Digitized Automation for a Changing World

Delta CNC Solution

NC5 Series

www.deltaww.com

CNC Solution NC5 Series

Towards Excellence & Infinite Scalability

The precision of numerical computation lies in the CNC controller. Delta's brand new CNC Solution NC5 Series adopts a next generation CPU with high performance computing as well as IEEE 64-bit floating point, providing cutting-edge technology to the market.

The NC5 Series not only supports ISO standard G code but also features thorough path analysis and an advanced look-ahead algorithm, achieving precise path and enhanced processing speed. A built-in compensation function on backlash and friction helps eliminate mechanical defects. Equipped with the new HMI programming software, users can customize interface and operation steps. It also possesses an Ethernet port for data exchange and easy connection with the MES system. In addition, the multipath control supports up to four different machining processes and integrates loading/unloading robots to achieve a fully automated production. Coupled with the EtherCAT motion control internet that enables a hassle-free integration with peripheral devices, the NC5 Series provides an outstanding teammate for lathe, milling, woodworking, 3C processing, and grinding applications.

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Delta CNC Solution
NC5 Series

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- High-Speed Look Ahead Algorithm
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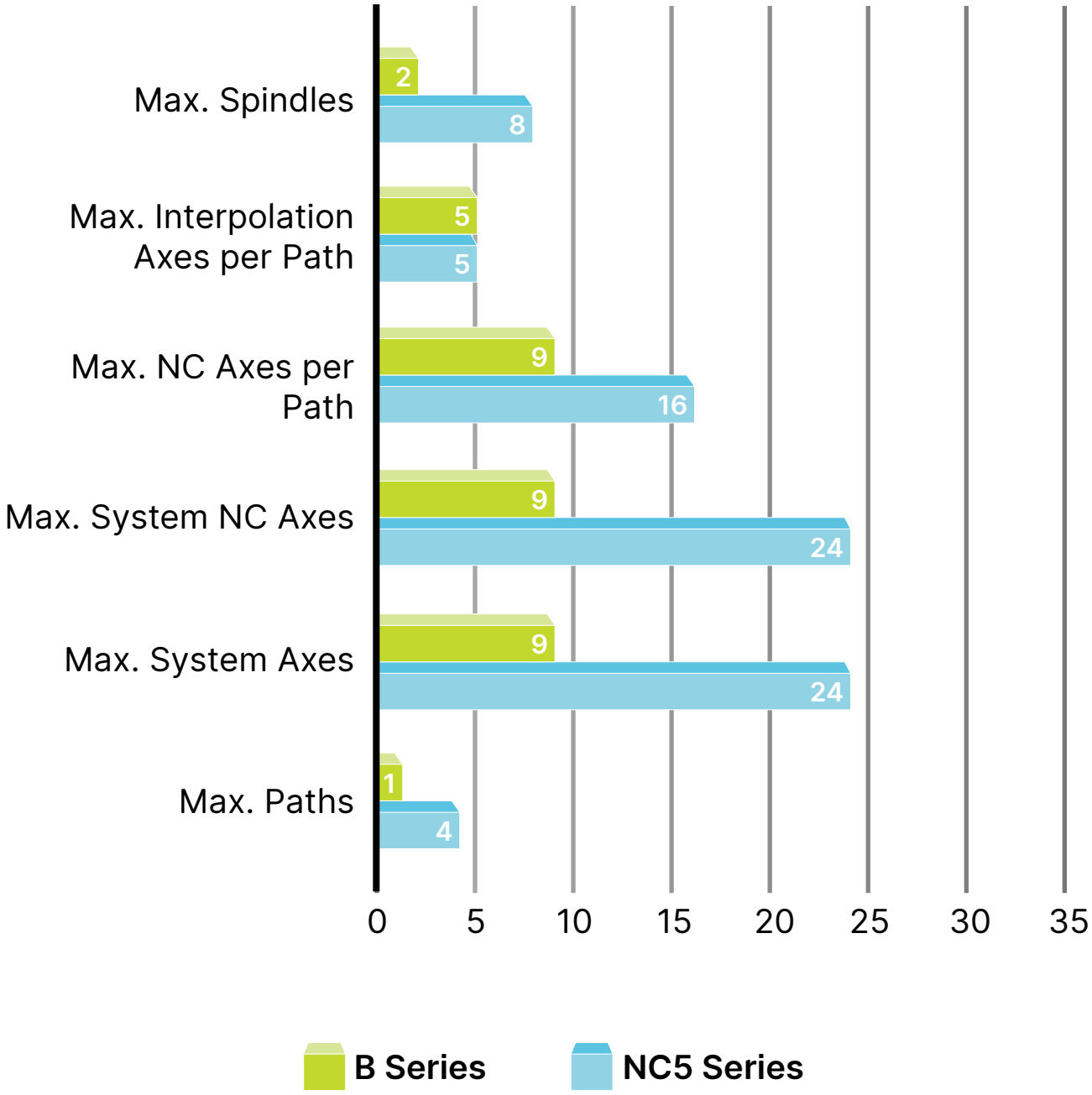
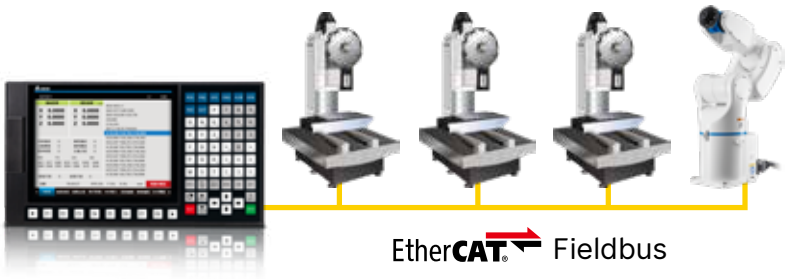
- Graphic Programming


Max. Spindles
2
8
Max. Interpolation Axes per Path
5
5
Max. NC Axes per Path
9
16
Max. System NC Axes
9
24
Max. System Axes
9
24
Max. Paths
1
4
0
5
10
15
20
25
30
35
B Series
NC5 Series

Overview

Multi-Path Control

Interpolation multi-tasking of machining and robotic loading and unloading on a single controller to reduce implementation, manpower, and time costs

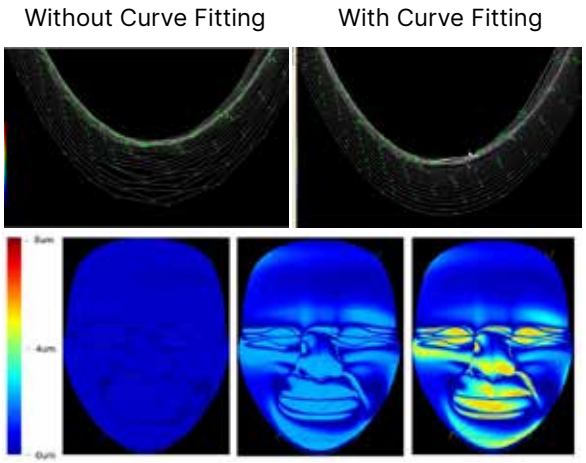


5-Axis Machining with RTCP (Rotation Tool Center Point)

Tool tip stays on the same plane for smooth optimal cutting without interference. Completes 5-sided machining using a single clamping for quality and efficiency enhancement

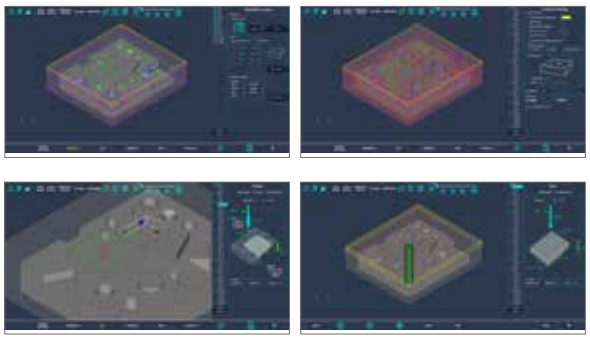
High Speed & High Precision

Advanced multi-block Look Ahead and curvature analysis for feed rate planning with high-order curve analysis and fitting to optimize machining paths and velocity planning



Built-in CAD/CAM Software

Comprehensive solution leverages Delta's CAD/CAM to build models and assembly drawings for tool path generation with higher efficiency and quality for 2D, 3D, and multi-axis part production



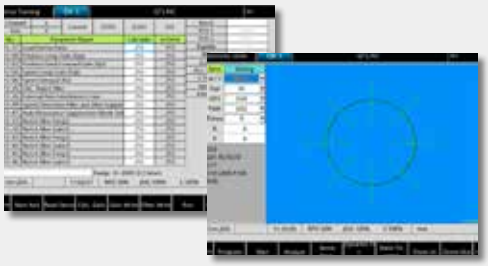
Features

Interactive Editing

Industry-specific and interactive graphical editing and programming for an easy-to-use operating interface for process management

Smart Tuning and Integration

The CNC controller supports servo inertia, resonance suppression, bandwidth control, and servo friction compensation with one-key operation for fast machine tuning, and eliminates issues for tool marks resulting from quadrant changes. For tapping applications, one-key turning is available as well

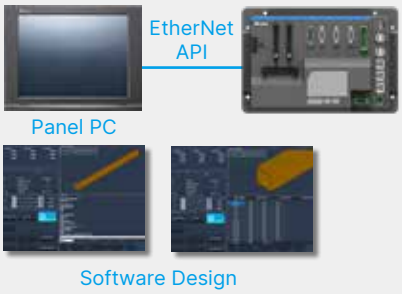


OPEN CNC Software Operation on Large Touchscreen

Equipped with a large touch panel for operation and user-definable interface

PC + OPEN CNC Software for Interface Customization and Process Configuration

Provides Ethernet APIs for operating the controller, accessing data, defining a customized OPEN CNC software interface, and collecting controller data for analysis

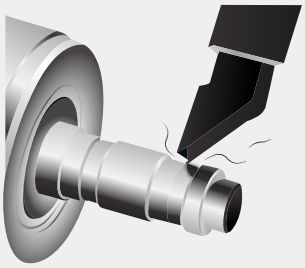


CAD/ CAM Software for Advanced Grinding Processes

Delta's CAD/ CAM software provides a graphical interface, allowing users to quickly design complicated milling processes, such as punch grinding, contour grinding, tool grinding, and more

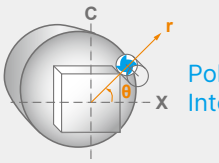
Lathe Turning Without Stringy Chips

Prevents stringy or strip-shaped chips from falling around tools or workpieces from damaging the processing surfaces or shortening the lifespan of tools

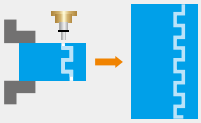


Compound Lathe Turning and Milling Functions

Integration of lathe turning and milling functions, such as SC switching, polar coordinate interpolation, cylindrical coordinate interpolation, drive-tool axis milling, and more, for diverse processing



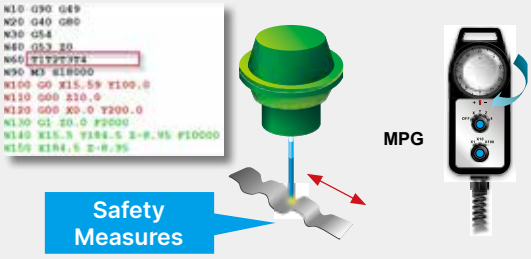
Polar Coordinate Interpolation



Cylindrical Interpolation

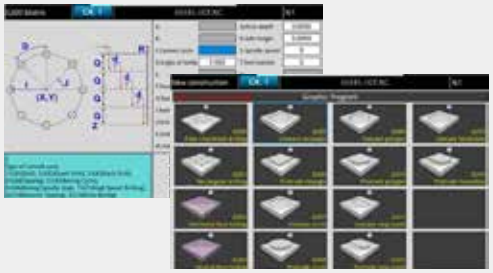
Woodworking Industry-Specific Functions

Supports multiple T commands in a single line command. Supports T codes to execute subordinates in advance for tool change preparation with better efficiency. The reversing handwheel operation facilitates managing anomalies



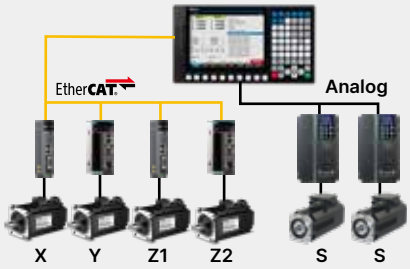
UI Customization and Automatic Programming of Specific Processes

Fast process configuration with user-definable interface for standard surface/ cylindrical grinding methods and ranges



Applications with Multiple Z Axes

- Provides control of synchronous & transfer motions tool table of the multi-end milling machine, and G43 length compensation for multi-end tools.
- Expandable for various high-speed contacts for multiple Z-axis motions.
- Industry-specific functions for single-end machine or up to six-end machine applications



Product Series

High Performance

CNC NC5 Series (Integrated Type / Split Type)

- Built-in multi-core CPU for multi-path interpolation, for higher Look Ahead speed
- Multi-path interpolation for loading, unloading and multi-process complicated process
- 5-axis with RTCP function to achieve high-end processing with molds or non-contact machining
- Automatic servo tuning and smart friction estimation and compensation
- Advanced high speed and high precision core to enhance milling and engraving performance and efficiency
- Expandable with MLC devices, tools, variable

OPEN CNC Controller NC5 Series

- CNC IIoT for fast integration
- Facility monitoring and control for energy-saving and yield enhancement
- Energy management for precise control for energy consumption costs

CNC Controller NC3 / NC2 B Series

- Connects to DMCNET AC Servo System to digitize data transmission for higher interference suppression ability
- Equipped with a high-resolution encoder with an accuracy of up to 0.1 um for smooth and precise motions
- Automatic gain adjustment offers adequate motion control during tuning
- A new operating interface built-in with the DOPSoft Software for customizable interface
- Open-structured system with Delta's CNC API developing PC software for differentiated smart machine building
- Supports standard G-code and Macro variable expansion
- Built-in 32 inputs / 32 outputs, spindle pulse output, and dual DAC output

