

# ANIMAL TRAP LATCH RELEASE

## Technical Document

Set up

Wiring

Options



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## DOG RESCUE

Components For Safely Trapping Dogs

## ELECTRIC LATCH RELEASE

Model: **ELR-12** Product Update...see page \*5



Designed to safely release cage or trap door by holding the door open against the pull of springs or bungy cords. A typical animal trap setup would include a sensor of type capable of outputting a +12VDC voltage when it is triggered. This unit features a servo driven mechanism that will perform the bar release when 12VDC is applied to the input. The input is marked RED for positive and BLACK for negative. Proper polarity must be used for proper operation.

This latch release requires no power to maintain a latched condition. This makes powering a trap less power intensive with smaller amp hour batteries and longer time between battery replacement or charging.

Typical operation to set the latch is done by inserting the release bar into the slot opening in the direction shown with the latch bar marked "UP". The latch lever is moved forward, toward the slot opening, (marked U) to allow the bar to be easily slid into place. The latch release lever is then moved to the back (away from the slot end, Marked L), trapping the bar in place. The unit is now latched and ready for use.

When momentary 12VDC is applied to the input, a servo drives the latch lever forward, allowing the Release Bar to be pulled out of the latch. When this occurs, an internal "switch" deactivates the servo, breaking the connection to power until the latch is reset by sliding the Release Bar back into the latch.

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### Electric Latch Release

Model: **ELR-12**

Specifications:

- |                          |  |
|--------------------------|--|
| 1. Operate Voltage:      | 12-24VDC (Momentary)                                   |
| 2. Release Time:         | <200ms   |
| 3. Input Release Signal: | +12VDC, pulse or maintained                            |
| 4. Nominal Hold:         | 30 pounds (cement block, electric current mom 1.5amps) |
| 5. MAX Hold              | 40 pounds (electric current momentary 2.5amps)         |

NOTE: When a trigger voltage is applied to the ELR-12, the Release Bar must have a "pulling force" attached. Do not power the ELR-12 in a "static" test, unless there is a "constant pulling force" being applied to the Release Bar!

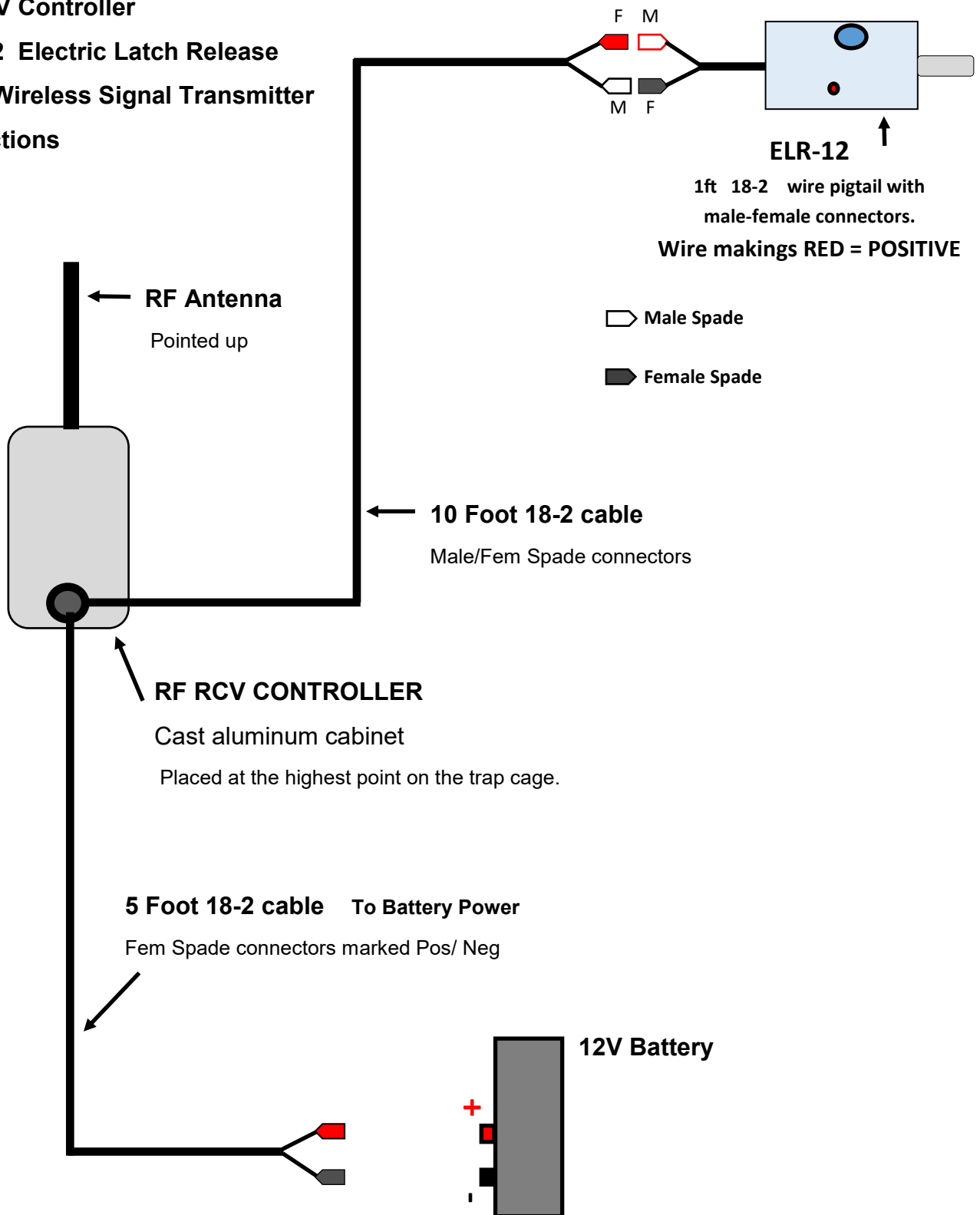
Construction is machined aluminum with stainless hardware and ABS guides. We warranty this product for 4 years of constant service. We designed this for simple, reliable operation, with all mechanical parts milled from aluminum and assembled with stainless hardware. This electric latch is specific to the application of: an electric latch release, that will hold a spring loaded trap door open. Used as the mechanism to release a \*trap door to closure, in a safe and effective manner.

