

Instruction Manual

LongArm™ ABL3 Remote Operator for Medium Voltage Allen-Bradley Centerline** Motor Control Center Units



Model: ABL3-C and ABL3-W

US Patent 9,666,384

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MARTEK

Arc Flash Safety

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Use and Operation Instructions

ABL3 Remote Operator for Allen-Bradley Motor Control Centers

1.0 Introduction

The ABL3 is designed to remotely operate the ON/OFF handle on Allen-Bradley Centerline medium-voltage motor control cabinets.

The ABL3 is offered in two basic models – a wireless version (ABL3-W) and a cabled version (ABL3-C). The advantage of the wireless version is that there are no cables to deal with which makes it more convenient to use. The cabled version is offered because some customers prefer cable operated equipment.

The following items should be included in with your ABL3:

Model: ABL3-W	ABL3-C
ABL3-W Actuator with battery pre-installed RTL-1 Handheld transmitter with battery pre-installed Instruction Manual Carrying case	ABL3-C Actuator with battery pre-installed RCL-1 Handheld controller 30-foot cable (50-foot optional) Instruction Manual Carrying Case

2.0 General Safety Information:

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- This equipment must only be installed by qualified personnel.
- Only use this equipment after reading and understanding all of the instructions contained in this manual.
- Follow electrical safe work practices. See NFPA 70E or CSA Z462

FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN DEATH OR SERIOUS INJURY

2.1 Arc-blast Hazards

The hazards associated with electrical arc-blasts are well documented. Studies conducted by numerous industries and professional organizations have sought to quantify the intensity of arc blast, the risks to personnel, and various methodologies for mitigating the risks.

Without a doubt, increasing the distance between the arc and a human is the single greatest favorable factor in reducing injuries. Remote operation of electrical equipment is not a cure-all, but rather one more tool available for protecting workers while they are performing electrical switching. Using the ABL3 remote operating device for A-B medium voltage switchgear may not negate the need for additional personal protective measures. The user is ultimately responsible for evaluating each situation to determine if additional protective measures are needed.

2.2 Battery Hazards

WARNING

THIS EQUIPMENT MAY CONTAIN PRIMARY LITHIUM OR ALKALINE CONTAINING BATTERIES

- **All Federal and State regulations must be followed for disposal, transport, and shipment of the batteries and equipment.**
- **Do NOT attempt to recharge the batteries.**

The ABL3 is battery powered from a custom battery that is installed within the actuator. The total maximum voltage is less than 24VDC. Although this is below the recognized threshold for a shock hazard, there can significant energy stored in the battery pack. Care must be taken to properly handle the battery pack.

The battery pack may contain Lithium or be of the Alkaline type. The type of battery in your ABL3 can be determined by the label on the side of the battery. Care must be taken when handling the battery and federal regulations must be followed for disposal and shipping of the batteries. Do not ship damaged lithium batteries. Please contact MarTek Limited at the address in Section 8.0 if you need more information on the battery pack.

2.3 Magnet Hazards

DANGER

THIS EQUIPMENT UTILIZES A POWERFUL MAGNET TO HOLD IT ON THE MOTOR CONTROL CENTER

Care must be taken to prevent injury when handling the equipment

The magnets that are used on the ABL3 to hold it on the motor control center produces a strong magnetic field. Care must be taken when handling the ABL3. The following steps should be followed to assure safe handling:

- The magnet needs to be kept at a safe distance from all magnetic storage devices, electronics, credit cards, etc.
- The ABL3 should be stored with the magnets in the “OFF” position. If left in the “ON” position and brought close to ferromagnetic materials, there will be a sudden and powerful attraction that could present a pinch hazard or equipment damage.
- Do not use the ABL3 if a magnet has been damaged.

- Do not attempt to service the magnet. There are no user serviceable parts inside the device.
- The magnet contains PTFE lubricant. Contact MarTek Limited for MSDS information.
- Always keep the bottom of the magnet free of debris and rust. If needed, wipe with WD40 or light oil.

