



IABU Headquarters

Delta Electronics, Inc.

Taoyuan Technology Center
No.18, Xinglong Rd., Taoyuan City,
Taoyuan County 33068, Taiwan
TEL: 886-3-362-6301 / FAX: 886-3-371-6301

Asia

Delta Electronics (Jiangsu) Ltd.

Wujiang Plant 3
1688 Jiangxing East Road,
Wujiang Economic Development Zone
Wujiang City, Jiang Su Province,
People's Republic of China (Post code: 215200)
TEL: 86-512-6340-3008 / FAX: 86-769-6340-7290

Delta Greentech (China) Co., Ltd.

238 Min-Xia Road, Pudong District,
Shanghai, P.R.C.
Post code : 201209
TEL: 86-21-58635678 / FAX: 86-21-58630003

Delta Electronics (Japan), Inc.

Tokyo Office
2-1-14 Minato-ku Shibadaimon,
Tokyo 105-0012, Japan
TEL: 81-3-5733-1111 / FAX: 81-3-5733-1211

Delta Electronics (Korea), Inc.

1511, Byucksan Digital Valley 6-cha, Gasan-dong,
Geumcheon-gu, Seoul, Korea, 153-704
TEL: 82-2-515-5303 / FAX: 82-2-515-5302

Delta Electronics Int'l (S) Pte Ltd

4 Kaki Bukit Ave 1, #05-05, Singapore 417939
TEL: 65-6747-5155 / FAX: 65-6744-9228

Delta Electronics (India) Pvt. Ltd.

Plot No 43 Sector 35, HSIIDC
Gurgaon, PIN 122001, Haryana, India
TEL : 91-124-4874900 / FAX : 91-124-4874945

Americas

Delta Products Corporation (USA)

Raleigh Office
P.O. Box 12173, 5101 Davis Drive,
Research Triangle Park, NC 27709, U.S.A.
TEL: 1-919-767-3800 / FAX: 1-919-767-8080

Delta Greentech (Brasil) S.A

Sao Paulo Office
Rua Itapeva, 26 - 3º andar Edificio Itapeva
One-Bela Vista
01332-000-São Paulo-SP-Brazil
TEL: +55 11 3568-3855 / FAX: +55 11 3568-3865

Europe

Deltronics (The Netherlands) B.V.

Eindhoven Office
De Witbogt 15, 5652 AG Eindhoven,
The Netherlands
TEL: 31-40-2592850 / FAX: 31-40-2592851



Automation for a Changing World

Delta Industrial Automation



Milestones



Delta Electronics, Inc. is the world's leading provider of switching power supplies, and a major source for power management, components, visual displays, networking products and industrial automation solutions. Delta's strength in power electronics and extensive knowledge in control technology has made us a leader in the industrial automation marketplace. Today, Delta has manufacturing plants in Taiwan and China, as well as R&D centers, sales and service offices worldwide.

With over 10 years of design and manufacturing of industrial automation solutions, Delta believes that everyone should benefit from advances in technology. For this reason we offer our customers Quality, Reliability, and Excellence in each product we sell.

"To improve the living environment, through advanced automation technology, with value added innovation."

Delta IABU profile

- ▶ **Headquarters in Taoyuan (Taiwan)**
- ▶ **Started manufacturing AC Motor Drives in 1995**
- ▶ **Manufacturing and R&D Centers in Taoyuan (Taiwan), Tainan (Taiwan), Wujiang (China)**
- ▶ **Number of Employees: 3853 (398 people in R&D)**



Delta IABU (Industrial Automation Business Unit) began with the design and manufacturing of variable speed AC motor drives in 1995, focusing on Drive, Motion and Control (DMC) integrated solutions for industrial automation. We have currently hundreds of DMC products designed to meet the needs of all ODM/OEM customers and end-users.





Intelligent Field-oriented Vector Control Drive **C2000**

High Efficiency
Ultimate Performance



- ▶ Field oriented control with built-in PLC function
- ▶ Wide variety of applications
- ▶ Wide range of models to fit different industries
- ▶ Built-in high speed communication CANopen protocols and MODBUS
- ▶ Long-life design and self diagnosis
- ▶ Enhanced protections and adaptation to ambient conditions
- ▶ Complies with global safety standards, including CE, UL and cUL
- ▶ Modular design for easy maintenance and many extensions
- ▶ Optional high-speed communication interface cards are available: PROFIBUS-DP, DeviceNet, MODBUS TCP and EtherNet/IP Cards

Standard models (IP/20/NEMA1)
Power range: 230V 0.75~90kW, 460V 0.75~355kW

| Power Range | 0.75kW~3.7kW 1~5HP | 5.5kW~15kW 7.5~20HP | 18.5kW~37kW 25~50HP | 45kW~90kW 60~125HP | 110kW~185kW 150~250HP | 220kW~355kW 300~475HP |
|-------------|-----------------------|------------------------|------------------------|-----------------------|--------------------------|--------------------------|
| C2000 | 230V/3-phase | | | | | |
| | 460V/3-phase | | | | | |

> Applications

Printing machines, extruders, calender machines, paper machines, compressor, wire drawing machines



reddot design award
winner 2010



Intelligent Sensorless Vector Control Drive **CP2000**



- ▶ Built-in LCD keypad panel for quick access and TP Editor soft for favorable main page selection
- ▶ Quick setting function enables user to define their parameter groups or copying parameters
- ▶ Quick and easy installation interface
- ▶ Modular design for flexible extension and easy maintenance
- ▶ High speed communication interface with built-in BACnet and MODBUS protocol
- ▶ Optional accessories are available for multi-controls: the Profibus-DP, the DeviceNet, the MODBUS TCP, the Ethernet-IP and the CANopen Cards
- ▶ Long-life design
- ▶ Enhanced environment tolerance with special PCB coating (Printed Circuit Board)
- ▶ Fire mode and Bypass function to evacuate the smoke with continuous pressure
- ▶ Controls up to 8 pumps synchronously and provides constant circulation of flow at specified time (Optional Relay card is available for multiple motor applications)
- ▶ Built-in PLC program with 10K step capacity and a Real Time Clock

Standard models (IP/20/NEMA1)
Power range: 230V 0.75~90kW, 460V 0.75~400kW



> Applications

Constant pressure pumps (steady flow and time-controlled wheel pumps), building automation (BA), factory automation (FA), HVAC drives, cold water pumps, water cooling towers and all types of motors.

Intelligent Vector Control Micro Drive **C200**



- ▶ Supports induction motor and permanent magnet motor
- ▶ Built-in PLC program with 5K step capacity
- ▶ Enhanced environment tolerance with special PCB coating (Printed Circuit Board) and ventilation channel
- ▶ Flange mounting design for Frame A and removable panel to facilitate intallation process
- ▶ Built-in pulse input terminal with encoder for closed-loop control
- ▶ Built-in CANopen protocol and MODBUS RS-485 port for internet connection

> Applications

Food packaging machines, conveyor equipment, textile machines, woodworking machines, fans and water pumps

| Power Range | 400W 0.5HP | 750W 1HP | 1.5kW 2HP | 2.2kW 3HP | 3.7kW 5HP | 4kW 5HP | 5.5kW 7.5HP | 7.5kW 10HP |
|-------------|---------------|-------------|--------------|--------------|--------------|------------|----------------|---------------|
| C200 | 230V/1-phase | | | | | | | |
| | 230V/3-phase | | | | | | | |
| | 460V/3-phase | | | | | | | |

Active Front End (Power Factor Correction & Energy Regeneration) AFE2000



Replace traditional braking resistor with energy generation

- Clear energy savings with more than 95% of regenerative energy converted and supplied back to the mains.
- Provides input current with $THD \leq 5\%$ and more than 99% of power factor at full load operation
- Using AFE2000 with AC motor drive realizes 4-quadrant operation with variable frequencies and adjustable system.
- Ability to maintain and provide constant DC bus voltage/current when the voltage provided by the mains is unstable

Applications

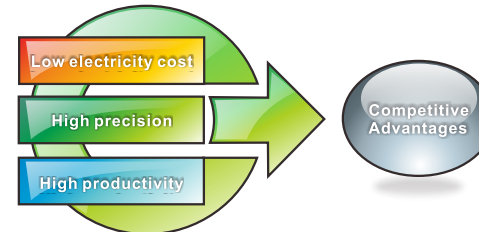
- Large-inertia loads applications: centrifuge equipment, dewatering machines and roving machines.
- 4-quadrant loads applications: elevators, cranes and pumpjacks (oil extraction machines)
- Quick braking applications : machine tools, bag making machines, auto storage and retrieval systems, and lathes
- Long energy feedback time applications: wind power, water power, steel printing and paper making machinery (winding equipment).
- Power quality improvement: semiconductor and panel industries

Supports all kinds of fieldbus and real-time monitoring of power status



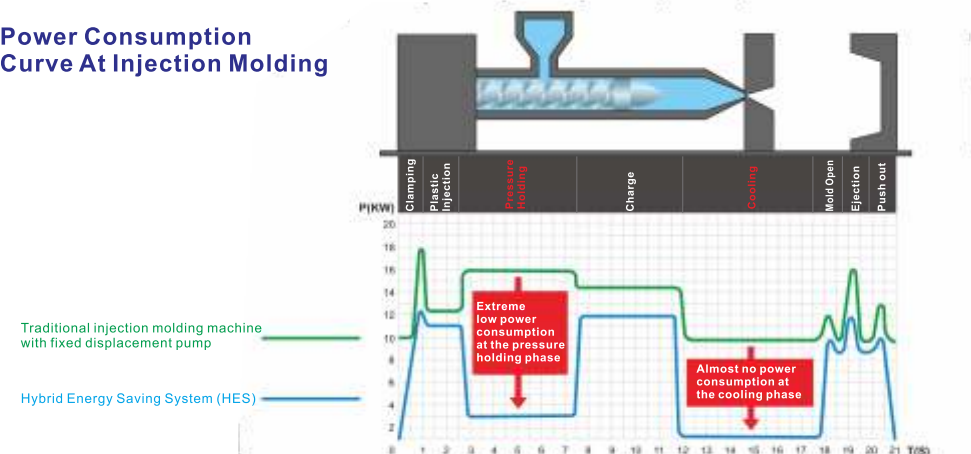
| Power Range | 7.5kW 10HP | 15kW 20HP | 22kW 30HP | 37kW 50HP | 45kW 60HP | 75kW 100HP |
|-------------|------------------------------|------------------------------|--------------|------------------------------|--------------|---------------|
| Frame B | 230V/3-phase 460V/3-phase | | | | | |
| Frame C | | 230V/3-phase 460V/3-phase | | | | |
| Frame D | | | | 230V/3-phase 460V/3-phase | | |

