

# SERVICE AND APPLICATION NOTES

June 4, 2013  
Revised August 3, 2015

## Load Shedding for Outdoor Units with iComfort® Control

### AFFECTED MODELS

- XC17, XC21, XP17 and XP21 early production with iComfort® outdoor control part numbers 101796-xx, 101797-xx, 101798-xx and 101799-xx.
- XC17, XC21, XP17, XP17N, SL18XC, SL18XP, XP21 and XP21N with iComfort® outdoor control part numbers 103369-01 through -04.
- XC20, XP20, XC25 and XP25 variable capacity with iComfort® outdoor control part number 103686-xx.

### ISSUE

Information in this note shows the proper application and interface wiring of utility load control devices to Lennox iComfort®-enabled outdoor units installed on iComfort®-enabled communicating thermostat systems. The use of the Load Shedding Relay Kit (10M34) is also addressed in this note.

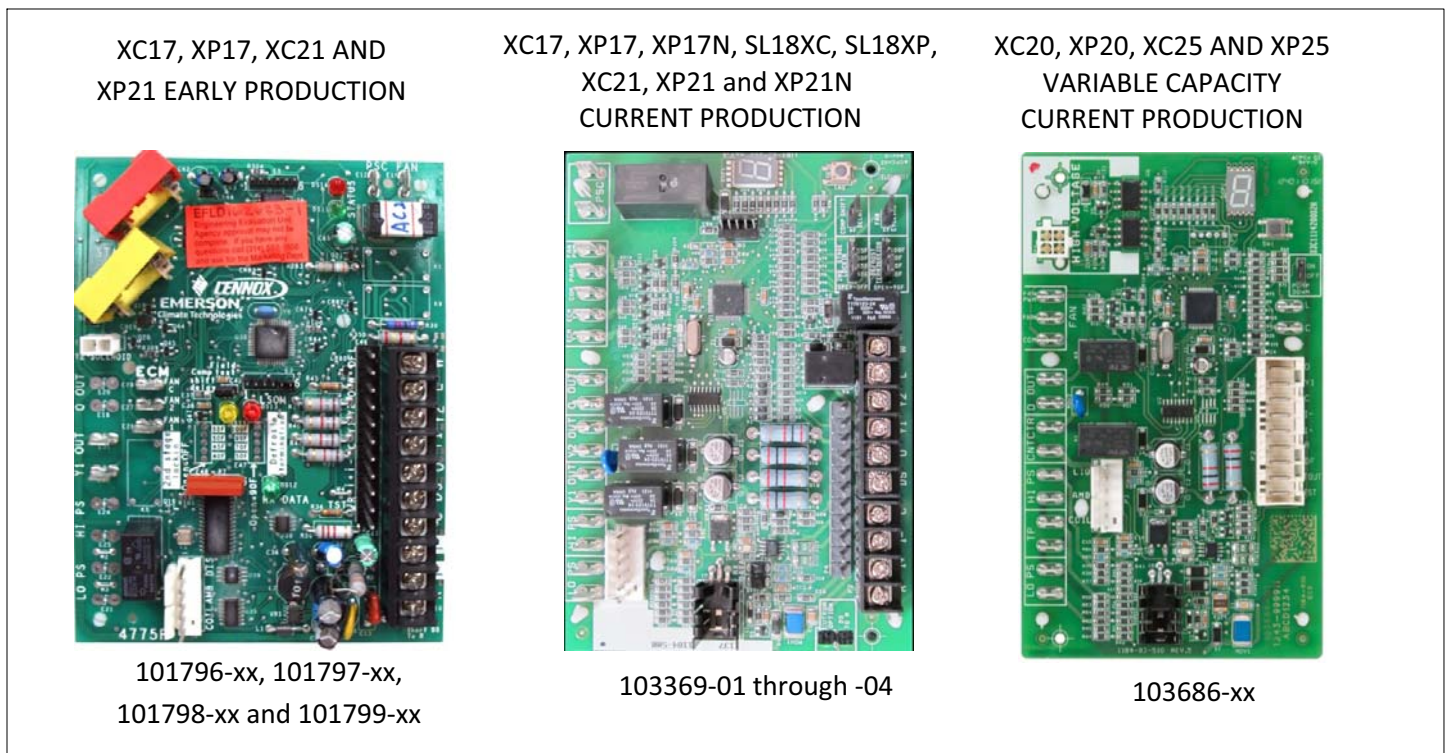


FIGURE 1

# PREFERRED METHOD FOR UTILITY LOAD SHED WIRING — SELECTED VERSIONS OF THE XC17, XP17, XP17N, XC21, XP21 AND XP21N

## 1. Applicable Models:

- XC17, XP17, XP17N, XC21, XP21 and XP21N

## 2. Applicable Outdoor Control:

- iComfort® outdoor controls 101796-xx, 101797-xx, 101798-xx, 101799-xx, 103369-01 and 100369-02

## 3. Utility Load Shedding Mode:

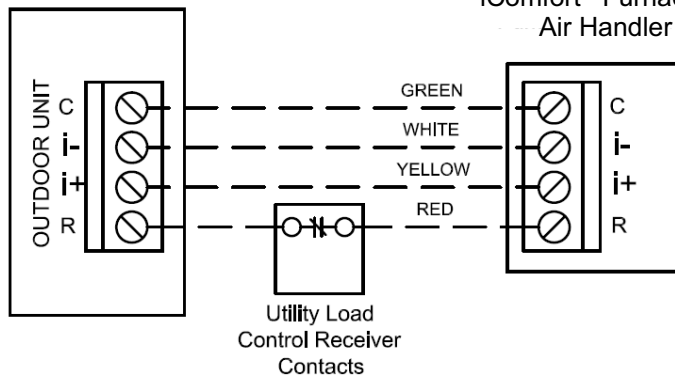
- A. **Utility Load Shedding Mode ACTIVATED (Utility Cycled Unit OFF)** – The normally closed set of contacts in the utility load control receiver **open**. This interrupts the iComfort® communication **R** (24VAC) terminal wire between the indoor unit and iComfort®-enabled outdoor unit. The iComfort®-enabled outdoor unit will be cycled **OFF**. A *Lost Communication alert* (code 31) will appear on the display of the iComfort® thermostat. When load shedding mode becomes activated, the customer will receive a notification email alert if they have selected this option in the iComfort thermostat.
- B. **Utility Load Shedding Mode DEACTIVATED (Normal Equipment Operation)** – When load shedding is deactivated, the contacts in the utility load control receiver are closed. The iComfort® communication **R** (24VAC) wire between the indoor unit and iComfort® outdoor unit is connected and iComfort® communication is restored. The outdoor unit will return to normal operation and the alert code will clear.

## XC17, XP17, XP17N, XC21, XP21 and XP21N iComfort® Outdoor Unit Wiring Detail with Utility Load Shedding - Preferred Wiring Method

