



SAFE-T-RACK
by remote solutions, llc

Catalog and Application Guide



Type SRN

**GE Magneblast M26 &
M36 Generation 4
Vertical Lift Switchgear**

Sales, Service, and Installation

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Safe-T-Rack Type SRN Remote Racking System

For

GE MagneBlast M26 & M36 Generation 4 Vertical Lift Switchgear Catalog & Application Guide

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1. Key Features

1.1 Introduction

Safe-T-Rack (STR[®]) is an innovative, patented, tool for circuit breaker remote racking and control. This product family was specifically developed to provide users of low and medium voltage circuit breakers, including GE vertical lift (MagneBlast) designs, a comprehensive alternative to arc flash protection garments. Three product families are available, SR, SRN, and SRH.

Safe-T-Rack (STR[®]) brings another solution for complying with the new NFPA and OSHA standards pertinent to electric arc flash, arc flash energy, safe working distance (arc flash zones) and personal protective equipment (PPE).

STR[®] systems are engineered to easily integrate with the original equipment switchgear and allow equipment operators to distance themselves from an arc flash incident. This patented technology revolutionizes the way circuit breakers are racked in / out of service and charged / closed / opened.

The Safe-T-Rack SRN- M26/M36 system is a remote racking product made specifically for G.E. MagneBlast M26 and M36 medium voltage circuit breakers. There are two system types used with the MagneBlast family of breakers in order to offer a remote racking solution for all breaker applications. The SRN system is designed for use with most indoor applications making it the most commonly used system. In addition we offer the SR system. This SR system was designed for use with outdoor non walk-in applications. One complete system consists of all the necessary components to outfit and confidently rack a MagneBlast M26 or M36 circuit breaker remotely.

This product is designed to support generation 4 MagneBlast gear.

If you have earlier generation MagneBlast gear, a conversion kit can be supplied. Please contact your local authorized Safe-T-Rack distributor for details.

1.2 Benefits

- Safe-T-Rack (STR[®]) allows the operator to rack a breaker while remaining at a distance of 30 + feet. Provides protection against the deadly possibilities of an arc-flash incident with a safe working distance between the operator and the switchgear.
- Safe-T-Rack (STR[®]) distance has a unique advantage over cumbersome flash suits designed only to decrease exposure to burns.
- Only Safe-T-Rack (STR[®]) provides protection against airborne projectiles often associated with arc-flash fatalities.
- Protects racking mechanism from excessive force which causes mechanical damage.
- Supports unlimited pendant cord length
- Limitilt[®] minimizes tilted breaker related equipment damage.
- Systems control and protection eliminates costly racking motor failure.
- Does not modify original controls.
- Supports emergency use of original design motor
- Protects user during all dangerous operations
 - Raise/ Lower
 - Charge
 - Open/ Close (Optional)
- Allows confident blind use
- NFPA & OSHA compliant
- ANSI tested
- Nuclear Rated 2/1 Seismic Compliant for 1E Applications
- Installed at numerous Industrial facilities, Nuclear and Fossil Generating Stations in North America

1.3 Product Features STR® Type SRN

GE Magneblast- Generation 4- M26 and M36

U.S. Patent No. 6,777,627

Portable Controller (Pendant Station)

Fault indications
 Motor run indication
 Breaker position LED indication
 Slide clutch locked indication
 Emergency stop button
 Raise/Lower buttons or switch
 Close/Trip permissive button
 Close/Trip buttons (P2 or P6)
 Automatic slide clutch unlock button
 Mil Spec dust/drip tight connector
 Mil Spec dust/drip tight plug protective cap
 Positive twist-lock plug
 Dust/Drip tight enclosure
 Drop/Shock resistant composite enclosure
 Portable system storage/tote case

Portable Elevating Motor (Remote Motor)

