



DESCRIPTION

The **Kele UCS-421E** is a solid-state device used for multistage control in HVAC systems, sequencing boilers or chillers, or floating/tri-state control of VAV boxes from a single analog signal. The **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 for easy installation.

FEATURES

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

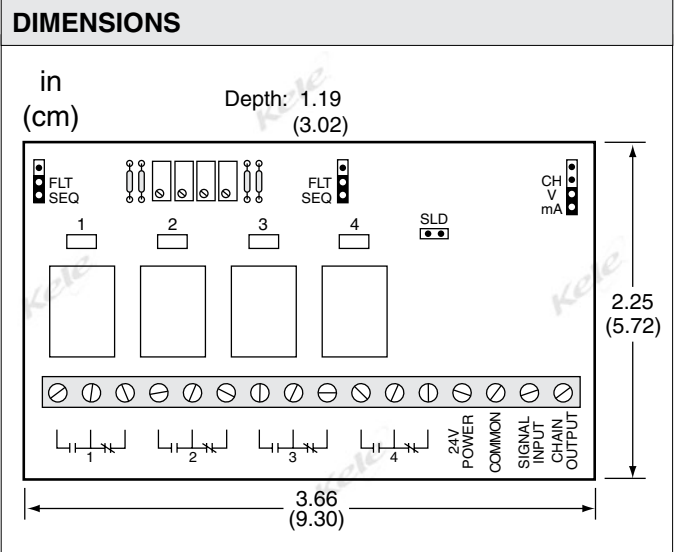


UCS-421E



OPERATION

The **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 **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.



SPECIFICATIONS	
Supply Voltage	24 VAC $\pm 10\%$, half-wave; or 24 VDC $\pm 10\%$
Supply Current	160 mA @ 24 VAC; 80 mA @ 24 VDC maximum
Accuracy	$\pm 1\%$
Input	0-20 mA or 0-15 VDC, jumper selectable
Input Impedance	250 Ω (mA input); 49.7 k Ω (VDC input)
Output	Four SPDT relays, adjustable via setpoint potentiometers
Relay Differential	Factory set at 0.5 mA or 0.375V, adjustable using plug-in resistors
Relay Output	10A @ 120 VAC
Wiring Terminations	Screw terminals
Operating Temperature	32° to 158°F (0° to 70°C)
Operating Humidity	5% to 95% RH (non-condensing)
Weight	0.6 lb (0.25 kg)
Approvals	RoHS
Warranty	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.

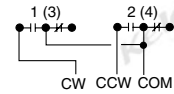
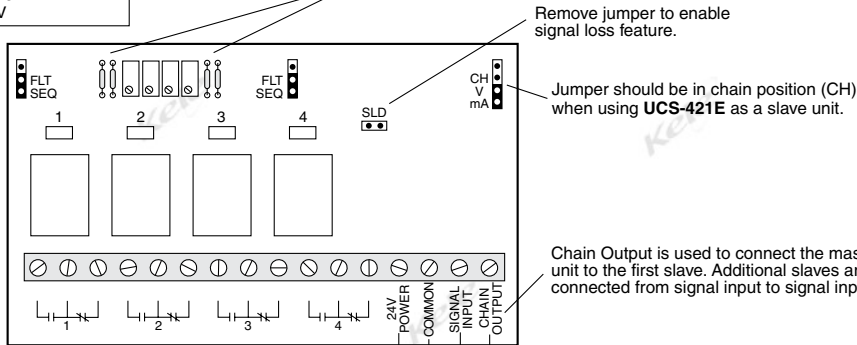
TABLE 1. OTHER DIFFERENTIALS

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

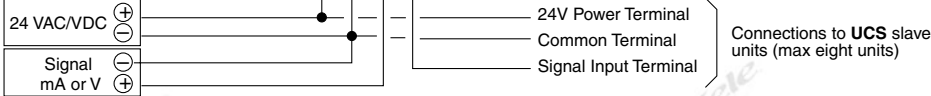
Plug-in Differential Resistors (1/4W, 1%)
 18.2 kΩ = 0.5 mA or 0.375V (factory supplied)
 See Table 1 for other differentials.

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 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
UCS-421E
UCS-421E-C

DESCRIPTION
 Sequencer control module, four relay outputs, field calibrated
 Sequencer control module, four relay outputs, pre-calibrated (specify settings when ordering)

B-7

RELATED PRODUCTS
 7"x5"x3" two-piece aluminum box with two 1/2" conduit knockouts