iComfort® Air Conditioning or Heat Pump Outdoor Unit

iComfort® Furnace or Air Handler

*Outdoor Control Part Numbers*



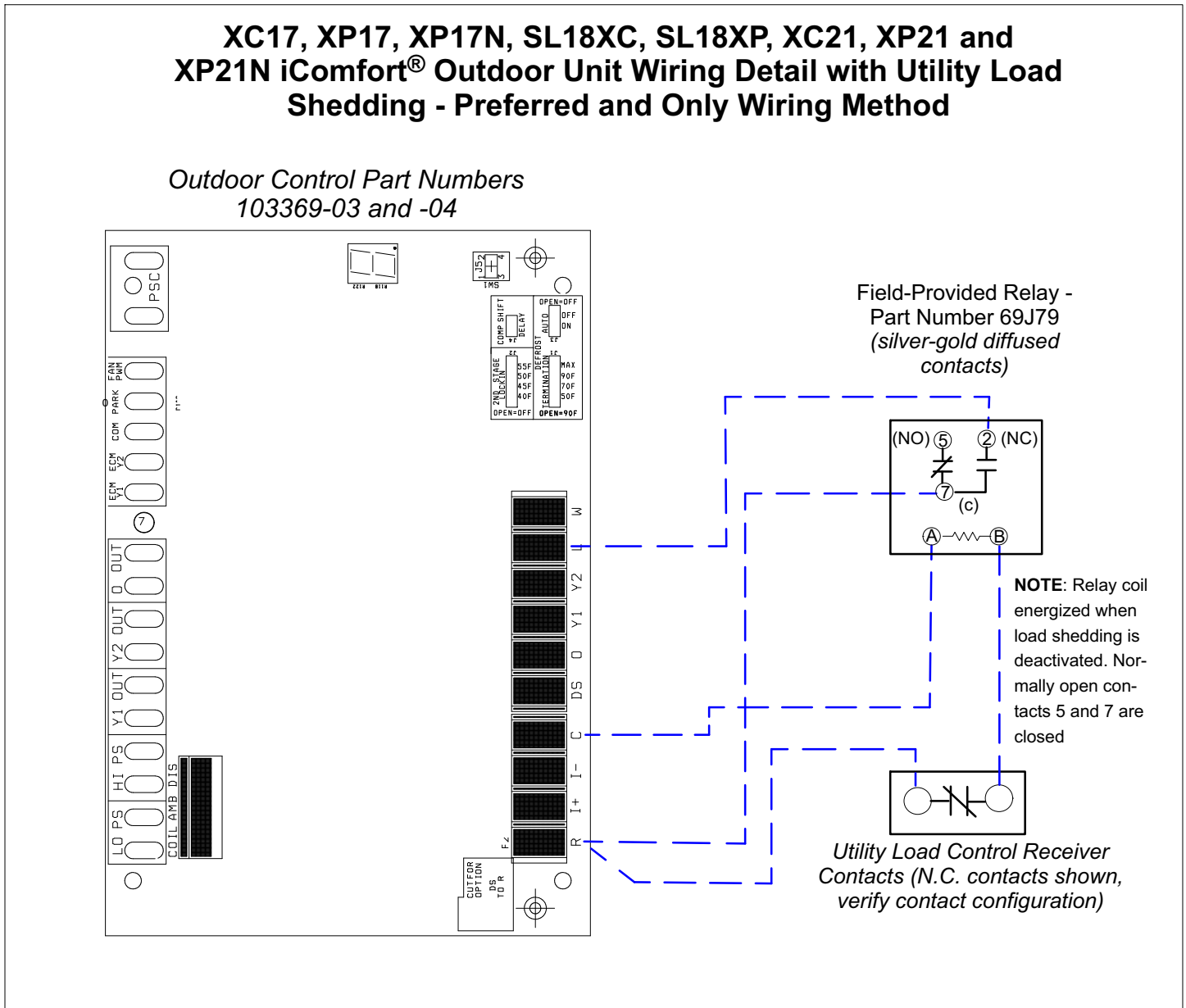
101796-xx  
101797-xx  
101798-xx  
101799-xx  
103369-01  
103369-02

FIGURE 2

4. **Applicable Models:** XC17, XP17, XP17N, SL18XC, SL18XP, XC21, XP21 and XP21N

5. **Applicable Outdoor Control:**

- iComfort® outdoor controls 103369-03 and -04 with iComfort® thermostat only
- A. **Utility Load Shedding Mode ACTIVATED (Utility Cycled Unit OFF)** – The normally closed set of contacts in the utility load control receiver **open**. This removes 24VAC from the coil of the field-provided relay (catalog # 69J79). The relay contacts close (terminal 7 to terminal 2), completing the circuit between terminals **R** and **L** on the outdoor control. This 24VAC input to terminal **L** activates the load shedding mode in the outdoor control and the outdoor unit will be cycled **OFF**. The 7-Segment display on the outdoor control will display a load shedding alert code **E600** and an alert will appear on the display of the iComfort® thermostat. When load shedding mode becomes activated, the customer will receive a notification email alert if they have selected this option in the iComfort® thermostat.
- B. **Utility Load Shedding Mode DEACTIVATED (Normal Equipment Operation)** – When load shedding not required, the contacts in the utility load control receiver are closed. This provides 24VAC to the coil of the field provided relay (catalog # 69J79). The relay contacts **OPEN** (terminal 7 to terminal 2) removing 24VAC from the **L** terminal on the outdoor control. This deactivates the load shedding mode in the outdoor control. The outdoor unit will return to normal operation and alert code will clear.



