

#### Application Note 51439 (Revision NEW, 12/2011) Original Instructions





- J1939 CAN communication
- (9 to 32) V (dc) operation
- IP67 enclosure
- Fixed or variable speed controller
- Switched or analog speed setpoint control
- Auto idle
- Fuel mapping
- Current based fuel rack feedback
- PTO mode
- Engine protection
- Flexible programming via RS-232
- Product manual: 36752

# **APECS™ 4500**

Performance and Flexibility Upgrade for Small Mechanically Governed Industrial Engines

Woodward reserves the right to update any portion of this publication at any time. Information provided by Woodward is believed to be correct and reliable. However, no responsibility is assumed by Woodward unless otherwise expressly undertaken.

Copyright © Woodward 2011 All Rights Reserved

# **APECS\* 4500**

### Performance and Flexibility Upgrade for Small Mechanically Governed Industrial Engines

#### Benefits

The APECS\* 4500 electronic controller optimizes control and flexibility for your existing mechanically governed engine. By adjusting the fuel control lever with a Woodward proportional actuator, the 4500 system controls and limits engine speed and fuel delivery. By adjusting to load, temperature, and fuel quality, it optimizes your engine's operating efficiency.

- Automatic start-up
- Autocrank control for starter motor
- Temperature-dependent glowplug timing control
- Universal speed input can detect engine speed from either MPU, coil spark, magneto spark, or hall-effect sensors
- Start-up smoke limiting
- Speed control—Either isochronous or droop speed selection is possible
- Configurable ramp rates for acceleration and deceleration
- Programmable auto idle speed and inactivity delay parameters
- Boost pressure based fuel control
- Engine protection—underspeed and overspeed protection
- Ground speed limiting
- Internal diagnostics—with external notification via LED or discrete out
- Enclosure sealed to IP67
- Operating temperature range of -40 °C to +85 °C
- Can drive any Woodward proportional linear actuator up to 4000 mA with PWM output
- Configurable discrete outputs for lamp drivers, relays, etc.

#### Applications

The APECS 4500 controller is part of a family of "off-engine" ECU's for industrial engines in the output range of 3 kW to 200 kW (4 hp to 270 hp).

The controller can be used on all kinds of engine applications, including (but not limited to) power generation, direct drive, hydraulic drive, and pump drive systems.

#### Installation

The APECS 4500 Control unit is preferably off-engine-mounted away from major heat sources. It can be mounted on-skid for skid-type application and in cab for vehicle-type applications.

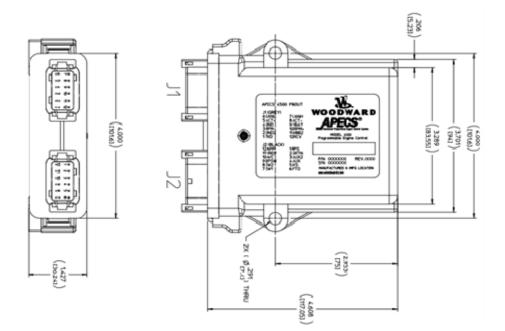
\*Trademark of Woodward, Inc.

# **APECS System Parts**

A typical APECS 4500 system is described below, but the APECS 4500 can drive any Woodward linear or rotary actuator.

Part Number	Description
8800-1012	APECS 4500 controller
SA-5026-12	12 V linear actuator
SA-5026-24	24 V linear actuator
1680-2013	MPU
6910-314	MAP sensor
5418-2570	APECS calibration tool
SA-4488	PC interface for APECS

For other Woodward actuator options, please contact our sales department.



# **Specifications**

	APECS 4500		
Technical Manual	36752		
Operating Temperature	–40 °C to +85 °C		
Storage Temperature	–40 °C to +85 °C		
Random Vibration	6 Gs from 40 Hz to 2000 Hz		
Mechanical Shock	20 Gs at 45 Hz		
Ingress Protection	EN60529 IP67		
EMC Directive	89/336/EEC		
Input Voltage Range	(9 to 32) V (dc)		
Maximum Transient Actuator Current	8000 mA		
Power Consumption	< 96 W		
Dimensions (HxWxD)	132 x 101 x 117 mm		
Weight	0.3 kg		
Mounting	Off-engine		

APECS 4500 CONTROLLER FAMILY FEATURES	ADDITIONAL HARDWARE REQUIRED?	FEATURE PRESENT IN:		
		SA-4489	8800-1006	8800-1012
Actuator Current Protection	No	•	•	•
Autocrank	Yes	●	•	•
Auxiliary Output	Yes	•	•	•
CAN Communications	No		•	•
Droop Governing	No	•	•	•
Engine Protection Input	Yes	•	•	•
Engine Start Calibration	No	•	•	•
Fuel Limiting: MAP-based	Yes			•
Fuel Limiting: Speed-based	No			•
Glowplug Control	Yes	•	•	•
Switched Glowplug Timing	Yes			•
Overspeed / Underspeed Protection	No	●	•	•
PID Gains Adjustment No	No	•	•	•
PTO Switch Input	Yes	●	•	•
Analog Speed Setpoint Input	Yes	●	•	•
Switched Analog Speed Ranges	Yes			•
Switched Speed Setpoint Inputs	Yes	●	•	•
Auto Idle / Configurable Brake Rate	Yes			•

#### Features

We appreciate your comments about the content of our publications.

Send comments to: icinfo@woodward.com

Please reference publication 51439.



PO Box 1519, Fort Collins CO 80522-1519, USA 1000 East Drake Road, Fort Collins CO 80525, USA Phone +1 (970) 482-5811 • Fax +1 (970) 498-3058

Email and Website—www.woodward.com

Woodward has company-owned plants, subsidiaries, and branches, as well as authorized distributors and other authorized service and sales facilities throughout the world.

Complete address / phone / fax / email information for all locations is available on our website.