MOTOCRANE

12VA

12 TO 48 VOLTAGE ADAPTER

12VA Operation Manual v1.0
SEPTEMBER, 2019

⚠WARNING

To minimize risk of serious injury, death or damage, before using MotoCrane 12VA, all drivers and operators must read this Operation Manual and all on-product labels.

All practices and procedures stated herein are required for the proper and safe operation of the 12VA.

If there are any questions, please contact MotoCrane Support at support@motocrane.com.

Keep this Operation Manual near your 12VA for future reference.

Safety Signal Words

This manual and the safety labels attached to this equipment utilize signal words that signify safety hazards with different levels of severity. The words are preceded by a triangle signifying that these are safety related. Below are the words used and the definitions for these words:

- **⚠WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury or damage
- **⚠CAUTION** indicates a hazardous situation which, if not avoided, could result in minor or moderate injury or damage
- ***NOTICE*** is used to address practices not related to physical injury

The terms IMPORTANT and NOTE are also used to describe ideas for better and more efficient use of the 12VA.

Contents

Before the First Drive

Do the following before using the 12VA for the first time.

1. Read this Operation Manual
2. Read the Warranty in the Terms of Sale
3. Watch any available video tutorials at www.motocrane.com/support
4. Recommended: Attend MotoCrane Training for in-person demonstration

IMPORTANT PRODUCT AND SAFETY INSTRUCTIONS

Safety

The MotoCrane 12VA is not a toy and can cause serious injury, death or damage if not used properly. You must exercise caution during use of the 12VA to ensure a safe filming environment for everyone. This Operation Manual describes safe operation and should be read in conjunction with the applicable online training videos or additional in-person training.

IMPORTANT: Restricted Use Statement

The 12VA must only be used by trained operators 18 years of age or older. Only appropriate motor vehicles driven on a closed course with paved or finished surfaces (for example, asphalt, concrete, or tarmac) or moderate off-road (for example, gravel or dirt roads) conditions may be used. In addition, the speed and acceleration of the motor vehicle must not exceed system ratings for MotoCrane products as set forth in this Operation Manual.

Do not modify or adjust the 12VA. The 12VA has been calibrated before it is shipped to you. No modification or adjustment to the 12VA is allowed without the express written approval of MotoCrane, LLC.

Disclaimer and Limitations of Liability

You agree that you are responsible for your own conduct and any content created while using the 12VA, and for any consequences thereof. You agree to use this product only for purposes that are proper and in accordance with local laws, regulations or other legal requirements.

You also agree:

1. Any part of this disclaimer is subject to change without prior notice. Refer to www.motocrane.com/support for the latest version.

2. MotoCrane, LLC reserves the right of final interpretation of this disclaimer.

3. MotoCrane, LLC has no control over the use, setup, assembly, modification or misuse of the 12VA, and therefore no liability shall be assumed or accepted by

MotoCrane, LLC for any resulting damage, death, or injury incurred directly or indirectly from the use of the 12VA. By the act of use, setup or assembly, the user accepts all resulting liability.

Limited Warranty

The 12VA has a limited manufacturer's warranty on parts and assembly. See the Terms and Conditions of Sale for your 12VA for a complete description of this limited warranty. This Limited Warranty is incorporated by reference into this Operation Manual.

