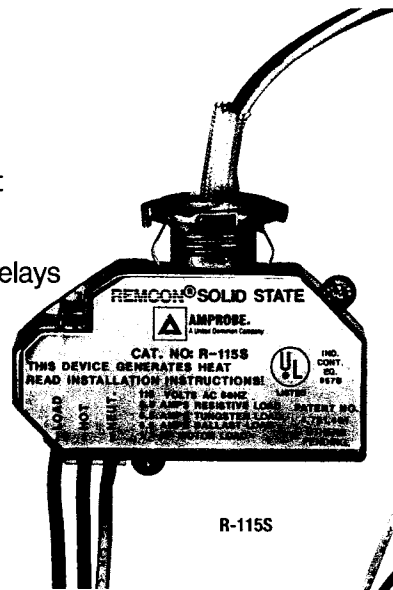
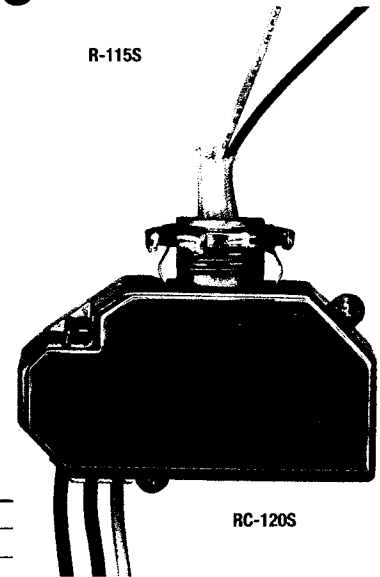


# R-115S & RC-120S Remcon Relays

- ▶ Switches AC power ON and OFF using low voltage control circuit
- ▶ Built in transformer, no step down transformers necessary
- ▶ Single relay can be controlled by multiple switches and multiple relays can be controlled by single switch
- ▶ Light #22 cable can be used to control relay instead of Romex or armored cable – significant time and cost savings
- ▶ AC Voltage from 105 to 125V
- ▶ AC Current up to 6.5A (1/4 HP max. motor load at 120V)
- ▶ Frequency: 60 Hz
- ▶ Safe control switching: 10VDC max. and 10 milliamps max.
- ▶ Safety: UL listed



R-115S



RC-120S

## R-115S

Momentary switch type relay (3 wire)

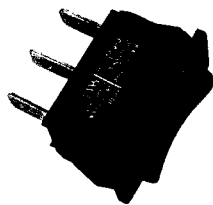
## RC-120S

Closet-light type relay (2 wire)

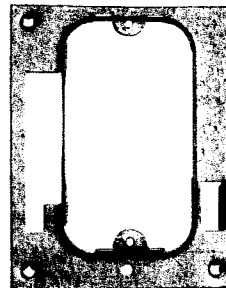
### Optional Accessories

### Part Number

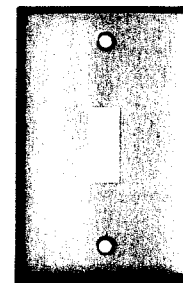
Switch	RE-SW
Mounting bracket	MB-1
Solder-less connector	STA-1
Switch plate, 1 gang Brushed Stainless Steel (can be painted)	SPR-1
Switch plate, 2 gang Brushed Stainless Steel (can be painted)	SPR-2
Switch plate, 3 gang Brushed Stainless Steel (can be painted)	SPR-3



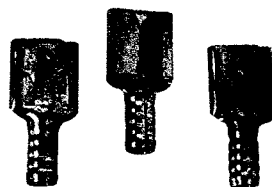
RE-SW



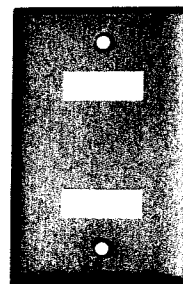
MB-1



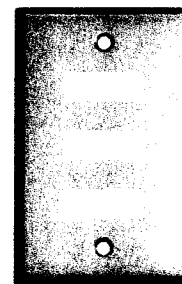
SPR-1



STA-1

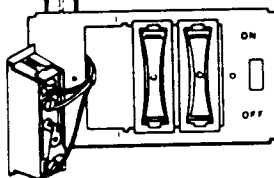
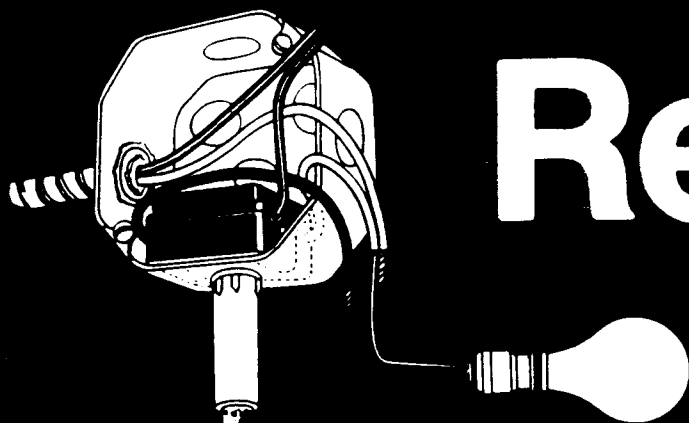


