MOOG

L180 Series
Digital Servo Drive

CE

SERVO DRIVE FEATURES

➢ **High Dynamics.** Digital control loops with high bandwidth response and advanced signal processing algorithms deliver even greater torque out of Moog's high power density servo motors.

➢ **Smooth Low Speed Performance.** Full PID control loops, sinusoidal commutation and Moog's low cogging G400 series motors all combine to deliver smooth low speed performance.

➢ **Simplified Installation and Wiring.** The highly integrated design offers high voltage and logic voltage supplies, servo amplifier, limit switch inputs and high power regen (3.8 kW peak) all within a compact enclosure to reduce wiring runs and free-up valuable real estate.

➢ **High Reliability.** Integral cooling fans and a multi-tiered fault protection system are designed to provide years of reliable operation in demanding industrial environments. Fault protection schemes include motor and drive thermal monitoring, software based I²t protection and hardware based current limiting.

➢ **Quick and Easy Setup.** Moog Windows® based interface for the L180 includes a virtual oscilloscope, data logger and drive status displays to simplify setup and system commissioning.

➢ **Value Priced.** Targeted for +/- 10 VDC control applications, the streamlined design makes high performance servo control affordable.

OPERATING MODES

➢ **Analog Current (Torque) Mode.** Motor current (torque) controlled by +/- 10 VDC command reference.

➢ **Digital Current (Torque) Mode.** Motor current (torque) controlled by command message transmitted over serial link.

➢ **Analog Velocity Mode.** Motor velocity controlled by +/- 10 VDC command reference.

➢ **Digital Velocity Mode.** Motor velocity controlled by command message transmitted over serial link.

DRIVE SPECIFICATIONS

Servo Drive Ratings

Model	Output Current (Arms)		Output Power (kW)		Regen Power (W)	
L180	Continuous	Peak	Continuous	Peak	Continuous	Peak
-310	5	10	2.0	4.0	300	3800
-410	10	20	4.0	8.0	300	3800
-510	15	35	6.0	14.0	300	3800

AC Mains Input Power
185-255 vac
50/60 Hz
Single or Three Phase

DC Backup Logic Input Power (optional)
Unregulated DC
Voltage range 24 VDC ±25%
500 mA DC @ 24VDC

Internal Regen Resistor
3.8 kW Peak
300 W Continuous

Analog Input
Velocity or Torque Mode Reference Input
Differential Inputs (8k ohm input impedance)

Digital Inputs (4)
Supply voltage Range 12-28 VDC
Polarity Current Activated (Configurable as Sink or Source)
Isolated Inputs (4.7k Ω Input Impedance)

Relay Outputs
Ready Relay, 0-30 VDC, 200 mA max

Communications
RS232, 9.6 kbaud

Position/Transducer Interface
Resolver Input
Encoder Simulation (programmable 8-8192)

DRIVE SPECIFICATIONS (cont.)

Fault Protection
Overvoltage
Undervoltage
Output Phase to Phase Short Circuit
Drive Overtemperature
Motor Overtemperature
Over Current Foldback
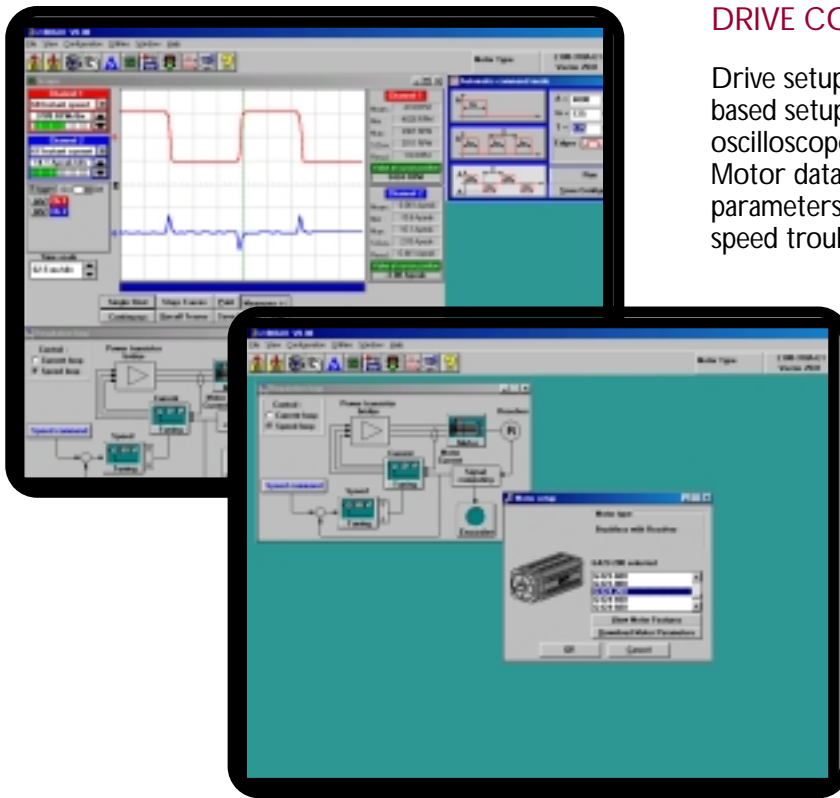I²t Current Limiting
Feedback Loss

