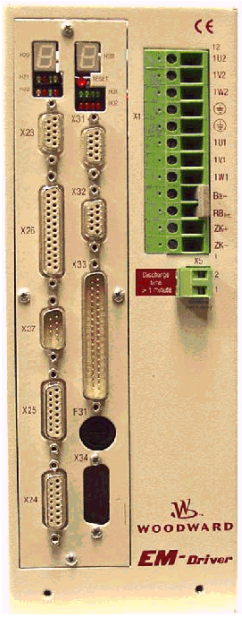
EM-80 and EM-300 Actuators

All-Electric Actuator System



- Fast slew times
- Freely programmable
- Brushless servomotor and resolver
- Precision gearbox, high stiffness, low backlash
- CE marking
- Models with ABS, BV, and DNV certification
- Cost effective solution

Applications

The EM-80 and EM-300 are intended to be mounted on large diesel, gas, and gasoline engines, and on all types of turbines, to control the position of engine fuel racks, turbine fuel valves, turbine and turbocharger variable geometry, and to handle timing control. These systems are well suited for engines without a mechanical drive or hydraulic oil supply.

Description

The EM-80 and EM-300 are all-electric actuator systems that provide 40 degrees of actuator output rotation. Each system consists of a three-phase brushless ac motor which drives a high-precision planetary reduction gear box. A dedicated driver controls the actuator position and allows monitoring of most features.

PC/Windows based software facilitates the system setup. The EM-80 and EM-300 are freely programmable to meet many customer requirements.

Specifications

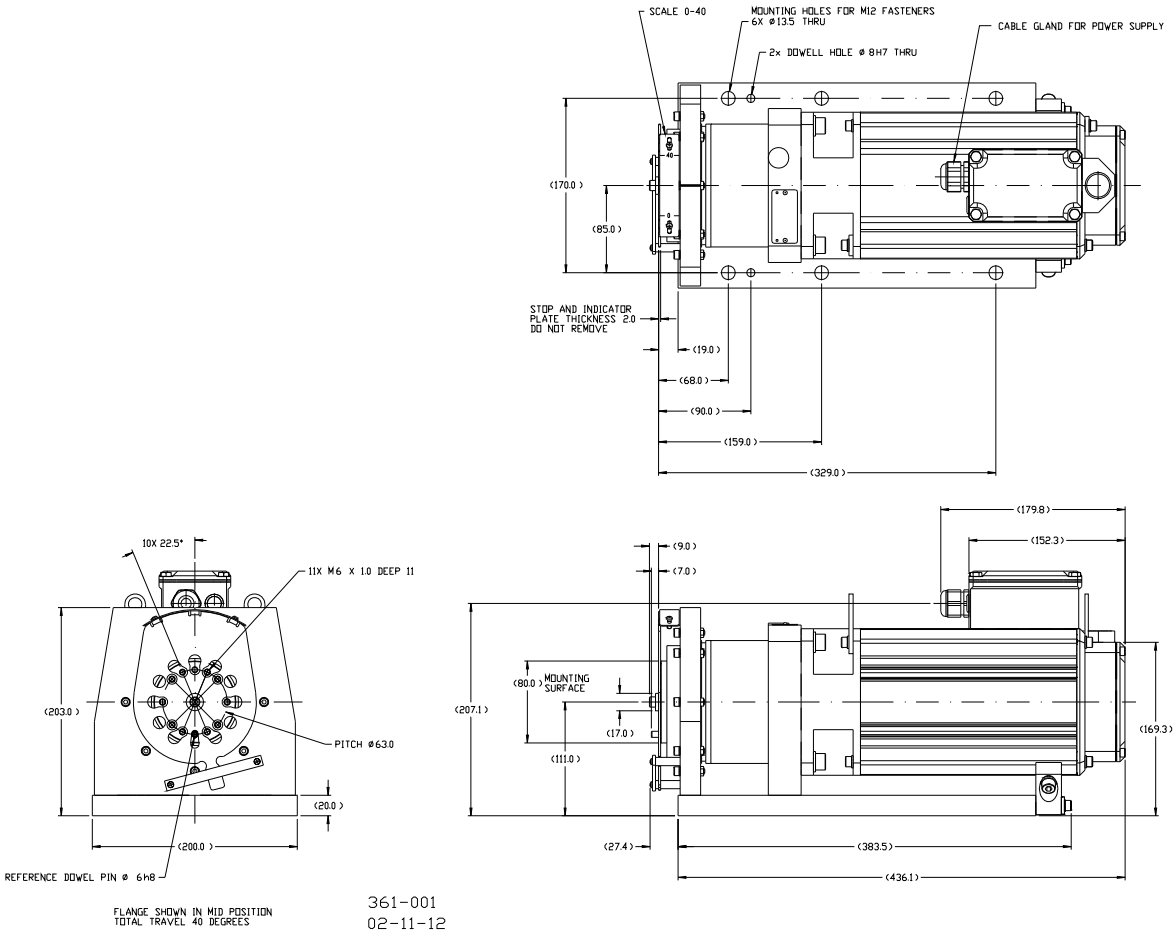
General Specifications	EM-80	EM-300
Nominal Torque Output (continuous) *	91 N·m (67 lb-ft)	260 N·m (192 lb-ft)
Maximum Torque Output (1 second max)	190 N·m (140 lb-ft)	429 N·m (316 lb-ft)
Nominal Work Output (continuous), 40° Travel *	64 J (47 ft-lb)	182 J (134 ft-lb)
Maximum Work Output (1 second max), 40° Travel	133 J (98 ft-lb)	299 J (221 ft-lb)
10–90% Slew Time	78 ms with no load	192 ms with no load

