

# CBS ArcSafe®

*Distance Is Safety®*

A Group CBS Company

# Installation and Operation

## RRS-3 DB-75/100

For Type DB-75, 3000A and  
Type DB-100, 4000A  
(Includes DB-75/100)



**Distance is Safety®**

WHAT STANDS  
BETWEEN YOU AND  
ARC-FLASH DANGER?

**WE  
DO.**

2616 Sirius Road | Denton, TX 76208 | (877) 4-SAFETY | [www.cbsarcsafe.com](http://www.cbsarcsafe.com)

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# More Products by CBS ArcSafe®

## **RRS-1 – Universal Remote Racking System (Rotary)**

The CBS ArcSafe® RRS-1 is a universal remote racking system capable of remotely installing and removing rotary style draw out circuit breakers without requiring any modification to the existing switchgear. Operation of the simple to use RRS-1 is quite intuitive and requires only minimal setup. When used properly, the RRS-1 allows technicians to remain outside of the arc flash boundary during the potentially dangerous racking operation.

## **RRS-2 – Universal Remote Racking System (Non-Rotary)**

The CBS ArcSafe® RRS-2 is a universal remote racking system capable of remotely installing and removing non-rotary style draw out circuit breakers without requiring any modification to the existing switchgear. Operation of the simple to use RRS-2 is quite intuitive and requires only minimal setup. When used properly, the RRS-2 allows technicians to remain outside of the arc flash boundary during the potentially hazardous racking operation.

## **RRS-3 – Application Specific Remote Racking System (Rotary And Non-Rotary)**

The CBS ArcSafe® RRS-3 product line is made up of various application specific remote breaker racking devices. Each standalone system allows service personnel to remotely install and remove a particular type of circuit breaker safely while stationed safely outside of the arc flash boundary during the potentially dangerous operation. The lightweight and compact design of the RRS-3 systems makes them ideal for hard to access areas where space is at a premium.

## **RRS-4 – PLC Based Universal Remote Racking System (Rotary)**

The CBS ArcSafe® RRS-4 universal remote racking system is an updated PLC based version of the best selling RRS-1. The dual mode, source programmable, PLC based control system offers two different operating modes to choose from based on user preference or the application. The RRS-4 is capable of remotely installing and removing rotary style draw out circuit breakers without requiring any modification to the existing switchgear, allowing users to remain outside of the arc flash boundary during the potentially hazardous racking operation.

## **RSA – Remote Switch Actuator**

The CBS ArcSafe® Remote Switch Actuator (RSA) product line is made up of various application specific remote operating devices. These products allow service personnel to remotely perform all aspects of an operation for a particular type of electrical equipment from outside the arc flash boundary – reducing or eliminating the possibility of serious injury or death resulting from an arc flash.

## **RSO – Remote Switch Operator**

During a remote operation, the CBS ArcSafe® RSO functions as both the power supply and user interface for the device being remotely operated by the user. When paired with an applicable CBS ArcSafe® device, this portable standalone system allows service personnel to remotely perform a racking or switching procedure from outside the arc flash boundary – reducing or eliminating the possibility of injury or death resulting from an arc flash

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# About the User's Guide

This user's guide describes the functions and features of the CBS ArcSafe® Single Application Remote Racking System (RRS-3). 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-3 features.

## **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-3 on your switchgear. Contact your local group CBS service provider at [www.gcbs.com](http://www.gcbs.com) to assist in proper care and maintenance for your switchgear.

# 1 Installation

This RRS-3 requires slight modification to the breaker's switchgear in order to perform properly. The instructions in the following sections will describe how to perform the necessary switchgear modifications, as well as describe the installation procedure for the RRS-3.

## DANGER!

Ensure that the equipment to be remotely operated matches the equipment shown and described on the cover page. If the equipment does not match, please contact CBS ArcSafe® for more information regarding remote operating applications for the equipment in question.

