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Q series
MOTOR and DRIVES



Compumotor's Q-Series DC servosystem offers the simplicity of step motor/drive control in a DC servo positioning system. Ready to plug in and run, the new Q-Series system consists of a motor, microprocessor based driver, and brushless resolver feedback.

The Compumotor Q-Series drivers accept digital step and direction inputs to control positioning and velocity. The onboard microprocessor monitors both the pulse inputs and the resolver position feedback, then determines the proper voltage levels to apply to the motor. The Q-Series offers speeds to 3600 RPM and a maximum torque of 34 lb-in (540 oz-in) continuous and 100 lb-in (1600 oz-in) peak.

Closed loop performance is simplified by the microprocessor control and a sophisticated servo algorithm. All servo parameters are stored in non-volatile memory (EEPROM), eliminating analog potentiometer adjustments required in conventional servosystems. Q-Series motor/drives are supplied as packaged systems, factory compensated for typical loads and performance requirements.

Q-Series systems are readily installed and operated by personnel with little training in servo controls. In most applications, no adjustments will be required. A simple pushbutton adjustment is provided to alter factory set servo constants for special loads. In addition, an RS-232C interface port allows access to all servo parameters for applications requiring critical adjustment.

Compumotor's new Q-Series utilizes a proprietary hybrid power MOSFET module in the power amplifier section for high frequency (20 KHz) pulse width modulation current control. This Compumotor innovation improves efficiency and low speed smoothness, and results in virtually inaudible operation.

Features of the Q series include:

- DC brushed servomotor
- Brushless resolver feedback
- Speeds to 3600 RPM
- Torques to 100 lb-in (1600 oz-in)
- 4096 steps/rev resolution
- Microprocessor control: no drift, no analog pots to adjust
- Compact convection-cooled driver enclosure
- Inaudible 20 KHz PWM switching frequency
- Accepts digital step and direction inputs
- Servo parameters factory set and stored in non-volatile (EEPROM) memory
- High noise immunity due to opto and transformer isolation
- Pushbutton adjustment of servo compensation

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Specifications

Parameter			Value
Performance:			
Repeatability			±5 arc min. (.088°) Unloaded—one revolution returning to start point from same direction.
Accuracy			±14 arc min. (-0.23°) Unloaded—motor bearing and seal friction only.
Relative accuracy			±5 arc min. (.088°) Step to step, bidirectional
Resolution			
—R5			4,096 steps/rev
—R8			16,384 steps/rev (Maximum speed is 2100 RPM)
Power:	**Single Phase**	**3 Phase**	**DC**
Volts	105-125 VAC	105-125 VAC	100-160 VDC
Frequency	50/60 Hz	50/60 Hz	
Current	10A maximum	10A maximum	10A maximum
Inputs:			Optically isolated
Step			3.5-6.0 VDC
Direction			500 N. Sec. minimum pulse width
Shut Down			20 mA maximum source current required
Interface: RS-232C			
Baud Rate			1200
Data Bits			8
Stop Bits			2
Parity			None
Environmental:			
Operating			
Drive			32 to 122°F (0 to 50°C). Maximum heatsink temperature is 122°F (50°C).
Motor			255°F (125°C) Maximum motor case temperature
Storage			-40°F to 185°F (-40°C to 85°C).
Humidity			0 to 95% Non-condensing

Adjustment to Factory Preset Servo Parameters

Factory preset servo parameters will ensure optimum performance under most operating conditions. External pushbuttons provide easy "up/down" adjustment to meet more critical load/performance requirements. For extremely critical positioning needs, the following software commands can be used to redefine motor performance parameters. User defined parameters are simply entered over an RS-232C interface and stored in on-board non-volatile EEPROM memory. Factory settings can be recalled at any time.

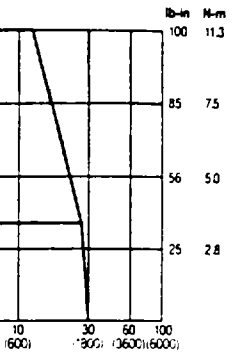
Software Commands

AC	Average Current
CF	Define desired crossover frequency
DB	Dead band definition
ES	Enter setup mode
FE	Define maximum following error
MS	Motor enable
RE	Report error conditions
RF	Factory preset settings
RS	Reset drive system
RV	Report software revision
SC	Report average current
SE	Report the following error
SV	Save parameters in EEPROM

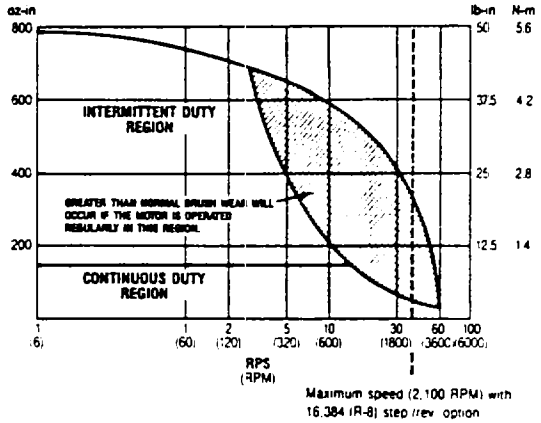
Setup Mode Commands

D	Decrease gain
E	Enter tuning process
S	Save new setup parameters
U	Increase gain
X	Exit setup mode

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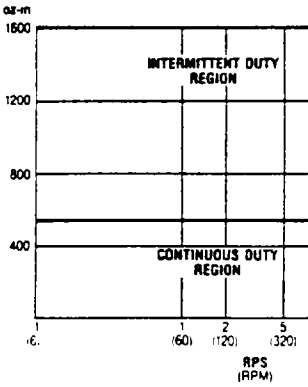


