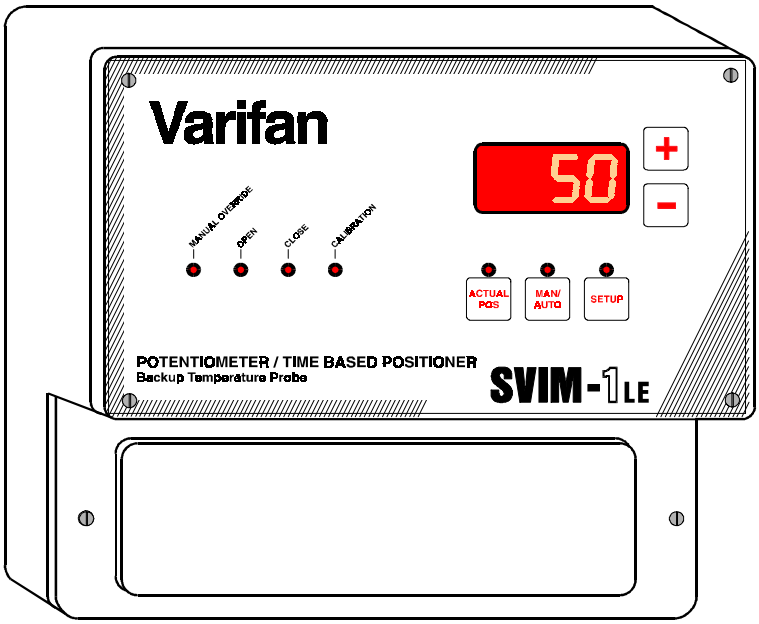
SVIM-1LE

User's Manual



Although the manufacturer has made every effort to ensure the accuracy of the information contained herein, this document is subject to change without notice due to ongoing product development.

WARNING AND PRECAUTIONS

Equipment, probe failure, blown fuses and/or tripped breakers may prove harmful to the contents of the building. Therefore it is strongly recommended to install backup devices and alarm or warning devices. Spare equipment should also be available at the owner's site. Equipment manufactured by the manufacturer is protected against normal line surges. High surges caused by thunder storms or power supply equipment may damage this equipment. For added security against line voltage surges it is recommended that surge and noise suppression devices be installed at the electrical distribution panel. Use of shielded cable for probes is recommended for protection against lightning. These devices are available from most electrical supply distributors.

RECOMMENDATIONS

The manufacturer recommends that all installation procedures described herein be performed by a qualified electrician or installation technician. Further more the manufacturer recommends to test all the functions and equipment connected to the SVIM-1LE, including the alarm system and backup devices, after installation, after changes to the installation and every month after that.

Fuse verification and replacement, as well as the proper setting of control values remain the responsibility of the owner of this equipment.

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1. GENERAL

This document provides you the necessary information to install and operate the SVIM-1LE. The document is presented as follows:

- Introduction
- Installation
- User's Guide
- Appendix

1.1 DESCRIPTION

The SVIM-1LE is a positioner which controls motorized air inlets. The SVIM-1LE is connected to a master control either a SVC or an IC (configurable control). With the commands sent by the SVC or IC, the SVIM-1LE is able to position an air inlet according to the ventilation requested.

The SVIM-1LE can control two different types of air inlet actuators: with or without feedback potentiometer.

- With feedback potentiometer: The positioning is controlled by the feedback potentiometer which delivers a more precise positioning.
- Curtain time positioning (time mode): This method is used when the air inlet system does not have a feedback potentiometer. The time mode positioning uses the the travelling time of the curtain to evaluate its position.

Calibration

The SVIM-1LE has a calibration function very simple to use. The calibration allows the unit to establish its own position references during installation.

User's Settings

The SVIM-1LE is easy to use; most settings are automatically set by the master control (SVC or IC). However, the user can also adjust some settings, in order to adapt the SVIM-1LE functioning to particular needs of an application. With the 4 digit LED display, the SVIM-1LE keeps you informed of its status, it also

allows to be aware of the system general status and error messages, if it happens.

Security

The SVIM-1LE has several security features. In case it loses communication with the master control, the SVIM-1LE is able to operate autonomously the air inlet by using his own temperature probe or by positioning itself to a preprogrammed position.

The SVIM-1LE is also able to detect problems associated with irregular feedback from a problematic potentiometer. If it happens the SVIM-1LE switches to time mode, thus allowing normal operation until the problem is solved.

The time mode feature offers a curtain re-positioning function. This feature will ensure dependable long term actuator precision even in the absence of a feedback potentiometer.

Temperature Probe

The SVIM-1LE temperature probe can be installed in two different ways:

- Inside probe: With inside temperature probe the SVIM-1LE is able to command the air inlet, according to the room temperature, in case the master control loses power or fails.
- When using an IC (intelligent control) in conjunction with the SVIM always use the inside probe configuration (use only the Inside probe option).
- Outside probe: For applications without feedback potentiometer, the outside probe is used to ensure that the air inlet re-positioning will not be done if the outside temperature exceed a certain temperature limit.