**FIGURE 3**

6. **Applicable Models:** XC20, XP20, XC25 and XP25 (iComfort® outdoor control 103686-xx)

- A. **Utility Load Shedding Mode ACTIVATED (Utility Cycled Unit OFF)** – The normally closed set of contacts in the utility load control receiver “open”. This removes 24VAC from the coil of the field-provided relay (catalog # 69J79). The relay contacts close (terminal 7 to terminal 2), completing the circuit between terminals R and L on the outdoor control. This 24VAC input to terminal L activates the load shedding mode in the outdoor control and the outdoor unit will be cycled **OFF**. The 7-Segment display on the outdoor control will display a load shedding alert code **E600** and an alert will appear on the display of the iComfort® thermostat. When load shedding mode becomes activated, the customer will receive a notification email alert if they have selected this option in the iComfort® thermostat.
- B. **Utility Load Shedding Mode DEACTIVATED (Normal Equipment Operation)** – When load shedding not required, the contacts in the utility load control receiver are closed. This provides 24VAC to the coil of the field provided relay (catalog # 69J79). The relay contacts **OPEN** (terminal 7 to terminal 2) removing 24VAC from the L terminal on the outdoor control. This deactivates the load shedding mode in the outdoor control. The outdoor unit will return to normal operation and alert code will clear.

