

# CBSArcSafe<sup>TM</sup>

## RRS-2 (Remote Racking System)



## More products by CBS ArcSafe™

### **RRS-1** – Remote Racking System for rotary type breakers

*The RRS-1 is a universal remote racking system capable of removing or inserting low and medium voltage draw out rotary circuit breakers while the operator remains outside the arc flash boundary. This device is portable, weighing less than 200 pounds, and user friendly requiring no modifications to the switchgear or circuit breakers. Each system can be custom designed to fit your circuit breaker needs.*

### **RRS-2** – Remote Racking System for extraction type breakers

*The RRS-2 is a universal remote racking system capable of removing or inserting low and medium voltage non-rotary circuit breakers while the operator remains outside the arc flash boundary. This device is portable, weighing less than 200 pounds, and user friendly requiring no modifications to the switchgear or circuit breaker. Each system can be custom designed to fit your circuit breaker needs.*

### **RRS-3** – Single Application Remote Racking System

*The RRS-3 system is an inexpensive single application remote racking system which allows the operator to install and remove a breaker while standing 25 to 75 feet away with a hand control unit. CBS ArcSafe also offers a radio remote option which allows for operation up to 150 feet away without the need for an extension cable. The radio remote option also allows for closed door racking to occur once the RRS-3 has been attached to the breaker.*

### **RSO** – Remote Switch Operator

*A remote switch operator allows service personnel to charge, close, and trip circuit breakers from a safe distance using a CBS ArcSafe™ RSA. The RSO can be used in conjunction with the CBS ArcSafe™ remote racking system or independently as a stand-alone device for remote racking. Each CBS ArcSafe™ remote switch operator includes a 24Vdc power supply and a wired/wireless pendant station.*

### **RSA** – Remote Switch Actuator

*A remote switch actuator allows service personnel to charge, close, and trip circuit breakers from a safe distance in conjunction with a CBS ArcSafe™ RSO. The remote switching actuator attaches to the front of your circuit breaker and is mechanically assisted by magnets without the need for any modification to your switchgear. After setup and installation the RSO controls the RSA's operation.*

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# Table of Contents

<b>1.0 Description .....</b>	<b>2</b>
1.1 Components.....	2
1.1.1 Structural Assembly .....	2
1.1.2 Control Assembly.....	7
1.1.3 Tooling Assembly .....	7
<b>2.0 Controls and Indications.....</b>	<b>8</b>
<b>3.0 Preparation and Operation .....</b>	<b>10</b>
3.1 Set up Training .....	10
3.2 Unpacking the RRS-2.....	10
3.3 Charging the RRS-2.....	11
3.4 Setting up the RRS-2 for Operation .....	11
<b>4.0 Operation .....</b>	<b>12</b>
4.1 Circuit Breaker Installation .....	12
4.1.1 Requirements for Installation .....	12
4.1.2 Steps for Installation.....	12
4.2 Circuit Breaker Removal .....	13
4.2.1 Requirements for Removal.....	13
4.2.2 Steps for Removal.....	13
<b>5.0 Maintenance.....</b>	<b>14</b>
5.1 Introduction .....	14
5.2 Prior to Use .....	14
5.3 After Use .....	14
5.4 Every 12 to 18 Months.....	14
<b>6.0 Ordering Replacement Parts .....</b>	<b>15</b>
<b>Appendix A: Specifications.....</b>	<b>19</b>
<b>Appendix B: Troubleshooting Guide .....</b>	<b>21</b>
<b>Appendix C: Wireless Camera System .....</b>	<b>23</b>
1.0 Components.....	23
2.0 Camera System Set-up.....	24
3.0 Camera System Operation.....	24
4.0 Camera Troubleshooting Guide .....	25

<b>Appendix D: Radio Remote PS.....</b>	<b>27</b>
1.0 Components .....	27
2.0 Radio Remote Models .....	28
3.0 Possible Button Configurations .....	29
4.0 Radio Remote Troubleshooting Guide .....	31
<b>Appendix E: Bucket Extractor (BE) .....</b>	<b>33</b>
1.0 Description .....	33
2.0 Pendant Station Operation .....	34
3.0 RRS-2-BE Parts List.....	35

## About the User's Guide

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This user's guide describes the functions and features of the CBS ArcSafe™ RRS-2. This technical document is intended to act as a simplified reference for users of the equipment, allowing for safe, quick, and efficient use of the RRS-2 features.

### Before You Begin

#### **DANGER!**

*\*This is a red hazard alert warning box; red hazard alert boxes contain information pointing out potential hazards to personnel and equipment.*

#### **ATTENTION**

**This is a green information box; green information boxes are used to place emphasis on valuable information the user will want to pay particular attention to.**

#### **DANGER!**

*\*Ensure that personnel using this equipment are adequately trained in the operation of the switchgear they are planning to work with; that they are correctly stationed outside the arc flash boundary; and that they comply with all applicable Federal, State, Local, and In-house safety regulations and procedures. Attention should be given to distance, angle, and personal protective equipment (PPE).*

#### **DANGER!**

*\*Ensure that switchgear is properly maintained and in good working order before using the RRS-2 on your switchgear. Contact your local group CBS service provider at [www.qcbs.com](http://www.qcbs.com) to assist in proper care and maintenance for your switchgear.*



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# 1.0 Description

The CBS ArcSafe™ RRS-2 is a portable, highly configurable remote racking system designed to reposition circuit breakers that are equipped with non-rotary racking mechanisms. The primary goal for the design and operation of the RRS-2 remote racking system is to reposition industrial circuit breakers with the operator positioned safely outside of the arc flash boundary.

The RRS-2 is powered from either standard AC power or the internal battery. The RRS-2 is operated with the pendant station via a 25' pendant retracting cord (*additional cord lengths are available*) or an optional radio remote pendant station. The pendant station allows for the operator to manipulate the tooling assembly which repositions the circuit breaker when equipped with the required tooling.

## 1.1 Components

The RRS-2 consists of three components, the structural, control, and tooling assemblies (breaker specific).

### 1.1.1 Structural Assembly

The RRS-2 structural assembly is made up of the frame (Fig. 1.1.2), slide rail (Fig. 1.1.1), cubicle brace (Fig. 1.1.6), transportation and stability wheels (Fig. 1.1.9), and the floor locks/stabilizers (Fig. 1.2).

**Slide Rail (Fig. 1.1.1)** – The slide rail is an extruded aluminum track system, allowing for the quick repositioning of the cubicle brace and drive assembly. Several optional slide rail configurations are available, including single and double rails, fixed or extended-height rail mounting, and several rail lengths.

**Steel Frame (Fig. 1.1.2)** – All components of the RRS-2 are directly or indirectly mounted to and supported by the steel frame. The curved top tubes act as handles when tilting the unit on the rear wheels for transportation. Integrated storage hooks are provided to secure the pendant station and pendant retracting cord when not in use.

