

## ProAct™ Gen 3 FLEX Actuator

### Electric Actuators with Integral Driver

#### Applications

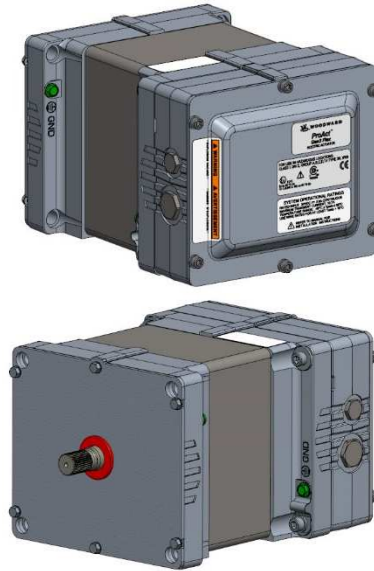
The ProAct™ Gen 3 FLEX actuator is a family of electric actuators intended to be mounted on-engine to control functions including (but not limited to): fuel rack positioning, timing control, throttle valve, and wastegate positioning. The actuator accepts a position command signal from another device in the system such as a speed control.

It includes an integral digital driver that controls the actuator, communicates with the outside control system, and provides on-board software and intelligence to realize monitoring and customizing functions.

#### Description

The actuators can be base- or flange-mounted (Model IV is base-mounted only) on-engine and can therefore withstand high levels of vibration and temperature extremes. They all have a 0.625-36 serrated tooth terminal shaft, and an optional rotation scale and indicator are available for visible travel detection. The actuator accepts analog (0 to 5 Vdc, 4 to 20 mA, or 0 to 200 mA), CAN, or PWM position command signals and can be configured with a primary and backup position command signal input, providing redundancy with automatic failover and backup logic. An eleven-point curve function provides a means to create non-linear output behavior. The actuator monitors all available internal and external signals, and annunciates any detected faults through a discrete output. An analog output (0 to 25 mA or 0 to 5 Vdc) provides actual position indication, and a discrete input is available to force a low-power standby mode.

Additionally, the ProAct Gen 3 FLEX includes a diagnostic event log, current limiting based on driver electronics temperature, and CAN-based communications for control and service port functions. It is field programmable, allowing a single design to be used in many different applications. It must be configured and calibrated to the specific engine with a personal computer (PC) and a Woodward ProAct Service Tool that communicates to the driver via CAN bus and appropriate USB to CAN adapter. The Service Tool (part number 9927-2636) can be downloaded from the Woodward website ([www.woodward.com](http://www.woodward.com)). The Woodward ToolKit service tool can be used to create configuration files which can then be loaded into other ProAct Gen 3 FLEX units off-line to save time when commissioning identical engine applications. Refer to manual 26915 for more detailed information.



- Extremely fast, bi-directional actuator, electronically positioned in both directions
- All-electric actuator requires no external drive or hydraulic supply
- Integral driver compatible with broad range of control systems
- 72.5° rotary output allows direct coupling to butterfly, eliminating linkage
- Multiple sizes to fit broad range of applications
- Single or redundant position command signals
- Highly flexible field wiring options
- Configurable parameters for tailoring to varied applications
- CAN communications
- Advanced diagnostics

## General Specifications

Actuator Model	Torque Output		Maximum Input Power		Maximum Current	
	Transient	Continuous	Transient	Continuous	Transient	Steady State
<b>Model II</b>	5.2 N•m 46 lb-in	2.6 N•m 23 lb-in	251 W	65 W	13 A	3.5 A
<b>Model III</b>	10.4 N•m 92 lb-in	5.2 N•m 46 lb-in	282 W	73 W	15 A	6.5 A
<b>Model IV</b>	20.8 N•m 184 lb-in	10.4 N•m 92 lb-in	370 W	100 W	20 A	6.5 A

## End User I/O Description

<b>Power Input</b>	18–32 Vdc with out-of-range diagnostics
<b>Command Input</b>	PWM: 4–32 V, 300 to 2000 Hz Analog: 0–25 mA, 0–200 mA, or 0–5 Vdc CAN
<b>Position Feedback Output</b>	0–25 mA or 0–5 Vdc
<b>Discrete Inputs (3)</b>	Low Power standby mode Four CAN address combinations using two of the inputs
<b>Discrete Output</b>	Normally "ON" turns "OFF" to indicate a detected fault. The logic can be reversed so it turns "ON" for a fault, or the function can be turned off completely.
<b>CAN 2.0B Communications</b>	Complies with SAE J1939 but uses proprietary group extensions. Supports position command signal and monitoring of all shutdown and alarm conditions as well as some system variables. The service tool communicates over either of the two CAN ports.