Universal application for M26/M36
 1.1 horsepower rating
 Precision laser cut stainless steel frame
 Hex drive coupling
 Self latching with positive interlock
 Positive drive coupling required to lock clutch
 Local and remote indication of clutch position
 Automated clutch release (breaker charge)
 Manual clutch release (emergency by-pass)

Portable Circuit Breaker Tilt Angle Monitor (LimiTilt®)

LimiTilt® bypass (defeat) plug
 Multi-axis digital sensors
 Automatic relative zero set point
 Protected auto-ranging tilt scale
 Preset multi-axis tilt angles
 Field adjustable multi-axis tilt angles
 Local backlit display- tilt angles
 Local LED display- operation mode
 Local tilt fault angle display
 Remote tilt fault indication
 Active tilt fault trip and lockout
 System power permissive interlock
 Motor run permissive interlock
 Magnetic base dual mounting
 Coiled control cord with locking plug
 Storage/ tote bag

System Controller and Cubicle Kit

Circuit breaker close/trip control interface (optional)
 Circuit breaker tilt monitor control interface
 Centralized control box with circuit protection
 Backward compatible to a “local” elevating motor
 Motor receptacle plug-in interface J-Box
 Source Power/ Breaker position LED indication
Does Not Require switchgear control wire modification
 High speed DC circuit breaker protection
 Adjustable threshold motor jam protection
 Directional time delay motor plugging protection
 Emergency stop remote system isolation
 Mil Spec positive lock wire harness connectors
 Door mounted receptacle and harness assembly
 Mil Spec dust/drip tight receptacle
 Mil Spec dust/drip tight receptacle protective cap
 Door mounted system ID escutcheon plate
 Complete installation hardware kit
 Installation instructions and drill/punch template
 Complete installation tool kit (Optional)

1.4 System Components

Each Control System Remote Kit should contain:

- 1 System Control Box
- 1 Mounting Hardware Kit

Each Cubicle Kit should contain:

- 1 Hardware Kit
- 1 Junction Box with Door Harness Assembly
- 2 Installation and Operation Manuals will be issued with each order & one CD containing .pdf copies of the Installation & Operation Manual.

Each Portable Kit should contain:

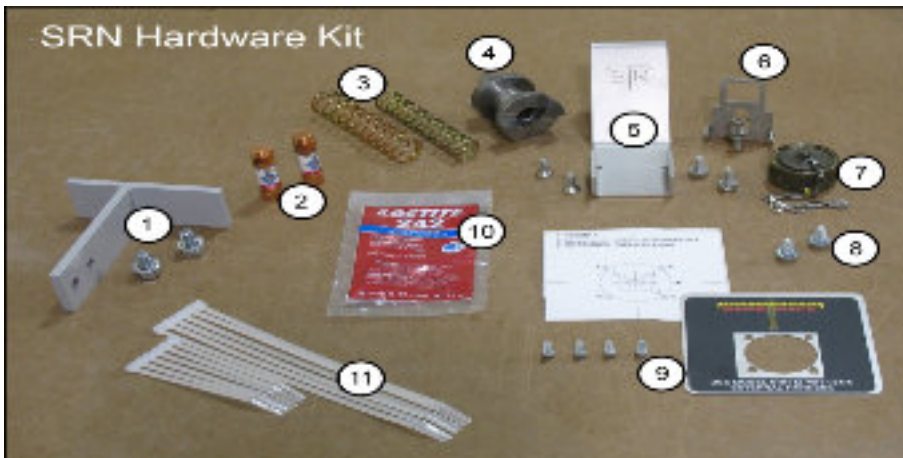
- 1 Pendant Controller
- 1 Remote Elevating Motor
- 1 External Harness Assembly
- 1 LimiTilt® Digital Inclinometer
- 1 Inclinometer Shorting Plug
- 1 Inclinometer Storage Bag
- 1 Tote Case
- 1 Operation Guide

1. **Control Box (SRN-M-75CR-1)** – The control box is a component part of the Control System Remote Kit that provides the systems management and protection. All control relays, reversing DC contactor, fuses, high speed DC circuit breaker and adjustable motor jam protection are contained in this stationary panel to insure performance and reliability. User serviceable parts (control circuit fuses) and the circuit breaker are both easily accessible from the front panel. All field connections are made through MIL Spec. gender-keyed receptacles which insure a failsafe installation or replacement.



