

# LOW TEMPERATURE RANGE SMARTMOTOR™ (SM17205M-LTR)

Engineered for robust and reliable operation in harsh environments and high altitudes



The Moog Animatics Low Temperature Range (LTR) SmartMotor™ is available in a standard NEMA 17 frame size, model SM17205M-LTR (the “LTR-17”). This motor has been engineered for robust and reliable operation in extremely frigid environments and at high altitudes.<sup>[1]</sup>

To achieve this, onboard internal heaters ensure that the motors can start up in temperatures below -40 degrees C. Along with this, other design changes allow these motors to withstand random vibrations up to 6 G RMS, 10 - 2000 Hz, and standard IP sealing protects the motors from condensation.<sup>[2]</sup>

The LTR-17 motor allows you to have SmartMotor™ capability in a fully integrated, IP sealed package specifically designed for extremely low temperature and high altitude applications.

## Features:

- NEMA 17 size
- Designed for operation with extreme temperatures, vibrations and high altitude
- IP62 high altitude operation
- Low temp startup with onboard heater to raise circuit temperature from -65 to -40 °C
- Magnetic, single turn absolute encoder
- Four 5 V TTL sourcing inputs
- RS-422 differential communication
- FAA approved, click-fit connector
- Non-RoHS

<sup>[1]</sup>For RoHS exempt applications only – the LTR motors contain lead-based solder on some internal components to achieve increased reliability over greater thermal ranges.

<sup>[2]</sup>IP sealed only when mounted to an equivalently sealed mating component.

## ADVANTAGES

- Extreme low temperature startup through onboard heater
- Protection against condensation through standard IP sealing
- High altitude operation ensured through proprietary design and testing
- Ease of programming through powerful AniBasic (BASIC-like) language with over 200 commands
- Minimal cabling and space requirements due to fully integrated design
- Ability to solve difficult application problems through field-proven Class 5 features

## APPLICATIONS

- Aerospace motion actuation where high altitude and low temperature are factors
- Motion requirements in arctic regions
- Pan and tilt solar collectors
- High altitude surveillance cameras
- Refrigerated food and pharmaceutical processing
- Wind tunnel testing in extreme temperatures
- Cryogenic containment handling
- Cold thermal test chambers
- Nozzle/valve flow for coolers
- Ice handling systems

# SPECIFICATIONS

## TECHNICAL DATA

<b>Continuous torque (up to 4500 rpm)</b>	36	oz-in
	0.25	N-m
<b>Peak torque at stall</b>	66	oz-in
	.47	N-m
<b>Nominal continuous power (@ 5500 rpm)</b>	135	watts
<b>No load speed</b>	7,200	rpm
<b>Motor constant</b>	7.3	oz-in/(watts) <sup>5</sup>
<b>Rotor inertia</b>	21.7	(oz-in-sec <sup>2</sup> ) x10 <sup>-4</sup>
<b>Weight</b>	0.6	lb
	0.27	kg
<b>Shaft diameter</b>	0.20	in
	5.08	mm
<b>Shaft, radial load</b>	7	lb
	3.17	kg
<b>Shaft, axial thrust load</b>	3	lb
	1.36	kg
<b>Maximum continuous current (@ 6000 rpm)</b>	3.6	amps
<b>Peak power (@ 5100 rpm)</b>	155	watts
<b>Torque sensitivity (K<sub>t</sub>)</b>	8.8	oz-in/amp
<b>Voltage constant (K<sub>e</sub>)</b>	6.51	volts/krpm
<b>Terminal resistance (R<sub>T</sub>)</b>	1.44	Ohms
<b>Terminal inductance (L<sub>T</sub>)</b>	1.4	mH

Storage temperature -65 to +85 °C.

Normal operating temperature -55 to +70 °C.

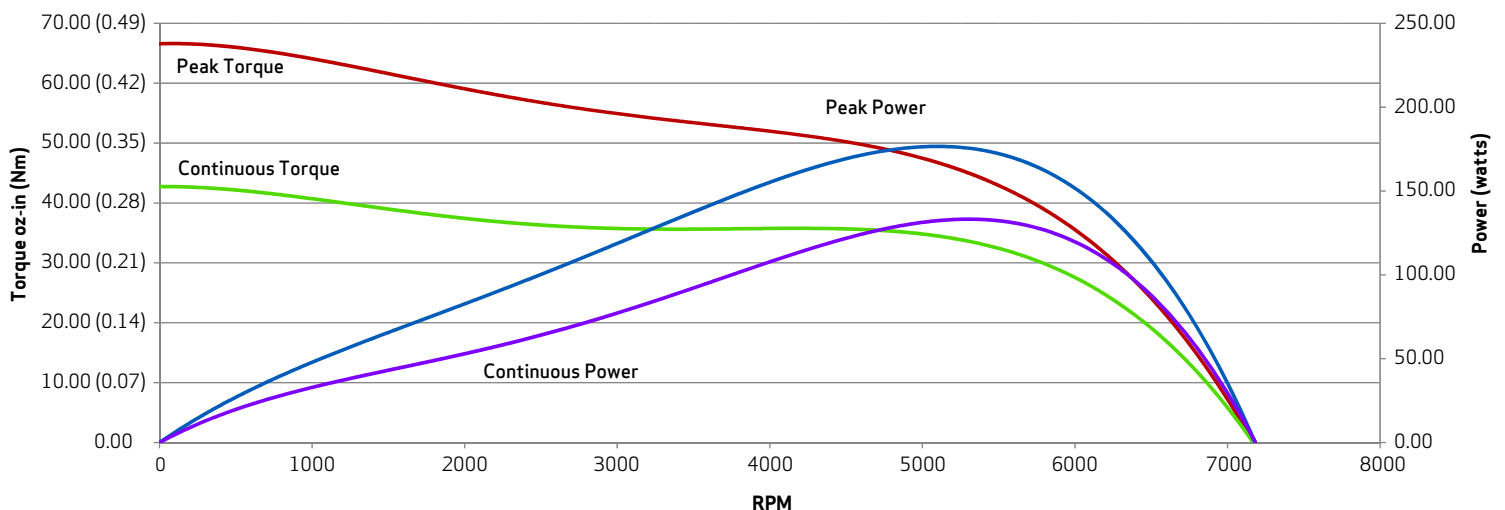
External power or heater must bring temperature up to at least -40 °C for startup from cold.\*