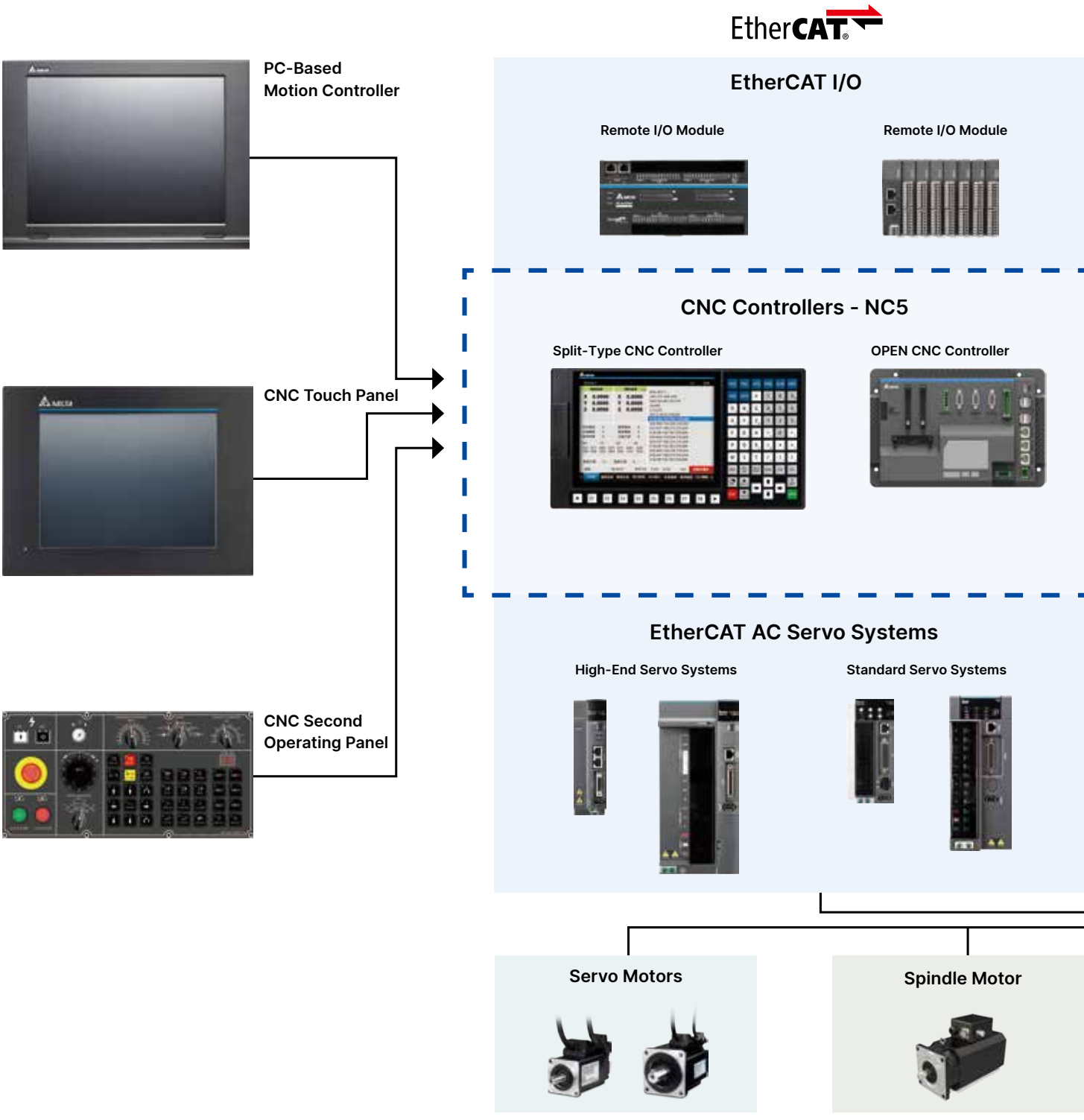
Standard

	Lathe	Machining Center
Max. Axes (Max. NC+PLC axes)	24	24
Max. NC Interpolation Axes	4	5
Max. Spindles	8	8
Max. PLC Axes per Path	9	16
Max. NC Axes per Path	9	16
Max. Paths	2	4
Min. Length Increment	1nm	1nm

	Lathe	Machining Center
Max. Axes (Max. NC+PLC axes)	24	24
Max. NC Interpolation Axes	4	5
Max. Spindles	8	8
Max. PLC Axes per Path	9	16
Max. NC Axes per Path	9	16
Max. Paths	2	4
Min. Length Increment	1nm	1nm

	200 Series	300 Series
Max. Axes (Max. NC+PLC axes)	8	8
Max. NC Interpolation Axes	4	4 (H = 5)
Max. Spindles	2	2
Max. PLC Axes per Path	8	8
Max. NC Axes per Path	6	8
Max. Paths	1	1
Min. Length Increment	0.1um	0.1um

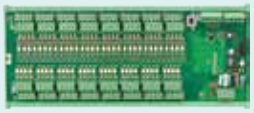
System Architecture



DMCNET

High Speed Serial I/O

Optocoupler-Type Serial I/O



Editing Software

CNC Controllers - NC3

OPEN CNC Controller

Integrated-Type CNC Controller

OA / OB / OZ

Analog / Pulse

Vector Control Drive

Heavy Duty Drive

DMCNET AC Servo Systems

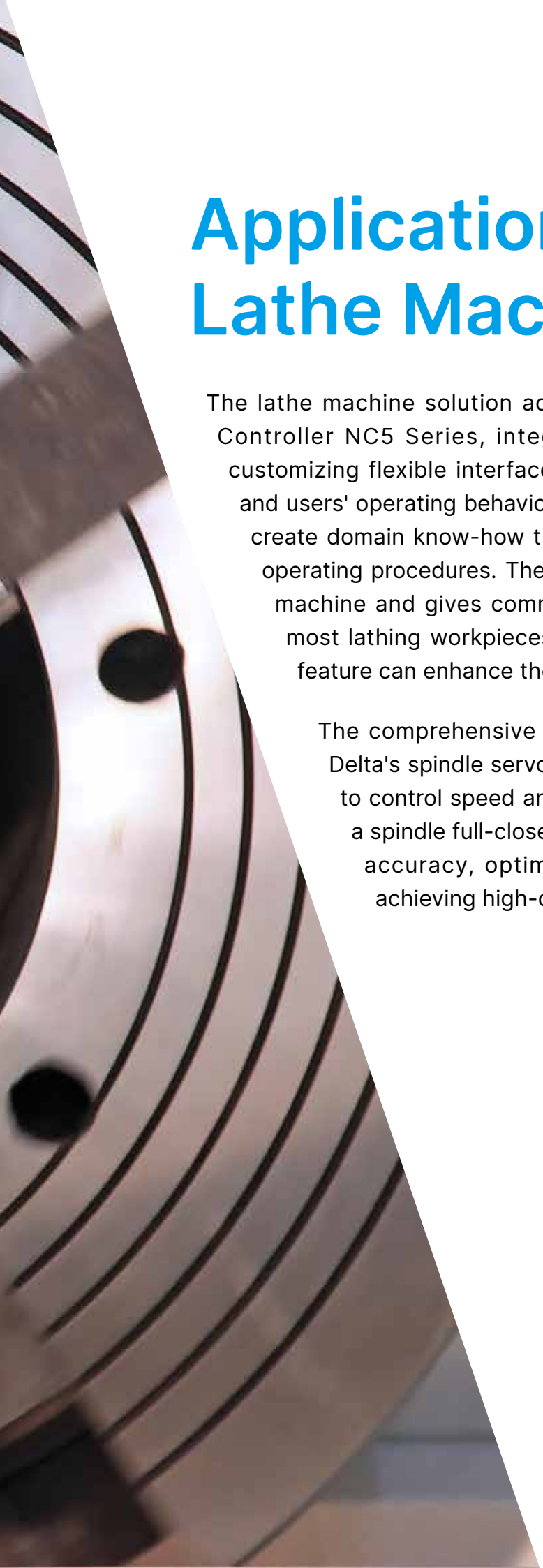
High-End Servo Systems

Standard Servo Systems

Optical Linear Ruler

Communication-Type Ring Encoders

Pulse Encoder



Application – Lathe Machine Solution

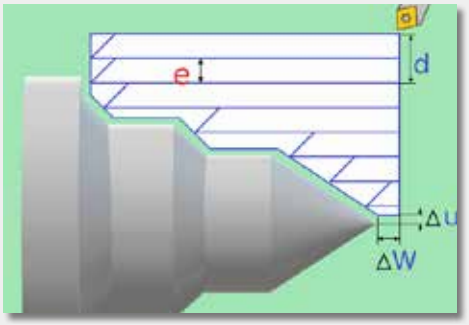
The lathe machine solution adopts the High-Performance General CNC Controller NC5 Series, integrating a human machine interface and customizing flexible interfaces aligned with the industrial requirements and users' operating behavior. The solution can help a machinery factory create domain know-how that meets its needs and quickly control the operating procedures. The NC5 Series solution controls a 2-axis lathe machine and gives commands to compound lathing and milling for most lathing workpieces. The "lathe turning without stringy chips" feature can enhance the machining and prolong tool use.

The comprehensive spindle solution is flexibly integrated with Delta's spindle servo, inverters, and the third-party spindle drive to control speed and location. Meanwhile, the solution features a spindle full-closed function, ensuring end-spindle positioning accuracy, optimizing the compound milling, turning and achieving high-quality processing.

Features

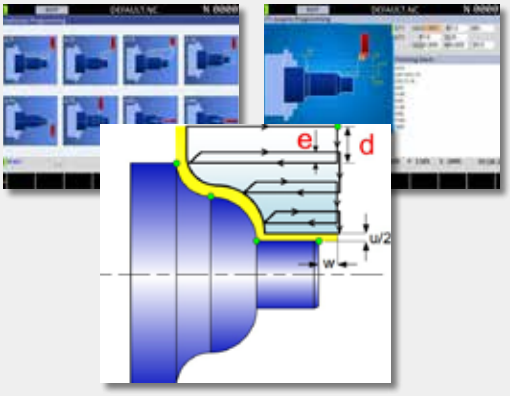
Comprehensive Turning and Cyclical Command Functions

Supports two-axis turning, threading, tapping, and external / face turning with circular command functions. It can complete most turning workpiece processing and also supports polygonal cutting and turning for gears and polygons.



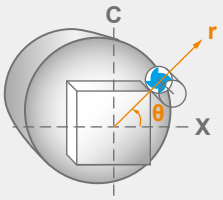
Flexible Human Machine Interface & Comprehensive Graphical Programming Interface

This is equipped with a flexible human machine design for machinery factories to choose based on their Cambridge Dictionary styles. Meanwhile, the controller features a complete graphical programming interface, easy for users to fast-track programming.

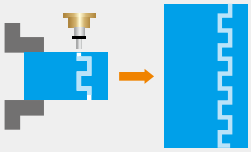


Compound Lathe Turning and Milling Functions

The lathe controller enhances its turning and milling compound capability, including SC switching, polar/ cylindrical coordinate interpolation, and power-driven spindle milling. This enables the controller to perform turning and milling compound processing, allowing for various machine processes.



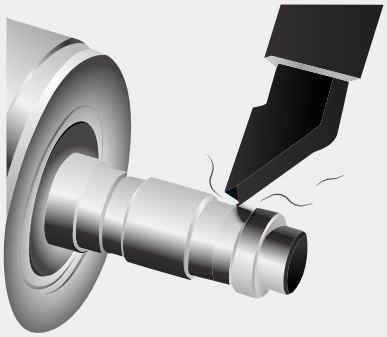
Polar Interpolation



Cylindrical Interpolation

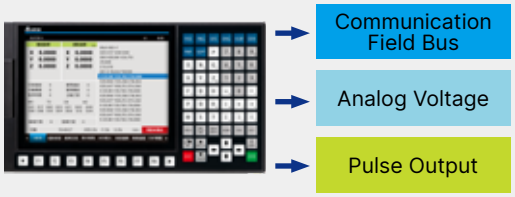
Lathe Turning Without Stringy Chips

The controller prevents stringy or strip-shaped chips from falling around tools or workpieces and damaging the processing surfaces or shortening the lifespan of tools.



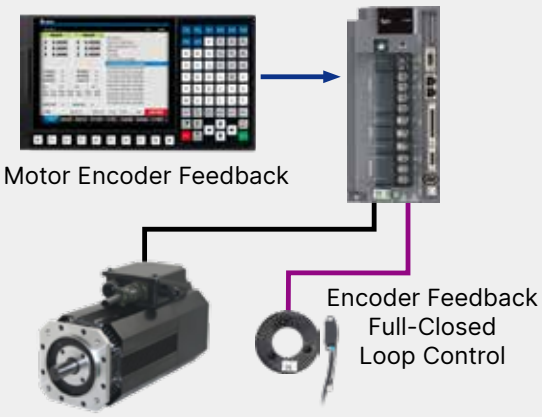
A Comprehensive Spindle Drive Solution

The NC5 Series controls the main spindle and is equipped with the communication field bus, analog voltage, pulse output, flexibly matching the third-party AC Servo Drive Systems, motor drives, and spindle drive devices.



Full-Closed Loop Control

The solution features motors and end-to-end dual teach-back function. It conducts spindle full closed-loop control to ensure positioning accuracy of the feeding axis and C-axis milling control.



Application - Engraving Machine

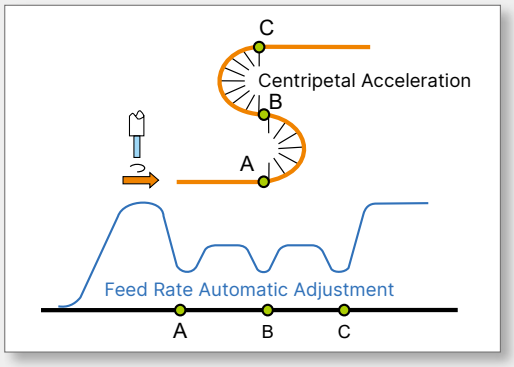
The engraving machine solution features a high-speed and high-precision algorithm and a multi-block Look Ahead preview for smooth speed, curve fitting, path simulation to enhance engraving processing precision and surface finishing. Adopts EtherCAT motion bus with the next generation AC Servo Systems ASDA-A3 / ASDA-B3 Series to enhance machining requirements.