Hybrid Energy Saving System HES



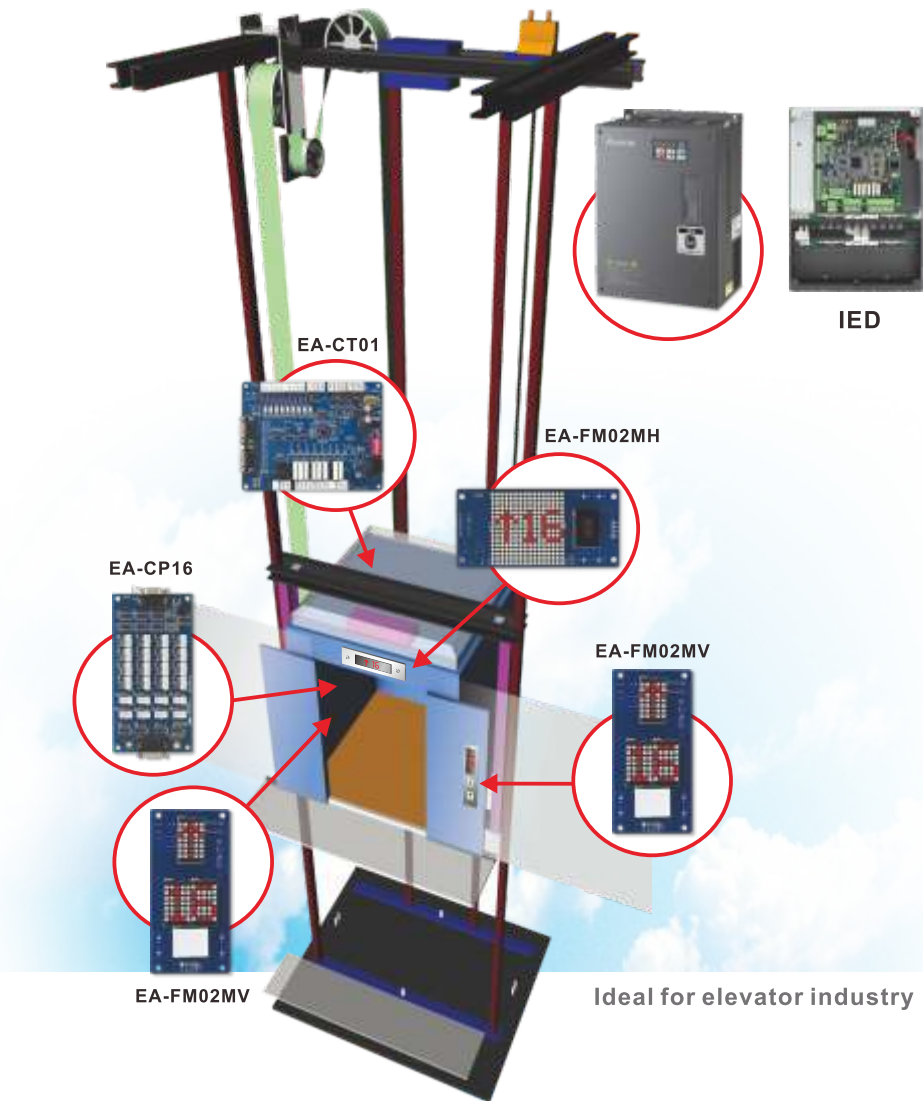
- **Superior Energy-Saving Outcomes:** Lower energy consumption rate at the clamping and cooling stage while maintaining high productivity and high precision. 40% less energy consumption compared to a variable pump hydraulic systems. 60% less energy consumption compared to a traditional quantitative pump hydraulic system.
- **Low Oil Temperature:** Oil temperature reduced by 5~10 °C; oil usage reduced by 50~60%; 50% less oil tank volume; lower cooler specifications required or even no cooler required.
- **High Duplication Accuracy:** Precise flow and pressure control featuring duplication of products with less than 0.09% difference.
- **Long Holding Pressure:** Keeps mold halves securely closed for a longer period for thick plastic products formation.
- **Good Frequency Response:** Delta HES with permanent magnetic servo motor (PMSM) speeds up frequency response to 50ms.
- **Suitable for Harsh Environments:** Resolver is resistant to earthquakes, oil and dust.
- **Old Machine Replenishment:** Supports analog command 0~10V and linear correction (3 points), no replacing
- **Flow Convergence:** Saves cost on tubes, large flow capacity, enhances energy-saving.

Power Consumption Curve At Injection Molding



| Flow | 63L/min | 80L/min | 100L/min | 125L/min | 160L/min | 200L/min | 250L/min |
|------|------------------------------|---------|----------|----------|----------|----------|----------|
| HES | 230V/3-phase 460V/3-phase | | | | | | |

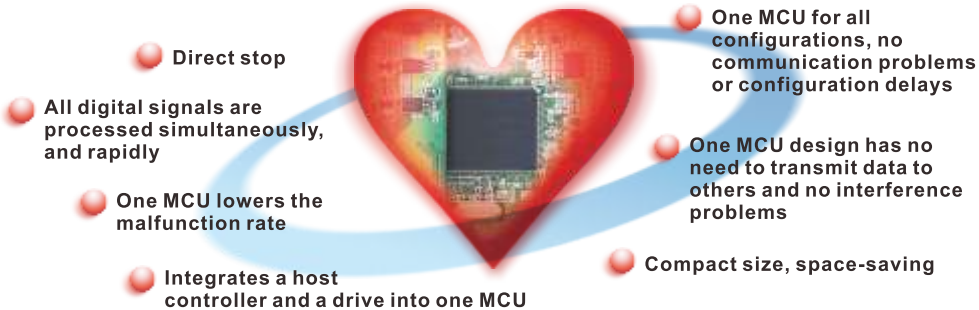
Integrated Elevator Drive IED



| Power Range | 750W 1HP | 1.5kW 2HP | 2.2kW 3HP | 4kW* 5HP | 5.5kW 7.5HP | 7.5kW 10HP | 11kW 15HP | 15kW 20HP | 18.5kW 25HP | 22kW 30HP | 30kW 40HP | 37kW 50HP | 45kW 60HP | 55kW 75HP | 75kW 100HP |
|-------------|-------------|--------------|-----------------|--------------|----------------|---------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|---------------|
| IED | | | 230V 1-phase | 230V/3-phase | 230V/3-phase | 230V/3-phase | 230V/3-phase | 230V/3-phase | 230V/3-phase | 230V/3-phase | 230V/3-phase | 230V/3-phase | 230V/3-phase | 230V/3-phase | 230V/3-phase |
| | | | | 460V/3-phase | 460V/3-phase | 460V/3-phase | 460V/3-phase | 460V/3-phase | 460V/3-phase | 460V/3-phase | 460V/3-phase | 460V/3-phase | 460V/3-phase | 460V/3-phase | 460V/3-phase |

*Minimum power range of the 460V model is 4kW

• A fully integrated drive technology in one MCU



► Easy adjustment with load (without disconnecting the rope or car)

- Allows auto-tuning with load and when the elevator structure is built
- Supports all types of encoder when elevator is with loads
- Precisely measures the motor parameters with loads present
- Precisely measures the PG offset angle with loads present
- Simple and easy tuning for construction site applications. No need to add loads for balancing
- Safe, reliable and labor-saving

► Smooth start and stop

- Easy adjustment with simple testing process
- Applicable to any elevator structure, provides precise control, consistent efficiency and not affected at all by external conditions
- Auto-adjustment of starting torque to provide a smooth and comfortable ride

► Reliable ride with comfort and safety ensured

- Auto-detection on output phase loss to ensure proper operation of motor
- Automatic confirmation on torque output before releasing the mechanism
- Supports single-phase 230 VAC UPS and executes a light-load direction search automatically when power failure occurs

► Compact design of control cabinet to strengthen the structure

- Smaller size: 146mm in depth

► Built-in digital keypad (optional pull-out type keypad is also available)

- Optional LCD (KPC-CC01) digital keypad supports multi-languages

► USB port convenient for program upload/download and facilitating the tuning process

| One MCU | | Two MCUs |
|---|---|---|
| Quick calculation for Direct Stop | 👑 | Slow calculation for Direct Stop |
| Faster speed, all digital signals are processed simultaneously | 👑 | Slower speed, digital signals are processed separately |
| A single operational MCU lowers the malfunction rate | 👑 | Two MCUs processing simultaneously increase the malfunction rate |
| One MCU does all configurations, no communication no configuration delays | 👑 | Two MCUs compute data separately and interact via communication causes delays in computing time |
| One MCU does all configurations, no communication no interference problem | 👑 | Two MCUs compute data separately and transfer data to each other increasing the possibility of errors causing by interference |
| Compact size, space-saving | 👑 | Two MCUs consume more space |
| Integrates host controller and drive into one MCU | 👑 | Separate MCU for host controller and drive |

Door Control Drive VFD-DD



Door Control Solutions

- Distance Control Mode
- Speed Control Mode

- ▶ Simplified elevator door control system
- ▶ Supports IM/PM motors
- ▶ Personal safety protections
- ▶ Auto-tuning for door width
- ▶ Auto-positioning as power turns ON
- ▶ Multi-step Speed Control Mode
- ▶ Smooth door re-open/re-close curve
- ▶ Demo mode
- ▶ Easy installation with special Input/Output contacts
- ▶ Supports elevator door obstruction detection function

Power range: 200W/400W are 230V single phase

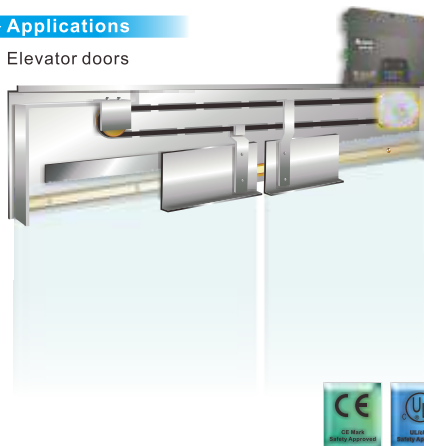
Optional Motors

ECMD - B9120GMS
ECMD - B9160GMS



Applications

Elevator doors



Elevator Drive VFD-VL

- ▶ Supports asynchronous and synchronous motors
- ▶ 5-point adjustable S curve
- ▶ Optional PG feedback cards (for ABZ & Heidenhain encoder)
- ▶ Advanced field oriented vector control
- ▶ Automatic torque compensation function to prevent elevator from slipping or vibrating
- ▶ Emergency operation is enabled using UPS or battery set as power failure occurs
- ▶ Allows both embedded installation and wall-mounting
- ▶ Optional LCD digital keypad

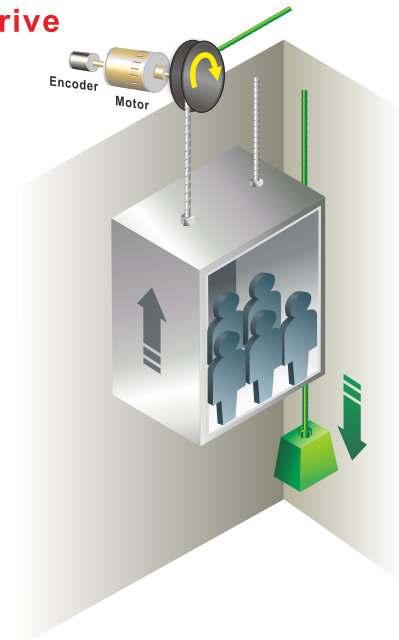


VFD-ED

- ▶ Built-in LED digital keypad
- ▶ Newly-added models: 2.2kW ~ 4kW
- ▶ Improved rated current comparing to the VL drive with same power range
- ▶ Provided with 4 sets of relay outputs
- ▶ Provided with USB ports for connection to computer
- ▶ Supports extension card for high input-voltage
- ▶ Provided with 2 sets of MODBUS RS-485 ports



Advanced
Elevator Drive



| Power Range | 750W 1HP | 1.5kW 2HP | 2.2kW 3HP | 3.7kW 5HP | 5.5kW 7.5HP | 7.5kW 10HP | 11kW 15HP | 15kW 20HP | 18.5kW 25HP | 22kW 30HP | 30kW 40HP | 37kW 50HP | 45kW 60HP | 55kW 75HP | 75kW 100HP |
|-------------|-------------|--------------|--------------|--------------|----------------|---------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|---------------|
| VFD-VL | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

| Power Range | 750W 1HP | 1.5kW 2HP | 2.2kW 3HP | 3.7kW 5HP | 4kW* 5HP | 5.5kW 7.5HP | 7.5kW 10HP | 11kW 15HP | 15kW 20HP | 18.5kW 25HP | 22kW 30HP | 30kW 40HP | 37kW 50HP | 45kW 60HP | 55kW 75HP | 75kW 100HP |
|-------------|-------------|--------------|--------------|--------------|-------------|----------------|---------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|---------------|
| ED | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

*Minimum power range of the 460V model is 4kW

AC Motor Drives

VFD-E/EL



New Generation Micro-type and Multifunction AC Drives

- ▶ Optional extension modules for more flexible applications (PG cards for VFD-E series, highspeed fieldbus, braking modules, I/O card for VFD-E series)
- ▶ Fans with modular design for easy maintenance and replacement
- ▶ Built-in EMI filter for 230V single-phase and 460V models to minimize the electromagnetic interference effectively
- ▶ Built-in RFI Switch for noise suppression (all models)
- ▶ Built-in PLC function with program capacity: 500 steps capacity (VFD-E series)
- ▶ Supports common DC bus. The regenerative energy generated during braking is shared by the parallel connected AC motor drives and the DC bus voltage of each drive is more stable
- ▶ Innovative thermal design allows side-by-side installation and DIN RAIL mounting
- ▶ Built-in PID feedback control. The VFD-EL series also provides special functions for constant pressure pump.
- ▶ Built-in RS-485, compatible with Modbus communication (baud rate up to 38400 bps)
- ▶ VFD-E series offers two types of models for selection, the CANopen built-in drive with CANopen communication protocols and the plate drive with no fan and cooling fins installed

| Power Range | 200W 0.25HP | 400W 0.5HP | 750W 1HP | 1.5kW 2HP | 2.2kW 3HP | 3.7kW 5HP | 5.5kW 7.5HP | 7.5kW 10HP | 11kW 15HP | 15kW 20HP | 18.5kW 25HP | 22kW 30HP |
|-------------|----------------|---------------|-------------|--------------|--------------|--------------|----------------|---------------|--------------|--------------|----------------|--------------|
| VFD-E | 115V 1-phase | | | | | | | | | | | |
| | 230V 1-phase | | | | | | | | | | | |
| | 230V 3-phase | | | | | | | | | | | |
| | 460V 3-phase | | | | | | | | | | | |
| VFD-EL | 115V/1-phase | | | | | | | | | | | |
| | 230V/1-phase | | | | | | | | | | | |
| | 230V/3-phase | | | | | | | | | | | |
| | 460V/3-phase | | | | | | | | | | | |



Built-in PLC Function

Easy to write PLC program without additional PLC



Side-by-side Installation (40°C)

High-efficiency cooling and flexible space



Easy Maintenance

Removable cooling fan for easy maintenance



Various communication modules

ProfiBus
(CME-PD01)



DeviceNet
(CME-DN01)



LonWorks
(CME-LW01)



CANopen
(CME-COP01)



Applications



Food packaging machines



Textile machines



Punching machines



Conveyor belts

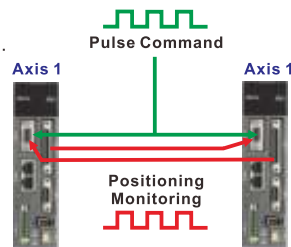
High Performance Servo System for Motion Control and Network Communication Applications

ASDA-A2



Built-in Motion Control Functions

- ▶ Electronic Cam (E-Cam) function for mark tracing, positioning, synchronous control applications. 720 points max. for E-Cam outline.
- ▶ High-speed Capture and Compare function for position latch and detection. Max. 800 records can be stored in the memory.
- ▶ Built-in gantry control algorithm.



