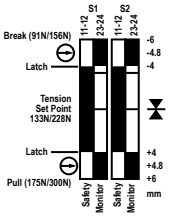
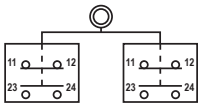
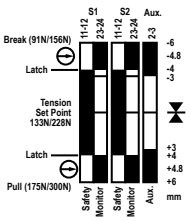
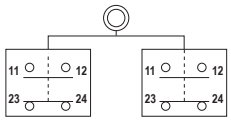
RP-RM83F-.. Heavy-Duty Rope Pulls

WIth E-Stop Button for Indoor or Outdoor Use

For the latest technical information about this product, including specifications, dimensions, and wiring, see *http://www.bannerengineering.com*

- Both safety contacts latch open when rope is pulled or in case of a broken wire; requires manual reset
- Aluminum die-cast housing, rated IP67 and NEMA 4, suitable for demanding indoor and outdoor industrial environments
- Innovative **RP-RM83F-..LT..** design provides quick, easy rope adjustment
- Rope spans up to 75 m (245'), depending on model
- Both safety contacts are closed with normal rope tension, and open when rope is pulled or if rope breaks (or if tension is reduced from normal amount)
- Both Monitoring contacts operate opposite the safety contacts for monitoring by another device
- Additional Aux. 24V solid-state PNP output on some models provides remote rope tension monitoring
- Tension indicator window indicates proper rope tension for operation or safety contacts latched open (the rope pull or the E-stop button is actuated)

Models

Model	Max. Rope Length	Rope Connection	Aux. Status Output	Run Position	Cable Pulled/ Cable Break	Switching Diagram
RP-RM83F-75LTE	75 m (245')	Built-in Turnbuckle	Yes	**Cable Run Position (All Models)**		**No PNP Aux. Output Models**
RP-RM83F-75LRE		Ring		**S1**	**S2**	
RP-RM83F-75LT		Built-in Turnbuckle	No			
RP-RM83F-75LR		Ring				
RP-RM83F-38LTE	37.5 m (123')	Built-in Turnbuckle	Yes	**Cable Pulled / Cable Break Position (All Models)**		**PNP Aux. Output Models**
RP-RM83F-38LRE		Ring		**S1**	**S2**	
RP-RM83F-38LT		Built-in Turnbuckle	No			
RP-RM83F-38LR		Ring				

☐ Open ■ Closed

NOTE: This symbol ⊖ for a positive-opening safety contact (IEC 60947-5-1) is used in the switching diagram to identify the point in actuator travel where the normally-closed safety contact is fully open.

Important... Read This First

Regarding the Use of Rope Pull Emergency Stop Switches. In the United States, the functions that Banner rope pull emergency stop switches are intended to perform are regulated by the Occupational Safety and Health Administration (OSHA). Whether or not any particular rope pull switch installation meets all applicable OSHA requirements depends upon factors that are beyond the control of Banner Engineering Corp. These factors include the details of how the switches are applied, installed, wired, operated, and maintained.

Banner Engineering Corp. has attempted to provide complete application, installation, operation, and maintenance instructions in this document. Direct any questions regarding the use or installation of rope pull switches to the factory applications department at the numbers or address listed on the last page.

Banner Engineering Corp. recommends that rope pull emergency stop switches be applied according to the guidelines set forth in the standards listed below. In addition, the user has the responsibility to ensure that all local, state, and national laws, rules, codes, and regulations relating to the use of Banner rope pull switches in each application are satisfied. Extreme care is urged that all legal requirements are met and that all installation and maintenance instructions are followed.

