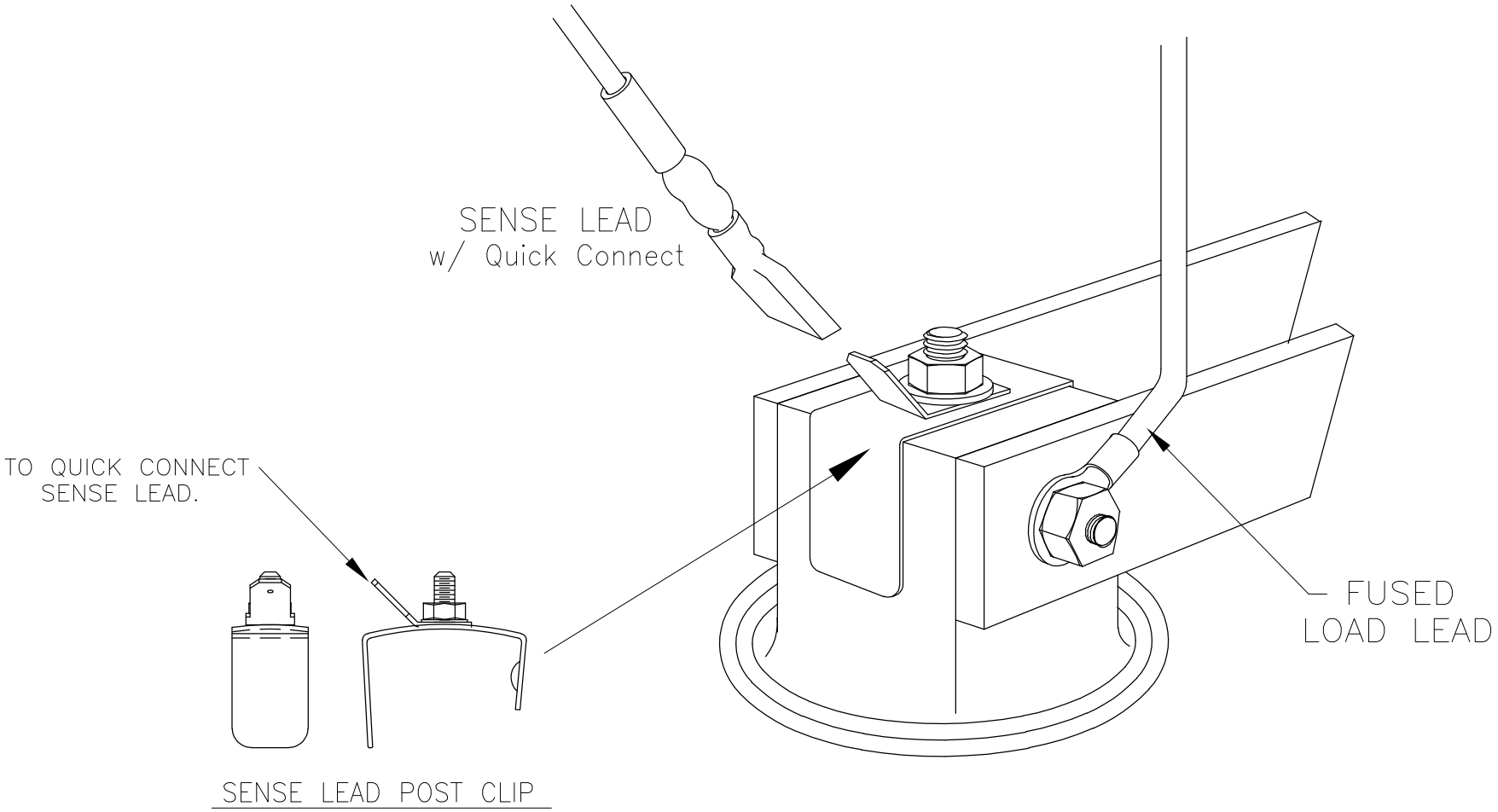
REV.	DATE	CHANGE RECORD

SUB ASSEMBLY
SERIAL INTERCONNECT CABLE
MPM-100

SHEET 1 OF 1

DRAWING No. BDS-162-A423

REV.



OPTIONAL POST CLIP CONNECTION

Alber
Boca Raton, FL 33437-2813

MATERIAL:

SCALE: N.T.S.	DRAWN BY: J. Jones
DATE: 2-3-99	CHECKED BY: Ed Deveau

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.
TOLERANCES: FRACT ± 1/32
.x ± .05 .xx ± .01 .xxx± .005