The solution supports standard FTP and communication protocols. Used with general FTP file transfer software, its speed is more than 10 times faster than the previous generation CNC Controller B Series. It greatly reduces the transmission time of engraving programming, thus enhancing overall work efficiency.

Features

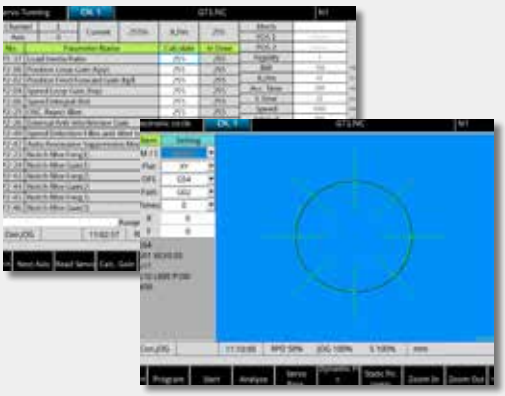
High-Precision & High-Speed Algorithm

Built-in path smoothing, curvature simulation, curve fitting, front/back acceleration/deceleration control, and multi-block Look Ahead technologies, satisfy requirements for high-precision, high-speed, and high-quality surface finishing. The parameter group function allows for switching between different parameter groups via G05 to optimize processing.



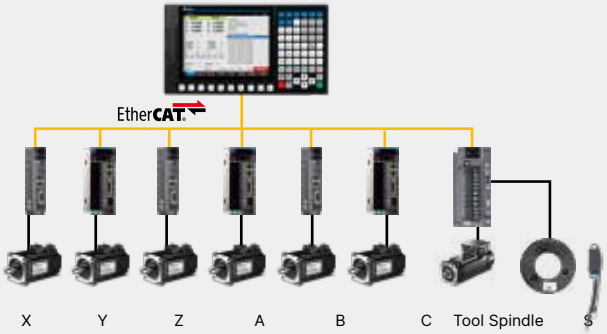
Smart Servo Tuning Integration

The CNC controller supports servo inertia, resonance suppression, bandwidth control, and servo friction compensation with one-key operation of fast machine tuning, and eliminates issues of tool marks resulting from quadrant changes. For tapping applications, one-key turning is available as well.



Rich Applications

Supports spindles, achieving multi-head tapping applications. Supports maximum 5-axis simultaneous interpolation and single path 16 NC axes control, fulfilling multi-axis machining and servo tool control. Supports dynamic NC/MLC axis switching, satisfying the requirement for control in peripheral devices.

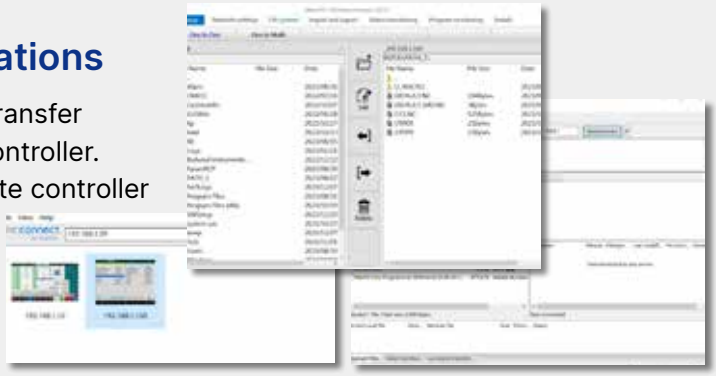


Highly Efficient Editing

Supports back-end programming editing, allowing users to conduct editing in the machining process, and enhancing efficiency of manual editing. Supports bilateral file manager, enabling fast replicating processes among various devices.

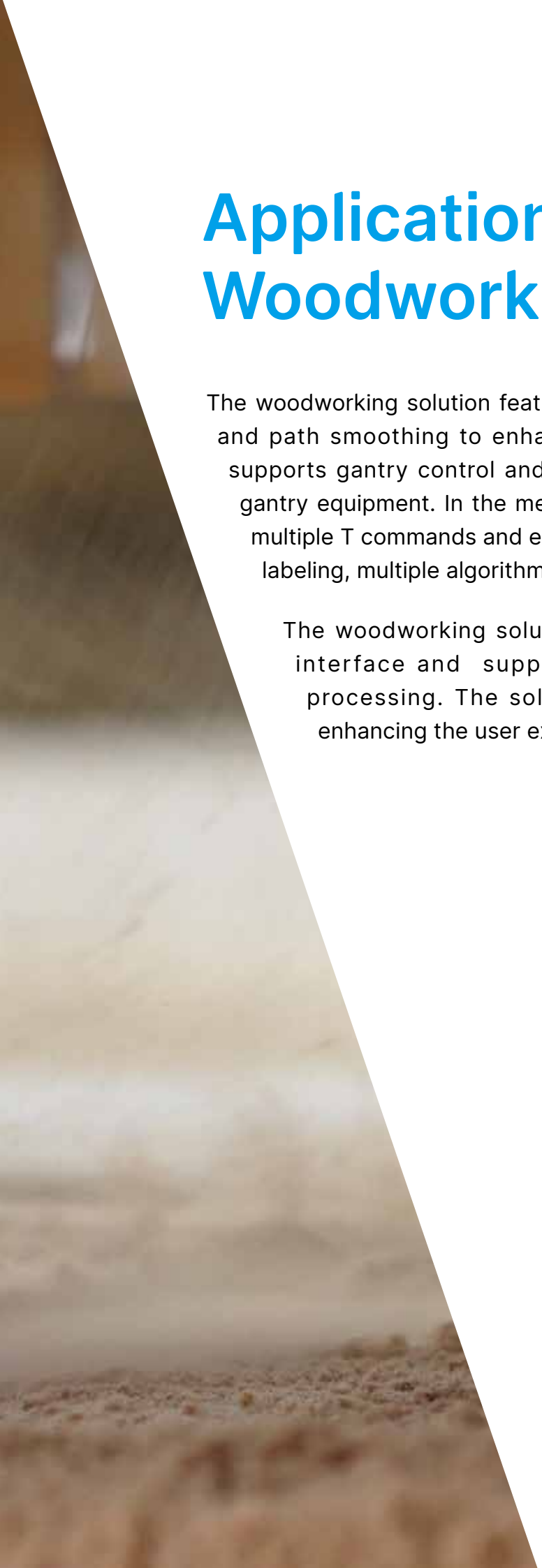
Remote & Expandable Applications

Supports standard FTP protocol for fast transfer of large processing files from PC to the controller. Supports standard VNC protocol for remote controller monitoring and operation. Supports SAMBA for sharing files to conduct transmission processing via the Internet.



Integrated with New Delta AC Servo System

Integrated with next-generation AC Servo Systems, ASDA-A3/B3 Series, equipped with higher response bandwidth, follows real-time command and position rectification. Equipped with 24-bit absolute encoder, which results in precise positioning, and is stable at a low speed. Equipped with optical encoder, full-closed loop control, flexible compensation, and advanced Notch Filter to satisfy machine tool applications.



Applications - Woodworking Machine

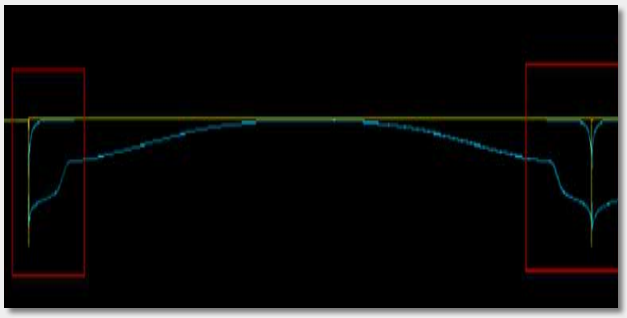
The woodworking solution features a high-speed, high-precision algorithm and path smoothing to enhance processing quality and efficiency. It supports gantry control and modification, fulfilling the needs of large gantry equipment. In the meantime, the woodworking solution supports multiple T commands and executes subordinates in advance, integrating labeling, multiple algorithms for files, and sequential machining.

The woodworking solution adopts a user-definable and flexible interface and supports a barcode scanner for scheduled processing. The solution facilitates the operating process, enhancing the user experience.

Features

High-Precision & High-Speed Algorithm

Built-in path smoothing, curvature simulation, curve fitting, front/back acceleration/deceleration control, and multi-block Look Ahead technologies, comply with machining accuracy and chamfer smoothness. It incorporates a smoothing function for G0/G01. Moreover, it can enhance machining efficiency while reducing mechanism tear and wear.



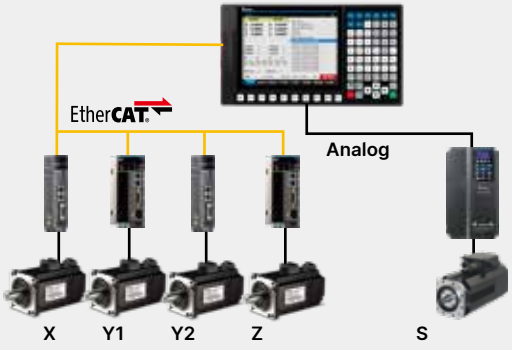
Industry T code

Supports multiple T commands with consecutive T codes in a single line command for fast tool change.
Supports T codes to execute subordinates in advance for tool change preparation with better efficiency.

```
N1 G90 G49
N2 G40 G80
N3 G54
N4 G53 Z0.0
N5 T01 T02 T03 T03 T05 T06 T07
N6 S1000 M03
N7 G00 X15.59 Y100.0
N8 G00 Z10.0
N9 G00 X0.0 Y200.0
N10 G01 Z0.0 F2000
```

Rich Applications

Supports synchronous main and secondary spindles calibration for gantry applications; supports maximum 9 NC-axis control, achieving servo tool change; supports diverse communication protocols, achieving peripheral device connections and whole factory connection requirements.



Highly Efficient Editing

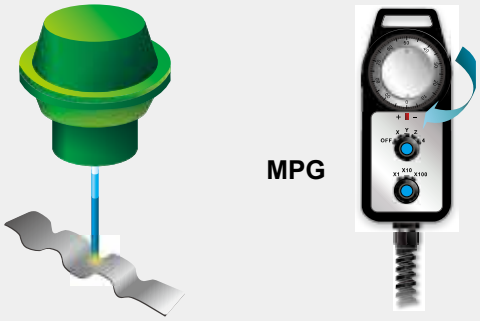
Supports back-end programming editing, allowing users to conduct editing in the machining process, enhancing efficiency of manual editing. Supports bilateral file manager, enabling the replicating process among various devices

Remote & Expandable Applications

Supports standard FTP protocol for fast transfer of large processing files from PC to the controller. Supports standard VNC protocol for remote controller monitoring and operation. Supports SAMBA for sharing files to conduct transmission processing via the Internet

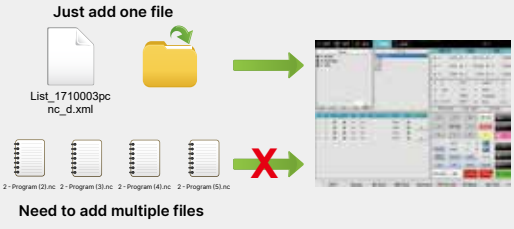
MPG Reversing Operation

Equipped with MPG reversing operation, allowing users to move forward or backward on the processing path. Confirms the accuracy of the machining path.



Industry-Specific Software for Post-Processing

The common cut list generation software generates XML files, woodworking router machining files, labeling graphs, and labeling positions. Enables direct selection of XML files, automatically launching woodworking router sequence sorting via built-in and post-processing, to achieve automatic labeling and woodworking router machining.



Application - Consumer Electronics Machining Center

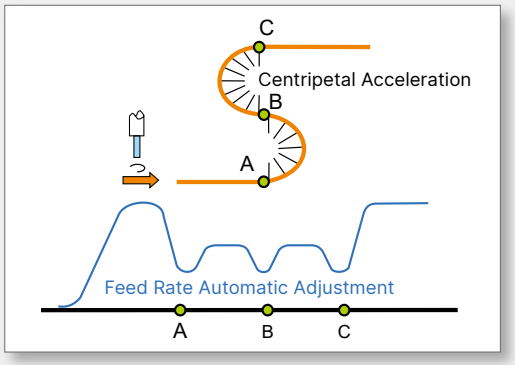
The 3C machining center solution is widely applied in 3C (computing, communication, and consumer)-related industries, such as high-speed spindle milling machine, glass edge grinders and more. It is built-in with a high-speed and high-precision algorithm, multi-block Look Ahead technologies, curve fitting, path smoothing, and curvature simulation. The integration of AC Servo System ASDA-A3/ASDA-B3 Series, and EtherCAT motion bus enhance the processing precision and fine surface finishing.

In addition, the abundant industry-specific applications and architecture for flexible control satisfies multi-position application requirements. The controller integrates peripheral devices and production management system, for more enhanced digitalized and smart equipment.

Features

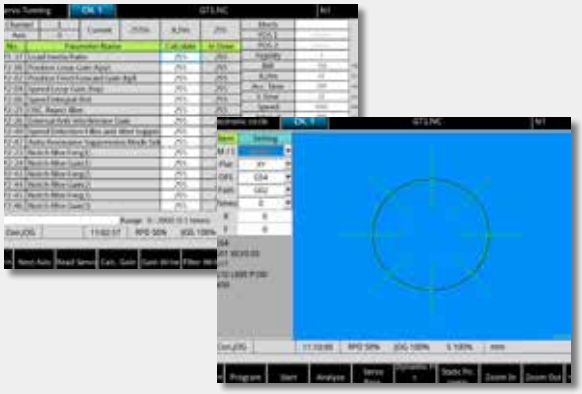
High-Precision & High-Speed Algorithm

Built-in path smoothing, curvature simulation, curve fitting, front / back acceleration / deceleration control, and multi-block Look Ahead technologies, satisfy requirements for high-precision, high-speed fine surface finishing.



