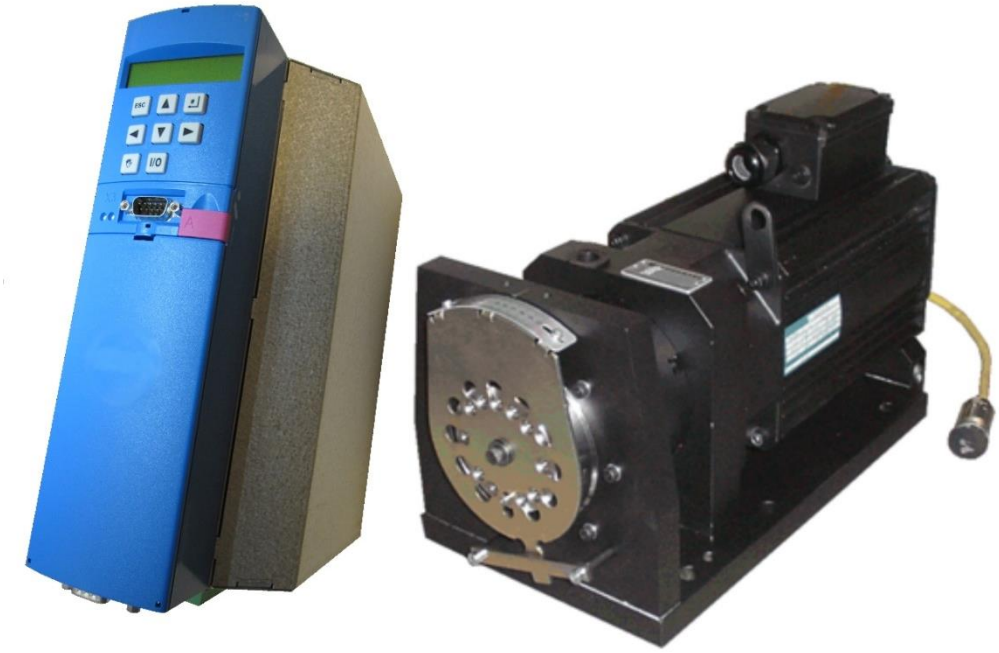
WOODWARD

Product Specification **03420**
(Revision B, 9/2017)

EM-80/EM-300 MDS 5150A/LIT Actuator System



- Fast slew times
- Brushless servomotor and resolver
- Precision gearbox, high stiffness, low backlash
- CE marking
- Models with ABS, BV, Lloyd's Register, and RMRS certifications
- Cost-effective solution

Applications

The EM-80 and EM-300 all-electric actuators provide precision, high-torque rotary positioning without using a mechanical drive or hydraulic oil supply from the engine. This actuator system is intended to be mounted mainly on large diesel and gas engines to control the position of engine fuel racks. While less common an application, they may also be used on various types of turbines to control turbine fuel valves, turbine and turbocharger variable geometry, and to handle timing control.

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.

The EM driver controls the EM-80/-300 actuator position and consists of a power board and a controller in one enclosure. The driver is a programmable digital controller to accommodate custom 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