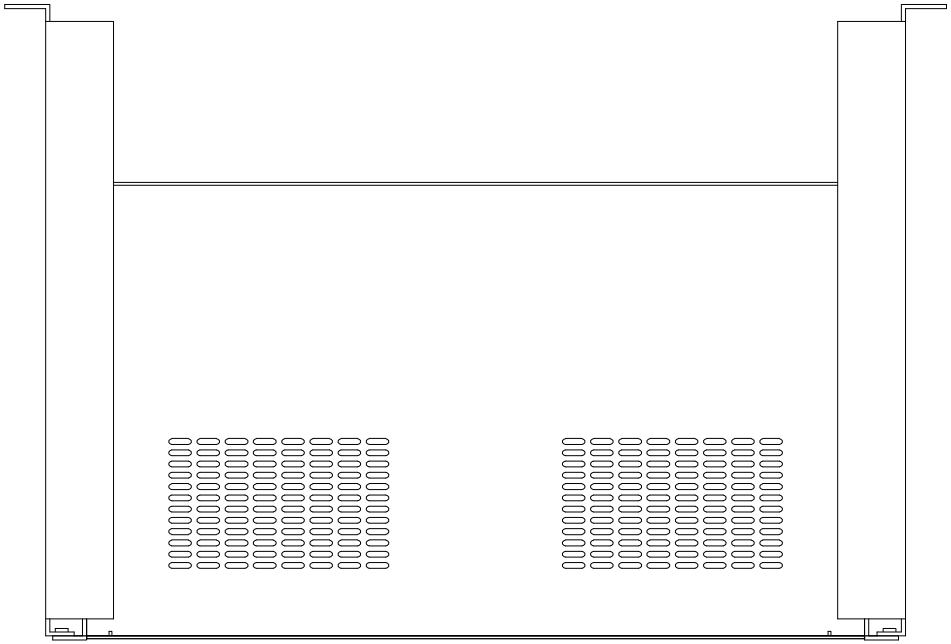
REV.	DATE	CHANGE RECORD
A	5/03	Added optional notes.

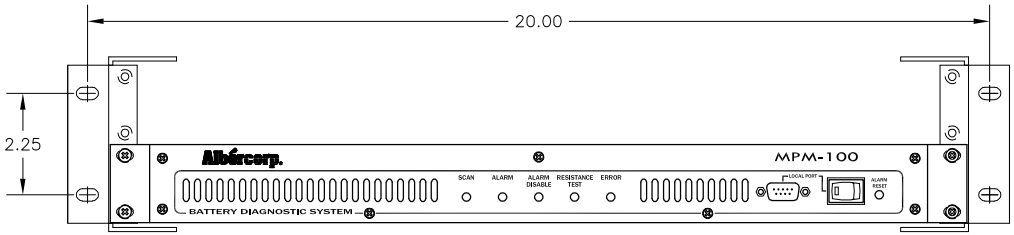
INSTALLATION DETAILS

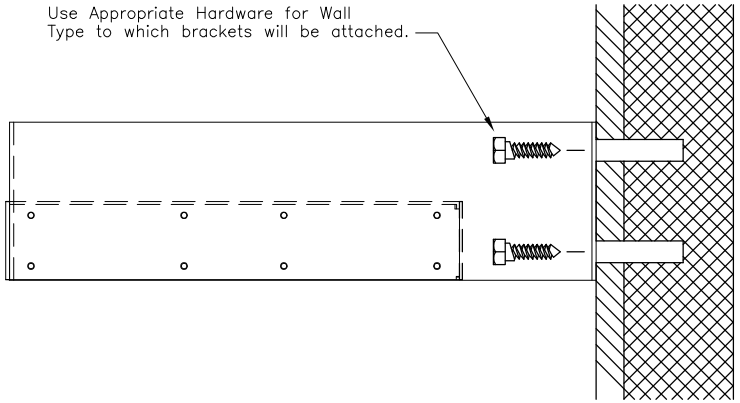
OPTIONAL QUICK CONNECT POST CLIP LEADS

BATTERY DIAGNOSTIC SYSTEM

SHEET	DRAWING No.	REV.
1 OF 1	BDS-163-A424	A







For Wall Mounting of 1 or 2 DCM–480 or MPM–100
Requires (2) 1400–778

REV	DATE	CHANGE RECORD
B	2/02	Chg'd to MPM–100
A	12/01	Added Alber P/N

UNLESS OTHERWISE SPECIFIED. ALL DIMENSIONS ARE IN INCHES
TOLERANCES:
ANGLES: ± 0 15'
FRACTIONS: ± 1/32
DECIMALS: x ± 05 xx ± 01 xxx ± 005

SUB ASS'Y or PART No. : 1400–778 (2)

MATERIAL:

SCALE: Half size

DRAWN BY: J. Jones

DATE: 10–29–2001

CHECKED BY: Ed Deveau

Albércorp.

