S66 Series Electronic Fan Speed Control

The S66 Series Electronic Fan Speed Control is designed to modulate the speed of single-phase, permanent split-capacitor motors that have been approved for speed control by the motor manufacturer. The S66 permits variable speed control of ventilation fans in response to a DC input signal. Compatibility with various VAV Box controllers allows for fan speed adjustment to meet cfm requirements.

Figure 1: S66 Electronic Fan Speed Control

Features and Benefits	
120-480 VAC, 50 or 60 Hz Motor Control	Allows for use on a wide range of voltage applications
Built-in Radio Frequency Interference (RFI) Suppression	Insulates the S66 from interference from other devices, and deters the S66 from interfering with other equipment
Internal Isolation Transformer (S66AA Model)	Allows the input signal and low voltage power supply to utilize the same common
Built-in Transient Protection	Exceeds IEEE 587 Standards
Hard Start of Motor (S66AA Model)	Applies 90 to 100% of the line voltage to the motor for a period of 7±3 seconds

Part No. 24-8374-8, Rev. E
Code No. LIT-121605

Operation

The S66 operates as follows:

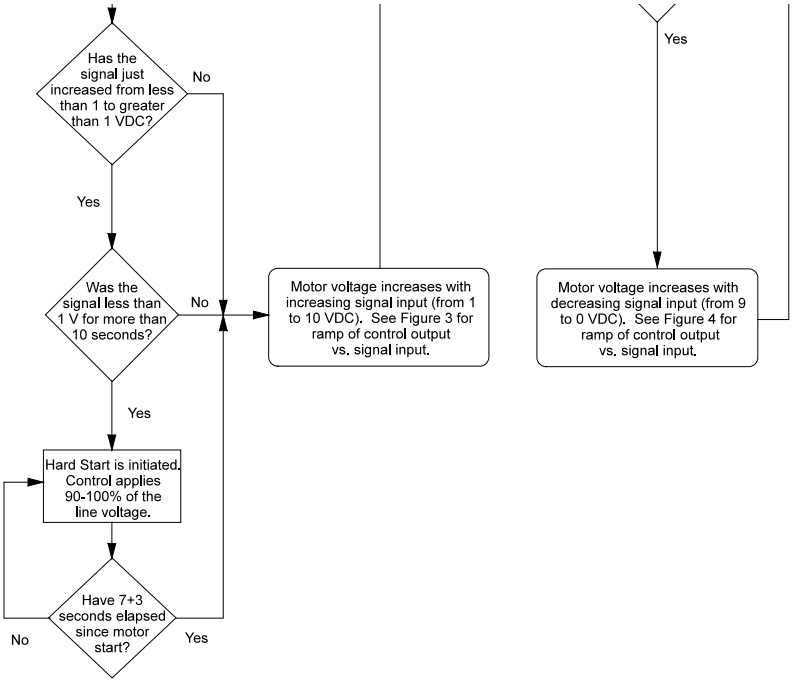

Figure 2: S66 Operation Flowchart

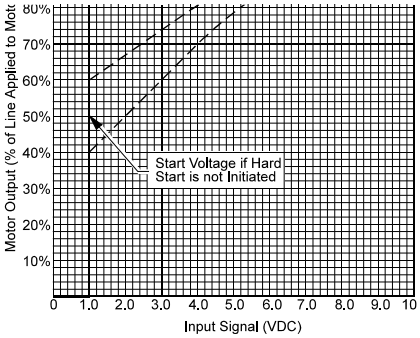

Figure 3: S66AA Input vs. Output Curve

Installation

The S66 controls may be used with motors that are approved by the manufacturer for speed control applications and meet the following requirements:

- Ball-bearing construction
- Service factor of 1.25 or greater
- Low heat rise
- Power factor of 0.7 or greater

> ⚠ WARNING: **Personal Injury Hazard.** All S66 Series Controls are designed for use only as operating controls. Where an operating control failure would result in personal injury or loss of property, it is the responsibility of the installer to add devices (safety, limit controls) or systems (alarm, supervisory systems) that protect against, or warn of, control failure.

> ⚠ CAUTION: **Equipment Damage Hazard.** Because the S66 is a single phase control, it may be used only with single-phase motors approved by the manufacturer for speed control applications.

Mounting

- Mount the S66 control with the cooling fins in a vertical position, making sure that there are no obstructions restricting or preventing the air flow through the cooling fins. Maintaining operating temperatures within the listed specifications is necessary for proper operation.

  Note: For maximum heat dissipation, locate the S66 where a large amount of air passes through the cooling fins. For maximum ambient temperature ratings, refer to the *Specifications* table.

- Do not mount the S66 in an area where the control is exposed to excessive heat.
- Mount the S66 where it can be conveniently wired to the power supply and the motor.

Adjustments

All S66 Series Controls come factory set. There are no field adjustments available.

Wiring

See Figure 5 and Figure 6 for wiring diagrams.

> **WARNING:** **Personal Injury Hazard.** To avoid possible electrical shock or damage to equipment, disconnect power supply before wiring any connections.

> **CAUTION:** **Equipment Damage Hazard.** To ensure proper operation, the S66 must be connected to a suitable earth ground.

- Make all wiring connections using copper conductors only.
- Install all wiring to conform to the National Electric Code and local regulations.

Note: For maximum electrical ratings of the control, see the *Specifications* table.

