

TRUE BLUE POWER®

A division of Mid-Continent Instrument Co., Inc.

Advanced Lithium-ion Battery Support Guide



True Blue Power® is a division of Mid-Continent Instrument Co., Inc.

Mid-Continent Instrument Co., Inc.
dba Mid-Continent Instruments and Avionics
9400 E. 34th Street N.
Wichita, KS 67226 USA
ph (800) 821-1212 fx (316) 630-0723

Revision 4, May 15, 2023

FOREWORD

This guide provides information intended for use by persons who, in accordance with current regulatory requirements, are qualified to install and maintain this equipment. If further information is required, please contact:

True Blue Power
c/o Mid-Continent Instrument Co., Inc.
Attn: Customer Service Dept.
9400 E. 34th St. N.
Wichita, KS 67226 USA
Phone 316-630-0101
Fax 316-630-0723
www.truebluepowerusa.com
www.mcico.com

We welcome your comments concerning this guide. Although every effort has been made to keep it free of errors, some may occur. When reporting a specific problem, please describe it briefly and include the guide reference number, the paragraph/figure/table number and the page number. Send your comments to:

True Blue Power
c/o Mid-Continent Instrument Co., Inc.
Attn: Technical Publications
9400 E. 34th St. N.
Wichita, KS 67226 USA
Phone 316-630-0101
Fax 316-630-0723

All products produced by Mid-Continent Instrument Co., Inc., including those identified as Mid-Continent Instruments and Avionics or True Blue Power®, are designed and manufactured in Wichita, Kansas, USA.

REVISION HISTORY

| Rev | Date | Detail | Approved |
|------------|-------------|-----------------------|-----------------|
| 1 | 2/3/2020 | Initial release. | |
| 2 | 2/22/2021 | Updated Phone numbers | |
| 3 | 2/7/2023 | Added TB60 | |
| 4 | 5/15/2023 | Added TB14 and TB28 | |

TABLE OF CONTENTS

| | |
|--|----------|
| FOREWORD | 2 |
| REVISION HISTORY | 3 |
| SECTION 1 BATTERY MAINTENANCE | 5 |
| 1.1 REQUIRED EQUIPMENT | 5 |
| 1.2 STORAGE | 5 |
| 1.3 CHARGING | 5 |
| 1.3.1 TS835 | 5 |
| 1.3.2 TB17 | 5 |
| 1.3.3 TB44 | 5 |
| 1.3.4 TB14/20/30/40/60 | 6 |
| 1.3.5 TB28 | 6 |
| SECTION 2 SHIPPING | 6 |
| 2.1 BACKGROUND | 6 |
| 2.2 CONTINENTAL USA | 6 |
| 2.3 OUTSIDE THE CONTINENTAL USA | 6 |
| 2.4 24/7 EVENT OR ACCIDENT EMERGENCY CONTACT | 6 |
| 2.5 MANUFACTURER'S SHIPPING ADDRESS | 7 |
| 2.6 DISPOSAL | 7 |
| 2.7 RECYCLING OPTIONS | 7 |
| SECTION 3 BATTERY OUTGASSING PROCEDURES | 8 |
| 3.1 HAZARDS | 8 |
| 3.2 EMERGENCY ACTIONS | 8 |
| 3.3 PERSONAL INJURY OR TREATMENT | 9 |
| 3.4 POST EVENT ACTIONS | 9 |
| SECTION 4 DOCUMENTS AND FORMS | 9 |
| 4.1 LITHIUM-ION BATTERY SHIPPING PREPARATION PROCEDURE | 9 |
| 4.2 RECOMMENDED SAFETY EQUIPMENT | 9 |
| 4.3 SAFETY DATA SHEETS (SDS) | 9 |
| 4.4 TRANSPORTATION CERTIFICATES | 9 |
| 4.4.1 TS60 | 9 |
| 4.4.2 TS835 | 9 |
| 4.4.3 TB17 | 10 |
| 4.4.4 TB44 | 10 |
| 4.4.5 TB20 | 10 |
| 4.4.6 TB30 | 10 |
| 4.4.7 TB40 | 10 |
| 4.4.8 TB60 | 10 |
| 4.4.9 TB14/28 | 10 |
| 4.5 PRODUCT RETURN PROCESS (PRP) | 10 |
| 4.6 WARRANTY CLAIM FORM | 10 |

SECTION 1 BATTERY MAINTENANCE

1.1 REQUIRED EQUIPMENT

- Power supply capable of constant potential/voltage
- Electronic load
- Respective Installation Manual

1.2 STORAGE

STORAGE TEMPERATURE: Recommended maximum storage temperature is 30° (86°F). Storage temperatures above 50°C (122°F) are to be avoided.