2. Hardware Kit (SRN-M-75KH-26 or -75K-36) – The hardware kit includes all of the necessary hardware to install the Safe-T-Rack remote racking system in a MagneBlast M26 or M36 cubicle. The hardware kit is part of the cubicle kit.

1. Replacement Breaker Handle & 3/8-16 Bolts & Lock Washers
2. TR15R Fuses
3. Kick-Out Springs
4. Slide Clutch
5. Slide Clutch Lever & Two 1/4-20 screws & Two 1/4-20 bolts & lock washers
6. Slide Clutch Key
7. Door Receptacle Dust Cap
8. 1/4-20 Self Tapping Screws & Star Washers (For Mounting the Junction Box)
9. Escutcheon Plate, Drill Pattern & 8/32 Mounting Screws
10. Single Use Loctite 242
11. Cable Ties



3. Junction Box – The Junction Box is a part of the Cubicle Kit and is designed to plug directly into the original equipment (Generation 4) elevating motor receptacle. This seamless interface provides the remote racking system with power and access to the existing raise and lower limit switches, thus eliminating the need for any control wire modifications. The door wiring harness connection is made through a MIL Spec. gender-keyed receptacle which insures a failsafe installation or replacement. Two green indicating lights provide local indication that source power is available to the remote racking system, as well as limit switch (breaker position) status. The Junction Box also provides the port for the Limitilt® digital inclinometer. The plug-in design permits the user to quickly revert back to a “local” elevating motor if necessary.



SRN-M-75JT-H1 or V1



SRN-M-75JT-P1

4. Pendant Controller (SR-M-75P4) – The pendant controller is a part of the portable kit which allows the operator to engage all system features including racking, clutch control, status and fault indications from a remote location. The controller is dust / drip proof and drop / shock resistant due to its rugged composite molded enclosure. The pendant controller connects to the system control box receptacle through a MIL Spec. gender-keyed plug (with protective dust cap) which insures a positive-lock connection. Standard cable length is 30 feet and may be special ordered in any length to suit customer-specific requirements. The pendant controller is designed to give the equipment operator comprehensive system control and function / fault status from an operating distance of 30 or more feet. The pendant includes clutch status, system fault and motor run indications, as well as Emergency Stop, Clutch Unlock, Raise, and Lower control functions.



5. Remote Elevating Motor (SR-M-75RMM-1) The “Remote” elevating motor assembly is a component part of the Portable Kit. It is an enhanced version of our “local” elevating motor. The automated clutch lock and release device provides local and remote control and indication of clutch status. Our elevating motor mounts in the existing location using the original motor pedestal for alignment and fastening. Extensive interlock logic prohibits motor operation without a pendant controller and the LimiTilt® digital inclinometer thus providing a failsafe operating procedure.



6. External Harness Assembly (SRN-M-75H-14)** The external harness assembly connects the control box to the cubicle being controlled. The harness assembly uses military specification connectors which are very resilient to the extreme environmental conditions found in most industrial and utility working environments. Although the harness is made for industrial use, care should still be taken to prevent unnecessary damage to both the cable and its connectors. It is a part of the Portable Kit.