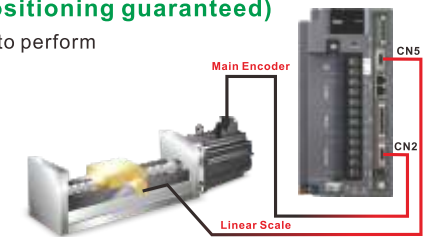
High Precision, High Performance Servo Motors

- ▶ Supports incremental type and absolute type encoders.
- ▶ Incremental type encoder provides up to 1280000 p/rev resolution for high-precision positioning.



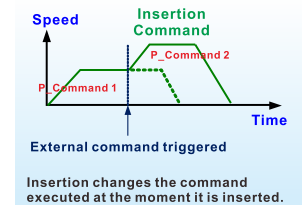
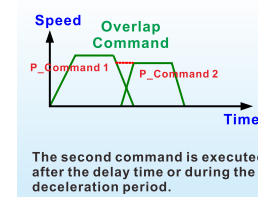
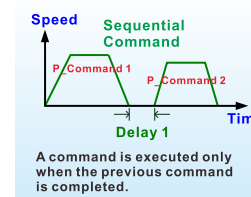
Full-Closed Control (Accuracy of positioning guaranteed)

- ▶ Direct signal transmission through CN5 port to perform full-closed function.
- ▶ Reduces the effect of backlash and flexibility from the machine and ensures the accuracy of positioning.



Versatile PR mode

- ▶ 64 procedures can be applied for various and multiple points continuous motion movements.
- ▶ 35 Homing modes / Jump mode / Write parameter mode / Speed mode / Position mode



Basic Features:

- ▶ Input voltage: AC 200V~230V, 0.1kW~15kW, 1-phase / 3-phase, or 3-phase
- ▶ Input voltage: AC 400V, 0.4kW~15kW, 3-phase
- ▶ Up to 1kHz frequency response for high speed and high precision applications
- ▶ Supports CANopen, DMCNET, EtherCAT communication protocols
- ▶ A2-E model is equipped with Safe Torque Off function (STO) complying with the international standard IEC61800-5-2.

Model Designation

| Type | PR mode | E-CAM | Extension Digital Input | EtherCAT/STO | CANopen | DMCNET |
|------|---------|-------|-------------------------|--------------|---------|--------|
| A2-F | O | X | X | X | X | O |
| A2-E | O | O | X | O | X | X |
| A2-M | O | O | X | X | O | X |
| A2-U | O | O | O | X | X | X |
| A2-L | O | X | X | X | X | X |

Applications

Filling and bottling equipment, feeding machines, lathes, electric discharge machines (EDM), woodworking machines, wire cutting machines, packaging machines, printing machines, textile equipment



Food Packaging Machines



Wire Cutting Machines



High-speed Labeling Machines



Feeding Machines



Standard Servo System for General Purpose Applications

ASDA-B2



Power Range: 0.1 kW ~ 3kW

- ▶ Input Voltage: AC 200V ~ 230V, 1-phase / 3-phase, or 3-phase
- ▶ Meets high precision positioning control requirements of general-purpose machine tools.
 - Built-in Position, Speed and Torque modes (Speed and Torque modes can be controlled via internal parameters or external voltage).
 - Provides pulse input (up to 4Mpps) and analog voltage commands.
 - Three notch filters are provided to optimize the operation of the mechanical system automatically.
 - Friction compensation and motor protection functions are available to reinforce the system.
 - Power of main circuit and control circuit is separated.
 - Maintenance is easy and very safe.
 - Built-in regenerative resistor is featured as standard (400W and above models). No need to purchase or wire up a separate regenerative resistor.



> Applications



Bar Feeders



Transporting and Conveying Equipment



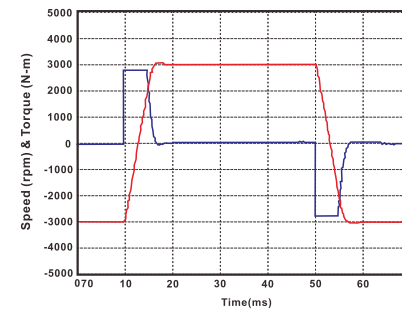
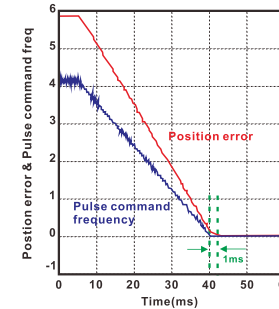
Electric Discharge Machines (EDM)



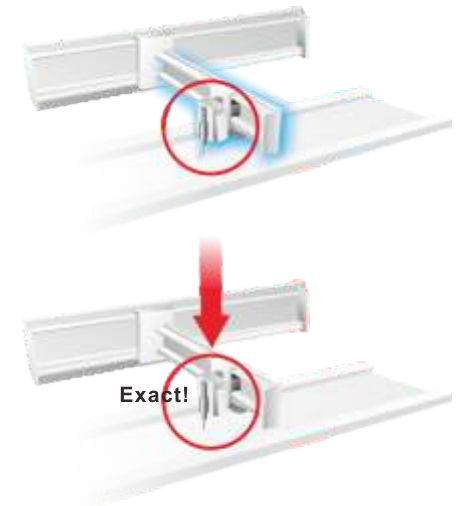
Cutting Machines

High Accuracy for Positioning

- ▶ ASDA-B2 series features an incremental encoder with 17-bit resolution (160,000 p/rev) which can eliminate unstable commands at low speed, smooth the motor operation and enhance the accuracy of positioning.

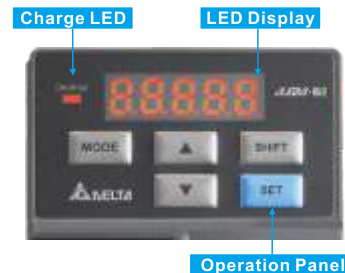


- ▶ Three auto notch filters are provided to suppress mechanical resonance efficiently.

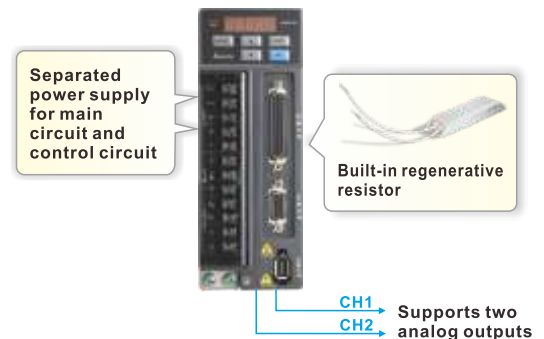


Easy-to-Use and Cost-Saving

- ▶ The same power and encoder cables as ASDA-B series. Easy to set up and no extra accessories are required.
- ▶ Easy-to-use digital keypad is ideal for setting parameters and monitoring the system directly.



- ▶ Built-in regenerative resistor (400W and above models) is provided. Simplifies wiring and minimizes space.



3-Axis Synchronous Servo System for Multi-Axes Motion Control Applications

ASDA-M

Impeccable motion control inside

- ▶ 3-axis synchronous servo module with performance better than comparable three servo drives.
- ▶ Built-in motion control and PLC functions.
- ▶ Multi-axis synchronous interpolation and built-in motion control commands are ideal for applications requiring high synchronous control accuracy.
- ▶ Versatile PR mode for various continuous motion movements.
- ▶ Built-in G-Code interpreter.

New PC Software Functions

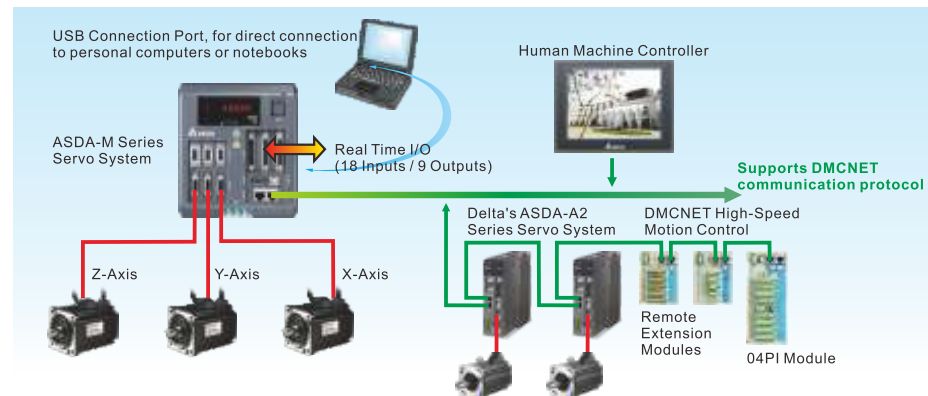
- ▶ ASDA-Soft provides built-in contour analysis function.
- ▶ EzASD provides PLC programming and motion commands editing environment.

High Precision, High Performance Servo Motors

- ▶ Supports incremental type and absolute type encoders.
- ▶ Incremental type encoder provides up to 1280000 p/rev resolution for high-precision positioning.

Real Time, Reliable and High-Speed Motion Control Network

- ▶ Supports DMCNET or CANopen communication protocol.
- ▶ With the aid of Delta's Human Machine Controller (HMC), it can establish an integrated system configuration by DMCNET.
- ▶ Supports DMCNET extension digital input and output modules.



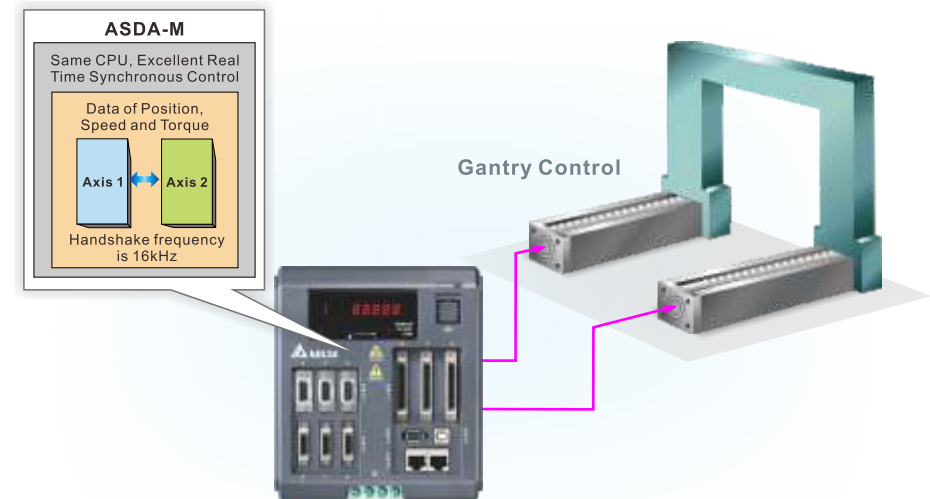
Product Line-up

| 750W | 1.5kW | 2.0kW |
|-----------|--------------|-------------|
| | | |
| 100W~750W | 0.75kW~1.5kW | 1.0kW~2.0kW |
| | | |

Advanced Gantry Control

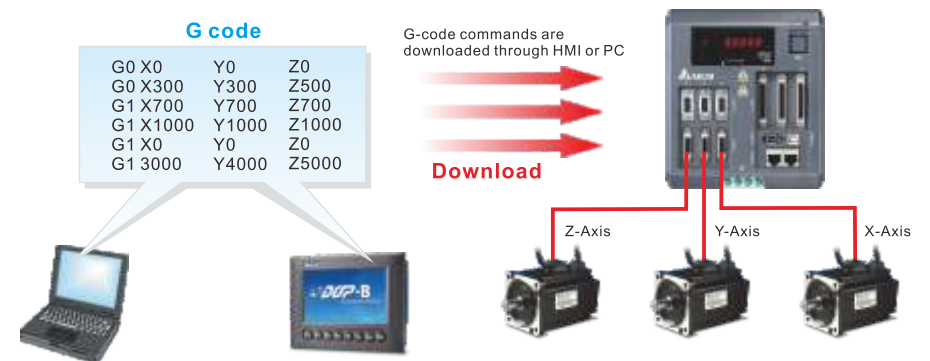
Plenty of data can be exchanged in real-time among 3 axes without any time delay. This greatly increases the efficiency and performance of gantry control.

