

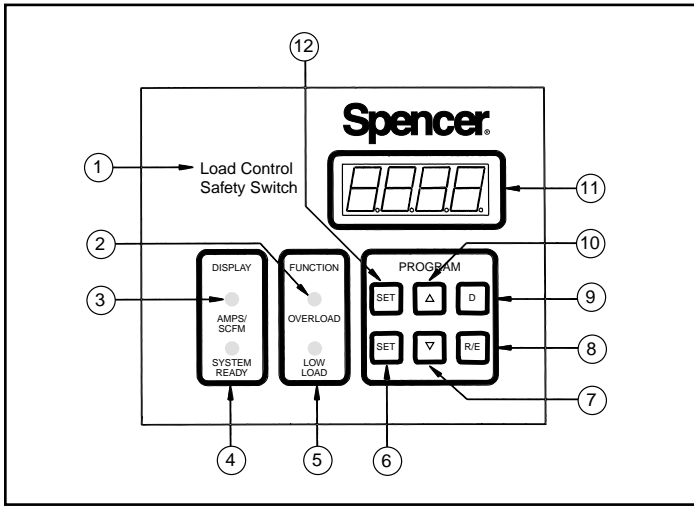
Spencer® Load Control Safety Switch

Operating Instructions



Important

Read and become familiar with this manual prior to uncrating and installing your Spencer equipment. This precision equipment is capable of extended service and lifespan. Realization of this potential can best be achieved through proper handling and adherence to the instructions detailed herein. Damage resulting from failure to follow correct procedures will void warranty.



1. Keypad Identifier
2. Overload LED
(OFF = Normal, Flash = Warning, ON = Shutdown)
3. Amps/SCFM Display LED
(OFF = Display reads SCFM, ON = Display reads Amps)
4. System Ready LED (OFF = Startup, ON = Enable)
5. Low Load LED
(OFF = Normal, Flash = Warning, ON = Shutdown)
6. Low Load "Set" Button
7. "Scroll Down" Button
8. Reset/Enter Set Points
9. Display Select Button
10. "Scroll Up" Button
11. 4-Digit Digital Display (7 Segment LED)
12. Overload "Set" Button

I. Overview

The *Load Control Safety Switch (LCSS)* will monitor the current load (amps) of a blower or vacuum producer to protect against low load or overload operation. The lower portion of the panel is divided into three categories: *Display*, *Function*, and *Program*. The *Display* group has an Amps/SCFM LED (Light Emitting Diode) that is linked to the 4-digit digital display (11) indicating the "units" of the numerical value being displayed. The *Display* group also has an LED indicator for *System Ready* that will illuminate to indicate that the start-up bypass time has expired and that the *LCSS* is providing machine protection. The *Function* group acts as a status indicator for alarm indication. Finally, the *Program* group contains push buttons that allow the user to interface with the controller.

The *LCSS* is programmed at Spencer with machine-specific data, allowing for more precise control of a machine and controller "matched set" configuration. The Amps/SCFM ratio will therefore be tailored to the blower or vacuum producer performance as determined by factory testing.

II. Applying Power

When power is applied to the *LCSS Universal Controller*, an initialization sequence takes place. The controller's 4-digit display will indicate: **8.8.8.8.** followed by **0000, 1111, 2222, 3333, 9999, SPENCER LCSS.** When the initialization sequence is complete, the *Amps/SCFM LED* (3) will light to indicate that the digital display is in the amps mode. The blower or vacuum producer may now be started by pressing the "start" button on the control panel. The *System Ready LED* (4) will flash for 5 seconds (the start-up time delay that is programmed at Spencer) and then remain lit, indicating that load control protection has been enabled for normal operation. When the motor starts, the motor current can be seen on the 4-digit digital display (11). By pressing the *Display button "D"* (9), the digital display may be changed from "Amps" to "SCFM" and vice versa.

Note: In SCFM mode, the "Amps/SCFM" LED (3) will be off.

III. Set Points

The *LCSS Universal Controller* has two set points, one for *Low Load* and one for *Overload*. Only the *Low Load* set point is field programmable. The *Overload* set point is programmed by Spencer at between 1 and 1.15 times the Full Load Amp (FLA) rating of the motor (depending on the service factor of the supplied motor).

Low Load:

The *Low Load* set point can be adjusted by pressing the lower *Set* button (6). The *Low Load LED* (5) will illuminate and the digital display (11) will show the *Low Load* set point in amps with the tenths digit flashing. To change the tenths digit in the set point, press the *Up* button (10) or the *Down* button (7). To change to the units digit, press the *Display button "D"* (9) and the units digit will flash. Now press the *Up* button (10) or the *Down* button (7) to change the set point. Pressing the "D" button (9) shifts the numerical place value to the left, allowing for a quicker change. To save the new set point and return to the Amps or SCFM Display (normal operation), press the *Reset/Enter "R/E"* button (8).

Overload:

The *Overload* set point can be viewed by pressing the upper *Set* button (12). The *Overload LED* (2) will illuminate and the digital display (11) will show the *Overload* set point in amps with all the digits flashing. To exit and return to the Amps display (normal operation), press the *Reset/Enter "R/E"* button (8).

Note: If either "Set" button is pressed and no operator intervention occurs for 30 seconds, the controller will switch back to normal operation. (The controller will revert to the last operating display: Amps or SCFM.)

