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Find the *Emerson Motion Control Epsilon Ei-205-00-000* at our website: *Click HERE*

Epsilon
Compact and Economical

The Epsilon Series is the most compact digital servo drive in the Control Techniques lineup. Designed to fit in cabinets as small as six inches (152mm) deep, with cables attached, Epsilon drives possess the rugged quality and reliability found in our larger drive series.

There are three sizes of each Epsilon drive: 2 Amp, 3 Amp and 5 Amp, with the largest drive delivering up to 40 lb-in continuous torque. Each drive contains a 14-segment status display, reset button, removable connectors and utilizes standard "D" type connectors.



- **90 to 264 VAC 1Ø input power**
- **Up to 40 lb-in continuous torque**
- **Drive options: Base, Indexing, and Indexing with DeviceNet**
- **Easy install, setup and operation**
  - **Compact, space saving design, six-inch (152mm) panel depth including cables**
  - **Pluggable connectors, Standard D-Shell and Screw Terminals**
  - **State-Space Observer Control, which allows 10-1 inertia mismatch out of the box, and 50-1 with tuning**
  - **Free PowerTools software, and upgrades**
- **Programmable, optically-isolated I/O**
- **RS-232/485 serial communication interface using Modbus protocol**
- **14-segment status and diagnostic display, time-stamping of last 10 faults for easy troubleshooting**
- **Field programmable flash memory firmware (upgrades are free)**
- **Auto-Tune support for any servo motor with encoder feedback**
- **24VDC auxiliary input for logic backup**

The Epsilon is available as a base drive, the Epsilon Eb; or as a single-axis positioning, indexing drive, the Epsilon Ei. The Epsilon Ei is also available as DeviceNet-ready drive, the Epsilon Ei-DN.

The Epsilon is very easy to commission and program using PowerTools FM software. This Windows-based programming environment makes extensive use of drag and drop editing, tabbed setup screens and hierarchical views. On-line help is a mouse click away to answer any questions. Application notes, programming examples and the current version of PowerTools FM software can be downloaded from our web site at no charge. PowerTools FM is used to select the operating mode and motor, configure I/O, set velocity limits and torque levels, and monitor drive and I/O Status.

The Base drive can be configured in seven operating modes: Analog Torque, Analog Velocity, Preset Velocity, Preset Velocity + Analog Velocity, Pulse/Pulse, Pulse/Direction and Pulse/Quadrature. For positioning, the indexing version is your choice. The indexing drive gives you 16 Indexes with chaining and linking capability, jogging, a multitude of homing routines, and user units.

Communication is done via RS-232 or RS-485 Modbus RTU, which is standard on all Control Techniques drives. DeviceNet is available as an option on the indexing model, Ei-DN. The Epsilon is designed to run with Control Techniques NT, MG and EZ Unimotors motors and can easily be configured for use with any third party motor.

2 YEAR Digital Drive Warranty
5 YEAR Extended Warranty
CE
c UL us LISTED
FREE Software
DeviceNet
MODBUS

Epsilon Eb
Base Drive Operation

The Epsilon Series Eb Drive is a compact drive that is ideal for use with single and multi-axis controllers, PLCs and host controllers. The analog torque or velocity modes can be used with classic position controllers using analog outputs and encoder inputs. The pulse mode is ideal for use with low-cost PLC stepper controllers. This drive works in a variety of applications where a host control provides a command signal determining the desired motion profile.

The Eb Drive is configurable for seven flexible modes of operation, and the parameters for each mode can be adjusted to tailor the drive to the specific application using Windows-based PowerTools FM software.

Analog Torque Mode
Analog Velocity Mode
Digital Velocity Preset
Pulse Mode
- Pulse/Pulse
- Pulse/Direction
- Pulse/Quadrature

Summation of Analog Velocity and Digital Velocity

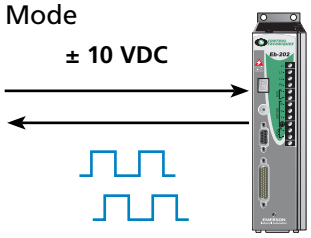
- **Programmable I/O**
  - **5 optically-isolated inputs (1 dedicated)**
  - **3 optically-isolated outputs**
  - **1 analog input ±10 VDC, 14 bit**
  - **2 analog output ±10 VDC, 10 bit**
- **Programmable encoder output, (up to 2,048 lines per revolution)**
- **Separate stop and travel limit decel ramps**
- **Torque, Travel, Following Error and Velocity Limits**
- **8 user defined speed presets with individual accel/decel rates**
- **2 Programmable Torque Level Outputs**
- **In Motion Velocity Output**
- **Software Oscilliscope**



STANDARD CONTROL MODES

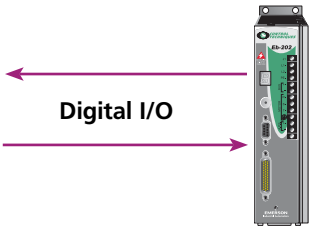
Analog Velocity/Torque Mode

- MC
- Position Controller



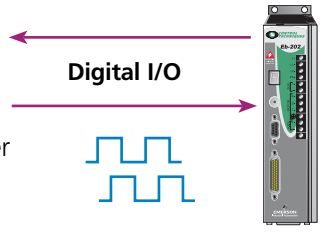
Digital Velocity Preset

- PLC
- User Logic



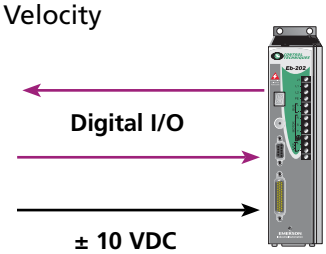
Pulse Mode

- PLC
- Master Axis
- Synchronized Encoder



Summation of Analog Velocity and Digital Velocity

- PLC
- User Logic
- Analog Trim



The operating mode of the drive is simply selected with one click in the PowerTools FM Detailed Setup tab.

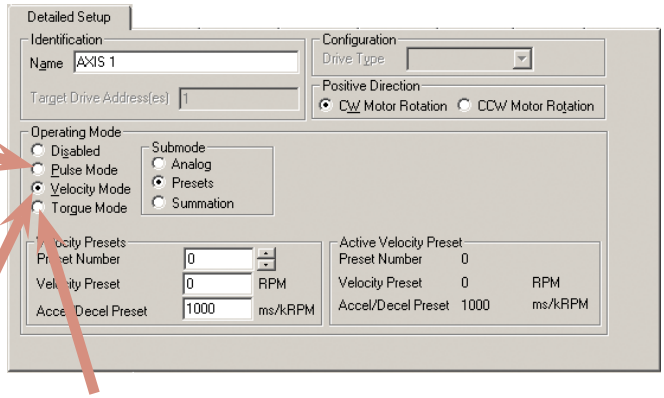
PULSE MODE

In Pulse Mode the drive will receive pulses from a master source (single-ended or differential), which can be interpreted in three ways:

- Pulse/Pulse
- Pulse/Direction
- Pulse/Quadrature

Application Examples

- PLC pulse command outputs
- Electronic gearing
- Stepper drive replacement
- Web line ratio control



VELOCITY MODE

Analog— In Analog Velocity Mode the drive develops a velocity command in proportion to the voltage (±10 VDC) received on the Analog Input. *Note: Analog full scale voltage and offest are programmable.*

Preset Velocity— In this mode one of up to eight digital velocities can be selected using the digital I/O or Modbus. Each preset has its own accel/decel ramps.

Application Examples

- Clutch-brake replacement
- Phase control with a differential
- Automatic feed control for machining operations
- Spindle speed control

Velocity Summation— This mode combines the features of Analog Velocity and Preset Velocity in one mode. It allows running a preset velocity and trimming it with an analog input, or vice versa, allowing advanced applications to be solved simply and elegantly without complex controllers.

