

APECS 0200 Integral Actuators



APPLICATIONS

APECS 0200 integral actuators provide proportional fuel control specifically for Yanmar three- and four-cylinder diesel engines from 1.33 to 3.318 liter displacement in its TNV Series.

The Woodward 0200 actuator is designed to fit the following Yanmar TNV engines:*

- 3TNV82A / 3-cylinder / 1.33L
- 3TNV84T / 3-cylinder / 1.496L
- 3TNV88 / 3-cylinder / 1.642L
- 4TNV84T / 4-cylinder / 1.995L
- 4TNV88 / 4-cylinder / 2.19L

(*) Woodward has validated operation on the 4TNV84T engine *only*. Customer validation on other TNV Series engines is recommended due to variations in packaging and pump configurations.

DESCRIPTION

The APECS 0200 is a linkage free, integral-type actuator designed for direct mounting on Yanmar TNV engines. It mounts directly to a fuel pump in place of the fuel shutoff solenoid. Coupled with a Woodward electronic controller, the 0200 provides precise engine speed control. The actuator responds in milliseconds to changes in current from a pulse width modulated signal generated by the controller.

APECS 0200 linear actuators provide precise positioning and form the foundation of a full electronic governing system. Many of the moving parts normally associated with electric actuators are eliminated, prolonging the MTBF (mean time between failure).

The actuator design employs the principle of variable reluctance for consistent force over the entire stroke. This simple design of a proportional electric linear actuator uses a sliding armature whose magnetic force is proportional to the input coil current.

These actuators are easy to install by mounting to the fuel pump, resulting in a more trouble-free and accurate control system.

APECS 0200 actuators are suitable for installation on Yanmar TNV series diesel engines with fuel system force requirements of less than 3 lbs (13.3 N) of force.

- Designed for simple, direct mounting on Yanmar TNV engines*
- Replaces the integral mount fuel shutoff solenoid
- Simple installation, with no brackets or linkages
- Fuel pump shutoff function built into actuator
- Precise engine speed control when used with APECS electronic PWM controller
- ECOAT corrosion protection for enhanced appearance and corrosion resistance in harsh environments
- Thermally efficient design for continuous operation at ambient temperatures up to 250°F (121°C)

SPECIFICATIONS

Electrical

Input Voltage Range:	12 Vdc	24 Vdc
Maximum Rated Current (Continuous Duty at 250°F [121°C]):	3.7 A	1.7 A
Maximum At Stall @ 75°F (24°C):	8.5 A	4.3 A
@ 250°F (121°C):	5.15 A	2.5 A

Performance

Resistance 12 Vdc:	1.4 Ohm
24 Vdc:	5.2 Ohm
Force with spring:	3 lbf (13.3 N)
Work w/o Spring:	0.29 ft-lb (0.39 J)
Output Stroke:	0.300 ± 0.025" (7.62 ± 0.64 mm)
Nominal Response Time to Travel 63% of Stroke:	0.03 sec

Environmental

Operating Temperature:	-67°F to +250°F (-55°C to +121°C)
Vibration:	16.5 G random, 20 hrs per axis
Case:	Corrosion resistant, ECOATED steel housing and mounting flange
Sealing:	Oil, water, and dust resistant
Weight:	1.6 lbs (0.73 kg)

AVAILABLE MODELS

APECS 0200 Linear Actuators

PART NO.	ACTUATION	VOLTAGE		MOUNTING STYLE	TERMINATION	RETURN SPRING*	
	Pull	12 V	24V	2-Hole Flange	Connector	S1	S2
†	[P]	[12]	[24]	[A]	[C]	[S1]	[S2]
8175-1507	•		•	•	•	•	
8175-1508	•	•		•	•	•	
8175-1510	•		•	•	•		•
8175-1511	•	•		•	•		•

† Copy in brackets [] is model number description.
 For example: Part No. 8175-1507 is Model Number 0200P-24ACS2.

* Spring Chart

SPRING TYPE	PART NO.	DE-ENERGIZED SPRING FORCE	ENERGIZED SPRING FORCE	SPRING RATE	FUEL PUMP
S1	SE-5154	3.5 (15.5 N)	5.5 (24.5 N)	6.9 lb/in (0.123 kg/mm)	G-Series
S2	1520-1231	3.9 (17.3 N)	5.9 (26.2 N)	6.9 lb/in (0.123 kg/mm)	D-Series