2.1 UNPACKING

Unpack the SVIM-1LE from its box and inspect contents for damages. Should the contents appear to be damaged, contact your distributor for return procedures.

The package should contain the following standard items:

- 1 SVIM-1LE module
- 2 fuses
- 1 temperature probe (part # 2004-5k/sv)
- 1 user's manual

The manufacturer recommends that the following installation instructions be observed very carefully, and that all the work be performed by a certified electrician. Failure to comply may void the warranty!

To limit the unit's exposure to noxious gases install it in a hallway.

Make sure the unit is properly installed, that is, side up with the cable entry holes facing down.

The SVIM-1LE will operate in a temperature range of 32°F to 120°F (0°C to 50°C).

The enclosure is watertight, it is not splash-proof or immersion-proof. DO NOT USE PRESSURIZED WATER on the control. Cover it carefully with plastic before cleaning the room. Also, DO NOT drill additional holes in the enclosure.

Install in an area protected from sunlight.

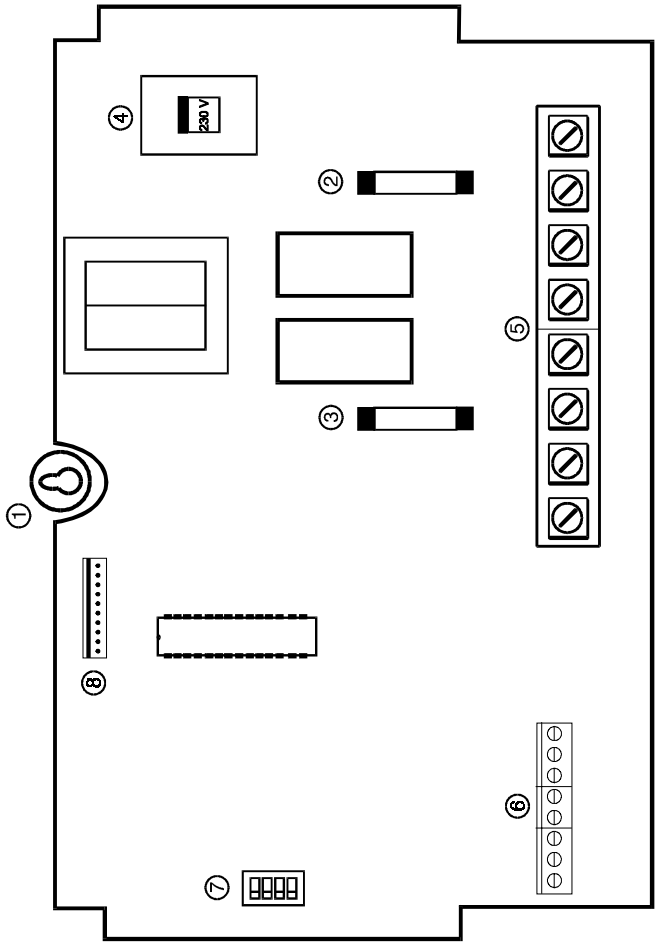
It is prohibited to use overhead cables outside the building.

2.2 INSTALLATION

- Use a screwdriver to remove the faceplate and the power compartment's cover.
- Once both faceplates are off, install the mounting screw on the wall and install the unit on it.
- Secure the SVIM-1LE in place using the bottom mounting holes.

Mounting hardware is not included with the unit.

Fig.1 SVIM-1LE Main Board View



1. Mounting hole
2. 0.125A slow blow fuse
3. 5A slow blow fuse
4. Line voltage selector switch
5. Power source terminal
6. Input terminal
7. Mini-DIP switch
8. Flat cable connector

2.3 CONNECTION PROCEDURE

2.3.1 Cabling

Use a screwdriver to remove cable knock-outs for the installation of cabling to the control panel.

Do not apply power to the control panel until all connections have been completed. The current draw of the load should be in the range of 100mA to 5A when it is activated. Set the voltage switch inside the SVIM-1 to the correct value before power up.

2.3.2 Connecting a Unit

Refer to figure 2 for standard actuators, to figure 3 for actuators using a Hired Hand switch box (PVR-2) or to figure 4 for a 3 phase actuator.