Applicable U.S. and International Standards (not all inclusive):
ANSI B11.0 Safety of Machinery - General Requirements and Risk Assessment
ANSI B11.19 Performance Criteria for Safeguarding
ANSI/NFPA 79 Electrical Standard for Industrial Machinery
ANSI/RIA R15.06 Safety Requirements for Industrial Robots and Robot Systems
ISO 12100 EN 292 Safety of Machinery - General Principles for Design, Risk Assessment and Risk Reduction
IEC 60204-1 Electrical Equipment of Machines: General Requirements
ISO 13850 EN 418 Emergency Stop Equipment Functional Aspects, Principles for Design
IEC 60947-5-5 Electrical Emergency Stop Devices with Mechanical Latching Function

These and other standards are available from:
NSSN National Resource for Global Standards : *http://www.nssn.org/* (Tel: 212-642-4980)
IHS Standards Store : *http://www.global.ihs.com/* (Tel: 303-397-7956, 800-854-7179)
Document Center : *http://www.document-center.com/home.cfm* (Tel: 650-591-7600)

EC Declaration of Conformity (DOC)

Banner Engineering Corp. herewith declares that the **RP-RM83F-.. Heavy-Duty Rope Pulls** are in conformity with the provisions of the Machinery Directive and all essential health and safety requirements have been met. For more information, visit *http://www.bannerengineering.com/*.

Overview

Models **RP-RM83F-..** are rope pull emergency stop switches in compact, heavy-duty die-cast aluminum housings, for indoor or outdoor use. When used with steel wire rope, they can provide emergency stop actuation along conveyors and similar machinery. Red PVC-covered 2, 3, 4, or 5 mm diameter wire rope is recommended, depending on model (force) and rope distance.

The switches have redundant contacts; terminals 11/12 are positive opening when there is a cable-pull or cable-brake situation. When used separately, these contacts provide inputs to a dual-channel safety module. Terminals 11/12 can also be used individually to provide single-channel switching or as a single-channel input to a safety module. Terminals 23/24 are for monitoring purposes only (closed in a cable-break/cable-pull situation).

When the rope is properly tensioned (228 or 133N, depending on model), the red arrows are centered under the hash mark on the tension indicator window, the contacts at terminals 11/12 are closed, and the contacts at terminals 23/24 are open. All models feature a “latching” operation. When the rope is pulled, the switch contacts 11/12 open and remain open until the built-in E-stop/reset button is manually reset.

These rope pull emergency stop switches are not generally considered safeguarding devices, in that they do not prevent or reduce exposure of individuals to a hazard. They provide the same function as other types of emergency stop switches.

WARNING: Not a Safeguarding Device
An Emergency Stop Device is not considered a safeguarding device because it requires an overt action by an individual to stop machine motion or hazards.

(A safeguarding device limits or eliminates an individual's exposure to a hazard *without action by the individual or others.)* Because an individual must actuate the device for it to function, these devices do not fit

the definition of a safeguarding device and cannot be substituted for required safeguarding. Refer to the relevant standards to determine those requirements.

WARNING: Emergency Stop Functions
Do not mute or bypass any Emergency Stop device. ANSI B11.19, ANSI NFPA79 and IEC/EN 60204-1 require that **the Emergency Stop function remain active at all times.**