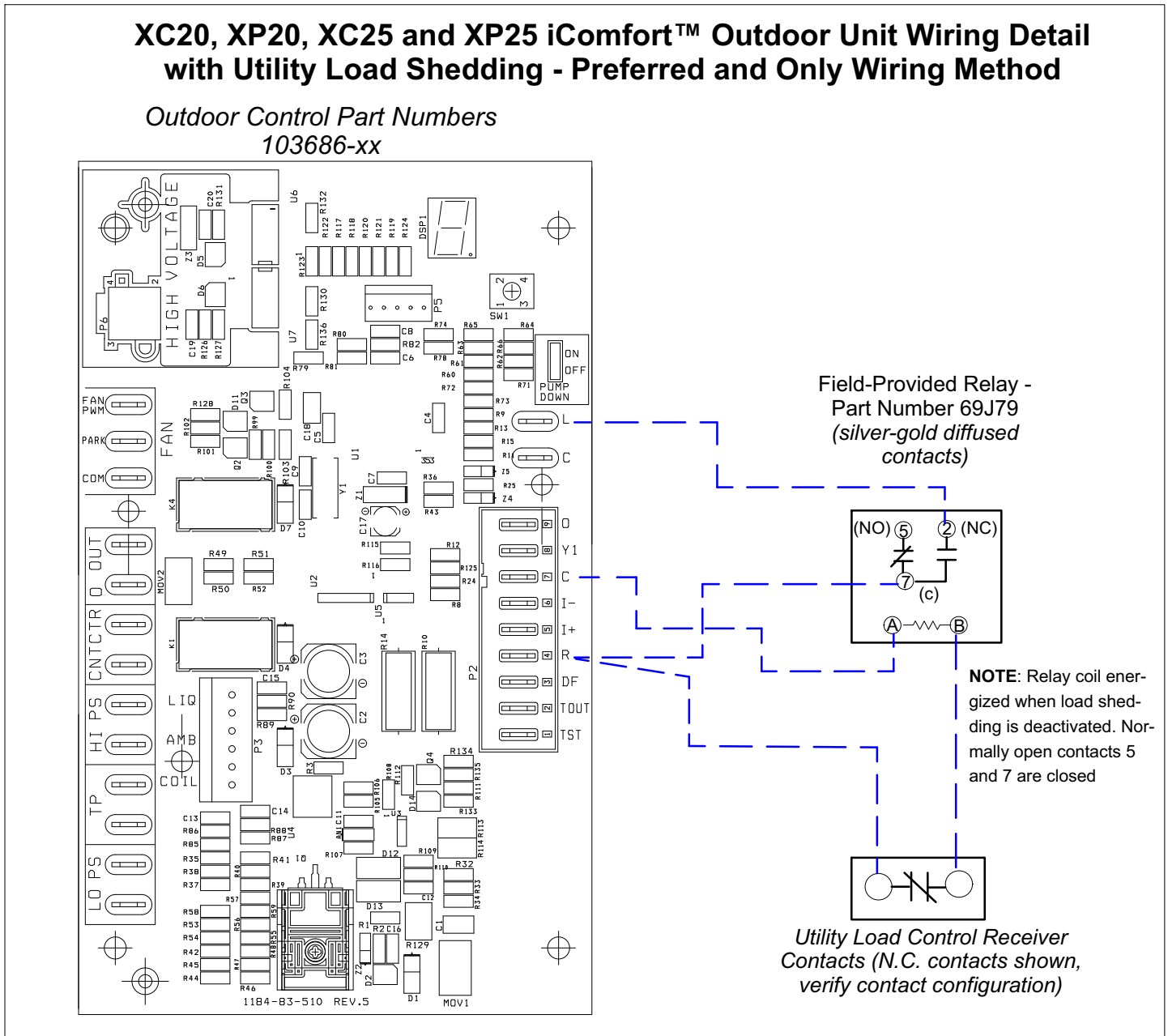


FIGURE 4

# ALTERNATE METHOD FOR UTILITY LOAD SHED WIRING — SELECTED VERSIONS OF THE XC17, XP17, XP17N, XC21, XP21 AND XP21N

7. **Applicable Models:** XC17, XP17, XP17N, XC21, XP21 and XP21N (iComfort® outdoor controls 103369-01 and -02 Only)

A. **Utility Load Shedding Mode ACTIVATED (Utility Cycled Unit OFF)** – The normally closed set of contacts in the utility load control receiver **open**. This interrupts the 24VAC signal from the **Y1 Out** terminal on the outdoor control to the compressor contactor coil and the compressor will be cycled **OFF**. The outdoor fan will continue to operate during a thermostat demand. The 7-segment display on the outdoor control will **NOT** display an alert code and the iComfort® thermostat will **NOT** display an alert. When load shedding mode becomes activated, the customer will receive a notification email alert if they have selected this option in the iComfort® thermostat.

**Note** - Some utilities may require the entire outdoor unit to cycle off during utility load shedding. If the entire outdoor unit is required to cycle off, the "preferred wiring method" shown in figure 2 must be used.

B. **Utility Load Shedding Mode DEACTIVATED (Normal Equipment Operation)** – When load shedding is not required, the contacts in the utility load control receiver are closed. The circuit is completed between the **Y1 Out** terminal on the outdoor control to the compressor contactor coil. The outdoor unit will return to normal operation.

## XC17, XP17, XP17N, XC21, XP21 and XP21N iComfort™ Outdoor Unit Wiring Detail with Utility Load Shedding - Alternate Wiring Method

**NOTE:** This alternate wiring method is not applicable to early production XC17, XP17, XC21 and XP21 outdoor units that used outdoor control 101796-xx, 101797-xx, 101798-xx and 101799-xx.