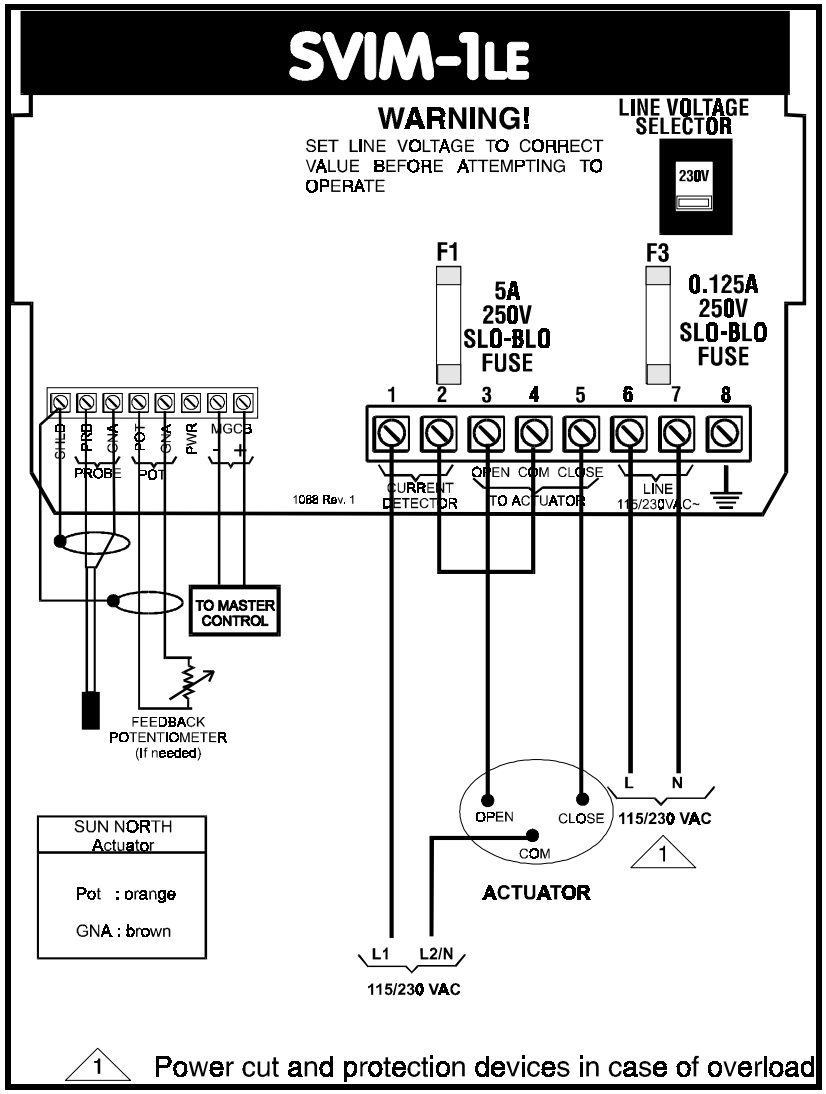
A temperature probe can be outside the building (see sections 2.4.2 and 3.2.3.6).

Note: It is recommended to use the actuator on the longest travel time possible to obtain maximum accuracy in the curtain's positioning.

Some actuators have a maximum functioning time. The calibration must be done within the maximum time, in order to avoid overheating motors. ***(Also see 3.2.3.12, page26)***

The maximum actuator travel time (opening or closing) must not exceed 45 minutes.

Fig.2 SVIM-1LE Wiring Diagram



CAUTION: It is recommended to use an air inlet system where the motor is able to work without overheating.

Remember that a bad connection of the cables / pulley between the actuator and the curtain influences the accuracy of the curtain's positioning.

2.3.3 Connecting to the Master Control

- Install a #22 AWG shielded cable between the SVIM-1LE and the master control. The cable can extend to a maximum length of 750 ft (230M).
- Connect one end of the cable to the (+) and (-) terminals of the SVIM-1LE low voltage terminal block. Refer to figures 1 (6) and 2.

ACTUATOR CONNECTION

Note : the wire connecting the SVIM-1/24LE and the actuator can not be longer than 200 ft (60M) and must have a minimum capacity of AWG # 16. It is also recommended to select the better wire depending on the installation. For example, when the distance is too long or the actuator has a strong current, you need to use a bigger conductor, in order to avoid voltage drops.

2.3.4 Connecting to a Feedback Potentiometer

If a feedback potentiometer is used:

- Connect the two potentiometer wires to the SVIM-1LE two terminals indicated as POT on the left hand terminal. Refer to figures 1 (6) and 2.
- Connect the common potentiometer wire to the terminal GNA.
- Connect the other wire to the terminal POT.

Note: The potentiometer's resistance value must increase when the air inlet opens.

2.4 SWITCH SETTINGS

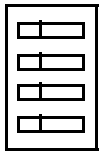
2.4.1 Line Voltage Selector Switch Refer to Figure 1 (4).

This switch is located on the surface of the main (bottom) board and adapts the control panel for 115VAC or 230 VAC line voltage.

230V
115V

2.4.2 Software Setting DIP Switches Refer to Figure 1 (7)

These switches are located on the bottom main board and adjust the following options:



OFF	ON
Time	Potentiometer
ID=1	ID=2
Inside	Outside
SVC	IC

Switch 1: Set to ON if a feedback potentiometer is used.