Application Examples

- Loop/dancer arm control
- Phase advance/retard
- Speed trimming

TORQUE MODE

In Analog Torque Mode the drive develops a torque command in proportion to the the voltage (±10 VDC) received in the Analog Input. *Note: Analog full scale voltage and offest are programmable.*

Application Examples

- With Position/Velocity Controller
- Tension Control

FLEXIBLE I/O FUNCTIONALITY

The digital I/O of the drive is completely programmable with the ability to map one or more I/O functions to the I/O points.

Input Functions

Stop
Reset
Travel Limit (+)
Travel Limit (-)
Torque Limit Enable
Torque Mode Enable
Velocity Presets
Brake Release
Brake Control

Output Functions

Drive OK
At Velocity
Travel Limits (+)
Travel Limits (-)
In Motion (+)
In Motion (-)
Power Stage Enabled
Torque Limit Active
Velocity Limiting Active
Fault
Brake
Shunt Active
Torque Level 1 & 2 Active
Foldback Active

Epsilon Ei
Compact Indexing Drive

The Epsilon Series Ei (Indexing) Drive offers user units, indexing, homing and jogging, and additional I/O in a package that is the same compact size as the base Epsilon Eb Drive. Operating information is setup via a PC. These setup parameters are easily entered and stored with the use of our feature filled Windows®-based PowerTools FM software. The setup can be downloaded, stored on disk or printed out for documentation. The ease-of-use saves time and money during installation and makes long term support a breeze.

USER UNITS

Using PowerTools FM, the Ei is easily programmed. Homes, Jogs and Indexes are set up using units representative of the application. This allows for an easy translation of motor revolutions to rotary, linear or other units. Once the desired user units are entered into the Units tab, all motion will be based on units specific to the application—not arbitrary units requiring conversion.

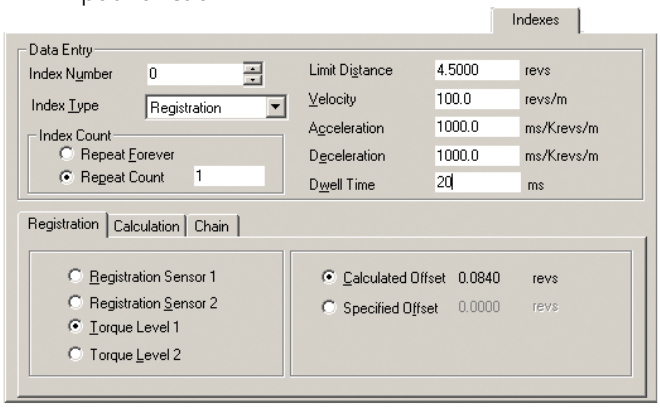
- **Epsilon Base Drive Features**
- **Programmable I/O**
  - **12 optically-isolated inputs**
  - **7 optically-isolated outputs**
- **16 indexes**
  - **Chaining index capability**
  - **Chain indexes to home**
- **Jogging and Homing**
  - **2 jog velocities**
  - **Homing**
  - **Home to sensor**
  - **Home to marker**
  - **Home to sensor/marker**
- **Alternate Mode**
  - **Analog Velocity**
  - **Analog Torque (with Speed Limit)**
  - **Pulse Mode**
- **Optional DeviceNet Version—Ei-DN**
- **User Units**
  - **Distance**
  - **Velocity**
  - **Time Scale**
  - **Acceleration**



INDEXING

The Epsilon Ei drive is easily programmed to meet a wide variety of indexing requirements, either using our PowerTools FM software or with a Modbus Master. Sequencing multiple indexes is possible using the chaining command.

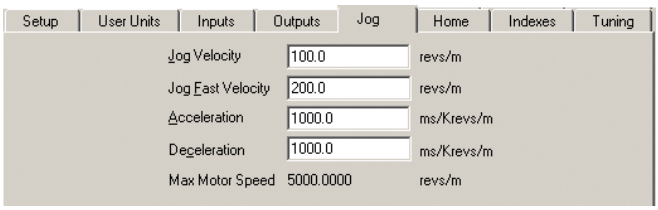
- 16 indexes —Incremental, Absolute, Registration, Rotary Plus, and Rotary Minus index types
- Parameters for Distance, Velocity, Accel/Decel, Dwell and Registration to Sensor or Torque Levels
- Chaining Options—Counts, Repeat Counts, Repeat Forever, Stop, Start Next Index, Wait for Run Next Input Function



JOGGING

The jogging function is comprised of two velocities with separate accel/decel ramps programmed in user units.

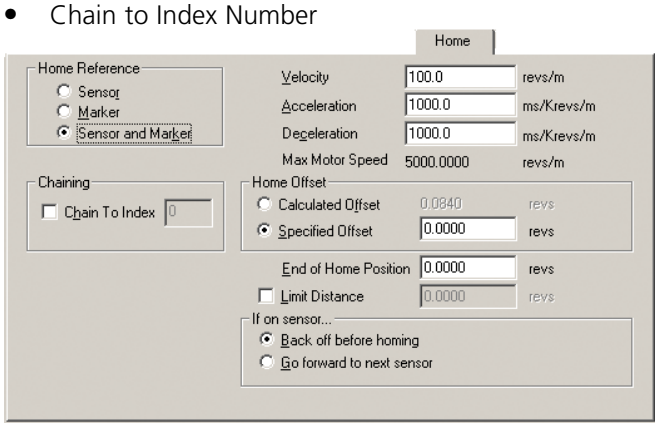
- Inputs: Jog +, Jog -, Jog Fast
- Parameters: Jog Velocity, Jog Fast Velocity, Accel and Decel



HOMING

The Homing feature set in the Ei is very extensive. The large number of parameters gives the user added flexibility and simplifies setting homing functions.

- Home to Sensor, Marker, Sensor & Marker
- If on home sensor, then back off before homing, or go forward to next sensor
- Home Offset distance relative to sensor/marker
- Parameters for Velocity, Accel, Decel, Home Offset, End-of-Home Position and Limit Distance
- Chain to Index Number



ALTERNATE MODE

Alternate mode adds base drive capabilities to the simple indexer. Users may acheive motions such as electronic gearing, analog signal following, and analog torque control using the Alternative mode function while retaining the full functionality of a powerful indexing drive.

- **Pulse Mode**

  In Pulse Mode the drive will receive pulses from a master source (single-ended or differential), which can be interpreted three ways:

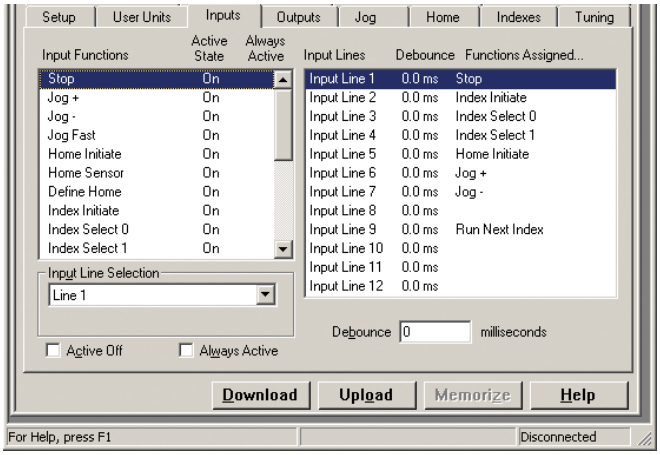
  - Pulse/Pulse
  - Pulse/Direction
  - Pulse/Quadrature

- **Analog Velocity Mode**

  In Analog Velocity Mode, the drive develops a velocity command in proportion to the voltage (±10 VDC) received on the Analog Input. *Note: Analog full scale voltage and offset are programmable.*