### Outdoor Control Part Numbers

103369-01

103369-02

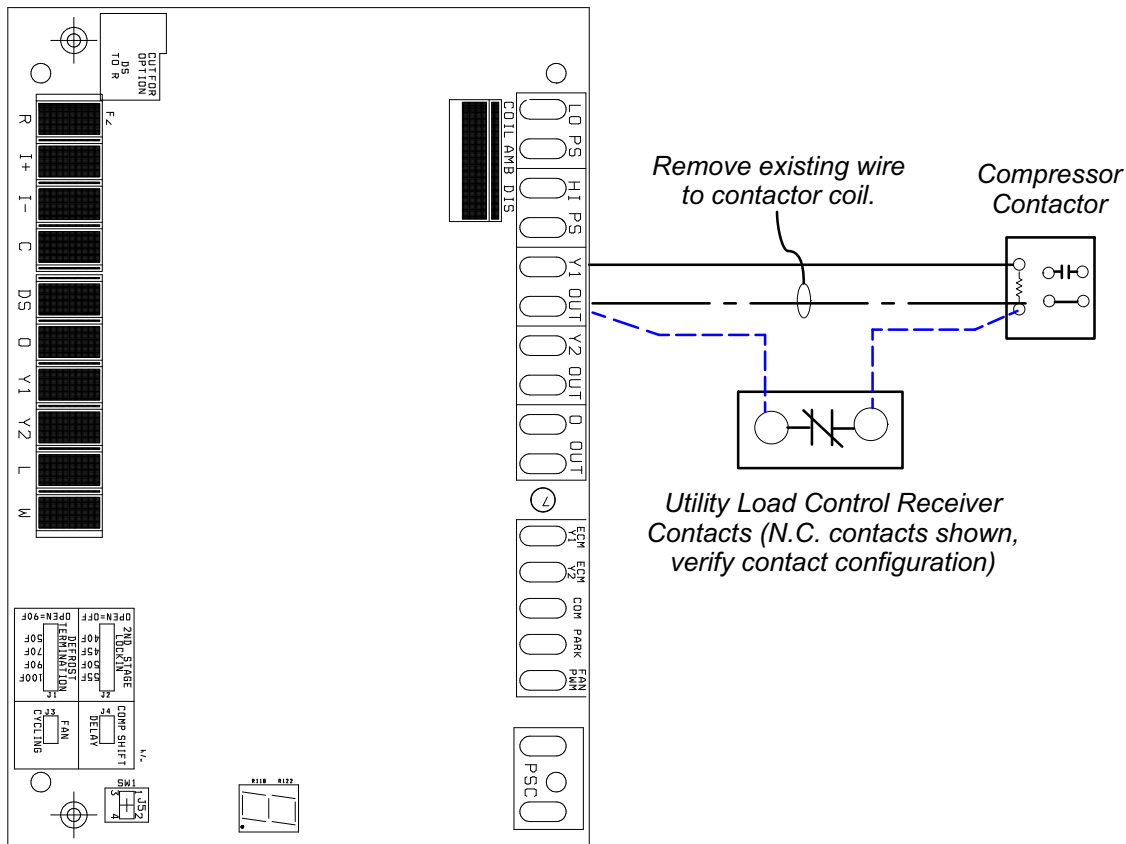


FIGURE 5

## Load Shedding Relay Kit (10M34), XC17, XP17, XP17N, SL18XC, SL18XP, XC21, XP21, XP21N using iComfort® Outdoor Control Part Number Series 103369-03 through -05 only and connected to a iComfort® thermostat

1. The load shedding relay control receives 24VAC through **R** (24VAC) and **C** (COM) terminals from the outdoor control.
2. The load shedding relay control has a relay which switches 24VAC between **L** and **NO** terminals.
  - The **L** terminal is a normally **closed** contact of the relay which is connected to **L** terminal of the outdoor control.
  - The **NO** terminal is a normally **open** contact of the relay which is left unused in this application.

**NOTE:** The **L** terminal on the outdoor control is the load shedding control terminal which is different from earlier versions of the outdoor control (103369-01 and -02) where this was the LSOM terminal.

- During normal operation, the load shedding relay control receives 24VAC to the **LS** terminal through the normally **closed** contacts of the utility box relay. The occurrence of a load shedding event will result in the utility box relay **opening** its normally **closed** contact.
- The 24VAC power is removed from the **LS** terminal on the load shedding relay control when the utility box relay contacts open. This switches the load shedding relay from normally **open** contact (terminal **NO**) to normally **closed** contact (terminal **L**).
- A 24VAC signal will appear on the terminal **L** indicating to the outdoor control that a load shedding event has occurred. The outdoor control will take the appropriate actions for a load shedding event, for example turning OFF the compressors and outdoor fan and display the **E600** status code on the outdoor control and iComfort® thermostat.