**Cubicle Brace (Fig. 1.1.6)** – The cubicle brace is a telescoping support arm, designed to rigidly secure the RRS-2 to the circuit breaker cabinet during operation. The cubicle brace engages the RRS-2 slide rail, allowing it to be repositioned as required. The cubicle side of the brace is configured with breaker specific tooling (Fig. 3) designed to quickly secure the cubicle brace, and thus the RRS-2 to the cubicle.

**Tooling (Fig. 1.5)** – The RRS-2 tooling is custom built for every breaker and allows for the RRS-2 to attach to a variety of breakers. Typically, the main actuator racks the circuit breaker while the secondary actuator depresses the circuit breaker interlocks although this may differ from your provided tooling.

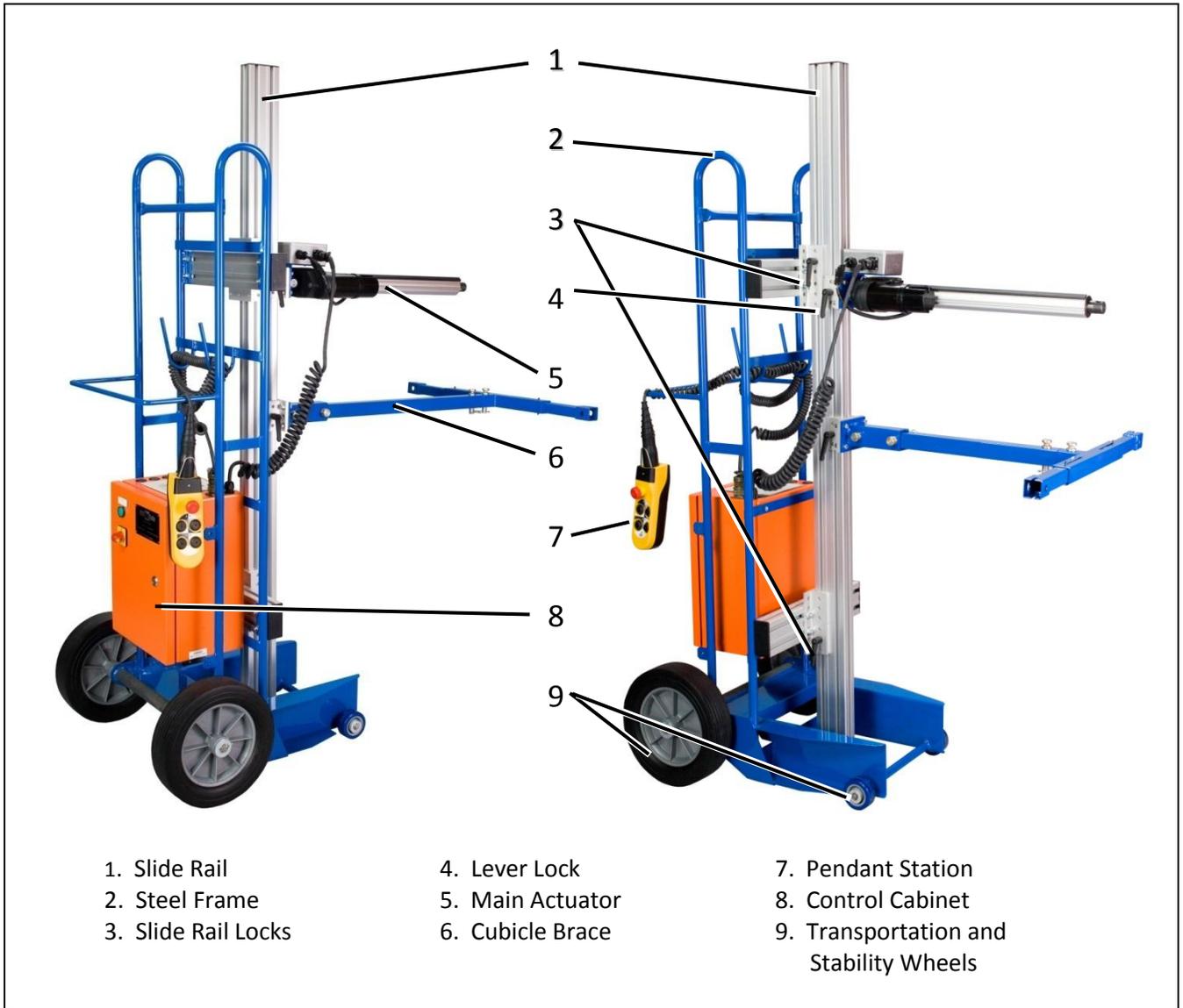


Figure 1.1 – Structural Assembly



Figure 1.2 – RRS-2 Floor Locks and Stabilizers (optional)

**Transportation and Stabilization Wheels (Fig. 1.1.17)** – The rear transportation wheels allow the RRS-2 to be tilted back and transported, similar to a hand-truck. The front stability wheels create a secure and steady, level platform during operation and storage. The solid rubber transportation wheels can be replaced with pneumatic tires (*optional*) for easier movement over rough terrain. The unit can also be equipped with stair climber rails (*optional*).

**Floor Locks and Stabilizers (Fig. 1.1.18, 1.2)** – The RRS-2 may be equipped with optional floor locks or stabilizers. Engaging the floor locks lifts the transportation wheels off the ground to limit RRS-2 movement during operation. The stabilizers help to prevent the RRS-2 from tilting backwards during operation.

**Stair Climber Rails \* optional (Fig. 1.3)** – The stair climbers allow for the RRS-2 to easily be moved up/down stairs and in/out of vehicles.

**Pneumatic Tires \*optional (Fig. 1.4)** – The RRS-2 may be equipped with optional pneumatic tires in order for the RRS-2 to easily travel over gravel or other rough surfaces.



