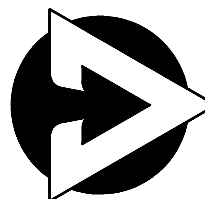


CONTROL CONCEPTS INC.

INSTRUCTION MANUAL MODEL 1039I

CURRENT OPTION CIRCUIT



CONTROL
CONCEPTS

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DESCRIPTION:

The 1039I Current Option Circuit attaches to the model 1039 controller, and provides the features of current limiting, over current trip, shorted SCR detection, and a means to provide auto/manual control.

OVERCURRENTTRIP:

The over current trip operates within one-half of an electrical cycle to prevent further operation of the SCRs, and it causes a relay to energize with form "C" contacts which may be used to remove system power and/or activate an alarm. The controller is reset by either removing the power from the system or by momentary closure of a switch connected between the terminal labeled reset, and the terminal labeled CCW on connector P2 on the 1039I Current Option Circuit. (See figure 3 on page 3.)

SHORTEDSCRDETECTION:

If an SCR fails as a short, allowing full power to be applied to the load, a relay with form "C" contacts is energized, which can be used to activate an alarm or cause system power to be removed. These contacts are accessible through connector P2 on the 1039I Current Option Circuit. (See figure 3 on page 3.)

CURRENTLIMITING:

The model 1039 can be factory configured to linearly control, with respect to a command signal, the RMS value of either the load voltage or the current applied to the load. With the addition of the 1039I Current Option Circuit, the current limit can be adjusted to prevent the load current from exceeding a preset value. This feature is useful for preventing excessive load current from occurring when variable impedance loads are used. (See figure 4 on page 4 for location of adjustments.)

AUTO/MANUALCONTROL:

The Current Option Circuit provides the means which allows the controller to be operated by a second, alternate input signal from a process controller such as: 0 to 5Vdc, 4 to 20mA, or by 1K potentiometer. Closure of a switch connected between the terminals labeled "SEL", and "CCW" of P2 on the 1039I Current Option Circuit board, switches the command control from the standard input on the 1039 controller board to the alternate input on the current option board. (See figure 1 & 2 on page 3.) This feature provides a convenient method of providing input signals for "RUN", and "IDLE" settings. In this situation, a control signal, such as 4/20 mA, 0 to 5Vdc or 1K potentiometer, would be connected to the command input on the 1039 main circuit card, and an alternate control signal would be connected to the command input on the 1039I Current Option Circuit. One command input could be used for the desired output for "RUN" conditions, and the other could be set for the desired output for "IDLE" conditions.

INSTALLATION:

The 1039I current option circuit, when ordered with the model 1039 controller will be shipped installed and calibrated. The sketches on page 3 show the connections that are made to the current option circuit. Note that any or all of the features may be utilized.

1039IUpgrade

If the 1039I circuit is ordered as an upgrade, it may be installed directly on a 1039 controller circuit.

To install the 1039I Current Option Circuit, move the P4 jumper on the 1039 board to the **OPT** position. See Fig. 9 on page 6 of the 1039 manual for location of this jumper. Remove the two screws holding the 1039 controller board onto the long metal standoffs, (do not remove the stand-offs) and replace them with the two 3/4 inch plastic circuit board supports provided with the 1039I Current Option Circuit. Place the receptacle P1 on the underside of the current option circuit onto the connector P1 on the 1039 controller board. Press the receptacle firmly onto the connector and make sure the board snaps fully down on the two plastic supports just installed. See page 2.

CALIBRATION:

The 1039I Current Option Circuit has been factory calibrated. It is not recommended that the adjustments be changed. If it becomes necessary, adjustments should be made as follows.

1. Span and zero:

The zero and span adjustments determine the output of the controller when the command signal is zero and the select switch on the 1039I Current Option Circuit is closed. Adjust the zero potentiometer to provide the desired output with a minimum command signal. Adjust the span with a 100% command to achieve the desired output. Note: it may be necessary to repeat these steps, due to interaction between the span and zero pots.