SPR-2



SPR-3

# Remcon®



- Each Remcon relay, unlike any other low voltage relay, has a built-in transformer for unit control. Each relay in the system operates independently from and has no effect upon other relays. You can economically install as little as one relay and operate it with as many switches as is desired.
- Only 6 volts on switch legs. That means no Romex or armored cable\* to pull; just light, pliable #18 wire. Just think of the time you can save.  
\*Where code permits
- Simpler wiring. No need to wire back to a separate, low-

voltage transformer. You simply connect the three\* low-voltage wires to the three\* switch terminals.

\*Only two wires for Closet-lite relay.

- Silent operation. Low relay noise level permits installation of relay right at the fixture. No need to mount in a remote location.
- Relay can not burn out if low voltage switch legs are shorted.

## Let you handle special switching requirements in alteration jobs more economically; like those listed below -

As part of a building improvement job, the owner wants you to install 3-way (or more) switching of a particular light. One relay plus the desired number of switch locations with low voltage wire between the relay and switches does the job.

Partitioned cubicles in large office area are going to be rearranged and you are asked about providing individual switch control of the 277V fixtures. Each cubicle is to have control of the fixtures supplying its lighting. Again, a single relay (277V) and a 6V switch leg can handle the lighting load of individual offices in a safe, efficient and economical manner.

New warehouse extension that will be used for inactive storage calls for individual switching control of every bay. Lighting of a short bay can be controlled with single relay and one or two switches depending upon the desired degree of control. Long-bay, lighting loads can be divided among appropriate number of relays with switches conveniently located along the bay.

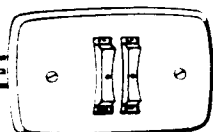
Homeowner wants you to convert pull-chain closet lights to operate from door jamb switches. Job includes some sliding door closets. You can handle this job by installing a Remcon Closet-Lite

Relay in place of the pull-chain switch and a momentary-contact, normally-closed, push-button switch in the door jamb (one in each door jamb for sliding doors). No need to do extensive cutting to door jamb to install a box(es) for the switch. Just drill a hole in the jamb for the switch and run #18 wire from the switch to the relay. You can even suggest Closet-Lite switching when you're called in on other home or apartment modification work. It is an attractive feature that adds to the value of a home or apartment.

Storeowner wants outside night lights installed on back of building with switching control at the store counter. One relay and a switch handle this easily. Long switch leg is more economical with low voltage wire.

You've probably run into many other special switching jobs that didn't call for a full low-voltage switching system but that could have been handled with just one or two relays. Remcon Low Voltage Control provides the economical answer.

See the reverse side for explanation of how easy it is to install Remcon Relays.