Used with a reflective IR sensor with a low standby current, the ELR-12 can give a greatly extended operation time to traps located in places that are not easily reached to change batteries.

# RADIO TRAP SYSTEM LAYOUT

## Standard Components

1. RF RCV Controller
2. ELR-12 Electric Latch Release
3. RFTX Wireless Signal Transmitter
4. Instructions



## CUSTOM TRAP

The power requirements of the Radio Trap are very low. This will allow the user to choose how they would prefer to power the system. The RF Trap is operated as a “Monitored” trap where the operator will be in sight of the trap visually or by camera. The Battery Power source can be in any of the following battery sets:

1. Sealed Lead Acid, SLA 5 Amp hr— Up

This is a good choice for ease of maintaining and long operation time

2. Lithium 18650 cells, 3-4 cells wired in series

If you had other equipment that used the 18650 lithium cell, this would be a good choice.

If already charging a group of 18650 cells, then add 3 or 4 for the trap. These cells are the superior power source, being low weight and small size.

In this system they would power for a duration similar to the SLA.

3. Alkaline, lithium, AAA, AA, C, D, 8 cells wired in series

Replaceable cells have generally good availability. Costly but no charging.

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## WIRING AND CONNECTOR OPTIONS

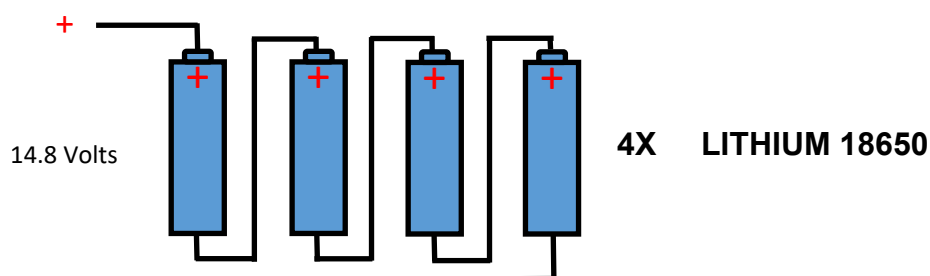
The standard RADIO TRAP comes with heavy Spade type connectors. You can order the system with 0.25 inch phone plugs that will simplify trap setup. A in line POWER switch is another option.