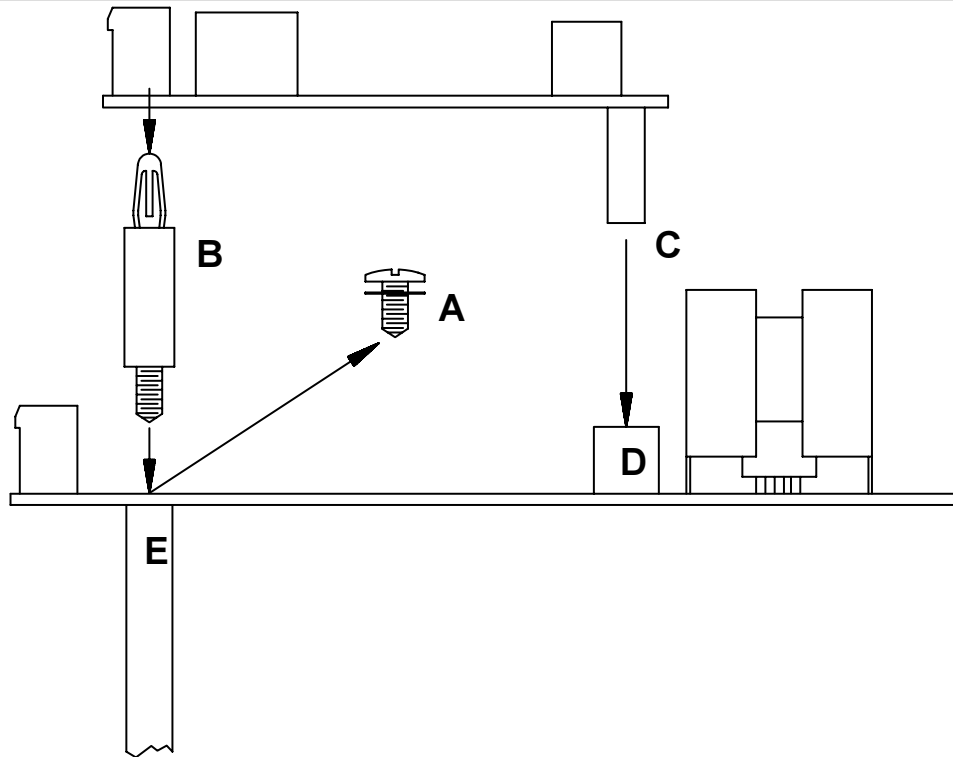
2. Current limit adjustment:

The current limit determines the maximum output current regardless of the whether voltage or current is controlled. Rotating the potentiometer clockwise increases the value at which the current is limited. Several techniques can be used to set the current limit. The first being to slowly increase the command signal until the desired load current occurs and then to adjust the current limit until the load current just starts to decrease. Another approach is to rotate the potentiometer full counterclockwise and apply 100% command signal then rotate the potentiometer clockwise until the desired load current is achieved.

3. Over current adjustment:

Rotating the overcurrent potentiometer counterclockwise lowers the current at which the overcurrent relay will operate. Note: power must be removed or the reset switch as shown in figure 3 on page 3 must be momentarily closed to reset the controller.

UPGRADE INSTALLATION:



TO INSTALL AN UPGRADE 1039I CURRENT OPTION BOARD IN THE FIELD.

Please read these instructions completely before proceeding.
(If any questions remain, please call the factory.)

1. Determine that power has been removed from the controller. (Turn power off at the disconnect and remove both line leads from the line 1 and line 2 terminals.)
2. On the main 1039 controller board; move the jumper on header **P4** to the **OPT** position. (See page 6 in the 1039 manual.)
P4-1 ☐ ☒ OPT
3. Remove 2 screws (**A**) and lockwashers that hold the 1039 board to the standoffs (**E**). Do not remove the standoffs.
4. Thread the plastic PC board mounts (**B**) through the 1039 controller board into the standoffs (**E**). Do not use the lockwashers removed in step 3.
The PC board mounts are provided with the 1039I upgrade kit.
5. Place the board so the mounting holes on the Current Option board rest on the PC board mounts and the connector (**C**) on the Current Option Board lines up with the receptacle (**D**) on the 1039 controller board.
6. Press the Current Option Board down on the PC board mounts (**B**) while applying downward pressure over the connector. Make sure the PC board mounts extend through the holes on the Current Option Board and that the board rests on the shoulders of the PC board mounts. Determine that the connector (**C**) is well seated in the receptacle (**D**).
7. Reattach the line 1 and line 2 leads and restore power to the controller.