- **Analog Torque Mode**

  In Analog Torque Mode, the drive develops a torque command in proportion to the voltage (±10 VDC) received on the Analog Input. *Note: Analog full scale voltage and offset are programmable.*



FLEXIBLE I/O FUNCTIONALITY

The digital I/O of the drive is completely programmable with the ability to map one or more I/O functions to the I/O points

Input Functions

- Index Initiate
- Index Select 0
- Index Select 1
- Index Select 2
- Index Select 3
- Run Next Index
- Home Initiate
- Home Sensor
- Define Home
- Stop
- Jog +
- Jog -
- Jog Fast
- Travel Limit +
- Travel Limit -
- Brake Control
- Brake Release
- Reset
- Registration Sensor 1
- Registration Sensor 2
- Torque Limit Enable
- Alternate Mode Enable

Output Functions

- Absolute Position Valid
- End of Index
- End of Index Motion
- End of Index Count
- End of Chaining Counts
- Registration Limit Distance Hit
- Home Limit Distance Hit
- End of Home
- At Velocity
- In + Motion
- In - Motion
- Drive OK
- Fault
- Brake
- Travel Limit +
- Travel Limit -
- Foldback Active
- Shunt Active
- Torque Limit Active
- Power Stage Enabled
- Torque Level 1 Active
- Torque Level 2 Active
- Index In Position
- Torque at Max Velocity

Epsilon Ei-DN
DeviceNet-Ready

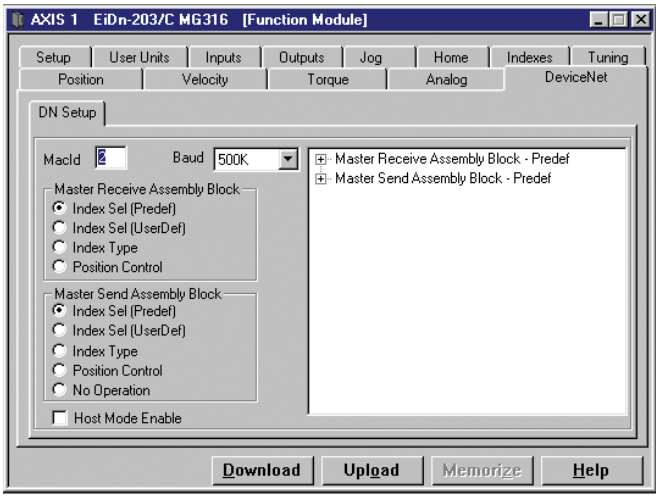
Small size and large functionality makes the Epsilon Ei-DN a natural fit in any DeviceNet related motion application. The Ei-DN retains the same footprint as the Ei and now uses Polled I/O and Explicit Messages to change or initiate any user parameter in the drive via DeviceNet. Choose between any one of four predefined DeviceNet word setups.



- **Index Select Predefined** (Static DeviceNet Word Block, full Ei features)
- **Index Select Userdefined** (Dynamic DeviceNet Word Block, full Ei features)
- **Index Type** (Position Control with Ei functionality)
- **Position Control** (Position Control only)

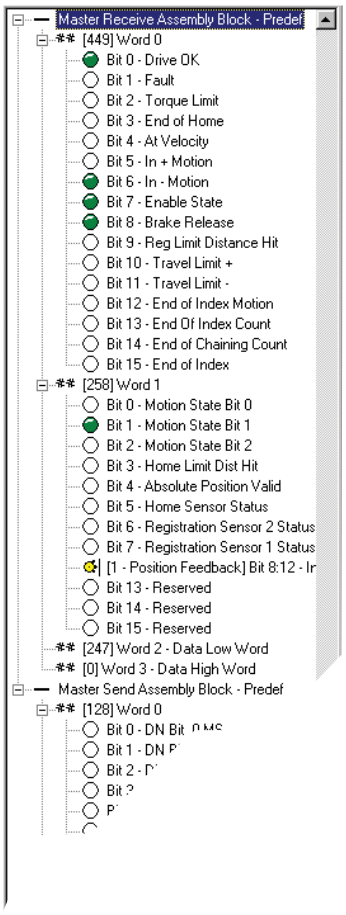
- **Some Features as Epsilon Indexer**
- **Supports Explicit Messaging**
- **Polled (8 bytes in, 8 bytes out)***
- **Access to all Motion Parameters within Polled I/O.**
- **Up to 63 devices per network**
- **Baud Rate (125k, 250k, 500k) and MacID configurable via PowerTools FM or the "one-touch" reset button**
- **Module and Status LEDs located on the front of the drive**
- **25 milliamp DeviceNet draw**
- **Easy 5-wire terminal block for DeviceNet connection**

***In and Out refers to PLC Inputs and Outputs**



Change the nature of the pre-configured assembly blocks by simply changing the mapping of the DN bits. The DN Bits are user defined bits that can have different I/O functions mapped to them.

PowerTools FM includes the most advanced diagnostic interface on the market for display of network data. When online, with PowerTools FM, the online DeviceNet tab gives the user a view of the actual data that is being sent and received through the DeviceNet network. Watch functions turn on and off over DeviceNet right in PowerTools FM. Look at transmit and receive message counters, check the established connections, even look at the current baud rate, MacID and Master MacID.



EPSILON DRIVE TERMINALS AND PINOUTS

Serial (J4)

Pin Number	Signal
3	RS-232 TX
2	RS-232 RX
6	Serial +5VDC
5	Serial 0V Common
4	RS-485+
9	RS-485-
1	Shield
7,8	No Connect

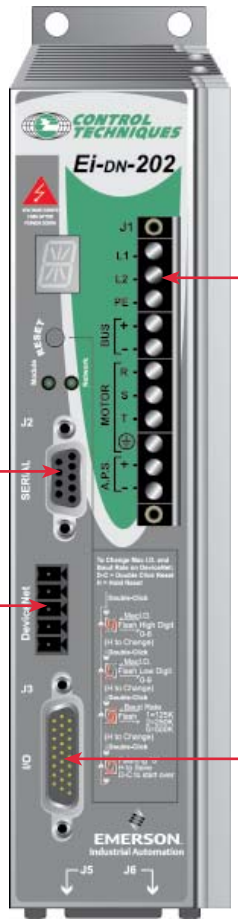
DeviceNet (Ei-DN Only)

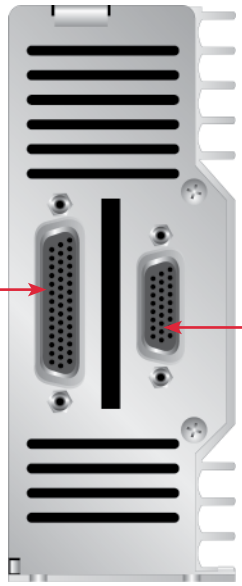
Pin Number	Signal
1	V-
2	CAN_L
3	Drain
4	CAN_H
5	V+

DeviceNet Connector (Ei-DN Only)

Commmand (J5)

Pin Number	Signal
15	Analog Command In +
14	Analog Command In -
8	Encoder Out A
9	Encoder Out A/
23	Encoder Out B
24	Encoder Out B/
37	Encoder Out Z
38	Encoder Out Z/
27	Pulse In A
41	Pulse In A/
26	Pulse In B
40	Pulse In B/
25	Pulse In Z
39	Pulse In Z/
20	Pulse In A (single ended)
36	Pulse In B (single ended)
16	I/O Input Drive Enable
1	I/O Input 1
2	I/O Input 2
3	I/O Input 3
4	I/O Input 4
19	I/O Output 1
18	I/O Output 2
17	I/O Output 3
33	I/O Supply +
34	I/O Supply +
31	I/O Supply 0V
32	I/O Supply 0V
29	Analog Out 0V
43	Analog Out Channel 1 +
44	Analog Out Channel 2 +
11	External Encoder +5VDC Power
12	External Encoder Common
28	+15V Power Out (10 mA)
6	RS-485 +
21	RS-485 -
5, 7, 10, 13, 22, 35, 30 ,42	No Connect