ALBÉR CORP.
BOCA RATON, FL. 33487-2813

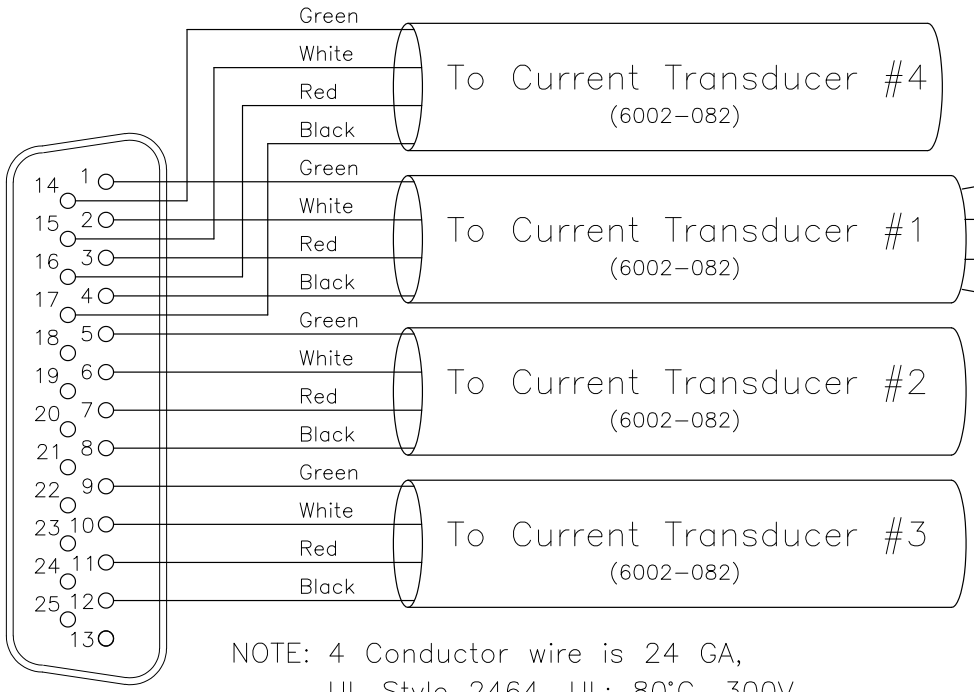
GENERAL ASSEMBLY
2U WALL MOUNT BRACKETS
DCM–480/MPM–100

SHEET 1 OF 1

DRAWING NUMBER BDS–345–C655

REV. B

J5
DB25(M)
(Amp No. 745496-5)
(Alber No. 2104-036)
(Amp No. 747824-1)
(Alber No. 2104-052)



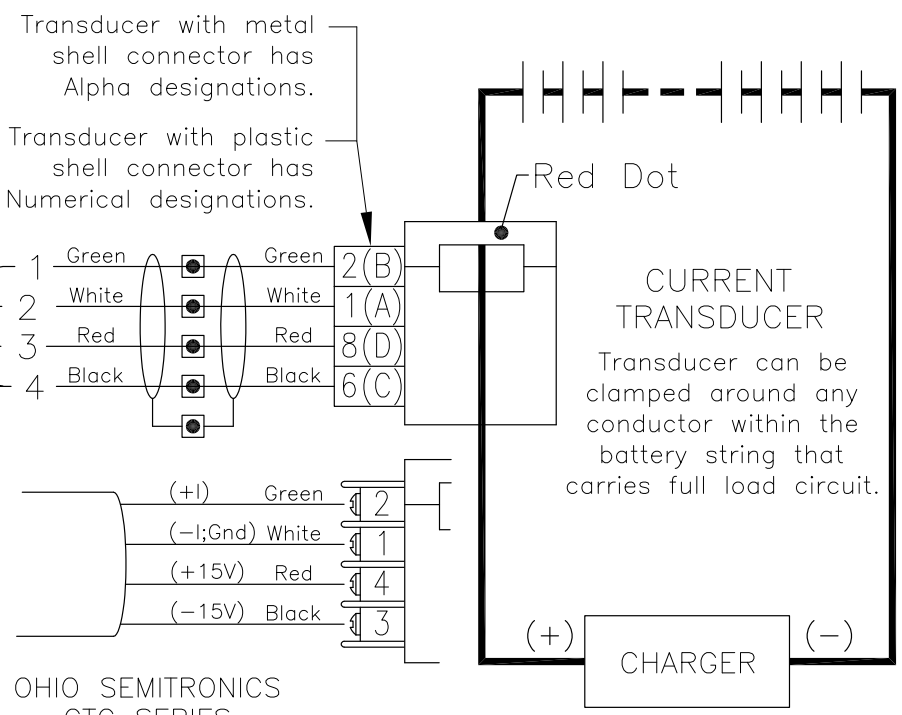
NOTE: 4 Conductor wire is 24 GA, UL Style 2464, UL: 80°C, 300V. End to be terminated at installation.

OHIO SEMITRONICS
CTG SERIES
CURRENT TRANSDUCERS
(With Connector and Cable)

Splice wires from OS cable to 4 Cond. cable as shown.

Transducer with metal shell connector has Alpha designations.

Transducer with plastic shell connector has Numerical designations.



OHIO SEMITRONICS
CTG SERIES
CURRENT TRANSDUCERS
(With Terminal Block)

Terminate 4 cond cable for connection directly to (4) #6-32 terminal screws.

Alber
Boca Raton, FL 33437-2813

MATERIAL:

SCALE: N.T.S. DRAWN BY: J. Jones

DATE: 6-14-2001 CHECKED BY: Ed Deveau

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.
TOLERANCES: FRACT ± 1/32
.x ± .05 .xx ± .01 .xxx± .005