Weight
3.2 kg

Environmental Conditions
Operating Temperature Range
   0-60°C Ambient (derate 2%/°C above 50)
Humidity
   5-95% non-condensing
Altitude
   3300 ft. (derate output 2%/1000 ft. above 3300 ft.)

Diagnostics
Seven Segment Display for Warnings/Faults
GUI Status Windows

DRIVE CONFIGURATION

Drive setup via user-friendly Windows®
based setup program. Utilities include virtual
oscilloscope with data logger to simplify tuning.
Motor database to quickly specify motor
parameters. Drive status and diagnostics to
speed troubleshooting and system diagnostics.

Digital I/O Functionality

Reference	Nomenclature	Type	Functionality
Input (1)	Drive Enable	Active High	Active signal enables the drive power stage
Input (2)	CW Limit	Active Low	Active signal initiates servo stop and prevents further CW rotation.
Input (3)	CCW Limit	Active Low	Active signal initiates servo stop and prevents further CCW rotation.
Input (4)	Auto/Manual Select	Active Low	Active signal switches drive operating limits from Auto to Manual (alternate current limits used in Torque Mode.
Output (1)	Ready Relay	Relay Contact	Contact is closed when no latched faults are present and drive power stage has been enabled.

200
(7.9)

252.5
(9.9)

295
(11.6)

