

S6700E SPEED CONTROL UNIT

SPECIFICATION

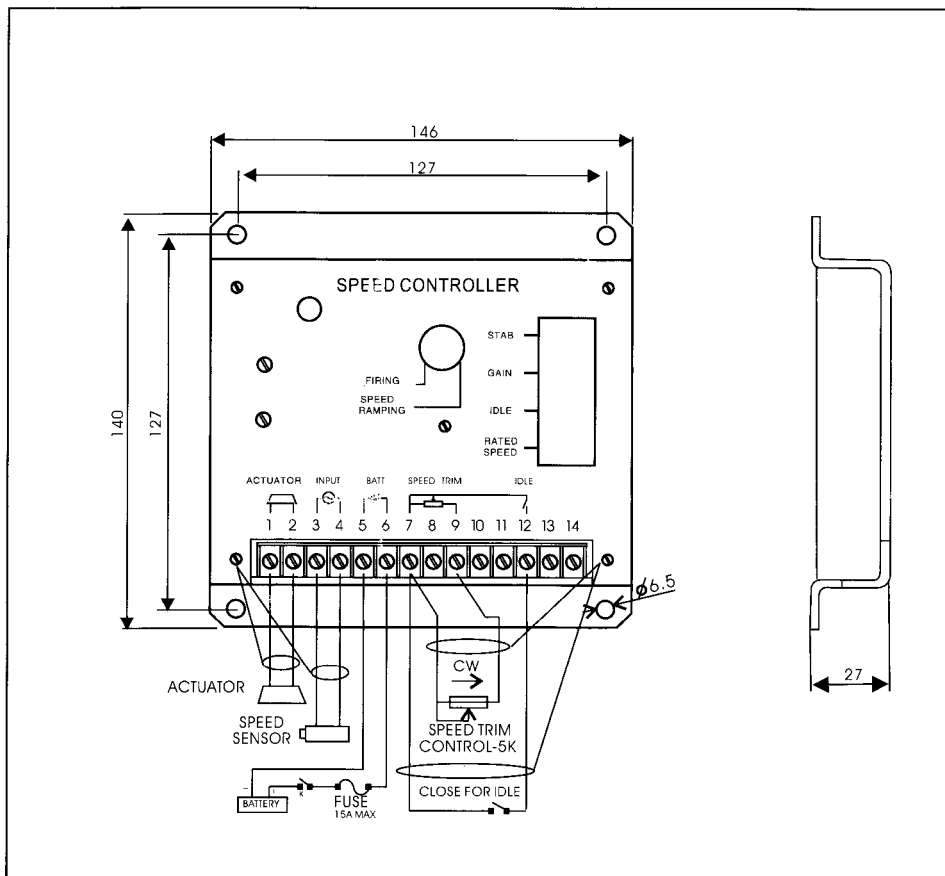
I. Introduction

The S6700E Speed Control Unit is an all-electronic device designed to control engine speed with fast and precise response to transient load changes. Based on a closed loop control, the basic characteristics of this unit is to reach rated speed and power as well as reducing smoke exhaust through adjustment of firing fuel and speed-rate. The S6700E Speed Control Unit provides a series of protection once the power supply is reversely connected, transient overvoltage or actuator fault happens, or speed input breaks.

II. Technical Parameters

Environmental	Ambient operating temperature range	-40~80°C
	Relative humidity	95%
Input power	Supply	24VDC
	Actuator current range	2.5-10A (continuous)
	Speed sensor signal	1-20V
Characteristics:	Speed fine adjustment range	±100r/min
	Frequency fluctuation	±0.25%
	Steady speed droop	0-3% (variable)
	Temperature drift	±1% (maximum)

III. The S6700E Speed Control Unit Wiring/Outline



IV. Adjustments

Before starting engine: Check the wiring and remove connection 1 and connection 2. Measure the resistance value of the actuator. Then, use connection 1 and connection 2 to touch positive and negative electrode of the battery jar. If applied, the actuator will energize to maximum fuel position with a sound of Pa, and return to minimum fuel position with another sound of Pa, when power is off. At last, check fuel pump racks to insure they can move smoothly.

The FIRING adjustment: The FIRING adjustment sets the amount of firing supply. It approximately points to mid position before turning on the power. Rotate the FIRING adjustment clockwise to increase firing fuel supply and counterclockwise to decrease it. Connect 7 and 8, and rotate the FIRING clockwise to the end before turning on the power. After adjustment of the unit, rotate the FIRING adjustment from clockwise maximum to counterclockwise minimum. Start the engine. At the same time, rotate the FIRING adjustment to a position where engine is just able to start. Then, start the unit and adjust repeatedly until minimal smoke exhaust.