7. LimiTilt® Digital Inclinometer (SR-M-75T-2) – The LimiTilt® digital inclinometer is a feature unique to the Safe-T-Rack family of remote racking systems. It allows confident blind racking of the breaker by constantly monitoring the breaker’s orientation relative the cubicle. Once plugged into the system control panel, LimiTilt® will power-up and automatically set “Relative Zero” for use as a reference for each mounting and operation. If the breaker tilts too far forward, backward, left, or right, LimiTilt® will trip the circuit breaker on the Safe-T-Rack control box, thus powering down the entire racking system and limiting further damage to the breaker, elevating mechanism, and / or cubicle. In addition the measured tilt angles are displayed on LimiTilt® and a fault indication appears on the pendant controller. The LimiTilt® digital inclinometer is a part of the Portable Kit.



8. Slide Clutch Lever and Clutch Key Assembly (SR-M-75K-26 or -36) – The clutch and key assembly are integral parts of the Safe-T-Rack system. This assembly replaces the OEM clutch handle in the MagneBlast cabinet. It allows for remote unlatching, and thus remote charging of breakers with ML mechanisms. The clutch lever and key assembly is a component of the Hardware Kit, which is a component of the Cubicle Kit.



9. Installation Tool Kit (SRN-M-75CTK) – The installation tool kit consists of the punches, drill bits, and assorted tools necessary for a Safe-T-Rack cubicle kit installation. The Installation Tool Kit is an optional item.

