

# MICROSTEPPING MOTOR DRIVES

## 3540M Series



### 3540M

- Pulse and Direction Stepper Drive
- 3.5 A, 40 Vdc
- Switch Selectable Resolutions: 400, 1000, 2000 and 12,800 Steps/Rev

### 3540MO

- Stepper Drive with Digital Oscillator
- 3.5 A, 40 Vdc
- Resolution: 12,800 Steps/Rev
- Speed Range Select: High (25 rps) or Low (5 rps)
- 0 to 5V Analog Input, External Speed Signal, Pot or Joystick
- Tach Output: 5 to 24V Optically Isolated, 100 Pulses/Revolution
- Acceleration/Deceleration Range, 1 to 250 Revs/Sec<sup>2</sup>

### Common Features

- DC Bus Voltage 12 to 42 Vdc Motor Supply (Including Ripple)
- Switch Selectable Motor Currents from 0.4 to 3.5 A/Phase
- Optically Isolated 5 Vdc Inputs for Step, Direction and Enable
- Enable Input to Turn Off Current to the Motor
- Screw Terminal Connectors
- MOSFET, Dual H-Bridge, Inaudible PWM Amplifier
- 3 State, Pulse Width Modulated Current Control, Switching at 20 to 30 KHz

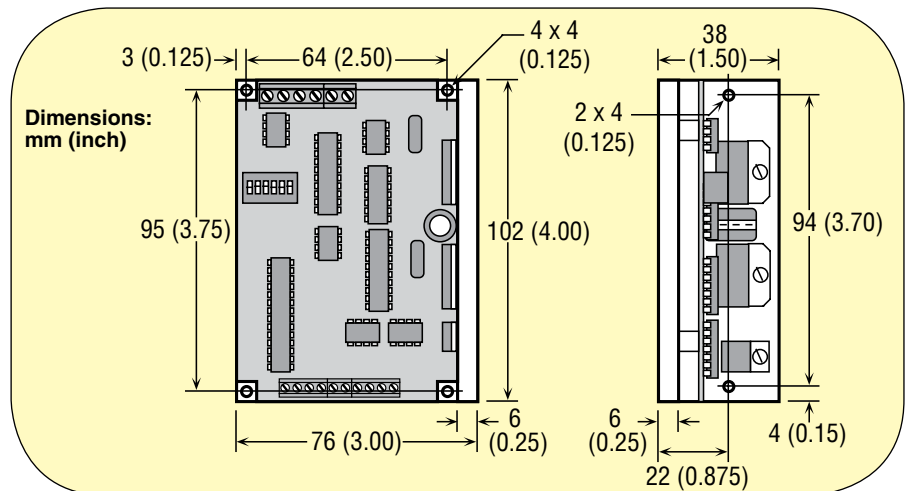
The 3540M/MO step motor drivers are microstepping drives with up to 12,800 steps per revolution, step phase sequencer with MOSFET three state switching amplifiers and optoisolated circuits. Both drives include 5 optically isolated inputs, and the 3540MO features external speed control, tach output, and internal pots for accel/decel rate along with high/low speed range selection.



3540M shown smaller than actual size.



3540MO shown smaller than actual size.



The 3540M is a step and direction drive, and includes an automatic feature (switch selectable) to reduce motor current by 50% when the motor is left at rest for more than one second. Additionally there is a switch selectable self-test which rotates the motor 1/2 revolution in each direction at 100 steps/second.

The 3540MO has an on-board oscillator which allows the motor speed to be controlled by an analog voltage or external joystick. This drive is ideal for continuous motion applications such as mixers and blenders. Microstepping resolution is selectable by DIP switch on the 3540M.

## SPECIFICATIONS

**Amplifiers:** Dual, bipolar MOSFET H-bridge, pulse width modulated three state switching at 20 KHz; 12 to 42 Vdc input; 0.4 to 3.5 A/phase output current, switch selectable in 0.1 A increments; 122 W maximum output power; automatic idle current reduction (switch selectable), reduces current to 50% of setting after one second

**Inputs (3540M):** Step, direction and enable, optically isolated, 5V logic; 5 mA/signal sink requirement; motor steps on rising edge of step input; 0.5 μsec minimum pulse width; 2 μsec minimum set up time for direction signal

