

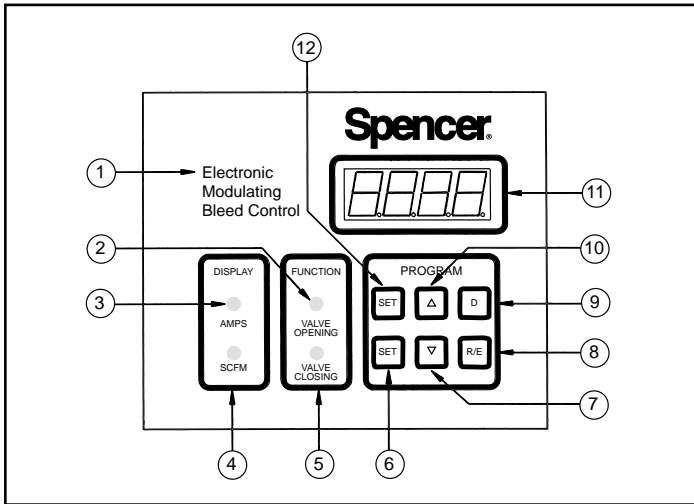
Spencer® Electronic Modulating Bleed Control

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. Valve Opening LED
(OFF = @ Rest, ON = Valve Opening)
3. Amps Display LED (ON = AMPS)
4. SCFM Display LED (ON = SCFM)
5. Valve Closing LED
(OFF = @ Rest, ON = Valve Closing)
6. Valve Closing "Set" Button
7. "Scroll Down" Button
8. Reset/Enter Set Points
9. Alternate Display Button
10. "Scroll Up" Button
11. 4-Digit Digital Display (7 Segment LED)
12. Valve Opening "Set" Button

I. Overview

The *Electronic Modulating Bleed Control (EMBC)* will monitor the current load of a blower or vacuum producer and open a bleed valve to prevent the machine from operating in a surge condition. It will also close the bleed valve when there is sufficient system load for normal operation. The lower portion of the panel is divided into three categories: *Display*, *Function*, and *Program*. The *Display* group is linked to the 4-digit digital display (11), indicating the "units" of the numerical value being displayed, either Amps or SCFM. The *Function* group acts as a status indicator for valve positioning control. Finally, the *Program* group contains push buttons that allow the user to interface with the controller.

The *EMBC* is programmed at Spencer with machine-specific data, allowing for more precise control in 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 EMBC, 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 EnBC.** When the initialization sequence is complete, the *Amps* LED (Light Emitting Diode) (3) will light to indicate that the digital display is in the amps mode. The *Valve Closing* LED (5) will also illuminate, indicating that the valve is being closed. The *Valve Closing* LED will remain lit for 15 seconds and the controller valve close output relay will remain energized for 15 seconds to allow the valve actuator to fully close the bleed valve. **Note: The bleed valve should be fully closed before starting the blower/vacuum producer.**

When the initialization sequence has been completed, pressing the "start" push button on the control panel will start the blower or vacuum producer. As the motor gains speed, 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.

III. Set Points

The EMBC Universal Controller has two fully programmable set points. These set points are for Bleed Valve open (minimum flow prior to surge) and Bleed Valve close (minimum flow to close the bleed valve without causing the valve to immediately reopen). If the machine is operating in the region between the two set points, the valve will idle in a partially open state until the load changes, prompting the valve to open for additional load or to close to avoid unnecessary load on the motor.

Valve Open (avoid surge):

The valve opening set point can be adjusted by pressing the upper *Set* button (12). The *Valve Opening* LED (2) will illuminate and the digital display (11) will show the Valve Open 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). 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 Display (normal operation), press the *Reset/Enter* key "R/E" button (8). This key **must** be pressed to exit the "Set" mode.

Valve Close (avoid unnecessary system output):

The valve closing set point can be adjusted by pressing the lower *Set* button (6). The *Valve Closing* LED (5) will illuminate and the digital display (11) will show the Valve Close 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). 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 Display (normal operation), press the *Reset/Enter* "R/E" button (8). This key **must** be pressed to exit the "Set" mode.

Note: If either "Set" button is pressed and no further 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.)