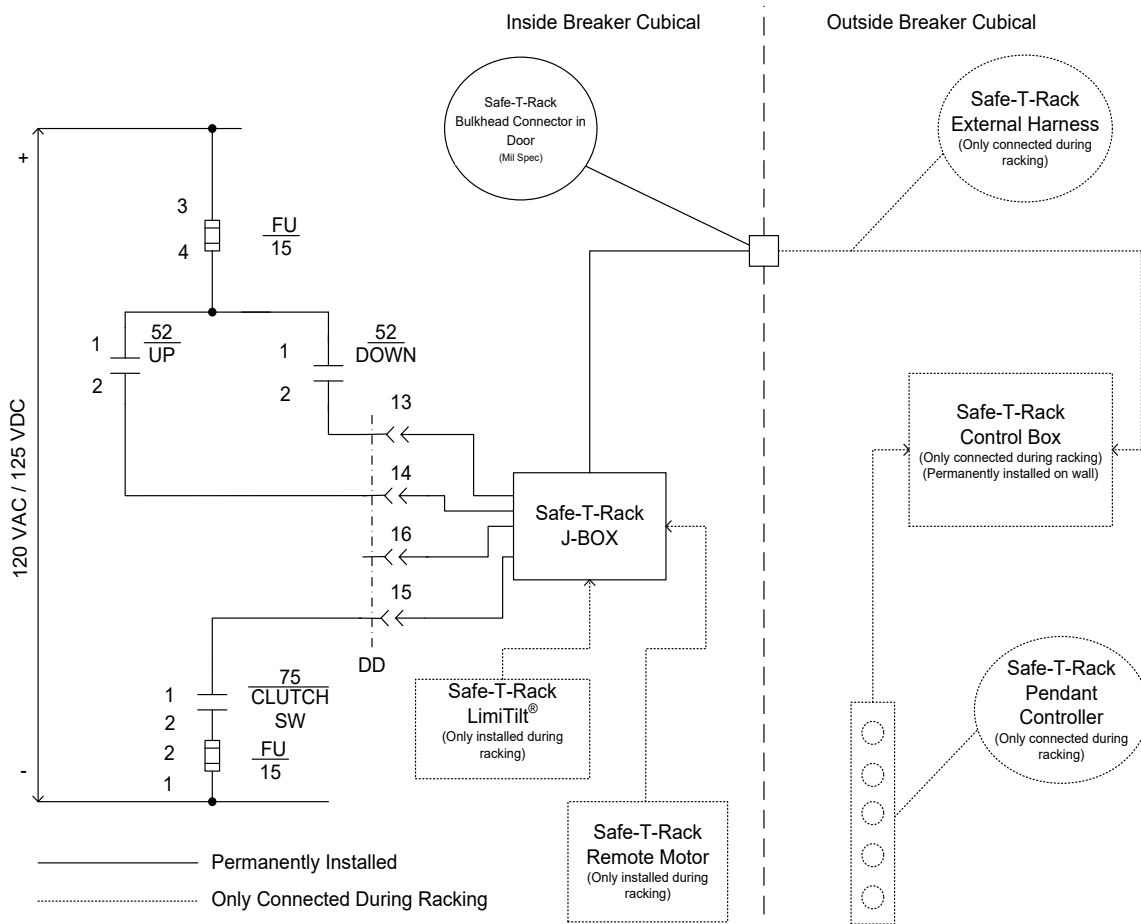


10. Cubicle Repair Kits (SRN-M-75MRK & SRN-M-75ERK) – The cubicle repair kit contains replacements for the parts which most often fail due to age and use. The Electrical Repair Kit (...ERK) contains the limit switches and connectors. The Mechanical Repair Kit (...MRK) contains a return spring, slide clutch, slide clutch lever & hardware, and kick-out springs. Synchronizing chains are additionally available in light and heavy versions for all M26 and M36 cabinets. The Cubicle Repair Kits are optional items.



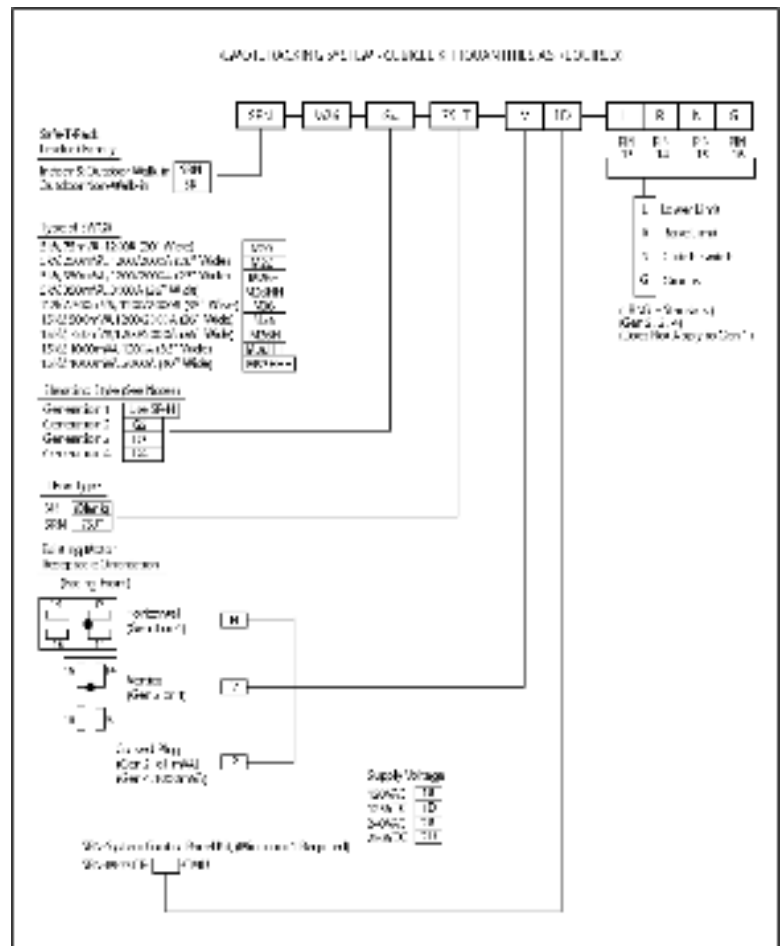
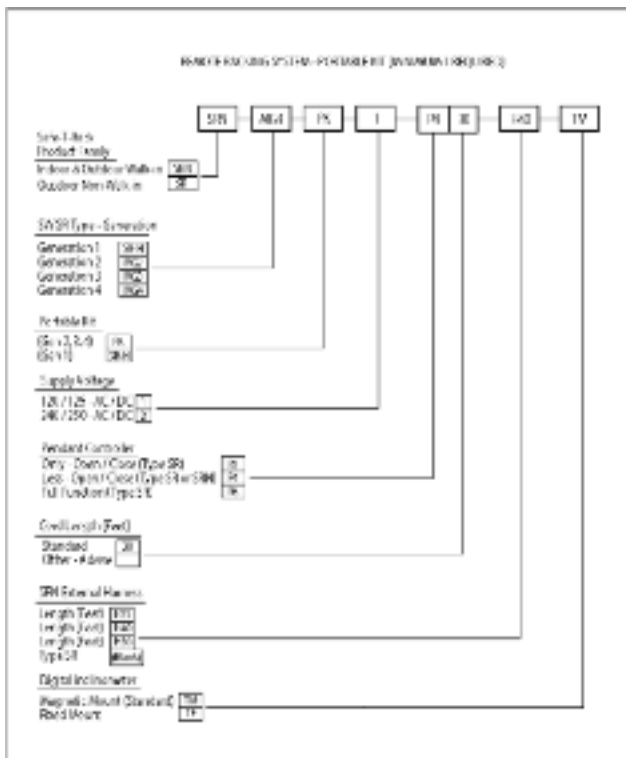
2. Electrical Data