2.4 Pinch Point Hazards

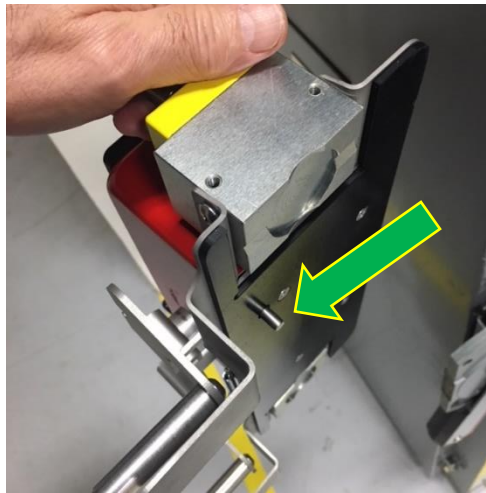
⚠ DANGER

THIS EQUIPMENT HAS MOVING PARTS THAT PRESENT PINCH POINT HAZARDS

Care must be taken to prevent injury when handling the equipment.

The ABL3 is a motorized device with moving parts that will produce the opportunity for pinch point hazards. Steps have been taken in the design to help prevent a pinch point injury. One of these features is the safety switch integrated into the bottom of the unit. This safety switch prevents the ABL3 from energizing, or remaining energized, unless it is installed on a flat surface. Once the ABL3 is removed from the motor control center, it will automatically de-energize. However, this alone is not assurance that a pinch point injury cannot take place. In order to prevent a pinch point injury, the following procedures should be followed:

- Install the ABL3 actuator on the MCC door prior to turning it on.
- Once the ABL3 is turned ON, do not touch or bring body parts near the actuator.
- Turn OFF the ABL3 actuator prior to removing it from the MCC door.
- Do NOT attempt to turn the ABL3 actuator ON unless it is installed and ready to use.



Additionally, the magnet used to hold the ABL3 actuator on the MCC door could present a pinch hazard. To prevent an injury the follow procedures should be followed:

- Only turn the magnet to the "ON" position when it is firmly against the metal surface of the MCC door.
- Turning the magnet to the "ON" position prior to installing the ABL3 could cause a quick uncontrollable attraction to ferromagnetic materials in close proximity and present a serious pinch point injury.
- Store the ABL3 actuator with the magnet in the "OFF" position.

2.5 Radio Frequency

The wireless version of the ABL3 uses a radio transmitter and receiver to communicate. The transmitter and receiver operate in the 2.4GHz frequency band and is low power at 1mW. These are commercially available radios that have agency certification through the manufacturer. They are certified with the following agency approvals:

United States – FCC

FCC ID: OUR-XBEE

The enclosed device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: *(i.)* this device may not cause harmful interference and *(ii.)* this device must accept any interference received, including interference that may cause undesired operation.

Canada – IC

IC: 4214A-XBEE

3.0 Battery Information

WARNING

THIS EQUIPMENT USES A CUSTOM DESIGNED BATTERY PACK.

DO NOT attempt to modify the battery pack or to install a battery pack not approved for use in the ABL1. Doing so could cause equipment damage, fire, or personal injury.

ABL3 Actuator Battery

The ABL3 is powered from a custom battery pack that has been pre-installed in the actuator. It consists of 15 single cell AA batteries connected in series to produce a nominal voltage of 22.5VDC. There are also two additional single cell AA batteries connected in series to produce a nominal voltage of 3.0VDC. The 17 total cells are packaged within the one replaceable battery pack. The 22.5VDC output is fused in the middle of the string to limit the current to 4.0 amps.

The two following battery types are offered with ABL3:

Lithium/Iron Disulfide – this battery pack has been tested to 3,000+ operations before needing replaced. The individual cells have an advertised shelf life of 10-20 years depending upon the storage temperature. The advantage to this battery is that it is long lasting and will not require replacement as often as an alkaline battery. The disadvantages are that there are regulations that in certain circumstances could prevent shipping or transporting them by air freight and internationally. See Federal 49 CFR 173.185 and IATA regulations for additional information for shipping and transporting Lithium batteries. See Section 7.0 for additional specifications.