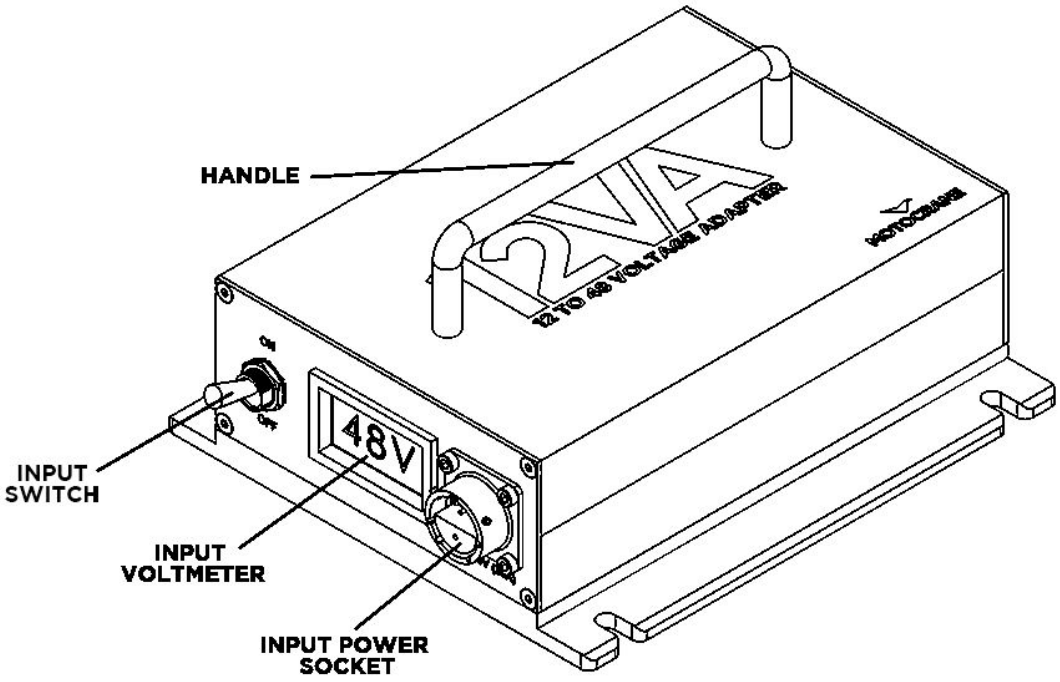
Intellectual Property

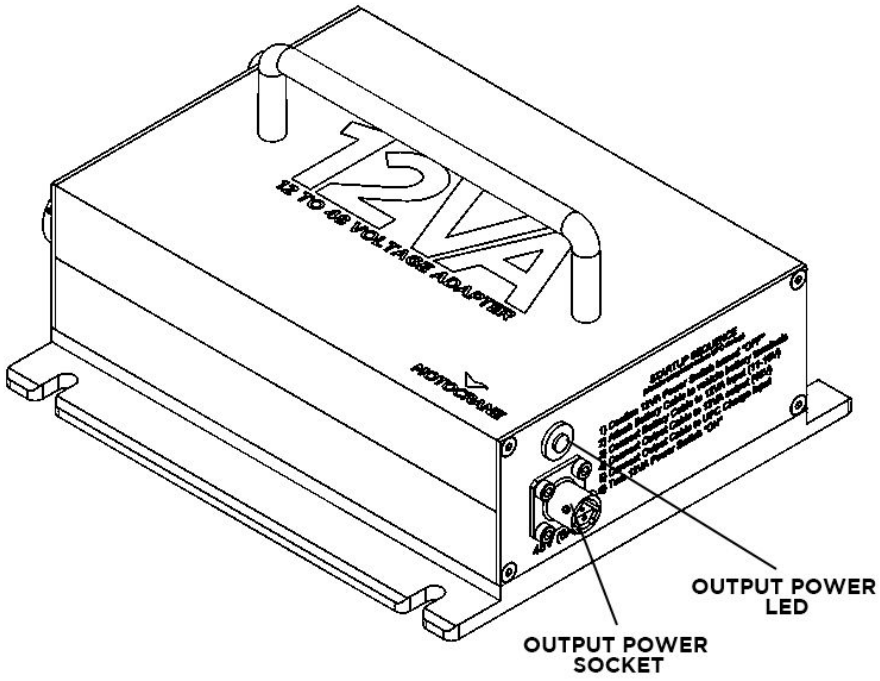
Parts of the 12VA

- 12VA Module
- 10’ Power Output Cable
- 25’ Battery Harness Cable

UPC System Overview

The 12VA (12V-ADAPTER) is a 400W power conversion device that allows the MotoCrane Ultracap Power Core (UPC) to be powered by a 12V car battery. In conjunction with the UPC, the 12VA effectively allows the user to run MotoCrane ULTRA from any 12V vehicle battery. Important features are pointed out in the following images.





Setting up the 12VA

NOTE: 12VA setup should occur before the MotoCrane Ultracap Power Core (UPC) and the MotoCrane Power Supply Unit (PSU) setup. Refer to the ULTRA Operation Manual and the UPC Operation Manual for more information.