Power (J1)

Terminal	Signal
L1	AC Input L1
L2	AC Input L2
PE	PE
Bus +	DC Bus +
Bus -	DC Bus -
Motor R	Motor Power R
Motor S	Motor Power S
Motor T	Motor Power T
⏚	Motor Power Ground
A.P.S. +	Logic Supply Backup +24VDC
A.P.S. –	Logic Supply Backup 0V Common

Digital I/O (J3)

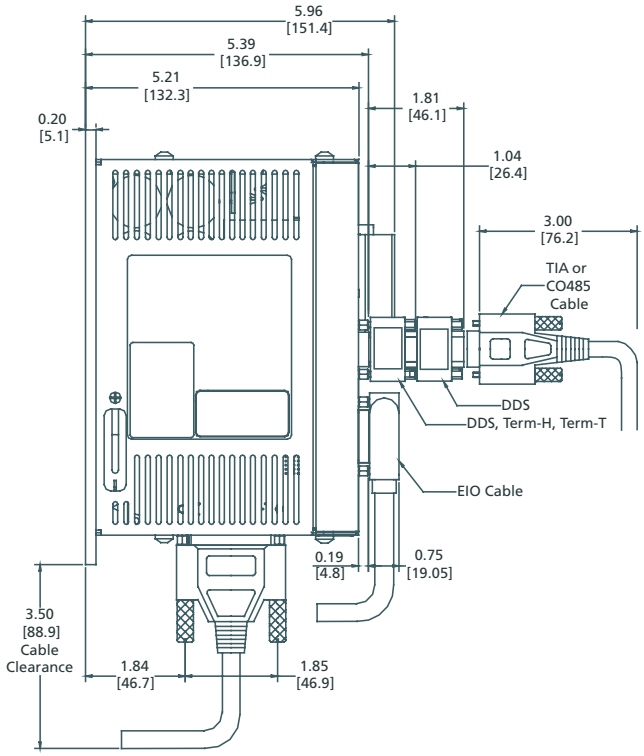
Pin Number	Signal
1	Input 1
11	Input 2
2	Input 3
12	Input 4
3	Input 5*
13	Input 6*
4	Input 7*
14	Input 8*
5	Input 9*
15	Input 10*
6	Input 11*
16	Input 12*
10	Drive Enable
19	I/O Supply +
20	I/O Supply 0V
7	Output 1
17	Output 2
8	Output 3
18	Output 4*
9	Output 5*
25	Output 6*
26	Output 7*
21-24	No Connect

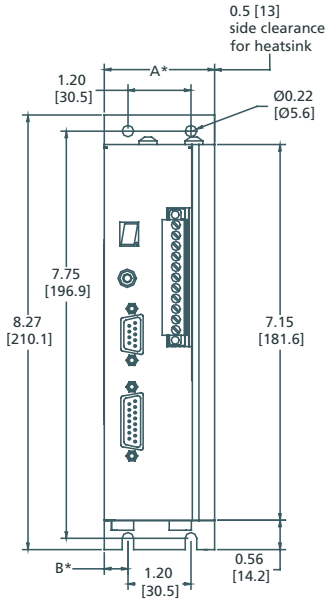
*Indexing Versions Only

Feedback (J7)

Pin Number	Signal
1	Motor Encoder A
10	Motor Encoder A/
2	Motor Encoder B
11	Motor Encoder B/
3	Motor Encoder Z
12	Motor Encoder Z/
4	Motor Commutation U
13	Motor Commutation U/
5	Motor Commutation V
14	Motor Commutation V/
6	Motor Commutation W
15	Motor Commutation W/
7,8	Encoder +5VDC Supply
17	Encoder 0V Common
9	Motor OverTemp
16,18-26	No Connect

EPSILON SPECIFICATIONS AND DIMENSIONS





Go to **Power CD** for complete data

Drive Model	Dimension A	Dimension B
ε**-202**	**2.10** [53.3]	**.45** [11.4]
ε**-203**	**2.10** [53.3]	**.45** [11.4]
ε**-205**	**3.56** [90.42]	**.70** [17.78]

Power Requirements

AC Input Voltage: 1Ø, 90 to 264 VAC, 47 - 63 Hz (240 VAC for rated performance)

AC Input Current

ε**-202:** 4.3Arms (140A for 2ms inrush)
ε**-203:** 6.5Arms (140A for 2ms inrush)
ε**-205:** 10.8Arms(140A for 5ms inrush)

Output Continuous Current (RMS)

ε**-202:** 1.8Arms
ε**-203:** 3Arms
ε**-205:** 5Arms

Output Peak Current (for 4 seconds)

ε**-202:** 3.6A
ε**-203:** 6A
ε**-205:** 10A

Continuous Output Power

ε**-202:** 0.7kW
ε**-203:** 1.2kW
ε**-205:** 2.0kW

Switching Frequency 20 kHz

Logic Supply Internal

Auxiliary Logic Supply +18 to 30 VDC @ 0.5A

Encoder Supply Output +5 VDC, 250 mA

System Efficency 93%

Cooling Method

ε-202: Convection
ε-203: Convection
ε-205: Convection

Regeneration

Internal Energy Absorption (115V)

ε**-202:** 41 Joules
ε**-203:** 41 Joules
ε**-205:** 113 Joules

Internal Energy Absorption (230V)

ε**-202:** 18 Joules
ε**-203:** 18 Joules
ε**-205:** 48 Joules

External: Connection to RSR-2 with external resistor, 20 Ohm min, 15 Arms, 2kW

Drive Control Inputs

Analog: (1) +/-10VDC, 14 bit, 100kOhm, Differential

Analog Max. Input Rating: Differential +/-14 VDC, Each Input with Reference to Analog Ground +/-14VDC

Digital: (5) +10 to 30 VDC, 2.8kOhm, Sourcing, Optically Isolated

Pulse: (1) Differential Rs-422, 2MHz/Channel, 50% Duty Cycle

Single Ended: (1) TTL Schmitt Trigger 1MHz/ Channel, 50% Duty Cycle

Motor Overtemperature: 0 to +5VDC, 10kOhm, single ended

Drive Control Outputs

Analog: (2) +/-10VDC, 10 bit, Single-ended 20mA

Digital: (3) +10 to 30VDC, 150mA, Sourcing Optically Isolated

Pulse: Differential RS-422 and TTL compatible, 20mA/Channel Sink or Source

I/O Supply: +10 to 30 VDC

Environmental

Rated Ambient Temperature: 32° to 104°F (0° to 40°C) for rated performance

Maximum Ambient Temperature: 32° to 122°F (0° to 50°C) with power derating of 3.5%/1.8F (1°C) above 104°F (40°C)

Rated Altitude: 3280' (1000m)

Maximum Altitude: For altitudes >3280' (1000m) derate output by 1%/328' (100m)

Vibration: 10 to 2000 Hz @ 2g

Humidity: 10 to 95% non-condensing

Storage Temperature: -13° to 167°F (-25° to 75°C)

Ingress Protection: IP-20

Serial Interface

RS-232/RS-485 Modbus RTU w/ 32-bit extension — 9600 to 19.2 kBaud

Internal RS-232 to RS-485 Converter

Drive Weight

ε**-202:** 3.3 lb (1.5 kg)
ε**-203:** 3.3 lb (1.5 kg)
ε**-205:** 3.7 lb (1.7 kg)

DeviceNet (Optional)

Power Consumption: 25mA
Baud Rateds: 125, 250 and 500kps
Node Addresses: 00-63

HOW TO ORDER

Use one of the next few pages to configure a basic Epsilon system by selecting one item from each of the four ordering columns, and the fifth column if you are choosing a brake motor. Note that item ❷ motor selection requires additional input as to flange, and on NT systems, connector type. (See the Motor Order String boxes for details.) Items ❸ through ❺ require cable lengths to be provided. The basic systems represented on these pages can be customized with a variety of components depending on your needs. A guide to Epsilon Options and Accessories can be found at the end of this page.