Figure 1.3 – RRS-2 Stair Climber Rails



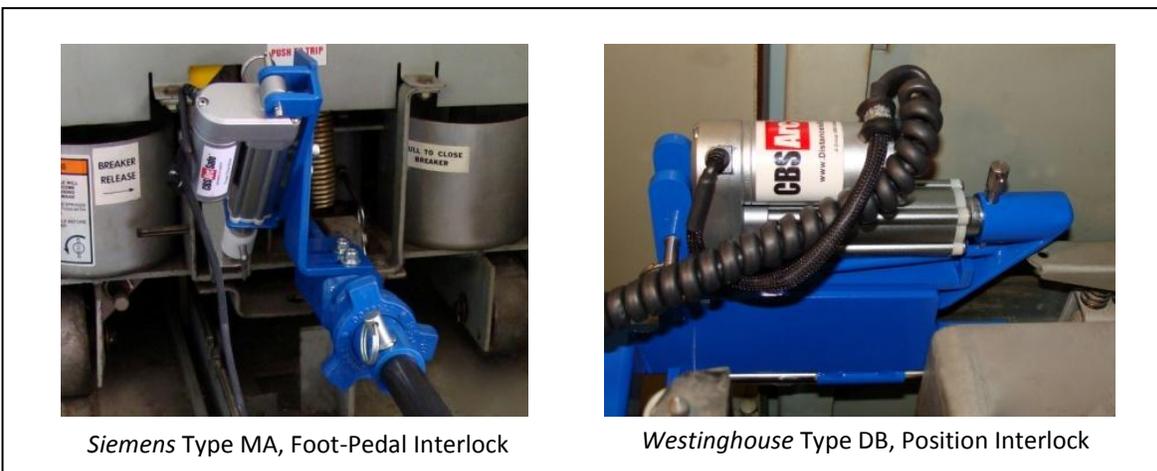
Figure 1.4 – RRS-2 Pneumatic Tires (optional)



Figure 1.3 – Pendant Station



Figure 1.4 – Control Cabinet, Internal



Siemens Type MA, Foot-Pedal Interlock

Westinghouse Type DB, Position Interlock

Figure 1.5 – Interlock Actuators and Tooling

**ATTENTION**

These are only two interlock actuators and tooling of many designs that are available. Every RRS-2 tooling accessory is custom built for your switchgear.

### 1.1.2 Control Assembly

The RRS-2 control assembly includes the pendant station (Fig. 1.3) and control cabinet (Fig. 1.4).

#### **Pendant Station (Fig. 1.1.7, Fig. 1.3)**

The pendant station controls the tooling assembly. There are many different types of pendant stations available including the PS-2 (2 button), PS-4 (4 button), PS-R4 (radio remote 4 button), PS-R6 (radio remote 6 button). On the wired models the 25' pendant retracting cord connects the pendant station to the control cabinet. The cord can be uncoupled from the control cabinet via a screw connector for storage or to add optional pendant extension cords. Onboard storage of the pendant station and pendant retracting cord is provided via the frame storage hooks or the storage bag. The pendant station and pendant retracting cord can be replaced with an optional radio remote system, consisting of a radio remote pendant station and receiver.

#### **Emergency Stop Pushbutton**

When the red emergency stop pushbutton is depressed all power from the unit will turn off. In order to resume normal operation the pushbutton must be turned counterclockwise.

#### **Pendant Retracting Cord (Fig. 1.1.13)**

The pendant retracting cord allows for the operator of the RRS-2 to distance themselves from the breaker during the racking/unracking operations.

#### **DANGER!**

*\*The pendant retracting cord may not remove the service personnel from the arcflash area in some circumstances. Attention should be given to distance, angle, and personal protective equipment (PPE). If the operator cannot leave the arcflash area with the length of the cable, we offer extension cables, radio remote pendant stations, and wireless video systems to ensure that the operator can be as far away from the racking/unracking operation as needed for safety.*

#### **Control Cabinet (Fig. 1.1.8, Fig. 1.4)**

The primary function of the control cabinet is to house and protect the system controls and power supply. Additional controls, including the main power switch and controls for optional equipment are located on the control cabinet.

#### **Cabinet Access (Fig. 1.1.14)**

The control cabinet can be opened using a flat-head screwdriver to unlock the cabinet. The cabinet houses the control wiring, and battery for the RRS-2.

### 1.1.3 Tooling Assembly

The components of the RRS-2 tooling assembly are dependent on the circuit breaker being racked however the components generally include the main and secondary linear actuators and the tooling that adapts the actuators to the circuit breaker racking mechanism.

**Main Actuator (Fig. 1.1.5)** – The main actuator supplies the driving force needed to reposition switchgear. There are two models available the standard 600 ft lb (80 m-kg) and the optional 1200 ft lb (170 m-kg) actuator. They both use an internal clutch to limit force available to prevent over racking. The actuator attaches to the RRS-2 via the slide rail, and can easily be repositioned with the lever locks (Fig. 2-4).

**Secondary Actuator (Fig. 1.5)** – The secondary actuator is generally used on the circuit breakers interlocks and supplies the driving force needed to engage circuit breaker interlock devices which are normally actuated manually by the operator. Mounting of the secondary linear actuator is dependent on the circuit breaker type.

## 2.0 Controls and Indications

**Current Control Module (Fig. 2.1.1)** – The current control module controls the current limit settings of the CBS ArcSafe™ RRS-2. The current control module also switches the current limiter between manual and automatic shutoff operation.

### ATTENTION

For the RRS-2 you will most likely not need to use the Current Control Module, however if this is needed for your operation you will be trained on how to use the Current Control Module.

**Lights Control Switch (Fig. 2.1.2) \*optional** – The light control switch operates the optional CBS ArcSafe™ LED lighting system that is attached to the RRS-2. Please remember to turn the lights off when not in use.

**Camera Control Switch (Fig. 2.1.3) \*optional** – The camera control switch operates the optional CBS ArcSafe™ camera system. The camera sends a wireless video feed to your display monitor. For more information please see Appendix C for the wireless camera system user's guide.

**Power Switch and Indication Light (Fig. 2.1.4)** – The main power control switch to the unit. The switch is ON when the unit is operating, and OFF when the unit is stowed and/or charging. The power indication light indicates the state of the power switch.

**Main Linear Actuator Port (Fig. 2.1.5)** – The main linear actuator port provides power for the main racking functions of the RRS-2 when the main linear actuator cable is properly connected.

**Auxiliary Linear Actuator Port (Fig. 2.1.6)** – The secondary linear actuator port provides power for the auxiliary racking procedures needed when the auxiliary linear actuator cable is properly connected.

**Pendant Station Port (Fig. 2.1.7)** – The pendant station port allows for the connection of the pendant station and optional extension cords.

**Low Battery Indicator (Fig. 2.1.8)** – When the battery is low the current control module will display “-6A” indicating a low battery. In order for continued operation the RRS-2 will need to be connected to AC power in order to charge.

### ATTENTION

The RRS-2 may be used for racking equipment while charging on AC power.

**Over-Current Protection Relay (located inside cabinet)** – The over-current protection relay protects the electrical system of the CBS ArcSafe™ remote racking system. The relay will trip to remove power from the unit when an over-current condition exists; a manual reset is required to restore power to the system.

