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OEM 770 Series



Compact, Low-Cost Solutions

The Making of a Servo System

Servo systems rely on feedback devices to continuously correct for errors in current or torque, velocity, and position. A typical servo system includes a servo controller, amplifier, and motor with a feedback device. The servo amplifier can have varying degrees of complexity and performance. A torque amplifier (e.g. OEM770T) controls only the current loop. A positioning servo (e.g., OEM770X) accepts encoder feedback to close the position loop.

The OEM770 Family

The OEM770 family of products bring high performance in a small, low-cost package. The OEM770 family offers a cost-effective solution to a number of fractional horsepower brushless servo applications.

The OEM770 family was designed to operate with Compumotor's SM, SE, NeoMetric, J and BE series of motors or any standard three-phase brushless DC servo motor equipped with Hall effect sensors. The OEM770 family uses three-state current control for efficient drive performance and cooler motor operation.

The OEM770 family products are small and convenient to use. Units install with only two screws (the screws also provide grounding and captivate the cover). Their right-angle screw terminal allows side-by-side mounting, and their small footprint maximizes cabinet space. The snap-on molded cover is removable for system configuration and helps provide a barrier against environmental contamination. The drives are the same size as a 3U Eurorack card. Their standard 25-pin connector is compatible with universally available connectors.

Computer Programmable Standalone Servo Drive/Controllers

Compumotor's OEM770X drive/controllers are standalone, fully integrated servo systems for fractional horsepower applications. Designed to provide greater flexibility and user convenience, the single-axis OEM770X incorporates a built-in RS-232C based controller in the same small package for quick, easy programming. Users can program seven sequences and utilize five programmable inputs and two programmable outputs per unit.

See Also:

The OEM Family of Stepper Drive Products in the Stepper Section

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Compact, Low-Cost Solutions

and (LVD)

Compumotor's OEM770 Series of servo drives were designed for the needs of OEMs and high-volume users with a fractional horsepower motion control application. These products were developed to provide performance, compact packaging, reliability, and power. The OEM770T is a torque amplifier utilizing a ± 10VDC analog input making it directly compatible with industry standard motion controllers.

Features

Performance

- Torque Mode operation with OEM770T
- Three-state current control for more efficient drive and cooler motor operation
- Configurable current fold-back
- Plug-in resistors for peak and fold-back current
- Six-state drive design with hall effect sensors for commutation
- Operates with brushless or brushed servo motors
- Several Brushless Servo motors are available from Compumotor providing up to 190 oz-in continous and 570 oz-in peak torque

Reliability

- Short circuit protected—phase-to-phase and phase-to-ground
- Overvoltage circuitry protects the drive from large inertial loads
- Status/fault LED indicators to confirm proper operation
- Enclosed packaging reduces danger of environmental contamination
- Overtemperature circuitry protects the drive from excess heat

Packaging

- Application-specific integrated circuit (ASIC) and surface mount technology minimize product footprint, overall package size, and increase product reliability
- Removable snap-on molded cover for convenient configuration and protection against contaminants
- Heat is dissipated through the mounting surface
- Install with only two screws (also provides grounding and captivates cover)
- Universally available standard 25-pin D connector
- Right-angle screw terminal allows side-to-side mounting, or Eurorack compatibility

Power

- Provides 6 Amps continuous current and 12 Amps peak current
- Single 24-75 VDC power supply input