12VA Setup at a Glance

1. Confirm the 12VA INPUT SWITCH is in the “OFF” position
2. Attach Battery Cable to vehicle battery terminals
3. Connect the Battery Cable to the 12VA INPUT POWER SOCKET (11-16V)
4. Connect the Output cable to the 12VA OUTPUT POWER SOCKET (48V)
5. Connect the Output cable to the UPC 48V CHARGE INPUT SOCKET
6. Turn 12VA INPUT SWITCH “ON”
7. Verify proper voltage input level with the 12VA INPUT VOLTMETER - Make sure the OUTPUT POWER LED turns green
8. The UPC is now ready to be powered on. Make sure to refer to the UPC setup procedure in the UPC Operation Manual

⚠WARNING: Failure to follow these instructions and those below can result in serious injury, death or damage.

These instructions will be demonstrated in our training videos and found online at www.motocrane.com/support. All terminology is referred to in the above diagrams.

Using the 12VA

The 12VA connects to a 12V battery (typically within a vehicle), and boosts the voltage to 48V, in order to provide an acceptable input source to the UPC. This 48V power is used to charge and maintain the ultra-capacitors within the UPC.

The 12VA is a high power device, capable of providing power to MotoCrane ULTRA, even during the most demanding applications. The 12VA, in conjunction with the UPC, is designed to provide a continuous user experience with that of a more traditional 48V battery. However, there are some features and protections within the user interface that the operator should be familiar with in order to ensure safe and reliable operation. Once connected to the UPC, the 12VA has built in intelligence and self-diagnostics, just like the rest of the ULTRA system. The user can access 12VA diagnostics and real-time information from the ULTRA Controller GUI, within the UPC Diagnostics page.

Known Hazards

⚠WARNING The following list represents a list of known hazards that exist when operating the 12VA. This is not exhaustive, but represents some common hazards to watch out for.

- The 12VA must be fixed and secured to avoid sliding
- The operating temperature should be between -30°C and 80°C

Transporting the 12VA

- 12VA switch must be in the "OFF" position
- Battery should be disconnected from the input socket
- UPC should be disconnected from the output socket
- 12VA should be kept at temperatures between -55°C and 125°C

Troubleshooting and Maintenance

Troubleshooting

Diagnosing with the INPUT Voltmeter and the OUTPUT LED

The 12VA has a voltmeter on the input side and and LED on the output side. The voltmeter allows the user to monitor the 12V battery voltage. The input voltage should be between 11V and 16V. When the 12VA INPUT POWER SWITCH is in the “ON” position, the OUTPUT POWER LED will turn GREEN if the 12VA is successfully outputting 48V. If the LED doesn’t turn GREEN, check the input battery voltage displayed on the voltmeter and make sure that the voltage is within the expected range.

Diagnosing with GUI Warning and Error Messages

ULTRA has multiple internal sensors and an error reporting system built into the GUI. The UPC and 12VA share this error and warning reporting infrastructure and allows the user to monitor these events via the Controller GUI.

If an active error or warning is present, the respective red or yellow icon will be displayed. A yellow icon indicates a warning, and the controller will beep once to alert the user. A red icon indicates an error, and the controller will beep repeatedly until the icon is touched or the DISARM physical switch is pressed by the user. Touching the error or warning icon will bring you to the Status page, where you can see a list of active errors and warnings.

If you are experiencing an intermittent issue, and the warning or error is not currently active, you can review events by navigating to the System Log, which is accessible through the Diagnostics page. The System Log will also provide a list of errors and warnings that have occurred, along with the time since the event occurred (in 2 minute increments). Note that the System Log will only hold the most recent 10 events, and is lost upon power cycling the system. From either the Status or System Log page, you can access the Code Lookup Table, which will provide you with a short description of the error or warning and a recommended first step for troubleshooting and clearing the issue. For reference, the ‘Controller - GUI’ section of the ULTRA Operation Manual shows the location of the System Log and Code Lookup buttons within their respective pages. More detail is given below about each error message along with a description of what to try if the first step does not work.

NOTICE When debugging any error or warning, first ensure that all cables are properly connected and check the status of the INPUT VOLTMETER and OUTPUT POWER LED.

NOTICE PLEASE REFER TO THE UPC OPERATION MANUAL FOR ERROR, WARNING, AND DIAGNOSTIC CODE DESCRIPTIONS AND TROUBLESHOOTING RECOMMENDATIONS

Maintenance

None required - contact Customer Support if you believe the unit requires service or maintenance.

Weather & Water

NOTICE The 12VA is NOT WATER RESISTANT and should be kept out of direct sunlight to avoid unnecessary heat buildup within the unit.

