

# 2301A

## Load Sharing and Speed Control



### Applications

The 2301A Load Sharing and Speed Controls are designed for use in electric generator systems where multi-unit load sharing is desired. 2301A controls may be used with diesel, gas or gasoline engines, or steam or gas turbines.

Controls are available:

- For applications requiring droop and/or isochronous speed control
- In forward- or reverse-acting models
- For single or tandem actuator installations
- With accelerating or decelerating ramps
- In several speed ranges

### Description

Automatic, adjustable start fuel limiting regulates the maximum fuel setting while the engine is starting. This helps decrease pollution and engine wear.

Each 2301A control has a self-contained load sensor. Most models provide a 0–200 mA output signal, designed to control Woodward EG, EGB, PB, TM, and 2301 actuators. 0–20 mA output is available for special applications. The output signal is proportional to the fuel

setting needed to attain the desired speed/load. Position feedback from the actuator is not required. The 2301A controls are compatible with Woodward SPM-A Synchronizers, Automatic Generator Loading Controls, Process Import/Export Controls, and Automatic Power Transfer and Load Controls.

### Reliable Control: Simple Adjustments

The 2301A Load Sharing and Speed Control stands up well in harsh environments. Built-in protection guards against electromagnetic interference/radio frequency interference (EMI/RFI), humidity, dust and vibration.

The control contains a single printed circuit board. All potentiometers are accessible from the front of the chassis. Speed range is set on an internal dip switch, accessible from inside the cover of the control. Speeds are set according to the speed sensor frequency in Hertz. External rated speed adjustment can be connected for remote speed change and manual operation. An optional deceleration ramp is available.

- Low- and high-voltage models
- Idle and rated speed settings
- Adjustable idle to rated speed linear ramps
- Start fuel limiting
- Failed speed sensor protection
- Four switch-selectable speed ranges
- Isochronous load sharing
- EU Directive Compliant (low voltage models)

## Specifications

### General Specifications

Power Supply Rating	90–150 Vdc or 85–132 Vac for High Voltage models 20–40 Vdc for Low Voltage models
Power Consumption	less than or equal to 15 W nominal
<b>Inputs—</b>	
3-phase PT Inputs	90–240 Vac line-to-line, 45–66 Hz. PT input, burden is between 1.5 VA and 1.7 VA per phase at 240 Vac, and between 0.4 VA and 0.5 VA per phase at 120 Vac
3-phase CT Inputs	3–7 Arms at full load, CT input burden at full load is 0.1 VA per phase
Speed Sensor Input Impedance	100–300 $\Omega$
Speed Sensor	magnetic pickup 1.0 Vac minimum to 30 Vac maximum
Speed Trim	0–100 $\Omega$ for 0 to 10% speed change
Speed Setting	terminals 23–24 jumpered, internally adjustable 100 $\Omega$ potentiometer allows external 0–10% speed trim
Idle Speed Select	external switch, open terminals 19 to 16
Droop	external switch, open terminals 14 to 16
Synchronizer	$\pm 5$ Vdc for speed change with Woodward SPM-A synchronizer
Load Sharing	0–6 Vdc
<b>Outputs—</b>	
Actuator	7.5 Vdc max for 0 to 214 mA with 35 $\Omega$ coil
<b>Adjustments—</b>	
Rated Speed	11 450 Hz
Acceleration Ramp ( $\pm$ Idle to Rated)	0–10 s, switch activated, close terminals 19 to 16
Actuator Compensation	time constant compatibility 0–500 ms
Low Idle Speed	55% rated
Amplifier Gain	
Reset (Stability)	
Load Gain	6 Vdc maximum at 5 A CT current
Droop	0 to 10%
Speed Control Range	switch selectable, 500–1500 Hz, 1000–3000 Hz, 2000–6000 Hz (standard), 4000–12000 Hz
Operating Temperature	–40 to +85 $^{\circ}\text{C}$ (–40 to +185 $^{\circ}\text{F}$ )
Load Sharing	$\pm 5\%$ of rated load with speed setting matched
Vibration	4 Gs, 5 to 500 Hz
Shock	60 Gs
Weight	approximately 1.8 kg (4 lb)
Finish	gloss powder