Smart Servo Tuning Integration

The controller supports servo inertia, resonance suppression, bandwidth control, and servo friction compensation with one-key operation for fast machine tuning, and eliminates issues of tool marks resulting from quadrant changes. For tapping applications, one-key turning is available as well.

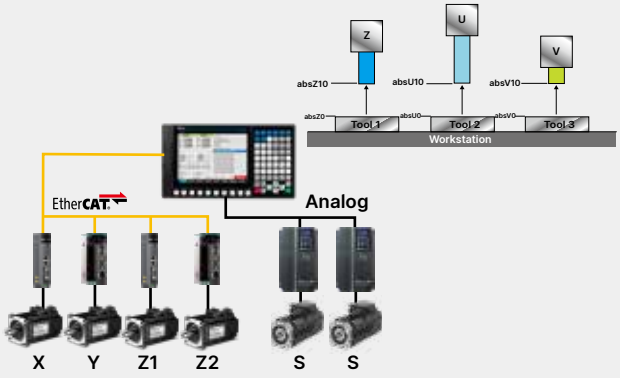


Application with Multiple Z Axes

Provides control of interpolation and moving motions, tool table of the multi-end milling machine, and G43 length compensation for multi-tool head machines.

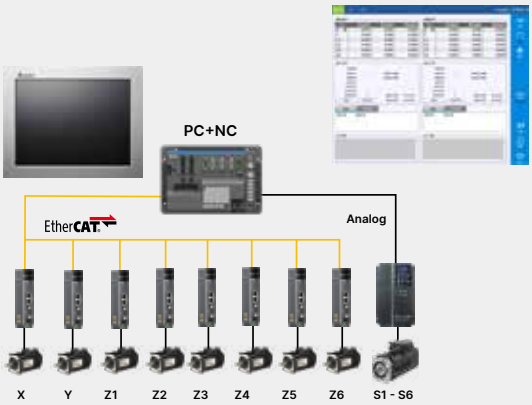
Expandable for various high-speed contracts for multiple Z-axis motions.

Industry-specific functions for single-tool head machine or up to six-tool head machine applications.



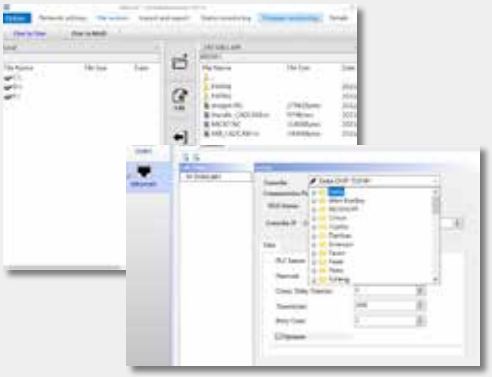
Flexible Architecture

Achieves flexible PC+NC architecture via API. One PC can control multiple NC controllers, accomplishing the architecture for multi-path control. It connects to industry-specific control software and is easy to operate. The NC5 Series is different from standard NC Controller operation, making it easier for users to operate.



Smart Factory & Peripheral Integration

Supports rich peripheral communication protocols for integrating vision or other controller connections; supports standard FTP protocol for fast transfer of large processing files from PC to the controller. Supports standard VNC protocol for remote controller monitoring and operation. Supports SAMBA for sharing files to conduct transmission processing via the Internet.



New AC Servo Systems

With the new AC Servo Systems, ASDA-A3/B3 Series come equipped with higher response and bandwidth and friction compensation, following real-time command and position rectification. Equipped with 24-bit absolute encoderIt results in precise positioning, and is stable at a low speed. Supports the third-party encoder protocol, achieving full-closed application control.

Application - Grinding Machine Solution

Delta's grinding machine solution features a comprehensive graphical programming interface, and supports supplementary programming for surface and external cylindrical grinding. Meanwhile, the AC Servo Systems support optical encoders for closed-loop control connected with overshoot, ensuring grinding accuracy.

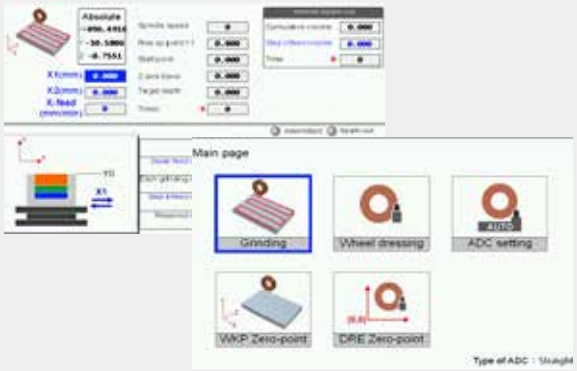
In addition, the NC5 Series supports prevailing functions in the grinding industry, including NC-MLC axis switch, M96 / M97 machining interrupt Marco, and multi-spindle & virtual encoder. The controller is expandable with ten G31 high-speed inputs, achieving flexible grinding and protection of machining centers.

The solution connects to PC + OPEN CNC Software for interface customization and process configuration. It provides an Ethernet API for operating the controller, accessing data, defining a desired OPEN CNC software interface, and collecting controller data for analysis. Moreover, the CAD/CAM software provides a graphical interface allowing users to quickly design complicated milling processes, such as punching grinding, contour grinding, tool grinding and more.

Features

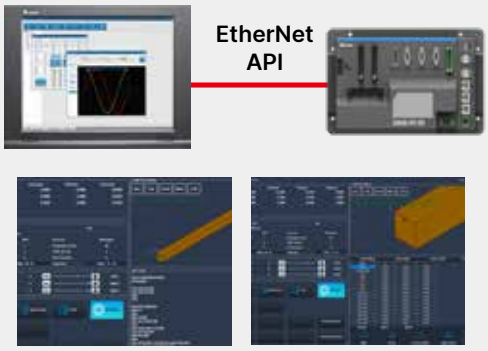
Customized UI and Automatic Programming of Specific Processes

Fast process configuration with user-definable interface for standard flat surface, cylindrical grinding methods and ranges.



PC + OPEN CNC Software for Interface Customization and Process Configuration

Provides Ethernet APIs for operating the controller, accessing data, defining a customized OPEN CNC software interface, and collecting controller data for advanced and statistical analysis.



Software Design

CAD/ CAM Software for Advanced Grinding Processes

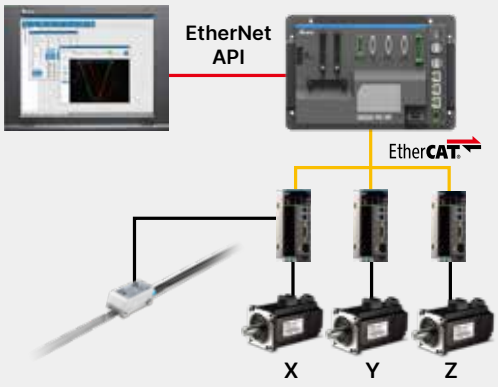
PC + OPEN CNC Software is compatible with CAD/ CAM software for a graphical interface, allowing users to quickly design complicated milling processes, such as punch grinding, contour grinding, tool grinding and more.

OPEN CNC Controller Equipped with Touch Panel & Operating Panel

Equipped with a large size touch panel for display and an operating panel. Enhances the user experience.

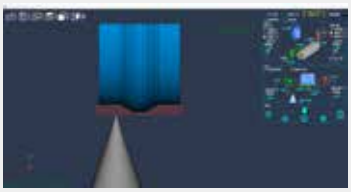
Supports Linear Encoder Feedback for Full Closed-Loop Control

Full closed-loop control with pulse or third-party communication type linear encoder. Overshoot control with servo positioning, ensuring end-positioning accuracy up to 1 nm.

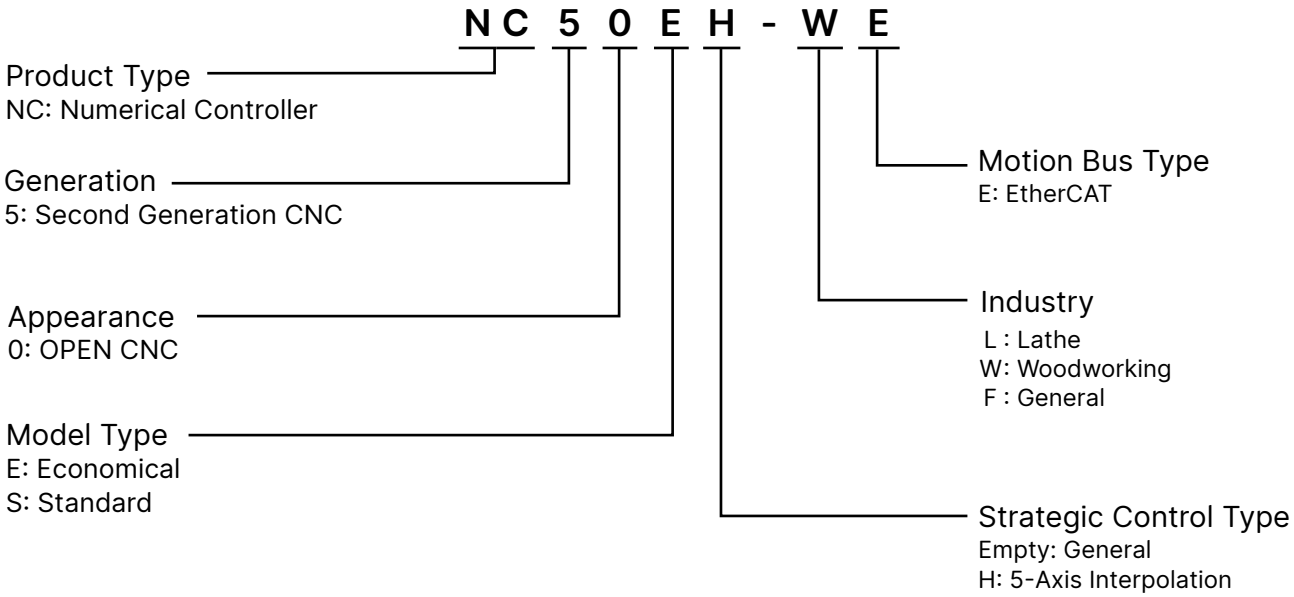


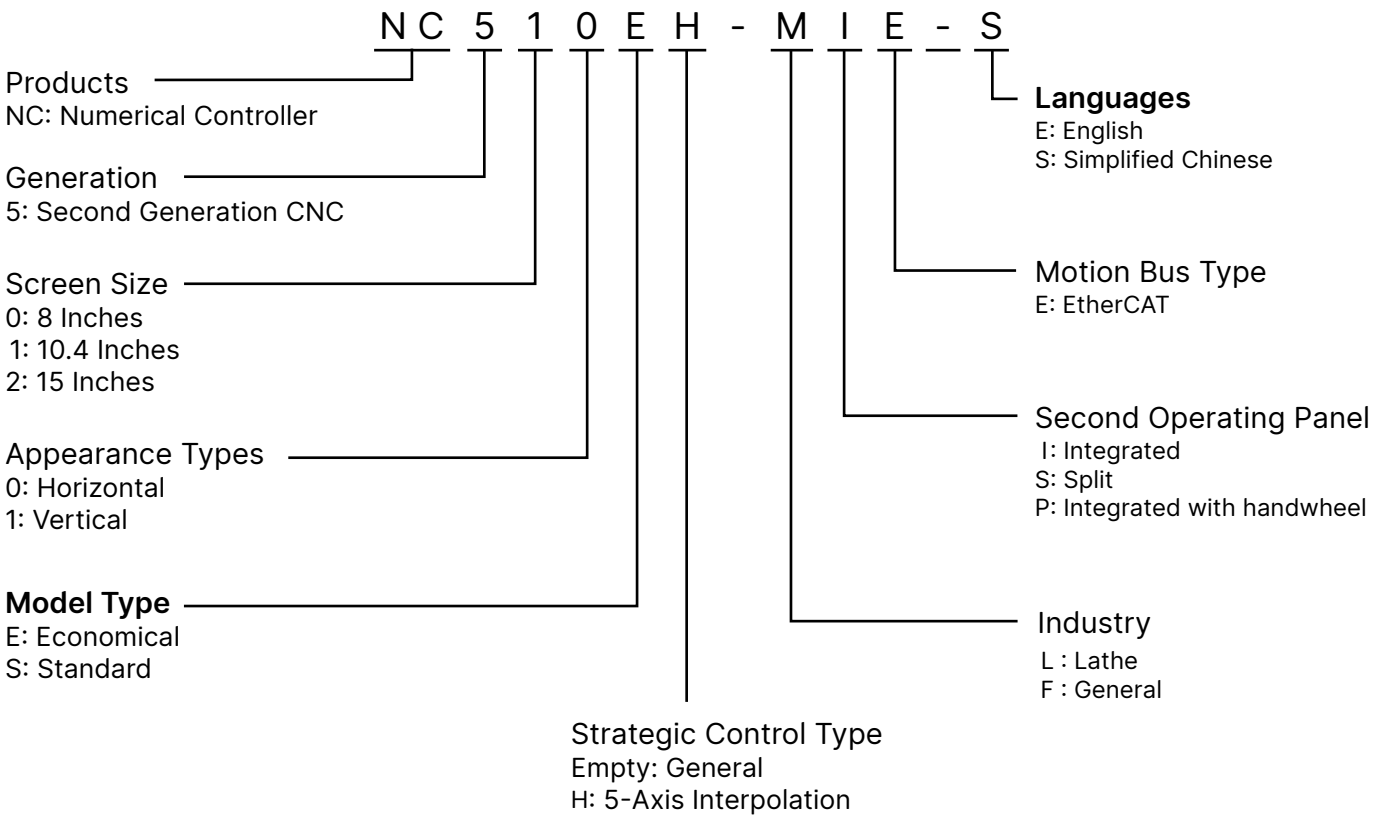
Industry-Specific Functions

- NC-MLC axis switching for flexible positioning or periodic round-trip movement by G-code or MLC.
- M96/M97 machining interruption macro (Macro) to protect the equipment during machining. Spindle multi-stage virtual encoder for speed and position control without end encoder position control.
- Bidirectional pitch compensation for optimal axes positioning accuracy.
- Expandable with 10 G31 high-speed input points for processing assistance and monitoring mechanism planning.
- External contour grinding with polar coordinates.



