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Electric motor performance data for CMA range

Introduction

This guide provides CMA actuator range motor data at 25 °C ambient temperature for the following power supply voltages:

1-Phase 50 Hz / 60 Hz	110 VAC
	115 VAC
	120 VAC
	208 VAC
	220 VAC
	230 VAC
	240 VAC
DC	24 VDC Only

Note: Supply voltage tolerance +/- 10%. Supply frequency tolerance +/- 5%

For AC supplies, the CMA uses a linear power supply to convert to 24 VDC. This voltage is used to feed the main control electronics and DC brushless motor.

Design criteria

The CMA utilises a special brushless DC motor, developed for high efficiency, continuous S9 / Class D rated unrestricted modulation. Using a brushless DC motor enables the actuator to perform the high modulation duty for millions of operations with minimal wear.

CMA motor design

CMA motors are of a low inertia, brushless 24 VDC permanent magnet type and are class F insulated.

CMA motor control protection

The primary protection for the motor is the current sensor capabilities which monitors the amount of current being supplied to the motor. The maximum rating is the current that the actuator can accept, without blowing its transformer. Using this method and comparing the value to the load limits set in the configuration, effective motor and more importantly valve protection is achieved. Thermostats in the motor also protect the motor from overheating, although the likelihood of this happening is remote due to the high modulation design.

The use of load and temperature protection along with the sophisticated motor position control eliminates the need for traditional protection methods normally used for industrial motors.

Power supply cable sizing

As a minimum requirement, cables must be sized to ensure the volt drop does not exceed 10% of nominal supply voltage at rated load.

Fuse selection

Due to the unique nature of the motor duty and taking into account the comprehensive control protection of the CMA, sizing of fuses should be based upon protecting the power cable to the actuator.

Frequency converter and UPS

Where UPS systems are required, the power supply should have negligible harmonic distortion. In general terms actuators are designed to operate on power supplies conforming to recognised power supply standard such as EN 50160 – Voltage Characteristics of Electricity Supplied by Public Distribution Systems.

Estimated electric motor performance data for CMA range

Actuator		120 VAC		240 VAC		24 VDC	
		Power (W)	Current (A)	Power (W)	Current (A)	Power (W)	Current (A)
Linear							
CML-100/250	Stationary	2.37	0.06	2.19	0.03	0.72	0.03
	Moving full load	44.50	0.49	44.50	0.25	37.83	1.58
CML-750	Stationary	2.37	0.06	2.19	0.03	0.72	0.03
	Moving full load	59.50	0.71	59.50	0.35	50.58	2.11
CML-1500	Stationary	6.30	0.13	7.26	0.22	0.58	0.02
	Moving full load	73.08	0.67	74.09	0.43	73.44	3.06
CML-3000	Stationary	6.31	0.13	7.34	0.22	0.58	0.02
	Moving full load	137.03	1.20	136.36	0.67	133.48	5.56
Part-turn							
CMQ-250/500	Stationary	2.37	0.06	2.19	0.03	0.72	0.03
	Moving full load	38.50	0.43	38.50	0.21	32.73	1.36
CMQ-1000	Stationary	2.37	0.06	2.19	0.03	0.72	0.03
	Moving full load	30.81	0.37	30.81	0.18	26.19	1.09
Rotary							
CMR-50	Stationary	2.37	0.06	2.19	0.03	0.72	0.03
	Moving full load	18.75	0.21	18.75	0.10	15.94	0.66
CMR-89/100/200	Stationary	2.37	0.06	2.19	0.03	0.72	0.03
	Moving full load	37.50	0.42	37.50	0.21	31.88	1.33
CMR-125/250	Stationary	2.37	0.06	2.19	0.03	0.72	0.03
	Moving full load	59.50	0.71	59.50	0.35	50.58	2.11

Note: These figures do not include optional items. For example, communication boards (Profibus®, HART®, Modbus®, Pakscan™), Input output board (RIRO) or Reserve Power Pack (RPP). The power and Amp levels reflect actuator rated or “modulating running” loads not “shut off” loads.

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www.rotork.com

Corporate Headquarters
Rotork plc

tel +44 (0)1225 733200
email mail@rotork.com

USA

Rotork Controls Inc.
tel +1 (585) 247 2304
email info@rotork.com



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