Alkaline – this battery pack has been tested to 1,500+ operations before needing replaced. The individual cells have an advertised shelf life of one year, which is the disadvantage of this battery. The advantage is that it can be easily shipped by air or internationally.

The type of battery installed in your ABL3 could be either the Lithium/Iron Disulfide type or the Alkaline depending on which type was ordered. The type of battery installed in your ABL3 can be determined by the label on the side of the battery.

Both types of battery packs are custom designed to work with the ABL3 and are only available through MarTek Limited. Use only approved battery packs. MarTek Limited can provide assistance to assure that you order the correct battery. See Section 8.0 for information to contact MarTek Limited.

RTL-1 Remote Transmitter

The RTL-1 is a remote transmitter used with the wireless version of the ABL3. It is powered by a 9VDC battery. Replace this battery as needed with a commercially available 9VDC battery. An alkaline type is recommended, but not required.

RCL-1 Remote Controller

The RCL-1 is a remote controller used with the cabled version of the ABL3. It is powered from the ABL3 actuator through the cable and does not contain a battery.

3.1 Removing and Replacing the Battery in the ABL3 Actuator

The ABL3 actuator requires a custom battery. Do not attempt to use a non-approved battery. To obtain a replacement battery, see Section 3.0 for detailed information. To replace the battery, complete the following steps:

STEP 1 - Using Phillips screwdriver, remove four screws from battery cover plate.



STEP 2 – Remove battery cover plate and slide battery out.



STEP 3 – Disconnect battery at connector.



STEP 4 – Plug new battery into the connector and slide battery into place. NOTE: The battery will only go in one way. The end where the battery leads exit the battery must go in first.



STEP 5 – Replace battery cover.



3.2 Replacing the Battery in Wireless Remote Transmitter

The RTL-1 remote transmitter uses a standard 9V battery. See Section 3.0 for additional information on the 9VDC battery to be used.

To replace the battery, complete the following steps:

- Remove the battery cover on the back of the transmitter.
- Replace the battery.
- Re-install the battery cover.



4.0 Use and Operation of the ABL3

The ABL3 can be installed over the MCC operating handle regardless of the position of the handle (whether it is in the ON or OFF position). Care must be taken when installing ABL3 that the MCC handle is not inadvertently operated.



4.1 Installing the ABL3 on the MCC Door

STEP 1 – Prior to installing the ABL3 actuator, the MCC door must be firmly latched or the actuator will pull the door open. Verify that the door is firmly latched before proceeding with installing the ABL3.



STEP 2 – Prior to installing the ABL3 actuator, verify that the magnets are in the OFF position. Start with the ABL3 held low on the switch. Slip the actuator arm under the operating handle and move the up and over the operating handle mechanism.



Use a similar (reverse) action when the disconnect handle is in the UP position. Start at the top, slipping the actuator arm behind the disconnect handle. Rotate the ABL3 downward.



STEP 3 – With actuator now flush against the MCC door, twist both magnet levers one-half turn clockwise to latch the magnet and actuator in place.



STEP 4 – For the wireless versions of the ABL3, the installation is complete and it is ready to operate. See Section 4.2 for the operating procedure.

For the cabled version of the ABL3, the cable must be installed prior to proceeding. Attach the cable to both the actuator and the hand-held controller by inserting the cable in the connector and turning the ferrule clockwise to lock it in place. Once the cable is connected, see Section 4.2 for operation.

4.2 Operating the ABL3

STEP 1 – Press the WAKE button to power up the actuator.



STEP 2 – While standing at a safe distance, press and hold the ENABLE button on the hand-held controller. The yellow light should illuminate. Then press and hold the button corresponding to the handle direction that is desired (ON or OFF). Both the ENABLE button and the ON or OFF button must be held simultaneously until the full stroke of the operating handle is complete. Then the buttons can be released and the actuator will return to its neutral position.

NOTE: The actuator will power itself OFF after a couple minutes of no use. If it does power down, turn it back on by pressing the WAKE button.

STEP 3 – When completed with operating the ABL3, power the actuator OFF by pressing the SLEEP button.