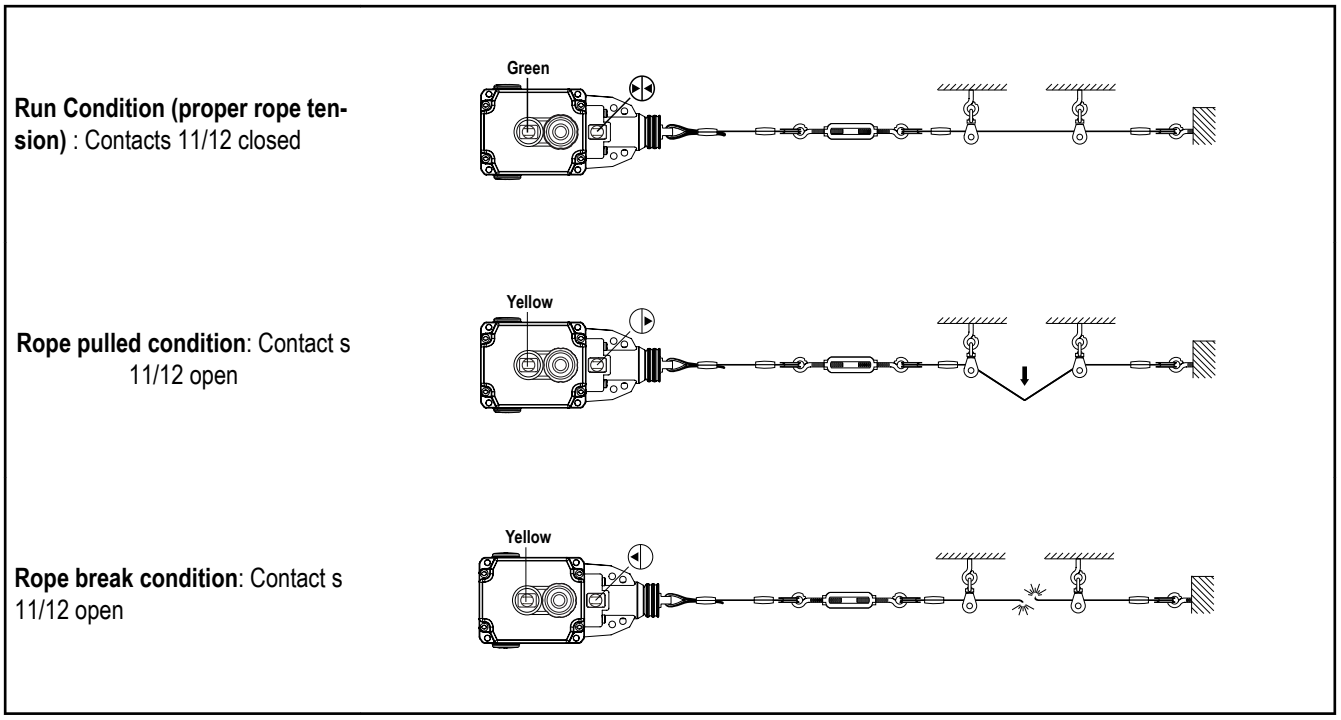


Figure 1. Run, rope pulled, and rope break switch positions

Mechanical Installation Guidelines

- The wire rope should be easily accessible and visible along its entire length. Markers or flags may be fixed on the rope to increase its visibility.
- Switch body, anchor mounts and wire rope supports (pulleys or eye bolts) must be rigid and secure.
- Although pulleys are preferred, a combination of pulleys and/or eye bolts are required to support the wire rope along its length. When pulled, the wire rope, should move freely through the pulleys or eye bolts to actuate the switch.

WARNING: Failure to use pulleys or eye bolts to support the wire rope can result in damage to the switch and may **create a dangerous situation that could lead to serious injury or death**.

- Use only pulleys (not eye bolts) when routing the rope around a corner or whenever direction changes, even slightly.
- Never run rope through conduit or other tubing.
- Never attach weights to the rope.
- Temperature affects rope tension. The rope expands (lengthens) when temperature increases, and contracts (shrinks) when temperature decreases. Significant temperature variations require frequent checks of the tension adjustment.
- Do not exceed the maximum specified total rope length. Banner offers models for other spans; contact the factory or visit www.bannerengineering.com for model selection.

Installation Procedure

1. Mount the switch securely on a solid stationary surface.
2. Fasten an eye bolt at the opposite end of the rope span from the switch. Verify that the anchor for the eye bolt is solid and stationary to withstand the constant tension and possible pull of the rope.
3. Assemble the rope as shown. Keep the rope's PVC cover intact along its complete length.
4. Use pulleys (recommended) or eye bolts at each support point. Always use a pulley when routing the rope around a corner, regardless of the angle.