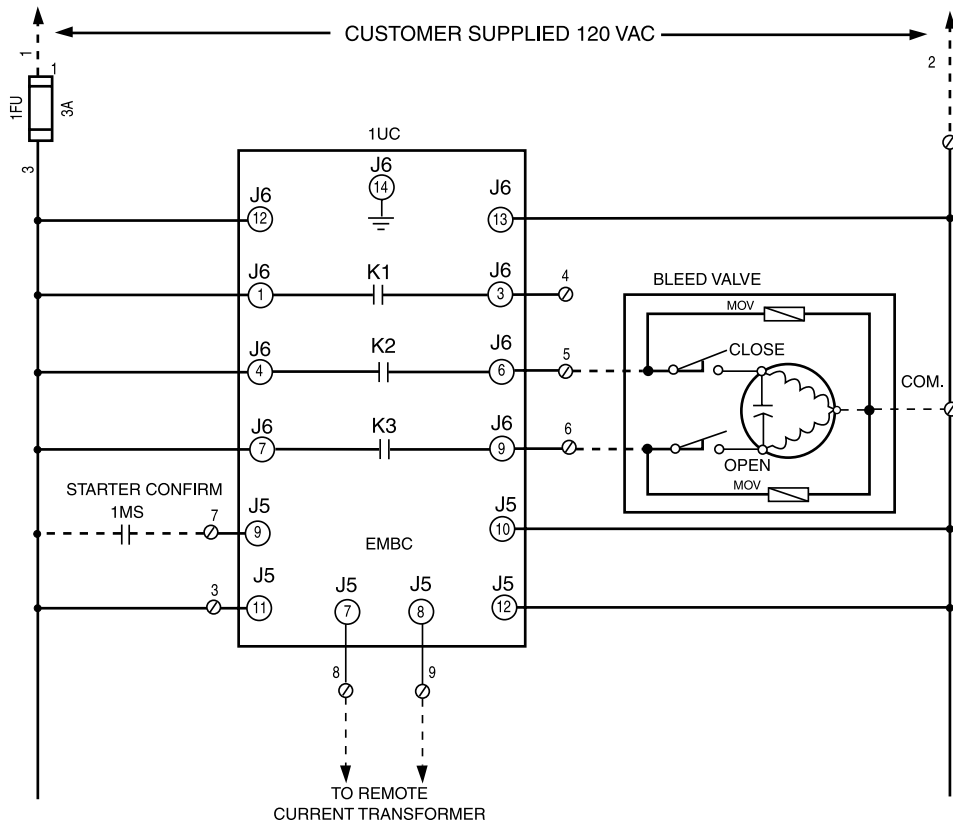
IV. Manual Override

The EMBC has a manual override that allows the user to manually open and close the bleed valve. Use the manual override to identify the minimum flow set point to avoid surge and the minimum flow set point necessary to close the valve without causing "hunting" of the valve. To enter the manual mode, press both the *Up* button (10) and the *Down* button (7) simultaneously. Both the *Amps LED* (3) and the *SCFM LED* (4) will flash. The *digital display* (11) will show motor amps only. Now press the *Up* button (10) to manually open the valve or the *Down* button (7) to manually close the valve. The corresponding valve LED will illuminate. To exit the manual mode, press the *Reset/Enter "R/E"* button (8). The last display mode will then appear (Amps or SCFM). **Note: If no operator control is initiated for 30 seconds, the control will revert to automatic.**

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V. Wiring Diagram

ELECTRONIC MODULATING BLEED CONTROL



Note: Dotted lines indicate field wiring.

Specifications			
Dimensions (H x W x D)	Overall 5 ¹ / ₈ x 6 ¹ / ₈ x 3	Cutout 4 ³ / ₄ x 5 ³ / ₄ x (n/a)	Part Number CTB 90008
Digital Display	7 Segment / LED 5 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	(2) Provided Rated @: 5 A General Purpose, 250 VAC; 1 ¹ / ₆ HP 120 VAC, 2A Pilot Duty, 120 VAC	Valve Open Valve Close	
Nema Ratings	1, 12, 4, 4X	Note: N-12, 4 and 4X, Indoor Only	
Agency Approvals	UL 873	File #E151368, 97ME50259, DD/215K	
	CUL	CAN/CSA 22.2, No. 24-93	



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