TRIO MOTION TECHNOLOGY

A MEMBER OF THE ESTUN GROUP

TRIO MOTION TECHNOLOGY
DX3 SERVO PACKAGES

- THE MOTION SPECIALIST -

DX3
200V - 400V Servo Solutions

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Cost Optimised Servo Drive

DX3, the single-axis ac servo drive, is designed to create the most cost-effective optimised entry level solution with excellent performance and practical control functions. The Trio DX3 drive is compatible with Trio MX servo motors and Trio *Motion Coordinators* to provide high-speed, high-precision, high performance machine solutions.

With a power range from 50W to 7.5kW and options for EtherCAT or Conventional (Pulse & Direction, Analogue and CANopen) control, DX3 will suit a wide variety of machine types.

DX3 is fully integrated into Trio's application development tool, *Motion* Perfect, our software environment for system planning, configuration, virtualisation and machine programming.

AT A GLANCE

- Fully integrated into *Motion* Perfect
- Matched with MX motor range
- Internal drive protection functions
- Comprehensive tuning technology
- Field upgradable firmware
- Electronic nameplate
- Compact size
- Zero stacking
- USB commissioning
- Keypad interface
- 200V ac from 50W to 2kW
- 400V ac from 1kW to 7.5kW
- 350% overload
- 2 Touch Probe inputs
- Preset positions, up to 32 stored positions - Conventional drives only (no *Motion Coordinator* required)
- EtherCAT or Conventional (Pulse & Direction, Analogue, CANopen) control

Preliminary specifications may change without notice

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Specifing Your Drives

Model		# Axes	Power	Voltage	Options	Version
DX3	-	1	20	A	E	A

DX3 comes in power ratings from 50W to 7.5kW. Matched with the MX series motors it offers high-dynamic performance and high-precision with electronic nameplate to simplify configuration for machine solutions.

A5	0.05kW
01	0.1kW
02	0.2kW
04	0.4kW
08	0.75kW
10	1kW
15	1.5kW
20	**2kW**
30	3kW
50	5kW
75	7.5kW

A	200V ac
D	400V ac

E	EtherCAT
M	Pulse/Dir

A	Revision

Integration Efficiency

Rapid application development of controller and drive configuration within *Motion* Perfect.

Space Efficient

Compact single axis servo drive. Zero stacking to save panel space.

Design Efficient

One system to program, simplifying development and any future production changes when required.

Cost Efficient

Developed to be cost optimised, entry level servo drive with either EtherCAT or Pulse/Direction, Analogue and CANopen interfaces.

DX3
200V Servo Solutions

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Specification

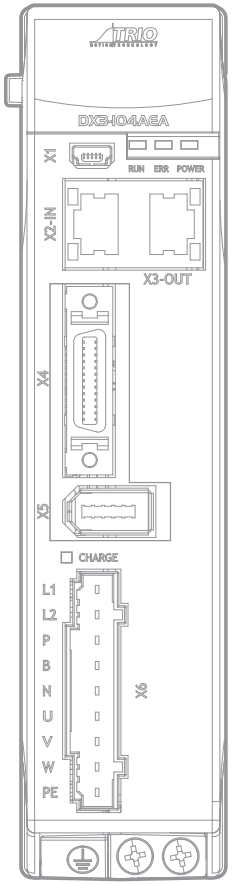
Product	Part #	Output Power	H	W	D
200V ac					
DX3-1A5AEA	D3000	50W	172	40	180
DX3-1A5AMA	D3020				
DX3-101AEA	D3001	100W	172	40	180
DX3-101AMA	D3021				
DX3-102AEA	D3002	200W	172	40	180
DX3-102AMA	D3022				
DX3-104AEA	D3003	400W	172	40	180
DX3-104AMA	D3023				
DX3-108AEA	D3004	750W	172	55	180
DX3-108AMA	D3024				
DX3-110AEA	D3005	1kW	172	55	180
DX3-110AMA	D3025				
DX3-115AEA	D3006	1.5kW	172	70	180
DX3-115AMA	D3026				
DX3-120AEA	D3007	2kW	172	70	180
DX3-120AMA	D3027				