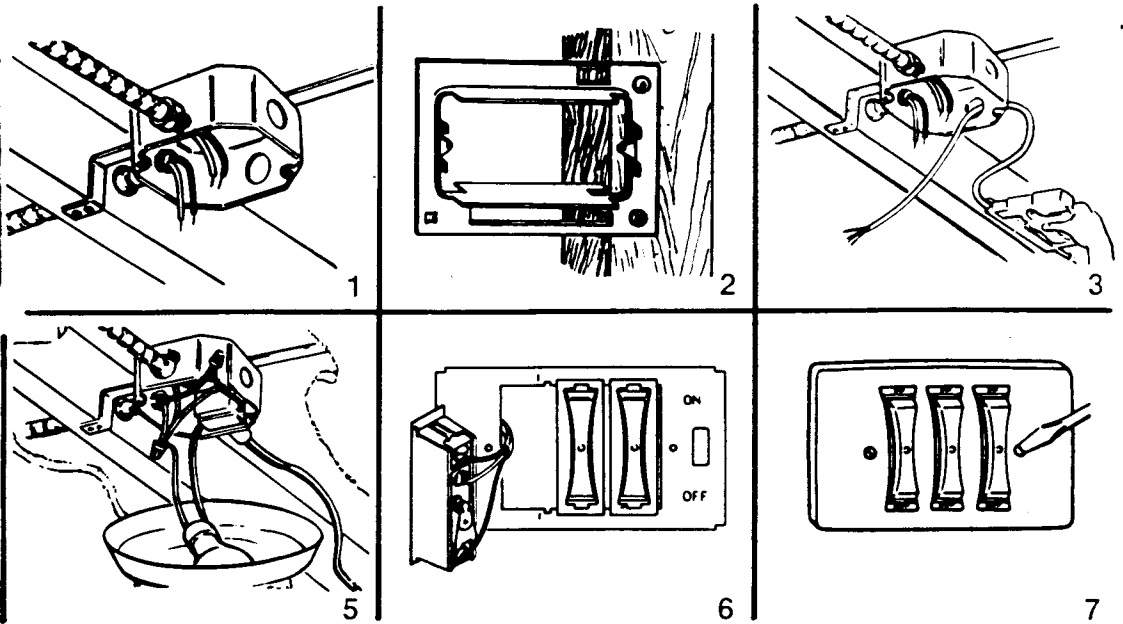


Remcon® Low Voltage Switching

**AMPROBE INSTRUMENT®**

DIVISION OF CORE INDUSTRIES INC., LYNBROOK, NEW YORK 11563

# INSTALLATION INSTRUCTIONS



R-115\* rated 5 amps 120 volts AC 60Hz.  
\*Four-wire versions also available.

R-277\* rated 5 amps 277 volts AC 60Hz.

## Only Remcon . . . . remote-control switching is so easy to install.

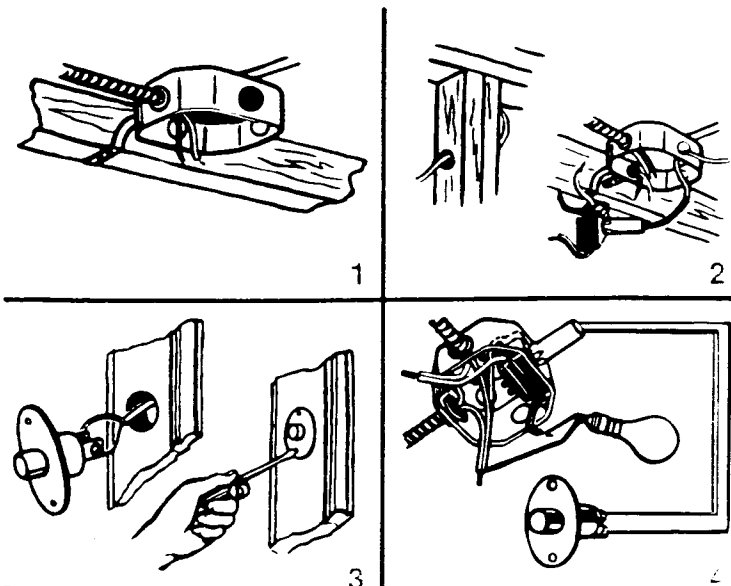
The few simple step-by-step instructions illustrated are all that you need to install REMCON switching. When installing more than one relay, tag each switch leg with the relay number so that circuits can be easily identified when finish wiring is done.

- 1 Rough in service and branch circuits. Mount boxes at the fixture locations to be controlled. Run high-voltage wiring to each box. Break out knockouts to be used for relay. All uncontrolled outlets are wired in conventional fashion. REMCON relays should not be mounted at this stage of wiring to avoid any possibility of damage.
- 2 Mount plaster ring MB-1 for switch supports at all switch locations. Each MB-1 can accommodate up to 3 switches. Mount the MB-1 horizontally.
- 3 Run #183-conductor low-voltage thermoplastic wire from each relay location to its switch location. Use a staple gun and simply staple-as-you-go. Leave a 12 inch loop on both switch and relay ends. Wire should be installed in workmanlike manner so that other trades will not injure the thermoplastic covering.
- 4 Match the thin, low-voltage RED, BLACK and WHITE wires coming

from the REMCON relay cylinder to low-voltage wires in the fixture outlet box. All wire connections must be securely made. It is recommended that tape be used for connections. Where wire nuts are used, stagger the connections. Then, slip the relay through the proper knockout. Spring clips on sides will hold the relay securely in place.

- 5 Connect the high-voltage line to relay and fixture.
- 6 Attach switch assembly plate to switch mounting bracket. Pull 3-conductor #18 wire through wall opening and connect securely to the three terminals of the switch. Terminals are marked RED, WHITE, and BLACK. Just match the thin low-voltage wires to the colored switch terminals. Then snap switches firmly into switch assembly plate. (Plate is marked for 1, 2 or 3 gang switches.) There is no restriction on the number of switches that can be hooked up to the same relay.
- 7 Attach switchplate with screws provided, making sure that ON is on top. When installing clear plastic switchplate, be sure to insert gold-tone card.