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OEM770 Specifications

	Parameter	Value
Power Input	Voltage	24–75 VDC
	Current	0–12 amps
Power Output-Motor	Peak Current	12 A (approx 2 sec max duration at 45°C ambient temperature)
	Continuous Current	6A
	Voltage	90 VDC max
	Peak Power	840 W (1.1 hp) @ 75 V supply voltage
	Continuous Power	420 W (0.56 hp)
	Switching Frequency	20 kHz
	Bandwidth	2 kHz typical (dependent on motor)
	Transconductance	1 volt = 1.2 amp
	Commutation	120° hall effect sensors for six-state commutation method or brushed DC motor
	Short-Circuit Protected	Yes
Power Output-Hall Effect Sensors	Voltage	+5 VDC ±0.5 VDC
	Current	50 mA max
	Short-Circuit Protected	No
Power Output-to Controller Output Stage	Voltage	+15 VDC ±1.5 VDC; -15 VDC ± 1.5 VDC
	Current	10 mA max
	Short-Circuit Protected	No
Control Inputs	Command Input	-10 V to +10 V analog voltage; 1 volt input = 1.2 amp output
	Enable Input	Active LOW: 0–0.8 V @ 2 mA; when disabled: internal 2.49 kΩ pull-up resistor to +5 VDC
Hall Inputs	Low State	0-0.8 V
	High State	Internal 1 kΩ pull-up resistor to +5 V
	Input Frequency	0–2 kHz max
Signal Outputs	Fault Output	Active High: open collector output, max volts = 24 VDC; Inactive LOW: 0-0.4 VDC @ 0-20 mA
	Current Monitor	-10 V to +10 V analog voltage; scale: 1 V corresponds to 1.2 A output; Output Impedance: 10 KΩ
	LEDs	Green = power; Red = various fault conditions
Protective Circuits	Short Circuit	Turns off outputs to motor; latched
	Overtemperature	55°C ±5°C trip temperature; latched
	Overvoltage	95 V ±5 V trip voltage; latched
	Undervoltage	21.5 V max; not latched
	Current Foldback	Configurable with 3 resistors
	Position Error (OEM670SD)	2,047-16,383 post-quad encoder counts
Motor Characteristics	Minimum Inductance	50 µH (micro Henrys)
	Minimum Resistance	0.25 Ω
	Loop Gain Adjustment	Configurable with one resistor
	Motor Type	Compumotor recommends the OEM770 Series with NeoMetric, J, SM, SE and BE Series motors.
Environmental	Minimum Temperature	0°C (32°F)
	Max Temperature	45°C (113°F)
	Max Heatplate Temperatsure	45°C (113°F)
	Package Dissipation	Heatplate: 0–30 W, depending on motor current; PP = (I_{AVG}/12 A) 30 W; Cover: 3 watts max
Physical	Power Connector	10-pin screw terminal; 14 awg max wire size
	Input/Output Connector	25-pin D connector
	Approx Dimensions	5" x 1.6" x 3.5" (127 x 41 x 90)
	Weight	OEM770T: 12 oz

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and (LVD)

Fully Integrated Controller and Brushless Servo Drives

The OEM770X is designed for the needs of OEMs and high-volume users with a fractional horsepower motion control application. Compumotor's OEM770X fully integrated servo systems combine the power, compact packaging, and reliability of the OEM770T torque servo amplifiers with a simple, programmable, built-in, RS232C-based servo controller. Users can program seven sequences and have five programmable inputs and two programmable outputs per unit.

The OEM770X is ideal for less demanding motion control applications such as rotary indexing, step-and-repeat, and linear positioning. The "X" version is a cost-effective, single-axis servo system to meet your high-volume application needs.

Features

Performance

- Servo controller and drive in one small package
- Standard RS-232C serial communications interface
- Optional 2 kBytes of battery-backed RAM to store up to 7 command sequences (-M2 option)
- Daisy chaining up to 256 units on one serial port
- Five programmable inputs for remote sequence select, trigger, and home limit, and two dedicated limit inputs
- Two programmable outputs for machine interaction
- Operates with standard differential, optical encoder for velocity and position feedback
- PID control algorithm used for servo tuning
- Several AC Brushless Servo motors are available from Compumotor providing up to 190 oz-in continous and 570 oz-in peak torque

Reliability

- Short-circuit protected: phase-to-phase, and phase-to-ground
- Overvoltage circuitry protects the drive from large inertial loads
- Status/fault LED indicators to confirm proper operation
- Enclosed packaging reduces danger of environmental contamination
- Overtemperature circuitry protects the drive from excess heat

Packaging

- Application-specific integrated circuit (ASIC) and surface-mount technology minimize product footprint, overall package size, and increase product reliability
- Removable snap-on molded cover for convenient configuration and protection against contaminants
- Heat is dissipated through the mounting surface
- Install with only two screws (also provides grounding and captivates cover)
- Universally available standard 25-pin D connector
- Right-angle screw terminal allows side-to-side mounting, or Eurorack compatibility
- Overall dimension 5.0 x 3.6 x 1.6 in (127 x 9 x 41 mm)

Power

- Provides 6 amps continuous current and 12 amps peak current
- Single 24-75 VDC power supply input