SELECT SYSTEM AND MOTOR

❶ Select the Epsilon drive appropriate to the needs of your application and operating environment, either Eb (base), Ei (indexing) or Ei-DN (indexing with DeviceNet support), and the size of drive, 2-Amp, 3-Amp or 5-Amp Epsilon (202, 203 and 205, respectively).

❷ Select a motor for your drive. The system selection matrix for NT motors is found on the next page. The matrix with MG and EZ Unimotors motors are found on the page following NT motors.

CABLE ORDERING OPTIONS

Motor power, feedback and brake cables are fully shielded with IP-65 molded connectors and are available in standard and custom lengths. For more information on these and other cables, *see Options and Accessories section*.

Standard lengths of 5, 15, 25, 50 and 100 feet are available from stock. Non-standard lengths require additional lead time.

When ordering, replace xxx with specified length in feet (i.e. 005 = 5 ft). For applications involving continuous flexing, flexible cables are available. Cable components such as connector kits and raw cable are also available. See Options and Accessories section for details or consult factory for special requirements.

❸ Motor power cables
CMDS-xxx 16 AWG for 2-3" motors; connector on motor end, ferrules on drive end

❹ Motor Feedback Cables
CFCS-xxx Connectors on both ends.

❺ Motor Brake Cable
CBMS-xxx Required for all motors with brake option; connector on motor end only.

Software is Free!

The Control Technique's "Motion Made Easy" Power CD (CT-MME-POWER-CD) is shipped with every product. Software updates are free and can be downloaded from our website, as are firmware updates.

EPSILON OPTIONS AND ACCESSORIES

Control Techniques provides a complete array of options and accessories to complete your system. For details, see the Options and Accessories section of the catalog.

Brake Relay
BRM-1

Breakout Board
ECI-44, STI-EIO

Diagnostics
DGNE

Auxillary Logic Supplies
MLP-002-00, MLP-005-00 and MLP-010-00

External Shunts/Resistors
RSR-2, ES-20-500, ES-20-1K, ES-20-2K, ES-30-1K, ES-30-2K, MS-530-00-000

AC Line Filters
960307-01

Synchronization Encoders
SCSLD-4, SCSLD-4R

Operator Interface
OIT, CTIU

Prosoft Comms Modules
3100-MCM, 3150-MCM, MV156-MCM

Extended Warranty
Extends Two Year Warranty to Five Years

Epsilon
120-240V NT Motor Selection

The NT motor is a high performance motor utilizing patented technology to maximize torque in a compact package. The NT motor uses powerful Neodymium magnets and manufactured with a segmented core to maximize stator efficiency. The NT motor has a very low inertia for applications that demand high accel and cycle rates. NT motors are available in English (NEMA 23 or 34) or Metric (IEC-72-1) flanges, with or without brakes. The standard encoder resolution is 2048 lines per rev. NT motors can be ordered with MS style connectors, 1m Flying Leads, or 1m Flying Leads with MS connectors.

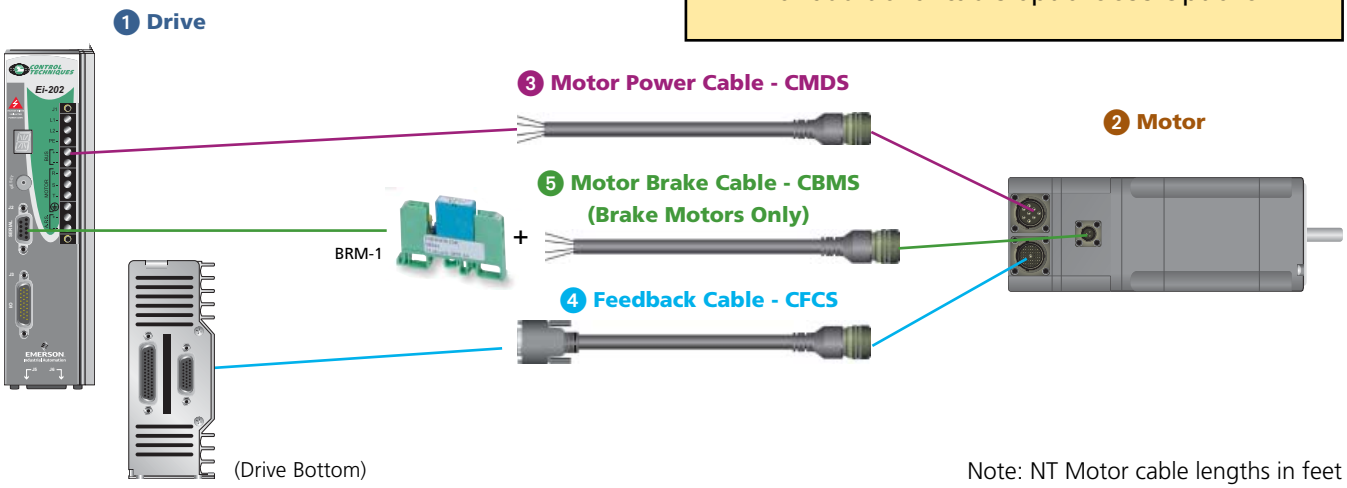
NT Motor Order String for Epsilon

NT X–X XX–X X N S – 0000

- Special Options: DSXX=DSUB Conn
- Inertia: S = Standard Inertia
- N = Feedback Type: Encoder
- Brake Option:
  - B = with brake
  - O = without brake
- Connector Type:
  - C = MS connectors on motor
  - T = MS connectors on one meter leads
  - L = one meter leads without connectors
- Continuous Torque (lb-in): 7, 12, 20, 30, or 45
- Frame Size (in inches): 2 or 3
- Mounting Flange: E = English, M = Metric
- NT Motor Family

For additional motor information see Motors.

For additional cable options see Options.



Note: NT Motor cable lengths in feet

❶ Epsilon Servo Drive (ε=Eb, Ei or Ei-DN)	❷ NT Servo Motor (first x=flange type; second x=connector type)	❸ Motor Power Cable (xxx=feet)	❹ Feedback Cable (xxx=feet)	❺ Motor Brake Cable* (required w/ all brake motors) (xxx=feet)
ε-202-00-000	NTx-207-xONS-0000	CMDS-xxx	CFCS-xxx	
ε-202-00-000	NTx-207-xBNS-0000	CMDS-xxx	CFCS-xxx	CBMS-xxx
ε-202-00-000	NTx-212-xONS-0000	CMDS-xxx	CFCS-xxx	
ε-202-00-000	NTx-212-xBNS-0000	CMDS-xxx	CFCS-xxx	CBMS-xxx
ε-203-00-000	NTx-212-xONS-0000	CMDS-xxx	CFCS-xxx	
ε-203-00-000	NTx-212-xBNS-0000	CMDS-xxx	CFCS-xxx	CBMS-xxx
ε-205-00-000	NTx-320-xONS-0000	CMDS-xxx	CFCS-xxx	
ε-205-00-000	NTx-320-xBNS-0000	CMDS-xxx	CFCS-xxx	CBMS-xxx
ε-205-00-000	NTx-330-xONS-0000	CMDS-xxx	CFCS-xxx	
ε-205-00-000	NTx-330-xBNS-0000	CMDS-xxx	CFCS-xxx	CBMS-xxx
ε-205-00-000	NTx-345-xONS-0000	CMDS-xxx	CFCS-xxx	
ε-205-00-000	NTx-345-xBNS-0000	CMDS-xxx	CFCS-xxx	CBMS-xxx

*Not required when ordering NT brake motors with Flying Lead cable option.

