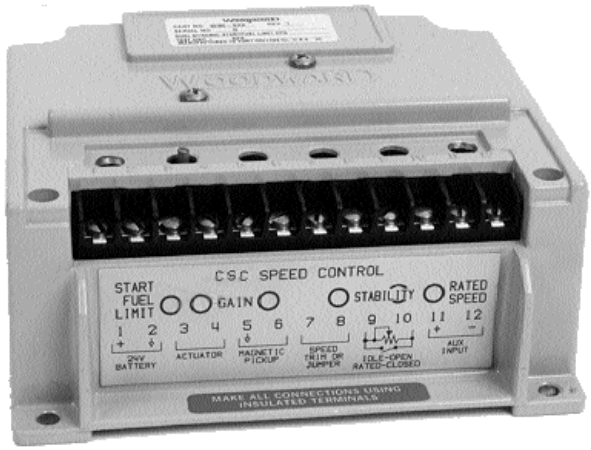
CSC

Speed Control for Cummins PT™ * Fuel System

Applications



The CSC speed control is designed for precise control of diesel engines. This quick and simple retrofit enables you to utilize analog and digital Woodward power management products on Cummins engines equipped with a PT™* fuel pump. Available for 12 Vdc or 24 Vdc applications, the CSC control furnishes state-of-the-art start fuel limiting and superior performance with dual dynamics.

Description

The CSC interfaces directly with the Cummins EFC rail valve which is mounted inside the Cummins PT fuel pump. The control works with normally-closed electronic fuel control actuators. The CSC's dual dynamics ensure fast synchronization with stable parallel operation. Load sharing devices are available for use in paralleled applications.

Gain and stability adjustments tailor the control's response to the specific engine application. Each set of dynamics is independently set to provide the exact engine response needed at a specific condition. The choice of dynamics is selected by a switch. The switch may be a part of the auxiliary breaker contacts in a generator system, or could be automatically set by other changes in the process being powered.

Easy Installation

The CSC is designed to use existing wiring for a clean, straightforward installation. No modifications to the factory-installed control system wiring nor to the factory calibrations of the fuel system are needed. A rugged cast aluminum housing permits installation on the engine skid.

* PT is a trademark of Cummins Engine Company, Inc.

- Superior performance with dual dynamics
- State-of-the-art fuel limiting
- Accepts load sharing accessories
- Isochronous control
- No mechanical drive or hydraulic supply required
- 12 or 24 volt operation
- UL/cUL Listed; CE Compliant

Options

The CSC speed control is compatible with a full line of Woodward accessories, providing for various levels of precision control of electrical generation or other processes. Accessories for power systems that can be connected to the CSC speed control include:

Generator Load Sensor (Product Specification 82314)
The Generator Load Sensor is used with the CSC control to provide droop or isochronous load-sharing capabilities. It allows the use of the SPM-A Synchronizer, Process and Import/ Export Control, Automatic Generator Load Control (AGLC), Automatic Power Transfer and Load Control (APTL), or DSLC™ Digital Synchronizer and Load Control.

SPM-A Synchronizer (Product Specification 82383)
The SPM-A Synchronizer may be installed for a fully automatic synchronizing, paralleling, and load-sharing system.

Ramp Generator (Manual 82359)
The Ramp Generator is connected to add linear ramp times of up to 25 seconds. For exponential ramp times up to four seconds, a capacitor can be connected to the CSC control.