iComfort Outdoor Control Part Number Series  
103369-01 through -04

**IMPORTANT:** This load shedding relay kit will only work with the 103369-03 or -04 outdoor control.

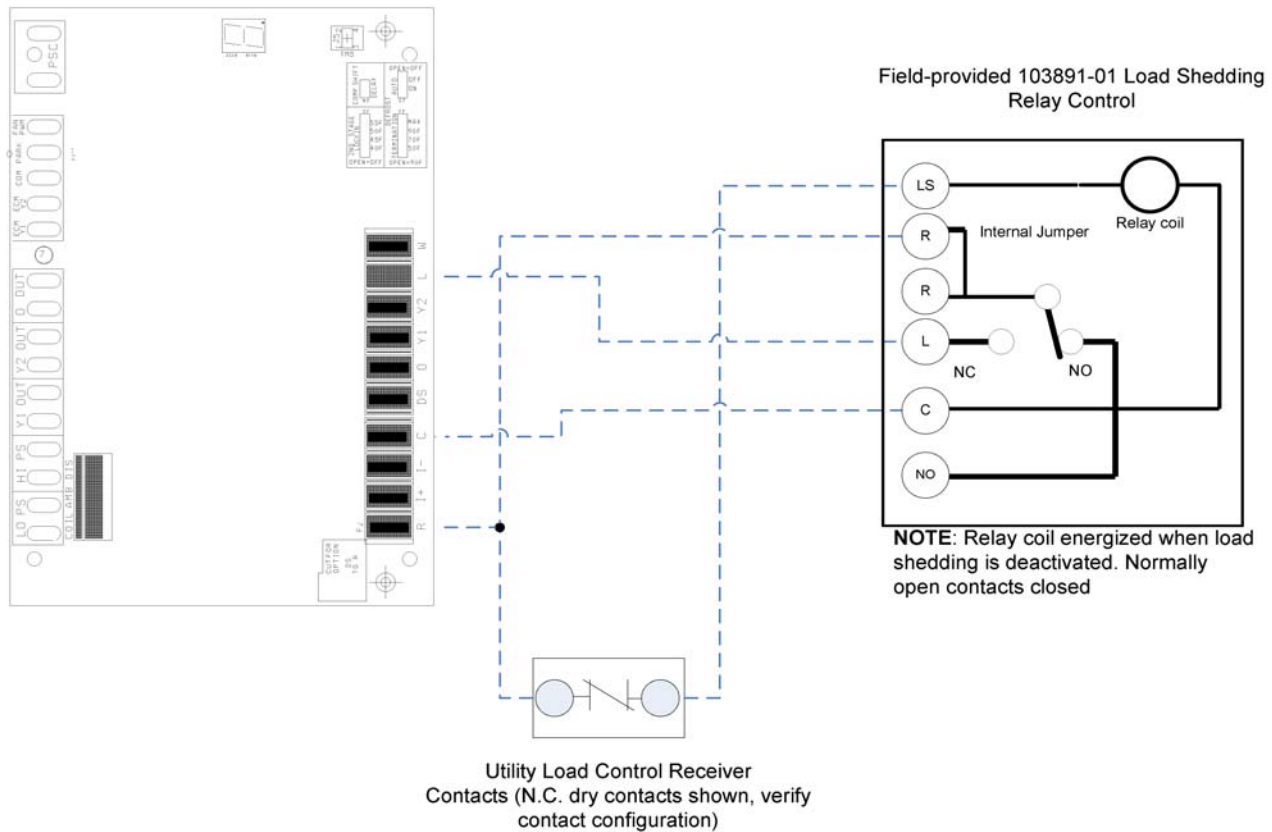
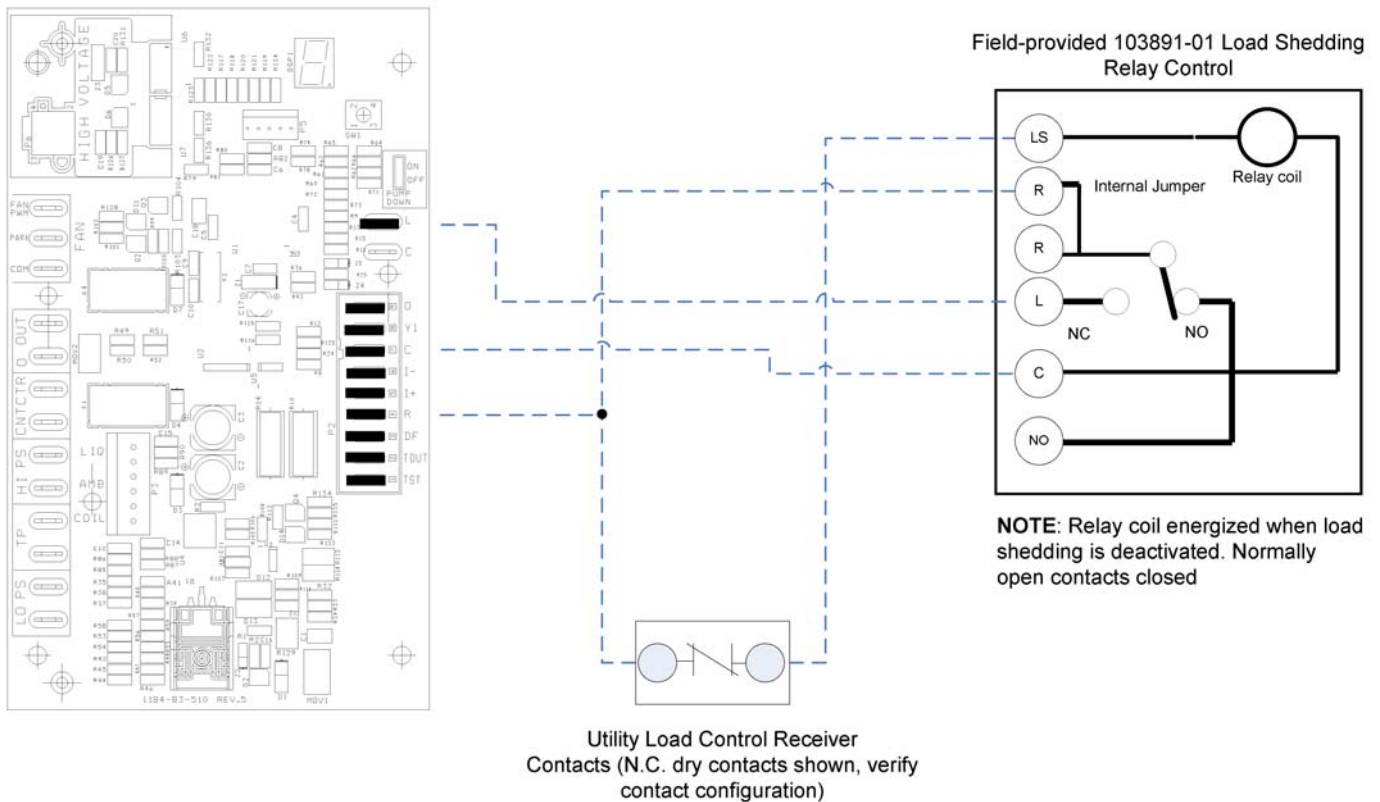