In rigid or general mechanical systems, no matter if the loading on multiple axes is equal or not, the ASDA-M series can perform precise motion control and drive each axis simultaneously.



Built-in G-code Interpreter

- ▶ G-code commands are downloaded and executed to the servo drive through HMI or PC.
- ▶ ASDA-M series provides built-in G-code interpreter to decode the G-code commands and complete the motion movement.



High-Speed Motion Control System

DMCNET



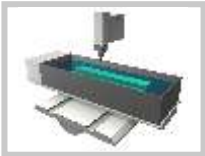


The PCI-DMC-A01 motion control card provides high performance and extended functions for multi-axis motion control. It is capable of controlling up to 12 units of ASDA-A2-F series AC servo drives and motors within 1ms simultaneously.

It also supports various motion control modules (linear interpolation, arc interpolation, helical interpolation and continuous interpolation). DMCNET, a complete "Motion Control Solution" meets the demanding requirements of a wide variety of applications.



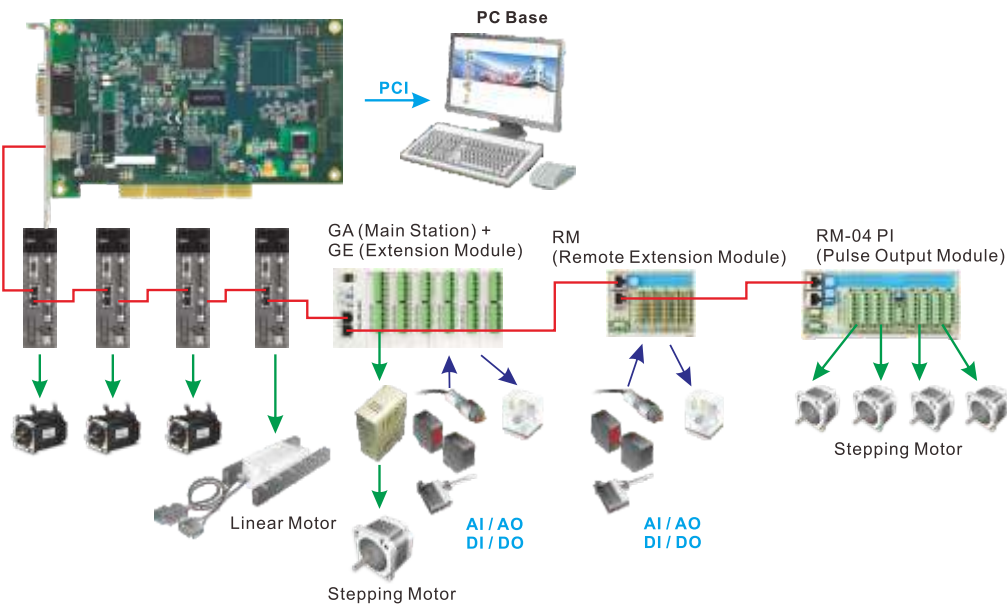
> Applications

Electronic components processing, printing machines, woodworking machines, discharge machines, adhesive machines, tube bending machines

Woodworking Machines
Discharge Machines
Adhesive Machines
Tube Bending Machines

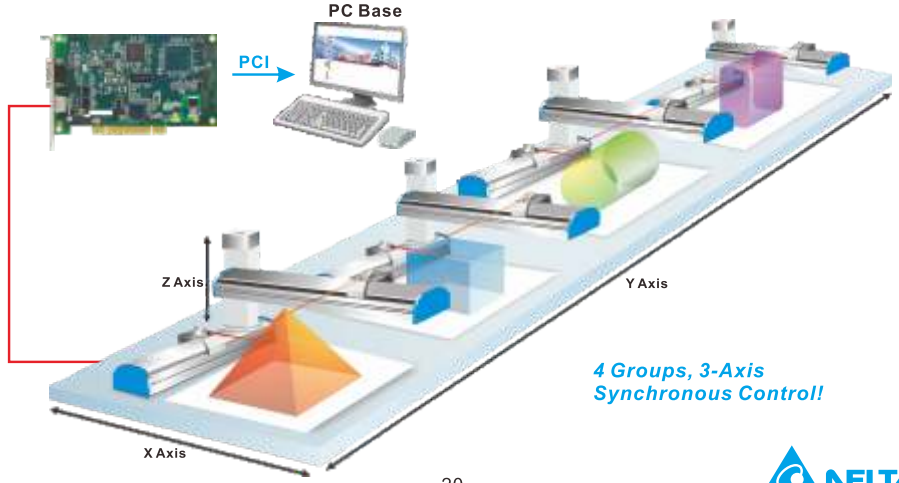
System Configuration



Synchronous Control

Simultaneous 3-axis linear interpolation, 2-axis arc interpolation, 3-axis helical interpolation and continuous interpolation can be implemented.

DMCNET is a motion control communication network which is able to update data every 1 ms and offer the ability to control 12 units of servo systems or 4 groups, 3-axis interpolation algorithm synchronously. It is also capable of transferring the data of 12 units of servo motors, or 768 digital inputs and outputs within 1 ms simultaneously.



Linear Drive System

ASDA-A2R

The new ASDA-A2R series linear drive system provides high accuracy, high rigidity and high response. It not only expands the applications of the servo system, but also increases the work efficiency of the motion control system and satisfies high-precision requirements.

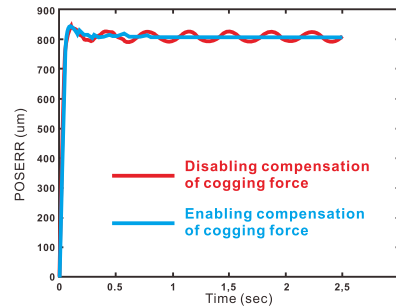
The ASDA-A2R follows in the footsteps of Delta's successful servo system and provides the same functions such as high-speed and high response performance, excellent vibration and resonance suppression, versatile PR mode, DMCNET and CANopen communication interfaces, built-in E-Cam and gantry control functions.

Motion inside. Cost-effective!



Power range: 100W~3kW

- ▶ Intelligent motor parameter measuring, easy and fast auto tuning.
- ▶ Accurate positioning and initiation without a Hall sensor unit.
- ▶ High flexibility in connecting various kinds of linear motors and servo motors.
- ▶ Signal Converter Box (Delta option) available for high speed and high precision requirements
 - Supports AB phase square waves of digital signals and sine waves of analog signals.
 - Signals can be divided up into a multiple of 2048 to increase positioning resolution for precise position control.
- ▶ Detection and compensation of cogging force.



Coreless Linear Motor

ECML Series

Power range: 100W -750W

- ▶ Rated thrust: 21 ~ 177N
- ▶ Direct driving mechanism, high speed and high precision control
- ▶ No cogging and low thrust ripple



Spindle Servo Drive System

ASDA-S

Power range: 3kW~7.5kW

- ▶ Supports Delta permanent magnet spindle motors and other induction motors.
- ▶ Provides high performance servo vector control as ASDA-A2 series.
- ▶ Supports pulse encoder signals (ABZ phase) via CN5 port. External converter card is no longer necessary.
- ▶ Built-in induction motor parameter measuring and estimating function.
- ▶ Offers V/F control for induction motors without encoders.
- ▶ Equipped with analog speed and resolution switching function.
- ▶ Accepts analog voltage, position pulse and DMCNET communication commands.
- ▶ 200V models and 400V models are available for selection.
- ▶ Capable of connecting to CNC controllers via DMCNET high-speed serial communication.

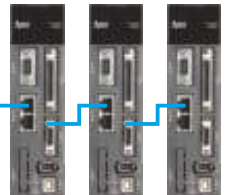


DMCNET
High-Speed Serial
Communication

Spindle ASDA-S Series



Servo ASDA-A2 Series



IPM Spindle Motor

ECMS Series

Power range: 3.7kW / 5.5kW / 6.7kW

- ▶ Encoder resolution: 13-bit
- ▶ Max. torque: 14.72 N·m / 21.88 N·m / 26.65 N·m
- ▶ Speed range: 6000 r/min~12000 r/min
- ▶ Options: Coolant through spindle
- ▶ IP degree: IP54





CNC Total Solution

Provides the ultimate in performance for CNC machinery applications



- ▶ Features a built-in 64-bit high speed and high processing dual CPU that can construct a real-time and multi-functional control center.
- ▶ With the aid of Delta's high-speed servo and spindle systems, high-quality digital data transmission can be achieved and vibration suppression is enhanced.
- ▶ Provides auto-tuning for the servo system so the servo parameters can be set automatically. Optimum control of the mechanical system is easy and in real time.
- ▶ CNC Soft software offers user-friendly setup support and allows users to build custom screens for user-defined operation.
- ▶ Capable of connecting serial digital I/O modules. The extension capacity is also greatly improved.