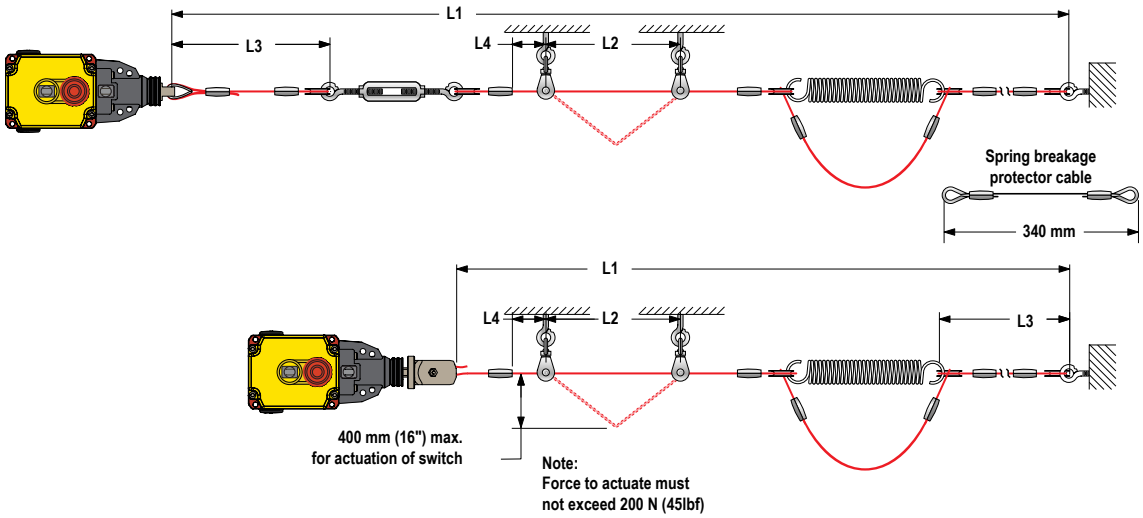


Figure 2. Assembly of rope and hardware (see Accessories section for components)

Switch Model	Max. Total Length L1	Max. Distance Between Pulleys L2	Max. Distance to Spring/Turnbuckle L3*	Min. Distance Fitting to Pulley L4**
75 m	75 m (245')	3-5 m (10-15')	150 mm (6")	150 mm (6")
38 m	37.5 m (123')			
*Closer, if possible **Distance must allow necessary clearance to all mounting hardware.				

NOTE: All hardware is supplied by the user. See Dimensions for switch mounting hole mounting pattern and size.

Installing Models RP-RM83F-..75.. or RP-LS42F-xxLF (with Integral Turnbuckle)

These models have their own integral turnbuckle and clamp to tension the rope and to hold it in place. This innovative design provides for quick and easy rope fixing and tensioning. These models require no external turnbuckle or any additional clamp at the switch end of the rope.

To install the rope at the switch end:

1. Strip away several inches of the cable covering.
2. Loosen the set screw on the switch fitting using a 4 mm hex wrench.
3. Insert the cable into the center hole, and pull the cut end out from the side hole.
4. When the tension is correct, tighten the set screw to hold the rope firmly in place.

Figure 3. Tightening the rope into the internal turnbuckle (models RP-RM83F-..LT and -..LTE)

Tensioning the Rope

After the rope span components are installed, apply tension to the rope until the arrows in the tensioning indicator are centered on the line in the tension indicator window. This indicates sufficient rope tension. (Contacts 11/12 will close.)

1. For Models **RP-RM83F-..LT and RP-RM83F-..LTE** : Turn the external turnbuckle until the arrows are centered.
   For Models **RP-RM83F-..LR and RP-RM83F-..LRE** : Turn the shaft of the switch using a 17 mm wrench as shown, until the arrows are centered.
2. Pull hard on the rope and reset the latch several times. If the arrows in the tensioning indicator window do not return to the correct position (centered on the line in the window), further tighten or loosen the rope tension as needed, then reset, until proper tension is shown.

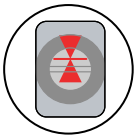


Figure 4. Tension Indicator Window: Too little tension shown

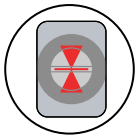


Figure 5. Tension Indicator Window: proper tension shown

Figure 6. Adjusting rope tension (models RP-RM83F-..LT and-..LTE)

WARNING: Shock Hazard and Hazardous Energy
Always disconnect power from the safety system (for example, device, module, interfacing, etc.) and the machine being controlled before making any connections or replacing any component.

Electrical installation and wiring must be made by Qualified Personnel and must comply with the relevant electrical standards and wiring codes, such as the NEC (National Electrical Code), ANSI NFPA79, or IEC 60204-1, and all applicable local standards and codes.