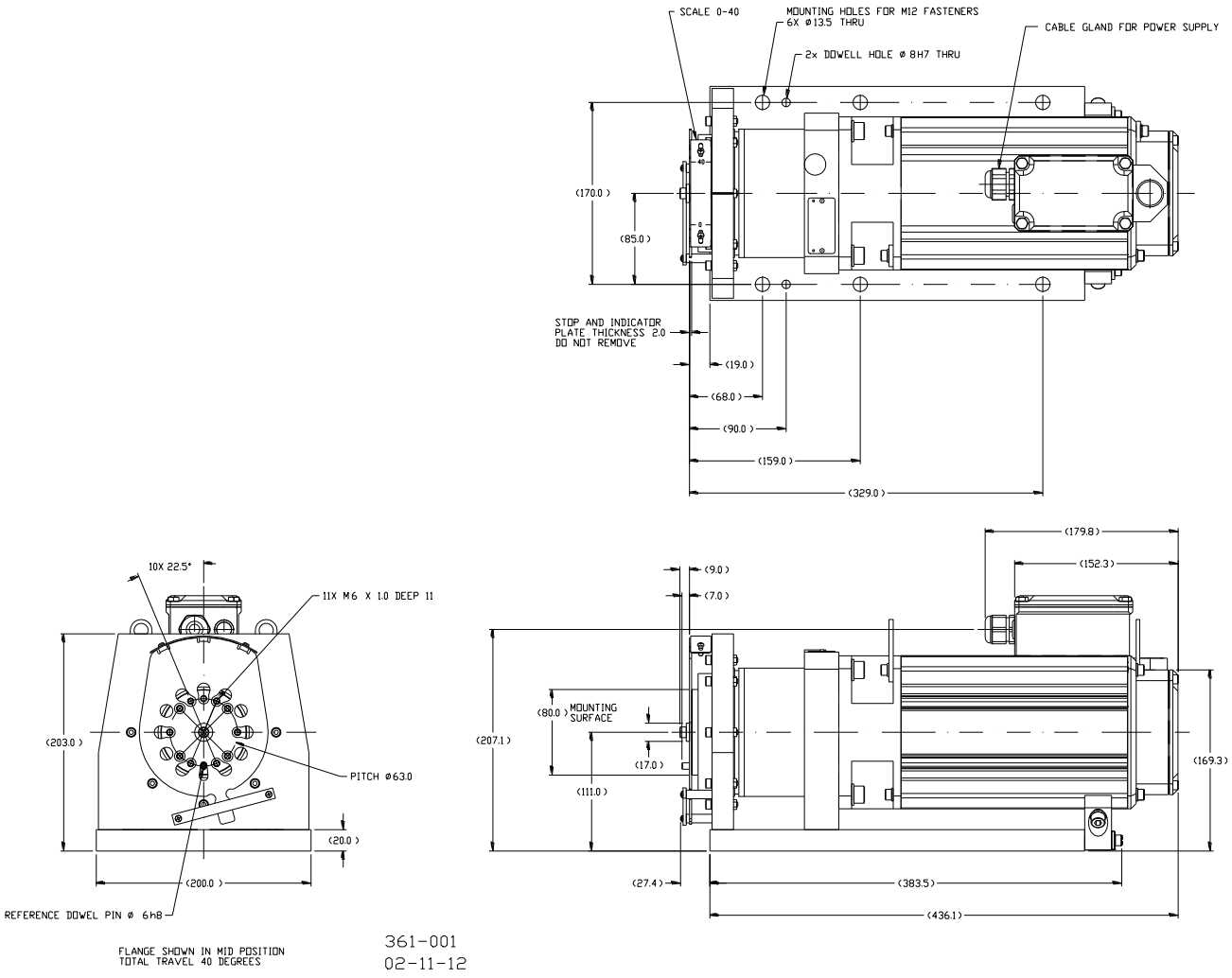
Actuator Specifications	EM-80	EM-300
Output Travel	0–40°, no internal mechanical stops	0–40°, no internal mechanical stops
Storage Temperature Range	–30 to +100 °C (–22 to +212 °F)	
Ambient Temperature Working Range	0 to +85 °C (+32 to +185 °F)	
Mounting	Engine mounted. Actuator can be mounted in any 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 Power redundancy: 1-phase, 230 Vac, 50–60 Hz
Rated Input Current	20 A
Redundant Power	Single-phase, 230 Vac, 50 A, 50–60 Hz (This power can only be used for temporary power outage recovery and cannot be used for normal operation.)
Low Voltage Power Supply	24 V ±10% (55 W max)
Control Input	4–20 mA
Position Output	1–5 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 IEC60529
Pollution Degree	2
Overvoltage Category	III
Mounting	The driver box is designed for installation in a control cabinet and should not be installed directly on the engine.
Weight	3.8 kg (8.4 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 can be added to the power supply to suppress emissions (filter not recommended for 'IT' grounding schemes).

