Enhance machine performance through easy integration with any motion controller

Digitax Epsilon EP



Nidec Control Techniques'

Control Techniques' AC drives provide world-class solutions to a wide range of applications and industries. AC drives also known as variable frequency drives (VFD), variable speed drives (VSD), adjustable-speed drives or inverter drives also referred to as motor controls.

Control Techniques drives offer:

- Wide power and voltage ranges with advanced motor control
- Extendable through a large range of option modules
- Compact with onboard programming and motion control
- Robust design for long and reliable service

Digitax Epsilon EP

compact and easy-to-use servo drive, is scalable from a simple amplifier to a completely programmable 1.5-axis motion controller.

is available in three flexible models:

1. **Epsilon EP-B (base)**
2. **Epsilon EP-I (indexer);**
3. **Epsilon EP-P (programming).**

- 2.2 - 16.0 A rms (4.4 - 32 Peak)
- 100 | 240 V

Each model is available with five drive different power stages: 2.2A, 4.0A, 6.5A, 9.0A and 16.0A, providing the capability to deliver over 198 lb-in (22.4 Nm) of torque at the rated motor speed and 396 lb-in (44.8 Nm) of peak torque for those high demanding pulse duty application.

Phone

NL
+31 499 371007

DE
+49 2157 128990

Address

NL
Dynetics B.V.
De Rijn 12
5684 PJ Best
Netherlands

DE
Dynetics GmbH
Klostergasse 6
D-41334 Nettetal-Kaldenkirchen
Germany

Connectivity is the key

The Epsilon EP compact servo drive offers four of the most popular network connections for industrial controls. RS485 with the standard Modbus RTU interface is on all models allowing interfacing to PC Tools, simple HMI's, and Drive to drive configurations.

Optional ProfiBus DP and DeviceNet communication configurations for system integration to common PLC platforms, and EtherNet, standard on every Epsilon EP-P, opening up a whole new world of interfacing possibilities are also available—see the communications section under the options tab for more information.

Epsilon EP is currently in the legacy phase of its product lifecycle. However, rest assured replacement drives can be purchased.

Please contact us for support

Images

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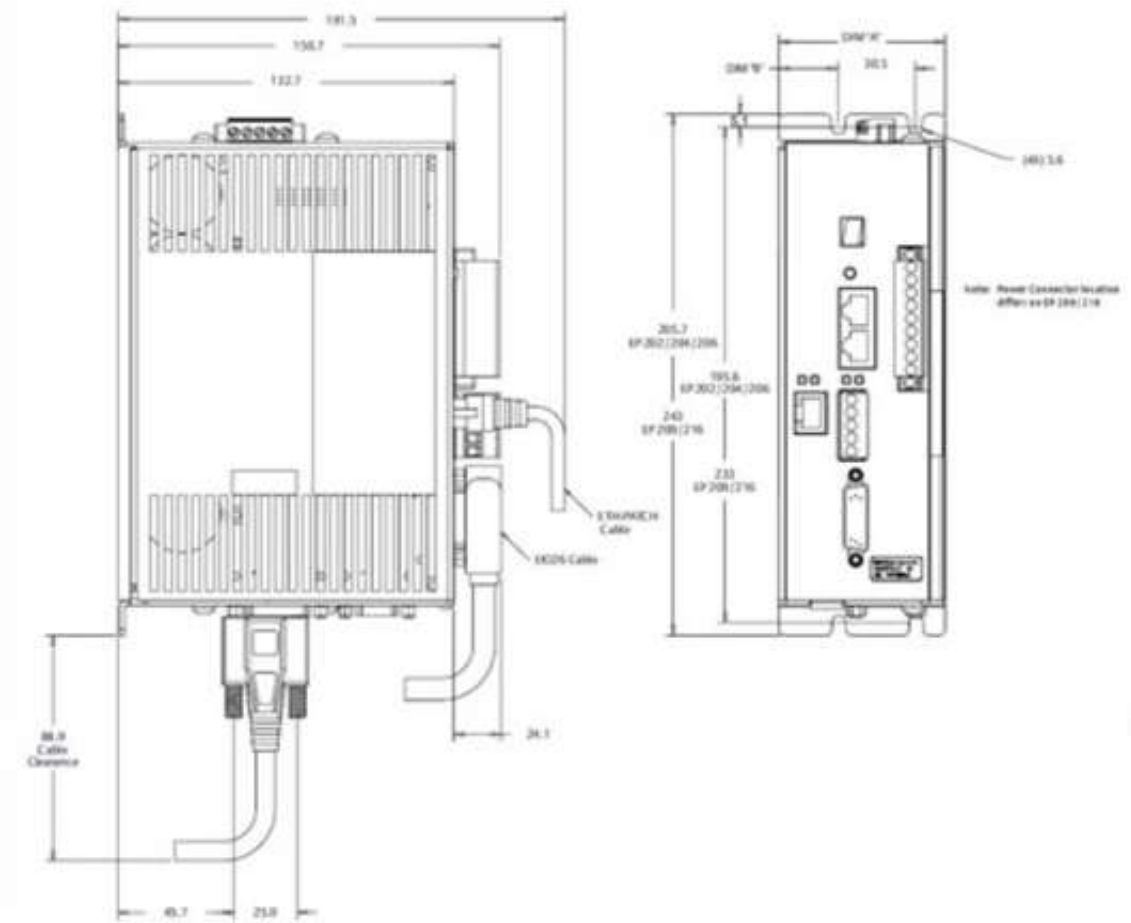