## Remcon® Low-Voltage Closet-Lite Switching



These are the few simple instructions needed to install REMCON low-voltage closet-lite switching -

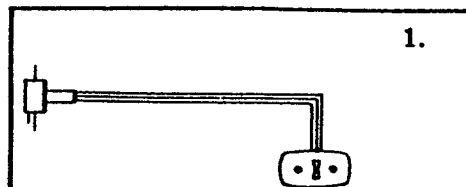
- 1 Mount box at closet fixture location and run 120-volt line to box. Break out knockout for later insertion of relay.
- 2 Drill hole in door jamb to accommodate switch\*. String 2-conductor #18 wire from door jamb and pull through knockout in box. Connect 2 wires projecting from cylinder of relay to the 2-conductor #18 wire and insert relay through knockout.
- 3 Connect the 2-conductor #18 wire to switch, insert switch in door jamb and secure with screws.
- 4 Connect relay to 120-volt line as per diagram.

These are some of the switches that can be used  
Edwards No. 44/Cutler Hammer No. 8096K3/Trine No. 340/Tonepak No. 244  
These are momentary - contact, normally-closed switches (door open, light on)

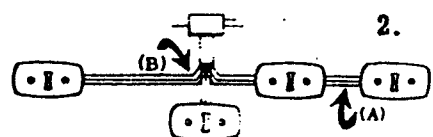
RCL-1 Closet-Lite Relay rated 2.6 amps 1/8hp. 120 volts AC 60Hz.

# How REMCON Works Electrically

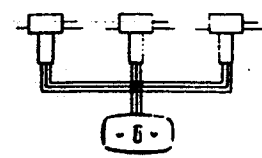
**1. SINGLE RELAY TO SINGLE SWITCH**  
 A basic REMCON hookup...one relay and one switch...is easy to install... saves time and trouble.



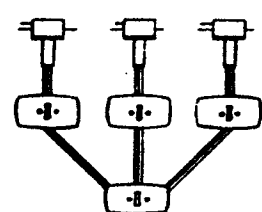
**2. SINGLE RELAY TO SEVERAL SWITCHES**  
 No matter how many low-voltage switches you're installing, working with the REMCON relay is never more complicated than installing one relay and one switch. And you can have as many switching points on a single REMCON relay as you wish. You can add a switch to existing switches (A) or to the relay (B).



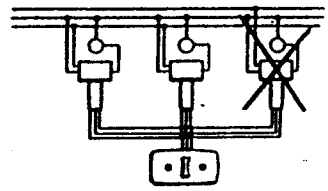
**3. SEVERAL RELAYS TO SINGLE SWITCH**  
 You can simultaneously control as many as five REMCON relays from a single switch. (See note below)



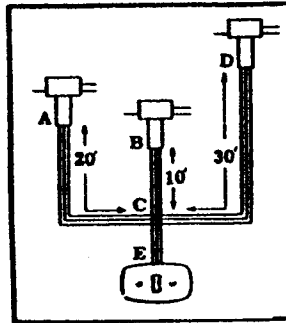
In this type of hookup the relays cannot be individually controlled.



**NOTE:** When one switch is hooked to several relays in a single-phase 3-wire service, the BLACK hi-voltage wire of all the relays must be connected to the same hot leg of the service.



**LENGTH OF SWITCH LEG --**



In general, #18 gauge 3-conductor jacketed wire is recommended for all your low-voltage switch legs. Length of switch leg should be limited to 160 feet when the supply voltage to relay is 120V. Because of the resistance of the low-voltage cable between the relay and switch, the following size wires are required to work efficiently at 110V and 120V for various lengths of switch legs:

**Important Note!**

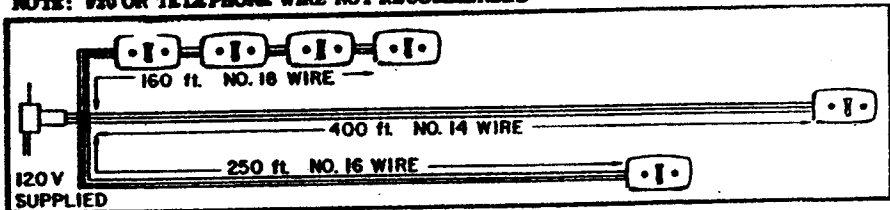
When more than one relay operates on a common switch leg, divide the distances in the table below by the number of relays. In the illustration shown to the left take the distance from the junction point to the furthest relay, CD (30 feet). Subtract 30 feet from the permissible distance, 160 feet, for a total of 130 feet. Divide 130 feet by the number of relays (3) for a total of approximately 45 feet. This is the maximum permissible distance for the leg CE.