Specifications

Mechanical

Module Weight
12VA: 1kg

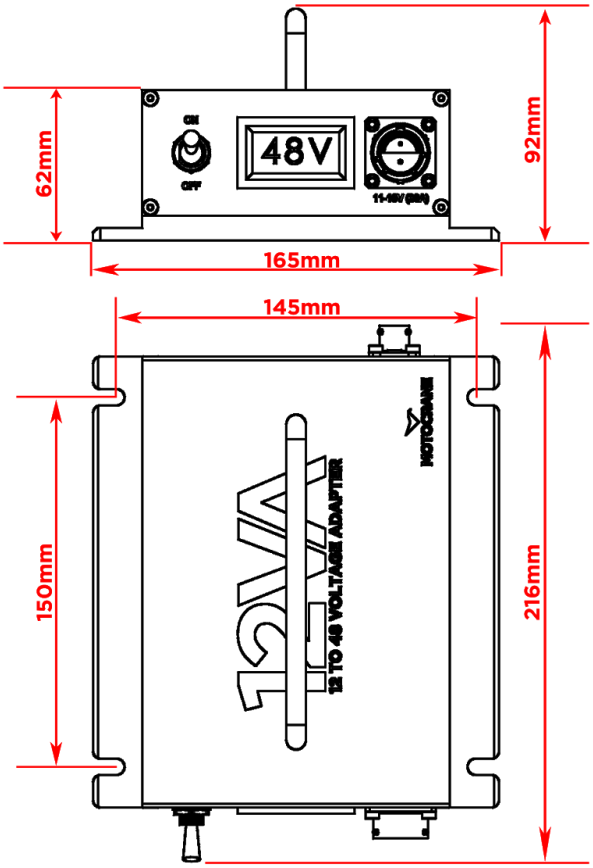
Electrical

12VA Output: 48V, 8A peak
12VA Input: 11-16V, 30A peak - Any 12V battery that can discharge 30A continuously
Certifications: CE, RoHS

Mounting/Dimensions of 12VA

The 12VA is equipped with a mounting flange that can be used for more permanent installation of the module. Make sure adequate room is given for cable and wire routing to the 12VA, and for the easy install/removal in the event of maintenance.

The 12VA and be mounted in any orientation, but must be protected from water and direct sunlight.

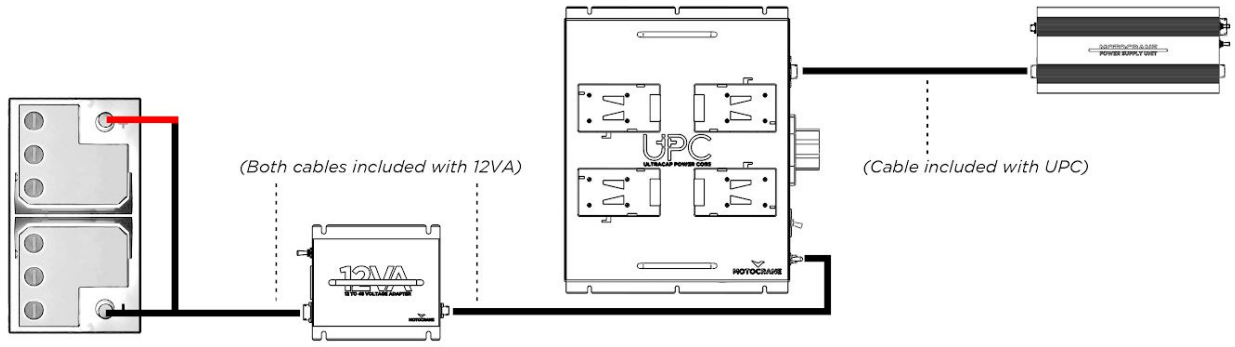


The 4x mounting flange clearance slots are designed for M6 or ¼" bolts/screws.

12VA Connection Diagram

The 12VA must be used in conjunction with the UPC and 48V Power Supply (PSU) included with every ULTRA.

Use the diagram below to better understand how these various components are connected together:



12V Battery **12VA** UPC PSU

Revision History

Revision	Date	Description
1.0	SEP, 2019	Initial Release

MotoCrane Support
support@motocrane.com

This content is subject to change.

Download the latest version from
www.motocrane.com/support

If you have any questions about this document, please contact MotoCrane, LLC by sending a message to contact@motocrane.com.