Delta Series Motors and Drives

Delta Series is a family of all digital high performance motors and drives for today’s demanding applications. SMT board design, embedded high speed 32-bit RISC processor and clever engineering result in a very compact, lightweight drive containing advanced features and performance at modest cost. Compact, high power density motors provide low rotor inertia, making them ideal for positioning and indexing applications.

Driver parameters are digitally controlled for consistent performance and are accessed through the built-in tactile membrane keypad. And the front panel digital display gives real time readout of all key servo parameters and diagnostics.

Delta Series Features

- 19 models from 120 W to 6500 W
- Low cost with high performance
- Compact motors and drives
- High power density motors
- Internal 24 VDC I/O power supply
- Sine wave commutation
- Membrane keypad
- Digital display
- Powerful 32-bit RISC processor
- All digital electronics and SMT boards
- S-curve profiling
- PC software for quick setup, diagnostics and scope functions
- Dozens of programmable parameters
- Auto servo tuning
- Fault history log
- RS-232 port built-in
- All motors available with mechanical holding brakes
- High resolution resolver feedback
- Available encoder feedback
- Available Power Off absolute feedback
- Master follower encoder input channel
- Motor position output channel

Delta Series Driver Specifications

- Processor: One 32-bit RISC
- Communications port: RS-232
- Driver operating temperature: 0-55°C
- Analog inputs: 10-bit A/D; 14-bit available
- Analog input range: +/-10V
- Optically isolated inputs: 8 @ 24 VDC/8 mA
- Current, velocity and position loops closed digitally
- Feedback: resolver standard; encoder and absolute available
- Resolver resolution: 24,000 bits/rev
- Encoder resolution dependent on encoder
- Output form: PWM 3Ø sine wave
- Motor ripple frequency: DSD-8.5/RA 20 kHz

Diagnostic Tool, Cables and Accessories

This tool plugs into the Delta Driver and allows you to check most driver and motor functions. Can be used for all six operational modes. Toggle switches, LEDs and pots provide easy setup and use.

Mechanical brake power supply, dynamic brake and external regen resistor are available options.

Resolver and motor cables are available in standard 20, 50 and 100-foot lengths. A 36-position I/O cable and DIN track-mounted I/O terminal strip are available. A 10-foot RS-232 communications cable is available for Delta to IBM PC AT, using a 9-pin D connector. All cables are also available in non-standard lengths.

An RS-232 port is also available for programming the driver using your personal computer. PC software is available for complete driver setup, diagnostics and PC screen oscilloscope functions.

High resolution resolver or optional encoder feedback provides very precise speed control and accurate electronic gear ratios. Built-in accel-decel control and S-curve profiling make the driver very flexible for standalone applications.

The driver can be used as a positioning controller accepting pulse train or step/direction outputs from PLCs, follower encoders or stepper motor controllers.
### 6 Modes of Operation

**Speed Control**

In this mode the Driver is a precision speed regulator, with command from an external analog voltage...a pot, follower tach, dancer loop, etc. A torque limit can be applied with a second analog input or via preset parameters. Accel/decel rates are fully programmable with S-curve or linear profiles.

**Inputs**
- Brake Confirm
- Stop at Marker
- Drive Enable
- Monitor Select
- Alarm Reset
- Speed Limit Enable

**Outputs**
- Brake Output
- Speed Coincidence
- Torque Limit On
- Stopped at Marker
- Set “O” Confirm
- Motor Stopped
- Battery Alarm
- Servo Normal

**Torque Control**

In analog torque mode the Driver is a precision torque regulator, commanded from an external analog source such as a dancer loop, tension controller or positioning controller. A speed limit can be programmed using either an internal preset parameter or external analog voltage.

**Inputs**
- Brake Confirm
- Drive Enable
- Monitor Select
- Alarm Reset
- Speed Limit Enable

**Outputs**
- Brake Output
- Running CW
- Running CCW
- Absorbing Torque
- Driving Torque
- Motor Stopped
- Speed Limit On
- Servo Normal

**Pulse Position Control**

In the pulse position control mode the Driver is a position loop controller accepting pulse train commands from another Delta Driver, a stepper controller, PLC or follower encoder. Gear ratios between input, pulse train and motor shaft movement are fully programmable. Torque, speed and travel limits are also programmable.

**Inputs**
- Brake Confirm
- Stop at Marker
- Drive Enable
- CCW Run Enable
- CW Run Enable
- Alarm Reset
- Torque Limit Enable

**Outputs**
- Brake Output
- Stopped at Marker
- Set “O” Confirm
- CCW Run Inhibited
- CW Run Inhibited
- Position Coincidence
- Battery Alarm
- Servo Normal

**Electronic Gearing**

In this mode the Driver is a positioning follower commanded from an external encoder. Electronic ratio between servo and master encoder is adjustable via I/O or program parameters. This mode is excellent for web control where the follower axis must draw, or for the traverse function in a spooling application.

**Inputs**
- Ratio Trim 7 (MSB)
- Ratio Trim 6
- Ratio Trim 5
- Ratio Trim 4
- Ratio Trim 3
- Ratio Trim 2
- Ratio Trim 1 (LSB)
- Drive Enable

**Outputs**
- Speed Coincidence
- Ratio Trim 7
- Ratio Trim 6
- Ratio Trim 5
- Ratio Trim 4
- Ratio Trim 3
- Ratio Trim 2
- Ratio Trim 1
- Servo Normal

**Driver Programming: Fast, Easy, Versatile**

The convenient tactile membrane keypad on the front of the Delta Driver makes setup a snap. Using the five keys you can scroll through, confirm or change any of dozens of operational variables as shown here, with all data indicated on the five digit LED display.