Actuator Specifications	EM-80	EM-300
Output Travel	0–40°, no internal mechanical stops	0–40°, no internal mechanical stops
Storage Temperature Range	–30 to +100 °C (–22 to +212 °F)	
Ambient Temperature Working Range	0 to +85 °C (+32 to +185 °F)	
Mounting	Engine mounted. Actuator can be mounted in any orientation within 45° of horizontal using the actuator bracket.	
Vibration	Random: 0.01 G²/Hz at 10 Hz, 0.1 G²/Hz at 100 Hz, 0.1 G²/Hz at 1000 Hz, 0.05 G²/Hz at 2000 Hz (12.8 Grms) 3 hours per axis.	
Shock Qualification Testing	MS1—40 G 11 ms sawtooth	
Humidity Qualification Test	55 °C (131 °F), 95% RH for two days at one cycle per day	
Approximate Weight (including bracket)	35 kg (77 lb)	38 kg (84 lb)

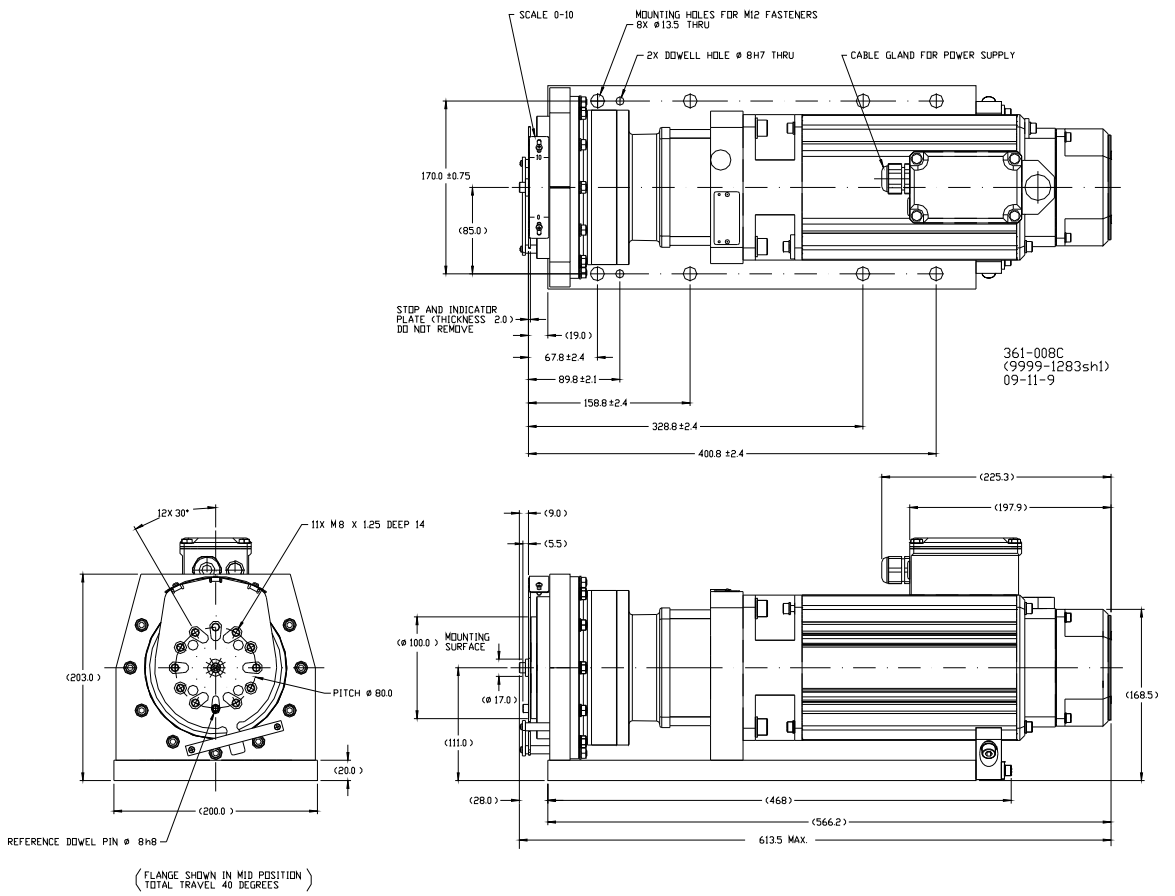
Driver Specifications	
Power Supply	3-phase, 400–480 Vac, 50–60 Hz
Rated Input Current	16 A
Maximum Output Current	24 A
Steady State Output Current	12 A at 45 °C *
Power Supply, PLC	24 V ±10% (55 W max)
Control Input	4–20 mA, 1–5 V
Position Output	0–5 V
Storage Temperature Range	–30 to +70 °C (–22 to +158 °F)
Ambient Temperature Working Range	0 to +55 °C (+32 to +131 °F)
Relative Humidity	up to 85% (no condensation)
Site Altitude	Below 2000 m (6500 ft)
Ingress Protection	IP20 per IEC529
Mounting	The driver box is designed for installation in a control cabinet and should not be installed directly on the engine.
Weight	7 kg (15 lb)
Cabling	Two cables are required between driver and actuator. Power supply cable—3-phase: standard plus protective earth Position sensor cable—The maximum length between driver and actuator is 100 m (328 ft).
Filter	An EMI filter is added to the power supply to suppress emissions.

* Continuous torque and work output is limited for actuator ambient environments over 40 °C. See product manual for a complete derating schedule.

Technical Manual	36173



EM-80 Actuator Outline Drawing



EM-300 Actuator Outline Drawing