**Inputs (3540MO):** Run/stop (cw limit), direction (ccw limit), high/low speed and enable inputs are optically isolated, 5 to 24V logic. 3 to 15 mA input current; 2200 Ω input impedance; can be configured for sinking or sourcing signals

**Recommended External Pot/Joystick Resistance:** 1 to 5 K  
**Joystick Dead Zone:** ±80 mV  
**Potentiometer/Analog Signal Dead Zone:** 40 mV

**Speed Ranges (3540MO):**

**Low Speed Range:** 0 to 5 rev/sec  
**High Speed Range:** 0 to 25 rev/sec  
**Accel/Decel Range:** 1 to 250 rev/sec/sec

**Tach Output (3540MO):**

Phototransistor, open collector, open emitter; 24V max, 20 mA max; 100 pulses per motor revolution, 50% duty cycle (square wave)

**Physical:** Mounted on ¼ inch thick black anodized aluminum heat transfer chassis; 38.1 x 76.2 x 101.6 mm (1.5 x 3.0 x 4.0") overall; power on red LED; maximum chassis temperature: 70°C (158°F)

**Connectors (3540M):** European style screw terminal blocks

**Max Wire Size:** 18 AWG  
**Motor:** 4 position (A+, A-, B+, B-)  
**DC Input:** 2 position (V+, V-)  
**Signal Input:** 4 position (+5, STEP, DIR, EN)

**Connectors (3540MO):** European style screw terminal blocks

**Power Supply and Motor:** 6 position  
**Wire Size:** 12 to 28 AWG  
**Signal Input:** 10 position  
**Wire Size:** 16 to 28 AWG  
**Motor:** 4 position (A+, A-, B+, B-)