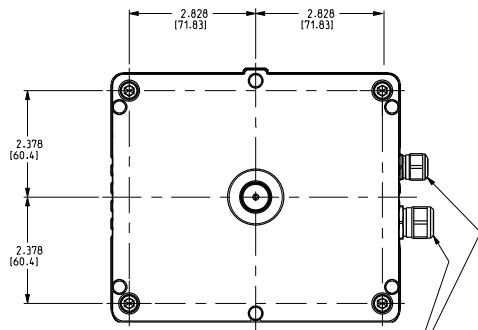
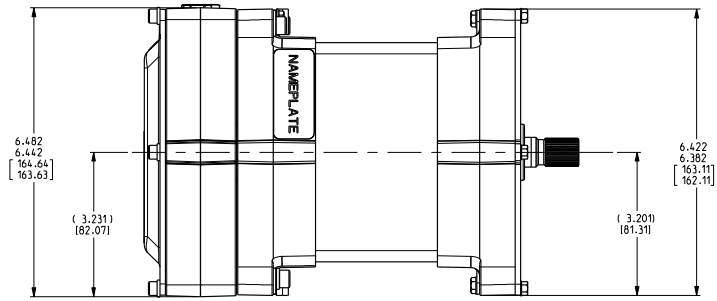
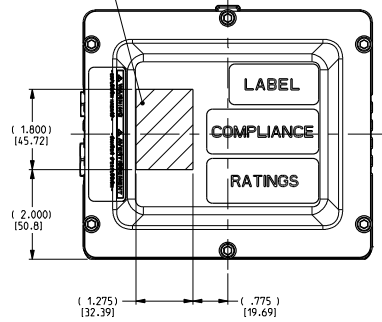
## Environmental Specifications

Specification Item	Acceptable Range or Qualification Condition	Comments
<b>Operating Temperature Limits</b>	–40 to +85 °C. Under all conditions the Temperature Monitoring Zone must remain below 90 °C.	See Mechanical Installation section of the product manual for discussion of this specification item.
<b>Storage Temperature</b>	–40 to +125 °C, unpowered.	
<b>Mechanical Vibration</b>	US MIL-STD-202F, procedure 214A: 0.1 G <sup>2</sup> /Hz, 10 Hz to 2000 Hz, 3 hr/axis, 12.8 Grms	
<b>Mechanical Shock</b>	US MIL-STD-810C, Method 516.3, 516.4 procedure 1, 40 G Peak, 11 ms sawtooth pulse	
<b>EMC Emissions</b>	EN 61000-6-4:2011, IACS UR E10 Rev 7 General Zone	
<b>EMC Immunity</b>	EN 61000-6-2:2005, IACS UR E10 Rev 7 General Zone, ISO 7637-2 Pulse 5a Alternator Load Dump	
<b>Ingress Protection</b>	IP66 per IEC 60529	
<b>Humidity</b>	12 hours at 95% RH, 60 °C and 7 hours at 85% RH, 25 °C with 5 hours of transition for 5 complete cycles	
<b>Chemical Resistance</b>	The actuator uses materials proven capable of withstanding normal engine environment chemicals per SAE J1455, such as diesel fuel, engine oil, & antifreeze.	

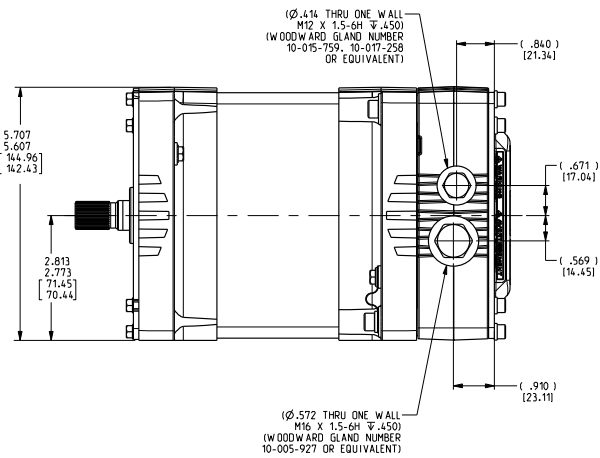
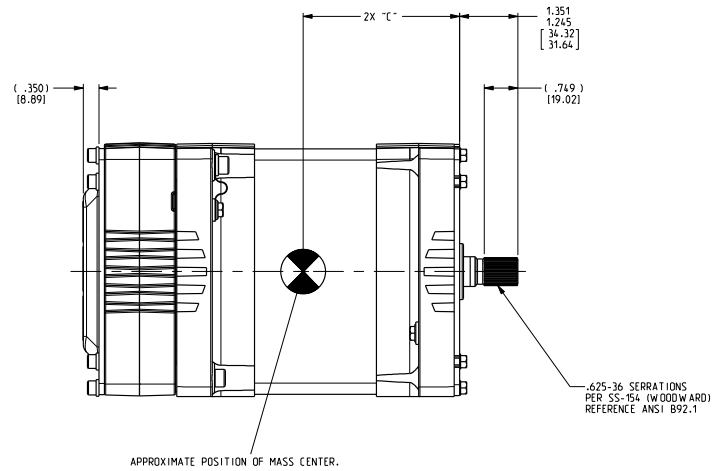
## Performance Specifications