Switch 2: Channel selector: **When 2 SVIMs must be used on the same configurable control port (with the appropriate configurations), each #2 dipswitch must be set at different positions.**

Switch 3: Determines the SVIM-1LE's temperature probe location.

Inside probe: The SVIM-1LE is able to control the curtains or shutters positioning according to the inside temperature in normal or in backup mode.

Outside probe: Allows to delay the auto-calibration cycle if the outside temperature exceeds the limit set in parameter CLd.t. or Hot.t. This parameter only appears when time mode is selected (no feedback potentiometer).

Switch 4: Selects the appropriate operating parameters according to the master control (SVC or IC).

2.5 POWERING UP AND CALIBRATION

Before powering up the SVIM-1LE, attach the faceplates to the casing of the control panel using the screws previously removed.

The SVIM-1LE has to be calibrated the first time it is started. This calibration enables the SVIM-1LE to evaluate the maximum and minimum positions of the curtain / inlet. Two-step initial calibration:

Step 1: Press the SETUP button until CAL flashes on the display.
Step 2: Press the [+] and [−] buttons simultaneously. At this point, the Calibration LED turns on and the calibration process, consisting in the 8 following operations, begins:

1 Inlet closes completely to set minimum position
2 Inlet opens completely to set maximum position
3 Cooling delay PAUS (if activated)
4 Inlet closes once again
5 Cooling delay PAUS (if activated)
6 Inlet opens in steps
7 Cooling delay PAUS (if activated)
8 Inlet closes in steps

Once the process is successfully completed, the SVIM-1LE is ready for normal operation. It is possible to interrupt the calibration cycle by repeating steps 1 & 2.

To test the unit independently from the master control, set the SVIM-1LE to **MANUAL** mode (see section 3.2.2 in the user's guide). Then press the adjustment buttons to open or close the air inlet. If the air inlet does not move or an error message appears, refer to the Troubleshooting section in the appendix of this document.

CONTINUATION ...

How to calculate the calibration:
Calculate the time needed by the actuator to completely open (in minutes) and complete the following calculation:

(Opening time x 4) _____minutes

+ (Parameter PAUS setting time delay x 3)
+_____minutes

= Calibration total time =_____minutes

Fig. 3. Connection of actuator motor with HIRED HAND (PVR-2) switch box.