\*Contact CBS Arc Safe™ for ordering information at (940) 382-4411

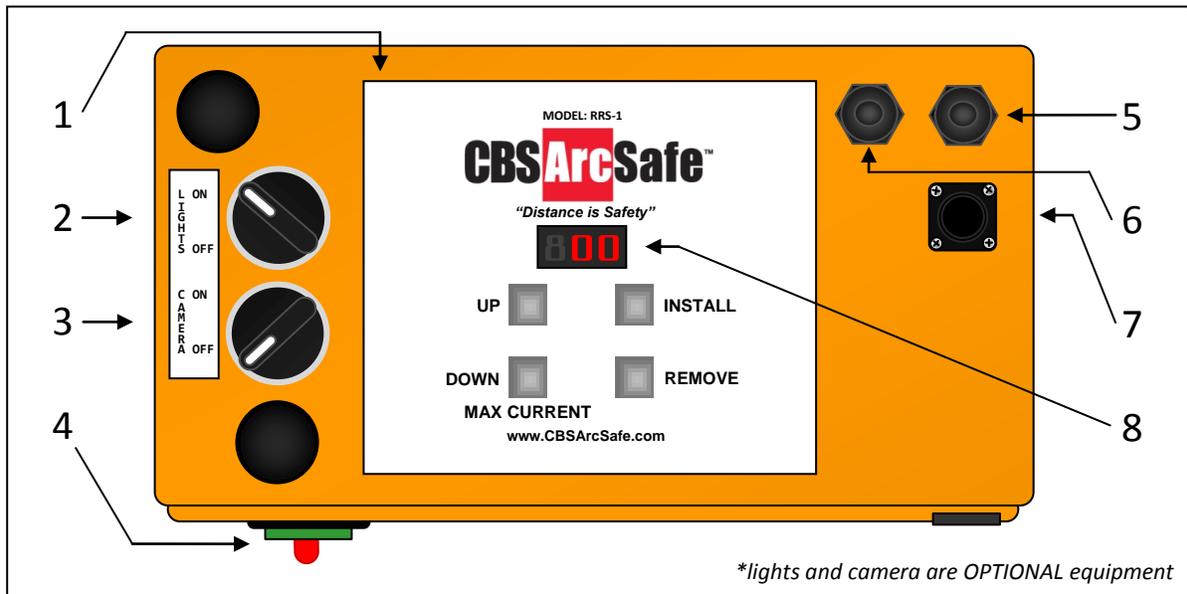


Figure 2.1 – RRS-2 Electrical Cabinet Mounted Controls

# 3.0 Preparation and Operation

The preparation and operation of the remote rack is described in the following sections and include:

### 3.1 Set up Training

This section lists the necessary steps to set up training for your RRS-2.

### 3.3 Charging the RRS-2

This section describes the procedure for charging the remote racking system to prepare it for future operations.

### 3.2 Unpacking the RRS-2

This section lists the necessary steps to uncrate the remote rack and prepare it for operational readiness.

### 3.4 Setting up the RRS-2 for Operation

This section lists the preliminary steps for operation.

## 3.1 Set up Training

Included with your purchase of the RRS-2 is 4 hours of training from either a CBS ArcSafe™ equipment trainer or an approved CBS ArcSafe™ outside representative. Please call CBS ArcSafe™ at (940) 382-4411 to set up this FREE training seminar for your service personnel prior to ANY operations.

**DANGER!**

*\*It is VERY important to have proper training before using this unit as improper use may damage your RRS-2 and void all warranties written or implied.*

## 3.2 Unpacking the RRS-2

The RRS-2 is placed in a protected condition to allow the unit to be shipped more efficiently and to prevent damage from occurring. Perform the following steps to unpack the RRS-2 and prepare it for operation.

**DANGER!**

*\*Do not unpack the RRS-2 until your FREE training seminar has been provided. Unpacking the unit before training may void your warranty. This guide is intended for companies that have already received training and have ordered more remote racking systems.*

1. Remove the cardboard cover by cutting the perimeter at the base with a utility knife or removing the nails/screws.
2. Carefully remove the steel strapping that secures the remote rack to the pallet and roll the unit onto the floor.
3. Inventory the CBS ArcSafe™ RRS-2 components to ensure nothing is missing. A CBS ArcSafe™ representative will assist with inventory before the FREE training seminar.
4. If pneumatic tires are installed on the unit (optional), ensure the tires are inflated to their proper pressure.
5. Properly attach necessary tooling to the RRS-2.
6. The CBS ArcSafe™ RRS-2 is now ready for charging and setting up for operation.

### 3.3 Charging the RRS-2

The CBS ArcSafe™ remote racking unit is equipped with batteries to enable operation when AC power is unavailable. Perform the following steps to charge and store the unit to prepare for future operation:

1. Turn the power switch to the OFF position.
2. Connect the RRS-2 power supply into an AC outlet via the included power cable and ensure that the red light on the side of the unit turns on while plugged in and charging.
3. While charging feel free to use the RRS-2 in normal operation mode.
4. Whenever possible, leave the CBS ArcSafe™ RRS-2 plugged in and properly stowed with either the CBS ArcSafe™ dust cover or the waterproof cover to ensure the RRS-2 will be ready for the next operation. Once fully charged the battery charger switches to a 'Standby Voltage Mode' maintaining a fully charged battery.

#### **DANGER!**

*\*Storing the RRS-2 in freezing temperatures will drastically reduce battery performance, CBS ArcSafe™ recommends storing the unit where temperatures are regulated 68°F to 77°F. If storage in freezing temperatures is required, contact CBS ArcSafe™.*

#### **ATTENTION**

**At or below 40°F / 5°C we recommend using the AC power supply over the battery power in order for the unit to operate at max power. At temperatures lower than 40°F / 5°C the current provided by the batteries becomes limited and thus may not provide enough racking power for your breaker.**

### 3.4 Setting up the RRS-2 for Operation

This section explains the steps necessary to prepare the RRS-2 for racking operations, however tooling has been tailored to your specific needs and may require a different operational setup then described here.

1. Ensure the RRS-2 is charged and/or the unit is plugged in to an AC power source.
2. Ensure the breaker being racked is OPEN according to manufacturer specifications.
3. Position the remote racking system in front of the circuit breaker to be racked, with the cubicle brace aligned with the circuit breaker cubicle.
4. Ensure the safety shut off switch on the pendant station is off.
5. Turn the power switch to the ON position, the green POWER ON light will light up.
6. Position the necessary tooling to the breaker.

#### **ATTENTION**

**For selected models of circuit breakers, the RRS-2 will move slightly. This may include the RRS-2 slightly rocking or rolling forwards/backwards, however violent movements should not occur. If any movement seems concerning please contact your CBS ArcSafe™ agent.**

7. The RRS-2 is now ready for operation.

## 4.0 Operation

This section describes the steps necessary to install and remove the circuit breaker using the RRS-2.

### 4.1 Circuit Breaker Installation

These are the following requirements and steps for circuit breaker installation using the RRS-2.