(Do not use for construction)

Regulatory Compliance

Low Voltage Directive	73/23/EEC
ABS Certification	EM-80 Actuator 8256-XXX EM-80 Driver 3522-XXXX EM-300 Actuator 8256-XXX EM-300 Driver 3522-XXXX
BV Certification	EM-80 Driver 3522-XXXX EM-300 Driver 3522-XXX EM-80 Actuator 8256-308 EM-300 Actuator 8256-310
DNV Certification	Drivers 3522-1004 through 3522-1012 EM-80 and EM-300 Actuators 8256-308 & 8256-310

Features

The actuator output is an ISO 9409 flange. This allows for easy mounting of levers to simplify replacement. The orientation of the output flange relative to the bracket base is the same for each actuator. Additionally, the actuators are equipped with break-away stops that prevent the actuator from exceeding the maximum output travel range during setup. An output position indicator is standard.

The EM-80 and EM-300 systems include a mounting bracket with hole pattern. The bracket design ensures that stresses in the actuator are reduced to a minimum. Actuator specifications and performance are based on a system including bracket.

The actuators are equipped with a flying-lead position-sensor cable (including connector). A position sensor cable connecting the actuator and the driver is available. This cable is similar for both the EM-80 and the EM-300.

A single EM-driver is used for both the EM-80 and the EM-300. Only the software setup for each actuator system differs. Monitoring, alarm, and diagnostics are available.

An EMI power filter is supplied to suppress emissions.

Optional Features

The EM-80 and EM-300 systems include a bracket for mounting on the engine or turbine. A standard mounting hole pattern is provided. Alternative patterns are available on request.

WOODWARD

PO Box 1519, Fort Collins CO, USA 80522-1519
1000 East Drake Road, Fort Collins CO 80525
Tel.: +1 (970) 482-5811 ◆ Fax: +1 (970) 498-3058
www.woodward.com

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