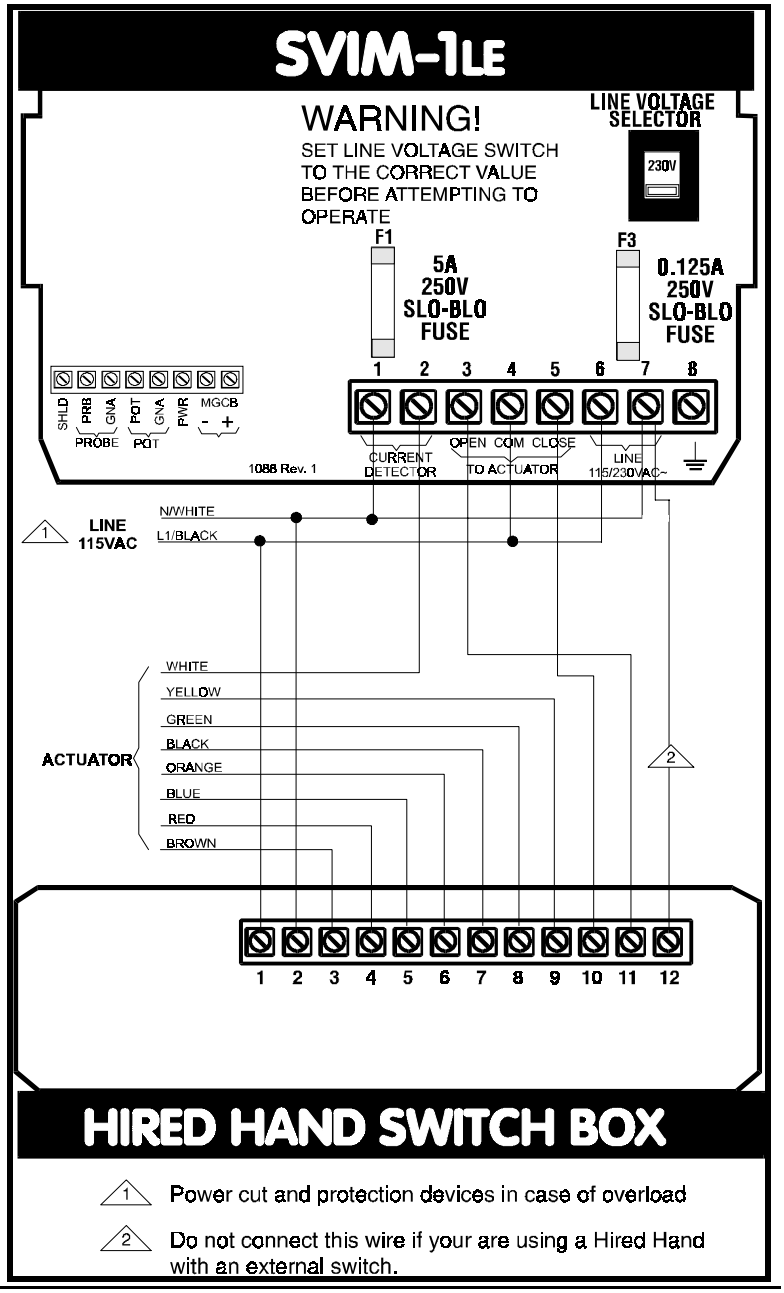
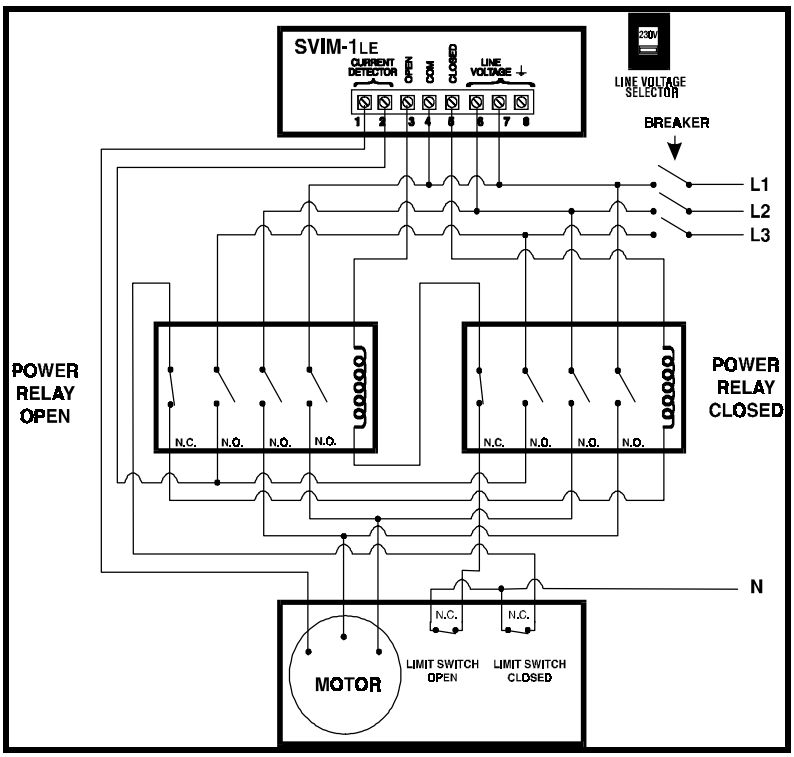


Fig. 4 Connection of actuator motor with a 3 phase motor



CHAPTER 3

USER'S GUIDE

3.1 FACEPLATE

The SVIM-1LE's faceplate (refer to figure 5) has 4 LED indicators, 3 selection buttons, 2 adjustment buttons and a 4-digit LED status window. Below is a brief description of those features:

3.1.1 LED Indicators Refer to figure 5 (2,3,4)
On the left-hand side of the faceplate are four LED indicators showing four different modes:
1. MANUAL OVERRIDE: indicates a manual mode operation.
2. OPEN: indicates an activated open relay.
3. CLOSE: indicates an activated close relay.
4. CALIBRATION: indicates a currently running calibration cycle.

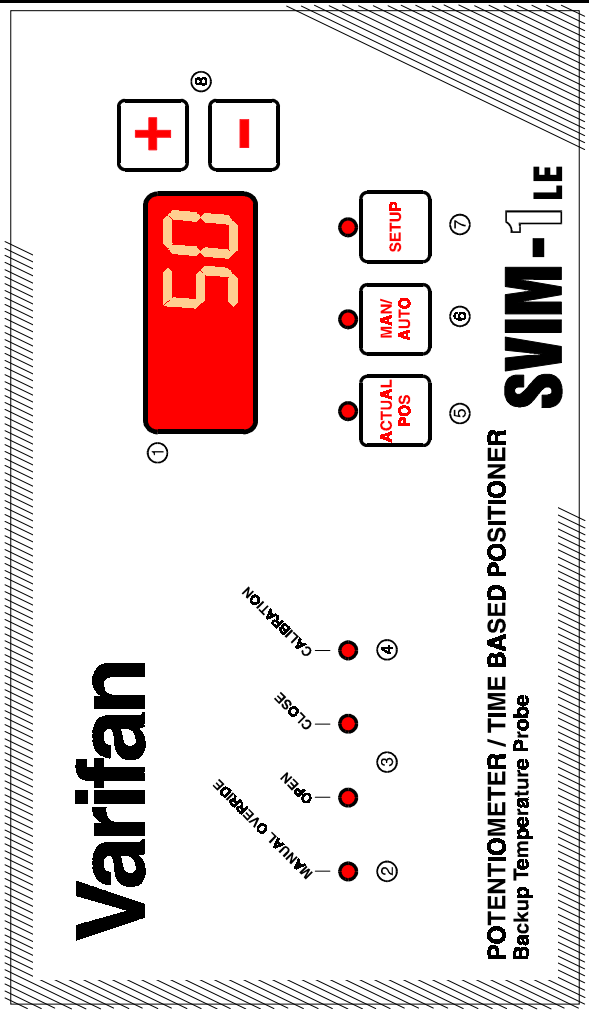
If the LED OPEN or CLOSE are blinking, it means the SVIM-1LE is requesting for movement, but it has to wait the end of the delay before moving the air inlet.