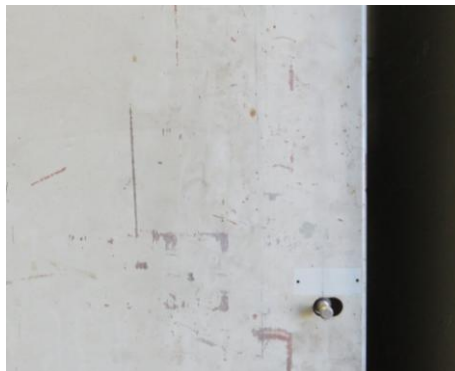
## 1.1 Switchgear Modification

Along with this RRS-3, CBS ArcSafe ships a punchout tool and template to allow users to cut a hole in the switchgear door for remote racking operations. This additional hole allows the RRS-3 to remotely rack the breaker with the switchgear door closed, increasing safety for racking operations.

## DANGER!

Do not attempt to modify live switchgear! Attempting to modify live switchgear could cause an arc flash, resulting in serious injury or death.

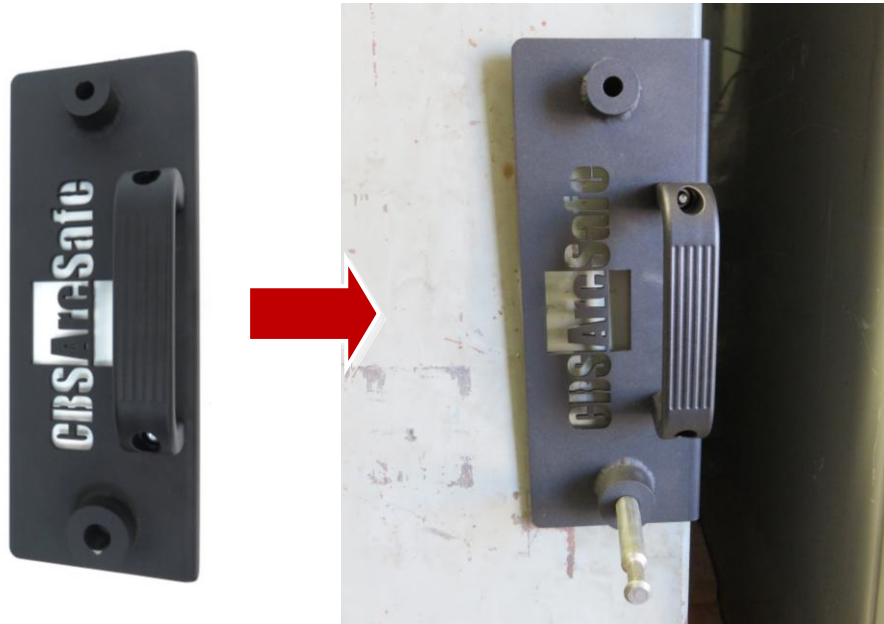
1. Ensure the area around the breaker racking interlock is clear from any obstructions, or lockout mechanisms. Remove obstructions as necessary (they can be re-installed later).



2. Pull the breaker racking interlock fully outward.



- Slide the ArcSafe cutting template over the interlock, as shown, and ensure the tab on the right side of the template is flush with the right-side of the switchgear.



- Using a 3/8 drill bit, drill a pilot hole through the upper guide on the included cut template. This hole will be used by the punchout tool.
- Using the punchout tool included with the RRS-3 and a 1" wrench or socket and ratchet, punch a 1" diameter hole in the switchgear door. Follow the instructions included with the punch on its installation and operation.



The switchgear is now ready to accept the RRS-3

## 1.2 RRS-3 Installation

### ATTENTION!

The location of certain items such as mimic bus, stickers, and/or placards may interfere with the installation of the remote operating equipment. These items may need to be removed or repositioned for proper installation.

1. Ensure that the breaker is free from any obstruction that may interfere with the proper installation of the RRS-3.



2. Ensure that the torque limiter on the RRS-3 is set correctly to allow proper operation. See section 3.1 Torque Limiter in this manual for more details
3. Check that the circuit breaker is OPEN, according to manufacturer procedures and specifications.
4. Pull the racking interlock fully outward.





5. Place the RRS-3 on the front of the breaker, ensuring that the device is fully seated onto the switchgear, and that the tool is fully engaged with the racking mechanism. Also ensure that the upper locator is seated into the grill on the switchgear door, as shown below to prevent rotation of the RRS-3 during racking.
  - a. Rotate the racking tool with the knurled knob on the back of the RRS-3 as necessary to align the tool.