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## BATTERY OPTIONS

**A typical 18650 power arrangement in a battery holder with series connections.**

**Note: It is not possible to properly charge the 18650 cells without a charger designed for this. As shown, these batteries must be removed, and charged as individual cells, after which they can be returned to the battery holder.**

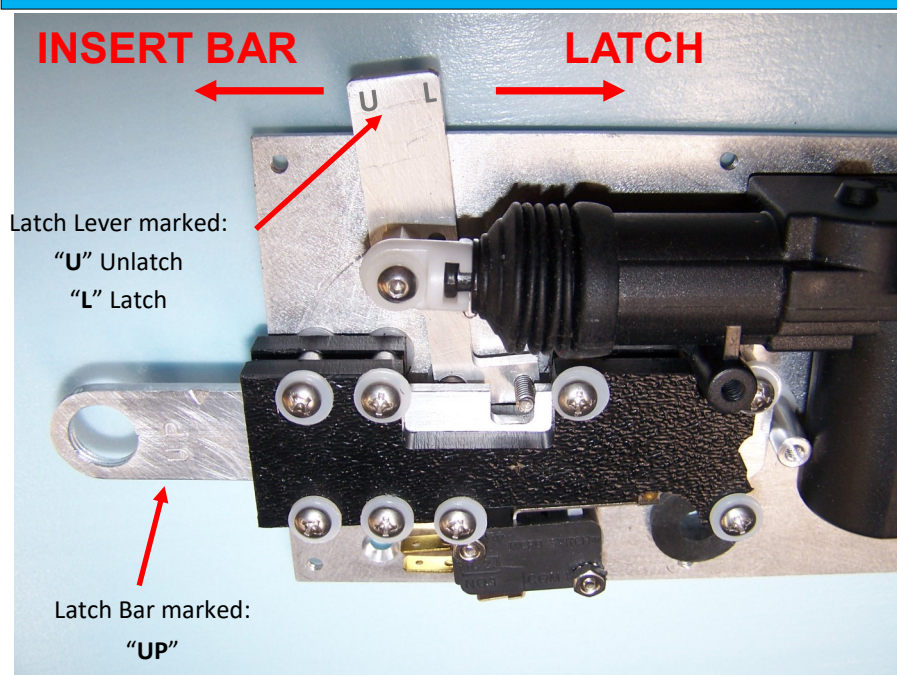
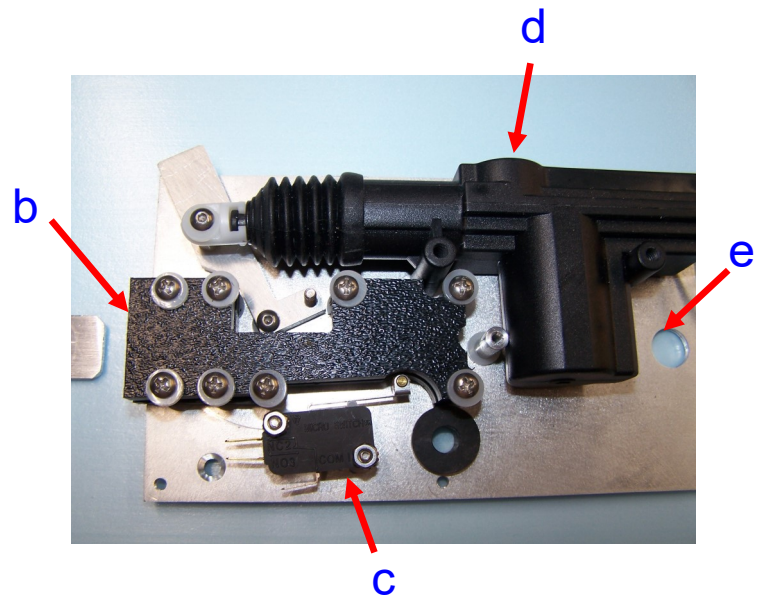
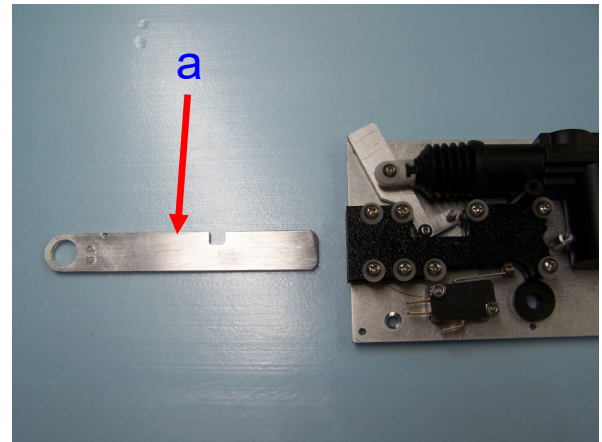


# ELR-12 LATCH

## 12VDC Servo Latch Release

- a.** The Latch Bar is 1/8th milled aluminum with attachment opening large enough for rope or clip. Marked "UP" for insertion as shown
- b.** 0.25" ABS plastic guides provide low friction movement of the release bar and are milled to maintain placement of the alignment posts.
- c.** A heavy duty microswitch with roller provide definite contact for the servo. When bar is released, the microswitch disconnects the servo from the input.
- d.** The servo is a 12VDC geared drive that gives the release a sure, fast action.
- e.** The MAIN PLATE is 0.1" machined aluminum. A 0.5" hole is provided for rope or S hook attachment to the trap.