IV. Alarm Status

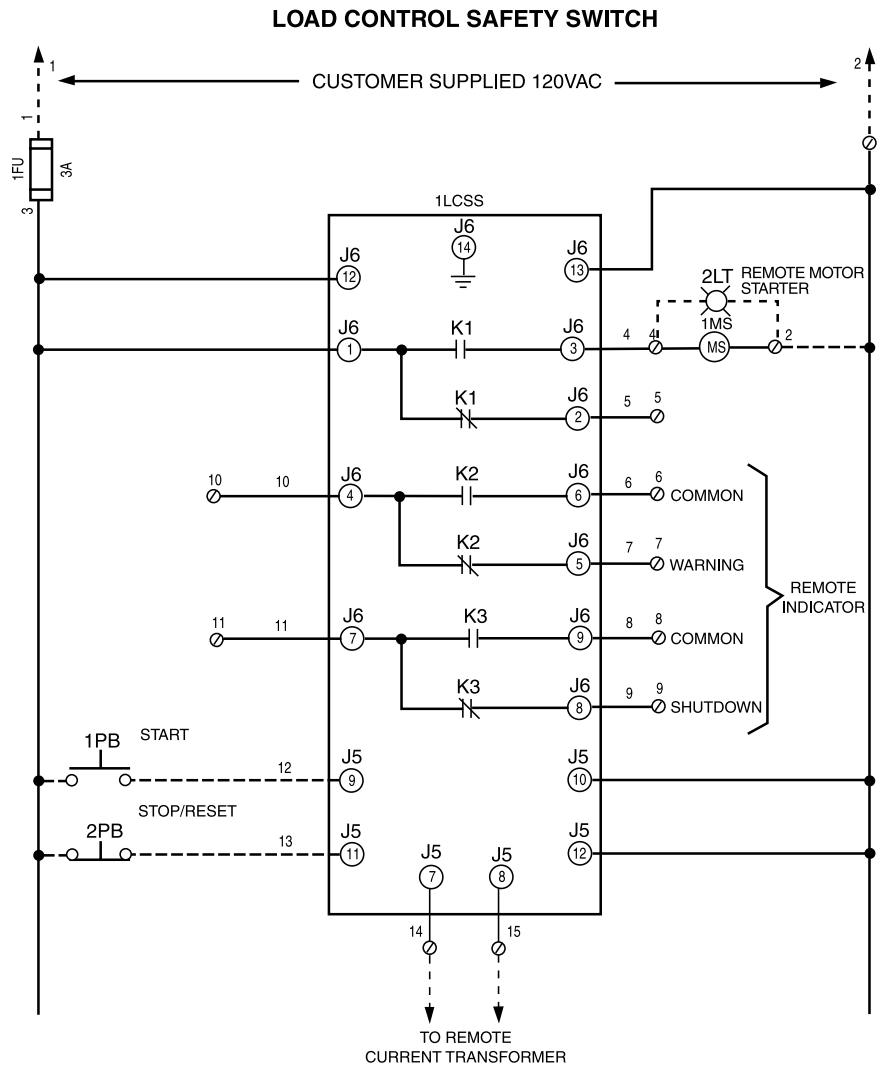
The LCSS Universal Controller provides both Low Load (surge) protection and Overload protection. These alarm conditions are displayed on the digital display (11) and in the "Function" group. Each mode of protection provides two tiers of alarm indication. The first tier is a *Warning*. When the machine is within 5 percent of either the Low Load set point or the Overload set point, the corresponding LED, *Low Load* (5) or *Overload* (2), will flash. The flashing LED is a visual indicator that the machine is close to the shutdown set point and precautionary measures should be taken. A common "Warning" relay (K3) will also be energized. The form "C" contact may be used for remote indication of "Warning" status.

The second tier is a *Shutdown*. In the *Shutdown* state, the corresponding alarm LED, *Low Load* (5) or *Overload* (2), will illuminate and the digital display (11) will show "L Ld" for Low Load or "O Ld" for Overload. The starter relay (K1) will also de-energize, shutting down the blower or vacuum producer. The common "Shutdown" relay (K2) will also energize. The form "C" contact may be used for remote indication of "Shutdown" status.

To clear any *Warning* or *Shutdown* alarm, the *Reset/Enter* "R/E" button (8) must be pressed for 5 seconds or the control panel "Stop/Reset" button must be pressed. The start button must then be pressed to restart the blower or vacuum producer.

Note: The "O Ld" display will flash if the motor current exceeds the Full Load Amp (FLA) rating of the motor that is programmed into the controller at Spencer.

V. Wiring Diagram



Note: Dotted lines indicate field wiring.

Specifications			
Dimensions (H x W x D)	Overall 5 ¹ / ₈ x 6 ⁷ / ₈ x 3	Cutout 4 ³ / ₄ x 5 ³ / ₄ x (n/a)	Part Number CTB 90007
Digital Display	7 Segment / LED 5/8 High	Display Amps / SCFM	
Power Supply	120/240 VAC, 1Ø, 50/60 Hz		
Inputs	Analog (1)	0-5A Current Transformer	
	Digital (2)	120 VAC (Enable, Reset)	
Outputs	(3) Provided Rated @: 5 A General Purpose, 250 VAC; 1/8 HP 120 VAC, 2A Pilot Duty, 120 VAC	Overload Shutdown, Low Load Shutdown, Common Warning Alarm	
Nema Ratings	1, 12, 4	Note: N-1, 12 and 4, Indoor Only	
Agency Approvals	UL 873	File #E151368, 97ME50259, DD/215K	
	CUL	CAN/CSA 22.2, No. 24-93	



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