#### 4.1.1 Requirements for Installation

The following installation procedure assumes that the following prerequisites have been met:

1. *The circuit breaker racking mechanism is in working order.*
2. *The circuit breaker has been properly maintained.*
3. *The circuit breaker is removed from the cubicle and OPEN according to manufacturer specifications.*
4. *The tooling is connected properly to both the circuit breaker and the RRS-2.*

#### **DANGER!**

*\*For your safety please ensure that all personnel follow the personal protective equipment rules and regulations along with following all of the manufacturer guidelines at ALL times.*

#### **DANGER!**

*\*If possible remove control power from the control circuit in order to prevent the accidental closing or tripping of the breaker during the racking procedure.*

#### 4.1.2 Steps for Installation

To install the circuit breaker to the OPERATING position, perform the following steps.

1. Ensure the RRS-2 is properly setup and attached to the breaker using the breaker specific tooling provided.
2. Verify the circuit breaker is OPEN according to manufacturer specifications.
3. Exit the arc flash boundary with the pendant station.

#### **DANGER!**

*\*Exiting the arc flash boundary may prevent the operator from observing the circuit breaker during repositioning, if this situation occurs we recommend acquiring the CBS ArcSafe™ camera system in order to remotely view the repositioning.*

4. Ensure the emergency stop push button is deactivated by turning the button clockwise.
5. Use the pendant station as you were shown in the training seminar to install the breaker. If the pendant retracting cord is not long enough for the operator to leave the arc flash boundary additional pendant extension cords are available and the pendant station and pendant retracting cord can be replaced with an optional radio remote system.
6. Detach and uninstall the RRS-2 unit from the circuit breaker cubicle.

## 4.2 Circuit Breaker Removal

These are the following requirements and steps for circuit breaker removal using the RRS-2.

### 4.2.1 Requirements for Removal

The following removal procedure assumes that the following prerequisites have been met:

1. *The circuit breaker racking mechanism is in working order.*
2. *The circuit breaker has been properly maintained.*
3. *The circuit breaker is installed in the cubicle and OPEN according to manufacturer specifications.*
4. *The tooling is connected properly to both the circuit breaker and the RRS-2.*

#### **DANGER!**

*\*For your safety please ensure that all personnel follow the personal protective equipment rules and regulations along with following all of the manufacturer guidelines at ALL times.*

### 4.2.2 Steps for Removal

To remove the circuit breaker to the DISCONNECTED position, perform the following steps.

1. Ensure the RRS-2 is properly setup and attached to the breaker using the breaker specific tooling provided.
2. Verify the circuit breaker is OPEN according to manufacturer specifications.
3. Exit the arc flash boundary with the pendant station.

#### **DANGER!**

*\*Exiting the arc flash boundary may prevent the operator from observing the circuit breaker during repositioning, if this situation occurs we recommend acquiring the CBS ArcSafe™ camera system in order to remotely view the repositioning.*

*\*Although the pendant station allows the operator to be away from the immediate arc flash boundary personal protective equipment requirements must still be met at all times.*

4. Ensure the emergency stop push button is unlatched by turning the button clockwise.
5. Use the pendant station as you were shown in the training seminar to remove the breaker. If the pendant retracting cord is not long enough for the operator to leave the arc flash boundary additional pendant extension cords are available and the pendant station and pendant retracting cord can be replaced with an optional radio remote system.
6. Detach and uninstall the RRS-2 unit from the circuit breaker cubicle.

# 5.0 Maintenance

## 5.1 Introduction

The CBS ArcSafe™ RRS-2 is designed to require little maintenance; however, adopting a regular maintenance program will keep the RRS-2 in good condition allowing years of trouble-free service.

## 5.2 Prior to Use

Before use examine the general condition of the unit.

1. *Inspect the switch and indicators for tightness and damage.*
2. *Inspect the cables for wear or cracking, always replace a damaged cable.*
3. *Check cable glands for tightness.*
4. *Check for loose fasteners.*
5. *Ensure actuators are free of dirt and grime by wiping down with a damp cloth.*
6. *Run the unit unloaded to verify there is no abnormal noise or vibration. If abnormal condition exists, do not use.*
7. *If the unit has been inactive for more than 30 days, please measure the voltage across each battery in order to ensure that they are both running at 12Vdc for a combined 24Vdc*

## 5.3 After Use

After use, clean the RRS-2 ensuring the vents are free of dust and debris. Ensure the unit is free of oil or grease and if necessary, clean with mild soap and damp cloth. Store the device covered with either the standard dust cover or the waterproof cover (optional), in a clean, dry location to prevent damage.

## 5.4 Every 12 to 18 Months

Every twelve to eighteen months, depending on use, CBS ArcSafe™ recommends performing the following preventative maintenance.

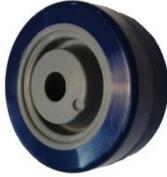
1. Check that the batteries maintain a charge.
2. Perform an electrical inspection of internal wiring, checking for signs of heat and loose connections.
3. Check all cables for extreme wear or cracks.
4. Check that the pneumatic tires (optional) are properly pressurized to 24 PSI and sufficiently sealed.

## 6.0 Ordering Replacement Parts

When ordering replacement parts please specify the serial number and MFD from the RRS-2 nameplate.

From the RRS-2 nameplate:	
Nomenclature:	<u>RRS-2</u>
Serial number	_____
MFD:	_____

## Remote Racking Unit RRS-2 Parts List

Item	Description	CBS ArcSafe™
		Part Image
1	2 * 12Vdc Batteries for 24 Vdc	
2	Battery Charger	
3	Power Cable	
4	Charging Light	
5	Front Wheel	
6	Door Lock	

## Remote Racking Unit RRS-2 Parts List Cont.

Item	Description	CBS ArcSafe™
		Part Image
7	25' Spiral PS Cable	
8	Power Switch	
9	Power Light	
10	Storage Bag	
11	PS mounted Receptacle R2/R4	
12	Stair Climber Rails	

## Remote Racking Unit RRS-2 Parts List Cont.

Item	Description	CBS ArcSafe™
		Part Image
13	Standard Tires	
14	Pneumatic Tires	

# Appendix A: Specifications

## 1.0 Specifications

<b>Charging Time:</b>	3 Hours (maximum)
<b>Dimensions (L x W x H):</b>	40" x 40" x 5' high (assembled unit).
<b>Frame Weight (<i>uncrated</i>):</b>	160 lbs/75 kg ( <i>base unit weight</i> )

## 2.0 Available Additional Options

**Wireless Camera System** – The wireless camera system includes a hardwired/mountable camera and a wireless video system so that the racking operation can be viewed remotely.

**Radio Remote Pendant Station** – The radio remote pendant station allows for the operator to control the RRS-2 remotely without needing to be tethered to the RRS-2.

**Lightweight Frame** – The lightweight units use a lightweight aluminum frame and lightweight motor for special applications where the normal RRS frame would be either too heavy or too large to use.

**Magne-blast Supervisory Link** – The Magne-blast supervisory link allows for the RRS to attach to a Magne-blast breaker using the existing supervisory link attachment to simplify the racking operations of GE Type AM Magne-blast circuit breakers.

