

# OEM650

*Microstepping Drive for  
Low Inductance,  
High-Current Motors*

## Features

### Performance

- Designed for use with a low inductance (<10 mH)
- Three-state current control allows the drive and motor to run cooler and more efficiently than two-state drives
- Selectable resolution up to 50,800 steps/rev
- Auto standby reduces motor current (and heating) at rest
- Provides 0.8 amps to 7.5 amps
- Single 24-75 VDC power supply input
- Compatible with a variety of motors
- Six predefined current waveforms to optimize smoothness

### Protection Circuit

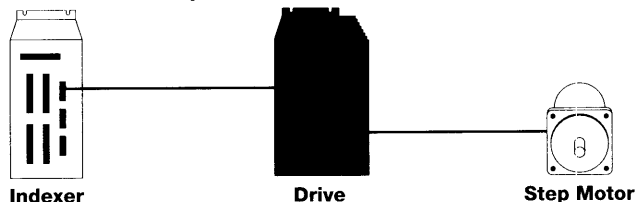
- Optically isolated step and direction inputs
- Short circuit protected—phase-to-phase, and phase-to-ground
- Power dump circuitry to protect drive from regeneration caused by large inertial loads
- Self-test feature to verify proper system operation
- Overtemperature circuitry protects the drive from thermal damage
- Certified as UL-recognized component

### Physical

- Status/fault LED indicators to confirm proper operation
- 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
- Optically isolated fault output for imbedded applications
- Heat plate design allows thermal dissipation through the mounting surface
- Simplified, two-screw mounting
- Only two screws required to mount
- Right-angle screw terminal allows side-to-side mounting, or Eurorack compatibility
- Built-in indexer version for complete application solutions—OEM650X
- Overall dimensions 5.0 x 3.6 x 1.6 in. (127 x 91 x 41 mm)
- Also available with a removable 10 pin motor/power connector (-RC option)

## A Full Spectrum of Products

*The following OEM products  
are available to complement  
your need for a drive.*

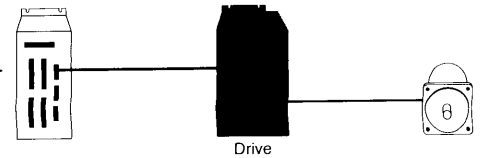


OEM010  
OEM023-AT  
OEMAT6400  
OEM6200  
PC21

QM



For complete specifications by  
return fax, please call us at this  
number and request Document 1320.



# OEM650 Specifications

Parameter	Value
<b>Power Input</b> DC	24–75 VDC @ 2 amps rms (motor dependent)
<b>Performance</b>	
Accuracy	±5 arc min (0.0833°) typical. Unloaded-bidirectional with Compumotor supplied motors. Other motors may exhibit different absolute accuracy. ±1 arc min (0.0167°) Loaded-in addition to unloaded accuracy, per each frictional load equal to 1% rated torque.
Repeatability	±5 arc sec (0.0014°) typical. Unloaded-one revolution returning to start point from same direction.
Hysteresis	Less than 2 arc min (0.0334°) unloaded-bidirectional.
Resolution	16 selectable choices: 200, 400, 1000, 2000, 5000, 10000, 12800, 18000, 20000, 21600, 25000, 25400, 25600, 36000, 50000, 50800
Waveform	Selectable. Allows waveform shaping for optimum smoothness or relative accuracy. Pure sine; -4%, -6%, -8%, -10% 3rd harmonic.
<b>Amplifier</b>	
Type	20 kHz fixed frequency, variable duty cycle pulse width modulated (PWM) Current controlled, bipolar chopper
Number of Phases	2
Output Current	0.8–7.5 amps current per phase peak (selectable)
Drive Supply Voltage	24–75 VDC (dependent on external power supply)
Standby Current Reduction	25%, 50% or 75% of selected motor current
Nominal Chopping Frequency	20 kHz
Max Stepping Rate	2 MHz max pulse rate; 50 rps max speed
Step Input	High-going pulse, 200 nsec min width; max pulse rate is 2 MHz; User-supplied driver for the step and direction inputs should be capable of providing a minimum of 6.5 mA to a maximum of 15 mA
Direction Input	Logic High = positive (CW) rotation—3.5–5.0V Logic Low = negative (CCW) rotation—0–0.4V User-supplied driver for the step and direction inputs should be capable of providing a minimum of 6.5 mA to a maximum of 15 mA. The direction input must be stable for at least 120 µsec before the drive receives the first pulse
Fault Output	Open-Collector/Emitter, Vce = 35 VDC, Vce sat = 0.3 VDC, Ic = 10 mA (max) Maximum dissipation = 100 mW Conducting = normal operation Non conduction = drive fault
<b>Protective Circuits*</b>	
Short Circuit	Phase-to-phase, phase-to-ground
Brownout	If DC supply drops below 24 VDC
Overtemperature	If internal air temperature exceeds 158°F (70°C)
<b>Environmental</b>	
Operating	32° F to 122°F (0°C to 50°C)
Drive	Max allowable ambient temperature is 122°F (50°C). Fan cooling may be required if airflow restricted
Storage	-40°F to 185°F (-40°C to 85°C)
Humidity	0 to 95% Non-condensing
<b>Physical</b>	
Drive Dimensions	5.0 x 3.6 x 1.6 in (127 x 91 x 41 mm)
Weight	0.72 lb (0.32 kg)
<b>Motor</b>	
Type	Two-phase hybrid permanent magnet, 1.8°
Number of Leads	4, 6 or 8
Minimum Inductance	0.5 mH (40 mH max)

\* Drive shuts down in conditions listed. Power must be cycled to resume operations.