SHELF LIFE: Stored batteries shall be fully recharged at a minimum every 6 months, except the TB44 shall be recharged every 3 months, following the procedure found in the respective Installation Manual or the below in Section 1.3 CHARGING. If the storage time is unknown, a battery should be fully recharged prior to reaching 20VDC for TS835, TS60, TB17, TB44 or 10% SOC for the TB20/30/40.

1.3 CHARGING

When shipped by air, batteries are at a reduced state-of-charge and shall be fully charged upon receipt. Batteries that are stored shall be fully recharged at a minimum every 3 months, or prior to reaching 20VDC for TS835, TS60, TB17, TB44 or 10% SOC for the TB14/20/28/30/40/60. Always charge with Constant Potential/Voltage.

***** CAUTION *****

If battery is below 20VDC (except TB28), contact True Blue Power at +1 316.630.0101 before proceeding further. If you attempt to charge a battery and the battery does not accept charge current, contact True Blue Power at +1 316.630.0101 for assistance.

Always charge with Constant Potential/Voltage. For automated method with a battery analyzer, reference example below in 3.2.6.

1.3.1 **TS835**

Charge will take approximately 1.5 hours for a fully discharged unit.

1. Use of a power supply capable of 5A.
2. Apply 28VDC power to primary input pin (power on pin 10, ground on pin 12).
3. Current draw should be 0.15 - 3.5A throughout the charge cycle.
4. When the current draw reaches 0.15A or below, unit is fully charged.

1.3.2 **TB17**

Charge will take approximately 1 hour for a fully discharged unit.

1. Set the power supply to constant voltage of 28.8VDC.
2. Limit the maximum current of power supply to 17A.
3. Charge battery until charge current tapers to less than 0.7A.

1.3.3 **TB44**

Charge will take approximately 45 minutes for a fully discharged unit.

1. Press and hold the Heater Enable/Disable switch on front of battery for 2 seconds. (Green light should illuminate continuously)

***** NOTE *****

If the light does not illuminate, this indicates the battery is of a very low state of charge or is damaged. **DO NOT ATTEMPT TO CHARGE.**

Contact True Blue Power at +1 316.630.0101.

2. Set power supply to constant voltage of 28.5VDC.

3. Limit maximum current of power supply to 60A or less. (Reduced amperage limits will increase charge time)
4. Charge battery until charge current tapers to less than 1.0A.

1.3.4 TB14/20/30/40/60

Charge will take approximately 1 hour for a fully discharged unit.

1. Set the power supply to a constant voltage of 28.8VDC.
2. Limit the maximum current of the power supply to 14/20/30/40/60A respectively or less. (Reduced amperage limits will increase charge time)
3. Charge the battery until the charge current tapers to less than 1.0A

1.3.5 TB28 12 VDC

Charge will take approximately 1 hour for a fully discharged unit.

1. Set the power supply to a constant voltage of 14.4VDC
2. Limit the maximum current of the power supply to 28A (or less)
3. Charge the battery until the charge current tapers to less than 1.0A

SECTION 2 SHIPPING

2.1 BACKGROUND

True Blue Power Lithium-ion battery products are classified as Class 9 HazMat Dangerous Goods and require special processes for shipping. All True Blue Power Lithium-ion batteries may ship via ground or vessel at 100% State of Charge, but per IATA regulations are REQUIRED to be at 30% State of Charge prior to shipping via air and can only be transported via Cargo Aircraft only (i.e. FedEx, UPS, DHL, etc). It is important to only discharge to 30% shortly before shipping to avoid a potential over discharge scenario. Batteries will need to receive full recharge within 30 days to ensure battery health is maintained.