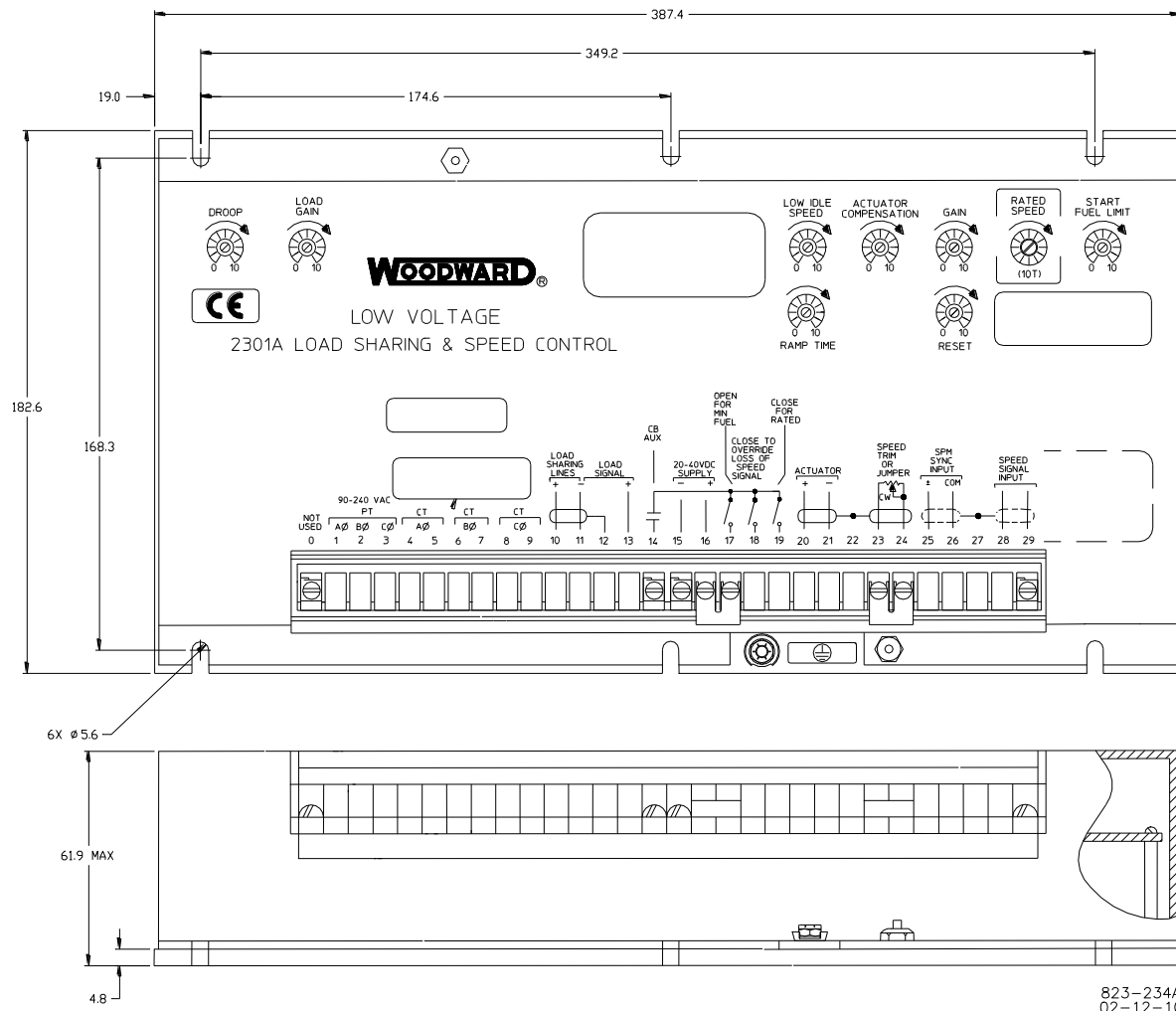
### Regulatory Compliance

#### European Compliance for CE Mark (specified low voltage models only)—

EMC Directive:	Declared to Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility (EMC)
Low Voltage Directive:	Directive 2014/35/EU on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits

#### North American Compliance:

CSA:	CSA Certified for Ordinary Locations for use in the United States and Canada.
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2301A LSSC Outline Drawing (Do not use for construction)

823-234A  
02-12-10

METRIC CONVERSION CHART	
MM	INCH
4.8	0.188
5.6	0.219
7.1	0.279
19.0	0.748
61.9	2.437
168.3	6.625
174.6	6.874
182.6	7.188
349.2	13.748
387.4	15.251

Reference technical manual 82389 for full details on the 2301A controller.



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