Applications



CNC High-Speed Tapping Machines



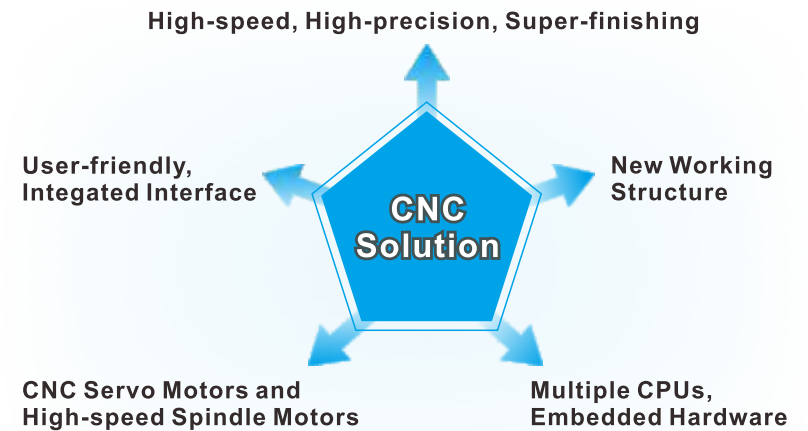
CNC Machine Centers, Engraving Machines



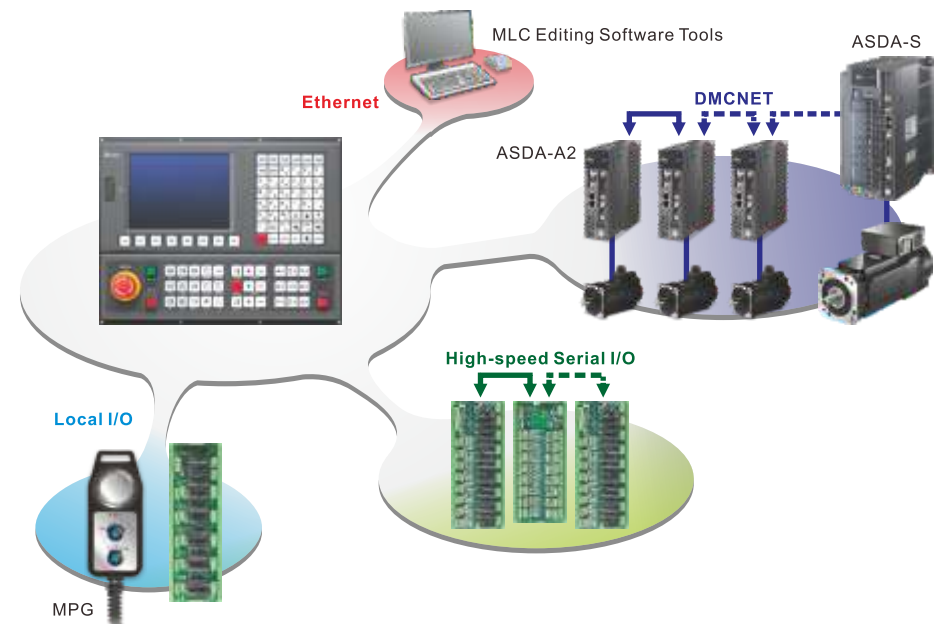
CNC Gantry Control Machines



CNC Woodworking Machines



System Configuration





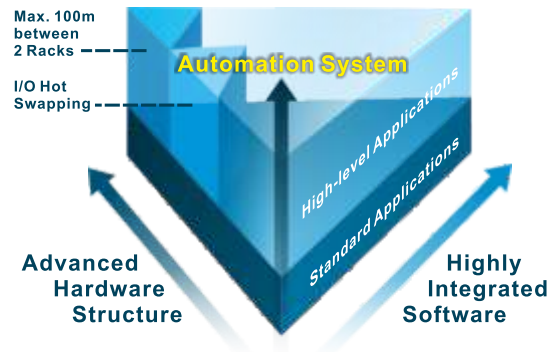
Programmable Logic Controllers

AH500 Series



The Smart Solution for Industrial Machines and System Integration

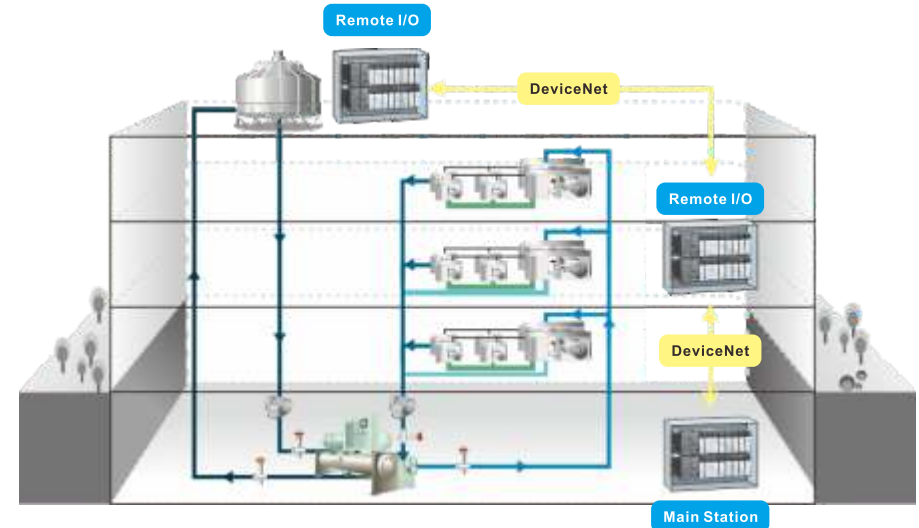
Modularized Hardware Structure, Highly Integrated Software



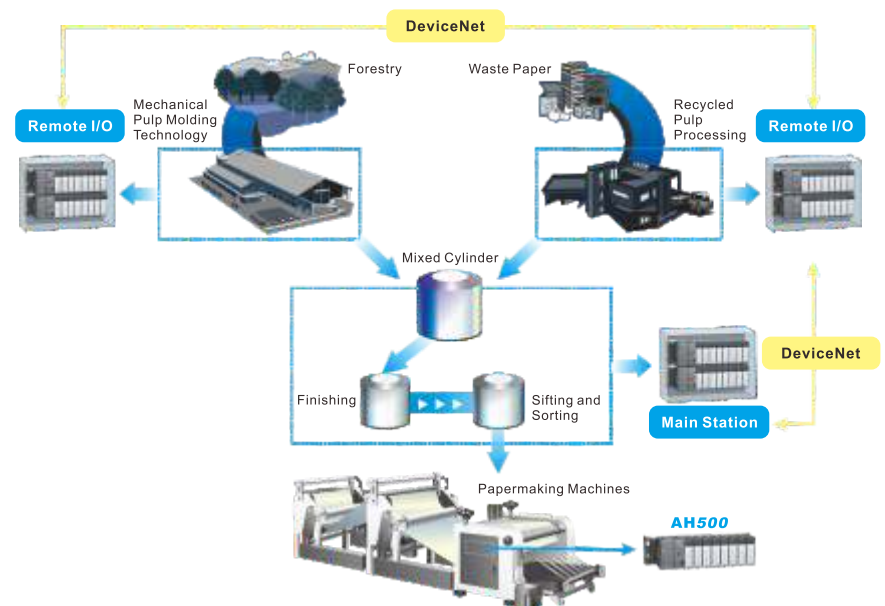
- Highly integrated software ISPSOft: Graphical Interface with 5 programming languages
- Enhanced flexibility: max. 100m between 2 local extension racks
- Improved maintainability: Hot-swapping function keeps the system running
- ▶ Utilizes dual-core multi-tasking processor
- ▶ Max. I/O points:
DIO: max. 4,096+128,000 points
AIO: max. 512+4,000 channels
- ▶ Program capacity: 256k steps
- ▶ Data register: 64k words
- ▶ Excellent program execution speed: 0.3ms / 1k steps
- ▶ CPU built-in with RS-232/422/485, Mini-USB, Ethernet, SD Card 1.0 (compatible with the memory cards on the market)
- ▶ Abundant selection of AIO modules, DIO modules, temperature modules, network modules and motion control modules

System Applications

HVAC



Papermaking Industries



High Performance PLC DVP-EH3

The new generation DVP-EH3 PLC is the high-end model of the Delta DVP-E series. It provides larger program capacities and data registers for more demanding and complex applications



Excellent Motion Control

- ▶ High-speed pulse output: 4 points of 200kHz pulse output
- ▶ Supports max. 4 hardware 200kHz high-speed counters
- ▶ Increases many motion control commands to meet the applications that require high-speed and high-precision positioning control such as labeling machines, packaging machines and printing machines
- ▶ Offers linear / arc interpolation motion control
- ▶ Provides up to 16 external interrupt pointers



Complete Program Protection

- ▶ Auto backup function to prevent losing programs and data even when the battery runs out
- ▶ Second copy function provides a backup for extra insurance in the event that one set of programs and data are damaged
- ▶ Up to 4-level password protection protects your source programs and intellectual property

Function Cards

■ Converting COM2 from RS-485 to RS-232/422

DVP-F232
(RS-232 card)



DVP-F422
(RS-422 card)



■ For Ethernet Communication

DVP-FEN01



■ For CANOpen Communication

DVP-FCOPM



■ For Third COM Port

DVP-F485



■ Analog Input / Output

DVP-F2AD



Second Generation Standard PLC / Second Generation Analog I/O PLC DVP-ES2/EX2

Integrated communication functions. Built-in 1 RS-232 and 2 RS-485 Ports.

New DVP32ES2-C: Second Generation Standard PLC
(built-in CANopen, Baud Rate: 1Mbps)

New DVP30EX2: Second Generation Temperature / Analog I/O PLC

- ▶ DVP-ES2 provides 16/20/24/32/40/60 I/O points for a variety of applications
- ▶ DVP20EX2 provides 12-bit 4 analog inputs / 2 analog outputs. With the aid of 14-bit analog input / output extension module and built-in PID auto tuning function, it offers a complete analog control solution
- ▶ Program capacity: 16k steps
Data register: 10k words
- ▶ Higher programming speed compared to the competition: LD: 0.35μs, MOV: 3.4μs
- ▶ High efficient processing ability: 1k steps of programs can be completed within 1ms
- ▶ Max. 100kHz pulse control. Many motion control commands such as masking, label tracking and instant frequency change are available for the applications that require multi-axes motion control.
- ▶ Up to 4-level password protection protects your source programs and intellectual property.



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winner 2010



Network Type Advanced Slim PLC DVP-SE

Most complete communication type slim PLC in the industry.
Provides 8 digital inputs and 4 digital outputs. Built-in mini USB, Ethernet, and 2 RS-485 ports

- ▶ Program capacity: 16k steps
Data register: 12k words
- ▶ Higher programming speed compared to the competition: LD: 0.64μs, MOV: 2μs
- ▶ Built-in Ethernet supports MODBUS TCP and Ethernet/IP
- ▶ IP Filter function is a firewall that offers the first line of defense and provides protection from malware and network threats
- ▶ Remote I/O function is suitable for distributed sequence control applications such as building automation system
- ▶ Supports DVP-S series left-side and right-side modules



High Performance Slim PLC DVP-SV2

The new generation DVP-SV2 PLC is the high-end model of the Delta DVP-S series. It provides larger program capacities and data registers for more demanding and complex applications



Excellent Motion Control

- ▶ High-speed pulse output: 4 points of 200kHz pulse output
- ▶ Supports max. 4 hardware 200kHz high-speed counters
- ▶ Increases many motion control commands to meet the applications that require high-speed and high-precision positioning control such as labeling machines, packaging machines and printing machines
- ▶ Offers linear / arc interpolation motion control
- ▶ Provides up to 16 external interrupt pointers

Complete Program Protection

- ▶ Auto backup function to prevent losing programs and data even when the battery runs out
- ▶ Second copy function provides a backup for extra insurance in the event that one set of programs and data are damaged
- ▶ Up to 4-level password protection protects your source programs and intellectual property

Supports DVP-S series left-side and right-side modules. Increases Ethernet communication commands.



Left- Side High-Speed Modules

Communication Modules

- DeviceNet Master
DVDPNET-SL
- Ethernet
DVPEN01-SL
- CANopen Master
DVPCOPM-SL
- RS-485 / RS-422 Serial
Communication Module
DVPSCM12-SL

Analog Input / Output Modules

- Analog Input
DVP04AD-SL
- Analog Output
DVP04DA-SL

Load Cell / Tension Control

- Load Cell Module
DVP02LC-SL

Second Generation Standard Slim PLC DVP-SS2

Economic and Compact PLC. Max. 480 I/O points

- ▶ Program capacity: 8k steps
Data register: 5k words
- ▶ Higher programming speed compared to the competition:
LD: 0.35μs, MOV: 3.4μs
- ▶ Built-in RS-232 and RS-485 ports (Master/Slave).
Supports standard MODBUS ASCII/RTU protocol and PLC Link function

Motion Control Functions

- ▶ 4 points of 10kHz pulse output
- ▶ 8 points of high-speed counters: 20kHz*4 points, 10kHz*4 points



Second Generation Advanced Slim PLC DVP-SA2

Compact and Motion Control PLC

- ▶ 4 points of high-speed pulse output: 100kHz*2 points, 10kHz*2 points
- ▶ 8 points of high-speed pulse input: 100kHz*2 points, 10kHz*6 points,
1 group of A/B phase 50kHz
- ▶ Supports 2-axis synchronous control (linear and arc interpolation)
- ▶ Program capacity: 16k steps
Data register: 10k words
- ▶ Higher programming speed compared to the competition:
LD: 0.35μs, MOV: 3.4μs
- ▶ Built-in 1 group of RS-232 and 2 groups of RS-485 ports (Master/Slave)
Supports standard MODBUS ASCII/RTU protocol and PLC Link function
- ▶ Provides half month long battery-free real time clock function
- ▶ Supports DVP-S series left-side and right-side modules



Second Generation Analog I/O Slim PLC DVP-SX2

Built-in 4 analog inputs / 2 analog outputs. High efficient PID Control Function with New PID Auto Tuning Instructions

- ▶ Program capacity: 16k steps
Data register: 10k words
- ▶ Higher programming speed compared to the competition:
LD: 0.35μs, MOV: 3.4μs
- ▶ Built-in mini USB, RS-232 and RS-485 ports (Master/Slave)
Supports standard MODBUS ASCII/RTU protocol and PLC Link function.
- ▶ Provides half month long battery-free real time clock function.
- ▶ Supports DVP-S series left-side and right-side modules.