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Intellectual property protection		√	√
CTSoft programming		√	√
Program multi-tasking		√	√
PowerTools Pro programming		√	
SyPT Pro programming environment with PLCopen programming			√
Drive-to-drive networking			√

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	DIGITAX ST BASE	DIGITAX ST EtherCAT	DIGITAX ST INDEXER	DIGITAX ST EZ MOTION	DIGITAX ST PLUS
Two option module slots	√	√	√	√	√
Digital and analogue I/O	√	√	√	√	√
Smartcard	√	√	√	√	√
High speed freeze input	√	√	√	√	√
Safe Torque Off	√	√	√	√	√
DC bus paralleling	√	√	√	√	√
CT Soft and CTScope commissioning software	√	√	√		√
Removable keypad (optional)	√	√	√	√	√
RS485 PC programming port	√	√	√	√	√

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FUNCTION	QTY	I/O DEFAULT FUNCTION	RATING
Analog input 1	1	Frequency /speed ref 1	±10V
Analog input 2	1	Frequency /speed ref 2	±10V(default), 0-20mA or 4-20mA
Analogue input 3	1	Motor thermistor	±10V, 0-20mA, 4-20mA or Motor thermistor input (default)
Analogue output	2	Speed/frequency Torque (active current)	±10V(default), 0-20mA or 4-20mA
Digital input	3	Run reverse input Analogue input 1/2 select Jog forward input	+24V
Digital input / output	3	At zero speed output Reset input Run forward input	+24V
Relay	1	Drive OK indicator	Normally open
Drive enable (Safe Torque Off)	1	Safe Torque Off input	+24V
+24V External input	1	External 24V supply	+24V

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Details

Digitax Epsilon EP Enhance machine performance through easy integration with any motion controller; 2.2 - 16.0 A rms (4.4 - 32 Peak) 100 | 240 V

DIMENSIONS AND WEIGHT		DIM. B	WEIGHT(kg)
EP202 / EP204 -B,-I,-IDN	53.3	11.4	1.63

Phone

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DE
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EP206-B,-I,-IDN	71.6	11.4	1.91
EP202 / EP204 -P	68.3	26.1	1.77
EP206-P	86.3	26.1	2.04
EP209 / EP216 all models	86.3	26.1	2.49

Integrated Control

Control Techniques' servo Epsilon EP product line offerings include integrated motion control solutions. The Epsilon EP product line offers product scalability with base, indexer and programming variants.Variants and their respective solutions include:

-
-
-

Performance Advantage

Control Techniques has incorporated several advanced features and capabilities in the Epsilon EP family to make these drives even more powerful and easier to use. The key features are incorporated into the four variants of this product line. The four variants are:

Epsilon EP-B – Base

The base drive is ideal for servo applications utilizing an external motion controller. It accepts an analog command signal and sends out position feedback. The EP-B has the unique capability of combining an analog command with a preset velocity for trimming or advance/retard operations. The EP-B drive is an excellent choice for stepper replacements or centralized control systems.

Epsilon EP-I or EP-IDN – Indexer

The EP-I drive is a highly capable position controller that provides Home, Index, and Jog motion profiles. The EP-I holds up to16 unique indexes that also can be chained together to create complex motion profiles. The EP-I has a unique alternate mode feature whereby it can perform an Index or Home function and then switch to an alternate mode such as Analog Torque, Analog Velocity, or Pulse Follower mode on the fly! This compact indexing drive is a cost effective solution for countless applications.

Epsilon EP-P, EP-PDN and EP-PPB – Programming

Phone

NL
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DE
+49 2157 128990

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DE
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The EP-P drive provides the highest level of control by allowing the user to create complete programs to sequence the motion control along with other machine functionality. The EP-P can be used to solve the most complex motion applications and still be easy to use thanks to Control Techniques' FREE PowerTools Pro configuration software.