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OEM770X Specifications

	Parameter	Value
Power Input	Voltage	24–75 VDC
	Current	0–12 amps
Power Output- Motor	Peak Current	12 A (approx 2 sec max duration at 45°C ambient temperature)
	Continuous Current	6A
	Voltage	75 VDC max
	Peak Power	840 W (1.1 hp) @ 75 V supply voltage
	Continuous Power	420 W (0.56 hp)
	Switching Frequency	20 kHz
	Bandwidth	2 kHz typical (dependent on motor)
	Transconductance	1 volt = 1.2 amp
	Commutation	120° hall effect sensors for six-state commutation method or brushed DC motor
	Short-Circuit Protected	Yes
Power Output-Hall Effect Sensors	Voltage	+5 VDC ±0.5 VDC
	Current	50 mA max
	Short-Circuit Protected	No
Hall Inputs	Low State	0-0.8 V
	High State	Internal 1 kΩ pull-up resistor to +5 V
	Input Frequency	0–2 kHz max
Inputs	Programmable Inputs	5 user defined, TTL signal levels: low = 0–0.8 V, high = 2–5 V
	End-of-Travel Limits	CW/CCW, 0-5 TTL signal levels: low = 0–0.8 V, high = 2–5 V
	Enable Input	Active Low: 0-0.8V@2mA; when disabled: Internal 2.49W pull-up resistor to +5VDC
	Encoder	2-phase differential (recommended) or single-ended (+5VDC TTL compatible), 960 kHz max frequency
Outputs	Programmable Outputs	2 user-defined, TTL signal levels: low = 0–0.8 V, high = 2–5 V
	Fault Output	Active High: open collector output, max volts = 24 VDC; Inactive LOW: 0-0.4 VDC @ 0-20 mA
	Current Monitor	-10 V to +10 V analog voltage; scale: 1 V corresponds to 1.2 A output; Output Impedance: 10 KΩ
	LEDs	Green = power; Red = various fault conditions
Performance	Position Range	±1,073,741,823
	Velocity Range	0.01 to 200 rps
	Acceleration Range	0.01 to 9999 rps^2
	Velocity Accuracy	±0.02% of maximum rate
	Velocity Repeatability	±0.02% of set rate
	Resolution	400-65,532 encoder counts/rev
Digital Servo Loop	Update Time	266 µsec
	Output	12-bit DAC
	Servo Tuning	Digital, via RS232C
	Tuning Parameters	PID with digital filter
Protective Circuits	Short Circuit	Turns off outputs to motor; latched
	Overtemperature	55°C ±5°C trip temperature; latched
	Overvoltage	95 V ±5 V trip voltage; latched
	Undervoltage	21.5 V max; not latched
	Current Foldback	Configurable with 3 resistors
Motor Characteristics	Minimum Inductance	50 µH (micro Henrys)
	Minimum Resistance	0.25 Ω
	Loop Gain Adjustment	Configurable with one resistor
	Motor Type	Compumotor recommends the OEM770 Series with NeoMetric, J, SM, SE and BE Series motors.
Environmental	Minimum Temperature	0°C (32°F)
	Max Temperature	45°C (113°F)
	Max Heatplate Temperature	45°C (113°F)
	Package Dissipation	Heatplate: 0–30 W, depending on motor current; P = (I_{AVG}/12 A) 30 W; Cover: 3 watts max
Physical	Power Connector	10-pin screw terminal; 14 awg max wire size
	Input/Output Connector	25-pin D connector
	Approx Dimensions	5" x 1.6" x 3.5" (127 x 41 x 90)
	Weight	14 oz

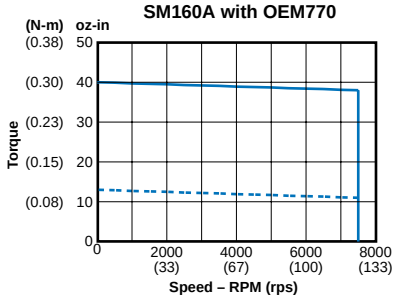
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Motor Speed-Torque Performance Curves

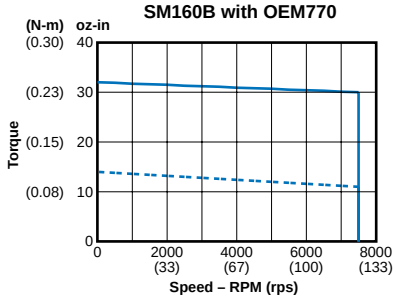
OEM770 with SM Motors, 16 and 23 frame, encoder feedback, 75 VDC

For complete SM motor and cable information, please refer to Servo Motor section.

