

I series MOTOR and DRIVES

Compumotor's I-Series motor/drives offer digital simplicity in a high performance brushless AC servosystem. Ready to plug in and run, the I-Series system consists of an AC servomotor, brushless resolver feedback, and a microprocessor based drive amplifier. Digital electronics and brushless motor and resolver technology make the system virtually maintenance free.

The I-Series driver accepts 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 current levels to apply to the motor. The system offers speeds to 3000 RPM, and torques to 175 lb-in (3000 oz-in) continuous, and 350 lb-in (5500 oz-in) peak.

Closed loop performance is simplified by microprocessor control. All servo parameters are stored in non-volatile memory (EEPROM), eliminating analog potentiometer adjustments required in conventional servosystems. Units are supplied as packaged systems, factory preset for typical load and performance requirements.

I-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 further tune servo constants for special loads. In addition, an RS-232C interface provides access to all servo parameters for the few cases where critical adjustment is required.

The I-Series hybrid power amplifier section utilizes a proprietary power MOSFET module 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 I-series include:

- AC Brushless Servomotor
- Brushless Resolver Feedback
- Maximum Torque:

Continuous	175 lb.-in.	Peak	350 lb.-in.
	2800 oz.-in.		5500 oz.-in.
	19.7 N-m		38.8 N-m
- Speeds to 3000 RPM
- NEMA sizes frame 145 and 182 TC
- 4,096 or 16,384 steps/rev resolution
- Microprocessor control: no drift, no analog pots to adjust
- Fan cooled drive enclosure
- Inaudible 20 KHz PWM switching frequency
- Accepts digital step and direction inputs
- Factory set for typical load and performance requirements
- Servo parameters stored in non-volatile (EEPROM) memory
- LED fault indicators
- Push button adjustment of servo compensation

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°) Loaded—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:	
Volts	105-125 VAC (1 phase or 3 phase)
Frequency	50/60 Hz
Current	20 A Maximum
Brown out protection	85 VAC
Inputs:	
Step	Optically isolated
Direction	3.5-6.0 VDC
Shut Down	500 N. Sec. Minimum pulse width 20 mA Maximum source current required
Interface: RS-232C	
Baud	1200
Data Bits	8
Stop Bits	2
Parity	None
Environmental:	
Operating Driver	32 to 122°F (0 to 50°C). Maximum heatsink temperature is 150°F (65°C).
Motor	266°F (130°C) Maximum motor case temperature
Storage	-40 to 185°F (-40 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

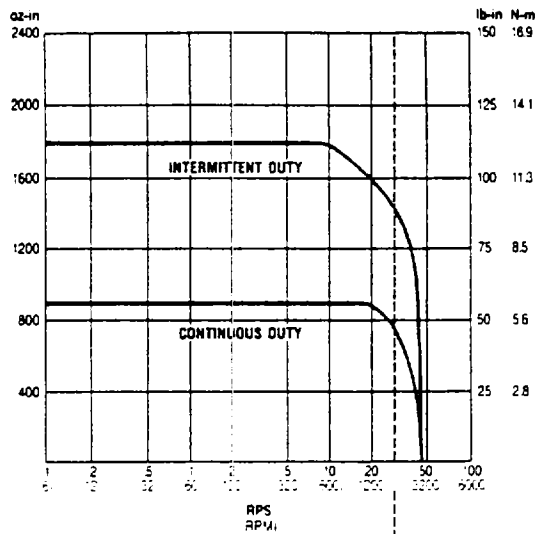
AC	Average current definition
CL	Current limit definition
CF	Define desired crossover frequency
DB	Dead band definition
DE	Drive enable input toggle
ES	Enter setup mode
FE	Define maximum following error
LD	Define load inertia attached to motor
MS	Motor enable toggle
PM	Define desired phase margin
RF	Factory preset settings
RE	Report error conditions
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