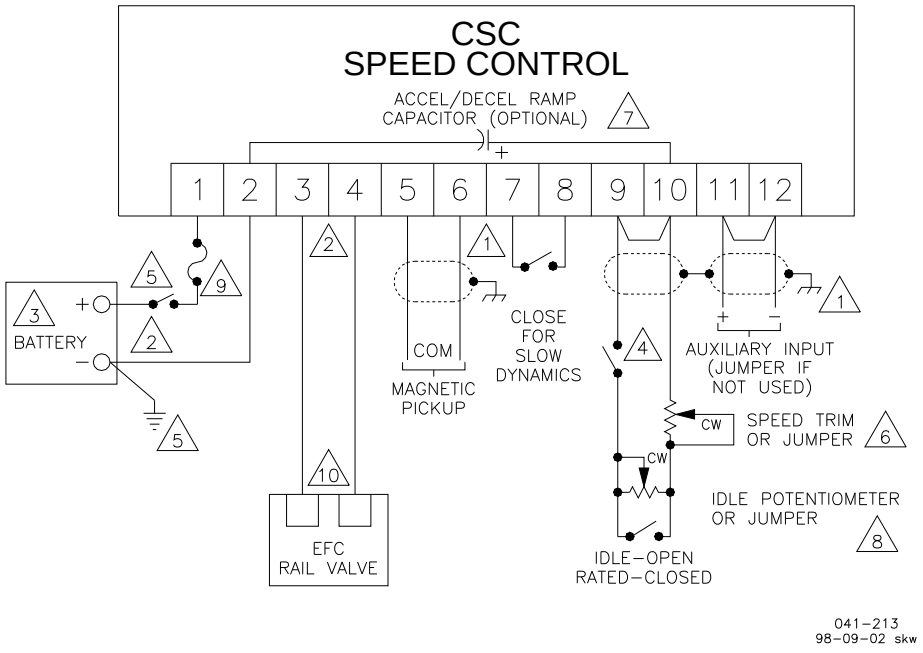
Process and Import/Export Control (Product Specification 02013)
The Process and Import/Export Control maintains a certain flow, pressure, power, or other output of engines which drive pumps, compressors, or other mechanical or electrical loads. It can control inlet or exhaust pressure.

Automatic Generator Loading Control (AGLC) (Product Specification 82399)
The AGLC provides for soft loading or unloading of a generator set into or out of a load-sharing system at controlled rates, and tracks the load to provide smooth transfer of power when loading or unloading. Requires a Load Sensor.

Automatic Power Transfer and Load Control (APTL) (Product Specification 82380)
The APTL can provide bumpless paralleling and adjustable speed ramps for loading and unloading the unit controlled by the CSC. The control allows peak shaving, import-export, and low and high limits for generator control. Requires a Load Sensor.

DSLC™ Digital Synchronizer and Load Control (Product Specification 02006)
The DSLC control is an integrated generator control that performs speed and phase matching, synchronizing, generator load sensing and controlling, isochronous load sharing, and process/import-export control, and it replaces motor-operated potentiometers (MOPs) with digital tuning.

1. Shielded wire to be twisted pairs with shield grounded at one end only.
2. No, 12 AWG or 14 AWG stranded wire. Must be as short as possible.
3.
4. Open for minimum fuel.
5. For positive ground systems, switch and fuse to be located in series with battery (-) and terminal 2. Positive terminal becomes chase ground. Leads from battery to terminals 1 & 2 must be direct and not pass through distribution points.
6. Approx. speed change with trim potentiometer:
   +/- 2.5% using a 1 KΩ potentiometer
   +/- 5.0% using a 2 KΩ potentiometer
7. Approx. 1 second ramp time per 50 UF. Capacitor specifications: 200 UF max; 15 WVDC minimum. Less than 30 UA DC leakage current over temp range.
8. Idle range approx. 25% to 100% of rated using 50KΩ potentiometer.
9. Use a 10 amp fuse (3 AG or GLH type)



Plant Wiring Diagram

Specifications

Supply Voltage

12 Volt Control	10–16 Vdc. Power consumption: 60 W max. A battery charger must be capable of at least 7 A when the governor is energized.
24 Volt Control	20–32 Vdc. Power consumption: 95 W max. A battery charger must be capable of at least 5 A when the governor is energized.
Steady State Speed Band	±0.5% of rated speed
Fuse and Wiring	A 10 A slow-blow fuse or circuit breaker must be installed in the non-grounded battery lead. Battery leads are routed directly to the speed control, not through any distribution points.
Magnetic Pickup (MPU)	1.5 Vrms min.; 100 Hz min. during cranking.