Epsilon-NT Motor Specifications

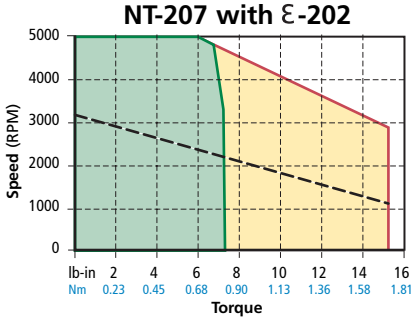
Drive Model (Ɛ= Eb, Ei or EI-DN)	Motor Model	Cont. Stall Torque lb-in / Nm	Peak Stall Torque lb-in / Nm	Rated Torque @Rated Speed* lb-in / Nm	Rated Power HP / kWatts	Max.* Operating Speed RPM	Encoder Resolution lines/rev	Inertia lb-in-sec² / kg-cm²	Motor Ke Vrms/krpm	Motor Kt lb-in/Arms / Nm/Arms	Motor Weight lb / kg
Ɛ-202	NT-207	7.3 0.83	15.2 1.72	6 0.68	0.48 0.36	5000	2048	0.000094 0.106	35	5.12 0.58	3 1.36
Ɛ-202	NT-212	8.7 .98	17 1.92	8.4 0.95	0.71 0.53	5000	2048	0.000164 0.185	35	5.12 0.58	4 1.82
Ɛ-203	NT-212	12.5 1.4	27 3.05	11.8 1.3	0.75 0.56	5000	2048	0.000164 0.185	35	5.12 0.58	4 1.82
Ɛ-205	NT-320	19 2.1	29 3.28	18.8 2.1	1.19 0.89	4000	2048	0.000328 0.370	29	3.50 0.40	6 8.55
Ɛ-205	NT-330	26 2.9	44 4.97	26 2.9	1.24 0.92	4000	2048	0.000438 0.494	36	5.04 0.57	7.3 3.31
Ɛ-205	NT-345	37 4.2	65 7.34	36 4.1	1.71 1.28	3000	2048	0.000668 0.754	50	7.13 0.81	10 4.54

* Rated Speed = Maximum Operating Speed

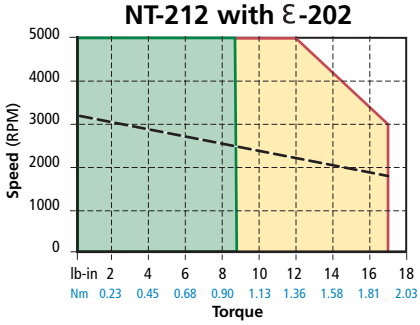
Epsilon-NT Motor Speed Torque Curves

Ɛ = Epsilon Drive: Epsilon Eb (base), Epsilon Ei (indexing), or Epsilon Ei-DN (indexing with DeviceNet support).

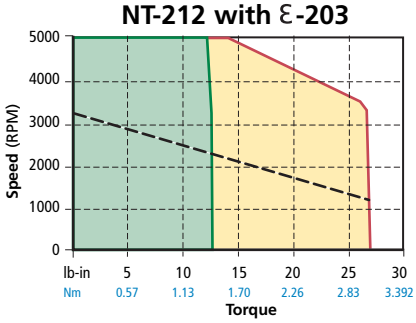
NT-207 with Ɛ-202



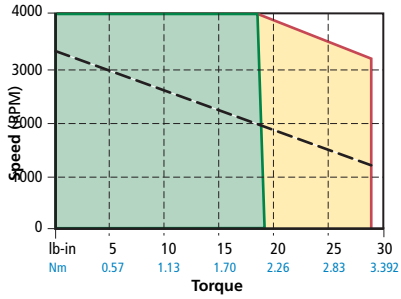
NT-212 with Ɛ-202



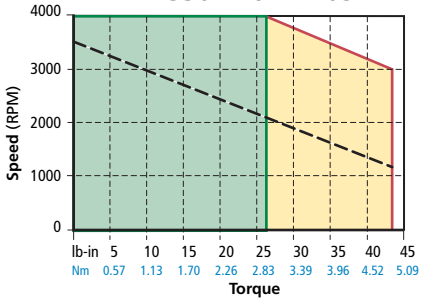
NT-212 with Ɛ-203



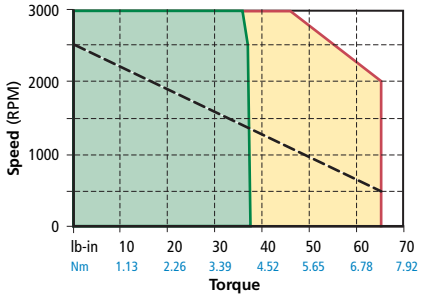
NT-320 with Ɛ-205



NT-330 with Ɛ-205



NT-345 with Ɛ-205



Legend

– – – 120V Curve

Continuous Torque

Peak Torque

SPECIFICATIONS

Voltage	240 VAC
Drive Frequency	20kHz
Ambient Temperature	25°C (77°F)
Case Temerature	100°C (212°F)

All performance data listed above (and similarly on page 65) has a +/-10% tolerance and is subject to change at any time without notice. For more detailed information on performance data and test conditions please refer to the motor section of the catalog. For brake motor information, complete motor specifications and dimensions please refer to our motor section.

Epsilon
120-240V MG Motor Selection

The MG motor is a low inertia motor that is great for dynamic applications that have larger load inertias. MG motors use Neodymium magnets to achieve a high torque to inertia ratio giving them a size advantage when compared to competitors motors. MG motors are available in English (NEMA 23, 34, or 56) and Metric (IEC-72-1) flanges, with or without brakes. The standard encoder resolution is 2048 lines per rev. MG motors come standard with MS style connectors. For applications that require custom motors the MG line is the choice.

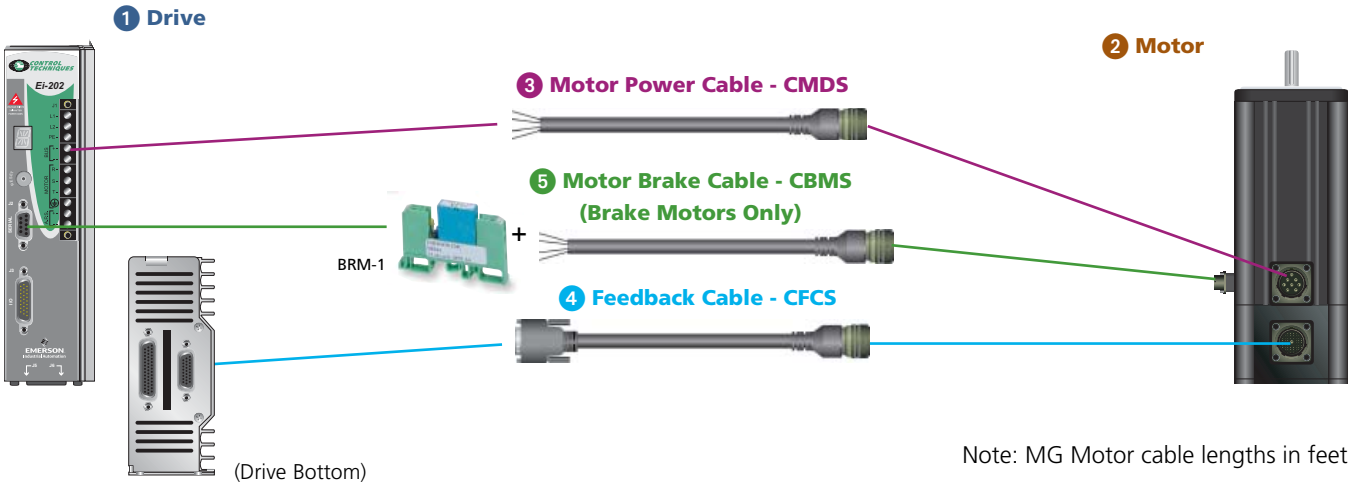
MG Motor Order String for Epsilon

MG X–X XX–C X N S – 0000

- MG Motor Family
- Mounting Flange: E = English, M = Metric
- Frame Size (in inches): 2 or 3
- Continuous Torque (lb-in): 5, 8, 16, or 40
- C = MS connectors on motor
- Brake Option:
  - B = with brake
  - O = without brake
- N = Feedback Type: Encoder
- S = Shaft Seal (Standard)
- Special Options

For additional motor information see Motors.