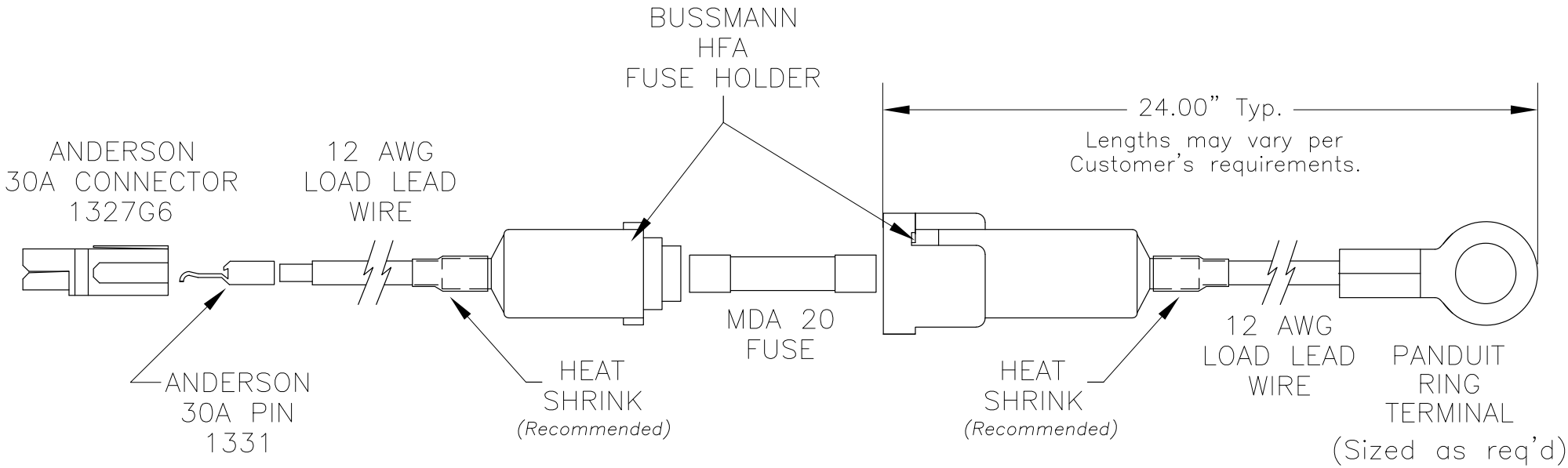
REV.	DATE	CHANGE RECORD
B	1/04	Added CT w/ Term. Bl.
A	10/01	Clarified Pin-outs

SUB ASSEMBLY
CURRENT TRANSDUCER CONNECTIONS
MPM-100

SHEET 1 OF 1

DRAWING No. BDS-1120-A483

REV. B



NOTE: For proper crimp connection use:

ANDERSON CRIMP TOOL
1351G1

NOTE: For proper crimp connection on fuse holder use:

THOMAS & BETTS CRIMP TOOL
WT–111–M

Alber
Boca Raton, FL 33437-2813

MATERIAL:

SCALE: Full Size | DRAWN BY: J. Jones
DATE: 5–14–97 | CHECKED BY: Ed Deveau

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.
TOLERANCES: FRACT ± 1/32
.x ± .05 .xx ± .01 .xxx± .005