**LENGTH OF SWITCH LEG (ft) - REMCON RELAYS**

3 WIRE CABLE	MAX. LENGTH OF SWITCH LEG RUN	
	CAT. R115 120V. At Relay	CAT. R115 110V. At Relay
	CAT. R277 277V. At Relay CAT. R4277	CAT. R277 CAT. R4277 254V. At Relay
# 18*	160 FEET	80 FEET
# 16	250 FEET	125 FEET
# 14	400 FEET	200 FEET

\* RECOMMENDED

NOTE: #20 OR TELEPHONE WIRE NOT RECOMMENDED



This wiring diagram illustrates application of the above information. Note that the number of switches on a switch leg run has no effect on length of line.

**TEMPERATURE FACTOR ---**

Because of REMCON's built-in safety features, REMCON relays will function satisfactorily only in temperatures ranging from -41°F up to 175°F.

**TYPE OF SWITCH ---**

For maximum efficiency, use REMCON switches only. Do not use rotary-type master controls because they do not work properly with REMCON relays.

**TIME DELAY FACTOR --**

The REMCON relay is a Thermo operated device which cannot burn out. As a result the relay requires 1/3 of a second to operate. REMCON switches are designed to compensate for the operating time characteristic. Use only REMCON switches with REMCON relays.

# How REMCON

## Components Are Mounted




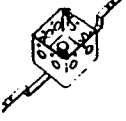



Now that we've gone into the electrical phases of the REMCON method, let's see how simply it fits together.

### 1. Where to locate the REMCON relay

Except for recessed fixtures, the REMCON relay should be mounted in the same outlet box that the fixture or convenience outlet is connected to. (See paragraph 4 for placement of REMCON relays with recessed fixtures.)

### 2. Size of outlet box needed

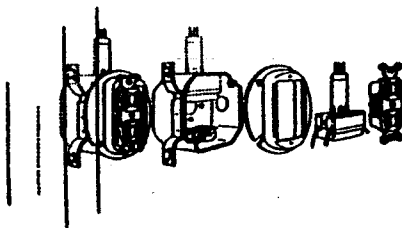
The following boxes are recommended for REMCON installations--

BOXES	FOR FIXTURES	
	WITH FIXTURE STUD	WITHOUT FIXTURE STUD
 4-in. octagon, 1 1/2-in. deep	Not recommended	Recommended. Use fixture strap.
 4-in. octagon, 2 1/8-in. deep, with shallow strap retainer	Not recommended	Recommended. Use fixture strap.
 4-in. square, 1 1/2-in. deep	Recommended. Stud must be removed when relay is inserted or taken out. Use plaster ring to reduce 4-in. square dimension to 3-in. round.	
 4-in. square, 2 1/8-in. deep	Recommended. Use plaster ring to reduce 4-in. square dimension to 3-in. round	
FOR CONVENIENCE OUTLETS		
BOXES	DUPLEX OUTLET	PLASTER RINGS
 4-in. octagon, 2 1/8-in. deep, with wall bracket	Standard depth	4-in. round
 4-in. square, 1 1/2-in. deep, with wall bracket	Shallow depth	4-in. square
 4-in. square, 2 1/8-in. deep, with wall bracket	Standard depth	4-in. square

Note: For each box in which a relay is mounted, the number of conductors permitted by the code is reduced by 2.

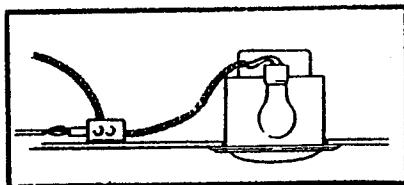
**3. Installing convenience outlets**

Place plaster ring over outlet box. It is advisable to use the type of convenience outlet where one outlet is controlled while the remaining outlet is live.

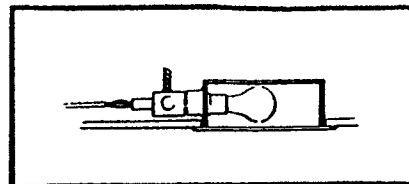


**4. Installing REMCON relays in recessed fixtures**

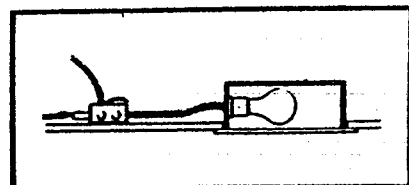
Follow manufacturer's recommendations and code requirements. Remember that REMCON built-in protection limits the use of relays to locations where temperatures are under 175°F. A good rule of thumb to go by is: where asbestos wire must be used to wire a recessed fixture, REMCON relays must be installed in a floating box. The following illustrations show how REMCON relays are installed in three types of recessed fixtures:



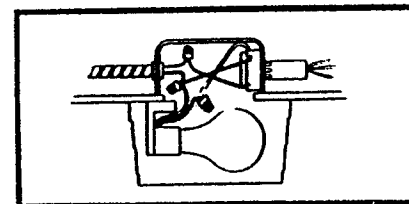
**HI-HAT - REMCON relay must be installed in floating box**



**PRE-WIRED - REMCON relay can be installed directly in fixture junction box**



**RECESSED BUT NOT PRE-WIRED - REMCON relay must be installed in floating box**



**NOTE:** When pan-type fixtures (shown above) are used and proper fixture ventilation is not provided, temperature build-up in box can exceed 175°F limit. In this event, the relay should be installed in a floating box.