Q-510



Maximum speed (2,100 RPM) with 16,384 (R-8) step /rev. option

Q-530



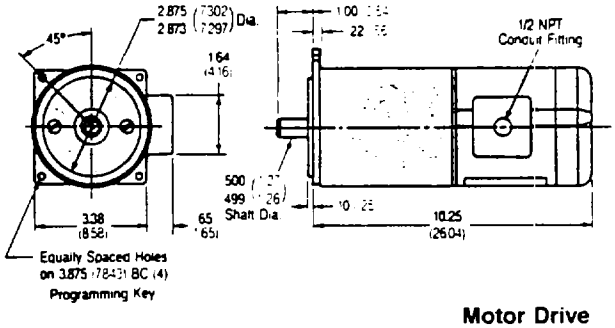
Technical Data

	Q-510	Q-530
Continuous torque (at 77°F/25°C)		
lb-in	9	34
oz-in	150	540
(N-m)	(1.06)	(3.81)
Peak torque		
lb-in	48.8	100
oz-in	780	1,600
(N-m)	(5.51)	(11.29)
Rotor inertia		
oz-in²	9.3	141.7
(Kg-cm²)	(1.69)	(25.92)
Maximum speed		
rps	60	30
(rpm)	(3,600)	(1,800)
Maximum armature temperature		
°F	310	310
(°C)	(155)	(155)
Maximum allowable ambient temperature at driver		
°F	122	122
(°C)	(50)	(50)
Maximum driver input current at 120 VAC		
in Amps	10	10
Bearings:		
Radial load		
lbs.	40.0	150.0
(N)	(180)	(670)
Weight (Net)		
Motor + Cable + Connector		
lbs.	7.4	33.0
(Kg)	(3.4)	(15.0)
Total shipping weight (Net)		
Motor/Drive + Cables + Container		
lbs.	18.0	43.0
(Kg)	(8.2)	(19.5)

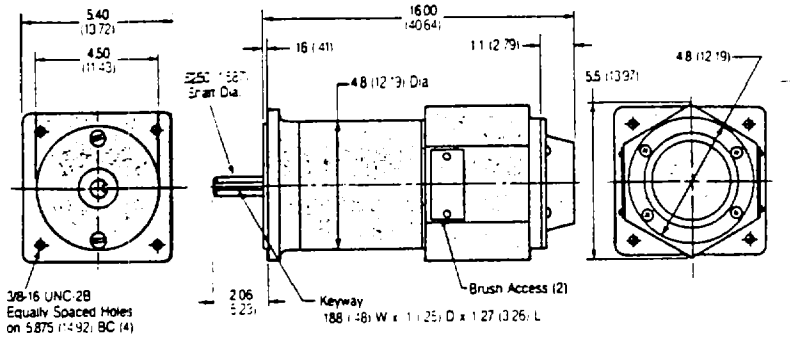
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Dimensions (—) denotes centimeters

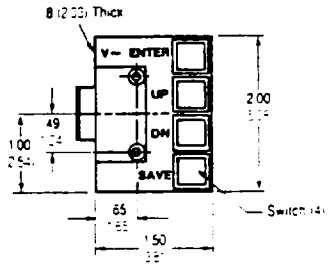
Model Q-510



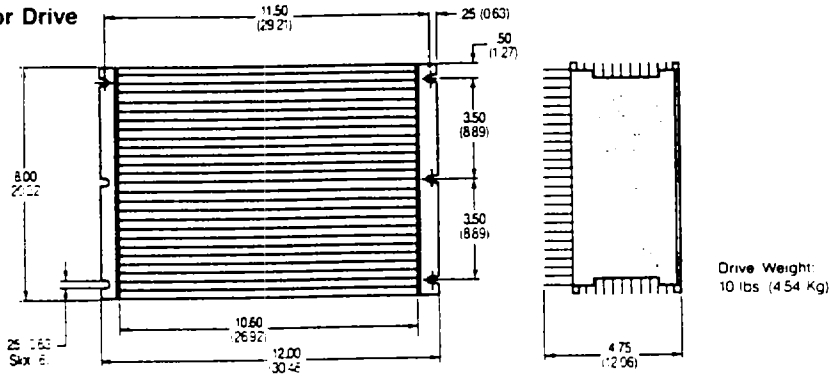
Model Q-530



Programming Key



Motor Drive



The drive should be mounted with the heat sink vertical. Allow a 6" vertical and 4" horizontal clearance for proper convection cooling.

Drive Connector Listing

RS-232C
25-Pin "D"

Pin No.	Signal
2	Receive Data
3	Transmit Data
7	GND

Motor
7-Pin Entrelec
(Shielding unnecessary)

Pin No.	Signal
1	Motor +
2	Strap
3	Motor –
4	Earth
5	Reserved
6	Reserved
7	Reserved

Power Connector
4-Pin Entrelec (Shielding unnecessary)

Pin No.	Signal		
	Single Phase	Three Phase	DC
1	Line	Phase 1	V+
2	Neutral	Phase 2	V–
3	—	Phase 3	—
4	Earth	Earth	Earth

Indexer
25-Pin "D"

Pin No.	Signal
1	Step +
2	Direction +
7	Fault reset +
9	Fault +
14	Step –
15	Direction –
16	Shutdown +
17	Shutdown –
19	Fault reset –
21	Fault –

Auxiliary
4-Pin Entrelec
(User responsible for shielding)

Pin No.	Signal
1	Pullup
2	Drive enable (Input)
3	Ground
4	Reserved

The drive should be mounted with the heat sink vertical. Allow a 6" vertical and 4" horizontal clearance for proper convection cooling.

Resolver
9-Pin "D"
Shielded from motor end

Programming Key
9-Pin "D"

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