For additional cable options see Options.



Note: MG Motor cable lengths in feet

❶ Epsilon Servo Drive (ε=Eb, Ei or Ei-DN)	❷ MG Servo Motor (x=flange type)	❸ Motor Power Cable (xxx=feet)	❹ Feedback Cable (xxx=feet)	❺ Motor Brake Cable (required w/ all brake motors) (xxx=feet)
ε-202-00-000	MGx-205-CONS-0000	CMDS-xxx	CFCS-xxx	
ε-202-00-000	MGx-205-CBNS-0000	CMDS-xxx	CFCS-xxx	CBMS-xxx
ε-202-00-000	MGx-208-CONS-0000	CMDS-xxx	CFCS-xxx	
ε-202-00-000	MGx-208-CBNS-0000	CMDS-xxx	CFCS-xxx	CBMS-xxx
ε-203-00-000	MGx-208-CONS-0000	CMDS-xxx	CFCS-xxx	
ε-203-00-000	MGx-208-CBNS-0000	CMDS-xxx	CFCS-xxx	CBMS-xxx
ε-203-00-000	MGx-316-CONS-0000	CMDS-xxx	CFCS-xxx	
ε-203-00-000	MGx-316-CBNS-0000	CMDS-xxx	CFCS-xxx	CBMS-xxx
ε-205-00-000	MGx-316-CONS-0000	CMDS-xxx	CFCS-xxx	
ε-205-00-000	MGx-316-CBNS-0000	CMDS-xxx	CFCS-xxx	CBMS-xxx
ε-205-00-000	MGx-340-CONS-0000	CMDS-xxx	CFCS-xxx	
ε-205-00-000	MGx-340-CBNS-0000	CMDS-xxx	CFCS-xxx	CBMS-xxx

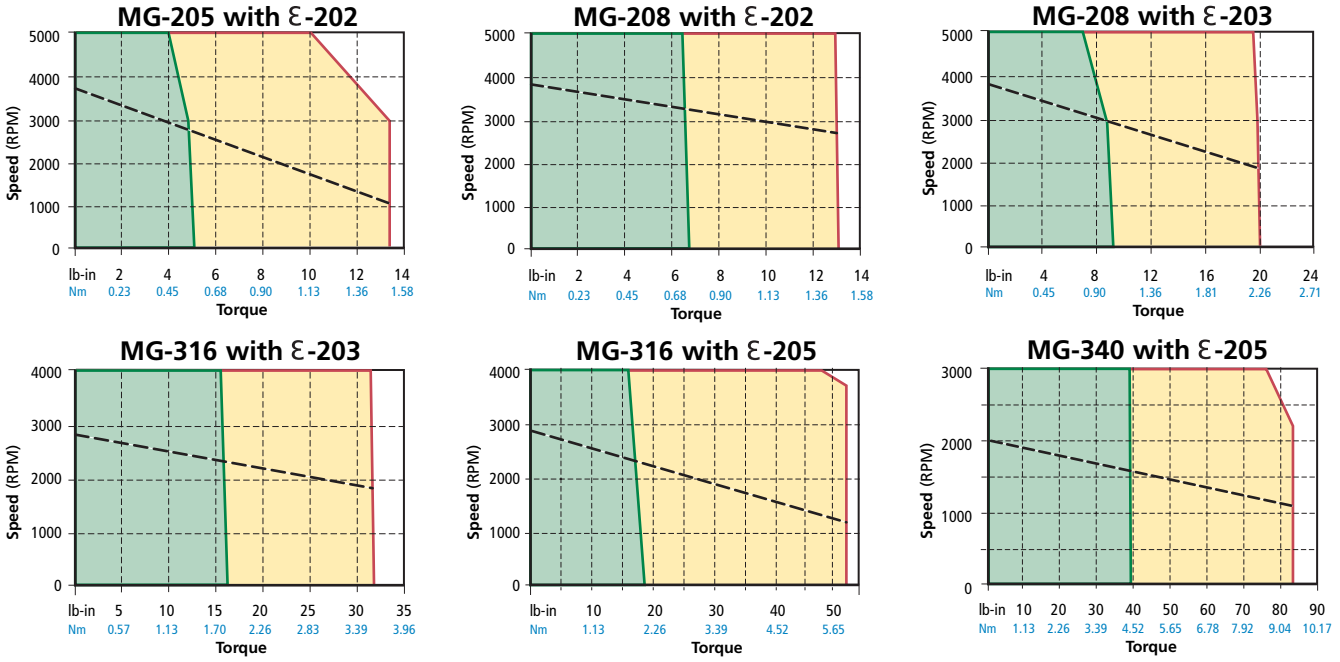
Epsilon-MG Motor Specifications

Drive Model (Ɛ = Eb, Ei or Ei-DN)	Motor Model	Cont. Stall Torque lb-in / Nm	Peak Stall Torque lb-in / Nm	Rated Torque @Rated Speed* lb-in / Nm	Rated Power HP / kWatts	Max.* Operating Speed RPM	Encoder Resolution lines/rev	Inertia lb-in-sec² / kg-cm²	Motor Ke Vrms/krpm	Motor Kt lb-in/Arms / Nm/Arms	Motor Weight lb / kg
Ɛ-202	MG-205	5 0.56	13.5 1.53	4 0.45	0.32 0.24	5000	2048	0.000099 0.112	28	4.1 0.47	3 1.3
Ɛ-202	MG-208	6.7 0.76	13.2 1.50	6.4 0.72	0.51 0.38	5000	2048	0.000169 0.191	28	4.1 0.47	4 1.8
Ɛ-203	MG-208	8.8 1.0	20 2.26	7.3 0.82	0.58 0.43	5000	2048	0.000169 0.191	28	4.1 0.47	4 1.8
Ɛ-203	MG-316	15.8 1.8	32 3.59	15.5 1.75	0.98 0.73	4000	2048	0.000575 0.630	38	5.5 0.62	8.3 3.8
Ɛ-205	MG-316	18.6 2.1	53 6.0	15.5 1.75	0.98 0.73	4000	2048	0.000575 0.630	38	5.5 0.62	8.3 3.8
Ɛ-205	MG-340	40 4.5	83 9.38	40 4.5	1.9 1.42	3000	2048	0.001458 1.646	57	8.3 0.94	14.6 6.6

* Rated Speed = Maximum Operating Speed

Epsilon-MG Motor Speed Torque Curves

Ɛ = Epsilon Drive: Epsilon Eb (base), Epsilon Ei (indexing), or Epsilon Ei-DN (indexing with DeviceNet support).