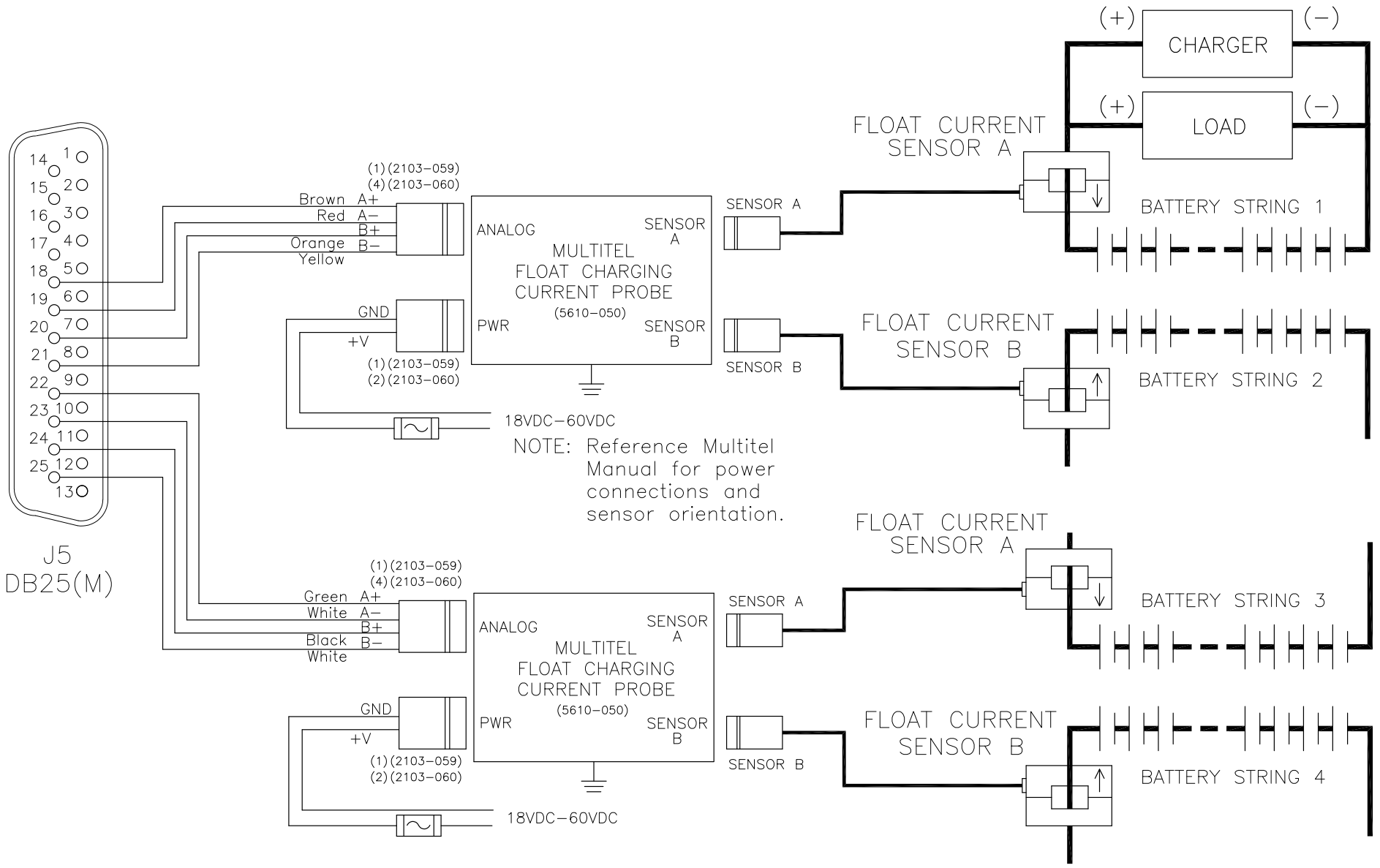
REV.	DATE	CHANGE RECORD

SUB ASS'Y
FUSE PROTECTED LOAD LEAD BATTERY DIAGNOSTIC SYSTEM

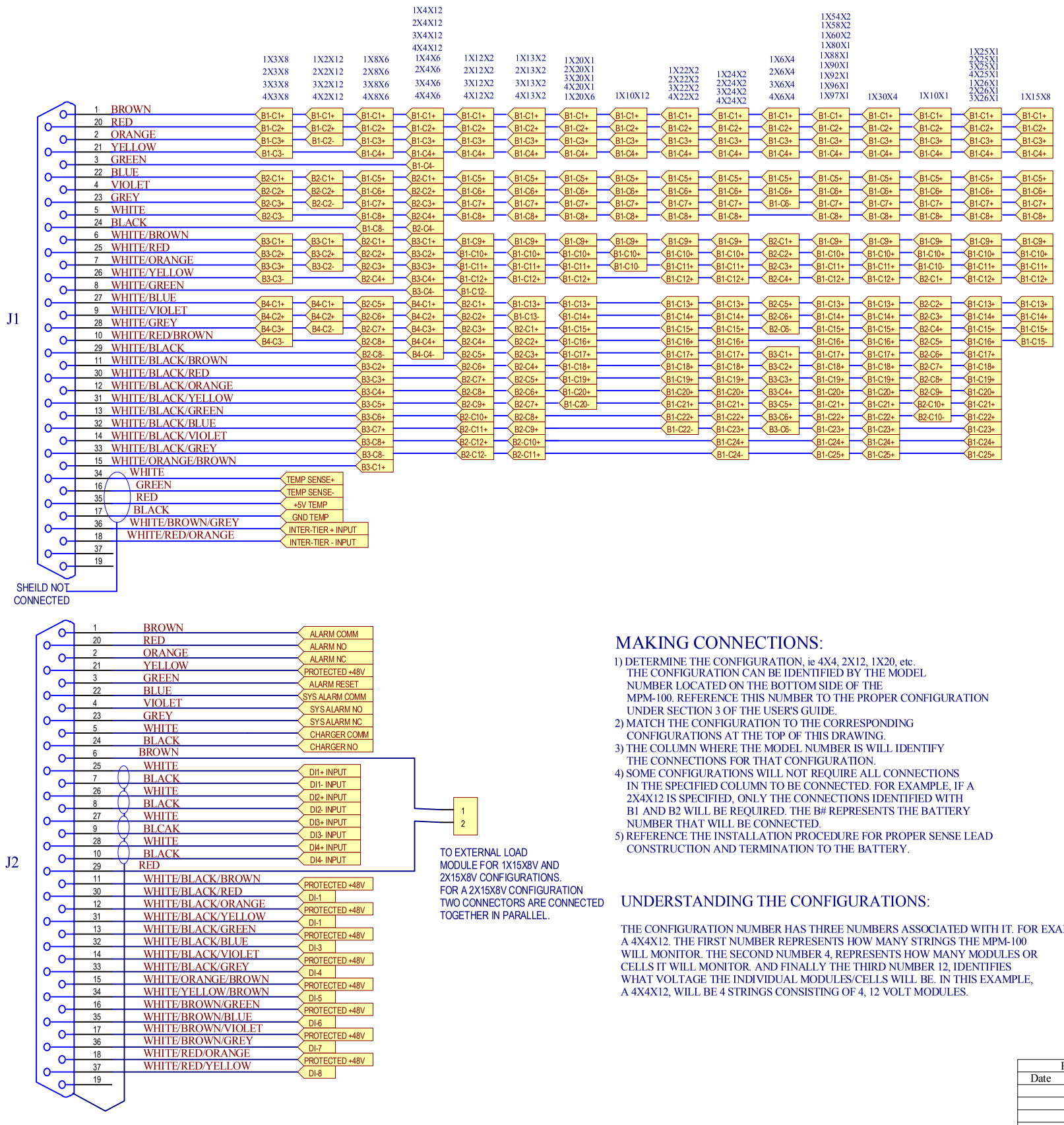
SHEET 1 OF 1

DRAWING No. BDS–1141–A510

REV.