**Use Your IBM-Compatible Personal Computer**

Plug your computer into the Delta Driver through the RS-232 port. Using the Delta software, you have instant access to all variables and parameters. The software even allows you to use your PC as an oscilloscope to display speed and current waveforms. And you can modify triggering, sampling intervals and scaling so the data is displayed exactly as you want it.

And since the control mechanism is built right into the driver, there’s nothing to lose, nothing to hunt for.

### Complete Operational and Setup Information Instantly Available

Use the keypad or your PC to display and modify Delta Driver operational data.

**Status Display**

- Monitor critical performance characteristics, including motor speed, I/O status, motor predicted thermal value, motor position, motor current, and others.

**Diagnostic Display**

- Check the status of all inputs and outputs, review current alarms and alarm history and many more.

**Adjustment Parameters**

- Modify important characteristics, including speed command span, electronic ratio, position gain, feed forward gain, notch filter setup and more.

**User Parameters**

- Program Delta using 29 separate controls. Choose any of 6 modes, select motor type, adjust accel/decel rates, S-curve shape, torque limits, preset feed speeds and more.
## Delta Driver DSD-8.5 Motor/Drive Packages

<table>
<thead>
<tr>
<th>Motor/Drive Package</th>
<th>Motor Part Number</th>
<th>Drive Part Number</th>
<th>Power Output Watts</th>
<th>Rated Speed RPM</th>
<th>Max Speed RPM</th>
<th>Rated Torque N-M</th>
<th>Rotor Inertia Kg-cm²</th>
<th>Rotor Inertia Lb-in-sec²</th>
<th>Lb-ft-sec²</th>
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<tr>
<td>Delta-120HRA</td>
<td>DBM-120/30R</td>
<td>DSD-8.5/RA</td>
<td>120</td>
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### Motor Mounting
- Shaft Diameter: 1.18 in. (30 mm)
- Weight: 0.551 lbs (0.250 kg)
- Resolver: C-245YYY
- Motor Cable: C-686YYY

### Dimensions
- Panel height: 6.70 in. (170 mm)
- Panel width: 3.15 in. (80 mm)
- Depth off panel: 5.90 in. (150 mm)

All specifications are at nominal line voltage.

## Delta Driver DSD-17.5 Motor/Drive Packages

<table>
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<tr>
<th>Motor/Drive Package</th>
<th>Motor Part Number</th>
<th>Drive Part Number</th>
<th>Power Output Watts</th>
<th>Rated Speed RPM</th>
<th>Max Speed RPM</th>
<th>Rated Torque N-M</th>
<th>Rotor Inertia Kg-cm²</th>
<th>Rotor Inertia Lb-in-sec²</th>
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### Motor Mounting
- Shaft Diameter: 1.18 in. (30 mm)
- Weight: 0.551 lbs (0.250 kg)
- Resolver: C-245YYY
- Motor Cable: C-686YYY

### Dimensions
- Panel height: 6.70 in. (170 mm)
- Panel width: 4.69 in. (119 mm)
- Depth off panel: 5.90 in. (150 mm)

All specifications are at nominal line voltage.
### Delta Driver DSD-35  Motor/Drive Packages

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<th>Motor/Drive Package</th>
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<th>Rated Speed RPM</th>
<th>Max Speed RPM</th>
<th>Rated Torque N-M</th>
<th>Max Torque N-M</th>
<th>Shaft Length mm</th>
<th>Shaft Diameter mm</th>
<th>Rotor Inertia Kg-cm²</th>
<th>Rotor Inertia Lb-in-sec²</th>
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### Delta Driver DSD-50  Motor/Drive Packages

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<th>Motor/Drive Part Number</th>
<th>Power Output Watts</th>
<th>Rated Speed RPM</th>
<th>Max Speed RPM</th>
<th>Rated Torque N-M</th>
<th>Max Torque N-M</th>
<th>Shaft Length mm</th>
<th>Shaft Diameter mm</th>
<th>Rotor Inertia Kg-cm²</th>
<th>Rotor Inertia Lb-in-sec²</th>
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### Dimensions

- **In. (mm.):**
  - Panel height: 9.84 (250)
  - Panel width: 5.31 (135)
  - Depth off panel: 7.87 (200)

- **Dimensions:**
  - Panel height: 9.84 (250)
  - Panel width: 5.31 (135)
  - Depth off panel: 7.87 (200)

- **All specifications are at nominal line voltage.**
## Delta Series

### Motor Drive Packages

<table>
<thead>
<tr>
<th>Motor/Drive Package</th>
<th>Motor Part Number</th>
<th>Drive Part Number</th>
<th>Power Output Watts</th>
<th>Rated Speed RPM</th>
<th>Max Speed RPM</th>
<th>Rated Torque N-M</th>
<th>Rated Torque Lb-in</th>
<th>Peak Torque N-M</th>
<th>Peak Torque Lb-ft</th>
<th>Rotor Inertia Kg-cm²</th>
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### Motor Mounting

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<th>Motor/Drive Package</th>
<th>Motor Part Number</th>
<th>Drive Part Number</th>
<th>Motor Length mm</th>
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<th>Resolver Cable</th>
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### Dimensions

- Panel height: 14.56 in, 370 mm
- Panel width: 8.66 in, 220 mm
- Depth off panel: 8.66 in, 220 mm

All specifications are at nominal line voltage.

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**Need Help With Your Motion Control?**

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