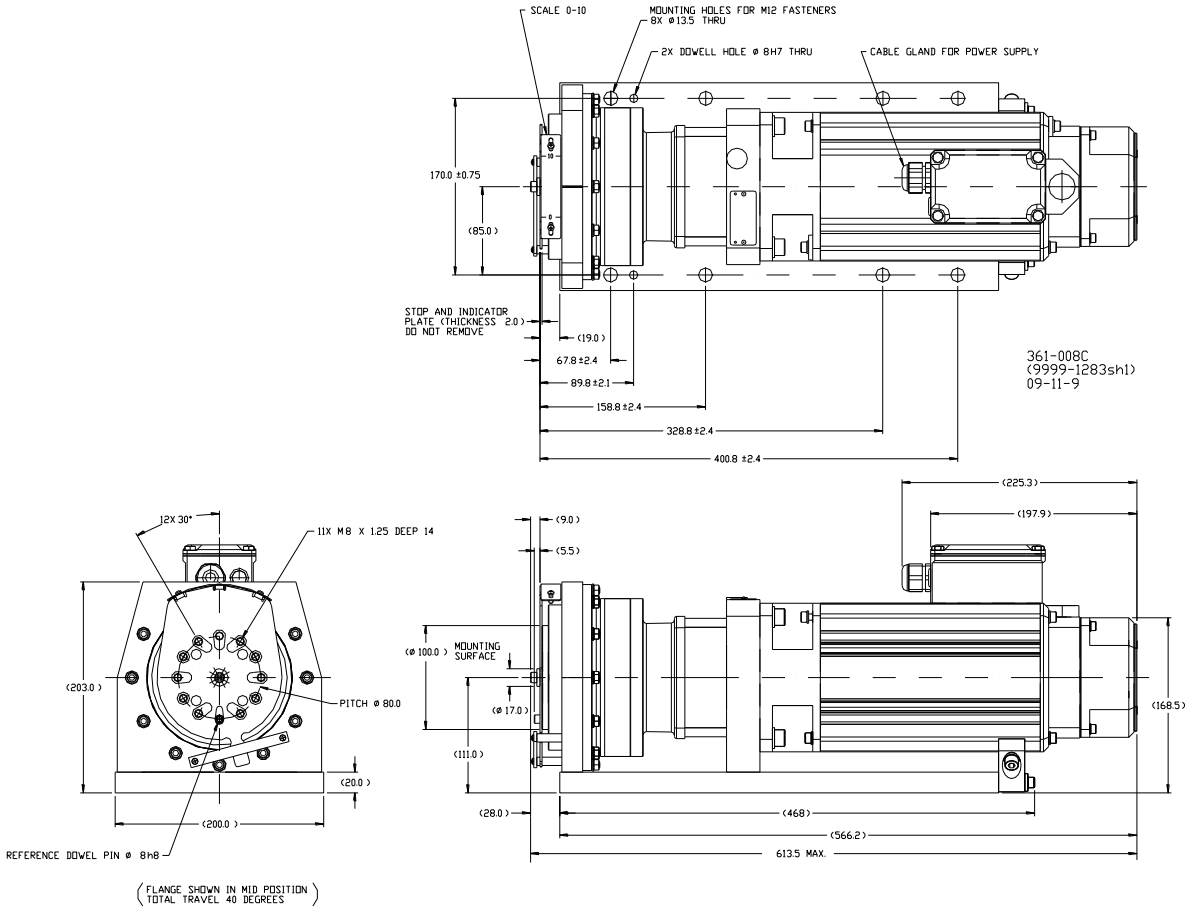
(*) Continuous torque and work output is limited for actuator ambient environments over 40 °C. See product manual 26761 for a complete derating schedule.

