



# TRANSDUCERS

## SEQUENCER CONTROL MODULE - FOUR STAGE MODEL UCS-421E

### DESCRIPTION

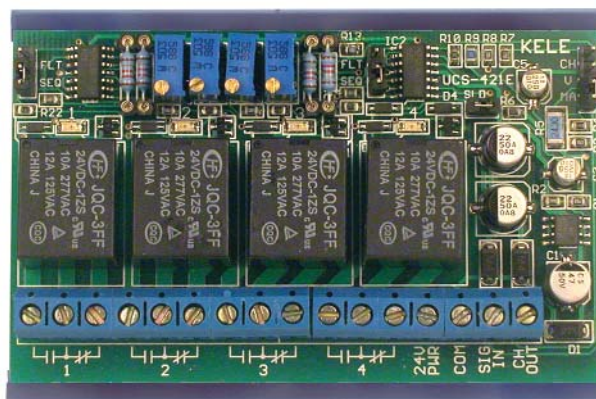
The **Model UCS-421E** is a solid-state device used for multistage control in HVAC systems, sequencing boilers or chillers. The **Model UCS-421E** can be used to obtain a digital output from a voltage or current producing sensor. Units may be daisy chained to provide additional stages of control, and a mounting track is supplied for easy installation.

### FEATURES

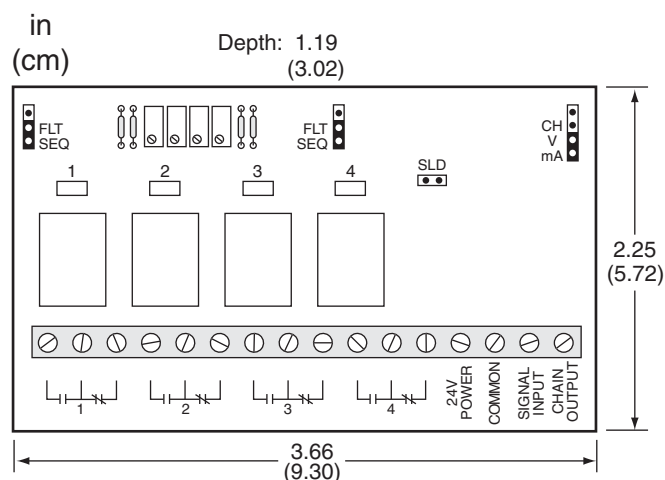
- **Four stages of relay control**
- **Voltage or current input**
- **24 VAC/VDC power**
- **LED indication of relay status**
- **Adjustable relay setpoints**
- **Adjustable relay differentials**
- **Loss of signal feature**
- **Snap-track mounted**

### OPERATION

The **Model UCS-421E** accepts a 0-20 mA or 0-15V input signal to produce a four-stage relay output. Each relay has a multi-turn potentiometer adjustment to set the pull-in point. Relays 1 and 4 can be jumper-selected to pull in on either a rise or fall in signal. Relays 2 and 3 always pull in on a signal rise. The **Model UCS-421E** considers an input signal below 1 mA or 0.75V to be a loss of signal, and all relays will de-energize if the SLD jumper is removed. If the SLD jumper is installed, the signal loss feature is disabled and the relays in the FLT mode will stay energized. Individual relay differential is easily adjusted by using different value plug-in differential resistors. Multiple UCS models can be daisy chained to operate additional stages from one input signal. A maximum of eight slave units can be daisy chained.



### DIMENSIONS



### SPECIFICATIONS

<b>Supply voltage</b>	24 VAC $\pm 10\%$ @ 160 mA (half-wave) 24 VDC $\pm 10\%$ @ 80 mA	<b>Operating temp</b>	32° to 158°F (0° to 70°C)
<b>Input signal</b>	0-20 mA or 0-15 VDC jumper selectable	<b>Humidity limit</b>	5% to 95% RH non-condensing
<b>Output</b>	Four SPDT relays	<b>Dimensions</b>	2.25"H x 3.66"W x 1.19"D (5.72 x 9.30 x 3.02 cm)
<b>Relay rating</b>	10A @ 120 VAC	<b>Weight</b>	0.55 lb (0.25 kg)
<b>Accuracy/Repeatability</b>	$\pm 1\%$	<b>Optional enclosure</b>	B7
<b>Setpoint adjustment</b>	25-turn potentiometers	<b>Relay differential</b>	0.5 mA or 0.375V (adjustable by plug-in differential resistors - see wiring on next page)
<b>Input impedance</b>	250 $\Omega$ (mA input), 49.7 k $\Omega$ (V input)	<b>Warranty</b>	1 year



### WIRING

Make all connections according to the diagram below or as shown on the job diagrams and in compliance with national and local codes. Make all connections with power removed. Failure to do so could result in circuit board damage. Use shielded #18-gauge cable for connections from the **UCS-421E** to the controller, shield grounded at the controller.