Alber Boca Raton, FL 33437-2813	UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES. TOLERANCES: FRACT ± 1/32 .x ± .05 .xx ± .01 .xxx± .005	SUB ASSEMBLY	
MATERIAL:		FLOAT CURRRENT TRANSDUCER CONNECTIONS	
		MPM−100	
SCALE: N.T.S. DRAWN BY: J. Jones	REV. DATE CHANGE RECORD	SHEET 1 OF 1	DRAWING No. BDS−1145−A511 REV.
DATE: 12−14−2001 CHECKED BY: Ed Deveau			



MAKING CONNECTIONS:

1) DETERMINE THE CONFIGURATION, ie 4X4, 2X12, 1X20, etc. THE CONFIGURATION CAN BE IDENTIFIED BY THE MODEL NUMBER LOCATED ON THE BOTTOM SIDE OF THE MPM-100. REFERENCE THIS NUMBER TO THE PROPER CONFIGURATION UNDER SECTION 3 OF THE USER'S GUIDE.
2) MATCH THE CONFIGURATION TO THE CORRESPONDING CONFIGURATIONS AT THE TOP OF THIS DRAWING.
3) THE COLUMN WHERE THE MODEL NUMBER IS WILL IDENTIFY THE CONNECTIONS FOR THAT CONFIGURATION.
4) SOME CONFIGURATIONS WILL NOT REQUIRE ALL CONNECTIONS IN THE SPECIFIED COLUMN TO BE CONNECTED. FOR EXAMPLE, IF A 2X4X12 IS SPECIFIED, ONLY THE CONNECTIONS IDENTIFIED WITH B1 AND B2 WILL BE REQUIRED. THE B# REPRESENTS THE BATTERY NUMBER THAT WILL BE CONNECTED.
5) REFERENCE THE INSTALLATION PROCEDURE FOR PROPER SENSE LEAD CONSTRUCTION AND TERMINATION TO THE BATTERY.

UNDERSTANDING THE CONFIGURATIONS:

THE CONFIGURATION NUMBER HAS THREE NUMBERS ASSOCIATED WITH IT. FOR EXAMPLE, A 4X4X12. THE FIRST NUMBER REPRESENTS HOW MANY STRINGS THE MPM-100 WILL MONITOR. THE SECOND NUMBER 4, REPRESENTS HOW MANY MODULES OR CELLS IT WILL MONITOR. AND FINALLY THE THIRD NUMBER 12, IDENTIFIES WHAT VOLTAGE THE INDIVIDUAL MODULES/CELLS WILL BE. IN THIS EXAMPLE, A 4X4X12, WILL BE 4 STRINGS CONSISTING OF 4, 12 VOLT MODULES.

PCN History	
Date	PCN No.

Title: **MPM-100 CONNECTIONS J1, J2 & J5**

Size: B | Number: BDS-1142-B655 | Rev.: D

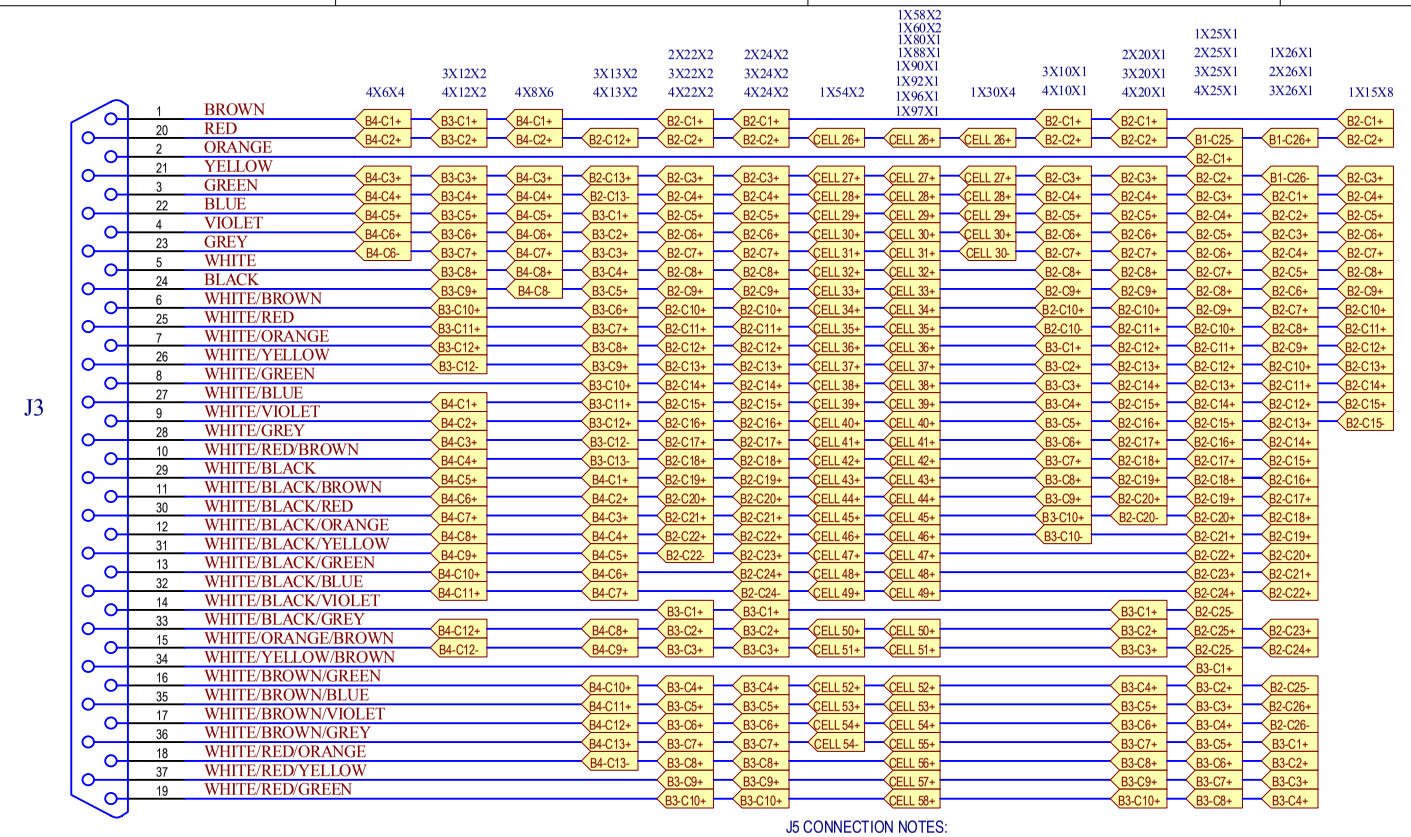
Date: 19-Jan-2004 Time: 09:35:17 Sheet 1 of 1