PowerTools Pro uses simple drag-and-drop and fill-in-the-blank screens that make setup a snap. User programs are created using a text-based motion language that is as easy to read as it is to program. If you don’t know the command, simply drag it in from the drop-down box and PowerTools Pro will assist you with the syntax. With intuitive software and plenty of online help, programming this servo drive is truly “Motion Made Easy!”®

Additional features include:

Real-Time Program

A Real-Time Program (RTP) is a user program that executes in a single servo update. A RTP allows synchronous execution of a user program with the internal motion kernel which enables the possibility of real-time modification of motion profiles, monitoring of key performance indicators, or to make time critical calculations needed to get the most out of your motion control system.

Electronic Camming

Programming electronic cams has taken a huge step forward with Control Techniques' easy-to-use camming functions. PowerTools Pro offers a unique graphical interface which show the motion engineer exactly what the cam profile looks like in polar or linear coordinates. Cam data can be imported from a CAD system or entered directly from the PowerTools Pro software or even self generated within a user program. Epsilon EP supports several different types of interpolation types including linear, cosine, square, cubic spline, and jerk free offering flexibility in trajectory generation. Cam profiles can be started as easily as turning on an input, with no user program involved. Of course for advanced capabilities, user programs can be also used enabling access to a wealth of cam information and dynamically monitoring.

Modbus Master

Modbus Master takes machine control capability to a whole new level. No longer limited to the drive's on-board I/O, the Modbus Master can manage a very large number of I/O and communicate updates to any Modbus follower device, giving machine builders extensive control options.

Position TrackerTM

Analog position control and Fieldbus position control allow the Epsilon EP to replace an expensive PLC motion control module with a simple, low cost analog signal or Fieldbus register. With Position Tracker, the closed loop feature of the position controller has been integrated into the drive itself. The user simply sends the drive an analog or Fieldbus signal that is proportional to the absolute motor/actuator position. Advanced features such as "teach" functions also contribute to faster set up.

Built-in Timers

Phone

NL
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DE
+49 2157 128990

Address

NL
Dynetics B.V.
De Rijn 12
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Netherlands

DE
Dynetics GmbH
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These timers provide a simple and accurate way to trigger an action based on a previously initiated time delay. Select from up to seven different timer types to match your needs.

Ethernet Programming

The EP-P drive uses common Ethernet protocols for all levels of networking ranging from applications setup and monitoring to communicating to PLC's via Ethernet/IP or connecting to an operator panel using Modbus TCP/IP.

Technology for reliability and performance

- **Flexible bus voltages DC, AC 10V to 264V**
- **5 Drive Power Options: 2.2, 4, 6.5, 9 and 16 Amps**
- **1 to 200 lb-in continuous torque range**
- **Drive types: Base, Indexing, and Programmable**
- **Indexing and Programmable drives can be ordered with optional DeviceNet or Profibus**
- **Easy install, setup and operation**
- **Compact, space saving design, six-inch (152 mm) 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**
- **RS485 serial communication interface using Modbus protocol**
- **Ethernet/IP and Modbus TCP/IP standard on the Epsilon EP-P programmable drive**
- **Field programmable flash memory firmware (upgrades are free)**
- **Wide variety of motor combinations: Unimotor HD, Unimotor FM, MG, NT, XV**
- **Auto-Tune support for any servo motor with encoder feedback**
- **24 VDC input for logic power supply**

Specifications and Dimensions

Power Requirements

- AC Input Voltage,
  - 47-63 Hz
  - EP 202/204/206: 1Ø, 20 to 264 VAC
  - EP 209: 1Ø, 90 to 264 VAC
  - EP 216: 3Ø, 90 to 264 VAC
  - (240 VAC for rated performance) SCCR 10kA
- DC Input Voltage
  - EP 202/204/206: 10-340 VDC
  - EP 209/216: 140-340 VDC
- AC Input Current (max. continuous)
  - EP202: 5.0 Arms (140A for 2 ms inrush)

Phone

NL

+31 499 371007

DE

+49 2157 128990

Address

NL

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    - EP204: 8.5 Arms (140A for 2 ms inrush)
    - EP206: 12.0 Arms (140A for 2 ms inrush)
    - EP209: 16 Arms (34A for 5 ms inrush)
    - EP216: 16 Arms (34A for 5 ms inrush)
- Output Current Continuous (rms) / Peak (4 sec.)
    - EP202: 2.2A / 4.4A
    - EP204: 4.0A / 8A
    - EP206: 6.5A / 13A
    - EP209: 9.0 A / 18A
    - EP216: 16.0A / 32A
- Continuous Output Power
    - EP202: 0.77 kW
    - EP204: 1.27 kW
    - EP206: 1.77 kW
    - EP209: 2.32 kW
    - EP216 3Ø: 4.8 kW
    - EP216 1Ø: 2.32 kW
- Switching Frequency: 10 kHz
- External Logic Supply: +18 to 30 VDC @ 0.5A
- Encoder Supply Output: +5 VDC, 250 mA
- I/O Supply: +10 to 30 VDCSystem Efficiency 93%
- Cooling Method: Convection EP202 through EP209 Internal Fan EP216