Motion Control Functions

- ▶ 4 points of high-speed pulse output: 100kHz*2 points, 10kHz*2 points
- ▶ 8 points of high-speed pulse input: 100kHz*2 points, 10kHz*6 points
- ▶ Supports 2-axis synchronous control (linear and arc interpolation)



CANopen Motion Controller DVP-MC

Up to 16 axes can be controlled through CANopen communication

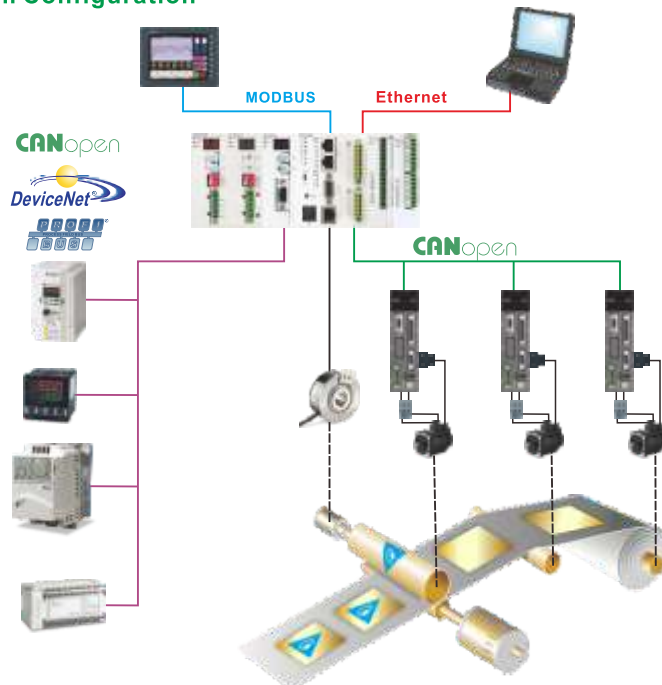
Supports electronic cam (2048 points) function for flying shear and rotary cut applications

Supports DVP-S series left-side and right-side modules

- ▶ Standard 12 I/O points. Max. 480 I/O points
- ▶ Program capacity: Ladder 16k steps / Motion 1Mbyte
- ▶ Built-in Ethernet, RS-232 and RS-485 ports. Supports standard MODBUS ASCII/RTU protocol
- ▶ Strong industrial networking support (supports DeviceNet Master/Slave, CANopen Master/Slave and PROFIBUS-DP Slave modules)
- ▶ Provides standard communication cables, terminal resistors, distribution boxes and more accessories for easy wiring and connection



System Configuration



Pulse-train Motion Controller DVP-PM

General Purpose Motion Controller DVP10PM00M

2 / 3 / 4 / 5 / 6 axes linear interpolation motion control

Highly accurate PWM 200kHz output, resolution 0.3%.

8 groups of high-speed captures (mark correction, frequency measurement), Comparative output, Mark/Mask function (for bag making)

- ▶ Standard 24 I/O points. Max. 256 I/O points
- ▶ Program capacity: 64k steps. Data register: 10k words
- ▶ Higher programming speed compared to the competition: LD: 0.1375μs, MOV: 2.1μs
- ▶ Built-in RS-232 and RS-485 ports. Supports standard MODBUS ASCII/RTU protocol



Motion Control Functions

- ▶ High-speed pulse output: built-in 6 groups of A/B phase pulse outputs
- ▶ 6 groups of high-speed counters and hardware digital filter for counting
- ▶ Single-axis motion control function (supports 1st speed, 2nd speed, MPG function)
- ▶ Electronic cam function

Professional Motion Controllers DVP20PM00D/M

Compatible with G-Code / M-Code. 3-axis linear / arc / helical interpolation.

Supports electronic cam (2048 points) function for flying shear and rotary cut applications

Not only a motion controller but also an extension module.

- ▶ Standard 16 I/O points. Max. 512 I/O points
- ▶ Program capacity: 64k steps
Data register: 10k words
- ▶ Built-in RS-232 and RS-485 ports
Supports standard MODBUS ASCII/RTU protocol



Motion Control Functions

- ▶ Built-in A/B phase differential signal outputs: 2 groups (DVP20PM00D) / 3 groups (DVP20PM00M). Max. differential output frequency is 500kHz.
- ▶ Supports MPG inputs
- ▶ Single-axis motion control function (supports 1st speed, 2nd speed, MPG function)
- ▶ Electronic cam function

Applications

3-axis servo positioning control, engraving machines, high-speed winding machines, IC soldering equipment of semiconductor industries



Standard 4 Line Text Panels TP04G-AL-C/TP04G-AL2

- ▶ 4.1" STN-LCD
- ▶ User-defined function keys available
- ▶ Supports RS-232 / RS-422 / RS-485 COM ports (TP04G-AL2)
- ▶ Password protection function available
- ▶ User-defined boot screen available
- ▶ Built-in Perpetual Calendar (RTC)



Standard Numeric Entry 4 Line Text Panel TP04G-BL-C

- ▶ 4.1" STN-LCD
- ▶ 0-9 numeric keys and user-defined function available
- ▶ Built-in RS-232 standard MODBUS ASCII/RTU modes
- ▶ Password protection function available
- ▶ User-defined boot screen available
- ▶ Built-in Perpetual Calendar (RTC)



Basic 2/4 Line Text Panels TP02G-AS1/TP04G-AS2

- ▶ STN LCD Size: 2.8" (TP02G), 3.0" (TP04G)
- ▶ Resolution: 160 x 32 dots (TP02G), 128 x 64 dots (TP04G)
- ▶ Built-in 256kB flash memory
- ▶ TP02 provides 16 user-defined function keys
- ▶ TP04 provides 12 user-defined function keys
- ▶ TP02 supports RS-232 and RS-485 COM ports
- ▶ TP04 supports RS-232 and RS-485 / RS-422 COM ports
- ▶ Password protection function available



Multi-function 8 Line Text Panel TP08G-BT2

- ▶ 3.8" STN-LCD
- ▶ Resolution: 240 x 128 dots
- ▶ Built-in 1024kB flash memory
- ▶ 24 user-defined function keys
- ▶ Built-in RS-232 and RS-485 / RS-422 COM ports
- ▶ Supports recipes and macro functions





4.7-inch High Color, Wide Screen DOP-B04S211

- ▶ 4.7" 16:9 wide screen, 65536 colors TFT
- ▶ Display Resolution: 480 x 272 pixels
- ▶ USB for high-speed data transfer



5.6-inch Standard High Color DOP-B05S100/ DOP-B05S101

- ▶ 5.6" 65536 colors TFT
- ▶ Display Resolution: 320 x 234 pixels
- ▶ USB for high-speed data transfer (USB Client)
- ▶ USB for direct connection to USB disk, printer and mouse (USB Host)



Applications

All kinds of industrial monitoring systems, e.g. HVAC, printing machines, exposure machines, and other monitoring equipment for production management.



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7-inch High Color, High Resolution, Wide Screen DOP-B07S(E)415

- ▶ 7" 16:9 wide screen, 65536 colors TFT
- ▶ Display Resolution: 800 x 480 pixels
- ▶ USB for high-speed data transfer (USB Client)
- ▶ USB for direct connection to USB disk, printer and mouse (USB Host)
- ▶ Supports SDHC card
- ▶ Supports Ethernet
- ▶ Supports audio output interface (mp3, wav files)



7-inch High Color, High Resolution DOP-B07S(E)515

- ▶ 7" 65536 colors TFT
- ▶ The world's first design: the effective display area is the same as 7-inch models, but the panel cutout's dimensions are just the same as 5.6-inch models.
- ▶ Display Resolution: 800 x 600 pixels
- ▶ USB for high-speed data transfer (USB Client)
- ▶ USB for direct connection to USB disk, printer and mouse (USB Host)
- ▶ Supports SDHC card
- ▶ Supports Ethernet
- ▶ Supports audio output interface (mp3, wav files)



8-inch High Color, High Resolution DOP-B08S(E)515

- ▶ 7" 65536 colors TFT
- ▶ Display Resolution: 800 x 600 pixels
- ▶ USB for high-speed data transfer (USB Client)
- ▶ USB for direct connection to USB disk, printer and mouse (USB Host)
- ▶ Supports SDHC card
- ▶ Supports Ethernet
- ▶ Supports audio output interface (mp3, wav files)



10.1-inch High Color, High Resolution, Wide Screen DOP-B10S(E)615

- ▶ 10.1" 65536 colors TFT
- ▶ Display Resolution: 1024 x 600 pixels
- ▶ USB for high-speed data transfer (USB Client)
- ▶ USB for direct connection to USB disk, printer and mouse (USB Host)
- ▶ Supports SDHC card
- ▶ Supports Ethernet
- ▶ Supports audio output interface (mp3, wav files)





Machine Vision System DMV



Intelligent Human Visual Inspection System for a Variety of Applications

DMV System Features:

- ▶ New user-friendly operation interface for setting up inspection system.
- ▶ Flowchart programming interface saves development time. Built-in multifunctional developing tools, no need for custom-design or complex programs.
- ▶ Offers versatile digital inputs and outputs.
- ▶ Compact and light, saves wiring and space, and installs easily. High specification hardware with performance better than comparable products and meets high-speed processing requirements.
- ▶ Supports standard FireWire 1394 series CCD. Provides a complete product line-up which includes lighting and lenses.
- ▶ Offers Ethernet and RS-232 communication interfaces for all types of data output.
- ▶ Supports SD card and USB storage interfaces.
- ▶ Passes high industrial standards with system reliability superior to PC-based systems.

• Bottle Cap Position Identification

Check for improperly closed caps.



• Beverage Packing Inspection

Check if the liquid level of each bottle is accurate.



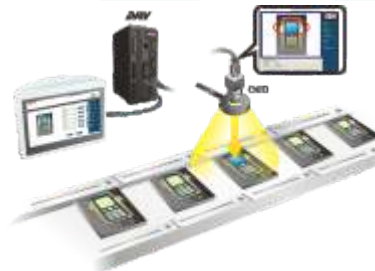
• Luminance Inspection

Inspect LED luminance automatically.



• Object Inspection

Verify touchscreens and push buttons of cellular phones are normal.



• Direction Identification

Verify the correct direction of work pieces conveyed on a production line.



• Characters Inspection

Inspect the characters on electronic devices



• Position Identification

Check that positions of IC components on PCBs are correct.



• Quantity Counting

Count the quantity of products in a basket or carton.

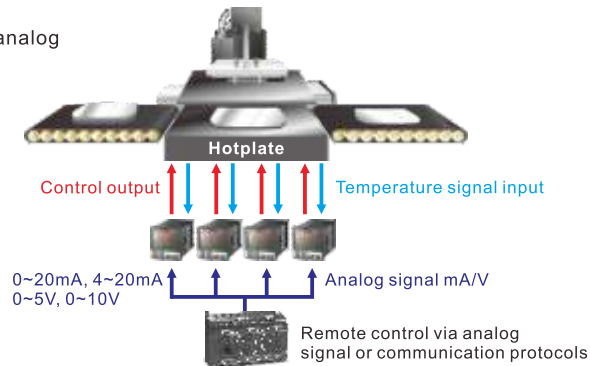


Next Generation Temperature Controller DT3



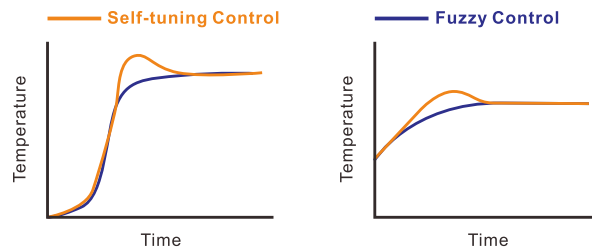
Remote Control

Sets DT3 temperature via analog output of host controller



Various Control Modes

- ▶ Self Tuning
- ▶ FUZZY
- ▶ Auto Tuning
- ▶ ON/OFF
- ▶ Manual



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Extension Ability

Modular design of functional devices enables customer to replace the module as needed for application flexibility



Large 3-color LCD Display

The 1st 3-color LCD temperature controller in Taiwan.