Model Name Explanation

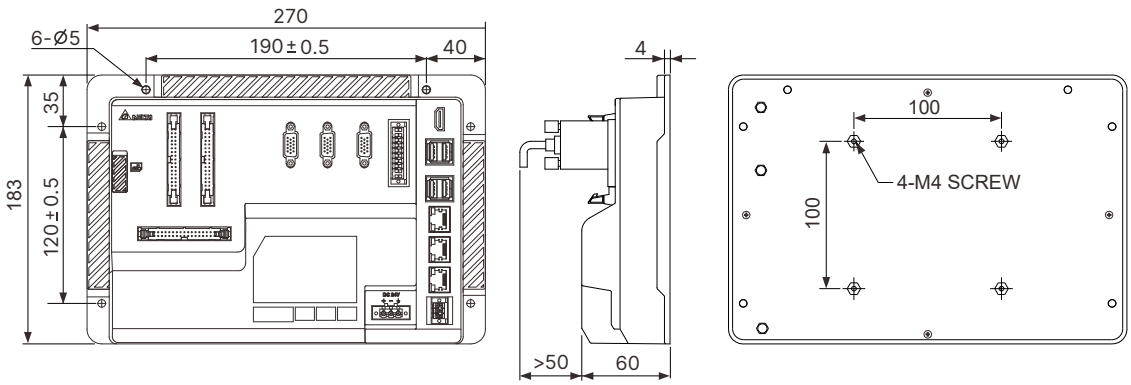




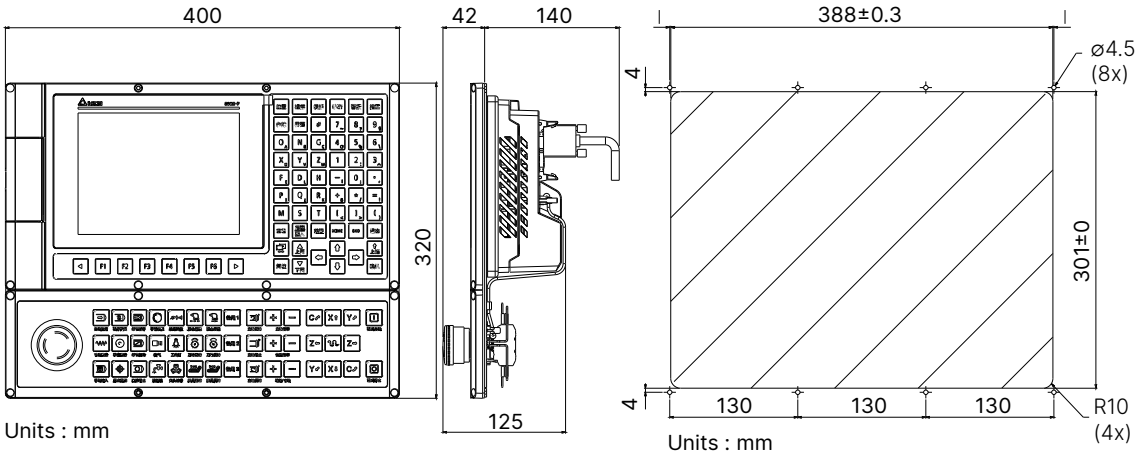
Product Size

NC50E-FE
NC50E-WE

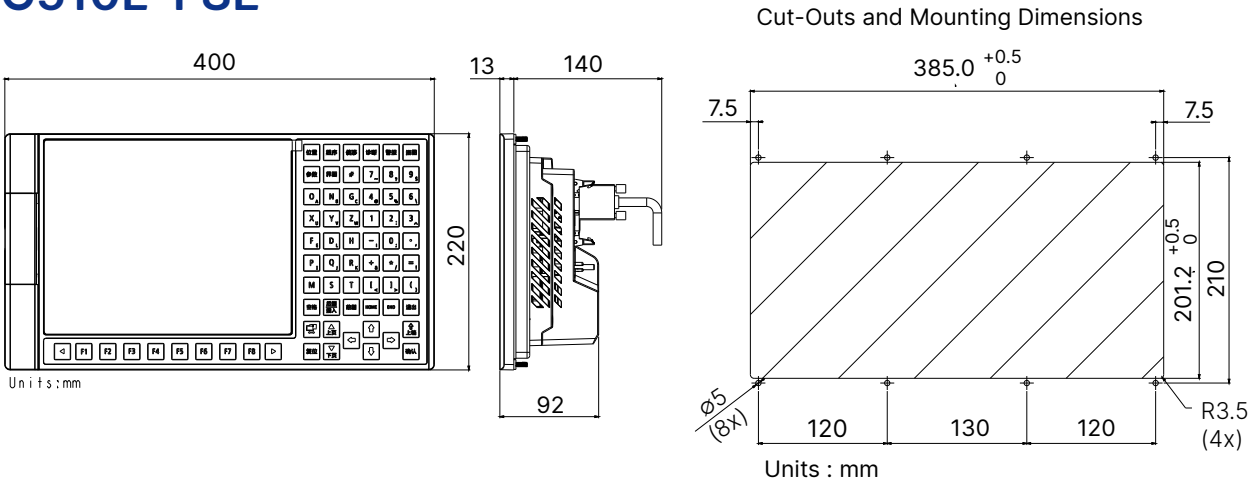
Unit: mm



NC500E-FIE
NC500E-LIE



NC510E-FSE



Specifications

CNC Controller NC5 Series

Model	NC50E-FE	NC50E-WE	NC50EH-FE	NC500E-FIE-□	NC500E-LIE-□	NC500EH-FIE-□	NC510E-FSE-□	NC510EH-FSE-□
System								
Processor	Quad Core CPU							
Memory	On Board DDR3 2 GB							
Power								
Input Voltage Type	24 V_{DC} + 15% / -10%							
Power Consumption	24 W			36 W				
Display								
Touch Panel Size	N/A			8” Colors TFT			10.4” Colors TFT	
Resolution	1,920*1,080 (65,536) / 1,280*720 (65,536)			800*600 (65,536)				
Peripherals								
USB Interface	Host Type A * 4							
Internet Interface	CIEEE 802.3 / 802.3u / 802.3ab 1G bps (Intel I210AT) * 2							
Key	N/A			Right MDI, 6*10 keys Thin Film Bottom function key, 8 keys Thin Film				
				MOP, (14*3) + 2 keys Thin Film + EMG Button			N/A	
Serial Communication Port								
RS-485 Port	Isolated							
Motion Control Interface								
EtherCAT Field Bus	EtherCAT master controls up to 24 axes							
System Storage Device								
Embedded Memory	eMMC 4 GB (Non-expandable)							
Memory Card	FAT32 / EXT4 (Only for Linux) (Expandable)							
USB Drive	FAT32 (Expandable)							
MISC								
Batteries	Button cell battery (CR2032)							
Architecture								
Installation Method	Front Lock							
Appearance Size W x H x D (mm)	270 x 183 x 60			400 x 320 x 121			400 x 220 x 92	
Environment								
Operating Temperature	0°C ~ 50°C							
Storage Temperature	-20°C ~ 60°C							
Relative Humidity	10% to 95% RH (non-condensing)							
Certifications	CE							
Operating System Setting								
System Tuning	Look ahead 4,000 blocks; 4,000 blocks process per second							
	Minimum Command Precision 1 nm							
	EtherCAT Cycle Time: 1 ms							
User Command Tool								
PLC	LD Ladder							
Processing Programming Language	G Code Standard Lathe & Milling							
HMI Interface	Human Machine Interface Programming & Macros							
Motion Control								
Max. Paths	2	2	4	2	2	4	2	4
Max. System Axes (Feed Axes + Spindles)	16	9	24	16	9	24	16	24
Max. Path Axes	12	9	16	12	6	16	12	16
Max. Path Interpolation Axes	4	3	5	4	4	5	4	5
System Max. Spindles	4	1	8	4	2	8	4	8
Milling	●	●	●	●		●	●	●
Lathe	●		●	●	●	●	●	●
(C/S-Axis) Compound Lathe & Milling	●		●	●	●	●	●	●
Sloping Plane			*			*		*
RTCP			*			*		*
Applicable Industries	General / 3C Processing	Woodworking Router	Advanced	General	Lathe	Advanced	General	Advanced
Advanced CAM Function	*	*	*	*	*	*	*	*

Note
(*): Optional

Matching Product

Second Operating Panel

Model	Description	Dimension
NC-PAN-301BL-PS	NC301 Lathe Crystal Capacitive Touch Panel: Vertical	400 x 250
NC-PAN-301BL-PE	NC301 Lathe Crystal Touch Panel: Vertical	400 x 250
NC-PAN-301BM-PS	NC301 Machining Center Lathe Crystal Touch Panel: Vertical	400 x 250
NC-PAN-301BM-PE	NC301 Lathe Crystal Touch Panel: Vertical	400 x 250
NC-PAN-300BL-PS	NC300 Lathe Crystal Touch Panel: Horizontal	290 x 332
NC-PAN-300BL-PE	NC300 Lathe Crystal Touch Panel: Horizontal	290 x 332
NC-PAN-300BM-PS	NC300 Machine Center Crystal Touch Panel: Horizontal	290 x 332
NC-PAN-300BM-PE	NC300 Machining Center Lathe Crystal Touch Panel: Horizontal	290 x 332

Touch Panel Display

Model	Specifications
NC-MOT-10SRTE	Capacitive Touch Panel Display 10 Inches
NC-MOT-15SRTE	Capacitive Touch Panel Display 15 Inches

Spindle Motor

Model	Specifications
ECM-N3M-GT1837ASJ	3.7 kW / 24.8 N-M / 1,500-8,000 RPM / 1,024 PPR
ECM-N3M-HT1837ASJ	3.7 kW / 17.7 N-M / 2,000-8,000 RPM / 1,024 PPR
ECM-N3M-GT2055ASJ	5.5 kW / 37.1 N-M / 1,500-8,000 RPM / 1,024 PPR
ECM-N3M-HT1855ASJ	5.5 kW / 28.3 N-M / 2,000-8.000 RPM / 1,024 PPR

Matching Products

EtherCAT I/O

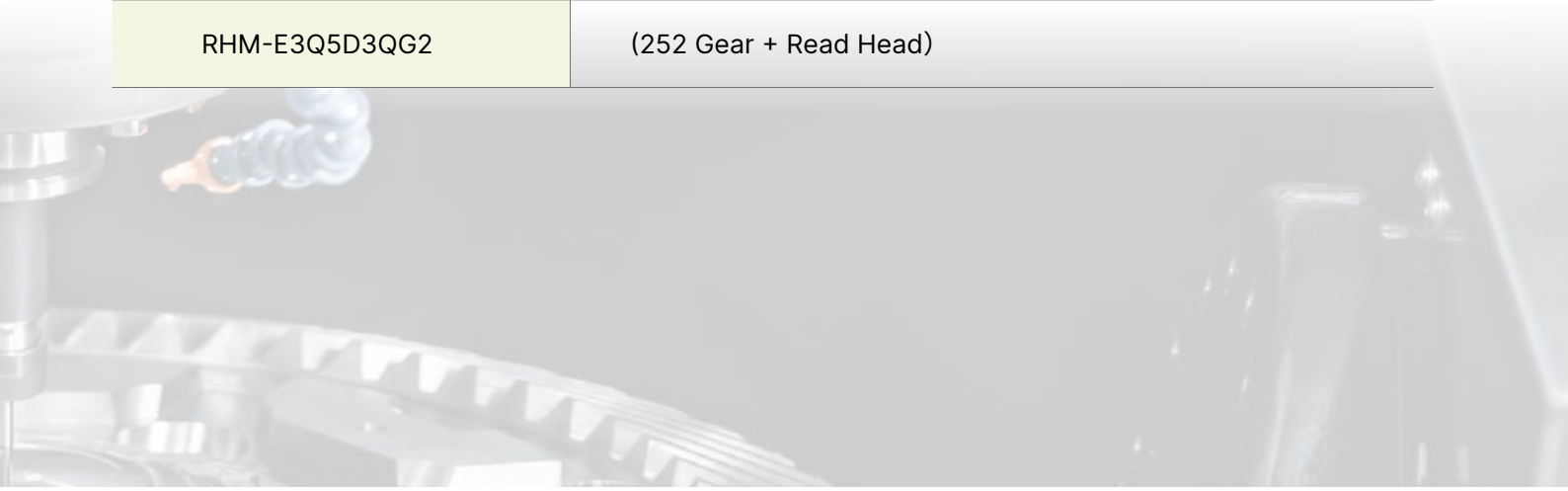
Model	Specifications
R1-EC5500D0	SLAVE MODULE ETHERCAT TO EBUS ADAPT
R1-EC6002D0	SLAVE MODULE 16-CH DI NPN/PNP 6
R1-EC6012D0	SLAVE MODULE 16-CH DI NPN/PNP 6
R1-EC6022D0	SLAVE MODULE 16-CH DI NPN/PNP 6
R1-EC6032D0	SLAVE MODULE 16-CH DI NPN/PNP 6
R1-EC7062D0	SLAVE MODULE 16-CH DO NPN 6
R1-EC70A2D0	SLAVE MODULE 16-CH DO PNP 6
R1-EC70E2D0	SLAVE MODULE 16-CH DO NPN SELF-RECO
R1-EC70F2D0	SLAVE MODULE 16-CH DO PNP SELF-RECO
R1-EC8124D0	SLAVE MODULE 4-CH ANALOG INPUT 6
R1-EC9144D0	SLAVE MODULE 4-CH ANALOG OUTPUT 6
R2-EC0902D0	SLAVE MODULE 32-CH DI GEN 32-CH DO

EtherCAT Wiring

Model	Specifications
UC-EMC003-02B	ETHERCAT RJ45 0.3M UL Certifications
UC-EMC005-02B	ETHERCAT RJ45 0.5M UL Certifications
UC-EMC010-02B	ETHERCAT RJ45 1M UL Certifications
UC-EMC020-02B	ETHERCAT RJ45 2M UL Certifications
UC-EMC030-02B	ETHERCAT RJ45 3M UL Certifications
UC-EMC050-02B	ETHERCAT RJ45 5M UL Certifications
UC-EMC100-02B	ETHERCAT RJ45 10M UL Certifications
UC-EMC200-02B	ETHERCAT RJ45 20M UL Certifications