## How REMCON Components Are Mounted

### 5. Type of wire recommended for switch legs

Any 3-conductor low-voltage wire can be used. For best results, #18 cotton-covered or thermoplastic-covered (flat preferably) wire is recommended. Care should be taken when wire is stapled to prevent shorting. Special staplers are available for this purpose.

### 6. REMCAN switches

REMCAN switches are precision made to ensure perfect alignment for easy insertion into REMCON mounting brackets.

### NOTE: DO NOT PAINT REMCON SWITCHES

Paint can cause switch to stick in ON or OFF position or can interfere with electrical contacts of switch.

### 7. Switch Mounting Brackets

Because the voltage at the switch is only 6 volts, it is not necessary to use conventional switch boxes. Switch boxes are replaced by REMCON mounting brackets or conventional plaster rings.

### REMCAN MB-1

REMCAN MB-1 mounting brackets are recommended for installing REMCON switch in horizontal or vertical position. They can be used equally well on plaster or sheetrock. Stopguides and square edges are provided to make installation easier.



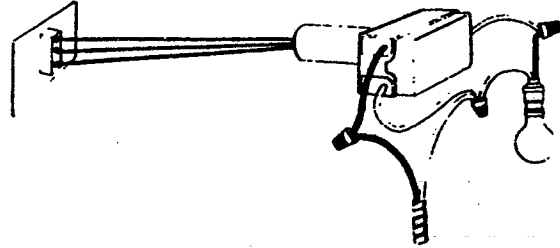
MB-1



## Checking a REMCON Installation

Checking a REMCON installation never becomes more involved than testing one relay and any switch connected to it. Complete switch failure throughout the house is impossible because REMCON relays act independently of each other. And remember, the chance of trouble at the low-voltage end of your installation is very small. You should therefore check your service entrance and high-voltage wiring first.

The actual checking of the REMCON installation is so simple it can be accomplished in these few short steps---



### CANNOT TURN RELAY ON

1. Check fuses and circuit breakers
2. Check connections at high-voltage end of relay.

Check to see if high voltage is available in the outlet box.

3. Check connections at low-voltage end of relay. Disconnect switch legs from relay. Allow 5 minutes needed for relay to cool off . . . then proceed to --
4. Touch RED and WHITE wires of relay to turn relay ON. If relay works properly at this point, there are 3 possibilities:
  - a) open in switch legs
  - b) short in switch legs
  - c) short or open in switches
5. Disconnect all switches hooked to this relay. Touch RED and WHITE wires at each switch location and see if relay is turned ON. If relay works properly from this point, replace switch. If relays still do not function properly, trouble is in switch leg.

### CANNOT TURN RELAY OFF

1. Check connections at the high-voltage end of the relay
2. Check connections at the low-voltage end of the relay.
3. Disconnect all switch legs from relay. Take 10 for your cigarette break . . . you've got the problem just about licked now. This interval allows the 5 minutes needed for the relay to cool off.
4. Touch BLACK and WHITE wires of relay to turn the relay OFF. If the relay works properly at this point, there are 3 possibilities:
  - a) open in switch legs
  - b) short in switch legs
  - c) short or open in switches
5. Disconnect all switches hooked to this relay. Touch BLACK and WHITE and see if the relay is turned OFF. If the relay works properly at this point, replace switch. If the relay still doesn't function properly, the trouble is in the switch leg.

The R-115S is a Solid State relay that replaces the R-115 in all present applications, and in addition, offers more applications than ever before.

### R-115S vs. R-115

- R-115S is solid-state. R-115 employs electromechanical switching.
- R-115S has a *maximum AC current rating* of 6.5 Amps. The R-115 is rated only 5 Amps maximum.
- The *control current* for the R-115S is only 10 mA DC. The R-115 uses 750 mA of AC control current. (See note below.)
- The package for the R-115S is designed to fit within a standard **metal gem** box. Since the solid state switching element generates heat, it is important to mount the device securely to a **metal gem** box.
- The R-115S is a U.L. listed device, as was the R-115.