6. Secure the RRS-3 to the breaker by turning the handles of the twist magnets 180 degrees clockwise.

The RRS-3 is now ready for operation



## 2 Operation

### ATTENTION!

Please ensure that the batteries to the RSO-IV are fully charged or that the unit is plugged into AC power.

For detailed instructions on the operation of the RSO-IV please see the RSO-IV Manual.

1. Ensure that the RRS-3 is properly installed. See the Installation section of this manual for detailed instructions.
2. Connect the cable from the RSO-IV to the motor control box on the RRS-3
3. Turn the power switch on the RSO-IV to the ON position.
4. Program the settings for the RRS-3 into the RSO-IV. These settings can be found on the placard on the RRS-3. For more information on programming the RSO-IV please refer to the RSO-IV Technical Manual.
5. Exit the arc flash boundary.
6. To rack the breaker out, press and release the REMOVE button on the RSO, or optional radio pendant. The breaker will rack from CONNECTED to REMOVED position.
7. To rack the breaker in, press and release the INSTALL button on the RSO, or optional radio pendant. The breaker will rack from REMOVED to CONNECTED position.

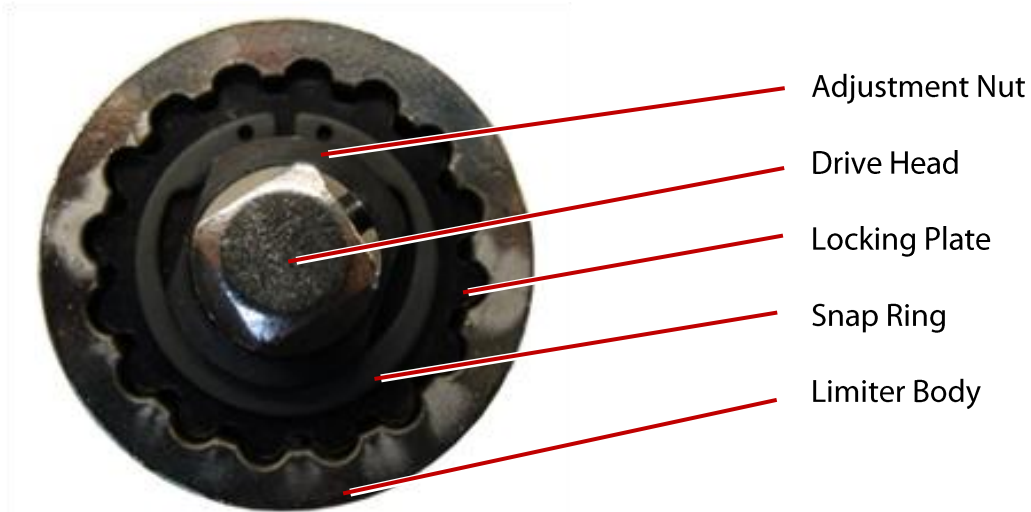




## 3 Adjustments

### 3.1 Torque Limiter

The torque limiter is designed as the primary safety system to reduce the possibility of damaging the circuit breaker racking mechanism with the RRS-3. The torque limiter attaches to the drive coupling and mates with the racking tool. The torque limiter is set from the factory for your particular breaker, so only adjust as needed for your specific situation. *Note: A ½ inch drive torque wrench will be required to perform this adjustment.*



1. First, remove the racking tool adapter from the RRS-3 by pushing in the locking pin at the base of the tooling shown below. The racking adapter can then be fitted to a standard ½ inch drive torque wrench.



2. On the de-energized and OPEN test breaker, extract the breaker's racking handle, and fit the racking adapter to the handle as shown in the Installation section of this manual.

3. To determine the proper torque required to rack the breaker, first rack the breaker out, measuring the maximum amount of torque needed. Record this value.

### ATTENTION!

When the breaker reaches either the test or disconnected position the torque will rise as various interlocks and mechanical limits engage. Do NOT apply any torque to the racking mechanism greater than that seen during the racking process.

4. Next, reset the torque wrench (if needed) and proceed to rack the breaker in, again measuring the maximum torque applied. Record this value.