3.1.2 Selection Buttons Refer to figure 5 (5,6,7)
Parameters are selected with 3 selection buttons located beneath the LED display. Details and examples will follow in subsequent sections. Each button has its own LED indicator to confirm activation.

3.1.3 LED Status Window Refer to figure 5 (1)
The LED status window features a 4 digit LED readout display of the actual position, temperature in °C or °F, and programmable settings. After a setting is selected, its value appears on the LED display. If the value is flashing, it can be changed with [+] the and [−] buttons.

3.1.4 Adjustment Buttons ([+] and [−]) Refer to figure 5 (8)
The adjustment buttons appear with a [+] and [−] sign on them. They are used to increase or decrease the value on the LED window. Press the button once and release it to increase or decrease the value by one increment. The value may be changed quickly by keeping your finger on either button.

Fig. 5 SVIM-1LE faceplate



1.LED display
2.Manual override LED
3.Open and close LED
4.Calibration LED
5.Actual position button
6.Manual/auto button
7.Setup button
8.Adjustment buttons

3.2 PARAMETERS

The current section gives a description of the SVIM-1LE parameters and how to operate them.

3.2.1 ACTUAL POS Refer to figure 5 (5)

The Actual Position parameter makes it possible for users to know the exact curtain position (CLO, 1, 2..., 99, OPEN). When the SVIM-1LE is in a calibration cycle, the message CAL is displayed.

3.2.2 MAN / AUTO Refer to figure 5 (6)

The Manual / Automatic parameter enables users to switch the SVIM-1LE from automatic to manual mode. The following examples show the functions of this button in various modes.

1- **In auto mode,** press once on MAN/AUTO. The LED window displays a blinking "AUTO". Press the same button once more to switch to manual mode and a flashing "Desired Position" will be displayed. The position can now be changed by pressing the adjustment buttons(+ −).

2- **In manual mode**, press on MAN/AUTO once. The desired position displayed is blinking. Press the same button once more to switch back to auto mode.

3- **During calibration cycles**, the position can not be manually changed. The message "CAL" is displayed and the MAN/AUTO button is locked.

3.2.3 SETUP Refer to figure 5 (7)

The setup button allows modification of configuration parameters. They can be accessed one after the other by pressing the SETUP button.

The following sub-parameters are accessed by pressing consecutively the SETUP button.

3.2.3.1 MINIMUM POSITION (Lo)

The minimum position parameter is the minimum opening which may be reached in auto mode. The curtain will not close beyond this value. Range: CLo, 1 ... 99. This parameter is not available when DIP switch #4 is set to SVC mode.

3.2.3.2 MAXIMUM POSITION (Hi)

The maximum position parameter is the maximum opening which may be reached in auto mode. The curtain will not open beyond this value. Range: Lo+1 , ... 99,Open

3.2.3.3 PROBE READING (Prb)

The Probe parameter displays the temperature read by the probe. The current value can either be in °C or °F, depending on the units set by the master control (SVC, IC).

3.2.3.4 CALIBRATION (CAL)

The Calibration parameter can be activated or deactivated when the flashing message "CAL" is displayed and both [+] and [−] buttons are pushed simultaneously. When a calibration cycle is in progress, it may be interrupted by pressing the [+] and [−] button simultaneously. If for any reason calibration is interrupted, the module will safely resume its operation with preceding values.

3.2.3.5 AUTO-CALIBRATION (A.CAL)

This parameter only appears if DIP switch #1 is OFF. With the Auto-calibration, users can determine after how many changes in direction the auto-calibration will occur. Users can select a value from 10 and 250 (and OFF) adjustable by increments of 10. This parameter can be deactivated, even though it is not recommended. This parameter does not appear when a feedback potentiometer is used.

If DIP switch #3 is set to OUTSIDE (assuming the temperature probe is located outside), then the auto-calibration may be delayed if outside conditions are not within a safe range. (See section 3.3 on Auto-Calibration).

3.2.3.6 EXTREME TEMP.(CLd.t or Hot.t)

The Extreme temperature parameter is a safety feature. It delays automatic calibration when outside temperature is beyond the acceptable limit. Range: -4°F (-20°C) to 80°F (30°C).