Lockout/tagout procedures may be required. Refer to OSHA 29CFR1910.147, ANSI Z244-1, or the appropriate standard for controlling hazardous energy.

Access to Wiring Chamber

Access the wiring chamber by loosening the 4 corner screws to remove the front cover. Select the best wiring entrance and thread in the ½" x 14 NPSM conduit adapter (supplied), or the optional M20 x 1.5 cable gland (see Accessories).

Single-Channel Connection **Dual-Channel Connection**

Figure 7. Wire the two switch contacts in series or independently, as described below

Wiring

These switch models have redundant pairs of safety contacts, so they may be wired for either single-channel or dual-channel output to a safety module or E-stop circuit. Monitor contacts may be wired as desired to an external alarm device.

CAUTION: Proper Wiring
Maximum tightening torque of contact screws is specified at 0.8 Nm; do not over-tighten. Before closing the front cover, verify that no wires are trapped. **Do not operate the rope pull without properly closing the cover.**

Single-Channel Output: Wire contacts 11/12 together in series to the input of a safety module or E-stop circuit.

Dual-Channel Output: Wire contacts 11/12 independently to the two safety module inputs.

Warning Signal

Switch models **RP-RM83F-...E** provide a 24V dc solid-state "warning signal" output, that signals when the rope tension is either too high or too low, *before* the safety contacts open and the switch latches OFF. This solid-state switch is located inside the wiring chamber next to the safety output contacts.

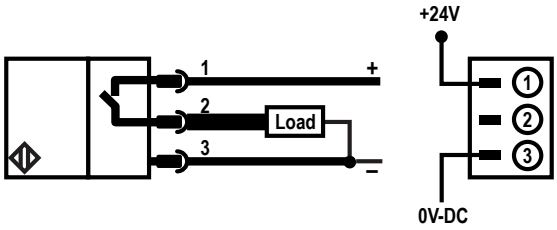


Figure 8. Warning signal electrical connections

Manual/Latch Reset

E-Stop and Latch Reset

Following the rope pulling/breaking or the E-stop button being pressed, the latch must be manually reset.
The E-stop can be reset only when proper tension is indicated. Pull the red E-stop button until the switch Status indicator changes from Yellow to Green and the latch makes an audible "click," indicating that the latch has been reset.

NOTE: Proper rope tension must be displayed before the latch can be reset.

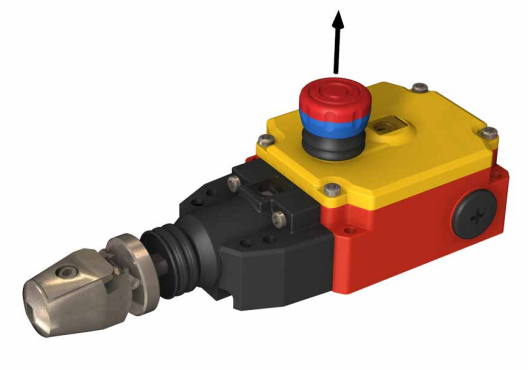


Figure 9. Resetting the latch

Maintenance

Test each rope pull emergency stop installation for proper machine shutdown response at each shift change or machine setup; this should be performed by a Designated Person*. In addition, a Qualified Person* should check for proper rope tension and adjust as needed, on a periodic schedule determined by the user, based upon severity of the operating environment and the frequency of switch actuations.

Periodically lubricate the pulleys and other moving parts associated with the rope. If inspection reveals dirt on the rope pull switch or rope assembly, clean off the dirt and eliminate its cause. Replace the rope pull switch and/or rope assembly when any parts (including contacts) or assemblies are found to be damaged, broken, deformed, or badly worn.

Replace the rope pull switch and rope assembly at specified intervals, based upon the environment and operating conditions. Consider replacement of the rope pull switch and rope assembly after no more than 100,000 operations. **Always test the control system for proper functioning under machine control conditions after maintenance or replacement of the rope pull switch.**

* A **Designated Person** is identified in writing by the employer as being appropriately trained to perform a specified checkout procedure. A **Qualified Person** possesses a recognized degree or certificate or has extensive knowledge, training, and experience to be able to solve problems relating to the emergency stop rope pull switch installation.