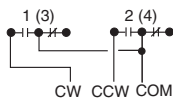
**TABLE 1. OTHER DIFFERENTIALS**

Other Differential Resistors can be used (customer-supplied):  
 9.1 kΩ = 0.25 mA or 0.1875V  
 36.5 kΩ = 1.0 mA or 0.75V  
 54.9 kΩ = 1.5 mA or 1.125V  
 73.2 kΩ = 2.0 mA or 1.5V

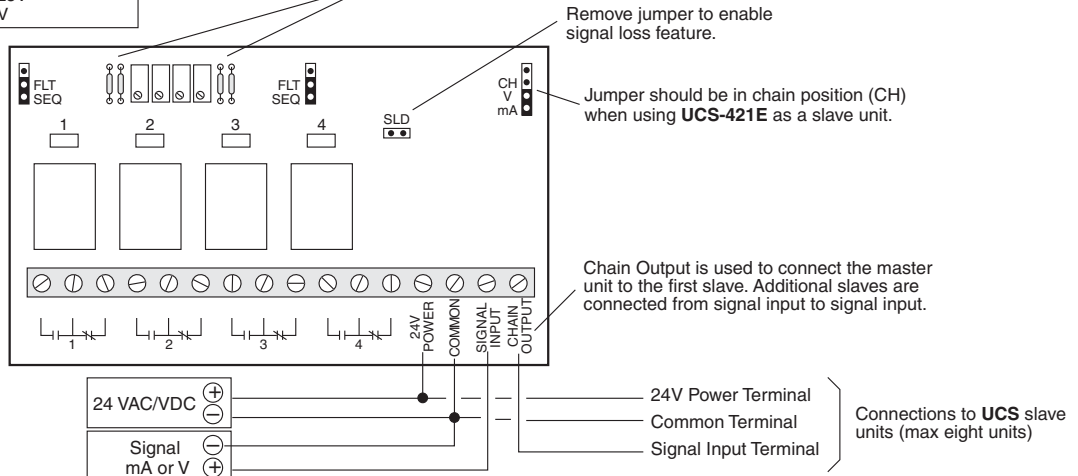
Plug-in Differential Resistors (1/4W, 1%)  
 18.2 kΩ = 0.5 mA or 0.375V (factory supplied)  
 See Table 1 for other differentials.

#### Factory Relay Settings

Relay 1: 5.3 mA, 4V  
 Relay 2: 6.6 mA, 5V  
 Relay 3: 8.0 mA, 6V  
 Relay 4: 9.3 mA, 7V



**Relay Contact Wiring for Floating/Tri-state Control** (set #1 mode Jumper in FLT position)



### SETUP / CALIBRATION

- Set jumpers to desired position as follows:  
**Mode jumpers** - In FLT position, Relays 1 and 4 energize on a decrease in signal. In the SEQ position, Relays 1 and 4 energize on an increase in signal. Relays 2 and 3 always energize on an increase in signal.  
**Input jumpers** - Select mA position for a 0-20 mA input or V position for a 0-15 VDC input. If the **UCS-421E** is used as a slave unit, place the bottle plug jumper in the chain position.
- Connect a meter in series with the SIGNAL INPUT terminal and the 0-20 mA (+) signal to read a current signal. To read a voltage input, connect across the COMMON (-) and SIGNAL INPUT(+) terminals.
- Adjust the input signal to the desired pull-in current or voltage for Relay 1.
- If Relay 1's LED is on, turn its setpoint adjustment clockwise (counterclockwise if Relay 1 has mode jumper in FLT position) until it de-energizes; otherwise, proceed to step 5.
- Adjust Relay 1 pull-in point by turning its setpoint adjustment counterclockwise (clockwise if Relay 1 has mode jumper in FLT position) until the relay energizes. (The potentiometers are 25-turn potentiometers.)
- Repeat steps 3, 4, and 5 for Relays 2, 3, and 4 using corresponding setpoint adjustments.
- When using a 0-20 mA input, the CHAIN OUTPUT produces a 0-12 VDC signal, which is proportional to the input signal. Connections should be made between CHAIN OUTPUT and COMMON. If a voltage input is used, the CHAIN OUTPUT is directly proportional to the input.

### ORDERING INFORMATION

MODEL	DESCRIPTION
UCS-421E	Sequencer control module - four relay outputs, field calibrated
UCS-421E-C	Sequencer control module - factory-set custom relay settings (Specify settings when ordering.)