**Self Test (3540M):** Switch selectable, rotates motor ½ revolution each direction at 100 steps/second, half step mode

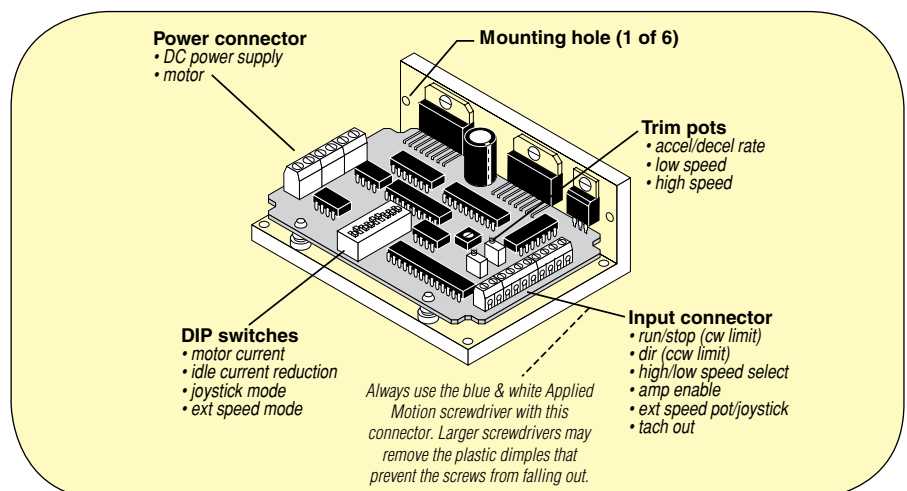
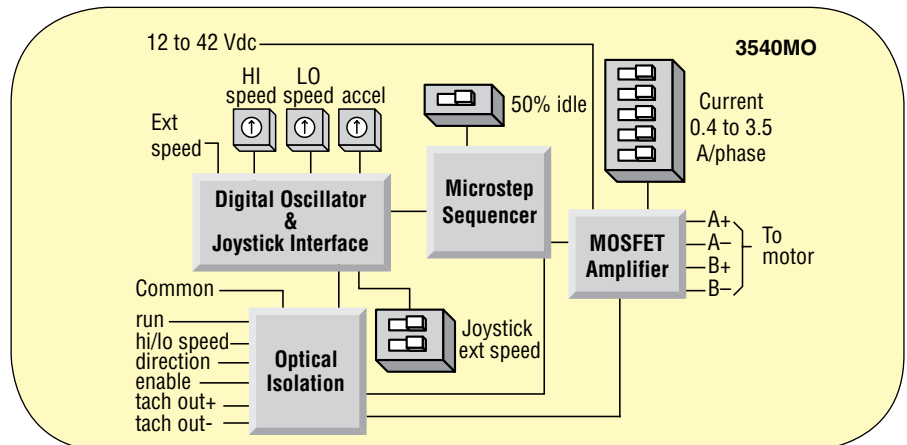
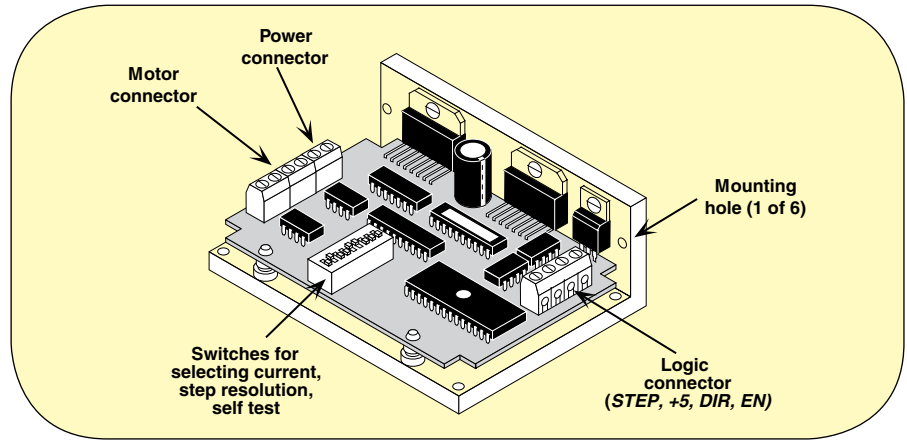
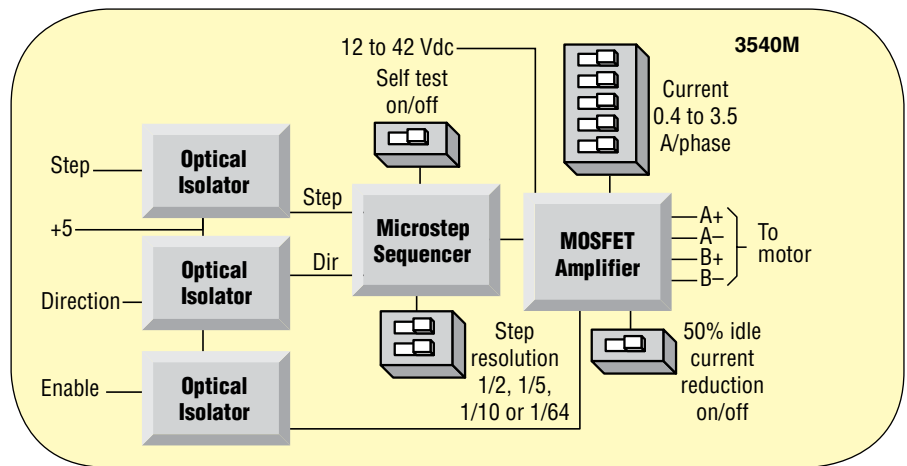
**Microstepping (3540M):** Four switch selectable step resolutions with 1.8° motor; half Step (400 steps/rev); ½ step (1000 s/r); ¼ step (2000 s/r); 1/16 step (12,800 s/r)