2.1 System Overview / Connection Diagram



3. Cataloging/ Part Numbers

3.1 Part Number Diagrams



3.2 Catalog Numbers List

STR® (Safe-T-Rack)
GE MagneBlast M26/M36 (Generation 4)
Version SRN - 120 Volt AC/ 125VDC

Cubicle Kit [Required in Each Breaker Cubicle] Model #SRN-[*]-G4-75JT-[*]LRNG

Part Number	Description	Qty Per Kit
SRN-M-75KH-26 or -36	**[M26] or [M36] Hardware Kit	1
SRN-M-75JT-H1, V1 or P1	***[H1] Horiz., [V1] Vert. or [P1] Corded Plug J-Box	1

System Control Kit [Minimum 1 Each Required] Model #SRN-M-75CR-1D-CMU

Part Number	Description	Qty Per Kit
SRN-M-75CR-1	System Control Panel 120V AC/ 125V DC	1
SRN-M-75CMU	Universal Channel Mounting Kit	1

Portable Kit [Minimum 1 Each Required] Model #SRN-MG4-PK-1-P430-H40-TM

Part Number	Description	Qty Per Kit
SR-M-75P4	P4 Pendant (Less Open/Close)	1
SR-M-75RMM-1	Remote Elevating Motor	1
SRN-M-75H-1640	External Harness, 40 Ft.	1
SR-M-75T-2	LimiTilt® Digital Inclinometer (Dual Axis)	1
SR-M-75T-SP	LimiTilt® Shorting Plug	1
SRN-M-75RTC	Portable Kit Tote Case	1
SR-M-75TSB	LimiTilt® Storage Bag	1