File: Sense-J1-J2 - Rev.D.sch

ALBERCORP
990 SOUTH ROGERS CIRCLE
SUITE 11
BOCA RATON, FL 33487

Drawn by: E. Deveau

Checked by: S.C.



REFERENCE DRAWING BDS-1145-/

PCN History	
Date	PCN No.

Title: **MPM-100 CONN. W/100 CHAN. OPTION**

Size: B | Number: BDS-1144-B657 | Rev.: D

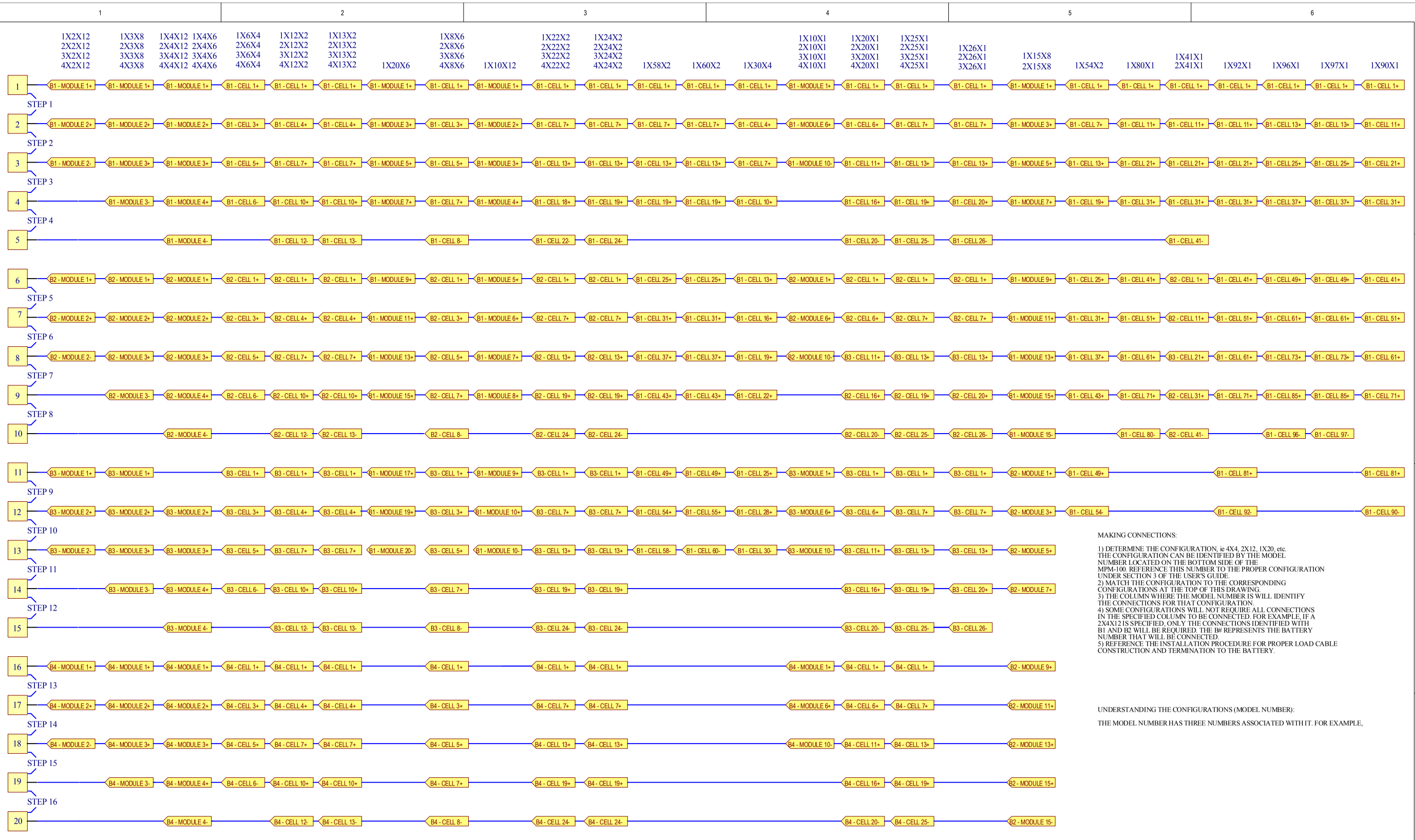
Date: 19-Jan-2004 Time: 09:36:23 Sheet 1 of 1

File: Sense-100CH-OPTION - Rev.D.Sch

ALBERCORP
990 SOUTH ROGERS CIRCLE
SUITE 11
BOCA RATON, FL 33487

Drawn by: E. Deveau

Checked by: S.C.