Legend

– – – 120V Curve

Continuous Torque

Peak Torque

SPECIFICATIONS

Voltage	240 VAC
Drive Frequency	20kHz
Ambient Temperature	25°C (77°F)
Case Temerature	100°C (212°F)

All performance data listed above (and similarly on page 65) has a +/-10% tolerance and is subject to change at any time without notice. For more detailed information on performance data and test conditions please refer to the motor section of the catalog. For brake motor information, complete motor specifications and dimensions please refer to our motor section.

Epsilon
240V EZ Unimotor

The EZ Unimotor line is a medium inertia line for larger load applications. The EZ Unimotor line uses a 4096 line encoder for high precision and is designed with low cogging torque to provide smooth operation and excellent velocity regulation. Unimotors are available in Metric frames of 75mm, 95mm, 115mm, 142mm, and 190mm, with or without brakes. The unique finned design has excellent thermal characteristics providing a compact design. The torque range available is 19.5lb-in (2.2Nm) to 36.3lb-in (4.1Nm).

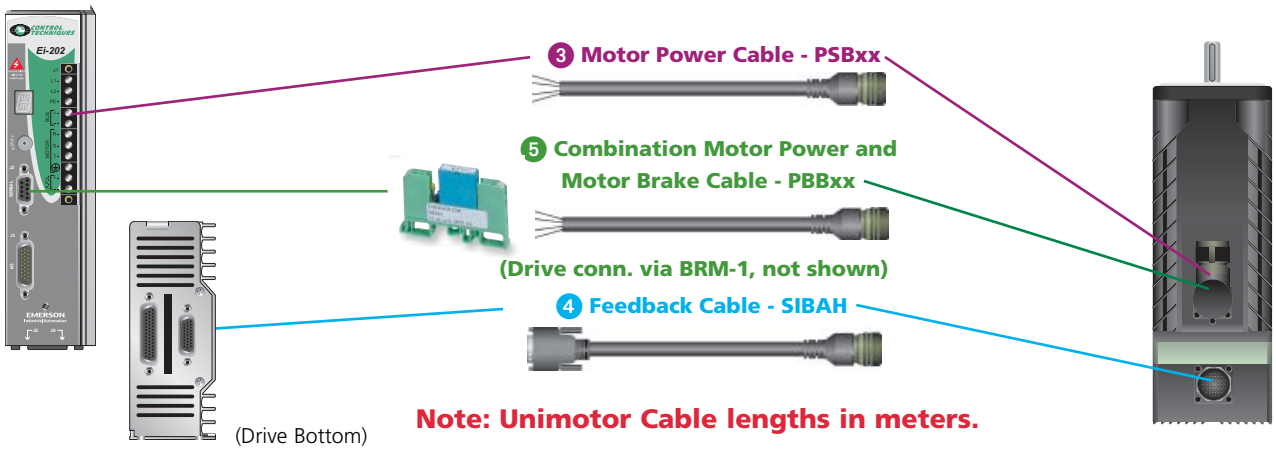
EZ Unimotor Motor Order String

95 EZ B 30 0 C A C A A

- Inertia: A=Standard, B=High
- Flange Mounting: A=IEC
- Feedback Device: C=Incremental Encoder, R=Sin/Cos multi turn Encoder, S=Sin/Cos single turn Encoder, A=Resolver
- Shaft Key: A=With Key, B=No Key
- Connection Type: C=Connectors
- Brake: 0=None, 1=24VDC
- Rated Speed: 20=2,000, 30=3,000, 40=4,000, 60=6,000rpm
- Stator Length: A, B, C, D, E
- Unimotor EZ=230V
- Frame Size 75, 95, 115, 142, 190

For additional motor information see Motors.

For additional cable options see Options.



❶ Epsilon Servo Drive (Ɛ=Eb, Ei or Ei-DN)	❷ EZ Unimotor (x=flange type)	❸ Motor Power Cable (xxx=feet)	❹ Feedback Cable (xxx=feet)	❺ Motor Brake Cable (required w/ all brake motors) (xxx=feet)
Ɛ-203-00-000	75EZB300CACAA	PSBAA-yyy	SIBAH-yyy	
Ɛ-203-00-000	75EZB301CACAA		SIBAH-yyy	PBBAA-yyy
Ɛ-205-00-000	75EZD300CACAA	PSBAA-yyy	SIBAH-yyy	
Ɛ-205-00-000	75EZD301CACAA		SIBAH-yyy	PBBAA-yyy
Ɛ-205-00-000	95EZB300CACAA	PSBAA-yyy	SIBAH-yyy	
Ɛ-205-00-000	95EZB301CACAA		SIBAH-yyy	PBBAA-yyy

Epsilon- EZ-Unimotor Specifications

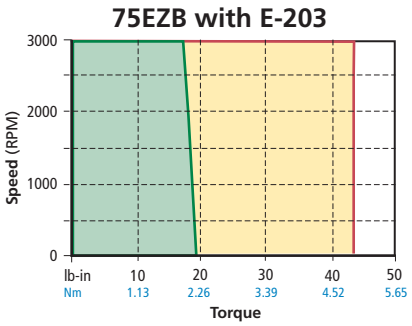
Drive Model (Ɛ = Eb, Ei or Ei-DN)	Motor Model	Cont. Stall Torque lb-in / Nm	Peak Stall Torque lb-in / Nm	Rated Torque @Rated Speed* lb-in / Nm	Rated Power HP / kWatts	Max.* Operating Speed RPM	Encoder Resolution lines/rev	Inertia lb-in-sec² / kg-cm²	Motor Ke Vrms/krpm	Motor Kt lb-in/Arms / Nm/Arms	Motor Weight lb / kg
Ɛ-203	75EZB	19.5 2.2	43.4 4.9	17.7 2.0	0.84 0.63	3000	4096	0.000885 1.0	49.9	7.26 0.82	9.5 4.3
Ɛ-205	75EZD	34.5 3.9	72.6 8.2	31.0 3.5	1.48 1.10	3000	4096	0.001682 1.9	49.9	7.26 0.82	12.8 5.8
Ɛ-205	95EZB	36.3 4.1	72.6 8.2	34.5 3.9	1.64 1.22	3000	4096	0.002213 2.5	49.9	7.26 0.82	13.5 6.1

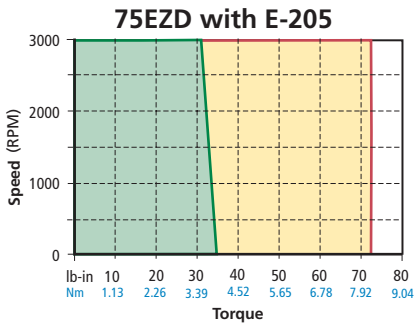
* Rated Speed=Maximum Operating Speed

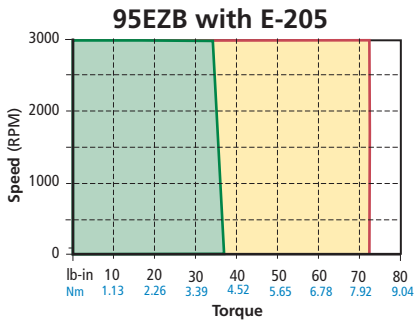
Unimotors are available in optional stack lengths and other maximum operating speeds. Contact your Control Techniques representative for more data.

Epsilon- EZ-Unimotor Speed Torque Curves

Ɛ = Epsilon Drive: Epsilon Eb (base), Epsilon Ei (indexing), or Epsilon Ei-DN (indexing with DeviceNet support).







Legend

- Continuous Torque
- Peak Torque

SPECIFICATIONS

Voltage	240 VAC
Drive Frequency	20kHz
Ambient Temperature	25°C (77°F)
Case Temerature	100°C (212°F)

All performance data listed above has a +/-10% tolerance and is subject to change at any time without notice. For more detailed information on performance data and test conditions please refer to the motor section of the catalog. For brake motor information, complete motor specifications and dimensions please refer to our motor section.



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