### CAUTIONS

1. IMPROPER CONNECTION OF POWER LEADS WILL RESULT IN PERMANENT DAMAGE TO THE RELAY. RE-CHECK YOUR WIRING BEFORE TURNING ON AC POWER!
2. TO CONTROL RELAY, USE ONLY REMCON MOMENTARY-CONTACT SWITCH CAT. NO. RE-SW OR EQUIVALENT. IF ANY OLD REMCON CONTROL SWITCHES CONTAINING A LIGHT BULB EXIST IN THE INSTALLATION, THE LIGHT BULB MUST BE REMOVED FROM THESE SWITCHES, OR IMPROPER RELAY OPERATION WILL RESULT!
3. THE R-115S CANNOT BE USED TO REPLACE THE R-4115.
4. DO NOT EXCEED THE UNDERWRITERS LABORATORIES, INC. RATINGS OF 6.5 AMPS AC RESISTIVE, TUNGSTEN OR BALLAST LOAD, OR 1/4 HP MOTOR LOAD.
5. DO NOT INSTALL RELAY IN A LOCATION WHERE THE TEMPERATURE MAY EXCEED 40 DEGREES CELSIUS. (104 °F)
6. INCORRECT HOOK-UP CAN RESULT IN AN ELECTRICAL HAZARD.

NOTE: If there is more than one relay on a circuit, the relays must be the same type (i.e. All R115 or all R115S). They cannot be intermixed because of the difference in control currents.

### R-115S SPECIFICATIONS

- AC voltage rating: 105 to 125 VAC, 50-60 Hz.
- AC current rating: 6.5 Amps Max. Resistive, Tungsten, or Ballast Load, 1/4 HP Max. Motor Load at 120 VAC.
- Control switching current: 10 Milliamps Max.
- Control switching voltage: 10 VDC Max. (Isolated from AC line).
- Control switch closure time: 5 Milliseconds Min.
- Ambient operating temperature: 40 °C Max. for full rated output.
- Operation: Momentary contact closure of control wires turns AC power ON or OFF.

### NEW APPLICATIONS FOR THE R-115S

- Industrial Control Applications.
- Where isolated low voltage is needed for safety reasons.
- Higher current applications. (Up to 6.5 Amps, 1/4 HP).
- Long-distance remote operation.
- Alarms.
- Computer control applications.
- Plant process controls.
- Hostile or hazardous environments.
- Reduce control wiring costs and electrical interference.
- Economically meet building codes in new installations.
- Applications where a U.L. Listed device is required.

## HOW TO CONNECT THE R-115S IN NEW INSTALLATIONS

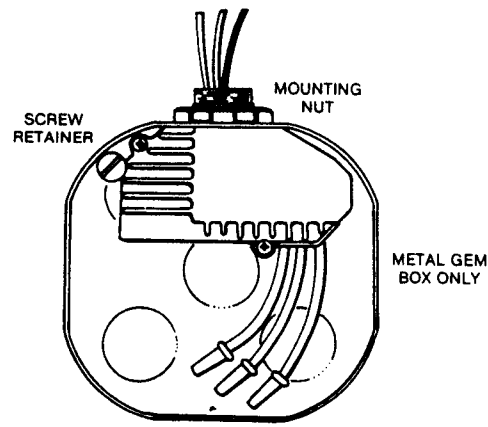
1. Turn off AC power to circuit which you will be wiring the R-115S into (using fuse or circuit breaker).
2. Mount the R-115S relay in a **metal gem** box near the load to be switched as shown on pages 5 and 6.
3. Connect some 3-conductor light-gauge wire to the remotely located control switch (Cat. No. RE-SW or equivalent) according to the colors marked on the switch.
4. Run this wire over to the R-115S location and connect them to the light-gauge R-115S control wires matching up the colors.
5. Connect the heavy-gauge white power wire of the R-115S to the white (neutral) wires of the incoming AC power and the load.
6. Connect the heavy-gauge black wire of the R-115S to the black (hot) wire of the incoming AC power.
7. Connect the heavy-gauge red wire of the R-115S to the black (hot) wire of the load.

**NOTE:** PLEASE REFER TO THE CAUTIONS ON THE PREVIOUS PAGE BEFORE APPLYING AC POWER TO THE REMCON R-115S CIRCUIT!

8. Apply AC power to the R-115S controlled circuit.
9. When control switch momentarily connects white control wire to red control wire, power to load is turned ON. When control switch connects white control wire to black control wire, power to load is turned OFF. Contact state of the R-115S is maintained even if AC power to the relay is lost and is then restored.