Shown below, unwired for clarity, the ELR-12 can provide a reliable latching mechanism for trapping. The Latch Lever will be marked as shown below.





# ELR-12 Latch Release Connection

Version 2/28/21

**NOTE:** Use lamp cable with gauge **18awg**  
 \*Notice one of the wires will have ridges along its length.  
 Shown in drawing as the **Grey** Dashed wire.  
 Let the ridged wire be the **NEGATIVE** connections.

### DRAWING LEGEND

Female Spade crimp connector ———— **F**

Male Spade crimp connector ———— **M**

RED Heat shrink ———— **■**

Twist wires together ———— **○**  
 and solder— crimp and cover

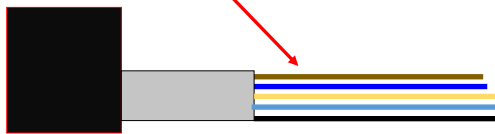
**NOTE:** The Sensor Relay Output connection may be chosen for the **ELR-12 Latch Release** use (**BLACK WIRE**).  
 For magnetic latch use (**GREY WIRE**)

WHITE Wire shown as YELLOW

### SENSOR CONNECTION

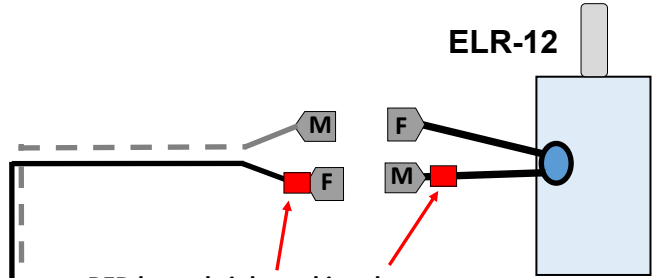
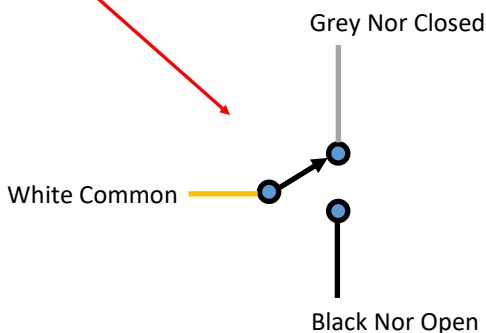
Use **BROWN** for **POSITIVE**; **BLUE** for **Negative**

1. **BLUE, BROWN = POWER** (Non-Polar)
2. **WHITE = Switch Common** (shown as **YEL**)
3. **GREY = Normal Closed Switch**
4. **BLACK = Normal Open Switch**



**Reflective Photo sensor**

### Sensor RELAY switch output connection



**ELR-12**

RED heat shrink marking the Positive Connection

**NOTE:** Use lamp cable with gauge **18awg**  
 Notice one of the wires will have ridges along its length. Shown here in drawing as the dashed Grey wire.  
 Let the ridged wire be the **Negative** connections.

The connections shown in the Green circle should be wrapped with tape or shrink tubing. To maximize the strength of the cable junction, it is OK to include nylon ty-raps before covering.

10feet

### WIRE CUT LIST 18awg lamp cord

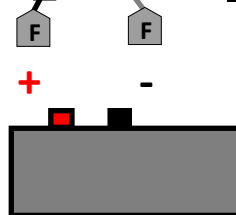
1. LATCH Wire 10 feet
2. POWER Wire 5 feet

### WIRE PREPARATION FOR lamp cord

1. Separate wires, 4-6 inches on each end
2. Strip each wire 1/2 inch bare ends
3. Place heat shrink tubing as needed over all wire connections.
4. Connect the **ridged wires** together with the **BLUE** Sensor wire.
5. Connect the un-ridged 10foot wire to the **BLACK** Sensor wire.
6. Connect the un-ridged 5foot wire to the **BROWN and WHITE** Sensor wires
7. Solder or use crimp type connectors to join wires.
8. Use tape or heat shrink tubing to protect connections.
9. Use **RED** heat shrink or label to clearly mark the **POSITIVE** connection at the Battery and at the LATCH.