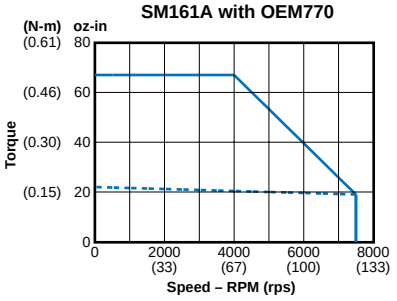
SM160A with OEM770



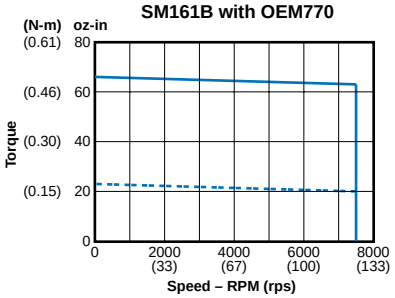
SM160B with OEM770



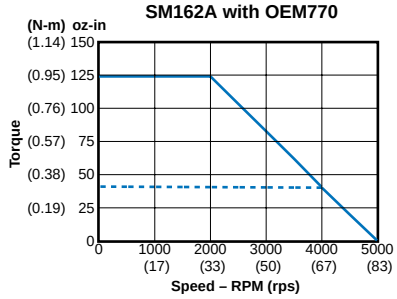
SM161A with OEM770



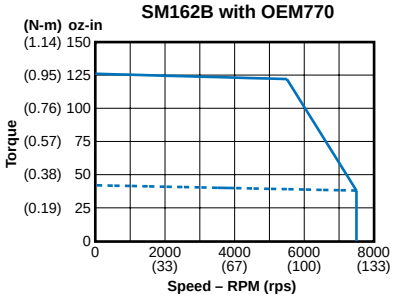
SM161B with OEM770



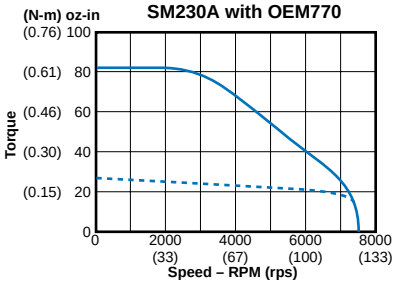
SM162A with OEM770



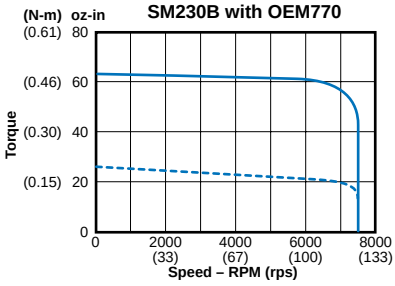
SM162B with OEM770



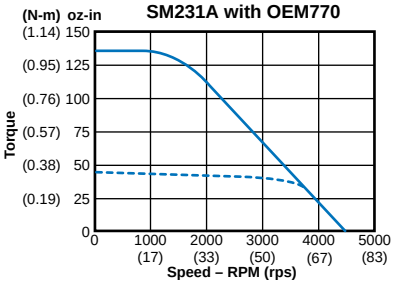
SM230A with OEM770



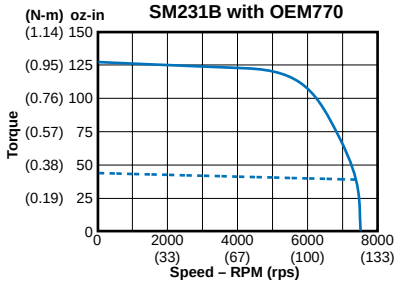
SM230B with OEM770



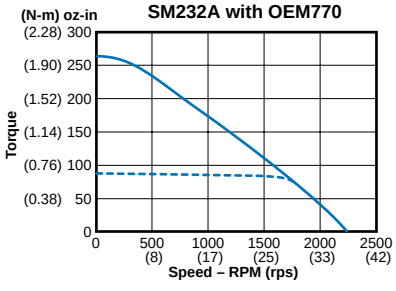
SM231A with OEM770



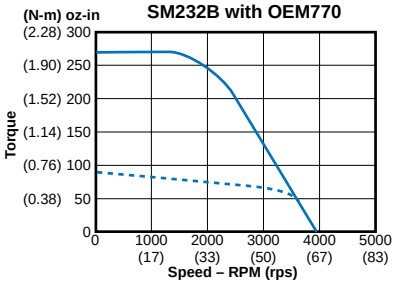
SM231B with OEM770



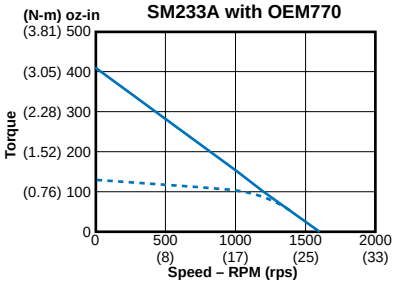
SM232A with OEM770



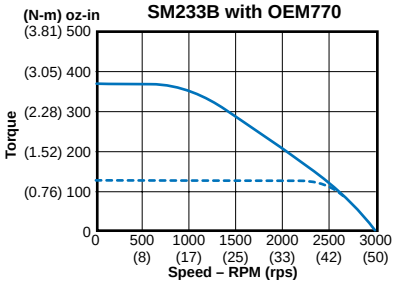
SM232B with OEM770



SM233A with OEM770



SM233B with OEM770