200Vac								
Drive Model: DX3-	1A5A	101A	102A	104A	108A	110A	115A	120A
Continuous output current [Arms]	0.9	1.1	1.5	2.9	5.1	6.9	9.5	12.6
Maximum output current [Arms]	3.3	4	5.8	11.5	19.5	21	31.6	42
Main power supply unit capacity [kVA] (single phase)	0.2	0.3	0.6	1.2	1.9	2.6	4.0 *	-
Main power supply capacity [kVA] (three-phase)	-	-	-	-	1.6	2	3	3.5

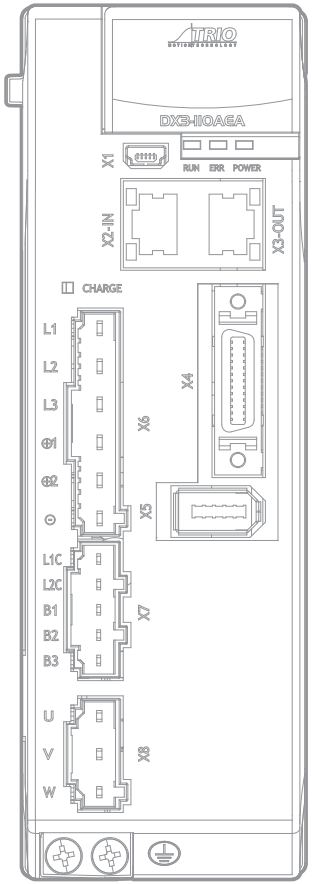
*: When operating from a single-phase power supply for the DX3-15AEA (rated power 1.5 kW), please deratify to 1.2 kW.

Products ending with **AEA / DEA** = **EtherCAT**
Products ending with **AMA / DMA** = **Conventional**

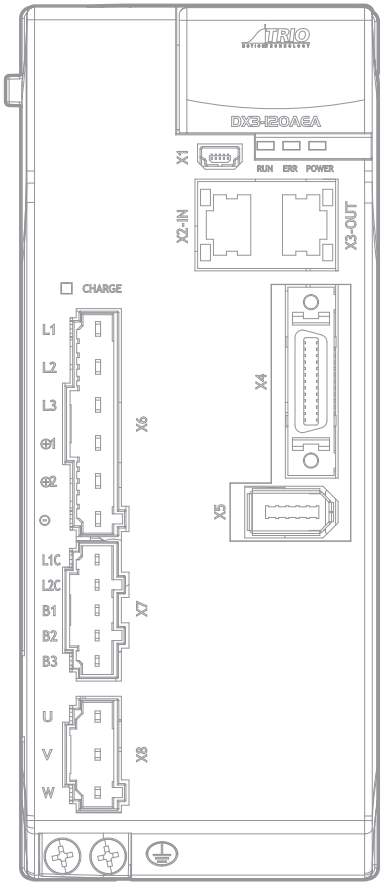
Preliminary specifications may change without notice



DX3-1A5AEA/AMA
DX3-101AEA/AMA
DX3-102AEA/AMA
DX3-104AEA/AMA



DX3-108AEA/AMA
DX3-110AEA/AMA



DX3-115AEA/AMA
DX3-120AEA/AMA

DX3
400V Servo Solutions

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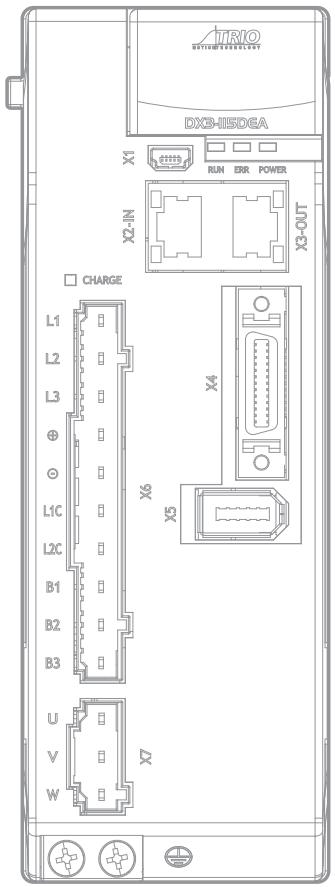
Specification