The parameter only appears if DIP switch #3 is set to OUTSIDE and if DIP switch #1 is set to time mode. With this temperature set point, users can tell the SVIM-1LE what they consider a cold or hot limit.

Fig.6 **EXAMPLE:** Extreme temperature parameter safety measure for auto-calibration

Outside temp.	Extreme temp. setting	A. CAL Setting	Result Auto-calibration
25°C	10°C (Cld.T)	OPEn	YES
9°C	10°C (Cld.T)	OPEn	DELAYED
30°C	27°C (Hot.t)	CLo	DELAYED
15°C	27°C (Hot.t)	CLo	YES

3.2.3.7 DELAY BEFORE OPENING (dEL. O)

If there is an opening request, the SVIM-1LE will wait until the delay is completed before opening. Thus, the LED OPEN (refer to figure 5 (3)) will flash during the delay. The Delay Before Opening is set in seconds and can be adjusted from OFF to 254 seconds by increments of one second.

3.2.3.8 MAXIMUM PERCENTAGE OF OPENING (Pct.O)

This parameter slow sdown the opening of the curtain or the air inlet, by limiting the actuator movement to PcT.O % in between each delay before opening. To deactivate this function the PcT.O parameter must be set to 100%. This movement limitation only applies when opening.

This parameter can not be set at a lower value than the resolution (see section 3.2.3.10).

EXAMPLE:
The inlet is 50% open and the master control commands the SVIM LE to open at 63%. The Pct.O parameter is set at 10%. After the delay (dEL.O), the SVIM-1LE will open the inlet at 60%, then wait for the remainder delay before opening again. Once the delay (dEL.O) is over, the curtain will open the remaining 3%.

3.2.3.9 DELAY BEFORE CLOSING (dEL. C)

If there is an closing request, the SVIM-1LE will wait until the delay is completed before closing. Thus, the LED CLOSE (refer to figure 5 (3)) will flash during the delay. The Delay Before Closing is set in seconds and can be adjusted from OFF to 254 second by increments of one second.

3.2.3.10 RESOLUTION (rES)

This parameter enables the SVIM-1LE to move by steps of more than 1% to avoid small unnecessary movements of the actuator. Operating range :1% to 15%

EXAMPLE:
The inlet position is 50% and the resolution is set at 4%. If the master control requests 53% the SVIM -1LE will not move the inlet , because, in this case the movement requested is lower than the resolution.

3.2.3.11 AUTOMATIC CALIBRATION DIRECTION (dir.C)

Using the SVIM-1LE without a feedback potentiometer (time mode). This parameter is used to determine the direction in which the automatic calibration will be done. Users can select between CLo if they want avoid the inlet to completely open during winter or OPEn if they want to avoid the inlet to completely close during summer. This parameter is not accessible when the SVIM-1LE is not using a feedback potentiometer (DIP switch #1=OFF).

3.2.3.12 COOLING DELAY (PAUS)

Some actuators can overheat if they are used for a long period of time. The actuator's overheating can cause problems during the SVIM-1LE calibration. In that case, it will be preferable to provoke a cooling delay. The PAUS delay is calculated in minutes and is activated three times during the calibration procedure. The calibration LED blinks to indicate the SVIM-1LE is waiting the end of the delay, before continuing the calibration procedure.

3.3 AUTOMATIC CALIBRATION

Auto-calibration is a feature of the SVIM-1LE that is only operational when in time mode (DIP switch #1 is OFF). When in potentiometer mode, auto-calibration is always deactivated. This function enables the SVIM-1LE to reevaluate its position and precision either by opening or closing completely the curtain. The Automatic Calibration is set with parameters A.CAL and dir.C

The parameter dir.C tells the SVIM-1LE to carry out auto-calibration in opening or in closing direction. The SVIM-1LE will reposition the inlet/baffle precisely after a number of changes in direction defined by the user (parameter A. CAL, section 3.2.3.5). The SVIM-1LE can also reposition the inlet/baffle when it reaches a limit of Lo or Hi.

CAUTION:
For tunnel ventilation the air inlet auto-calibration must be in opening position, in order to avoid curtain jam in closing position. Parameter Dir.C= open.

CAUTION:
If the application requires the air inlet never to go beyond the limits Lo or Hi, you must use an actuator with feedback potentiometer.

3.4 USER'S SETTINGS

Parameters	summer	winter
Lo (1)	_____%	_____%
Hi	_____%	_____%
A.CAL (2)	_____	
CLd.t (3)	_____☐°C ☐°F	_____☐°C ☐°F
Hot.t (3)	_____☐°C ☐°F	_____☐°C ☐°F
dEL.O	_____seconds	_____seconds
Pct.O	_____%	_____%
dEL.C	_____seconds	_____seconds
rES	_____%	_____%
dir.C (2)	☐OPEN ☐CLOSE	☐OPEN ☐CLOSE
PAUS	_____minutes	_____minutes

(1) This parameter does not apply if the master control is a SVC.
(2) This parameter does not apply if the system uses a feedback potentiometer.
(3) This parameter is visible, only if the system uses an outside temperature probe.