Wiring Diagrams

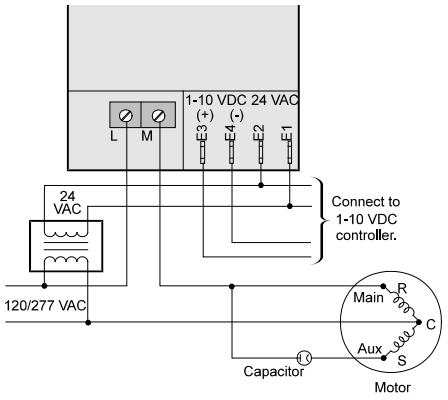

Figure 5: Permanent Split-capacitor Connections to the S66AA Fan Speed Control

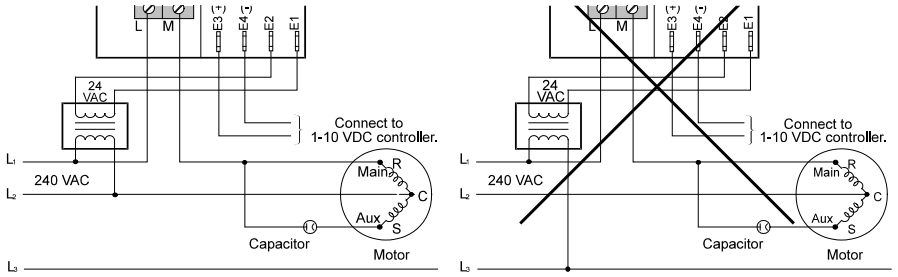

Figure 6: Permanent Split-capacitor Single Phase Connections to the S66AA Fan Speed Control when used on Three-phase Systems. The S66 and the Single Phase Motor Must be on the Same Phase.

Checkout Procedure

Note: Before applying power, make sure installation and wiring connections are according to job specifications.

After necessary adjustments and electrical connections have been made, put the system in operation and observe at least three complete operating cycles before leaving the installation.

Repairs and Replacement

Field repairs must not be made. Replacement controls are available through local Johnson Controls/PENN distributors and the original equipment manufacturer.

Ordering Information

Table 1: Ordering Information

Product Code Number	Description
S66AA-1C	Motor Controller with Hard Start Feature Line Voltage Range: 120-277 VAC, 60 Hz, 1-10 VDC Input Signal, Start Voltage: 50% of Line Voltage if Hard Start is not Initiated See *Specifications* table for output current ratings.

An S66 with selectable hard start (enable or disable), or models with different start voltages, are also available. For more information, contact Refrigeration Application Engineering at (414)-274-5535.

Dimensions

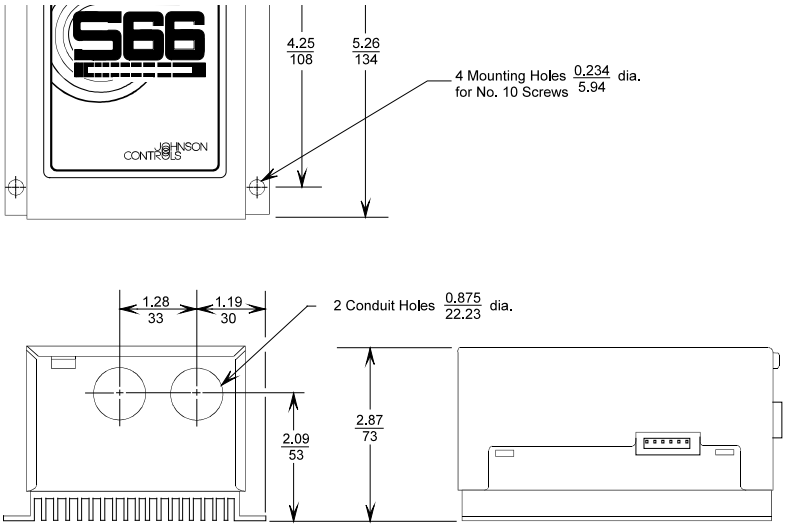

Figure 7: S66 Dimensions, in./mm

Specifications

Product	S66 Electronic Fan Speed Control				
Line Voltage Range	120-480 VAC at 50-60 Hz				
Output Current Ratings	**120 VAC**	**208 VAC**	**240 VAC**	**277 VAC**	**480 VAC**
S66AA Full Load Amperes	9.8	9.3	8.0	6.9	
Locked Rotor Amperes	24	24	24	24	
Start Voltage : S66AA	40% to 60% of Line Voltage (Factory Set), see Figure 3				
Ambient Operating Temperature:	**120 VAC**	**208 VAC**	**240 VAC**	**277 VAC**	**480 VAC**
S66AA Maximum	131°F/55°C	140°F/60°C	140°F/60°C	140°F/60°C	
Minimum	-40°F/-40°C	-40°F/-40°C	-40°F/-40°C	-40°F/-40°C	
Ambient Storage Temperature	-40°F to 185°F / -40°C to 85°C				
Ambient Humidity	0 to 95% RH Non-condensing; Maximum Dew Point: 85°F/29°C				
Control Case Material	Cold Rolled Steel				
Enclosure	NEMA 1				
Wiring Connections	**S66AA**				
Input Signal	1/4 in. Quick Connects				
Low Voltage	1/4 in. Quick Connects				
Line Voltage	Terminal Strip (14 AWG Wire Maximum)				
Mounting	Vertical Only, Four Holes for No. 10 Screw				
Signal Input Impedance	10,000 ohms				
Input Signal Voltage	**S66AA:** 1-10 VDC				
Transient Protection	320 V Surge Suppression; Exceeds IEEE 587 Standards				
Low Voltage Input	20-30 VAC, Class 2				
Dimensions (H x W x D)	5.26 in. x 4.40 in. x 2.87 in./134 mm x 112 mm x 73 mm				
Shipping Weight	1.875 lb/0.850 kg				
Agency Listing :	UL recognized (US): File SA516, Guide SDFY2 UL recognized (Canada): File SA516, Guide SDFY8				

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult Johnson Controls/PENN Application Engineering at (414) 274-5535. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.

www.penncontrols.com