This document is intended as a reference guide for installing and using a BENDER CME420 AC current relay. This document includes installation, setup, and usage instructions. For complete details, including installation, setup, settings, and troubleshooting, refer to the CME420 user manual, document number TGH1400en. This document is intended as a supplement and not a replacement to the complete user manual.

Only qualified maintenance personnel shall operate or service this equipment. These instructions should not be viewed as sufficient for those who are not otherwise qualified to operate or service this equipment. This document is intended to provide accurate information only. No responsibility is assumed by BENDER for any consequences arising from use of this document.

Installation

Mounting
CME420 series devices may be DIN rail mounted, or screw mounted using the black clips located on the top and bottom of the device. Screw mounting requires an extra black clip (article number B98060008, sold separately).

Wiring - General
Refer to figure 1 for wiring the CME420. For systems less than 16 A, the device may be directly wired in series with the circuit, or utilize an external x/5 ratio current transformer. For systems greater than 16 A, an external x/5 ratio current transformer is required. Use minimum AWG 24, maximum AWG 12 size wire. Refer to CME420 series user manual for complete technical details.
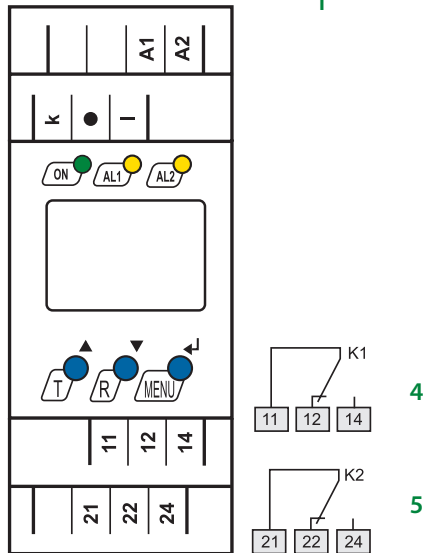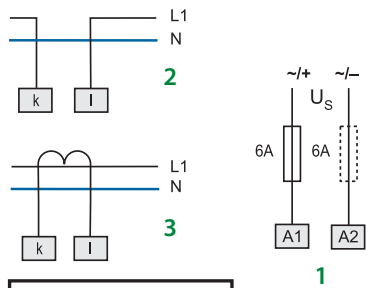
> ### ⚠ DANGER
>
> **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**
>
> • Disconnect all power before servicing.
> • Observe all local, state, and national codes, standards, and regulations.

Figure 1 - CME420 wiring diagram

1. External supply voltage; 5A fuse required for internal device protection
2. Direct system connection with no current transformer (less than 16 A)
3. System connection with current transformer
4. Alarm relay K1: SPDT contact
5. Alarm relay K2: SPDT contact

Wiring - Contacts
Using a normally closed or normally open contact utilizes two factors: wiring out of the proper terminal, and setting the respective contact to normally energized or deenergized operation. Refer to the chart below for relay conditions. For changing the energized state of the contact, refer to "Figure 7 - Contact operation" on the reverse side of this document.

The factory default for the CME420 is normally deenergized operation for relays K1 and K2.

Device Relay Conditions

| Relay Operation Setting	Device Alarm State	K1 STATE	K2 STATE
Normally deenergized mode (N/D) Non-failsafe mode "N/O" in device settings menu	Power ON, normal state (no alarms)	11-12 CLOSED 11-14 OPEN	21-22 CLOSED 21-24 OPEN
Energized in the alarm state	Power OFF	11-12 CLOSED 11-14 OPEN	21-22 CLOSED 21-24 OPEN
Relay will switch when the alarm is activated.	Power ON, alarm state	11-12 OPEN 11-14 CLOSED	21-22 OPEN 21-24 CLOSED
Normally energized mode (N/E) Failsafe mode "N/C" in device settings menu	Power ON, normal state (no alarms)	11-12 OPEN 11-14 CLOSED	21-22 OPEN 21-24 CLOSED
Energized in the normal state	Power OFF	11-12 CLOSED 11-14 OPEN	21-22 CLOSED 21-24 OPEN
Relay will switch when the alarm is activated, or when supply voltage to the device is lost.	Power ON, alarm state	11-12 CLOSED 11-14 OPEN	21-22 CLOSED 21-24 OPEN

