

## FIN ACTUATOR

Three of these units are used in the Tomahawk Cruise Missile to actuate the fins. A brush-type DC motor drives case-hardened stainless steel gearing. A ball screw provides further mechanical advantage at high efficiency. A precision potentiometer, geared directly from the output hub, provides a position feedback signal. The fin is attached directly to the output hub of the actuator. Units go through environmental stress screening, consisting of temperature cycling, random vibration, and full stroke cycling. Performance requirements are extensive, including position accuracy, torque, speed, frequency and step response, and stiffness. Over 1500 actuators have been produced.

### TYPICAL MOTOR CHARACTERISTICS

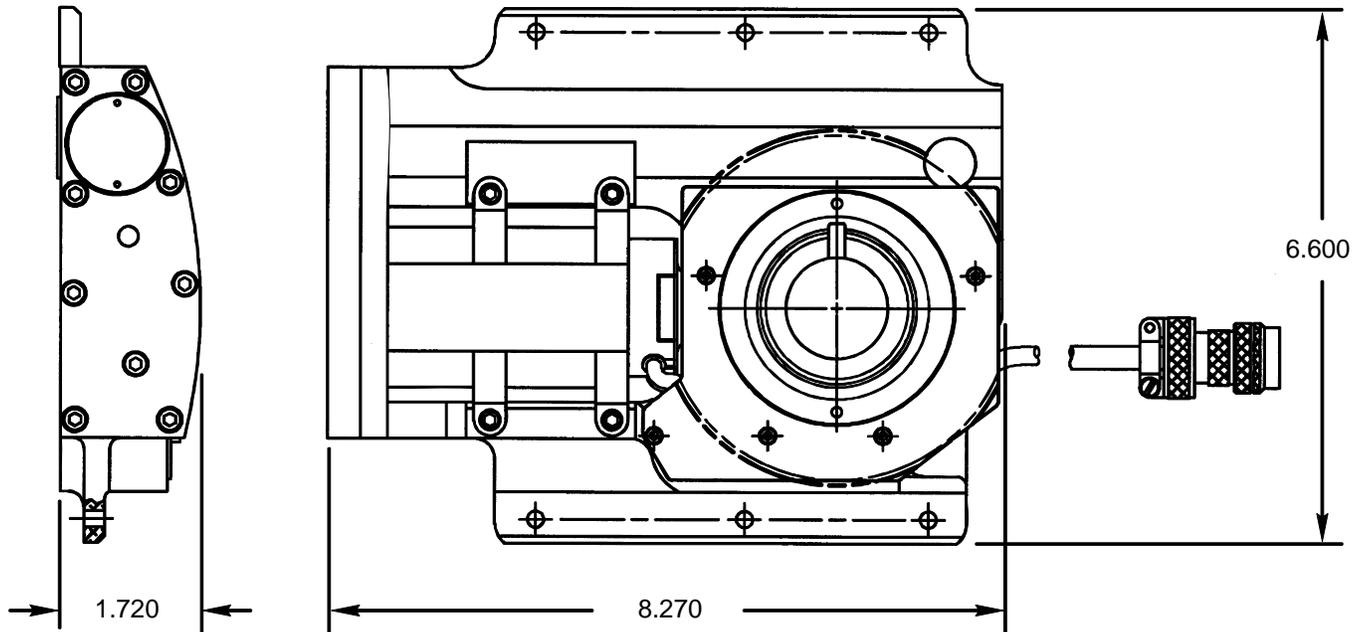
CHARACTERISTICS	UNITS	SYMBOL	VALUE
VOLTAGE	VOLTS DC	E	23.4
TORQUE SENSITIVITY (REF)	OZ-IN/AMP	K <sub>t</sub>	6.3
BACK EMF	VOLTS/KRPM	K <sub>e</sub>	4.7 ±10%
RESISTANCE	OHMS	R	0.42 ±10%
INDUCTANCE (REF)	mH	L	0.38
PEAK TORQUE (CURRENT LIMITED) (REF)	OZ-IN	T <sub>P</sub>	101
PEAK CURRENT (REF)	AMPS	I <sub>P</sub>	16
RATED TORQUE (MIN)	OZ-IN	T <sub>r</sub>	74.5
RATED SPEED (MIN)	RPM	ω <sub>r</sub>	3300
NO LOAD SPEED (REF)	RPM	ω <sub>nl</sub>	4700
ROTOR INERTIA (REF)	OZ-IN-SEC <sup>2</sup>	J	0.0028

### TYPICAL ACTUATOR CHARACTERISTICS

CHARACTERISTIC	UNITS	SYMBOL	VALUE
WEIGHT (MAX)	POUNDS	W <sub>T</sub>	7.5
RATED TORQUE (REF)	IN-LBS	T <sub>r</sub>	950
RATED SPEED (MIN)	DEG/SEC	ω <sub>r</sub>	70
NO LOAD SPEED (MIN)	DEG/SEC	ω <sub>nl</sub>	95
RATIO-MOTOR TO OUTPUT (MID STROKE)	-	N <sub>m</sub>	251:1
RATIO-POTENTIOMETER TO OUTPUT	-	N <sub>p</sub>	8.267:1
PEAK TORQUE (MIN)	IN-LBS	T <sub>P</sub>	1300
ROTARY INERTIA	IN-LB-SEC <sup>2</sup>	J	13.9

### TYPICAL POTENTIOMETER CHARACTERISTICS

CHARACTERISTIC	UNITS	SYMBOL	VALUE
VOLTAGE	VOLTS DC	E	±5
RESISTANCE	OHMS	R	1000
SCALE FACTOR (AT ACTUATOR OUTPUT)	VOLTS/VOLT/DEG	-	0.024314



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For additional information on this product or any other product listed above please contact Kearfott's Marketing Department at:

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