* For motor specifications and dimensions, please refer to the servo motor section.

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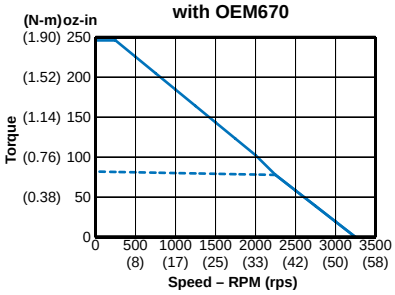
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Motor Speed-Torque Performance Curves

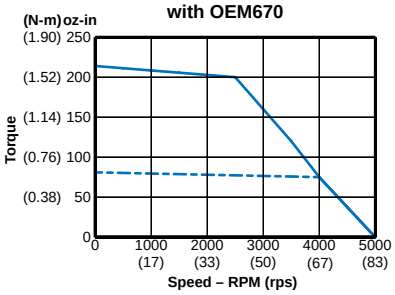
OEM770 with NeoMetric and J Series Motors, 34 and 70mm frame, encoder feedback, 75 VDC

For complete NeoMetric and J Series motor and cable information, please refer to Servo Motor section.

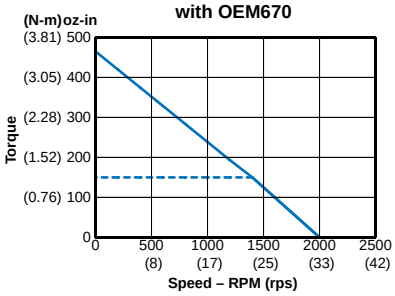
N0701D/N0341D/J0701D/J0341D with OEM670



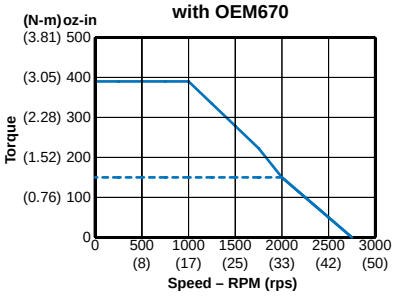
N0701F/N0341F/J0701F/J0341F with OEM670



N0702E/N0342E/J0702E/J0342E with OEM670



N0702F/N0342F/J0702F/J0342F with OEM670



CONTINUOUS PEAK

* For motor specifications and dimensions, please refer to the servo motor section.