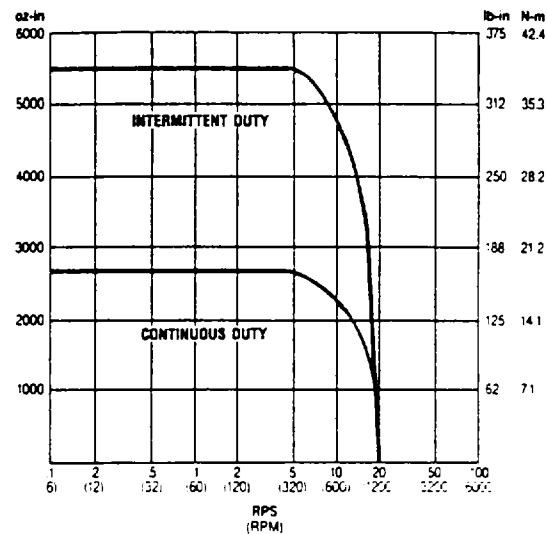
I series MOTOR and DRIVES

I-610



Maximum speed (2,100 RPM) with
16.384 (R:8) step/rev option

I-620



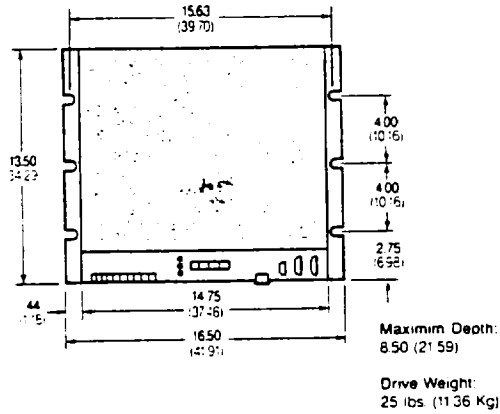
Technical Data

	I-610	I-620
Continuous torque (at 77°F/25°C)		
lb-in	560	175.0
oz-in	900	2800
(N·m)	(6.35)	(19.77)
Peak torque		
lb-in	110	340
oz-in	1800	5500
(N·m)	(12.7)	(38.8)
Rotor inertia		
oz-in ²	135.1	270.2
(Kg·cm ²)	(24.71)	(49.42)
Maximum speed		
rps	50	20
(rpm)	(3000)	(1200)
Maximum case temperature		
°F	266	266
(°C)	(130)	(130)
Maximum allowable ambient temperature at driver		
°F	122	122
(°C)	(50)	(50)
Maximum driver input current at 120 VAC		
in Amps (Rms)	20	20
Weight (Net)		
Motor + Cable + Connector		
lbs.	24	40
(Kg)	(10.91)	(18.18)
Total shipping weight (Net)		
Motor/Drive + Cables + Container		
lbs.	56	72
(Kg)	(25.45)	(32.72)

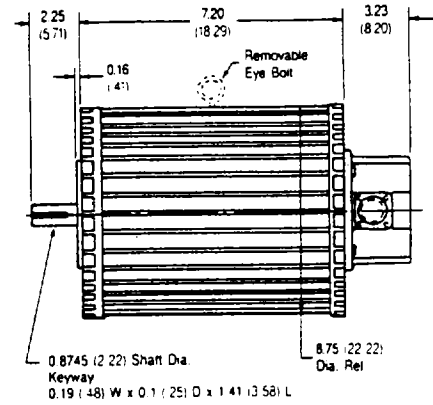
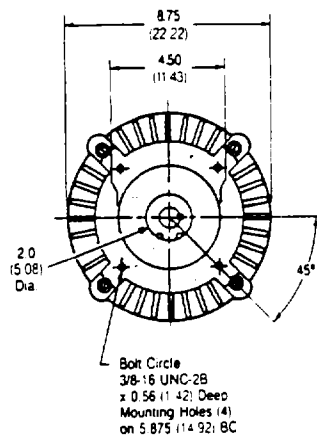
I series MOTOR and DRIVES

Dimensions (—) denotes centimeters

Motor Drive

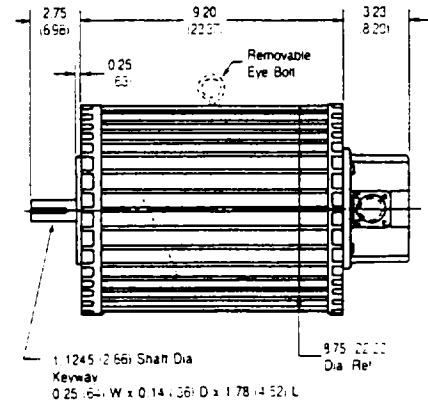
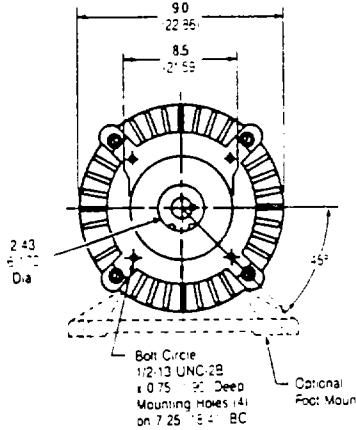


I-610



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

I-620



Drive Connector Listing

RS-232C

25-Pin "D"

Pin No. Signal

2	Receive data
3	Transmit data
7	GND

Auxiliary

Pin No. Signal

1	Fault (Output)
2	Fault return
3	Drive Enable return
4	Drive Enable (Input)

Indexer

25-Pin "D"

Pin No. Signal

1	Step
2	Direction
3	NC
4	NC
5	NC
6	NC
7	Fault reset
8	NC
9	Drive fault
10	Deadband (slip fault)
11	Reserved (overdrive)
12	NC
13	NC
14	Step return
15	Direction return
16	Remote shutdown
17	Remote shutdown return
18	NC
19	Fault reset return
20	NC
21	Drive fault return
22	Deadband return (slip fault return)
23	Reserved (overdrive return)
24	NC
25	NC

NC = No Connection

Resolver

9 Pin "D" Shielded from motor end

Power and Motor Connector

Terminal Block

Pin No. Signal

1	AC GND
2	Line 1
3	Line 2
4	Line 3
5	Motor shield
6	Motor phase A +
7	Motor phase A -
8	Motor phase B +
9	Motor phase B -
10	Motor phase C +
11	Motor phase C -