**High Lift** – The high lift system, when installed allows for the RRS-2 to rack/unrack breakers that are up to 90" high, although depending on the application needs some high lift systems are built higher.

**LED Light** – The LED light system attaches a light to the front of the RRS-2 in order to account for low light conditions.

**Stair Climber Rails** – The stair climbers allow for the RRS-2 to easily be moved up/down stairs and in/out of vehicles.

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# Appendix B: Troubleshooting Guide

Symptom	Problem	Solution
The system power will not energize when the main power switch is in the ON position.	The over-current protection relay has tripped.	Reset the over-current protection relay within the electrical cabinet.
	The emergency stop pushbutton is latched.	Rotate the emergency stop pushbutton clockwise to reset.
	The battery leads are disconnected.	Reconnect the battery terminal leads.
	The batteries are completely discharged.	Charge the system batteries.
	An open has occurred within the sealed batteries.	Test and replace the system batteries.
The system batteries will not charge/will not hold a charge.	The battery leads are disconnected.	Reconnect the battery terminal leads.
	The battery charger is not connected to AC power.	Check the AC power connection.
	Faulty batteries or charger.	Replace faulty equipment. Contact your CBS ArcSafe™ Technical Sales/ Support Agent to obtain replacement parts.
	The RRS-2 has been stored in freezing temperatures.	Contact your CBS ArcSafe™ Technical Sales/ Support Agent for solutions.
	The batteries have aged from non-use.	Replace the system batteries. In order to obtain the longest life out of your batteries they must be discharged regularly. Contact your CBS ArcSafe™ Technical Sales/ Support Agent to obtain replacement parts.
	The batteries are being stored without a charge.	Replace the system batteries. Batteries must be charged before the unit is stored. Contact your CBS ArcSafe™ Technical Sales/ Support Agent to obtain replacement parts.

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# Appendix C: Wireless Camera System

## 1.0 Components

**Wireless Camera** – The wireless camera is either mounted on the front of the remote racking system or magnetically mounted to the switchgear.

**Monitor Case** – The monitor case houses the wireless video receiver, LCD display, power cable, and internal battery pack.

**Wireless Video Receiver** – The wireless video receiver is inside of the monitor pack and has multiple channels for combating wireless interference.

**LCD Display** – The LCD display is mounted inside of the monitor pack and folds flat for storage.

**Power Cable** – The power cable charges the internal battery pack and powers the unit if AC power is available.

**Battery Pack (internal)** – The battery pack in the wireless camera system will run for approximately 5 hours on a single charge.



## 2.0 Camera System Set-up

The wireless camera is either hard mounted to the remote racking system or magnetically mounted to the switchgear being racked; turning the 'CAMERA' switch, located on the Current Control Module on the RRS, clockwise to the ON position supplies power to the camera. When power is supplied to the camera, the camera then transmits the video signal wirelessly to the receiver. When the receiver is supplied power via the battery or the AC power cable provided, it outputs the signal to the LCD display.

### ATTENTION

**The maximum reception distance for the wireless camera system is 300 ft, however if there are any obstructions between the camera and the receiver some interference may build up and distort the wireless signal.**

## 3.0 Camera System Operation

The system is operated in the following manner:

- (1) Charge the LCD display.
  - a. The initial charge was performed by CBS ArcSafe™ personnel, subsequent charges are performed by plugging the LCD power cable into AC power.
- (2) Power on the camera.
  - a. The camera is located on the CBS ArcSafe™ Remote Racking System; the camera is powered on by turning the 'CAMERA' switch located on the Remote Racking Unit Control Panel clockwise to the ON position.
- (3) Power on the wireless camera kit.
  - a. Ensure the Monitor Case is fully charged or is connected to AC power.
  - b. Power on the monitor by turning the main power switch clockwise.
- (4) Changing Wireless Channels
  - a. Sometimes there will be a need to change wireless channels if too much interference affects your signal, if this is done please make sure to change wireless channels on both the wireless camera and the wireless receiver to make sure they are both sending/receiving to the same channel after being changed.

## 4.0 Camera Troubleshooting Guide

Symptom	Solution
Grainy video / static due to electromagnetic interference	<ul style="list-style-type: none"><li>• The wireless camera and receiver can switch to multiple wireless channels; switching channels or ensuring a direct line of sight with the camera may reduce the effects of interference (See System Operation Section for information regarding changing channels).</li><li>• Re-align wireless system antennas.</li></ul>
No video signal	<ul style="list-style-type: none"><li>• Check to ensure the wireless camera is connected to the racking unit.</li><li>• Check to ensure the 'CAMERA' switch is ON.</li><li>• Check to ensure that the camera and receiver are on the switched to the same channel.</li><li>• Check to ensure power is available to both the receiver and the monitor. Ensure the receiver is connected to either the battery or its AC power supply. Ensure the LCD display is charged or connected to its AC power supply. Ensure the rechargeable power supply has an adequate charge.</li><li>• Ensure the A/V cable is connected to the output of the wireless receiver and the input of the LCD display.</li></ul>

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# Appendix D: Radio Remote PS

## 1.0 Components

**Radio Remote** – The radio remote allows for the use of a radio remote pendant station in order to control the operation of your RRS.

### ATTENTION

The radio remote pendant station is designed specifically for the system that it came with. The radio remote will NOT work with any other CBS ArcSafe™ Remote System, therefore please keep the radio remote with the system that it came with.

**Radio Remote Receiver** – The radio remote receiver receives the radio remote signals needed to control the RRS. The radio remote receiver is attached to the system and although it is quite sturdy, care must be taken to ensure that during movement the remote receiver is not damaged. The radio remote receiver is powered by 2 AA batteries in the internals of the unit.