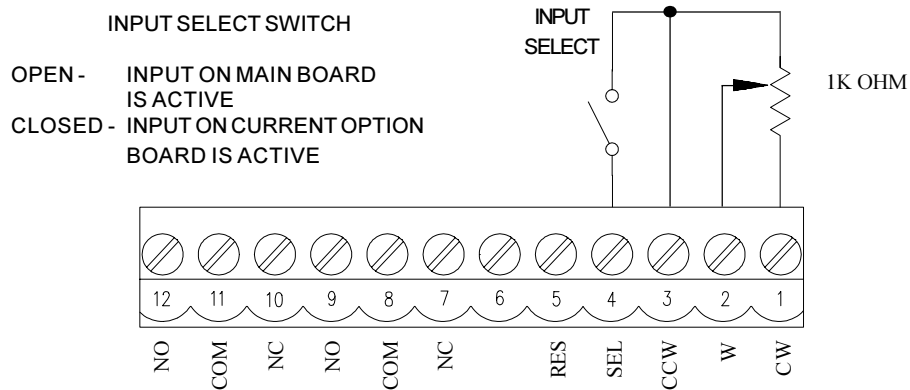


Figure 1. Current option board input connections with potentiometer command.

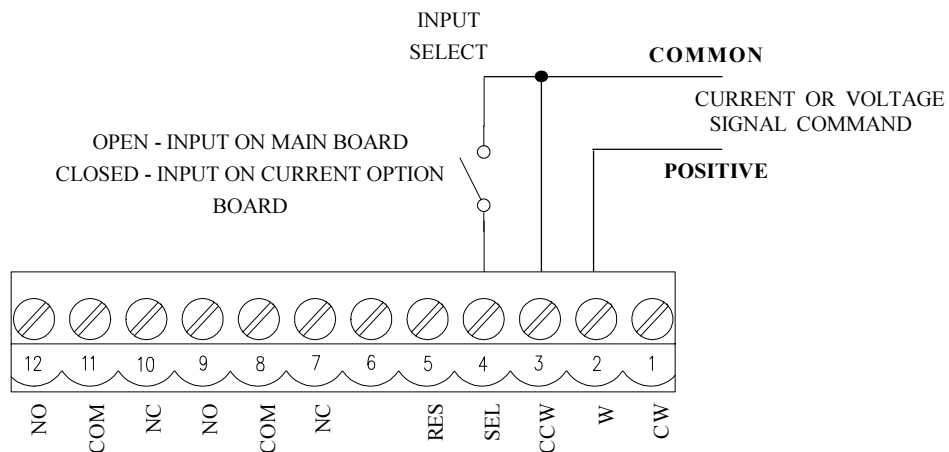


Figure 2. Current option board input connections with signal command.