Procedures on properly charging and discharging a battery for shipment can be found in the respective installation manual and, for main ship batteries only, in the following Section 4.1 CHARGING AND DISCHARGING GUIDE.

2.2 CONTINENTAL USA

True Blue Power Lithium-ion battery products are classified as Class 9 HazMat Dangerous Goods and require special processes for shipping. Forms the carrier may request for shipping are available in Section 4.2 SAFETY DATA SHEETS (SDS) and 4.3 TRANSPORTATION CERTIFICATES. If your facility is within the continental USA but not HAZMAT certified, True Blue Power can support a Product Return Process (PRP). Information can be found in Section 4.4 PRODUCT RETURN PROCESS (PRP). For coordination of a PRP, please contact us by phone at +1 316.630.0101 or by email at productsupport@mcico.com

2.3 OUTSIDE THE CONTINENTAL USA

True Blue Power Lithium-ion battery products are classified as Class 9 HazMat Dangerous Goods and require special processes for shipping. If your facility is NOT certified to ship HAZMAT, please contact a HAZMAT approved carrier for support. Forms the carrier may request for shipping are available in Section 4.2 SAFETY DATA SHEETS (SDS) and 4.3 TRANSPORTATION CERTIFICATES.

2.4 24/7 EVENT OR ACCIDENT EMERGENCY CONTACT

CHEMTREC
Spill Leak Fire Exposure or Accident
Domestic North America: 800-424-9300
International: +1 703-527-3887 (collect calls accepted)

2.5 MANUFACTURER'S SHIPPING ADDRESS

True Blue Power
9400 E 34th St N
Wichita, KS 67226
Phone: 316.630.6000

2.6 DISPOSAL

At True Blue Power, we want to be your long-term partner throughout the life of the product, so we have developed a return program within the USA to assist with proper disposal of True Blue Power Lithium batteries.

- Do not incinerate.
- Battery should be fully discharged prior to disposal.
- End of life batteries should always ship in packaging that complies with related HAZMAT regulations regarding labeling and always using ground services to ship.
- Lithium-ion batteries are classified by the United States government as nonhazardous waste and are safe for disposal as normal municipal waste or can be recycled (Recycling Options noted in Section 2.7 below).
- International options are noted in Section 2.7 below.

2.7 RECYCLING OPTIONS

Lithium-ion batteries do contain recyclable materials and recycling options available in your local area should be considered when disposing of these products. Recycling and disposal are generally regulated by country, state, and local regulations.

USA

BATTERY SOLUTIONS, INC.
4930 Holtz Dr
Wixom, MI 48393
800-852-8127
<https://www.batterysolutions.com/>

RETRIEV TECHNOLOGIES
8090 Lancaster-Newark Rd NE
Baltimore, OH 43105
740-653-6290
www.retrievtech.com

HERITAGE-CRYSTAL CLEAN
Corporate Office
2175 Point Blvd, Suite 375
Elgin, IL 60123
877-938-7948
<http://www.crystal-clean.com>

Europe

Lithium Werks BV
+44 (0)28 9084 5400
Mallusk Enterprise Park
Mallusk Dr
Newtownabbey BT36 4GN
<https://lithiumwerks.com/>

Lithium Werks BV produces lithium iron phosphate batteries, which are categorized as Industrial Batteries under the Waste Batteries and Accumulators Regulations of 2009. We are obliged to take back free of charge, waste industrial batteries supplied to an end user for treatment and recycling. We are required to do this in any calendar year we place new industrial batteries on the market. We agree to undertake the necessary arrangements for the return, proper treatment and recycling of the waste industrial batteries.