FIGURE 6

## Load Shedding Relay Kit (10M34), XC20, XP20, XC25 and XP25 using iComfort® Outdoor Control Part Number Series 103686 and connected to a iComfort® thermostat

1. The load shedding relay control receives 24VAC through **R** (24VAC) and **C** (COM) terminals from the outdoor control.
2. The load shedding relay control has a relay which switches 24VAC between **L** and **NO** terminals.
  - The **L** terminal is a normally **closed** contact of the relay which is connected to **L** terminal of the outdoor control.
  - The **NO** terminal is a normally **open** contact of the relay which is left unused in this application.
  - During normal operation, the load shedding relay control receives 24VAC to the **LS** terminal through the normally **closed** contacts of the utility box relay. The occurrence of a load shedding event will result in the utility box relay **opening** its normally **closed** contact.
  - The 24VAC power is removed from the **LS** terminal on the load shedding relay control when the utility box relay contacts open. This switches the load shedding relay from normally **open** contact (terminal **NO**) to normally **closed** contact (terminal **L**).
  - A 24VAC signal will appear on the terminal **L** indicating to the outdoor control that a load shedding event has occurred. The outdoor control will take the appropriate actions for a load shedding event, for example turning OFF the compressors and outdoor fan and display the **E600** status code on the outdoor control and iComfort® thermostat.

iComfort Outdoor Control Part Number Series  
103686-xx



**FIGURE 7**