User-defined Function Keys

- ▶ Control modes selection
- ▶ Remote/Local Mode
- ▶ Start/Stop Mode
- ▶ Auto-tuning



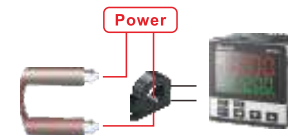
Point-to-Point Control (Proportional Output mA/V)

Sets the Present Value by point-to-point control



Heater Disconnection Detection

Measurable up to 100A

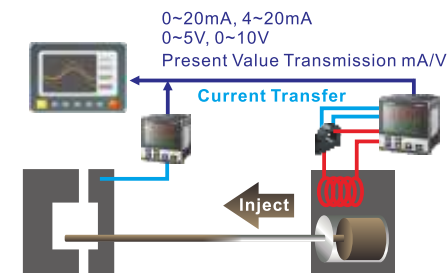


Built-in Long-life Relay SSR

- ▶ Saves on cost
- ▶ Suitable for frequent output applications

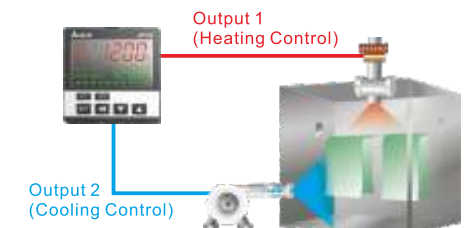


Retransmission Output



Dual-outputs Control

- ▶ Preset temperature is rapidly attained using two sets of outputs for heating and cooling control
- ▶ AT function is used to automatically calculate two sets of PID parameters, one for heating and one for cooling



40

Standard Temperature Controllers Models

DTA

- ▶ Sensors: Thermocouple, RTD
- ▶ Output methods: Relay, current, voltage pulse
- ▶ Control modes: ON/OFF, PID, manual
- ▶ Supports PID auto-tuning
- ▶ 2 alarm outputs, 12 alarm modes



Advanced Models

DTB

- ▶ Sensors: Thermocouple, RTD, linear voltage/current
- ▶ Output methods: Relay, current, voltage pulse, linear voltage
- ▶ Control modes: ON/OFF, PID, manual, PID programmable
- ▶ Supports PID auto-tuning and valve control
- ▶ Built-in RS-485 communication and supports MODBUS ASCII/RTU



Applications

Blower coil pipe in central air-conditioning system, heating systems

Modular & Extendable Models

DTC

- ▶ Sensors:
 - Thermocouple: B, E, J, K, L, N, R, S, T, U, TXK
 - RTD: PT100, JPT100
 - Analog current: 0 to 20mA, 4 to 20mA
 - Linear voltage: 0 to 5V, 0 to 10V
- ▶ Control modes: ON/OFF, PID, manual, PID programmable
- ▶ 2 outputs for auto-tuning 2 sets of PID parameters
- ▶ 2 alarms, and each with 12 alarm modes
- ▶ LED status display
- ▶ °C or °F temperature display
- ▶ Built-in RS-485 interface (MODBUS ASCII/RTU, baud rate: 2,400 to 38,400)
- ▶ Sampling time: 0.4s/time (thermocouple, RTD), 0.15s/time (analog input)
- ▶ Programmable control function supports 64 sets of temperature and control time
- ▶ 3 levels of password protection, wire-saving, synchronous communication, auto ID setup



Cost-Effective Models

DTD

- ▶ Control modes: ON/OFF, PID, manual, PID programmable
- ▶ Built-in multiple input sensors
- ▶ 1 alarm output, 8 alarm modes
- ▶ Supports analog input
- ▶ The keys can be locked to enhance safety
- ▶ IP56 waterproof panel



Multi-Channel Modular Models

DTE

- ▶ Fast sampling frequency
- ▶ 4 control modes
- ▶ Saves space and development cost
- ▶ Supports various temperature sensors, CT
- ▶ Output methods: Relay, voltage, current
- ▶ I/O extendable through extension cards
- ▶ Supports MODBUS ASCII/RTU
- ▶ Portable display/parameter setup
- ▶ Brand-new monitoring software
- ▶ Programmable control available



Multi-Function Small Pressure Sensor DPA



- ▶ Energy-saving mode
- ▶ Easy code display
- ▶ 3 sets of color display
- ▶ Various unit conversion functions
- ▶ Various output modes available
- ▶ Fast zero reset
- ▶ Analog output function
- ▶ Parameter copy function
- ▶ Safety control function
- ▶ Response time setup function

> Applications

Machine processing industry, solar energy industry, food packaging, semiconductor industry, electronic component industry, automated distribution industry

• Food Packaging Industry

Drinks, cans suction & packaging



• Solar Energy Industry

TurnKey Module Lines suction



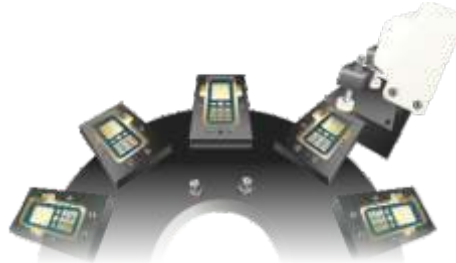
• Electronic Component Industry

IC component suction & confirm



• Automatic Assembly Industry

Automatic component assembly & confirm



Valve Controllers DTV

Specially designed for valve controller applications with easy-to-use functions and built-in MODBUS for facilitating the data collection process

- ▶ Single key to switch between auto/manual modes
- ▶ "Left" key to fast set up parameters
- ▶ Real-time output percentage displays the valve opening percentage
- ▶ Control method designed for the features of electronic valves
- ▶ 2 alarm outputs, 17 alarm modes
- ▶ Supports MODBUS ASCII/RTU



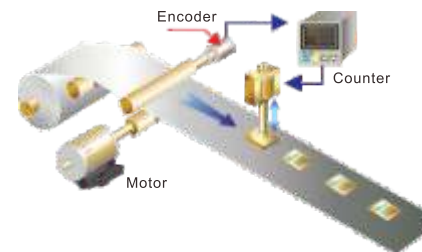
Timer/Counter/Tachometer CTA

- ▶ Timing and counting can be done together in the integrated mode
- ▶ 6-digit LCD display
- ▶ Max. counting speed: 10Kcps
- ▶ NPN or PNP signals for the input terminal
- ▶ Pre-scale function
- ▶ Counting modes: 1-stage, 2-stage, batch, total, dual

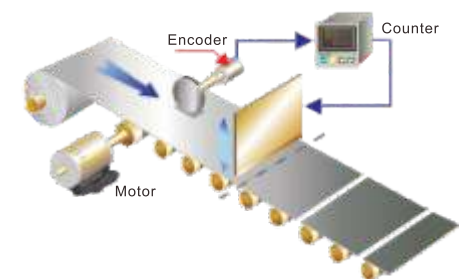


> Applications

• Label Printing Machine



• Fixed Length Cutting Machine





High speed and stable
industrial network solutions



RS-485/RS422 Communication Modules

DVPSCM12-SL

- ▶ Standard MODBUS communication and definable RS-485/422 communication protocols
- ▶ Two sets of independent RS-485/422 communication interfaces
- ▶ Isolated power and communication of RS-485 provides strong noise immunity. Built-in 120 ohm terminal resistor switch. Removable feed through type terminal block
- ▶ Transmits data via software setting, no more complex programming is required
- ▶ Use as PLC communication ports for uploading/downloading programs and monitoring purpose



Ethernet Communication Modules

DVPEN01-SL

- ▶ Supports MODBUS TCP protocol
- ▶ MODBUS TCP connections
Client: 32
Server: 16
- ▶ Smart data exchange
- ▶ RTU mapping
- ▶ Simple firewall
- ▶ Email alarm



PROFIBUS DP Communication Modules

DVPPF02-SL

- ▶ Left-side high-speed PROFIBUS DP slave module
- ▶ Supports PROFIBUS DP protocol
- ▶ Supports GSD files for identification and cyclic data transmission
- ▶ Data transmission: supports up to 100 words of I/O input and 1000 words of I/O output



DeviceNet Communication Modules

DVPDNET-SL

- ▶ Supports DeviceNet protocol
- ▶ Connectable to 63 slaves
- ▶ Supports EDS files for identification and cyclic data transmission
- ▶ Max. network length: 500m
- ▶ RTU mapping



CANopen Communication Modules

DVPCOPM-SL

- ▶ Supports CANopen protocol
- ▶ Connectable to 110 slaves
- ▶ Various PDO and high speed SDO functions available
- ▶ Supports NMT slave, Heartbeat, Emergency and more protocols



PROFIBUS DP Communication Modules

DVPPF01-S DVPPF02-H2

- ▶ PROFIBUS DP slave module
- ▶ Supports PROFIBUS DP protocol
- ▶ Supports GSD files for identification and cyclic data transmission



DeviceNet Communication Modules

DVPDT01-S DVPDT02-H2

- ▶ DeviceNet slave module
- ▶ Supports DeviceNet protocol
- ▶ Supports EDS files for identification and cyclic data transmission



Unmanaged Industrial Ethernet Switches



DVS-005/00

- ▶ 5 ports: 10/100Mbps-Full/Half-duplex, auto MDI/MDI-X, auto negotiation
- ▶ Complies with IEEE802.3/802.3u/802.3x
- ▶ Supports 802.1p based QoS for packet forwarding precedence
- ▶ Built-in Broadcast Storm Protection
- ▶ Provides both DIN RAIL mount or wall mounting installation
- ▶ IP30 Aluminum case
- ▶ Operation temperature -10°C to 60°C
- ▶ Certified by UL508/60950-1, CE, FCC

DVS-005/8/16W01 Series

- ▶ Options for 5 / 8 / 16 port 10/100Base-T(X), 4 / 7 / 15 port 10/100Base-T(X) + 1- port 100Base-FX
- ▶ Complies with IEEE802.3/802.3u/802.3x
- ▶ Supports 802.1p based QoS for packet forwarding precedence
- ▶ Single Mode Fiber (SMF) or Multi-Mode Fiber (MMF) transmission up to 30km
- ▶ Built-in Broadcast Storm Protection
- ▶ Transparent transmission of VLAN tagged packets (DVS-008/016W01 only)
- ▶ Redundant 12~48VDC terminal block power input
- ▶ Auto warning for link break and power failure by relay output
- ▶ Patent combination design for DIN-RAIL and Wall-mounting installation
- ▶ IP30 Aluminum case
- ▶ Operation temperature 40°C to 75°C
- ▶ UL508/60950-1, CE, FCC Certified

The Best Choice to Achieve Network Extension and Save Costs

Ethernet Remote I/O Communication Module

RTU-EN01

- ▶ Supports MODBUS TCP slave
- ▶ Connectable to 8 DVP-S series analog I/O modules
- ▶ Connectable to 256 points of digital I/O modules
- ▶ The RS-485 port is connectable to max. 32 MODBUS slaves
- ▶ Smart PLC if-then function
- ▶ Smart Monitor
- ▶ Supports webpage setup and on-line monitoring
- ▶ Serial Virtual COM available



PROFIBUS DP Remote I/O Communication Module

RTU-PD01

- ▶ Supports PROFIBUS DP protocol
- ▶ Auto-detects baudrate, max. baudrate: 12Mbps
- ▶ Supports GSD files for identification and cyclic data transmission
- ▶ Connectable to 8 DVP-S series analog I/O modules
- ▶ Connectable to 256 points of digital I/O modules
- ▶ The RS-485 port is connectable to max. 16 MODBUS slaves



DeviceNet Remote I/O Communication Module

RTU-DNET

- ▶ Supports DeviceNet protocol
- ▶ Supports EDS files for identification and cyclic data transmission
- ▶ Connectable to 8 DVP-S series analog I/O modules
- ▶ Connectable to 256 points of digital I/O modules
- ▶ The RS-485 port is connectable to max. 8 MODBUS slaves



RS-485 Remote I/O Communication Module


RTU-485

- ▶ Supports MODBUS protocol
- ▶ Connectable to 8 DVP-S series analog I/O modules
- ▶ Connectable to 256 points of digital I/O modules
- ▶ Max. baud rate: 115.2Kbps






USB Converters


| | | |
|---|---|---|
|  | IFD6500 USB to RS-485 Converter | <ul style="list-style-type: none"> ▶ 115.2k bps Max. ▶ No external power supply required ▶ Auto-detects the direction of data flow ▶ A USB portable device |
| | IFD6503 USB to CAN Converter | <ul style="list-style-type: none"> ▶ Extracts CAN message (incl. standard and extended frames), decodes and displays following DeviceNet and CANopen protocols ▶ Filters by set conditions ▶ Sends CAN messages, 1 message by manual mode, 8 messages by auto mode ▶ 1M bps Max. ▶ A portable USB device |
| | IFD6530 USB to RS-485 Converter | <ul style="list-style-type: none"> ▶ Offers 9V power supply, supports keypad (KPC-CC01) for C2000 series AC motor drive in conducting parameter storage and page editing ▶ 115.2k bps Max. ▶ No external power supply required ▶ Auto-detects the direction of data flow ▶ A USB portable device |