Front Panel Display
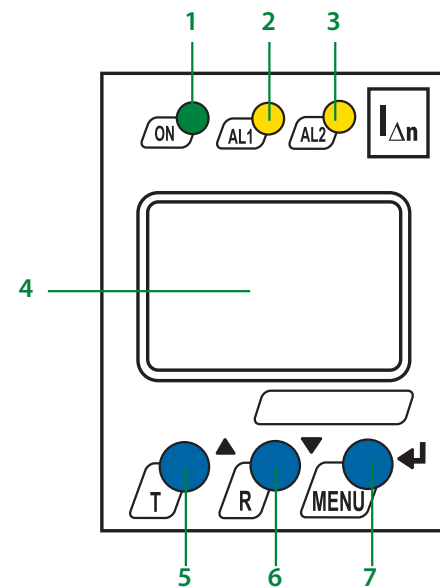
Figure 2 - CME420 front display

1. LED "ON" (green): Illuminates when power is applied to the device. Flashes when the CT connection alarm is active.
2. LED "AL1" (yellow): Illuminates when the prealarm is activated. Flashes when the CT connection alarm is active.
3. LED "AL2" (yellow): Illuminates when the main alarm is activated. Flashes when the CT connection alarm is active.
4. Backlit LCD display
5. TEST / UP button: Activates self-test / scrolls up inside main menu.
6. RESET / DOWN button: Resets device / scrolls down inside main menu.
7. MENU / ENTER button: Activates main menu / Confirms (momuntary push) or goes back a step (held > 1.5 s) inside main menu.

Dimensions
Dimensions in inches (mm).
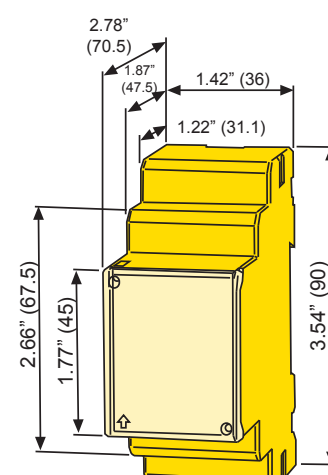
Menu Flow Chart for Common Settings
Figure 4 through figure 8 on the reverse side of this document contain flow charts for modifying commonly used features and settings in the CME420's main menu. Not all available features are listed in this document. For more information, consult the CME420 user manual.

Menu Legend

	DOWN ARROW button	< 1.5 s	Momuntary button push
	UP ARROW button	> 1.5 s	Hold button for at least 1.5 s, then release
	MENU / ENTER button		

Figure 4 - Setting alarm type and CT ratio (if used)

The recommended first step is to set the type of alarm that will be used. Set this option to "HI" for undercurrent, "LO" for undercurrent, or "In" for both.

If a current transformer is being used, the ratio must be changed as well, in order to be able to program correct values seen on the primary (no calculations are required when setting trip values after this step is completed). Note that while an X/5 ratio CT is required for use with this device, the ratio is entered in as if it were an X/1. For example, if a 50:5 CT is being used, enter a value of "10" for the CT ratio value.