Spindle Encoder

Model	Specifications
RHM-E3Q5D3Q00	(128 Gear + Read Head)
RHM-E3Q5D3QG2	(252 Gear + Read Head)



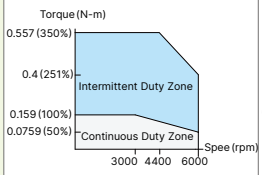
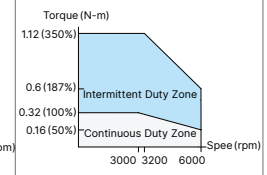
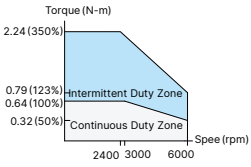
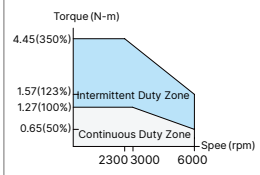
Matching Product Specifications

AC Servo System ASDA-A3 Series

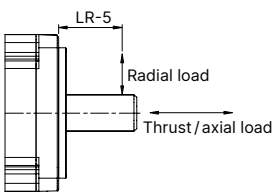
ASD-A3			100W	200W	400W	750W	1kW	1.5kW	2kW	3kW
			01	02	04	07	10	15	20	30
Power Supply	Phase / Voltage		Single-phase or Three-phase 220V$_{AC}$						Three-phase 220V$_{AC}$	
	Permissible Voltage Range		Single-phase/ Three-phase 200 ~ 230V$_{AC}$, -15% ~ 10%						Three-phase 200 ~ 230V$_{AC}$ -15% ~ 10%	
	Input Current (3PH) (Unit: Arms)		0.67	1.34	2.67	5.01	6.68	10.02	13.36	20.05
	Input Current(1PH) (Unit: Arms)		1.16	2.31	4.63	8.68	11.57	17.36	-	-
	Continuous Output Current(Unit: Arms)		0.9	1.55	2.6	5.1	7.3	8.3	13.4	19.4
	Instantaneous Max. Output Current(Unit: Arms)		3.54	7.07	10.61	21.21	24.75	35.36	53.03	70.71
Cooling System			Natural Air Circulation			Fan Cooling				
Drive Resolution			24-bit (16777216 p/rev)							
Control of Main Circuit			SVPWM Control							
Turning Mode			Auto / Manual							
Regenerative Resistor			None		Built-in					
Position Control Mode	Pulse Type (Only for Non-DMCNET mode)		Pulse + Direction, A phase + B + CW pulse							
	Max. Output Frequency (Only for Non-DMCNET mode)		Pulse + Direction: 4Mpps ; CCW pulse + CW pulse: 4Mpps ; A phase + B phase: Single phase 4Mpps ;							
	Command Source		External analog signal (Only for Non-DMCNET mode) / Internal parameter)							
	Smoothing Strategy		Low-pass and P-curve filter							
	Electronic Gear		Electronic gear N / M multiple N: 1~536870911, M: 1~2147483647 (1/4< N/M < 262144)							
	Torque Limit Operation		Set by parameters							
	Feed Forward Compensation		Set by parameters							
Speed Control Mode	Analog Input Command (Only for Non DMCNET mode)	Voltage Range	0 ~ ±10 V$_{DC}$							
		Resolution	15-bit							
		Input Resistance	1MΩ							
		Time Constant	25μs							
	Speed Control Range[*1]		1 : 6000							
	Command Source		External analog signal (Only for Non-DMCNET mode) / Internal parameters							
	Smoothing Strategy		Low-pass and P-curve filter							
	Torque Limit Operation		Set by parameters or analog input (Only for Non-DMCNET mode)							
	Frequency Response Characteristic		Maximum 3.1kHz							
	Speed Accuracy[*2]		0.01% or less at 0 to 100% load fluctuation							
			0.01% or less at ±10% power fluctuation							
			0.01% or less at 0°C to 50°C operating temperature fluctuation							
Torque Control Mode	Analog Input Command (Only for Non-DMCNET mode)	Voltage Range	0 ~ ±10 V$_{DC}$							
		Input Resistance	1MΩ							
		Time Constant	25μs							
	Command Source		External analog signal (Only for Non-DMCNET mode) / Internal parameters							
	Smoothing Strategy		Low-pass filter							
	Speed Limit		Set by parameters or analog input (Only for Non-DMCNET mode)							
Analog Monitor Output			Monitor signal can set by parameter (Output voltage range: ± 8V)							
Digital Inputs/Outputs	Inputs		Servo on, Reset, Gain switching, Pulse clear, Zero speed CLAMP, Command input reverse control, Command triggered, Speed / Torque limit enabled, Position command selection, Motor stop, Speed position selection, Position / Speed mode switching, Speed / Torque mode switching, Torque / Position mode switching, PT / PR command switching, Emergency stop, Forward / Reverse inhibit limit, Reference "Home" sensor, Forward / Reverse operation torque limit, Move to "Home", Electronic Cam (E-Cam), Forward / Reverse JOG input, Event trigger PR command, Electronic gear ratio (Numerator) selection and Pulse inhibit input)							
	Outputs		Encoder signal output (A, B, Z Line Driver and Z Open Collector)							
			Servo ready, Servo on, At Zero speed, At Speed reached, At Positioning completed, At Torques limit, Servo alarm (Servo fault) activated, Electromagnetic brake control, Homing completed, Output overload warning, Servo warning activated, Position command overflow, Forward / Reverse software limit, Internal position command completed, Capture operation completed output., Motion							
Protective Functions			Overcurrent, Overvoltage, Undervoltage, Motor overheated, Regeneration error, Overload, Overspeed, anomaly pulse control command. Excessive deviation, encoder error, adjustment error, Emergency stop activated,.Reverse / Forward limit switch error. Position excessive deviation of full-close control loop, Serial communication error, Input power phase loss, Serial communication time out, short circuit protection of U, V, W, and CN1, CN2, CN3 terminals							
Communication Interface			RS-485 / CANopen / USB							
Environment	Installation Site		Indoor environment (free of direct sunlight), no corrosive liquid and gas (free of oil mist, flammable gas, or dust)							
	Altitude		Altitude 2,000m or lower above sea level							
	Atmospheric Pressure		86kPa ~ 106kPa							
	Operating Temperature		0°C ~ 55°C (If operating temperature is above 45°C, forced cooling will be required)							
	Storage Temperature		-20°C ~ 65°C							
	Humidity		Humidity 0 ~ 90% RH (non-condensing)							
	Vibration		Vibration 9.80665 m/s2 (1G) less than 20Hz, 5.88 m/s2 (0.6G) 20 to 50H							
	IP Rating		IP20							
	Power System		Power System TN System[*3*4*3*4]							
	Certifications		IEC / EN / UL 61800-5-1							

Note:
*1. When it is with the rated load, the speed ratio is: the minimum speed (smooth operation) / rated speed.
*2. When the command is the rated speed, the velocity correction ratio is: (free run speed - full load speed) / rated speed
*3. TN system: The neutral point of the power system connects to the ground directly. The exposed metal components connect to the ground via the protective earth conductor.
*4. Use a single-phase and three-wire power systems for models of single-phase power.

Servo Motor ECM-A3 Series

	ECM-A3L-C2040F*1	ECM-A3L-C20401*1	ECM-A3L-C20602*1	ECM-A3L-C20604*1
Rated Power (kW)	0.05	0.1	0.2	0.4
Rated Torque (N-m)*2	0.159	0.32	0.64	1.27
Maximum Torque (N-m)	0.557	1.12	2.24	4.45
Rated Speed (rpm)	3,000			
Maximum Speed (rpm)	6,000			
Rated Current (Arms)	0.66	0.9	1.45	2.65
Max. Instantaneous Current (Arms)	2.82	3.88	6.2	10.1
Rated Power Rate (kW/s)*3	11 (9.9)	25.6 (24)	45.5 (34.1)	107.5 (89.6)
Rotor Inertia ($\times10^{-4}$kg.m^2)*3	0.0229 (0.0255)	0.04 (0.0426)	0.09 (0.12)	0.15 (0.18)
Mechanical Time Constant (ms)*3	1.28 (1.44)	0.838 (0.892)	0.64 (0.85)	0.41 (0.5)
Torque Constant -KT (N-m/A)	0.241	0.356	0.441	0.479
Voltage Constant -KE (mV/(rpm))	9.28	13.3	16.4	18
Armature Resistance (Ohm)	12.1	9.47	4.9	2.27
Armature Inductance (mH)	18.6	16.2	18.52	10.27
Electrical Time Constant (ms)	1.54	1.71	3.78	4.52
Brake Holding Torque [Nt-m (min)] *4	0.32	0.32	1.3	1.3
Brake Power Consumption (at 20°C) [W]	6.1	6.1	7.2	7.2
Brake Release Time [ms (Max.)]	20	20	20	20
Brake Pull-In Time [ms (Max.)]	35	35	50	50
Max. Radial Loading (N)*5	78	78	245	245
Max. Axial Loading (N)*5	54	54	74	74
Weight (kg)*3	0.38 (0.68)	0.5 (0.8)	1.1 (1.6)	1.4 (1.9)
Derating (%) (with oil seal)	20	10	10	5
Torque Feature (T-N Curve)				
Insulation Class	Class A (UL), Class B (CE)			
Insulation Resistance	> 100 MΩ, DC 500V			
Insulation Strength	1.8 kV$_{ac}$, 1 sec			
Vibration Level (μm)	V15			
Operating Temperature	0°C ~ 40°C*3			
Storage Temperature	-10°C ~ 80°C*3			
Storage & Operation Humidity	20 ~ 90%RH (non-condensing)			
Vibration Capacity	2.5 G			
IP Rating	IP67 (when using waterproof connections and when an oil seal is fitted to the rotating shaft (for an oil seal model)			
Certifications	CE cULus			

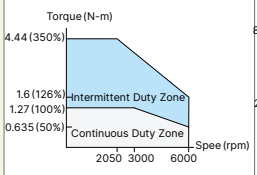
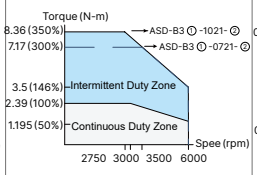
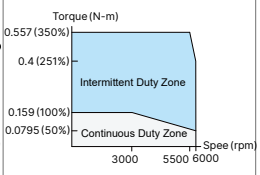
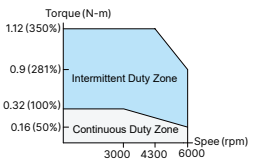
Notes:
1. In the servo motor model name, 1 represents the motor inertia and 2 represents the encoder type.
2. The rated torque is the continuous permissible torque between 0 to 40ºC operating temperature which is suitable for the servo motor mounted with the following heat sink dimensions.
   F40, F60, F80: 250 mm x 250 mm x 6 mm
   Material: aluminum
3. ( ) = motor with brake
4. The built-in servo motor brake is only for keeping the object in a stopped state.
   Do not use it for deceleration or as a dynamic brake
5. Please follow the max. tolerant loading of the motor shaft end listed below during operation



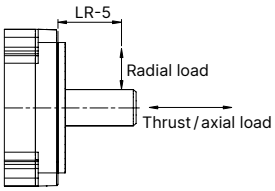
Specifications

Servo Motor ECM-A3 Series

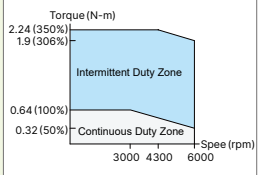
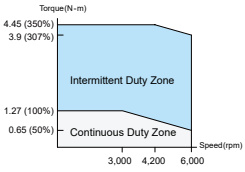
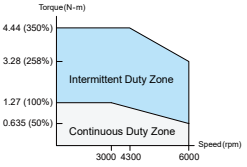
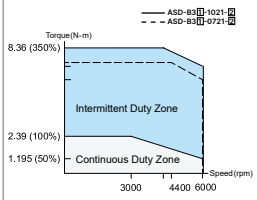
Low Inertia Motor ECM-A3L Series / High Inertia Motor ECM-A3H Series

	ECM-A3L-C2**0804**[*1]	ECM-A3L-C2**0807**[*1]	ECM-A3H-C2**040F**[*1]	ECM-A3H-C2**0401**[*1]
Rated Power (kW)	0.4	0.75	0.05	0.1
Rated Torque (N-m)[*2]	1.27	2.39	0.159	0.32
Maximum Torque (N-m)	4.44	8.36	0.557	1.12
Rated Speed (rpm)	3,000			
Maximum Speed (rpm)	6,000			
Rated Current (Arms)	2.6	5.1	0.64	0.9
Max. Instantaneous Current (Arms)	10.6	20.6	2.59	3.64
Rated Power Rate (kW/s)[*3]	45.8 (39.5)	102.2 (93)	5.56 (4.89)	13.6 (12.5)
Rotor Inertia ($\times 10^{-4}$kg.m^2)[*3]	0.352 (0.408)	0.559 (0.614)	0.0455 (0.0517)	0.0754 (0.0816)
Mechanical Time Constant (ms)[*3]	0.68 (0.78)	0.44 (0.48)	2.52 (2.86)	1.43 (1.55)
Torque Constant -KT (N-m/A)	0.488	0.469	0.248	0.356
Voltage Constant -KE (mV/(rpm))	17.9	17	9.54	12.9
Armature Resistance (Ohm)	1.6	0.6	12.5	8.34
Armature Inductance (mH)	10.6	4.6	13.34	11
Electrical Time Constant (ms)	6.63	7.67	1.07	1.32
Brake Holding Torque [Nt-m (min)] [*4]	2.5	2.5	0.32	0.32
Brake Power Consumption (at 20°C)[W]	8	8	6.1	6.1
Brake Release Time [ms (Max.)]	20	20	20	20
Brake Pull-In Time [ms (Max.)]	60	60	35	35
Max. Radial Loading (N)[*5]	392	392	78	78
Max. Axial Loading (N)[*5]	147	147	54	54
Weight (kg)[*3]	2.05 (2.85)	2.8 (3.6)	0.38 (0.68)	0.5 (0.8)
Derating (%) (with oil seal)	5	5	20	10
Torque Feature (T-N Curve)				
Insulation Class	Class A (UL), Class B (CE)			
Insulation Resistance	100 MΩ, DC 500V and above			
Insulation Strength	1.8k V_{ac}, 1 sec			
Vibration Level (μm)	V15			
Operating Temperature	0°C ~ 40°C*[3]			
Storage Temperature	-10°C ~ 80°C*[3]			
Storage & Operation Humidity	20 ~ 90% RH (non-condensing)			
Vibration Capacity	2.5 G			
IP Rating	IP67 (when using waterproof connections and when an oil seal is fitted to the rotating shaft (for an oil seal model)			
Certifications				