DIMENSIONS

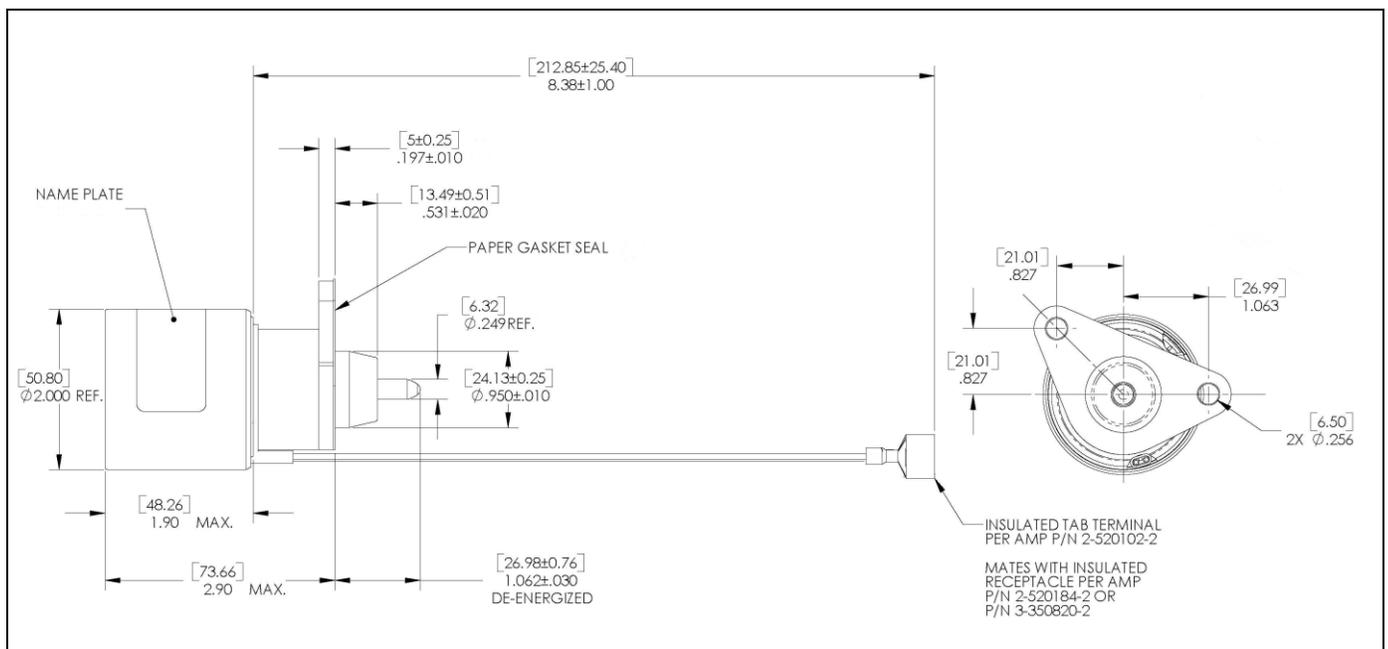


Figure 1. Two-Hole Flange Push Type Actuator

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INSTALLATION

The 0200 integral actuator mounts directly to the fuel pump in place of the fuel shutoff solenoid. Refer to **Figure 2** to install.

1. Place existing O-ring over the front collar of the actuator.
2. Torque existing bolts to engine specifications.

NOTE: AMP 2-520102-2 connectors mate to AMP 3-350820-2 or AMP 2-520184-2.

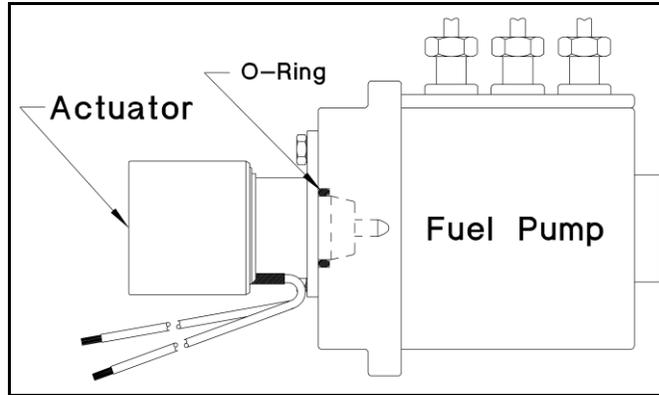


Figure 2. Mounting of 0200 Actuator to Fuel Pump

	WARNING
	<p>The engine, turbine, or other type of prime mover should be equipped with an overspeed shutdown device to protect against runaway or damage to the prime mover with possible personal injury, loss of life, or property damage.</p> <p>The overspeed shutdown device must be totally independent of the prime mover control system. An overtemperature or overpressure shutdown device may also be needed for safety, as appropriate.</p>

For more information contact:

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