3.2 Catalog Numbers List Cont.

Optional Equipment

Part Number	Description	Qty Per Each
SR-M-75CTK	STR® System Installation Tool Kit	1
SR-MG2-75BRUK	Gen 2 to Gen 4 Motor Platform, Receptacle and Switch Conversion Kit	1
SR-MG3-75RUK	Gen 3 to Gen 4 Motor Receptacle and Switch Conversion Kit	1
SR-M-75ERK	Cubicle Repair Kit - Electrical (Limit Switches & Connectors)	1
SR-M-75MRK	Cubicle Repair Kit - Mechanical (Replacement Handle & Hardware, Slide Clutch, Kick-Out Spring, Return Spring)	1
Add (-NH) Suffix to MRK	Cubicle Repair Kit - Mechanical (Without Slide Clutch Handle)	1
Add (-41M26) Suffix to MRK	M26 Cubicle Repair Kit - Mechanical (W/Light Chain)	1
Add (-50M26H) Suffix to MRK	M26H Cubicle Repair Kit - Mechanical (W/Heavy Chain)	1
Add (-41M36) Suffix to MRK	M36 Cubicle Repair Kit - Mechanical (W/Light Chain)	1
Add (-50M36H) Suffix to MRK	M36H Cubicle Repair Kit - Mechanical (W/Heavy Chain)	1
SR-M26-41RCK	M26 Replacement Light Chain and Link Kit	1
SR-M26H-50RCK	M26H Replacement Heavy Chain and Link Kit	1
SR-M36-41RCK	M36 Replacement Light Chain and Link Kit	1
SR-M36H-50RCK	M36H Replacement Heavy Chain and Link Kit	1
SR-M-75HRK	Monolithic Stainless Steel Slide Clutch Handle Replacement Kit	1
SRN-M-75HSR	Steel Storage Hanger for External Harness (Wall Mounted)	1
SRN-M-75H-1420	External Harness, 20 Ft.	1
SRN-M-75H-1450	External Harness, 50 Ft.	1
SR-M-75HCC	Clearance Tag Kit (With Red Dust Cap)	1
SR-M-75P2	Portable Kit P2 Pendant (Open/Close only)	1

3.2 Catalog Numbers List Cont.

Local Motors

Part Number	Description	Qty Per Each
SR-MG3-75LMM-1	Elevating Motor 120V, Gen 3 MagneBlast (W/O Toggle Switch)	1
SR-MG3-75LMM-2	Elevating Motor 240V, Gen 3 MagneBlast (W/O Toggle Switch)	1
SR-MG4-75LMM-1	Elevating Motor 120V, Gen 4 MagneBlast, (W/Toggle Switch)	1
SR-MG4-75LMM-2	Elevating Motor 240V, Gen 4 MagneBlast (W/Toggle Switch)	1

Notes

- Generation 1 (G1): Black frame solenoid (MS) operated circuit breaker
Hand crank elevating device (cubicle not equipped with provisions for elevating motor)
- Generation 2 (G2): Black or gray frame solenoid (MS) operated circuit breaker
Elevating motor fix mounted in cubicle, controlled by SB switch in cubicle
- Generation 3 (G3): Black or gray frame solenoid (MS) or stored energy (ML) operated circuit breaker
Elevating motor removable from cubicle, controlled by toggle switch in cubicle
- Generation 4 (G4): Gray frame solenoid (MS) or stored energy (ML) operated circuit breaker
Elevating motor removable from cubicle, controlled by toggle switch mounted on motor

4. Guide Form Specifications

*Suggested Specifications for GE Vertical Lift
Switchgear Types M26/M36
Circuit Breaker Remote Racking Systems*

Including but not limited to the following:

1. The system shall be designed as a true closed door racking system. Remote racking operations shall take place with the circuit breaker door closed. Portable racking system controls shall be plugged into the switchgear cubicle door via a quick connect plug.
2. The system shall have a built-in multi-axis circuit breaker tilt angle protection system.
3. The system shall be interlocked to prevent circuit breaker close/trip during racking operations.
4. The system shall be interlocked to prevent racking operations unless the circuit breaker is in the open position.
5. The system shall have a built-in emergency stop button.
6. The system shall be equipped with a DC reversing contactor and DC circuit breaker for motor control/protection.
7. No control rewiring to ensure backward compatibility to an original “local” elevating motor.
8. Racking motor controls shall be permanently installed in the individual switchgear cubicles.
9. The system shall be equipped with a portable pendant controller with a minimum of 30’ of cable. The pendant controller and individual switchgear controls shall be equipped with compatible quick connect plugs.
10. The system pendant shall have the following features:
 - Quick connect/disconnect
 - Clutch release button
 - Clutch lock/engage indication
 - Circuit Breaker close/trip buttons
 - Racking motor run indication
 - Circuit Breaker raise/lower buttons
 - System fault indication
 - Emergency Stop button

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