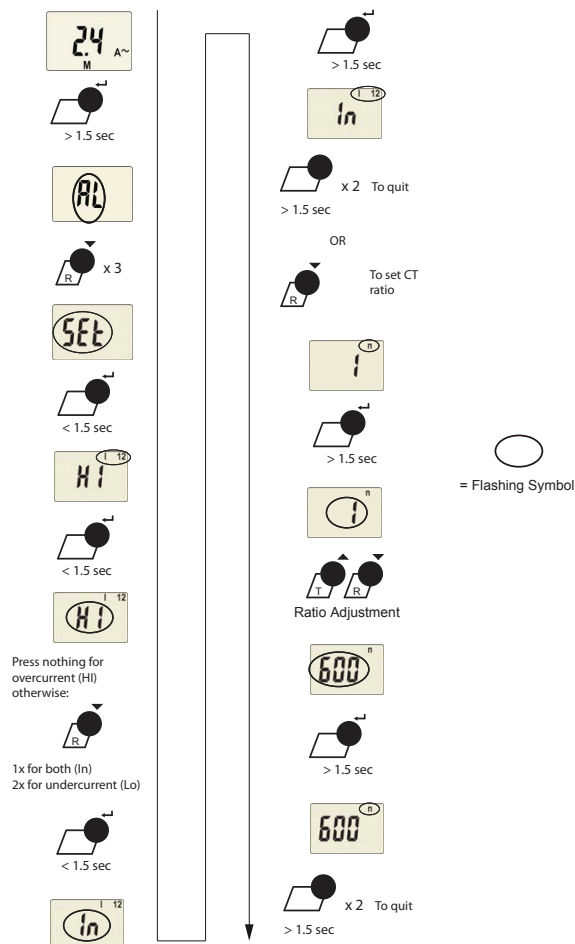If the device is being directly connected to the system, leave the ratio set to 1.

Figure 5 - Setting Alarm Values

The CME420 has two alarm values that may be set. Use the following guidelines for setting these numbers:

- **Using only overcurrent OR undercurrent:** Only one value is required. The value I_2 is the explicit alarm value that is set. The value I_1 is an optional prewarning that may be activated, which is a percentage value based on the previously set trip value.
- **Using both overcurrent AND undercurrent:** Both values are required. The value I_2 is the overcurrent value, entered as an explicit number. The value I_1 is the undercurrent value, entered as a percentage of the previously entered overcurrent value. EXAMPLE: For an overcurrent alarm of 20 A and an undercurrent alarm of 10 A, enter "20" for I_2, and enter "50%" for I_1.
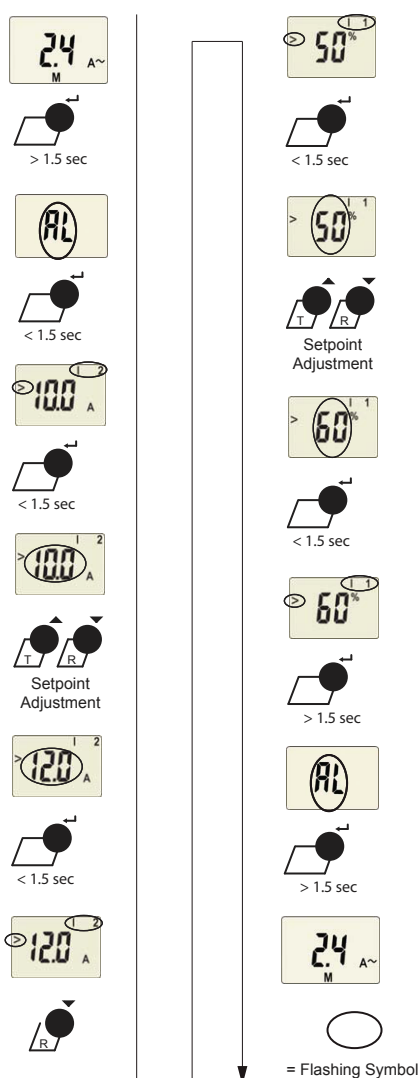

Figure 5 - Changing Time Delays

Four separate time delays are available:

- t_{on1} - Response delay, prewarning
- t_{on2} - Response delay, main alarm
- t - Startup delay
- t_{off} - Delay on release

Figure 6 - Latching behavior (fault memory)

Changing this setting to "ON" will cause the CME420 to latch in the event of an alarm, and require a manual reset if the alarm clears. Changing this setting to "OFF" will cause the CME420 to automatically reset if the alarm clears.

Figure 7 - Contact operation

Use this option to change the behavior of the contacts between normally deenergized (non-failsafe) mode and normally energized (failsafe) mode. The two SPDT contacts may be changed individually. Note that the CME420 labels normally deenergized operation as "N/O" and normally energized operation as "N/C"; utilizing a normally open or normally closed contact only depends on which contact output is wired.

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