

Electric Motor Performance Data for IQT, IQTM ¼ Turn Actuators and IQTF 360°



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Introduction

This guide provides IQT actuator range motor data, at the following supply voltages:

Voltages at 50Hz & 60HZ –

100, 110, 120, 200, 208, 220, 230, 240, 270, 380, 400, 415, 440, 460, 480, 500, 550, 575, 660 and 690
Voltage tolerance +10/-15%, frequency +/-5%

24VDC

(tolerance 17 – 36 V DC)

For AC supplies the IQT range utilises 2 phases only (phase - neutral / phase – phase) which are internally transformed and rectified to supply the control package and DC motor.

In order to achieve supply load diversity on 3 phase supplies, multiple actuators should be connected equally across all three phases. Three terminals are provided for cable connection. Refer to wiring diagram.

Design criteria

Motors designed for operation of valve actuators require special consideration. As continuous running is not a requirement with isolating and “inching” or regulating duty valves, motors need only be short duty time rated. Valve load can vary dramatically across stroke and from stroke to stroke as process and valve conditions vary. These conditions can vary from light running to rated torque with a facility to exceed rated in unseating “sticky” valves, actual motor loading has no constant. To apply traditional motor protection to actuator motors is therefore flawed, leading to spurious tripping or no protection at all.

Rotork recognise the special nature of actuator motors and have therefore designed the IQT range motor and its control package with this unique duty at the forefront.

IQT Motor Design

IQT motors are of a low inertia, 24VDC permanent magnet DC motors and are class F insulated, S2 – 20% duty cycle at 70% of rated torque.

IQT motor control protection

The primary protection for the motor is torque switch protection. By measuring the actuator output torque and comparing to the open and close torque switch setting, effective motor and more importantly, valve protection is achieved.

Thermostats providing over temperature protection, if the duty cycle exceeds actuator rating, also protect IQT units. IQT control protection will prevent motor stall in the event of valve jamming. Phase rotation protection and lost phase protection are also incorporated as standard. Using torque as the primary means of motor protection, along with thermostat and IQT control protection, the requirement for traditional protection methods and their inherent weakness when applied to short time duty, variable load motors is eliminated.

Power supply cable sizing

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

Fuse selection

Due to the unique nature of the motor duty and taking in to account the comprehensive control protection of the IQT, sizing of fuses or trip devices should be based on protecting the power cable connected to the actuator.

Frequency converters 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 standards such as EN 50160 - Voltage Characteristics of Electricity Supplied by Public Distribution systems.

IQT, IQTM and IQTF Electrical Performance Data

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Data is at actuator rated torque. Data is valid for both 50Hz and 60Hz supplies. All data is approximate.

Supply Voltage	IQT125			IQT250			IQT500			IQT1000			IQT2000		
	Current Amps	Power Factor	Power KW	Current Amps	Power Factor	Power KW	Current Amps	Power Factor	Power KW	Current Amps	Power Factor	Power KW	Current Amps	Power Factor	Power KW
24VDC	10.0		0.24	12.0		0.29	13.0		0.32	13.0		0.32	15.0		0.36
100	3.5	0.95	0.33	4.5	0.95	0.43	4.5	0.95	0.43	4.7	0.95	0.45	5.3	0.95	0.50
110	3.2	0.95	0.33	4.1	0.95	0.43	4.1	0.95	0.43	4.3	0.95	0.45	4.8	0.95	0.50
120	2.9	0.95	0.33	3.7	0.95	0.43	3.7	0.95	0.43	3.9	0.95	0.45	4.4	0.95	0.50
200	1.7	0.95	0.33	2.2	0.95	0.43	2.2	0.95	0.43	2.4	0.95	0.45	2.6	0.95	0.50
208	1.7	0.95	0.33	2.2	0.95	0.43	2.2	0.95	0.43	2.4	0.95	0.45	2.6	0.95	0.50
220	1.7	0.95	0.33	2.2	0.95	0.43	2.2	0.95	0.43	2.4	0.95	0.45	2.6	0.95	0.50
230	1.5	0.95	0.33	1.9	0.95	0.43	1.9	0.95	0.43	2.1	0.95	0.45	2.3	0.95	0.50
240	1.5	0.95	0.33	1.9	0.95	0.43	1.9	0.95	0.43	2.1	0.95	0.45	2.3	0.95	0.50
270	1.5	0.95	0.33	1.9	0.95	0.43	1.9	0.95	0.43	2.1	0.95	0.45	2.3	0.95	0.50
380	0.9	0.95	0.33	1.2	0.95	0.43	1.2	0.95	0.43	1.2	0.95	0.45	1.4	0.95	0.50
400	0.9	0.95	0.33	1.2	0.95	0.43	1.2	0.95	0.43	1.2	0.95	0.45	1.4	0.95	0.50
415	0.9	0.95	0.33	1.2	0.95	0.43	1.2	0.95	0.43	1.2	0.95	0.45	1.4	0.95	0.50
440	0.9	0.95	0.33	1.2	0.95	0.43	1.2	0.95	0.43	1.2	0.95	0.45	1.4	0.95	0.50
460	0.9	0.95	0.33	1.2	0.95	0.43	1.2	0.95	0.43	1.2	0.95	0.45	1.4	0.95	0.50
480	0.7	0.95	0.33	0.9	0.95	0.43	0.9	0.95	0.43	1.0	0.95	0.45	1.1	0.95	0.50
500	0.7	0.95	0.33	0.9	0.95	0.43	0.9	0.95	0.43	1.0	0.95	0.45	1.1	0.95	0.50
550	0.7	0.95	0.33	0.9	0.95	0.43	0.9	0.95	0.43	1.0	0.95	0.45	1.1	0.95	0.50
575	0.7	0.95	0.33	0.9	0.95	0.43	0.9	0.95	0.43	1.0	0.95	0.45	1.1	0.95	0.50
660	0.7	0.95	0.33	0.9	0.95	0.43	0.9	0.95	0.43	1.0	0.95	0.45	1.1	0.95	0.50
690	0.7	0.95	0.33	0.9	0.95	0.43	0.9	0.95	0.43	1.0	0.95	0.45	1.1	0.95	0.50