Repairs

Do not attempt any repairs to the rope pull emergency stop switch. It contains no field-replaceable components. Return it to the factory for warranty repair or replacement as follows.

Contact Banner Factory Application Engineering at the address or the numbers listed on the back page. They will attempt to troubleshoot the system from your description of the problem. If they conclude that a component is defective, they will issue a return merchandise authorization (RMA) number for your paperwork, and give you the proper shipping address.

Pack the rope pull switch carefully. Damage which occurs in return shipping is not covered by warranty.

Specifications

Contact Rating
10A @ 24V ac, 10A @ 110V ac, 6A @ 230V ac
6A @ 24V dc
2.5 kV max. transient tolerance
NEMA A300 P300

Monitoring Solid-State Output Rating
Rated operational voltage: U_e = 10 to 30V dc
Rated operational current: = 50mA
Utilization category: DC13
Protected against reverse polarity and short circuit

European Rating
Utilization categories: AC15 and DC13
U_i = 500V ac
I_{th} = 10A

Mechanical Life
100,000 operations

Wire Connections
Screw terminals with pressure plates accept the following wire sizes:

- **Stranded and solid:** 20 AWG (0.5 mm^2) to 16 AWG (1.5 mm^2) for one wire
- **Stranded:** 20 AWG (0.5 mm^2) to 18 AWG (1.0 mm^2) for two wires

Cable Entry
M20 x 1.5 threaded entrance; Adapter supplied to convert M20 x 1.5 to ½" - 14 NPT threaded entrance

Construction
Die-cast aluminum housing; zinc die-cast actuator

Rated surge capacity: 2.5 kV

40-60 Hz		
U_e V	**I_e/AC-15 A**	**I_e/DC-13 A**
120	6	0.55
240	3	0.27

Contact Material

Silver-nickel alloy

Maximum Switching Speed

20 operations per minute

Recommended Rope Size

Accomodates rope sizes 2 to 5 mm diameter steel rope (see Accessories); select rope diameter based on switch model and rope length

75 m models: recommended 2 to 5 mm diameters

38 m models: recommended 2 to 5 mm diameters

Maximum Rope Pull Length

75 m (245') or 37.5 m (123'), depending on model

Short Circuit Protection

10 amp Slow Blow, 15 amp Fast Blow, Recommended external fusing or overload protection.

Environmental Rating

NEMA 4, IEC IP67, per IEC/EN 60529

Operating Conditions

Temperature: -30º to +80° C (-34° to +176° F)

Weight

RP-RM83F-..LT and -..LTE: 1Kg (2.1 lbs.)

RP-RM83F-..LR and -..LRE: 0.77 Kg (1.6 lbs.)