[1] *With 75VDC bus voltage; 25°C (77°F) ambient temperature.*

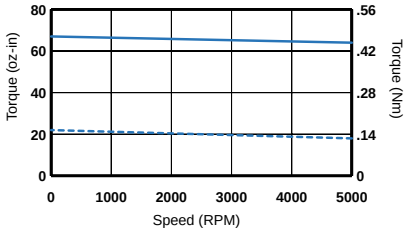
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Motor Speed-Torque Performance Curves

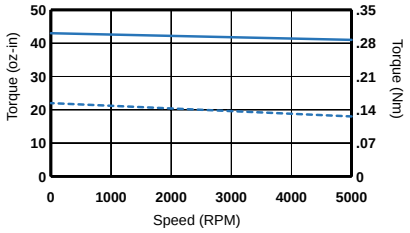
OEM770 with BE Series Motors, 16 and 23 frame, encoder feedback, 75 VDC

For complete BE motor and cable information, please refer to Servo Motor section.

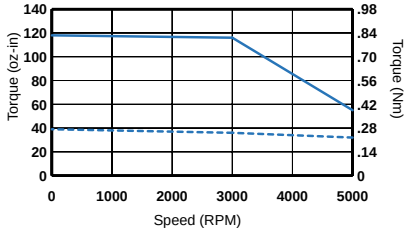
OEM770/BE161D



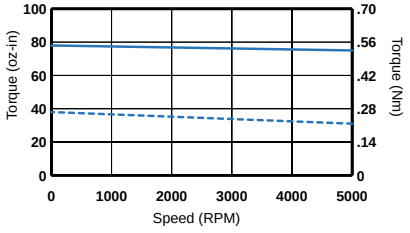
OEM770/BE161F



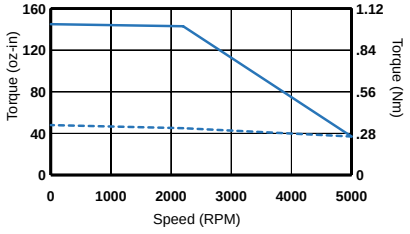
OEM770/BE162D



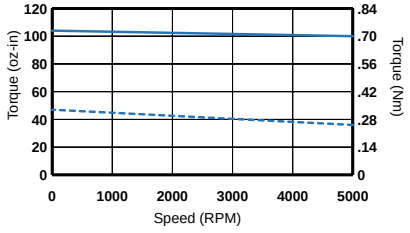
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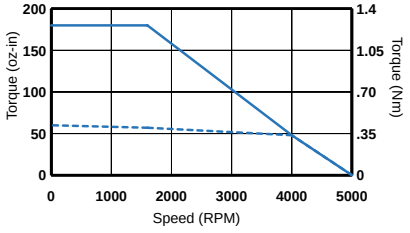
OEM770/BE163D



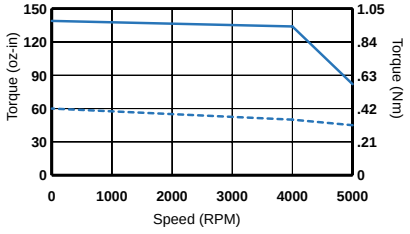
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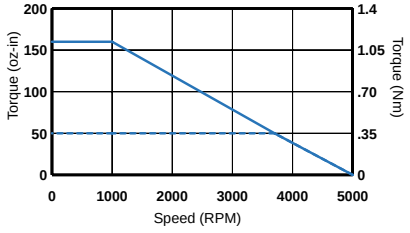
OEM770/BE164D



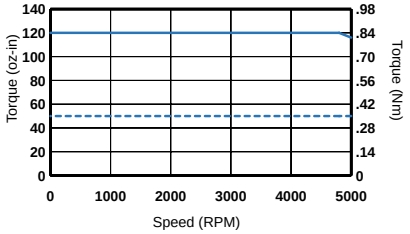
OEM770/BE164F



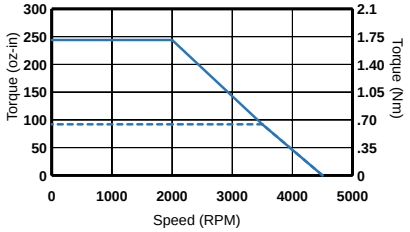
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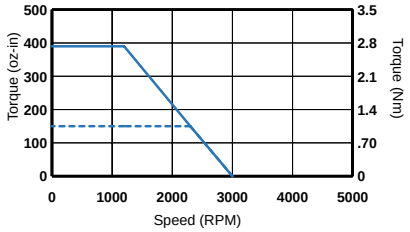
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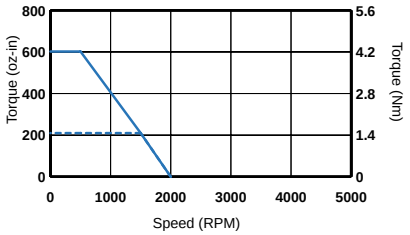
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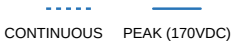


