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Product Specification **03470** (Revision -, 8/2020)

ProAct[™] Gen 3 Position Controller Electric Actuators with Integral Driver

Applications

The ProAct[™] Gen 3 Position Controller 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 or 4 to 20 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) provides actual position indication, and a discrete input is available to force a low-power standby mode.

Additionally, the ProAct Gen 3 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). The Woodward ToolKit service tool can be used to create configuration files which can then be loaded into other ProAct Gen 3 units offline to save time when commissioning identical engine applications. Refer to manual 26914 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
- Configurable parameters for tailoring to varied applications
- CAN communications
- Advanced diagnostics

General Specifications

| e | Torque Output | | Maximum Input Power | | Maximum Current | |
|--------------|-----------------------|----------------------|------------------------|------------|-----------------|-----------------|
| Actuator Mod | Transient | Continuous | Transient | Continuous | Transient | Steady State |
| Model II | 5.2 N∙m 46 lb-in | 2.6 N•m 23 lb-in | 251 W | 65 W | 13 A | 3.5 A |
| Model III | 10.4 N∙m 92 lb-in | 5.2 N∙m 46 lb-in | 282 W | 73 W | 15 A | 6.5 A |
| Model IV | 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

| Power Input | 18–32 Vdc with out-of-range diagnostics | | |
|--------------------------|---|--|--|
| Command Input | PWM: 4–32 V, 300 to 2000 Hz Analog: 0–25 mA, or 0–5 Vdc CAN | | |
| Position Feedback Output | osition Feedback Output 0-25 mA | | |
| Discrete Inputs (5) | Discrete Inputs (5) Low Power standby mode Four CAN address combinations using two of the inputs | | |
| Discrete Output | 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. | | |
| CAN 2.0B Communications | 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 |
|---------------------------------|--|---|
| Operating Temperature Limits | –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. |
| Storage Temperature | -40 to +125 °C, unpowered. | |
| Mechanical Vibration | US MIL-STD-202F, procedure 214A: 0.1 G² /Hz, 10 Hz to 2000 Hz, 3 hr/axis, 12.8 Grms | |
| Mechanical Shock | US MIL-STD-810C, Method 516.3, 516.4 procedure 1, 40 G Peak, 11 ms sawtooth pulse | |
| EMC Emissions | EN 61000-6-4:2011, IACS UR E10 General Zone Rev 7 | |
| EMC Immunity | EN 61000-6-2:2005, IACS UR E10 General Zone, Rev 7 ISO 7637-2 Pulse 5a Alternator Load Dump | |
| Ingress Protection | IP66 per IEC 60529 | |
| Humidity | 12 hours at 95% RH, 60 °C and 7 hours at 85% RH, 25 °C with 5 hours of transition for 5 complete cycles | |
| Chemical Resistance | 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 |
|---------------------------------|---------------------------------------|
| Max Slow Rate (No Load) | > 1000 degrees/second |
| | > 18.5 rad/s (10% to 90% travel) |
| Position Feedback Accuracy | < 1.3% (~ 0.98°) from -40 °C to 85 °C |
| Position Feedback Repeatability | < ±1.0% (~ 0.75°) |

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| PRODUCT CONFIGURATION TABLE | | | | | | | |
|-----------------------------|-----------------------------|-------------------------------|-----------------------|----------------|--|--|--|
| MODEL | DIMENSION "A" | DIMENSION 707 | REFERENCE INFORMATION | | | | |
| | | DIMENSION B | DIMENSION "C" | MASS (LB) [KG] | | | |
| 11 | 2.110-2.180 [53.59-55.37] | 6.725-6.986 [171.82-177.44] | (2.9 [73.6]) | 22.0 [10.0] | | | |
| 111 | 3.310-3.380 [84.07-85.85] | 7.925-8.186 [201.30-207.92] | (3.5 (88.9)) | 31.0 [14.1] | | | |
| IV | 5.760-5.830 [146.30-148.08] | 10.375-10.636 [263.53-270.15] | (4.7 [119.4]) | 47.0 [21.3] | | | |
| | | | | | | | |

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

Regulatory Compliance

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

The ProAct[™] Gen3 is equipped with a 24-pin MS-style connector.



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Distributors & Service

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