Product Performance Standards

DIN EN 60947-1, DIN EN 60947-5-1, DIN EN 60947-5-5, IEC 60947-1, IEC 60947-5-1, IEC 60947-5-5, ISO 13850

Certifications

Dimensions

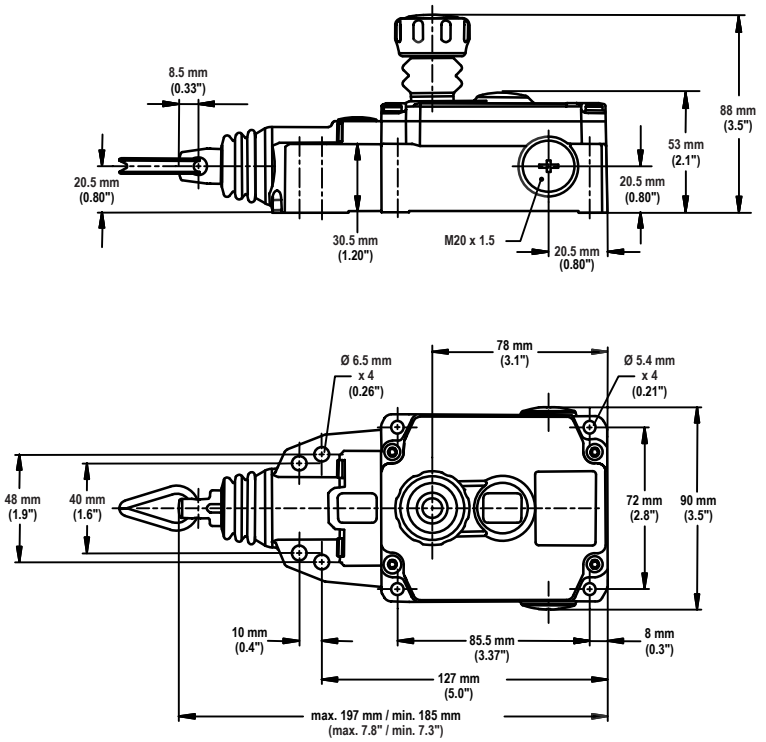


Figure 10. RP-RM83F-..LR..

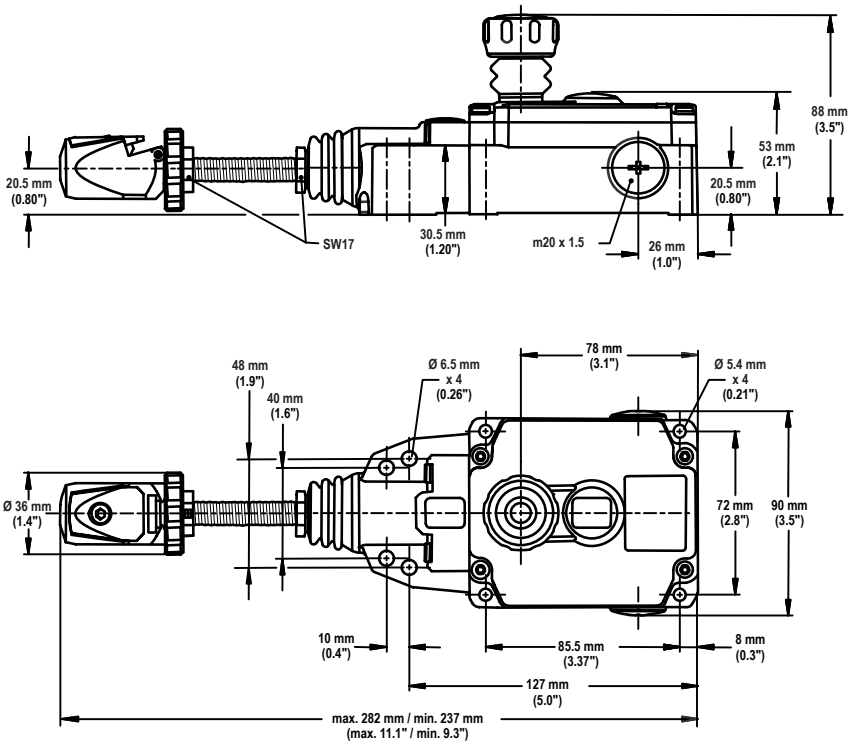


Figure 11. RP-RM83F-..LT..