The SPEED RAMPING Adjustment: The SPEED RAMPING adjustment sets time length of adjustment from engine's starting speed to rated speed. It originally points to mid position. Rotate the SPEED RAMPING adjustment clockwise to prolong the time length, and counterclockwise to shorten it. Rotate the SPEED RAMPING anticlockwise to the end before turning on the power. Start the engine after adjusting the unit. At the same time, adjust the SPEED RAMPING to minimal smoke exhaust under the condition of smoothly starting.

The SPEED adjustment: The SPEED adjustment sets rated speed of the engine. It is originally set as 1500 rpm. Rotate the SPEED adjustment clockwise to increase the speed and anticlockwise to decrease the speed.

The STABILITY adjustment: It originally points to mid position. Rotate the STABILITY adjustment clockwise until instability develops after starting the engine and adjusting the SPEED. Gradually move the adjustment counterclockwise until stability returns. And then rotate the GAIN 5-10 degree counterclockwise to insure the stability (under any loading condition).

The GAIN adjustment: It originally points to mid position. Once the engine is at operating speed, rotate the GAIN adjustment clockwise until instability develops. Gradually move the adjustment counterclockwise until stability returns. Move the adjustment 5-10 degree counterclockwise to insure stable performance. (under any loading condition)

The IDLE adjustment: The IDLE adjustment decides the idle speed. It is originally set within the range of required idle speed. The idle speed set point is increased by clockwise rotation of the IDLE adjustment and decreased by counterclockwise rotation, after 7 has been connected with 13. A switch can be placed here to insure engine's idle speed and rated speed.

V. Installation and Wiring

S6700E is rugged enough to be placed in a control cabinet of engine. If water, mist or condensation may come in contact with the governor, it should be mounted vertically to allow the fluid to drain away from the unit. Radioactive heat and high temperature should be avoided. Install particular shielding device in case of strong electromagnet.

Notice: in order to insure security and prevent loss, another over-speed shutdown device should be provided to cut off fuel in case of fault.

Terminal	Below 6 meters	Above 6 meters
Connect 1-2 to the actuator	2.5mm ²	4.0 mm ²
Connect 3-4 to the speed sensor (The lowest operation signal between 3 and 4 is AC 2.5V)	20.75mm ² or 21mm ² with shielding mesh, the end of the shielding mesh on the unit should be connected to 4.	
Connect 5-6 to the battery (24V)	2.5mm ²	4.0 mm ²
Connect 7-9 to the speed fine adjustment Connect 7-12 to the switch (of the IDLE)	In electromagnetic field, cable shield should be placed. The shielding mesh should be connected to terminal 7.	

VI. Fault judgment and treatment

Symptoms	Probable cause	Treatments
Engine can not be started	Air exists in fuel system	Discharge the air
	Rotation speed signals stop.	Check the sensor and cables
	Power of the governor is off or connected reversely	Check the power supply and wiring
	Driving bars are deadlocked in null-position.	Reinstall and adjust
Engine starts at a higher speed	The adjusting direction of fuel-adjustment mechanism and movement direction of the actuator conflict, or their null-positions are not consistent with each other.	Check, reinstall and adjust
	The rated speed is set too high	Decrease the rated speed
	The governor parameter is wrongly adjusted	Increase the GAIN moderately.
Unstable engine rotation speed	clamping stagnation of the driving bar between the actuator and rack happens or the gap is too large	Check and reinstall. Drip moderate amount of engine oil on the pre and post bearings of the actuator. Push it with hands several times. If it moves smoothly without any clamping stagnation, it can be used normally.
	Engine overloads	reduce the load of the engine
	The installation gap of Speed sensor is too large	Check and reinstall (about 0.8mm)
	Governor parameter is adjusted wrongly	1) high frequency oscillation of rotation speed ($>10\text{Hz}$) : decrease the GAIN moderately. 2) low frequency oscillation of rotation speed ($<1\text{Hz}$) : Increase the GAIN moderately.
Engine shuts off unexpectedly	Power supply of the governor breaks off	Check power supply and cables.
	Feedback signals of the speed breaks off	Check the sensor and its cables
	Setting signals of the speed breaks off	Check the remote-control adjustment and its cables
	Open-circuit or short-circuit of actuator's electronic cable happens	Check the actuator and its cables
	Fuel supply of the engine stops	Add fuel and discharge air in the pipes
Engine will not shut off	Null-positions of the actuator and control rack conflict	Check and reinstall
	Control rack is deadlocked	Check and reinstall
The steady droop of the device can not be adjusted	The governor maintains a state of constant frequency	Reset
	Control rack is deadlocked	Check and readjust or clean the fuel injection device
<p>Notice: 1.the maximum fuel adjustment of the governor should be adjusted when engine stops. 2. S6700E contains over-speed protection, which is set according to the rated speed. However, the starting value may be unsuitable for different users and can not be changed by users. In order to insure security, once engine's over-speed operation or runaway occurs, power supply of the governor should be off immediately.</p>		