MAKING CONNECTIONS:

1) DETERMINE THE CONFIGURATION, ie 4X4, 2X12, 1X20, etc. THE CONFIGURATION CAN BE IDENTIFIED BY THE MODEL NUMBER LOCATED ON THE BOTTOM SIDE OF THE MPM-100. REFERENCE THIS NUMBER TO THE PROPER CONFIGURATION UNDER SECTION 3 OF THE USER'S GUIDE.
2) MATCH THE CONFIGURATION TO THE CORRESPONDING CONFIGURATIONS AT THE TOP OF THIS DRAWING.
3) THE COLUMN WHERE THE MODEL NUMBER IS WILL IDENTIFY THE CONNECTIONS FOR THAT CONFIGURATION.
4) SOME CONFIGURATIONS WILL NOT REQUIRE ALL CONNECTIONS IN THE SPECIFIED COLUMN TO BE CONNECTED. FOR EXAMPLE, IF A 2X4X12 IS SPECIFIED, ONLY THE CONNECTIONS IDENTIFIED WITH B1 AND B2 WILL BE REQUIRED. THE B# REPRESENTS THE BATTERY NUMBER THAT WILL BE CONNECTED.
5) REFERENCE THE INSTALLATION PROCEDURE FOR PROPER LOAD CABLE CONSTRUCTION AND TERMINATION TO THE BATTERY.

UNDERSTANDING THE CONFIGURATIONS (MODEL NUMBER):

THE MODEL NUMBER HAS THREE NUMBERS ASSOCIATED WITH IT. FOR EXAMPLE,

PCN History	
Date	PCN No.

Title **LOAD CONNECTIONS FOR MPM-100**

Size: B | Number: BDS-156-B562 | Rev.: I

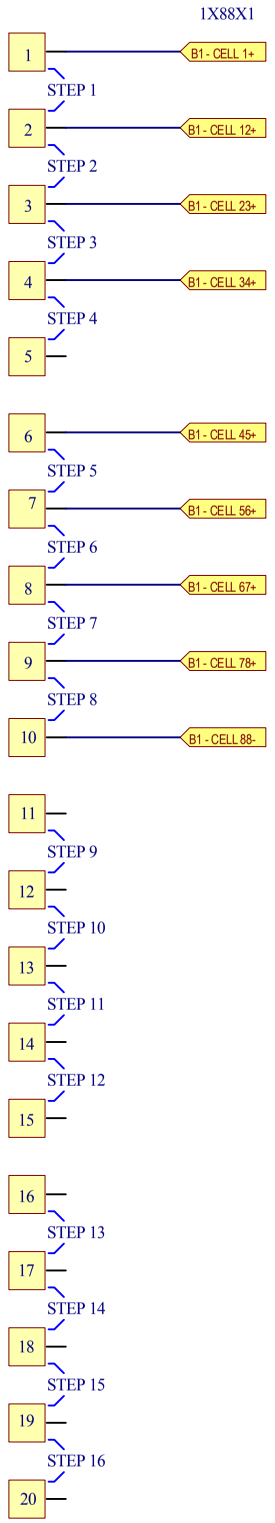
Date: 19-Jan-2004 Time: 09:37:02 Sheet 1 of 2

File: Load-1of2 Rev.I.sch

ALBERCORP
990 SOUTH ROGERS CIRCLE
SUITE 11
BOCA RATON, FL 33487

Drawn by: E. Deveau

Checked by: S.C.



MAKING CONNECTIONS:

1) DETERMINE THE CONFIGURATION, ie 4X4, 2X12, 1X20, etc.
THE CONFIGURATION CAN BE IDENTIFIED BY THE MODEL
NUMBER LOCATED ON THE BOTTOM SIDE OF THE
MPM-100. REFERENCE THIS NUMBER TO THE PROPER CONFIGURATION
UNDER SECTION 3 OF THE USER'S GUIDE.
2) MATCH THE CONFIGURATION TO THE CORRESPONDING
CONFIGURATIONS AT THE TOP OF THIS DRAWING.
3) THE COLUMN WHERE THE MODEL NUMBER IS WILL IDENTIFY
THE CONNECTIONS FOR THAT CONFIGURATION.
4) SOME CONFIGURATIONS WILL NOT REQUIRE ALL CONNECTIONS
IN THE SPECIFIED COLUMN TO BE CONNECTED. FOR EXAMPLE, IF A
2X4X12 IS SPECIFIED, ONLY THE CONNECTIONS IDENTIFIED WITH
B1 AND B2 WILL BE REQUIRED. THE B# REPRESENTS THE BATTERY
NUMBER THAT WILL BE CONNECTED.
5) REFERENCE THE INSTALLATION PROCEDURE FOR PROPER LOAD CABLE
CONSTRUCTION AND TERMINATION TO THE BATTERY.

UNDERSTANDING THE CONFIGURATIONS (MODEL NUMBER):

THE MODEL NUMBER HAS THREE NUMBERS ASSOCIATED WITH IT. FOR EXAMPLE,

PCN History	
Date	PCN No.

Title ***LOAD CONNECTIONS FOR MPM-100***

Size: B | Number: BDS-156-B562 | Rev.: I

Date: 19-Jan-2004 Time: 09:37:47 Sheet 2 of 2

File: Load-2of2 Rev.I.sch

ALBERCORP
990 SOUTH ROGERS CIRCLE
SUITE 11
BOCA RATON, FL 33487

Drawn by: *E. Deveau*

Checked by: *S.C.*