Accessories

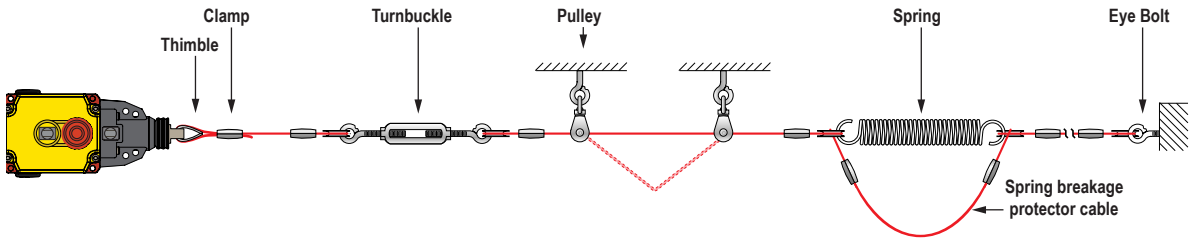


Figure 12. Components for Wire Rope Assembly Components

Wire Rope

Model	Length	
RPA-C1-10	10 m (33')	2 mm steel wire rope with 0.5 mm red PVC jacket (unterminated)
RPA-C1-20	20 m (66')	
RPA-C1-100	100 m (330')	
RPA-C2-10	10 m (33')	3 mm steel wire rope with 0.5 mm red PVC jacket (unterminated)
RPA-C2-20	20 m (66')	
RPA-C2-50	50 m (264')	
RPA-C2-80	80 m (')	
RPA-C3-10	10 m (33')	4 mm steel wire rope with 0.5 mm red PVC jacket (unterminated)
RPA-C3-100	100 m (')	

Thimble

Model	Package Quantity	
RPA-T1-4	4	Thimble for 2 mm wire rope
RPA-T2-4	4	Thimble for 3 mm wire rope
RPA-T3-4	4	Thimble for 4 mm wire rope

Clamp

Model	Package Quantity	
RPA-CC1-4	4	Clamp for 2 mm wire rope
RPA-CC2-4	4	Clamp for 3 mm wire rope
RPA-CC3-4	4	Clamp for 4 mm wire rope

Turnbuckle

Model	Package Quantity	
RPA-TA1-1	1	#4 Turnbuckle

Eye Bolt

Model	Package Quantity	
RPA-EB1-1	1	¼"-20 Eye bolt (3" bolt shaft)

Pulley

Model	Package Quantity	
RPA-P1-1	1	Hanging pully for in-line use
RPA-DP1-1	1	Right-angle mount deflection pulley for corner turns (90 to 180 degrees)

Tensioning Spring

Model	Package Quantity	
RPA-S3-1	1	Tensioning spring #3 for use with model **RP-RM83F-..75..**
RPA-S5-1	1	Tensioning spring #5 for use with model **RP-RM83F-..38..**

Tensioning Spring with Built-In Eye Bolt

Model	Package Quantity	
RPA-S4-1	1	Tensioning spring with built-in eye bolt, cable thimble, clamping, tensioning, and overload protection for use with model **RP-RM83F-..75..**
RPA-S6-1	1	For use with model **RP-RM83F-..38..**

Cable Gland

Model	Package Quantity	
SI-QM-CGM20	1	For cable diameters 5.0 to 12.0 mm (0.20" to 0.47"); M20 x 1.5 metal

Conduit Adapter

Model	Package Quantity	
SI-QM-M20	1	1 conduit adapter is supplied with each switch. ½"-14 NPT metal, M20 x 1.5 to ½"-NPT thread conversion

Banner Engineering Corp Limited Warranty

Banner Engineering Corp. warrants its products to be free from defects in material and workmanship for one year following the date of shipment. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture which, at the time it is returned to the factory, is found to have been defective during the warranty period. This warranty does not cover damage or liability for misuse, abuse, or the improper application or installation of the Banner product.

THIS LIMITED WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED (INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), AND WHETHER ARISING UNDER COURSE OF PERFORMANCE, COURSE OF DEALING OR TRADE USAGE.

This Warranty is exclusive and limited to repair or, at the discretion of Banner Engineering Corp., replacement. **IN NO EVENT SHALL BANNER ENGINEERING CORP. BE LIABLE TO BUYER OR ANY OTHER PERSON OR ENTITY FOR ANY EXTRA COSTS, EXPENSES, LOSSES, LOSS OF PROFITS, OR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES RESULTING FROM ANY PRODUCT DEFECT OR FROM THE USE OR INABILITY TO USE THE PRODUCT, WHETHER ARISING IN CONTRACT OR WARRANTY, STATUTE, TORT, STRICT LIABILITY, NEGLIGENCE, OR OTHERWISE.**

Banner Engineering Corp. reserves the right to change, modify or improve the design of the product without assuming any obligations or liabilities relating to any product previously manufactured by Banner Engineering Corp.