High impedance to noise with abundant fieldbus converters

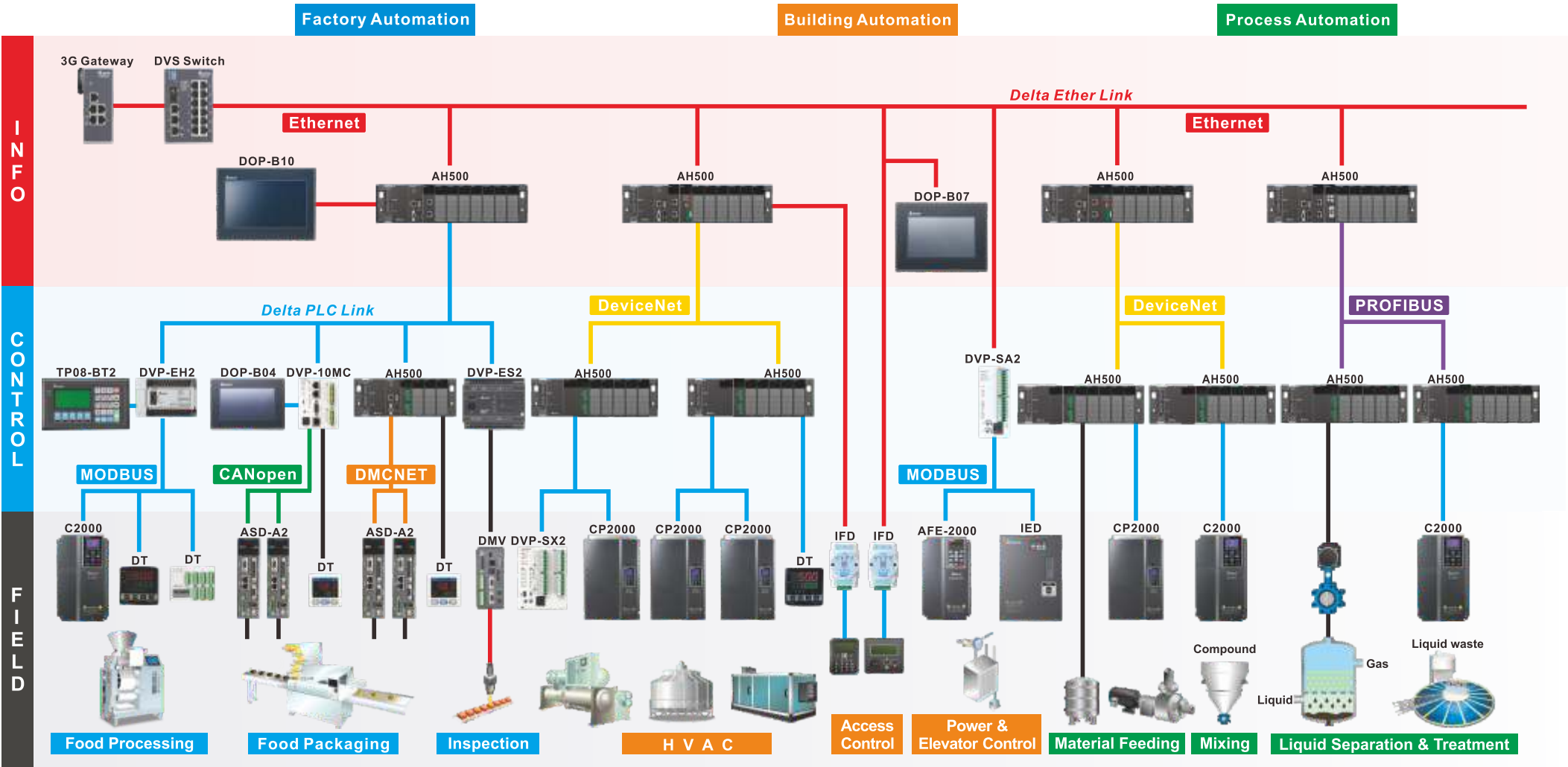
MODBUS Serial Converters

| | | |
|---|----------------|--|
|  | IFD8500 | <ul style="list-style-type: none"> ▶ RS-232 to RS-422/RS-485 isolated converter |
| | IFD8510 | <ul style="list-style-type: none"> ▶ RS-232 to RS-422/RS-485 isolated repeater ▶ Extends RS-422/485 transmission to 1.2km and connectable to 32 RS-485 devices |
| | IFD8520 | <ul style="list-style-type: none"> ▶ RS-232 to RS-422/RS-485 addressable isolated converter ▶ Connects RS-232 to RS-422/485 by setting up MODBUS address |

Industrial Network Converters

| | | |
|--|---|--|
|  | IFD9502 DeviceNet to MODBUS Converter | <ul style="list-style-type: none"> ▶ Complies with DeviceNet format ▶ Connectable to all Delta industrial automation products ▶ Isolation in RS-485 channel (incl. power supply) ▶ Passed full compatibility test |
| | IFD9503 CANopen to MODBUS Converter | <ul style="list-style-type: none"> ▶ Complies with CANopen format ▶ Connectable to all Delta industrial automation products ▶ Isolation in RS-485 channel (incl. power supply) ▶ Passed full compatibility test |
| | IFD9506 MODBUS TCP to MODBUS Converter | <ul style="list-style-type: none"> ▶ Isolation in RS-485 channel (incl. power supply) ▶ Supports MODBUS TCP protocol ▶ Smart Monitor ▶ Supports webpage setup and on-line monitoring ▶ Serial Virtual COM available ▶ Email alarm |
| | IFD9507 EtherNet/IP to MODBUS Converter | <ul style="list-style-type: none"> ▶ Supports EtherNet/IP protocol ▶ Isolation in RS-485 channel (incl. power supply) ▶ Smart Monitor ▶ Supports webpage setup and on-line monitoring ▶ Serial Virtual COM available ▶ Email alarm |

Industrial Automation Solutions



Ethernet

Delta Ethernet products transcend the limits on transmission distance, offering 10/100Mbps high-speed transmission and efficient remote monitoring.

CANopen

Delta CANopen products support CANopen DS301 and DSP402 protocols, and are able to achieve multi-axis, high-speed and complex motion control with max. speed 1Mbps.

DMCNET

Delta DMCNET offers 10Mbps communication speed, constructing a real-time control system which supports multi-axis synchronous motion. The system can be connected to servo motors, remote digital or analog I/O modules, step motors, DD motors, linear motors, MPG modules, and more.

DeviceNet

Delta DeviceNet products support interconnections among products of different brands and wire-saving network topology. The 500kbps stable and noise resistant fieldbus data transmission is suitable for harsh industrial sites.

MODBUS

Delta MODBUS serial products integrate easily with devices of other brands, and for communication among RS-232, RS-422, RS-485 and custom-defined formats, offering greater flexibility for on-site applications.

PROFIBUS

Delta PROFIBUS products support 12Mbps communication speed and are suitable for distributed automated industrial control networks.

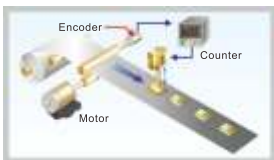
Rotary Optical Encoders ROE



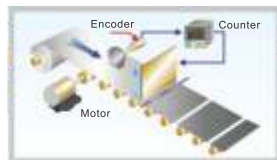
Delta's Rotary Optical Encoder series provides two types of encoders, one is a "standard type" and the other is a "special type". The "standard type" encoders are divided into incremental models and absolute models which both are designed for applications such as robot arms, elevators, conveyers, textile machines, storage equipment and other industrial automation machines. The "special type" encoders are designed for applications such as servo motors, CNC machine tools and other high precision equipment.

> Applications

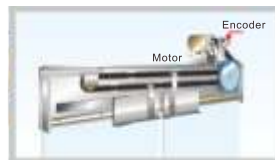
Label printing machines, detecting machines, elevators, bottling machines, cutting machines, elevator doors, testing/inspection machines



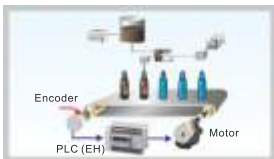
Label Printing Machines



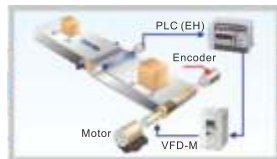
Cutting Machines



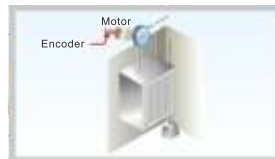
Elevator Doors



Bottling Machines



Testing/Inspection Machines



Elevators

Incremental Encoders ES/EH

- ▶ ES series: solid shaft with outer diameter of 36.6mm and 50mm
- ▶ EH series: hollow shaft with outer diameter of 36.6mm, 38.7mm and 50mm
- ▶ Light and compact, high reliability, incremental encoders
- ▶ Resolution: 100 ~ 5000 ppr
- ▶ Output type: open collector, voltage output, line driver and push pull
- ▶ Power voltage range: 5 ~ 24V
- ▶ Frequency response: max. 300kHz



Servo Motor Commutation Models MH

- ▶ MH series: hollow shaft with outer diameter of 38.7mm
- ▶ Resolution: 2500 ppr
- ▶ Output type: line driver
- ▶ Power voltage range: 5V
- ▶ Frequency response: max. 300kHz



CNC Spindle Models CS

- ▶ CS series: solid shaft with frame size of 68 x 68mm
- ▶ Resolution: 1024 ~ 2500 ppr
- ▶ Output type: line driver
- ▶ Power voltage range: 7 ~ 24V
- ▶ Frequency response: max. 300kHz



Industrial Power Supplies

Delta is the world's largest power supply manufacturer. The state-of-the-art DVP, DRP and PMC series power supplies offer a nominal output voltage of DC 24V/12V, a wide temperature range from -20 to +75°C and a minimum holdup time of 20ms. The rugged and ultra-compact case material is shock and vibration resistant according to IEC 60068-2. The power supplies provide over-voltage, overload and thermal protection. The wide input voltage ranges from 85 to 264 VAC (1 phase) and 320 to 575 VAC (3 phase), and the multiple output terminals are for fast wiring and easy installation.

DC 24V DIN rail models

| | | | |
|---|--|--|--|
| Model DVP-PS01 Spec 24W, DC24V, 1 phase White Plastic Case | Model DVP-PS02 Spec 48W, DC24V, 1 phase White Plastic Case | Model DRP024V060W1AZ Spec 60W, DC24V, 1 phase Black Plastic Case | Model DRP024V060W1AA Spec 60W, DC24V, 1 phase Aluminum Case |
| Model DRP024V120W1AA Spec 120W, DC24V, 1 phase Aluminum Case | Model DRP024V240W1AA Spec 240W, DC24V, 1 phase Aluminum Case | Model DRP024V480W1AA Spec 480W, DC24V, 1 phase Aluminum Case | |
| Model DRP024V060W3AA Spec 60W, DC24V, 3 phase Aluminum Case | Model DRP024V120W3AA Spec 120W, DC24V, 3 phase Aluminum Case | Model DRP024V240W3AA Spec 240W, DC24V, 3 phase Aluminum Case | Model DRP024V480W3AA Spec 480W, DC24V, 3 phase Aluminum Case |
| Model DRP024V060W1BA Spec 60W, DC24V, 1 phase Aluminum Case Removable Terminal Block | Model DRP024V120W1BA Spec 120W, DC24V, 1 phase Aluminum Case Removable Terminal Block | Model DRP024V240W1BA Spec 240W, DC24V, 1 phase Aluminum Case Removable Terminal Block | |

DC 12V DIN rail models

| | | | |
|--|--|---|--|
| Model DRP012V015W1AZ Spec 15W, DC12V, 1 phase Black Plastic Case | Model DRP012V030W1AZ Spec 30W, DC12V, 1 phase Black Plastic Case | Model DRP012V060W1AA Spec 60W, DC12V, 1 phase Aluminum Case | Model DRP012V100W1AA Spec 100W, DC12V, 1 phase Aluminum Case |
|--|--|---|--|

DC 24V panel mount aluminum-case models

| | | | |
|--|--|---|--|
| Model PMC-24V035W1AA Spec 35W, DC24V, 1 phase Aluminum Case | Model PMC-24V050W1AA Spec 50W, DC24V, 1 phase Aluminum Case | Model PMC-24V075W1AA Spec 75W, DC24V, 1 phase Aluminum Case | Model PMC-24V100W1AA Spec 100W, DC24V, 1 phase Aluminum Case |
| Model PMC-24V150W1AA Spec 150W, DC24V, 1 phase Aluminum Case | Model PMC-24V300W1BA Spec 300W, DC24V, 1 phase Aluminum Case | Model PMC-DSPV100W1A Spec 100W, DC5/24V, 1 phase dual output Aluminum Case | |

DC 12V panel mount aluminum-case models

| | | | |
|---|---|--|--|
| Model PMC-12V035W1AA Spec 35W, DC12V, 1 phase Aluminum Case | Model PMC-12V050W1AA Spec 50W, DC12V, 1 phase Aluminum Case | Model PMC-12V100W1AA Spec 100W, DC12V, 1 phase Aluminum Case | Model PMC-05V035W1AA Spec 35W, DC5V, 1 phase Aluminum Case |
|---|---|--|--|



Global Operations

ASIA (Taiwan)



Taoyuan Technology Center (Green Building)



Taoyuan Plant 1



Tainan Plant (Diamond-rated Green Building)

ASIA (China)



Wujiang Plant 3



Delta Electronics

ASIA (Japan)



Tokyo Office

ASIA (India)



Rudrapur Plant (Green Building)

EUROPE



Amsterdam, Netherlands

AMERICA



Research Triangle Park

▲ Factories 2 ■ Branch offices 60 ● R&D Centers 5 ■ Distributors 581

Sales Channels of Delta Industrial Automation are Located Worldwide in 74 Countries