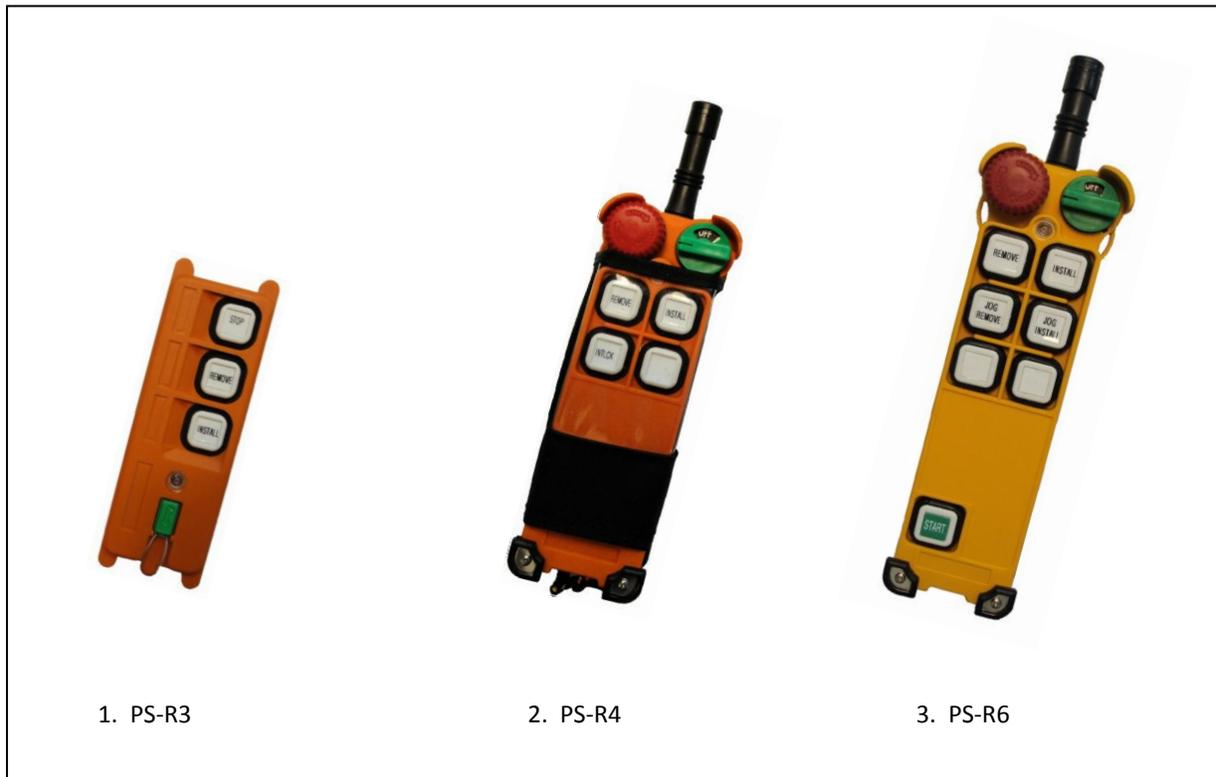


Figure D.1 – Available radio remote pendant station models

## 2.0 Radio Remote Models

### PS-R3 (Fig. D.1.1)

The PS-R3 radio remote has 3 control buttons that are designed to wirelessly control the included systems operation. With the PS-R3 the operator must ensure that the green magnetic key is inserted into the key slot before the pendant station will operate the unit. Generally the 3 buttons control the install and remove functions and include an emergency stop switch.

#### ATTENTION

Unlike the other pendant station models, the power on the system will appear on even when the radio remote is off when the key is removed. Therefore please ensure that the green key is inserted into the PS-R3 when in use.

### PS-R4 (Fig. D.1.2)

The PS-R4 radio remote has 4 control buttons that are designed to wirelessly control the included systems operation. In order to use the PS-R4 the operator must ensure that the emergency-stop button is raised by rotating the button clockwise and turning the operating switch clockwise from the off position, past the on positions, to the start position and then releasing the switch letting it spring back to the on position.

#### ATTENTION

The power on the system will appear off until the radio remote is turned on when using your system with the PS-R4. Therefore please ensure that the pendant station is turned on before troubleshooting why the power in your system is not turning on.

### PS-R6 (Fig. D.1.3)

The PS-R6 radio remote has six control buttons that are designed to wirelessly control the included systems operation and one start button that connects the PS-R6 to the receiver. In order to use the PS-R6 the operator must ensure that the emergency-stop button is raised by rotating the button clockwise and turning the operating switch clockwise from the off position to the on position, and then press the start button to connect the PS-R6 to the receiver.

#### ATTENTION

The power on the system will appear off until the radio remote is turned on when using your system with the PS-R6. Therefore please ensure that the pendant station is turned on before troubleshooting why the power in your system is not turning on.

### 3.0 Possible Button Configurations

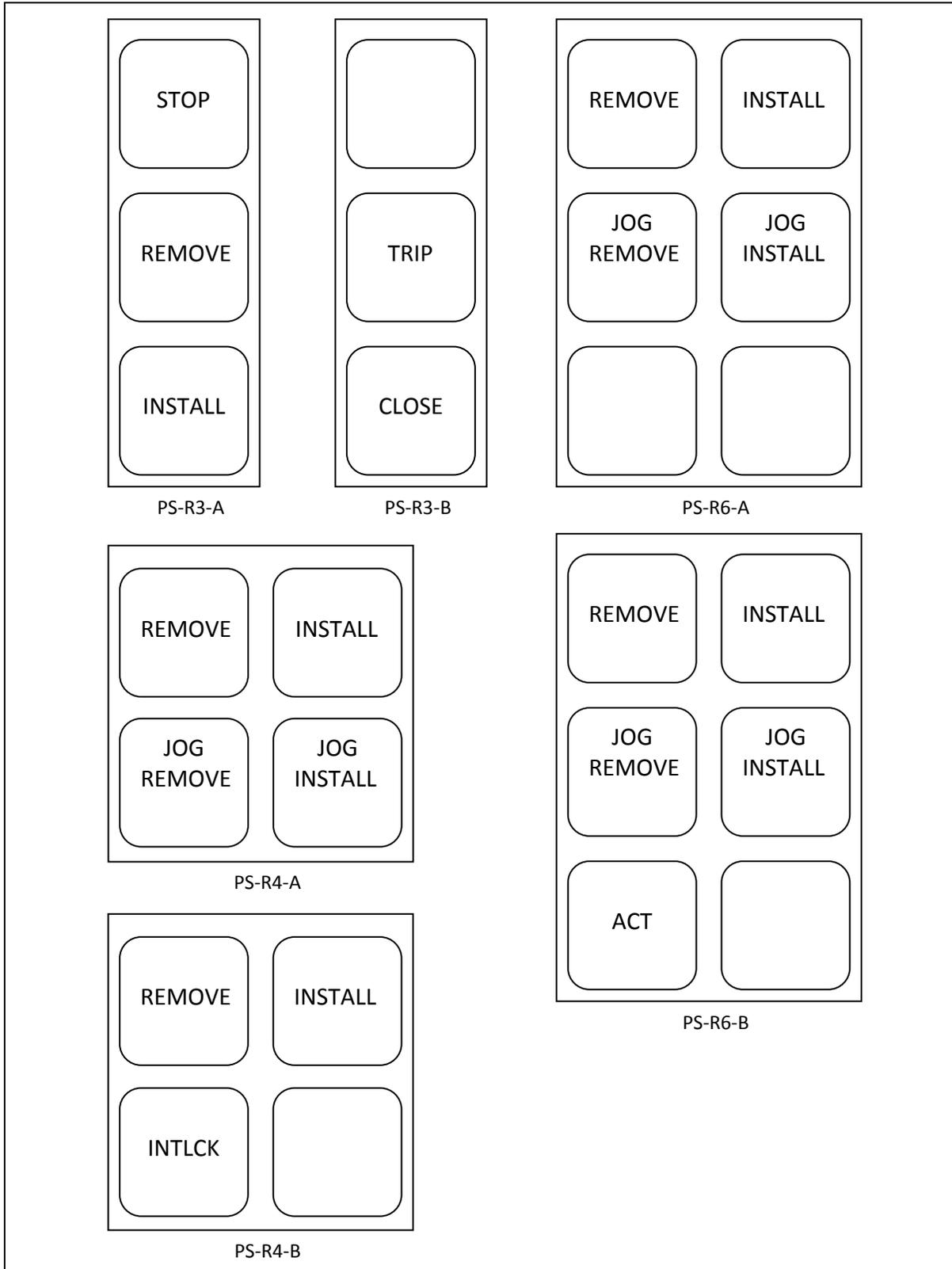


Figure D.2 – Possible Button Configurations

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## 4.0 Radio Remote Troubleshooting Guide