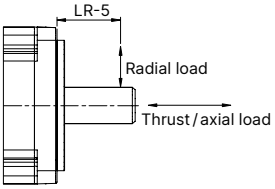
Notes:
1. In the servo motor model name, 1 represents the motor inertia and 2 represents the encoder type.
2. The rated torque is the continuous permissible torque between 0 to 40°C operating temperature which is suitable for the servo motor mounted with the following heat sink dimensions.
   F40, F60, F80: 250 mm x 250 mm x 6 mm
   Material: aluminum
3. ( ) = motor with brake
4. The built-in servo motor brake is only for keeping the object in a stopped state. Do not use it for deceleration or as a dynamic brake.
5. Please follow the max. tolerant loading of the motor shaft end listed below during operation



ECM-A3H High Inertia Series Servo Motor

	ECM-A3H-C2**0602**[*1]	ECM-A3H-C2**0604**[*1]	ECM-A3H-C2**0804**[*1]	ECM-A3H-C2**0807**[*1]
Rated Power (kW)	0.2	0.4	0.4	0.75
Rated Torque (N-m)[*2]	0.64	1.27	1.27	2.39
Maximum Torque (N-m)	2.24	4.45	4.44	8.36
Rated Speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Rated Current (Arms)	1.45	2.65	2.6	4.61
Max. Instantaneous Current (Arms)	5.3	9.8	9.32	16.4
Rated Power Rate (kW/s)[*3]	16.4 (14.6)	35.8 (33.6)	17.5 (15.07)	37.8 (34.41)
Rotor Inertia ($\times10^{-4}$kg.m^2)[*3]	0.25 (0.28)	0.45 (0.48)	0.92 (1.07)	1.51 (1.66)
Mechanical Time Constant (ms)[*3]	1.38 (1.54)	0.96 (1.02)	1.32 (1.54)	0.93 (1.02)
Torque Constant -KT (N-m/A)	0.441	0.479	0.49	0.52
Voltage Constant -KE (mV/(rpm))	16.4	17.2	17.9	18.7
Armature Resistance (Ohm)	3.8	1.68	1.19	0.57
Armature Inductance (mH)	8.15	4.03	4.2	2.2
Electrical Time Constant (ms)	2.14	2.40	3.53	3.86
Brake Holding Torque [Nt-m (min)] [*4]	1.3	1.3	2.5	2.5
Brake Power Consumption (at 20°C)[W]	7.2	7.2	8	8
Brake Release Time [ms (Max.)]	20	20	20	20
Brake Pull-In Time [ms (Max.)]	50	50	60	60
Max. Radial Loading (N)[*5]	245	245	392	392
Max. Axial Loading (N)[*5]	74	74	147	147
Weight (kg)[*3]	1.1 (1.6)	1.4 (1.9)	2.05 (2.85)	2.8 (3.6)
Derating (%) (with oil seal)	10	5	5	5
Torque Feature (T-N Curve)				
Insulation Class	Class A (UL), Class B (CE)			
Insulation Resistance	100 MΩ, DC 500V and above			
Insulation Strength	1.8k V_{ac}, 1 sec			
Vibration Level (μm)	V15			
Operating Temperature	0°C - 40°C*[3]			
Storage Temperature	-10°C - 80°C*[3]			
Storage & Operation Humidity	20 - 90%RH (non-condensing)			
Vibration Capacity	2.5 G			
IP Rating	IP67 (when using waterproof connections and when an oil seal is fitted to the rotating shaft (for an oil seal model)			
Certifications				

Notes:
1. In the servo motor model name, 1 represents the motor inertia and 2 represents the encoder type.
2. The rated torque is the continuous permissible torque between 0 to 40ºC operating temperature which is suitable for the servo motor mounted with the following heat sink dimensions.
   F40, F60, F80: 250 mm x 250 mm x 6 mm
   Material: aluminum
3. ( ) = motor with brake
4. The built-in servo motor brake is only for keeping the object in a stopped state.
   Do not use it for deceleration or as a dynamic brake
5. Please follow the max. tolerant loading of the motor shaft end listed below during operation



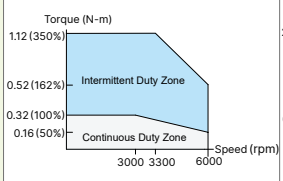
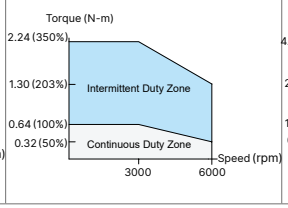
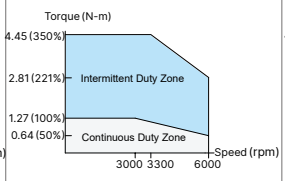
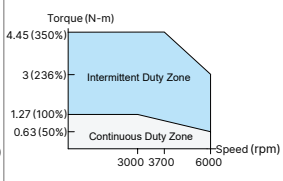
Specifications

AC Servo System ASDA-B3 Series

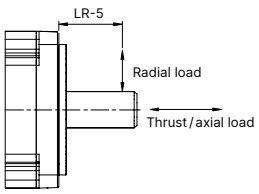
ASD-B3			100 W 01	200 W 02	400 W 04	750 W 07	1 kW 10	1.5 kW 15	2 kW 20	3 kW 30
Power Supply	Phase / Voltage		Single-phase / Three-phase 220V$_{AC}$						Three-phase 220V$_{AC}$	
	Permissible Voltage		Single-phase / Three-phase 200 - 230V$_{AC}$, -15% to 10%						Three-phase 200 - 230V$_{AC}$, -15% to 10%	
	Input Current (3PH) (Unit: Arms)		0.88	1.29	2.04	3.52	5.72	6.33	7.6	10.3
	Input Current (1PH) (Unit: Arms)		1.47	2.35	3.74	6.47	10.4	11.7	-	-
	Continuous Output Current (Unit: Arms)		0.9	1.55	2.65	5.1	7.3	8.3	13.4	19.4
	Max. Instantaneous Output Current (Unit: Arms)		3.88	7.07	10.6	14.14	21.21	24.3	38.3	53.03
Regenerative Resistor	Built-in Regenerative Resistor	Resistance (Ohm)	-	-	100	100	100	100	20	20
		Capacity (Watt)	-	-	40	40	40	40	80	80
	External Minimum Allowable Resistance Value (Ohm)		60	60	60	60	30	30	15	15
Cooling Method			Natural cooling				Fan cooling			
Drive Resolution			24-bit (16,777,216 pls/rev)							
Main Circuit Control			SVPWM control							
Tuning Mode			Auto / Manual							
Regenerative Resistor			N/A		Built-in					
Position Control Mode	Pulse Type (only for pulse control mode)		Pulse + Direction; A phase + B phase; CCW pulse +CW pulse							
	Max. Output Pulse Frequency (only for pulse control mode)		Pulse + direction: 4 Mpps; CCW pulse + CW pulse: 4 Mpps; A phase + B phase: single-phase 2 Mpps; Open collector: 200 Kpps							
	Command Source		External pulse (only for pulse control mode) / Internal register (PR mode)							
	Smoothing Method		Low-pass, S-curve, and moving filters							
	E-Gear Ratio		E-Gear ratio: N / M times, limited to (1 / 4 < N / M < 262144) N: 1 - 536870911/M: 1 - 2147483647							
	Torque Limit		Parameter settings							
	Feed Forward Compensation		Parameter settings							
Speed Control Mode	Analog Command Input	Voltage Range	0 to ±10 V$_{DC}$							
		Resolution	12-bit							
		Input Impedance	1 MΩ							
		Time Constant	25 μs							
	Speed Control Range[*1]		1 : 6000							
	Command Source		External analog command / Internal register							
	Smoothing Method		Low-pass and S-curve filters							
	Torque Limit		Parameter settings or analog input							
	Bandwidth		Maximum 3.1 kHz							
	Speed Calibration Ratio[*2]		±0.01% at 0% to 100% load fluctuation							
			±0.01% at ±10% power fluctuation							
			±0.01% at 0°C to 50°C ambient temperature fluctuation							
Torque Control Mode	Analog Command Input	Voltage Range	0 to ±10 V$_{DC}$							
		Input Impedance	1 MΩ							
		Time Constant	25 μs							
	Command Source		External analog command / Internal register							
	Smoothing Method		Low-pass filter							
	Speed Limit		Parameter settings or analog input							
Analog Monitor Output			Monitoring signal can be set with parameters (voltage output range: ±8V); resolution: 10-bit							
Digital Input / Output	Input		Servo on, Fault reset, Gain switch, Pulse clear, Zero speed clamping, Command input reverse control, Internal position command trigger, Torque limit, Speed limit, Internal position command selection, Motor stop, Speed command selection, Speed / Position mode switching, Speed / Torque command switching, Torque / Position mode switching, PT / PR command switching, Emergency stop, Forward / reverse limit, Original point, Forward / reverse operation torque limit, Homing activated, Forward / reverse JOG input, Event trigger, E-Gear N selection, Pulse input prohibition *The DI mentioned above are only used in pulse control mode. When controlling through communication, it is suggested that you use communication for DI input. DI only supports emergency stop, forward / reverse limit, and homing.							
	Output		A, B, Z line driver output							
			Servo ready, Servo on, Zero speed detection, Target speed reached, Target position reached, Torque limiting, Servo alarm, Magnetic brake control, Homing complete, Early warning for overload, Servo warning, Position command overflows, Software limit (reverse direction), Software limit (forward direction), Internal position command complete, Servo procedure complete, Capture procedure complete							
Protection Function			Overcurrent, Overvoltage, Undervoltage, Overheat, Regeneration error, Overload, Excessive speed deviation, Excessive position deviation, Encoder error, Adjustment error, Emergency stop, Forward / reverse limit error, Serial communication error, RST leak phase, Serial communication timeout, Short-circuit protection for terminals U, V, W							
Communication Interface			USB/RS-485/CANopen/DMCNET/EtherCAT							
Environment	Installation Site		Indoors (avoid direct sunlight), no corrosive vapor (avoid fumes, flammable gases, and dust)							
	Altitude		Altitude 2000 m or lower above sea level							
	Atmospheric Pressure		86 kPa - 106 kPa							
	Operating Temperature		0°C to 55°C (If operating temperature is above 45°C, forced cooling is required)							
	Storage Temperature		-20°C to 65°C							
	Humidity		0 to 90% RH (non-condensing)							
	Vibration		10 Hz ~ 57 Hz: 0.075 mm amplitude, 58 Hz ~ 150 Hz: 1G							
	IP Rating		IP20							
	Power System		TN system [*3*4]							
	Certifications		IEC/EN/UL 61800-5-1							

Notes:
*1. Within the rated load, the speed ratio is: the minimum speed (smooth operation) / rated speed.
*2. Within the rated speed, the speed calibration ratio is: (rotational speed with no load - rotational speed with full load) / rated speed.
*3. TN system: the neutral point of the power system connects directly to the ground.
The exposed metal components connect to the ground through the protective ground conductor.
*4. Use a single-phase three-wire power system for the single-phase power model.
*5. ASDA-B3A complies with the TUV Functional Safety certification.

Servo Motor ECM-B3 Series

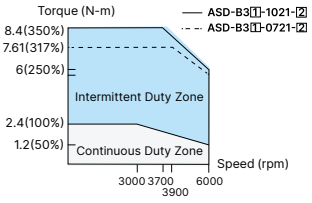
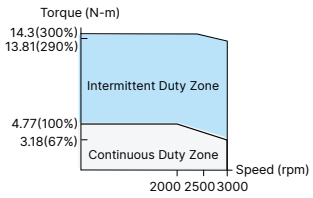
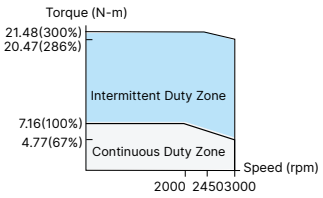
	ECM-B3L-C 2 0401	ECM-B3M-C 2 0602	ECM-B3M-C 2 0604	ECM-B3M-C 2 0804
Rated Power (kW)	0.1	0.2	0.4	0.4
Rated Torque (N-m)*2	0.32	0.64	1.27	1.27
Maximum Torque (N-m)	1.12	2.24	4.45	4.45
Rated Speed (rpm)	3,000			
Maximum Speed (rpm)	6,000			
Rated Current (Arms)	0.857	1.42	2.40	2.53
Max. Instantaneous Current (Arms)	3.44	6.62	9.47	9.42
Rated Power Rate (kW/s)	34.25	29.05	63.50	24.89
Rated Power Rate (kW/s) with Brake	32.51	27.13	61.09	23.21
Rotor Inertia ($\times 10^{-4}$kg.m^2)	0.0299	0.141	0.254	0.648
Rotor Inertia ($\times 10^{-4}$kg.m^2) with Brake	0.0315	0.151	0.264	0.695
Mechanical Time Constant (ms)	0.5	0.91	0.52	0.8
Mechanical Time Constant (ms) with Brake	0.53	0.97	0.54	0.86
Torque Constant -KT (N-m/A)	0.374	0.45	0.53	0.5
Voltage Constant -KE (mV/(rpm))	13.8	16.96	19.76	18.97
Armature Resistance (Ohm)	8.22	4.71	2.04	1.125
Armature Inductance (mH)	19.1	12.18	6.50	5.14
Electrical Time Constant (ms)	2.32	2.59	3.19	4.57
Weight – without Brake (kg)	0.5	0.9	1.2	1.7
Weight – with Brake (kg)	0.7	1.3	1.6	2.51
Max. Radial Loading (N)*5	78	245	245	392
Max. Axial Loading (N)*5	54	74	74	147
Brake Working Voltage	24 V_{DC} ± 10%			
Brake Power Consumption (at 20°C)[W]	6.1	7.6	7.6	8
Brake Holding Torque [Nt-m (min)] *3	0.3	1.3	1.3	2.5
Brake Release Time [ms (Max)]	20	20	20	20
Brake Pull-In Time [ms (Max)]	35	50	50	60
Derating (%) (with Oil Seal)	10	10	5	5
Torque Feature (T-N Curve)				
Insulation Class	Class A (UL), Class B (CE)			
Insulation Resistance	> 100 MΩ, DC 500V			
Insulation Strength	1.8 kV_{AC}, 1 sec			
Vibration Level (μm)	V15			
Operating Temperature	-20°C ~ 60°C*4			
Storage Temperature	-20°C ~ 80°C			
Storage & Operation Humidity	20 ~ 90%RH (non-condensing)			
Vibration Capacity	2.5 G			
IP Rating	IP67 (when using waterproof connections and when an oil seal is fitted to the rotating shaft (for an oil seal model))			
Certifications	CE c UL US			