OEM770/BE232F



OEM770/BE233F



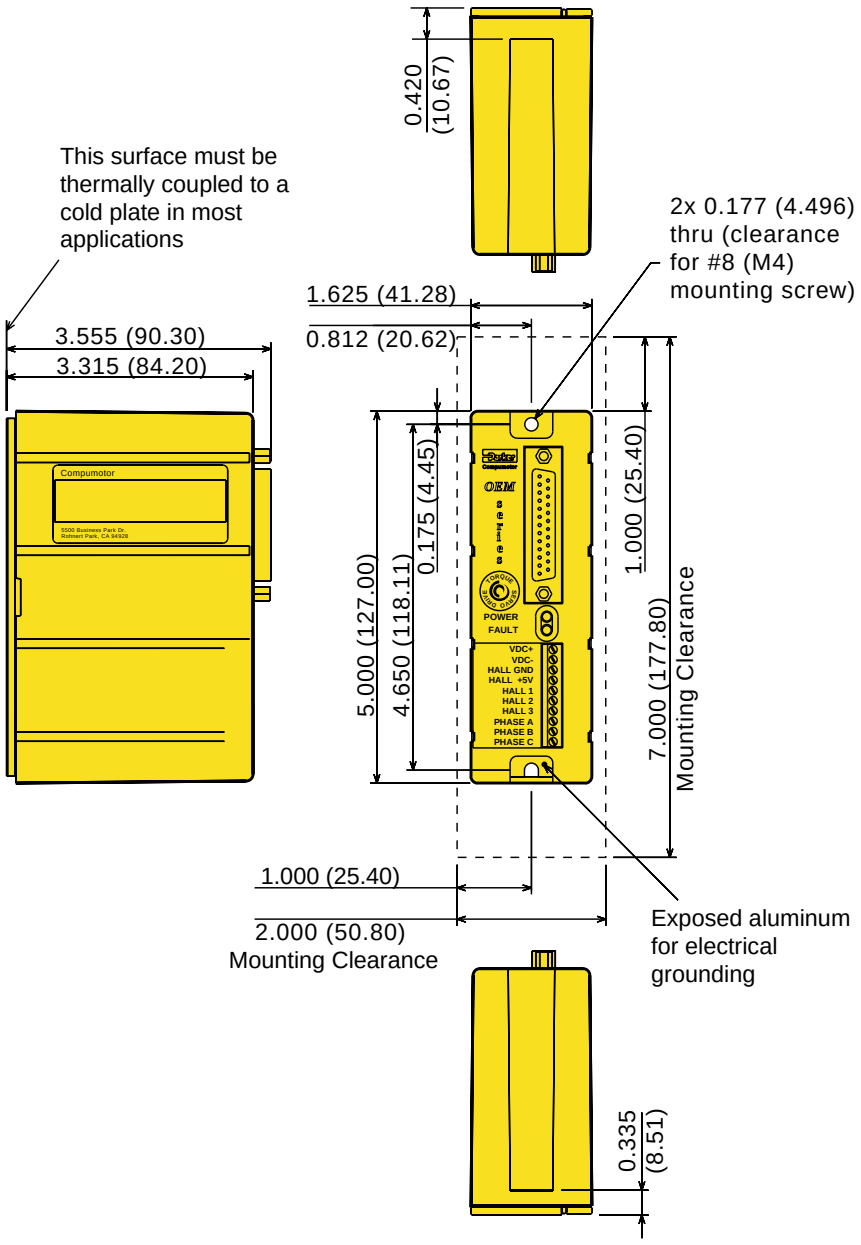


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OEM770 Series Dimensional Drawings

Dimensions in inches (mm)

