

Allied Motion (Emoteq)  
10002 E 43rd St  
Tulsa, OK 74146-3638  
USA  
(918) 627-1845

We would like to purchase 7 units of Emoteq QB02303 motors, each with the following specifications.

- Custom windings (see included spec sheet from 09-March-2012)
- Thermistors (one on each phase of the winding)
  - Datasheet URL:  
[http://www.epcos.com/inf/50/db/ntc\\_09/MiniSensors\\_B57861\\_S861.pdf](http://www.epcos.com/inf/50/db/ntc_09/MiniSensors_B57861_S861.pdf)
  - Series #:B57861S
  - MFG part number: B57861S0103F040
  - Digikey Part Number: 495-2142-ND
- Hall effect sensors
- Output shaft diameter:  $0.3745^{+0.0030}_{-0.000}$
- 2500 Linecount Encoder

This document consists of 5 total pages: This cover sheet, Emoteq quote CR-6783-040412, and three pages of the SPEED simulation winding specification.

Please feel free to contact us at any time via Email ([jonathan.hurst@oregonstate.edu](mailto:jonathan.hurst@oregonstate.edu)) or phone (541-791-7171).

Our shipping address is as follows.

Attn: Jonathan Hurst  
Dynamic Robotics Laboratory  
Oregon State University  
204 Rogers Hall  
Corvallis, OR 97330

Thank you –  
Jonathan Hurst  
Jesse Grimes



Quote No.: CR-6783-040412

Date: 4/4/2012

Name: Jesse Grimes  
Company: Oregon State University  
Address: 204 ROGERS HALL  
Address:  
City, State, Zip: CORVALLIS, OR 97331  
Country: USA

Phone:  
E-mail: [grimesje@onid.orst.edu](mailto:grimesje@onid.orst.edu)

FOA: EE  
NAICS:

					Currency: USD	
Item	Part Number	Cust. P/N	Description	Qty	Price	Total
1	QB02303-X0X-HE		Emoteq Housed Quantum Series Servo Motor	1	\$ 889.00	\$ 889.00
			Custom Winding, w/ encoder and	6	\$ 889.00	\$ 5,334.00
			customer supplied thermal sensor	7	\$ 889.00	\$ 6,223.00
			DESIGN DATE: 03/09/2012	10	\$ 889.00	\$ 8,890.00

Payment terms: Net 30 Days  
INCOTERMS: Ex-Works Tulsa, Oklahoma, USA  
Delivery: 6 to 8 weeks after receipt of Purchase Order or customer-supplied parts if applicable. Please contact Emoteq for expedited delivery requests.  
Validity: This quotation is valid for 30 days. All items quoted and ordered must be scheduled for delivery within 12 months from date on Purchase Order.  
Acceptance: Purchase Orders for items on this quotation are subject to Contract and Design Review prior to acceptance.  
Surcharges: Material and / or energy surcharges may be applied at time of product shipment.  
ITAR: Emoteq Corporation is registered with, and complies with, the United States of America's Export Compliance Regulations under International Trade in Arms Regulations (ITAR).

Iris Fernandez  
Customer Service Representative  
Phone: (918) 627-1845  
E-mail: [am-tul-csr@alliedmotion.com](mailto:am-tul-csr@alliedmotion.com)



SIZE CONSTANTS \*\*

Parameter	Symbol	Unit	VALUE
Maximum Rated Torque	Tr	ozin Nm	2146.336 15.156
Maximum Continuous Stall Torque @Temperature Rise 100.000 °C	Tc	ozin Nm	214.591 1.515
Motor Constant [Sqw. drive]	Km	ozin/sqrt.w Nm/sqrt.w	28.352 0.200
Electrical Time Constant	Te	msec	1.463
Mechanical Time Constant	Tm	msec	0.785
Angular Acceleration (theoretical)		rad/sec <sup>2</sup>	341992.892
Thermal Resistance *	TPR	°C/watts	1.260
Maximum Cogging Torque	Tf	ozin Nm	6.300 0.044
Viscous Damping (Infinite Source Impedance)	Fi	ozin/rpm Nm/rpm	1.562E-03 1.103E-05
Hysteresis Drag Torque	Th	ozin Nm	1.892 0.013
Rotor Inertia Frameless	Jm	ozins <sup>2</sup> kg.m2	4.453E-03 3.145E-05
Motor Weight Frameless	Wt	oz kg	36.077 1.023
Rotor Inertia Housed	Jm	ozins <sup>2</sup> kg.m2	4.522E-03 3.193E-05
Motor Weight Housed	Wt	oz kg	52.717 1.495
No. of Poles		P	6

\* TPR Assumes motor mounted to aluminium heat sink  
 8.000 8.000 0.250 inches ( Still air)  
 \*\* @ Ambient Temperature , 25.000°C

Winding Constants \*

Parameter	Symbol	Unit	VALUE
Design Voltage	Vp	volt	50.000
Peak Torque, +/-25%	Tp	ozin Nm	1546.603 10.921
Peak Current, +/-15%	Ip	ampere	59.513
Torque Sensitivity +/-10%	Kt	ozin/amp Nm/Amp	25.988 0.184
No Load Speed	Sn1	rpm rad/sec	2410.686 252.446
Voltage Constant +/-10%	Kb	v/Krpm v/rad/sec	19.218 0.184
Terminal Resistance +/-12%	Rm	ohms	0.840
Terminal Inductance +/-30%	Lm	mH	1.229

\* Performance @ 25.000°C  
RMS TORQUE PERFORMANCE

Design Voltage	Vp	volt	50.000
Continuous Power Output @	Power	watt	142.073
		Horsepower	0.191
Temperature Rise: 100.489°C	Torque	ozin	192.124
COOLING : { Still air}		Nm	1.357
Ambient temperature 25.000°C	Speed	rpm	1000.000
	Iphase	A [peak]	8.320
	I (dc-link)	amperes	4.437
	Efficiency	%	64.047

No. Of Phases	3	
Phase Connection	DELTA	
Lead Wire Gage	20 AWG	
Lead Wire Length	12.000 inch	304.800 mm
No. Of Poles	6	

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HOUSED :	MOTOR COOLING : (	Still air)
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Motor Length	5.050 inch	128.270 mm
Motor OD	2.300 inch	58.420 mm
Shaft OD	0.375 inch	9.525 mm
Shaft Length (Total)	6.320 inch	160.528 mm

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