Adjustments

Stability and Gain	These adjustments set the CSC speed control's response to match the individual engine characteristics. Slow and fast response settings are provided with the CSC control.
Rated Speed	Set by a 25-turn internal potentiometer.
Idle Speed	A 50 kΩ potentiometer can be connected to set the idle speed at 25%–100% of rated speed.
Speed Trim (Optional)	A 1 kΩ potentiometer is used for a ±2.5% speed change; a 2 kΩ potentiometer is used for a ±5% speed change.
Ramp Time, Idle/Rated (Optional)	An optional capacitor can add up to four seconds of acceleration and deceleration control. An optional ramp generator may be used for longer times.
Start Fuel Limit	Adjusted with an internal 10-turn potentiometer. The limit sets the maximum terminal shaft position until 95% of the selected (idle or rated) speed is attained. Start Fuel Limit is re-established when the magnetic pickup frequency drops to 5% of rated speed or lower.

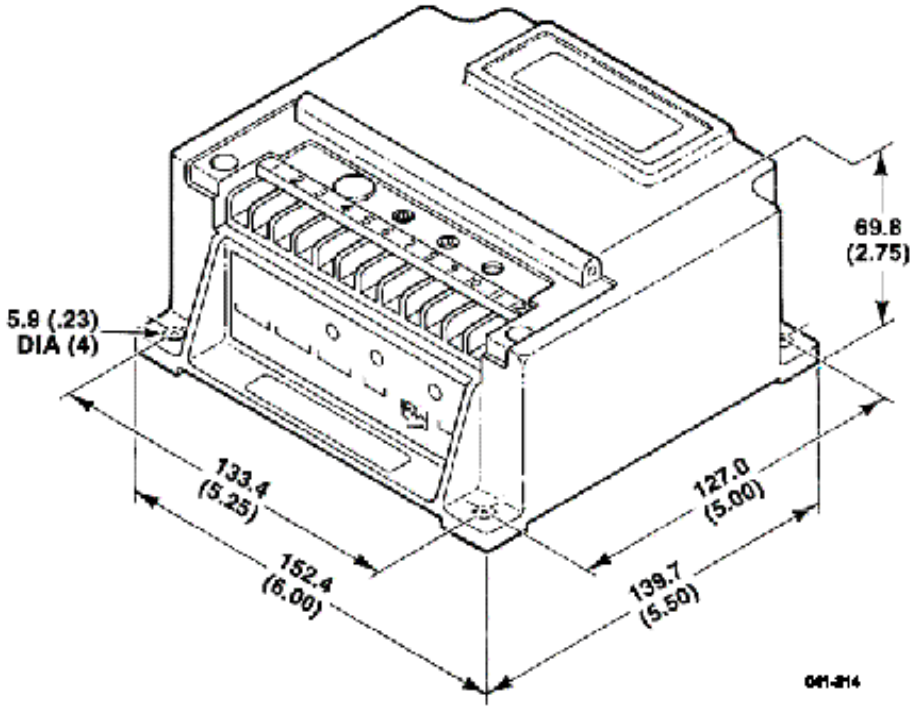
Environment/Physical

Operating Temperature	–40 to +75 °C (–40 to +167 °F)
Classification	UL, cUL, CE Compliant
Mounting	Engine skid mountable in any configuration

Declaration of Incorporation

In accordance with the EMC Directive 89/336/EEC and its amendments, this controlling device, manufactured by Woodward, is applied solely as a component to be incorporated into an engine prime mover system. Woodward declares that this controlling device complies with requirements of EN50081-2 and EN50082-2 when put into service per the installation and operating instructions outlined in the product manual.

NOTICE: This controlling device is intended to be put into service only upon incorporation into an engine prime mover system that itself has met the requirements of the above Directive and bears the CE mark.



Outline Drawing
(Do not use for construction)

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