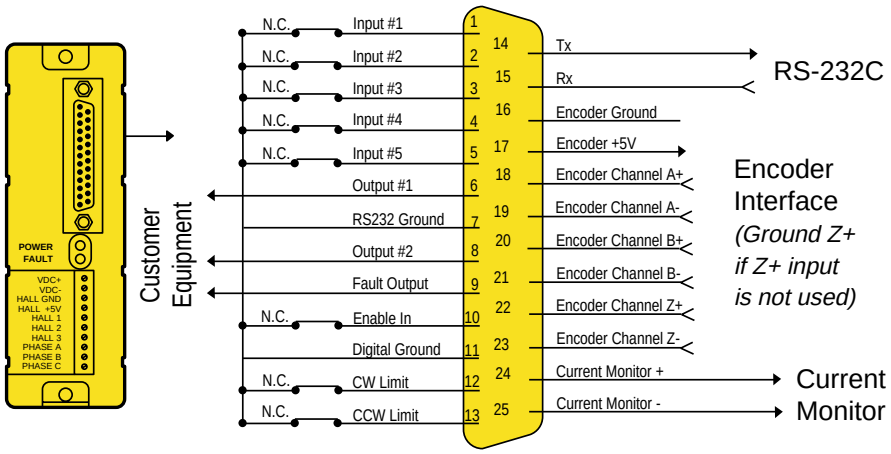


Motor/Power Screw-Terminal

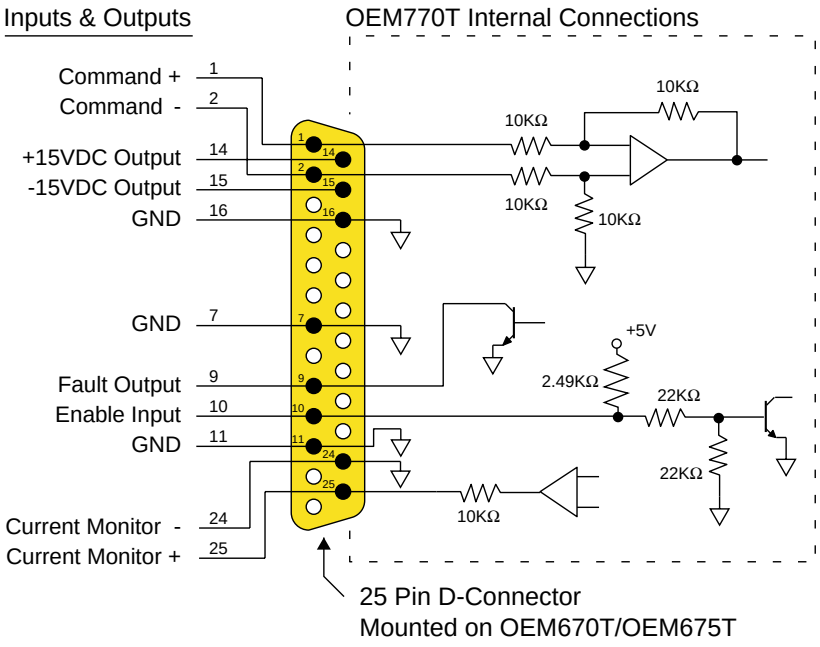
Pin No.	Signal
1	VDC+
2	VDC-
3	Hall GND
4	Hall +5V
5	Hall 1
6	Hall 2
7	Hall 3
8	Phase A
9	Phase B
10	Phase C

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OEM770X Drive Connections



OEM770T Drive Connections



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Ordering Information

Drives
UL and CE (LVD)

Part No.	Description
OEM770T	Torque Servo Drive
OEM770X	Servo Drive/Controller
OEM770X-M2	Servo Drive/Controller with battery-backed RAM (2KBytes)

Accessories
UL and CE (LVD)

Part No.	Description
OEM-HS1*	Heatsink Size 1
OEM-HS2*	Heatsink Size 2
58-013465-01	Thermstrate mounting pad (ordered in multiples of 25)
OEM300	300 Watt peak power output at 75 VDC. Operates at 120 or 240 VAC, 50/60 Hz
OEM1000	1000 Watt peak power output at 70 VDC. Operates at 120 or 240 VAC, 50/60 Hz
OEM1000-Cover	OEM1000 Power Module Cover
M2-KIT	Memory Upgrade Kit (Battery-backed RAM 2 KBytes)

** Note: Heatsinks are available for applications with inadequate mounting surface. Whether or not a heatsink is required depends on duty cycle and load characteristics.*

For complete motor and cable information, please refer to the Motor Cable Table at the end of the Servo Motors section.

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