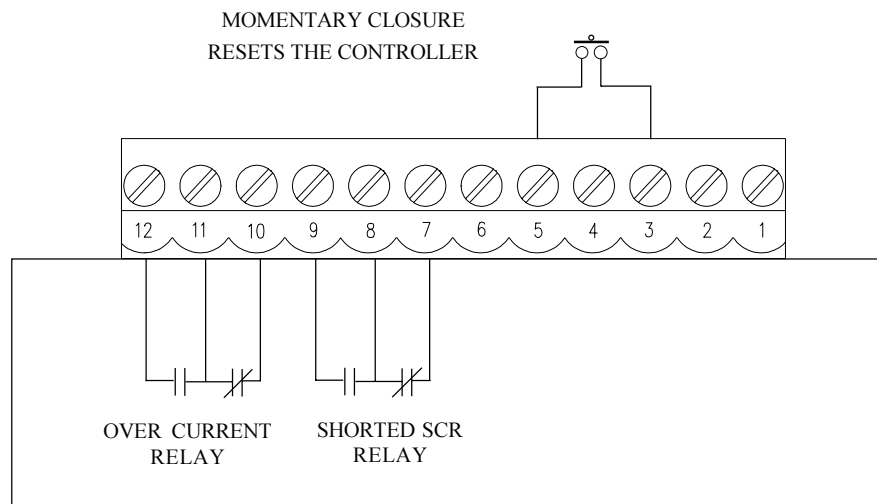
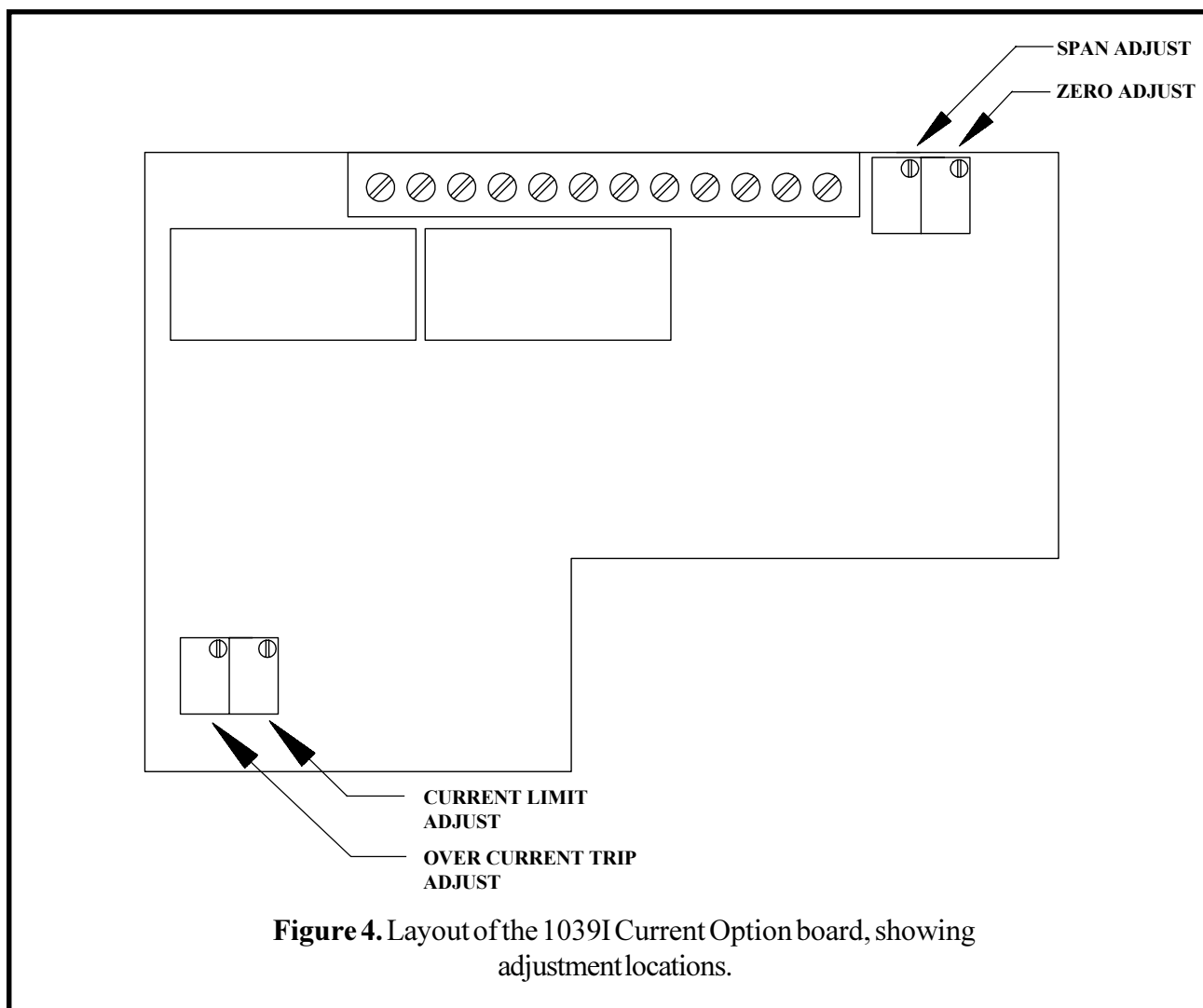


Figure 3. Over current and shorted SCR relays with reset.



MODEL NUMBER:

1039I-IL(XX)-(ACS)

1039I SPECIFIES CURRENT OPTION CIRCUIT WITH CURRENT LIMITING, SHORTED SCR DETECTION AND OVER CURRENT TRIP.

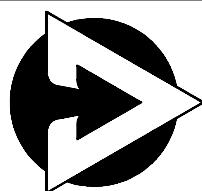
IL(XX) SPECIFIES RMS CURRENT (AMPS) AT WHICH LIMITING OCCURS. USEABLE FROM 20 TO 110%.

(ACS) SPECIFIES ALTERNATE COMMAND SIGNAL:
0/5Vdc, 4/20mA, POTENTIOMETER, ETC.

REFERENCE DRAWINGS:

D1000529A Schematic

MANUFACTURED BY:



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