Regeneration

- Internal Energy Absorption (115V / 230V)
    - EP202: 39 Joules / 8 Joules
    - EP204: 58 Joules / 12 Joules
    - EP206: 97 Joules / 20 Joules
    - EP209: 117 Joules / 24 Joules
    - EP216: 132 Joules / 28 Joules
- External: Connection to external resistor,
    - EP202-209: 30 Ohm min, 12A peak, 2 kW avg.
    - EP216: 20 Ohm min, 20A peak, 5 kW avg.

Drive Control Inputs

- Analog: (1) +/-10 VDC, 14 bit, 100 kOhm,DifferentialAnalog Max. Input Rating: Differential +/-14 VDC, Each Input with Reference to Analog Ground +/-14 VDC
- Digital: (16) (5 on EP-B) +10 to 30 VDC, 2.8 kOhm, Sourcing, Optically Isolated
- Pulse: (1) Differential RS-422, 1 MHz/Channel, 50% Duty Cycle
- Single Ended: (1) TTL Schmitt Trigger 500 kHz/ Channel, 50% Duty Cycle
- Motor Overtemperature: 0 to +5 VDC, 10 kOhm, single ended

Drive Control Outputs

Phone

NL

+31 499 371007

DE

+49 2157 128990

Address

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- Analog: (2) +/-10 VDC, 10 bit, Single-ended 20mA
- Digital: (8) (3 on EP-B) +10 to 30 VDC, 150 mA,Sourcing Optically IsolatedShort Circuit Protected
- Pulse: Differential RS-422 and TTL compatible, 20 mA/Channel Sink or Source

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 3.0%/1.8F (1°C) above 104°F (40°C)
- Rated Altitude: 3280' (1000 m)
- Maximum Altitude: For altitudes >3280' (1000 m) derate output by 1%/328' (100 m)
- 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: 2 x RS485 connectors for multi-dropapplications Modbus RTU w/ 32-bit extension,9600 to 19.2 kBaud
- Ethernet Interface (EP-P only)1 RJ-45, Modbus TCP/IP or EtherNet/IP
- DeviceNet (EP-xDN models only)
- Power Consumption: 25 mA
- Baud Rates: 125, 250 and 500 kps
- Node Addresses: 00-63
- Profibus-DP (EP-PPB model only): Baud: 1.5 to 12 Mb, Address Range: 00-126

Compliance and Standards

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-
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Options:

Optional ProfiBus DP and DeviceNet communication configurations for system integration to common PLC platforms, and EtherNet, standard on every Epsilon EP-P, opening up a whole new world of interfacing possibilities are also available.

	EP - B (BASE)	EP - I (INDEXER)	EP - P (PROGRAMMING)
EtherNet			Standard - all units

Phone

NL

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DE

+49 2157 128990

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NL

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DE

Dynetics GmbH
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Profibus		√
DeviceNet	√	√

The Epsilon EP-P's EtherNet port supports EtherNet/IP, Modbus TCP/IP, HTTP, and SMSC with up to eight simultaneous connections (sockets) at a single time. That means you can be online with your HMI at the same time as your PC Tools, monitoring drive status remotely via a web browser, and have the drives communicating to each other for a true distributed control system, all at the same time!

The Ethernet port is configured to communicate using two industrial protocols: EtherNet/IP and Modbus TCP/IP. Communication setup is easily done with drag and drop drive information into the Ethernet Mapping. The EP-PDN, EP-IDN (DeviceNet) and EP-PPB (Profibus) are the Epsilon EP drives with these industry standard fieldbus options.

The EP-P has built in RS485 multi drop serial ports. The ports use industrial standard Modbus RTU. Making connectivity easily with many PLC and HMI products.

Position Tracker™ – Fieldbus Indexing replaces expensive PLC motion controllers with fieldbus communications. Motion profiles can be dynamically changed on the fly.

Specifications

Supplier	Nidec Control Techniques	**Level**	box	**Motor phase current**	16 A

This PDF-document has been generated from a selection of the available details from the manufacturer. In case the contents of the PDF-file is incomplete or difficult to read, we apologize for the inconvenience and ask you to contact us (info@dynetics.eu)

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Phone

NL
+31 499 371007

DE
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De Rijn 12
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