### ATTENTION!

As you begin racking the breaker onto the stabs the torque should raise, and then almost immediately after the breaker is on the stabs the torque will lower and then spike as you hit the racking limits. This spike is the breaker starting to be racked in too far. DO NOT continue to rack in the breaker at this point. The maximum amount of force the breaker needs to rack will be found as breaker has gone onto the stabs

### DANGER!

As breakers age and/or do not see regular maintenance the torque needed to rack a breaker may increase. However, large increases of torque needed to rack a breaker including amounts over 10% of the average torque may indicate breaker problems, which could lead to an arc flash.

If the RRS does not seem to have enough torque, first double check that the breaker is operating properly before racking out by hand.

5. Take the the higher of the two recorded values and multiply by 1.1. This adds an additional 10% margin of error for the torque limiter. This new value is the setting for the torque limiter.
6. Next, Attach the torque wrench to the spring loaded drive head (Various different socket adapters may be necessary depending on the drive size of the torque wrench) and use the torque wrench to determine the present setting of the torque limiter. The torque limiter body will need to be held still during this operation.
7. Remove the snap ring and locking plate from the torque limiter.
8. Adjust the nut clockwise to increase torque, and counter-clockwise to decrease torque.
9. Obtain a new torque reading with the torque wrench to verify the new torque setting. Repeat steps 8-9 until the torque value determined in step 5 is reached.
10. Replace the locking plate and snap ring onto the torque limiter.

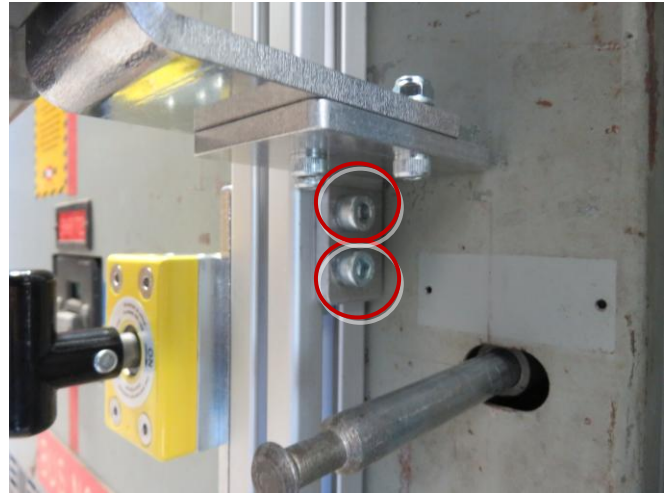
### DANGER!

Inaccurate setting of the torque limiter may result in excessive slip during racking operations or, if over-tightened, the remote rack placing excessive torque on the breaker racking mechanism; possibly leading to equipment damage.

## 3.2 Actuator Adjustment

The motor actuator on the RRS-3 may be adjusted to accommodate slight differences in breaker racking mechanism heights. Note that adjustment should be limited to the space allocated by the hole punched in the switchgear door (See section 1.1 for details). If there are any additional fit problems, please contact CBS ArcSafe.

1. Loosen the two bolts on each mounting plate, as indicated below.



2. Install the RRS-3 as described in the Installation section of this manual.
3. Adjust the position of the RRS-3 motor actuator as required so the racking tool is aligned with the racking mechanism and fully engaged. The drive motor and tool should be directly in line with the racking screw.
4. Re-tighten the bolts loosened in step 1.

### 3.3 Magnet Adjustment

The lower magnet on the RRS-3 can be moved, to accommodate for obstructions on the switchgear door.

1. Loosen the two bolts holding the magnet in place, as indicated below.



2. Install the RRS-3 as described in Section 1.2 of this manual.
3. Before locking the lower twist-lock magnet, slide it up or down as needed to accommodate any obstructions.
4. Turn the handle of the twist-lock magnet 180 degrees clockwise to lock the magnet in place.
5. Tighten the bolts on the magnet plate that were loosened in step 1.









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2616 Sirius Road  
Denton, TX 76208  
Tel: 877-4-SAFETY  
Fax: 940-382-9435  
Website: [www.CBSArcSafe.com](http://www.CBSArcSafe.com)  
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).