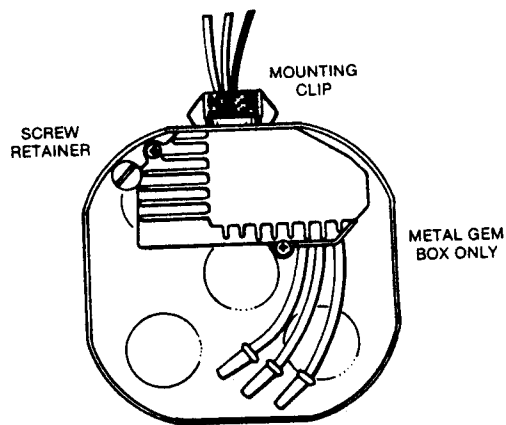
## INSTALLING WITH MOUNTING NUT

Preferred mounting method:  
Better heat dissipation.



- Insert REMCON through the knock-out in gem box, making sure it does not interfere with screw retainers.
- Screw on mounting nut *before* connecting control wires.
- Be sure to use a slip-joint pliers to securely tighten the nut.
- Make sure a good metal-to-metal contact exists between REMCON and gem box.

**INSTALLING WITH MOUNTING CLIP**  
**For locations where**  
**mounting nut cannot be used.**

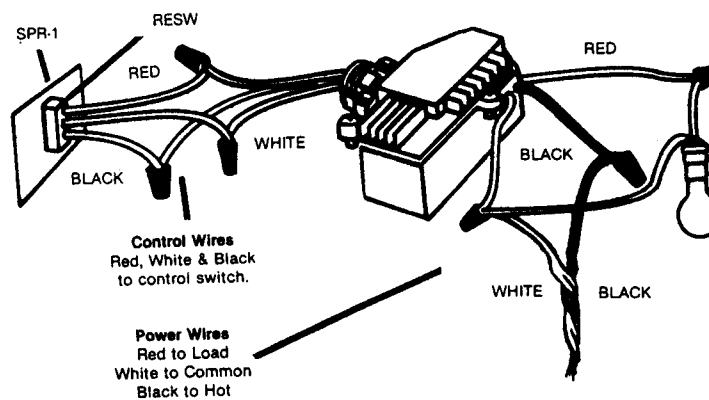


- Insert REMCON through the knock-out hole in the gem box.
- Make sure the REMCON is installed so that there is no interference with the gem box screw retainers.
- Make sure the REMCON contacts the metal surface of the gem box as tightly as possible.

**REPLACING THE R-115 WITH THE R-115S**  
**IN EXISTING INSTALLATIONS**

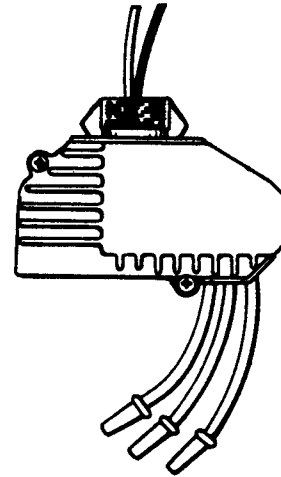
1. Turn off AC power to the circuit with the R-115 (using fuse or circuit breaker).
2. Disconnect and remove R-115 relay.
3. Mount R-115S relay in **metal gem** box as shown on pages 5 and 6.
4. Connect control switch wiring to R-115S (light-gauge thermostat wire or similar) as shown in diagram.
5. Connect AC power wiring to R-115S (Romex or BX) as shown in diagram.
6. Restore AC power to line.
7. When control switch momentarily connects white control wire to red control wire, power to load is turned ON. When control switch momentarily connects white control wire to black control wire, power to load is turned OFF. Contact state of the R-115S is maintained even if AC power to the delay is lost and then restored.
8. See note on preceding page.

**R-115S HOOK-UP DIAGRAM**



MODEL	DESCRIPTION
R-115S	Relay, Low Voltage 120V, 60 Hz, 6.5 AMPS
R277S	Relay, Low Voltage 277, 60 Hz, 6.5 AMPS
RC-120S	Closet-Light Relay, Low Voltage, 120V, 60 Cycle, 6.5 AMPS, AC 1/4 HP
MB-1	Mounting Bracket For All Remcon Switches
SPR-1	Switch Plate, 1 Gang
SPR-2	Switch Plate, 2 Gang
SPR-3	Switch Plate, 3 Gang
STA-1	Solderless Connector
RE-SW	Switch, Momentary Contact, Gangable, 125-250 VAC, 6 AMPS

Part No.  
957753  
6/84



For more information on operation and installation of the REMCON, request Cat. No. RD-67 or call Amprobe Instrument.

Technical Assistance 1-800-477-VOLT

**INSTALLATION INSTRUCTIONS  
FOR CONNECTING THE REMCOM R-115S RELAY  
(INCLUDING HOW TO REPLACE  
THE R-115 WITH THE R-115S)**



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