G&P BATTERIES LTD
Crescent Works Industrial Park
Willenhall Road
Darlaston WS10 8JR
United Kingdom
Telephone: +44 (0)121 568 3200
www.g-pbatt.co.uk

UMICORE RECYCLING SOLUTIONS
Watertorenstraat 33
B-2250 Olen, Belgium
+32 14 24.50.10
www.batteryrecycling.umicore.com

RECUPYL
Rue de la métallurgie
38420 Domène, France
+33 4 76 77 43 97
www.recupyl.com

Canada

RETRIEV TECHNOLOGIES
9384 Highway 22A
Trail, BC V1R 4W6
250-367-9882
www.retrievech.com

SECTION 3 BATTERY OUTGASSING PROCEDURES

3.1 HAZARDS

A unit will not emit or absorb any gas during storage, transportation, or during normal operating conditions. If a True Blue Power battery experiences a thermal event, you will note white exhaust smoke exiting through the vent, if vented. It is vaporized electrolyte and is very hot. It also contains small amounts of hydrogen fluoride; direct or prolonged exposure is not recommended. Further information is provided on the SDS in Section 4.2 SAFETY DATA SHEETS (SDS).

3.2 EMERGENCY ACTIONS

Section 4.2 RECOMMENDED SAFETY EQUIPMENT provides information on equipment to support safe handling of the batteries in emergencies.

1. Handle all suspect batteries with heat resistant gloves (do not use rubber gloves)
2. Safely disconnect power leading into battery
3. Depending on location of the battery when venting occurs, take following actions:

- a. Move battery on a cart to well-ventilated area or preferably outdoors, turn on ventilation system in battery room, or vacate area and open exterior doors.
- b. Allow battery to exhaust all its energy and cool to ambient temperature. Battery casing will withstand event. Or,
- c. Submerge or douse battery with water. Battery should remain submerged until completely cooled, or a minimum of four hours.

3.3 PERSONAL INJURY OR TREATMENT

See SDS (Section 4.2 SAFETY DATA SHEETS (SDS)) for complete information.

If direct contact with skin occurs, wash with water and immediately seek medical treatment for potential exposure to dilute of hydrogen fluoride which could include Iced Benzalkonium Chloride 0.13% Soaks or Calcium Gluconate gel.

If inhalation occurs, immediately seek medical treatment for potential exposure to dilute of hydrogen fluoride which could include oxygen and then possibly 2.5% Calcium Gluconate by Nebulizer.

3.4 POST EVENT ACTIONS

Wear appropriate Personal Protective Equipment (PPE), long gloves and dust mask.

Clean the immediate affected area with baking soda and water mixture (1 teaspoon of baking soda to 1 gallon of water) to neutralize possible acidity.

Dispose of water used to submerge battery: After the battery has cooled, the water must be pH tested to ensure a neutral reading before discarding water in a sanitary sewer (drain, sink, or toilet.) Water must not be discarded outside the building or in a storm sewer.

SECTION 4 DOCUMENTS AND FORMS

The following documents are attached and found in tool bar on left edge of document under attachments.

4.1 LITHIUM-ION BATTERY SHIPPING PREPARATION PROCEDURE

4.2 RECOMMENDED SAFETY EQUIPMENT

4.3 SAFETY DATA SHEETS (SDS)

4.4 TRANSPORTATION CERTIFICATES

4.4.1 TS60

4.4.2 TS835

4.4.3 TB17

4.4.4 TB44

4.4.5 TB20

4.4.6 TB30

4.4.7 TB40

4.4.8 TB60

4.4.9 TB14/28

4.5 PRODUCT RETURN PROCESS (PRP)

The Product Return Process (PRP) is available to customers within the continental United States who do not have HazMat shipping certification. The service does have a nominal fee dependent on materials required and quantity of units being shipped. The PRP can only be used for returns within the continental United States. FedEx is the only shipping method allowed. To initiate the Product Return Process, please contact True Blue Power by phone at +1 316.630.0101 or by email at productsupport@mcico.com.

Supplies required (per battery):

- Dangerous Goods form
- Dangerous Goods pouch
- 2 copies of SDS sheet (1 inside/1 outside)
- Copy of appropriate instructions (1 copy per order, per part number)
- Class 9 Label
- Address Label with Customer as Shipper
- FedEx Return Ship Label
- Caps for all connectors and terminals
- Packing materials – can be purchased if original packaging is unavailable
 - UN specified box
 - Top and bottom foam
 - Pink Antistatic bag
 - Blue reinforced tape to fit 3 sides for closure

4.6 WARRANTY CLAIM FORM