76.5
(3.0)
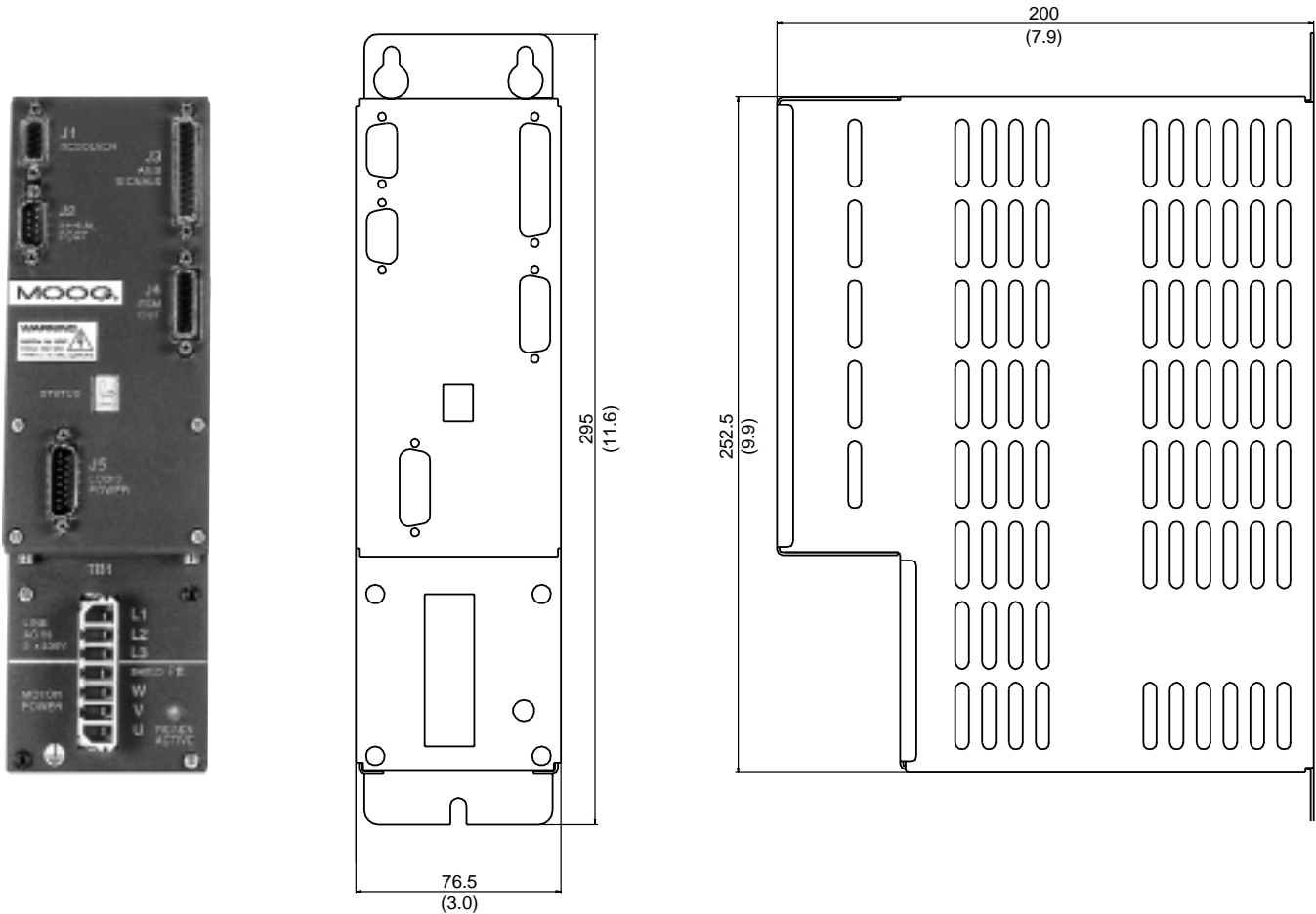
Motor			L180 Series Servo Drive					
			L180-310		L180-410		L180-510	
Model Number	Continuous Stall Torque T_C		Current Ratings I_C/I_p					
			5 / 10 Arms		10 / 20 Arms		15 / 35 Arms	
			T_C / T_p		T_C / T_p		T_C / T_p	
	Nm	lb-in	Nm	lb-in	Nm	lb-in	Nm	lb-in
G412-2XX	0.25	2.21	0.25/0.60	2.21/5.31	–	–	–	–
G412-4XX	0.50	4.43	0.50/1.40	4.43/12.4	–	–	–	–
G412-6XX	0.95	8.41	0.95/2.60	8.41/23.0	–	–	–	–
G412-8XX	1.70	15.1	1.70/5.00	15.1/44.3	–	–	–	–
G413-2XX	0.60	5.31	0.60/1.50	5.31/13.3	–	–	–	–
G413-4XX	1.65	14.6	1.65/4.50	14.6/39.8	1.65/4.70	14.6/41.6	–	–
G413-6XX	2.55	22.6	2.55/7.20	22.6/63.7	2.55/8.50	22.6/75.2	–	–
G413-8XX	3.70	32.8	3.70/8.80	32.8/77.9	3.70/13.0	32.8/115	–	–
G414-2XX	1.30	11.5	1.30/3.20	11.5/28.3	–	–	–	–
G414-4XX	2.60	23.0	2.60/4.85	23.0/43.0	2.60/6.50	23.0/57.5	–	–
G414-6XX	4.70	41.6	3.60/7.00	32.0/62.0	4.70/12.5	41.6/111	4.70/12.5	41.6/111
G414-8XX	8.20	72.6	–	–	8.20/16.5	72.6/146	8.20/22.0	72.6/195
G414-9XX	11.0	97.4	–	–	11.0/22.5	97.4/199	11.0/31.3	97.4/277
G415-2XX	5.80	51.3	–	–	5.80/10.8	51.3/95.6	5.80/12.2	51.3/108
G415-4XX	11.2	99.1	–	–	–	–	11.2/25.8	99.1/228
G415-6XX	16.6	147	–	–	–	–	16.6/37.0	147/327
G415-8XX	25.0	221	–	–	–	–	17.5/37.5	155/332

1. Torques "T_C/T_p" are specified as "continuous/peak" stall ratings.

2. Controller currents "I_C/I_p" are specified as "continuous/peak" rms amps per phase.

3. Motor peak torques are specified for at least 1 second out of 10 seconds and less than 15% saturation. Contact Moog for higher torque at lower duty cycle.

MOOG
Industrial Controls Division