4.3 Removing the ABL3

STEP 1 – Verify that the actuator is powered OFF by pressing the SLEEP button. DO NOT ATTEMPT TO REMOVE THE ACTUATOR WITH THE POWER ON AS THIS COULD CAUSE A PINCH POINT INJURY.



STEP 2 – While firmly holding the actuator in your right hand, disengage the magnets by pushing the magnet lever in and then counter-clockwise.



STEP 3 – Raise or lower the actuator off the operating handle (depending on the position of the disconnect handle).



STEP 4 -- Disconnect cable (for cabled versions only) and return components to carrying case or store on the side of the MCC. (See Section 5.0 for details)

5.0 Storage

The ABL3 is provided with a heavy duty carrying case that can be used to conveniently store the actuator and its necessary components. The carrying case and complete unit should be stored in a clean and cool environment.

In order to make the ABL3 more readily available for use, the actuator and hand-held controller can also be stored on a ferromagnetic surface such as the side of the MCC. Use the mounting magnet on the ABL3 to hold it in place and the hand-held controller has a magnet built in that will allow it to hold onto a steel metal surface as shown below. Storage on the front or side of an MCC is only recommended if the area is clean, dry, and cool (<90F)



6.0 Troubleshooting

SYMPTOM	SOLUTION
The LED on the Wake button flashes and then the unit shuts down.	The battery in the ABL3 is low and must be replaced
The RTL-1 wireless transmitter won't activate the ABL3	The problem could be caused if the transmitter is outside the 50-foot range. It is possible the problem could be due to a low battery in the RTL-1. Try replacing the battery.
The LED on the Wake button shuts off after a couple of minutes.	This is normal. The ABL3 will power down if not used within a couple of minutes in order to preserve the battery. Press the Wake button again to turn it back on.

7.0 Specifications

Voltage	<p>ABL3 – 22.5VDC and 3.0VDC (custom designed battery available in Lithium or Alkaline. See Section 3.0 for more details)</p> <p>RTL1 – 9VDC</p> <p>RCL1 – 5VDC (powered from ABL3)</p>
Lithium Battery (when supplied)	<p>17 cells, (each cell is Ultimate Lithium Energizer L91)</p> <p>Output Voltage – 22.5VDC and 3.0VDC</p> <p>Battery net weight – 0.27kg</p> <p>Lithium Disulfide (Li/FeS₂)content – less than 17g total</p> <p>Operating and Storage Temperature -40F to 140F (-40C to 60C)</p> <p>Shelf Life 20 years at 21C</p> <p>Designation (per cell) ANSI 15-LF, IEC-FR14505 (FR6)</p> <p>See Section 3.0 for additional information</p>
Magnet	<p>400lbs/181kg magnet strength, 20lbs/9kg sheer load.</p>
Wireless Transmitter (ABL3-W version only)	<p>Operating frequency 2.4Ghz, 1mW output. 50-foot range (line of sight).</p> <p>Transmitter and actuator are paired so that the transmitter can only operate the actuator that has been paired with it. Pairing is factory programmed and is not user programmable.</p>
Projected Life	<p>10,000+ operations (actuator)</p> <p>3,000+ operations from Lithium Battery</p> <p>1,500+ operations from Alkaline Battery</p>
Carrying case	<p>Manufactured by Pelican with the following features:</p> <ul style="list-style-type: none"> Two Press & Pull Latches Double-layered, Soft-grip Handle Two Padlock Hasps Vortex® Valve Flush Powerful Hinges Lightweight Strong HPX® Resin Watertight Meets airline regulations for carry-on luggage Exterior Dimensions 19.25" x 16.0" x 7.5" (48.9 x 40.64 x 19.05 cm)
Weight	<p>ABL3 Actuator – 12.45 lbs / 5.65 kg</p> <p>Complete Kit with carrying case – 21 lbs / 9.52 kg</p>

8.0 Contacting the Manufacturer

For any questions, repairs, or parts replacement please contact the manufacturer using any of the methods below.

MarTek Limited
4782 Chimney Drive
Charleston, WV 25302

Phone: 304-965-9220
Toll Free: 800-248-4958
Fax: 304-965-9220

email: sales@marteklimited.com