3.5 ADDITIONAL SAFETY FEATURES

A few additional safety features have been added to the SVIM-1LE so livestock is not affected by outside or inside temperature during extraordinary situations.

3.5.1 Stand-Alone Operation

The stand-alone operation of the SVIM-1LE can provide safe operation during control failure. With their own temperature probe, each SVIM-1LE can control the inlet position according to ambient temperature.

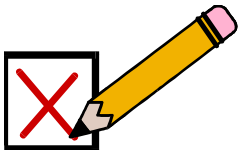
As for probeless SVIM-1LE's, they may be told to maintain the last position recorded when the control failure occurred or may be told to go to a specific position.

3.5.2 Potentiometer Failure Detection

If the feedback potentiometer is defective, the SVIM-1LE automatically switches to time mode, thus allowing normal operation until the problem is solved.

3.5.3 Master Control Backup

In the event of a curtain jam, the master control (SVC or IC) is immediately informed and takes the appropriate action.



NOTES

APPENDIX

TROUBLESHOOTING

SYMPTOMS	CAUSES and SOLUTIONS
Display is blank	– Verify that the line voltage selector switch is properly set. – Check if fuse F3 is blown. – Verify that the 10 pin flat cable between the main board and the faceplate board is connected.
Open or close lights go ON but motor isn't working	– The actuator is at its end (open or closed). – Fuse F1 is blown. Replace with fuse of the same type. – The actuator's motor thermal protection is OPEN. – Possible wiring problem. – The actuator is defective. – The SVIM-1LE has never been calibrated.
The air inlet does not go to the same position as indicated by the LED	– The actuator's motor is connected backwards, exchange the OPEN and CLOSE wires of the right hand side (refer to figure 2).
Err1 on display	– The curtain is jammed. – SVIM-1LE's calibration is lost. – Fuse F1 is blown. – Possible wiring problem. – The actuator's motor thermal protection is OPEN.
Err2 on display	– Potentiometer is hooked up backwards or OPEN and CLOSE wires are inverted.

Err 3 on display	– Module can't detect a potentiometer. (Consequently, it automatically switches to time mode for backup). The message disapears when the problem has been corrected. If this message appears often, it is recommended to check the wiring connections and to change the actuator's potentiomer.
Err 4 on display	– Faulty or missing temperature probe. – Faulty setting of normal or backup operating mode
Err 5 on display	– The opening time is too short to obtain a precise positioning.

SPECIFICATIONS

Description	Value
Power Consumption	12 W max.
Power Source	115/230 VAC, 50/60Hz, -20%, +10 %
Output (relays)	115/230 VAC, 10 Amps.
Current Detector	5 Amps. max.

Storage temperature range: -22 to 130°F (-30 to 55°C)

Operating temperature range: 32 to 122°F (0 to 50°C)

Temp. range read by probe: -3.5 to 121°F (-19.5 to 49.5°C)

Weight: 5 lb (2.25 kg)

Size: 8 ¼ X 8 X 3 3/4 in (21.3 X 20.3 X 9.5 cm)

Standards: CSA & NRTL

Fuse F1: 5A, 250V, Slow Blow

Fuse F3: 0.125A, 250V

Operating range of the SVIM-1LE current detector

- When **OFF**, the actuator current draw must be under 1 mA.
- When **ON**, the actuator current draw must be between 100mA and 5 A.

Limited Warranty

The manufactured equipment and supplied components have gone through rigorous inspection to assure optimal quality of product and reliability. Individual controls are factory tested under load, however the possibility of equipment failure and/or malfunction may still exist.

For service, contact your local retailer or supplier. The warranty period shall be for two years from manufacturing date. Proof of purchase is required for warranty validation.

In all cases, the warranty shall apply only to defects in workmanship and specifically exclude any damage caused by over-voltage, short circuit, misuse, acts of vandalism, fortuitous events, acts of God, flood, fire, hail, lightning or any other natural disaster. Any unauthorized work, modification or repair on this product automatically voids the warranty and disclaims the manufacturer from all responsibility.

The manufacturer assumes only those obligations set forth herein, excluding all other warranties or obligations. This warranty stipulates that in all cases the manufacturer shall be liable only for the supply of replacement parts or goods and shall not be liable for any personal injury, damages, loss of profits, interrupted operations, fine contravention of the law or damages to the production of the PURCHASER and the PURCHASER shall take up the defense and hold the manufacturer faultless regarding any legal or extra legal proceedings, notice, or claim by the customer or by a third party, and regarding any legal and extra legal expenses and fees brought forward on by such damages.

MAV SVIM-1LE VER:04.01
July 17, 2001
Chip 110e