Parameter	Specification
<b>Max Slew Rate (No Load)</b>	> 1000 degrees/second > 18.5 rad/s (10% to 90% travel)
<b>Position Feedback Accuracy</b>	< 1.3% (~ 0.98°) from –40 °C to 85 °C
<b>Position Feedback Repeatability</b>	< ±1.0% (~ 0.75°)

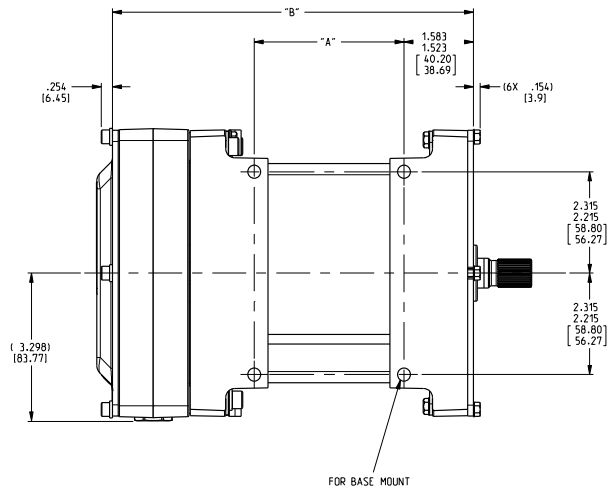
BLANK END COVER CAN BE MODIFIED TO ADD CUSTOMER CONNECTORS AS REQUIRED. CUSTOMER CONNECTOR(S) MUST FALL WITHIN THE HATCHED AREA (AFTER COVER MODIFICATION BY THE CUSTOMER). ALL WIRE ROUTING AND BEND RADIUS SHOULD BE MAINTAINED WITHIN 1.400 (35.56) MAX DEPTH WIRING POCKET.



OPTIONAL GLAND FITTINGS SHOWN IN THIS VIEW ONLY WHEN USING GLAND FITTINGS REFERENCE THE MANUAL FOR WIRE REQUIREMENTS AND RECOMMENDED INSTALLATION PROCEDURE.



UNITS = INCHES [MM]



PRODUCT CONFIGURATION TABLE

MODEL	DIMENSION "A"	DIMENSION "B"	REFERENCE INFORMATION	
			DIMENSION "C"	MASS (LB) (KG)
II	2.110-2.180 [53.59-55.37]	6.725-6.986 [171.82-177.44]	(2.9 [73.7])	21.7 [9.8]
III	3.310-3.380 [84.07-85.85]	7.925-8.186 [201.30-207.92]	(3.5 [88.9])	30.7 [13.9]
IV	5.760-5.830 [146.30-148.08]	10.375-10.636 [263.53-270.15]	(4.7 [119.4])	46.7 [21.1]

**ProAct Gen 3 FLEX Position Controller Outline Drawing**  
(Do not use for construction)

## Regulatory Compliance

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### European Compliance for CE Mark:

- EMC Directive: 2014/30/EU
- ATEX Directive: 2014/34/EU:  
Model II Zone 2 Ex ec IIC T3 Gc IP 54  
Model III and IV Zone 2 Ex ec IIC T4 Gc IP 54
- RoHS Directive: 2011/65/EU

### Other European Compliance:

- Machinery Directive as partly completed machinery (2006/42/EC)

### North America Listings:

- CSA Certified for Ordinary Locations
- CSA Certified for Hazardous Locations, Class I, Div 2, Groups A, B, C, D
- CSA Certified for Hazardous Locations, Class I, Zone 2, Category 3, Group II G:  
Model II AEx ec IIC T3 Gc IP 54  
Model III and IV AEx ec IIC T4 Gc IP 54
- For Use in Canada and the United States

### Marine Listings:

- DNV-GL, Lloyd's Register of Shipping.

### Other Compliance Available Upon Request

## Customer Electrical Connections

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The ProAct™ Gen3 FLEX is equipped with internal spring cage terminals for individual discrete wiring, or optionally with various configurations of external connectors. See manual 26915 for more details on the connection options available.



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