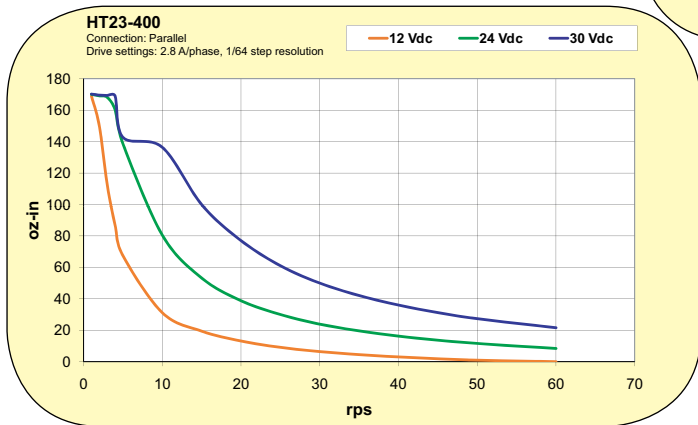
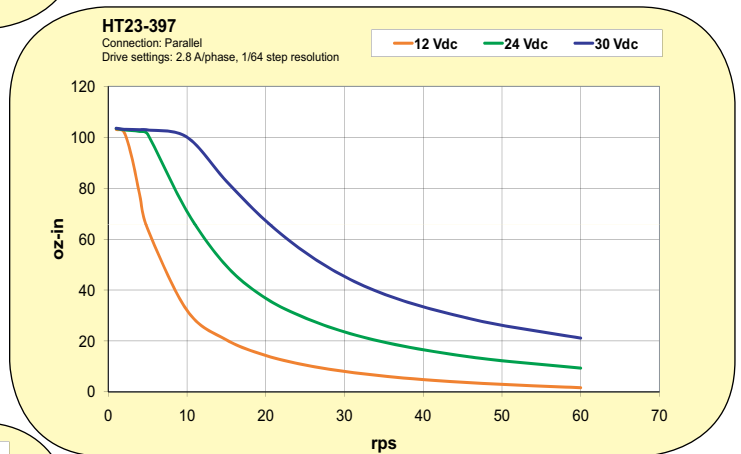
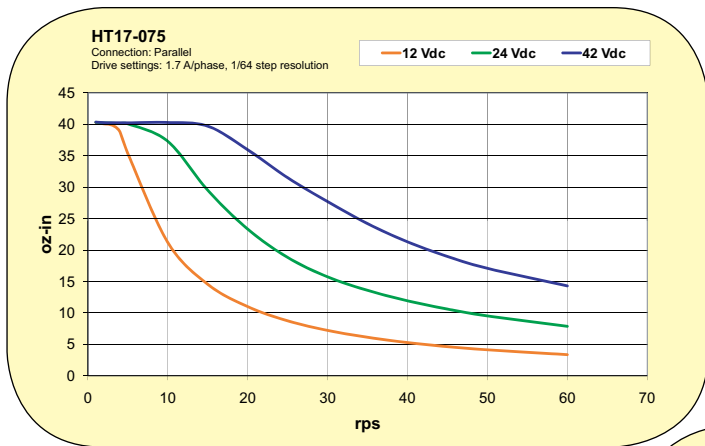
**Microstepping (3540MO):** 1/16 step (12,800 s/r) with 1.8° motor; pure sine waveform

**CE Mark:** Complies with EN55011A and EN50082-1(1992)

**OPTIONAL ACCESSORIES**

**Power Supply (Required for Drive Operation):** Recommended: OMPS150A24; 24 Vdc, 6.3 A; see omega.com/ps\_series





Torque vs. Speed Curves for 3540M/MO Drive-Motor Combinations

Order motors separately, see below for details

**To Order** Visit [omega.com/3540m](http://omega.com/3540m) for Pricing and Details

MODEL NO.	DESCRIPTION
3540M	Microstepping step motor drive 12 to 42 Vdc
3540MO	Microstepping step motor drive with digital oscillator

Ordering Example: 3540M, microstepping step motor drive.

**RECOMMENDED MOTORS FOR 3540M AND 3540MO**

MODEL NO.	HOLDING TORQUE g-cm (oz-in)	RATED VOLTAGE (V)	RATED CURRENT (A)	RESISTANCE OHMS	INDUCTANCE MH	ROTOR INERTIA g-cm <sup>2</sup> (oz-in <sup>2</sup> )
<b>NEMA 17 STEP MOTOR SPECIFICATIONS (RATINGS ARE WITH MOTOR CONNECTED IN PARALLEL)</b>						
OMHT17-075	4522 (62.8)	2.8	1.7	1.7	3.0	68 (0.37)
<b>NEMA 23 STEP MOTOR SPECIFICATIONS (RATINGS ARE WITH MOTOR CONNECTED IN PARALLEL)</b>						
OMHT23-397	12746 (177)	2.5	2.83	0.9	2.5	300 (1.64)
OMHT23-400	19011 (264)	3.2	2.83	1.1	3.6	480 (2.62)

Ordering Example: 3540MO, microstepping step motor drive with digital oscillator.

OMHT17-075, NEMA 17 step motor with 62.8 oz-in minimum holding torque.

Visit [omega.com](http://omega.com) for additional step motor information.

**ACCESSORY**

MODEL NO.	DESCRIPTION
OMPS150A24	Stepper drive power supply, 24 Vdc, 6.3 A