5feet

RED heat shrink marking the Positive Battery Connection



**12V Battery**

## ELR-12 LATCH RELEASE

### Converting An Existing Trap

The ELR-12 can be used to replace an existing trap release latch. This requires the user to make necessary electric conditions that:

1. 12VDC is applied to the ELR-12 input to release the latch.
2. Polarity of the input release voltage is **+12VDC** at the **RED** marked input wire.
3. Update: The ELR-12 input spade connectors will be **Female NEGATIVE**, and **Male POSITIVE**.

For existing systems that use a electro-magnet type of release (where the input voltage must be maintained to hold the trap open), it will be necessary to change the relay connection located at the IR trigger unit output cable.

For most of the available IR Sensor units, there is a Single Pole, Double Throw relay at the Output. This consists of a Common Terminal (**White**) plus a Normal Closed Terminal (**Grey**) and a Normal Open Terminal (**Black**). The **WHITE Common** from the IR Sensor should connect to the positive battery terminal. The Latch device can then be connected to either the BLACK or the GREY. See schematic drawings for details.

- A. Your battery power source provides power to the IR Trigger unit. Use **BROWN POS, BLUE NEG**
- B. The negative battery power is also connected to the ELR-12 Black Input wire
- C. The IR Trigger unit output relay should be common **WHITE** connect to **BROWN** power and +12V
- D. The IR Trigger unit output relay should be **BLACK** to connect to the ELR-12 **RED** wire
- E. The IR Trigger unit output relay should be **GREY** to connect to a Magnetic Coil type latch.

#### NOTE:

#### TEST BEFORE YOU MAKE FINAL CONNECTIONS!

Before heat shrinking and making your final wire connections to the IR Trigger relay and the ELR-12 input, you should verify that you have the relay output wire selected to properly operate the ELR-12. For existing trap systems that you are converting, you may want to have the option to use either the ELR-12 or the magnetic latch. This can be done by adding a third wire to connect to the unused relay terminal in your IR Trigger unit (**GREY**), to the end of your cable and latch release. You can use an opposite or different type of plug type to guarantee proper operation when changing between units.

#### TESTING YOUR FINISHED TRAP

The Reflector and the Sensor unit should be mounted and the aim tested before inserting the **LATCH RELEASE BAR** into the latch. Test using the red LED on the sensor as an indicator of proper operation.

#### !!!! BEFORE YOU TEST YOUR SYSTEM

**TESTING** Use available cord, rope, chain or other to tie the **ELR-12**, allowing it to “hang” with the **LATCH RELEASE BAR** at the bottom. Use another string or an “S” hook to attach a object of weight or use a bungy cord to pull on the **LATCH RELEASE BAR**.

After aiming is complete, slide the **LATCH RELEASE BAR** into the **ELR-12** latch. When the trap is triggered, the servo connection to the battery is immediately broken when the **LATCH RELEASE BAR** is pulled out out of the latch.

If you have questions or find errors in this documentation, please email: [info@avatarresearch.com](mailto:info@avatarresearch.com)



## CORRECTIONS FROM PREVIOUS DRAWINGS

1. Wire gauge used will be 18awg lamp wire, available at Home Depot.
2. Reflective passive panel should be flat, and present a 6" X 8" surface.
3. The connectors on the **ELR-12** will be:
  - a. **MALE** on the **POSITIVE** wire marked with RED heat shrink
  - b. **FEMALE** on the **NEGATIVE** wire marked with BLACK heat shrink
4. Corrected connection drawing

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## RUN TIME APROXIMATION FOR BATTERY POWERED LATCH

### Comparison between Magnetic Release and ELR-12 Release

<u>Latch Type</u>	<u>Standby Continuous Current</u>	<u>Total Current with Sensor</u>
ELR-12 Latched in Standby:	0.00ma	0.004ma — 0.018ma
Magnetic Latched in Standby:	0.050ma to 0.100ma	0.068ma — 0.118ma

### Approximate Run Time:

<u>Battery Capacity For SLA AGM type</u>	<u>@ 0.010ma ELR-12 Latch Hours</u>	<u>@ 0.080ma Magnetic Latch Hours</u>
5Amp Hour	550	45.8
7Amp Hour	770	96.25
8Amp Hour	880	110
10Amp Hour	1100	137.5

### \*PRODUCT UPDATE 4/02/2021

The ELR-12 Latch Release has an improved latch mechanism that reduces friction caused by the forces that it controls. The improved design also features a spring loaded latch setting operation in which the latch release bar is captured when it is inserted.

For sales inquiry or more information:

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