Symptom	Problem	Solution
The system power will not energize when using the remote, but the system power energizes and runs with the normal pendant station.	The emergency-stop push-button is latched.	Rotate the emergency stop pushbutton clockwise to reset.
	The radio remote is not communicating with the receiver.	Ensure that the remote has been properly connected wirelessly to the receiver. This can be done by either inserting the green key (PS-R3), rotating the operating switch to the start position (PS-R4), or pressing the start button (PS-R6).
	The radio remote is designed for another unit. (PS-R4,PS-R6)	Ensure that the radio remote being used is the radio remote provided for that particular unit, the radio remotes are NOT interchangeable between systems and are unique for every system.
The remote pendant station is "dead," but the system power is on.	The radio remote's batteries are dead and therefore cannot connect .	Replace the 2 AA batteries inside of the remote. This may require you removing the remote from its protective plastic cover and carefully unscrewing the back cover on the remote.
	The radio remote is not communicating with the receiver. (PS-R3)	Ensure that the remote has been properly connected wirelessly to the receiver. This can be done by inserting the green key (PS-R3), rotating the power switch to the start position (PS-R4), or pressing the start button (PS-R6).
	The radio remote is designed for another unit.	Ensure that the radio remote being used is the radio remote provided for that particular unit, the radio remotes are NOT interchangeable between systems and are unique for every system.
	The radio remote's batteries are dead.	Replace the batteries inside of the remote. This may require you carefully removing the remote from its protective plastic cover and carefully unscrewing the back cover on the remote.

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# Appendix E: Bucket Extractor (BE)

## 1.0 Description

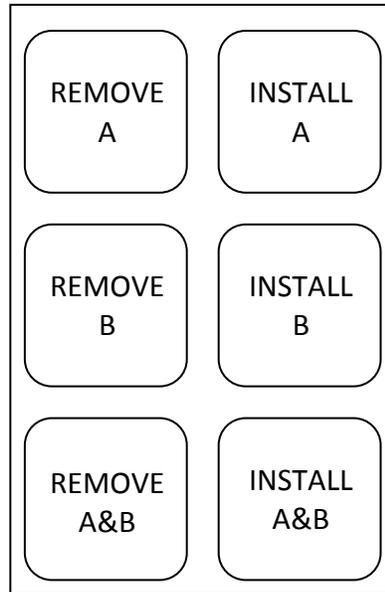
The RRS-2-BE, bucket extractor, units are a specialty version of the RRS-2, which is built for extracting MCC buckets. The main design of the unit is nearly identical to that of the RRS-2 with the following exceptions:

1. The control cabinet with the current control module has been removed for ease of operation.
2. The 6 button radio pendant station (PS-R6) is standard.



## 2.0 Pendant Station Operation

With the RRS-2-BE the pendant station has a unique set of controls which are as follows.



### 3.0 RRS-2-BE Parts List

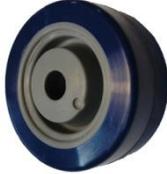
With the RRS-2-BE the parts list is slightly different than for the standard RRS-2.

Remote Racking Unit RRS-2-BE Parts List		
Item	Description	CBS ArcSafe™
		Part Image
1	Battery Charger	
2	Power Cable	
3	Male Power Connector	
4	Mounted Female Power Adapter	

## Remote Racking Unit RRS-2-BE Parts List Cont.

Item	Description	CBS ArcSafe™
		Part Image
5	Power Switch	 A black rotary power switch with a green ring and a black handle. The handle is currently in the 'OFF' position. The switch is mounted on an orange background. The labels 'OFF', 'LOC', and 'REM' are visible above the handle.
6	PS-R6 Radio Remote	 A handheld orange radio remote control with a black antenna and several buttons. It has a red emergency stop button at the top.
7	RSO Case w/ Components	 A black plastic carrying case with its lid open, revealing various electrical components, cables, and connectors inside.
8	Standard Tires	 Two solid black tires mounted on metal axles, shown side-by-side.
9	Pneumatic Tires	 Two pneumatic tires with a tread pattern, mounted on metal axles, shown side-by-side.

## Remote Racking Unit RRS-2-BE Parts List Cont.

Item	Description	CBS ArcSafe™
		Part Image
10	Front Wheel	
11	Magnet Brace	



Distance is Safety™

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**Email: [info@CBSArcSafe.com](mailto:info@CBSArcSafe.com)**

**DANGER!**

*\*Ensure that personnel using this equipment are adequately trained in the operation of the switchgear they are planning to work with; that they are correctly stationed outside the arc flash boundary; and that they comply with all applicable Federal, State, Local, and In-house safety regulations and procedures. Attention should be given to distance, angle, and personal protective equipment (PPE).*

**Guarantee:** Equipment is guaranteed free of inherent electrical or mechanical defects for one (1) year from date of shipment, and to perform according to ratings, under normal conditions and with competent supervision. Our obligation is limited to repair or replacement of defective parts, FOB our plant, Denton, TX. We're not responsible for consequential damage, for repairs or replacement made by others except when agreed to in writing.

*\*PLEASE TEAR OUT*

## WARRANTY REGISTRATION – **CBS ArcSafe™** Products

**IMPORTANT:** Complete and mail this warranty registration form as soon as possible.

Date: \_\_\_\_\_

CBS ArcSafe™ Model (CIRCLE ONE):            **RRS-2**      **RRS-2-BE**

CBS ArcSafe™ Serial Number: \_\_\_\_\_

Company: \_\_\_\_\_

Address 1: \_\_\_\_\_

Address 2: \_\_\_\_\_

City: \_\_\_\_\_

State/Province: \_\_\_\_\_

Zip/Postal Code: \_\_\_\_\_

Country: \_\_\_\_\_

Telephone and Fax: \_\_\_\_\_

Contact Person (please print): \_\_\_\_\_

Please mail or fax warranty registration to:

**FAX: (940) - 382 - 9425**

**CBS ArcSafe™**

**P.O. Box 550**

**Argyle, Tx 76226**

*\*PLEASE TEAR OUT*