Regulatory Compliance

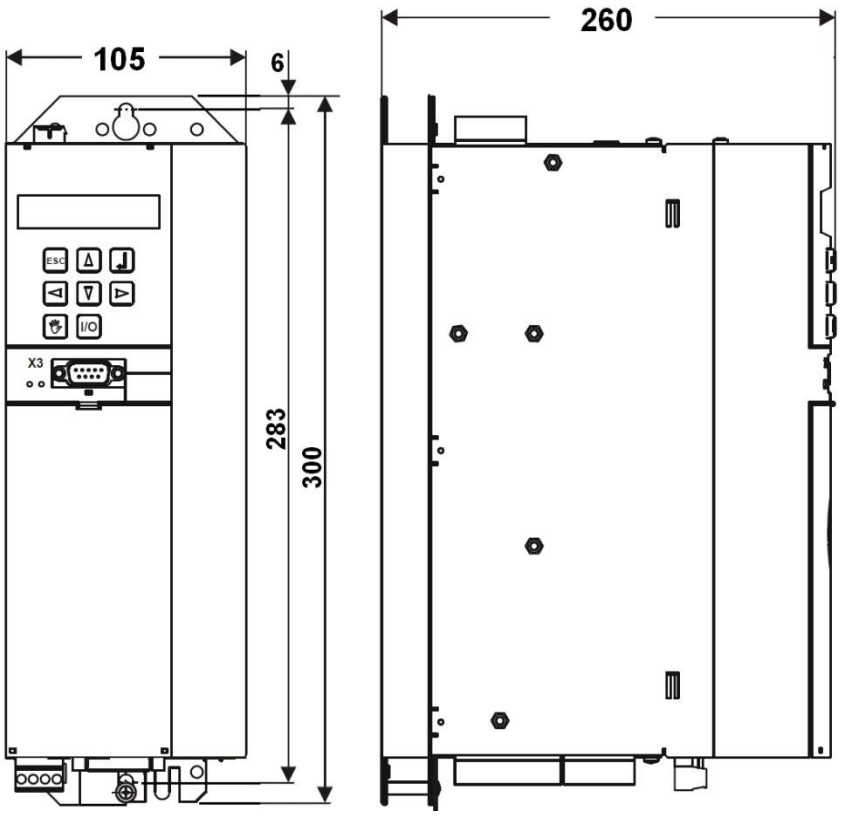
European Compliance:	Low-Voltage Directive 2014/35/EU EMC Directive 2014/30/EU
American Bureau of Shipping (ABS)	Part 1 – 2015Steel Vessels Rules 1-1-4/7.7, 1-1-A3, 1-1-A4 and 2015 Offshore Units and Structures 1-1-4/9.7, 1-1-A2, 1-1-A3, which covers the following: Mobile Offshore Drilling Units 2015: 4-3-1/15, 17.1
Bureau Veritas (BV)	Rules for Classification of Steelships – January 2013 Part C, Machinery, Electricity, Automation and Fire Protection, Part C, Chapter 3, Section 6
Lloyd's Register (LR)	Lloyd's Type Approval System – Test Specification No. 1, 2002. EM-80/-300 Driver: ENV2 EM-80/-300 Actuator: ENV4
Russian Maritime (RMRS)	Russian Maritime Register of Shipping – Section 10, Part IV, RS Rules for Technical Supervision, during Construction of Ships and Manufacture of Materials and Products for Ships, 2012. Code of Nomenclature: 15100105



EM-80 Actuator Outline Drawing



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



Driver Outline Drawing (all dimensions in mm)

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 breakaway 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 an installation that includes the 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 actuators include a bracket for mounting on the engine or turbine. A standard mounting hole pattern is provided. Alternative patterns are available on request.

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Woodward has company-owned plants, subsidiaries, and branches, as well as authorized distributors and other authorized service and sales facilities throughout the world. Complete address / phone / fax / email information for all locations is available on our website.

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