

Arc Flash Safety Remote Power Racking (RPR-2)

Electrical Sector
Low and Medium Voltage
Power Circuit Breakers



Arc Flash and Personnel Injury

Electric arcs result from thermal ionization that occurs when current flow is interrupted by the separation of conductors. Thermal ionization can generate temperatures as high as 35,000°F. Conductor materials melt into metal vapor and the surrounding air is ionized. If the arc is outside the interrupting chamber of a circuit breaker, a violent explosion occurs resulting in an inferno of ionized gases, molten debris, metal shrapnel, and a flash of light (Arc Flash). If an Arc Flash initiates in a



**Personal Protective Equipment
Required for Arc Flash Exposure.**

switchgear cabinet, the internal pressure rapidly expands, dislodging compartment doors and side sheets of the switchgear, turning hardware into high-speed projectiles.

Arc Flash levels are a function of circuit voltage, maximum available short circuit current at the point of flashover, conditions of confinement, and the distance between the point of flashover and the point of measurement. Many Arc Flash incidences with LV and MV switchgear occur during the process of inserting and removing (racking) Power Circuit Breakers in switchgear cubicles. Personnel are typically within two feet of the front of the circuit breaker during the racking process and this close proximity to an Arc Flash can cause serious injury. Published records indicate over 2000 people are treated annually in burn centers from exposure to Arc Flash and some result in death. A company's financial exposure is rarely less than \$100,000 for medical care and insurance claims per incident. NFPA 70E provides guidance for the requirements of personal protective equipment (PPE) to protect personnel from Arc Flash exposure. PPE for high levels

of Arc Flash can be bulky, hot, and uncomfortable. This may dissuade personnel from wearing proper protection. An Arc Flash occurrence is definitely a time when you want to be "dressed for the occasion."

The best way to limit exposure to Arc Flash during the process of racking power circuit breakers is to put more distance between the person and the possible point of exposure.

Safety Solution

Eaton's RPR-2 provides a means of remotely racking power circuit breakers that utilize the rotation of a shaft for insertion and removal. The person can be 25 feet or more away from the switchgear door during the racking process. This can allow personnel to wear a lower level of PPE (increased worker comfort and mobility) while operating the RPR-2 from an increased distance from the breaker. Since personnel can

be outside the flash protection boundary while operating the RPR-2, the circuit breaker door does not have to be closed during the racking process. Closed door racking is possible with many designs, however structure modifications may be necessary.

Customer surveys have shown that any remote racking device must:

- Be easily and quickly setup
- Require minimum programming
- Be portable and easy to maneuver
- Be capable of racking numerous manufacturers' models of circuit breakers

The RPR-2 system is the solution that provides the value customers requested. Contact your nearest Eaton representative and see the system built from customers' ideas.



RPR-2 Racking Magnum DS

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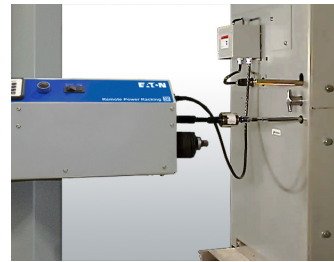
Balanced Weight Distribution

The consistent center of gravity allows the higher positioned circuit breakers to be easily racked.



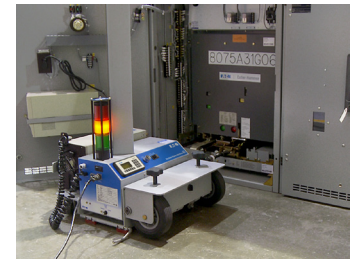
Finger-Touch Vertical Adjustment

Easily adjust the power module without the use of motors, gear drives or winches.



Vertical Lift Racking

The RPR-2 Plus has the capability of closed door vertical racking (with cell modifications and optional attachments).



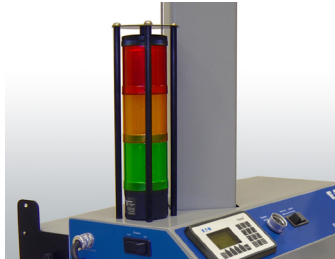
Horizontal Racking Pressure

The RPR-2 applies up to 10 pounds of positive pressure while racking breakers.



Power Module

Each control system can handle up to eight pre-selected breakers with no programming needed for operation.



Status Indicator Lights

The Eaton Stack Light is a status indicator as well as a warning for others during the racking process.



Locking Base and Power Module

The Power Module can be locked for transport and storage. Eaton provides a protective cover for indoor storage.



Standard Lifting Attachment

Allows secure lifting for any RPR-2 or RPR-2 Plus unit.



Removable Pendant and Cable

Each system comes standard with a remote operators pendant and a 25 ft control cable. Control cable extenders are available.

Power Requirements

The Power Module is fed by an integrated PowerWare Uninterruptible Power Supply (UPS), which connects to a standard 120 Vac, 15 Amp receptacle.

Torque Limit Features

Selecting the breaker type determines the maximum torque delivered to the breaker during insertion to prevent damage to the breaker and cell. The torque output delivered to the racking shaft is monitored electronically. An external mechanical torque-limiting device serves as a back-up to prevent damage to the breaker's racking system.

Automatic Alignment

The RPR-2 System can self-align up to 7 degrees with the levering shaft.

Corrosive Resistant Structure

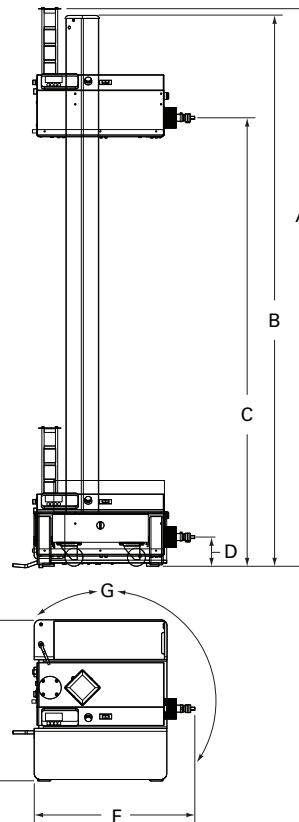
Materials are selected to be corrosive resistant when applied in usual service conditions as defined in IEEE/ANSI C37 standards.

Quality Management System

Every RPR-2 is designed, manufactured and tested in an ISO 9001:2008 certified facility.

Universal Design

The RPR-2 system is capable of racking most two-high medium voltage and four-high low voltage power circuit breakers. Breakers must have a screw-type racking system that requires rotary motion to rack the breakers and be within the racking height dimensions of the RPR-2 profiles listed in the dimensional data table.



RPR-2 and RPR-2 Plus Dimensional Data

RPR-2 Universal Profile

Overall Height	A	100"
Stanchion Height	B	98"
Max. Racking Height	C	81"
Min. Racking Height	D	4.875"
Width	E	28"
Depth	F	29"
360° Rotational Clearance	G	36"
Weight		315 lbs

RPR-2 Medium Profile

Overall Height	A	88"
Stanchion Height	B	86"
Max. Racking Height	C	68"
Min. Racking Height	D	4.875"
Width	E	28"
Depth	F	29"
360° Rotational Clearance	G	36"
Weight		310 lbs

RPR-2 Low Profile

Overall Height	A	68"
Stanchion Height	B	66"
Max. Racking Height	C	48"
Min. Racking Height	D	4.875"
Width	E	28"
Depth	F	29"
360° Rotational Clearance	G	36"
Weight		300 lbs

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