\*Consult manual found on the website for more details.

**⚠ Warning: This product contains lead-based solder on some internal components.**

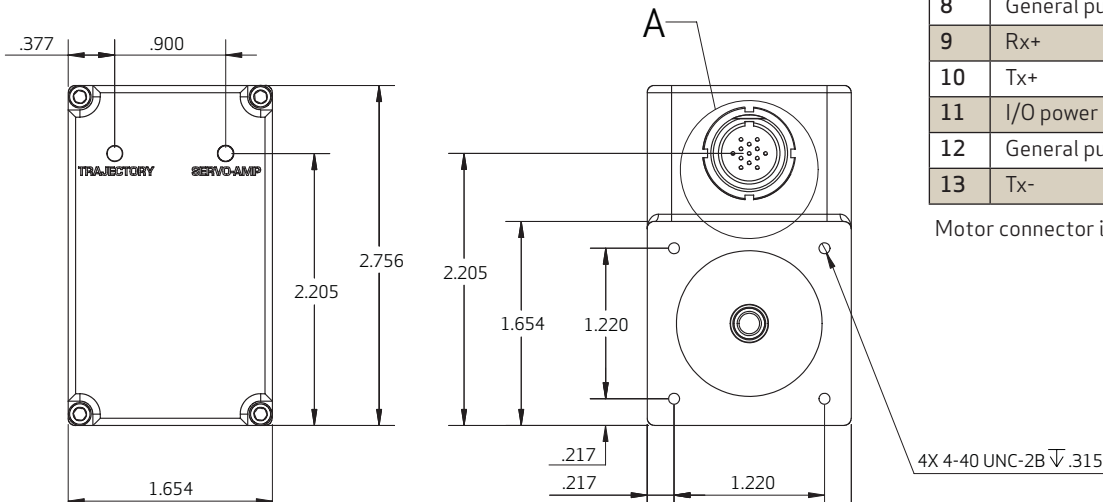
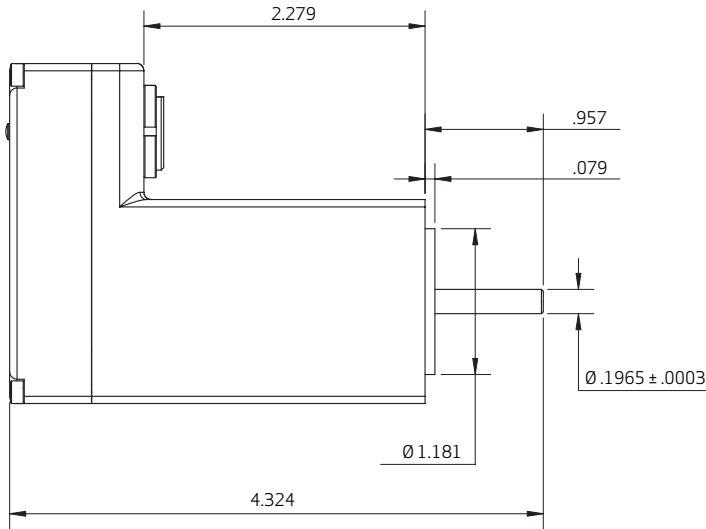
## PERFORMANCE TORQUE AND POWER CURVE

SM17205M-LTR motor torque versus speed, 48 volts, MDT commutation, 25 °C ambient (curves are derated at higher ambient).



# SPECIFICATIONS

## OUTLINE DRAWING



Dimensions are in inches

## CONNECTORS

Pin	Signal
1	+48V motor power in
2	Motor power return (common)
3	Rx-
4	Heater power return
5	+48V heater power in
6	General purpose I/O 2
7	General purpose I/O 1
8	General purpose I/O 0
9	Rx+
10	Tx+
11	I/O power return (common)
12	General purpose I/O 3
13	Tx-

Detail A

Motor connector is Glenair® model 804-005-07M8-13PA.

Moog has offices around the world. For more information or the office nearest you, contact us online.  
[mcg@moog.com](mailto:mcg@moog.com)

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SM17205M-LTR SmartMotor™ Technical Data Sheet  
 MA1026 09/18

For product information, visit  
[www.animatics.com](http://www.animatics.com)

This technical data is based on current available information and is subject to change at any time. Specifications for specific systems or applications may vary.