Notes:
1. In the servo motor model name, 1 represents the motor inertia and 2 represents the encoder type.
2. The rated torque is the continuous permissible torque between 0 to 40°C operating temperature which is suitable for the servo motor mounted with the following heat sink dimensions.
   F40, F60, F80: 250 mm x 250 mm x 6 mm
   Material: aluminum
3. The built-in servo motor brake is only for keeping the object in a stopped state.
   Do not use it for deceleration or as a dynamic brake
4. If the operating temperature is over 40°C, refer to the power derating curves of B3 motors on page 37.
5. Please follow the max. tolerant loading of the motor shaft end listed below during operation



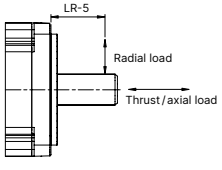
Specifications

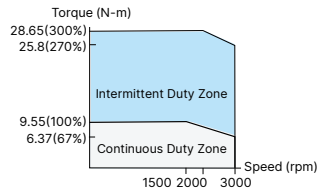
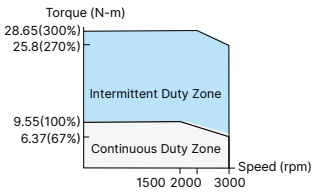
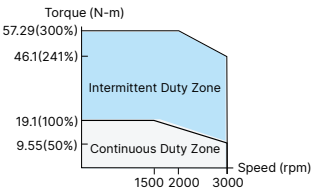
Servo Motor Series-ECMB3

	ECM-B3M-C ☐2 0807	ECM-B3M-E ☐2 1310	ECM-B3M-E ☐2 1315
Rated Power (kW)	0.75	1	1.5
Rated Torque (N-m)*2	2.4	4.77	7.16
Maximum Torque (N-m)	8.4	14.3	21.48
Rated Speed (rpm)	3,000	2,000	
Maximum Speed (rpm)	6,000	3,000	
Rated Current (Arms)	4.27	5.96	8.17
Max. Instantaneous Current (Arms)	15.8	19.9	26.82
Rated Power Rate (kW/s)	53.83	29.21	45.69
Rated Power Rate (kW/s) with Brake	50.97	28.66	45.09
Rotor Inertia ($\times 10^{-4}$kg.m^2)	1.07	7.79	11.22
Rotor Inertia ($\times 10^{-4}$kg.m^2) with Brake	1.13	7.94	11.37
Mechanical Time Constant (ms)	0.54	1.46	1.1
Mechanical Time Constant (ms) with Brake	0.57	1.49	1.12
Torque Constant -KT (N-m/A)	0.56	0.8	0.88
Voltage Constant -KE (mV/(rpm))	20.17	29.3	31.69
Armature Resistance (Ohm)	0.55	0.419	0.26
Armature Inductance (mH)	2.81	4	2.81
Electrical Time Constant (ms)	5.11	9.55	10.81
Weight – without Brake (kg)	2.34	4.9	67
Weight – with Brake (kg)	3.15	6.3	7.4
Max. Radial Loading (N)*5	392	490	686
Max. Axial Loading (N)*5	147	98	343
Brake Working Voltage	24 V_{DC} ± 10%		
Brake Power Consumption (at 20°C)[W]	8	21.5	21.5
Brake Holding Torque [Nt-m (min)] *3	2.5	10	10
Brake Release Time [ms (Max)]	20	50	50
Brake Pull-In Time [ms (Max)]	60	110	110
Derating (%) (with Oil Seal)	5	5	5
Torque Feature (T-N Curve)			
Insulation Class	Class A (UL), Class B (CE)		
Insulation Resistance	> 100 MΩ, DC 500V		
Insulation Strength	1.8 k V_{AC}, 1 sec		
Vibration Level (μm)	V15		
Operating Temperature	-20°C ~ 60°C*4		
Storage Temperature	-20°C ~ 80°C		
Storage & Operation Humidity	20 ~ 90% RH (non-condensing)		
Vibration Capacity	2.5 G		
IP Rating	IP67 (when using waterproof connections and when an oil seal is fitted to the rotating shaft (for an oil seal model))		
Certifications	CE cULus		

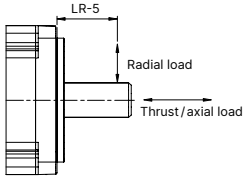
Notes:
In the servo motor model name, 2 represents the encoder type.
2. The rated torque is the continuous permissible torque between 0 to 40°C operating temperature which is suitable for the servo motor mounted with the following heat sink dimensions.
   F80: 250 mm x 250 mm x 6 mm
   F100: 300 mm x 300 mm x 12 mm
   Material: aluminum
3. The built-in servo motor brake is only for keeping the object in a stopped state.
4. If the operating temperature is over 40°C, refer to the power derating curves of B3 motors on page 37.

5. Please follow the max. tolerant loading of the motor shaft end listed below during operation



	ECM-B3M-E 2 1320	ECM-B3M-E 2 1820	ECM-B3M-F 2 1830
Rated Power (kW)	2	2	3
Rated Torque (N-m)*2	9.55	9.55	19.1
Maximum Torque (N-m)	28.65	28.65	57.29
Rated Speed (rpm)	2,000		1,500
Maximum Speed (rpm)	3,000		3,000
Rated Current (Arms)	10.59	11.43	18.21
Max. Instantaneous Current (Arms)	34.2	36.21	58.9
Rated Power Rate (kW/s)	62.25	31.33	68.02
Rated Power Rate (kW/s) with Brake	61.62	30.02	66.45
Rotor Inertia ($\times10^{-4}$kg.m^2)	14.65	29.11	53.63
Rotor Inertia ($\times10^{-4}$kg.m^2) with Brake	14.8	30.38	54.9
Mechanical Time Constant (ms)	1.03	1.83	1.21
Mechanical Time Constant (ms) with Brake	1.04	1.91	1.24
Torque Constant -KT (N-m/A)	0.9	0.836	1.05
Voltage Constant -KE (mV/(rpm))	32.7	31.6	37.9
Armature Resistance (Ohm)	0.198	0.159	0.086
Armature Inductance (mH)	2.18	2.34	1.52
Electrical Time Constant (ms)	11.01	14.72	17.67
Weight – without Brake (kg)	7	10	13.9
Weight – with Brake (kg)	8.5	13.7	17.6
Max. Radial Loading (N)*5	980	1,470	1,470
Max. Axial Loading (N)*5	392	490	490
Brake Working Voltage	24 V_{DC} ± 10%		
Brake Power Consumption (at 20°C)[W]	21.5	31	31
Brake Holding Torque [Nt-m (min)] *3	10	25	55
Brake Release Time [ms (Max)]	50	30	50
Brake Pull-In Time [ms (Max)]	110	120	150
Derating (%) (with Oil Seal)	5	5	5
Torque Feature (T-N Curve)			
Insulation Class	Class A (UL), Class B (CE)		
Insulation Resistance	> 100 MΩ, DC 500 V		
Insulation Strength	2.3k V_{AC}, 1 sec		
Vibration Level (μm)	V15		
Operating Temperature	-20°C ~ 60°C*4		
Storage Temperature	-20°C ~ 80°C		
Storage & Operation Humidity	20 ~ 90% RH (non-condensing)		
Vibration Capacity	2.5 G		
IP Rating	IP67 (when using waterproof connections and when an oil seal is fitted to the rotating shaft (for an oil seal model))		
Certifications			

Notes:
1. In the servo motor model name, 2 represents the encoder type.
2. The rated torque is the continuous permissible torque between 0 to 40ºC operating temperature which is suitable for the servo motor mounted with the following heat sink dimensions.
   F180: 550 mm x 550 mm x 30 mm
   Material: aluminum
3. The built-in servo motor brake is only for keeping the object in a stopped state.
4. If the operating temperature is over 40ºC, refer to the power derating curves of B3 motors on page 37.
5. Please follow the max. tolerant loading of the motor shaft end listed below during operation



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Industrial Automation Headquarters

Taiwan: Delta Electronics, Inc.
Taoyuan Technology Center
No.18, Xinglong Rd., Taoyuan District,
Taoyuan City 33068, Taiwan
TEL: +886-3-362-6301 / FAX: +886-3-371-6301

Asia

China: Delta Electronics (Shanghai) Co., Ltd.
No.182 Minyu Rd., Pudong Shanghai, P.R.C.
Post code : 201209
TEL: +86-21-6872-3988 / FAX: +86-21-6872-3996
Customer Service: 400-820-9595

Japan: Delta Electronics (Japan), Inc.
Industrial Automation Sales Department
2-1-14 Shibadaimon, Minato-ku
Tokyo, Japan 105-0012
TEL: +81-3-5733-1155 / FAX: +81-3-5733-1255

Korea: Delta Electronics (Korea), Inc.
1511, 219, Gasan Digital 1-Ro., Geumcheon-gu,
Seoul, 08501 South Korea
TEL: +82-2-515-5305 / FAX: +82-2-515-5302

Singapore: Delta Energy Systems (Singapore) Pte Ltd.
4 Kaki Bukit Avenue 1, #05-04, Singapore 417939
TEL: +65-6747-5155 / FAX: +65-6744-9228

India: Delta Electronics (India) Pvt. Ltd.
Plot No.43, Sector 35, HSIIDC Gurgaon,
PIN 122001, Haryana, India
TEL: +91-124-4874900 / FAX: +91-124-4874945

Thailand: Delta Electronics (Thailand) PCL.
909 Soi 9, Moo 4, Bangpoo Industrial Estate (E.P.Z),
Pattana 1 Rd., T.Phraksa, A.Muang,
Samutprakarn 10280, Thailand
TEL: +66-2709-2800 / FAX: +66-2709-2827

Australia: Delta Electronics (Australia) Pty Ltd.
Unit 2, Building A, 18-24 Ricketts Road,
Mount Waverley, Victoria 3149 Australia
Mail: IA.au@deltaww.com
TEL: +61-1300-335-823 / +61-3-9543-3720

Americas

USA: Delta Electronics (Americas) Ltd.
5101 Davis Drive, Research Triangle Park, NC 27709, U.S.A.
TEL: +1-919-767-3813

Brazil: Delta Electronics Brazil Ltd.
Estrada Velha Rio-São Paulo, 5300 Eugênio de
Melo - São José dos Campos CEP: 12247-004 - SP - Brazil
TEL: +55-12-3932-2300 / FAX: +55-12-3932-237

Mexico: Delta Electronics International Mexico S.A. de C.V.
Gustavo Baz No. 309 Edificio E PB 103
Colonia La Loma, CP 54060
Tlalnepantla, Estado de México
TEL: +52-55-3603-9200

EMEA

EMEA Headquarters: Delta Electronics (Netherlands) B.V.
Sales: Sales.IA.EMEA@deltaww.com
Marketing: Marketing.IA.EMEA@deltaww.com
Technical Support: iatechnicalsupport@deltaww.com
Customer Support: Customer-Support@deltaww.com
Service: Service.IA.emea@deltaww.com
TEL: +31(0)40 800 3900

BENELUX: Delta Electronics (Netherlands) B.V.
Automotive Campus 260, 5708 JZ Helmond, The Netherlands
Mail: Sales.IA.Benelux@deltaww.com
TEL: +31(0)40 800 3900

DACH: Delta Electronics (Netherlands) B.V.
Coesterweg 45,D-59494 Soest,Germany
Mail: Sales.IA.DACH@deltaww.com
TEL: +49 2921 987 238

France: Delta Electronics (France) S.A.
ZI du bois Challand 2,15 rue des Pyrénées,
Lisses, 91090 Evry Cedex, France
Mail: Sales.IA.FR@deltaww.com
TEL: +33(0)1 69 77 82 60

Iberia: Delta Electronics Solutions (Spain) S.L.U
Ctra. De Villaverde a Vallecas, 265 1º Dcha Ed.
Hormigueras – P.I. de Vallecas 28031 Madrid
TEL: +34(0)91 223 74 20

Carrer Llacuna 166, 08018 Barcelona, Spain
Mail: Sales.IA.Iberia@deltaww.com

Italy: Delta Electronics (Italy) S.r.l.
Via Meda 2–22060 Novedrate(CO)
Piazza Grazioli 18 00186 Roma Italy
Mail: Sales.IA.Italy@deltaww.com
TEL: +39 039 8900365

Turkey: Delta Greentech Elektronik San. Ltd. Sti. (Turkey)
Şerifali Mah. Hendem Cad. Kule Sok. No:16-A
34775 Ümraniye – İstanbul
Mail: Sales.IA.Turkey@deltaww.com
TEL: + 90 216 499 9910

MEA: Eltek Dubai (Eltek MEA DMCC)
OFFICE 2504, 25th Floor, Saba Tower 1,
Jumeirah Lakes Towers, Dubai, UAE
Mail: Sales.IA.MEA@deltaww.com
TEL: +971(0)4 2690148

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