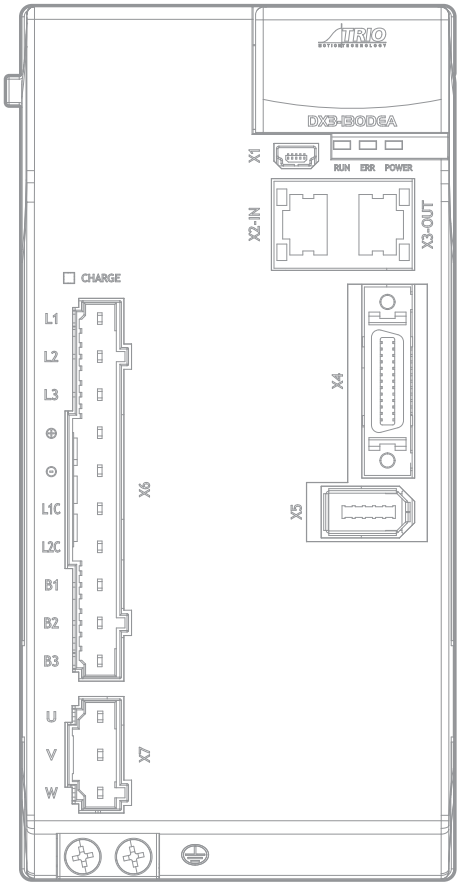
Product	Part #	Output Power	H	W	D
400V ac					
DX3-110DEA	D3010	1kW	172	60	180
DX3-110DMA	D3030				
DX3-115DEA	D3011	1.5kW	172	60	180
DX3-115DMA	D3031				
DX3-120DEA	D3012	2kW	172	85	180
DX3-120DMA	DD032				
DX3-130DEA	D3013	3kW	172	85	180
DX3-130DMA	D3033				
DX3-150DEA	D3014	5kW	260	90	230
DX3-150DMA	D3034				
DX3-175DEA	D3015	7.5kW	260	90	230
DX3-175DMA	D3035				

400Vac						
Drive model: DX3-	110D	115D	120D	130D	150D	175D
Continuous output current [Arms]	3.6	5	7.1	12	17	27.3
Maximum output current [Arms]	10.9	16.3	24.7	37.8	53	70.7
Main power supply capacity [kVA] (three-phase)	1.8	2.8	3.5	5	8.2	12



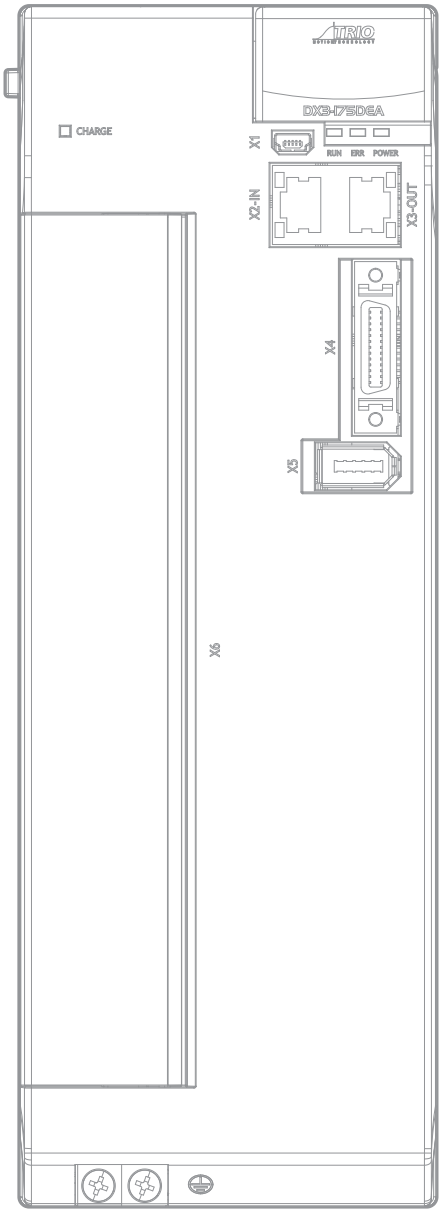
DX3-110DEA/DMA

DX3-115DEA/DMA



DX3-120DEA/DMA

DX3-130DEA/DMA



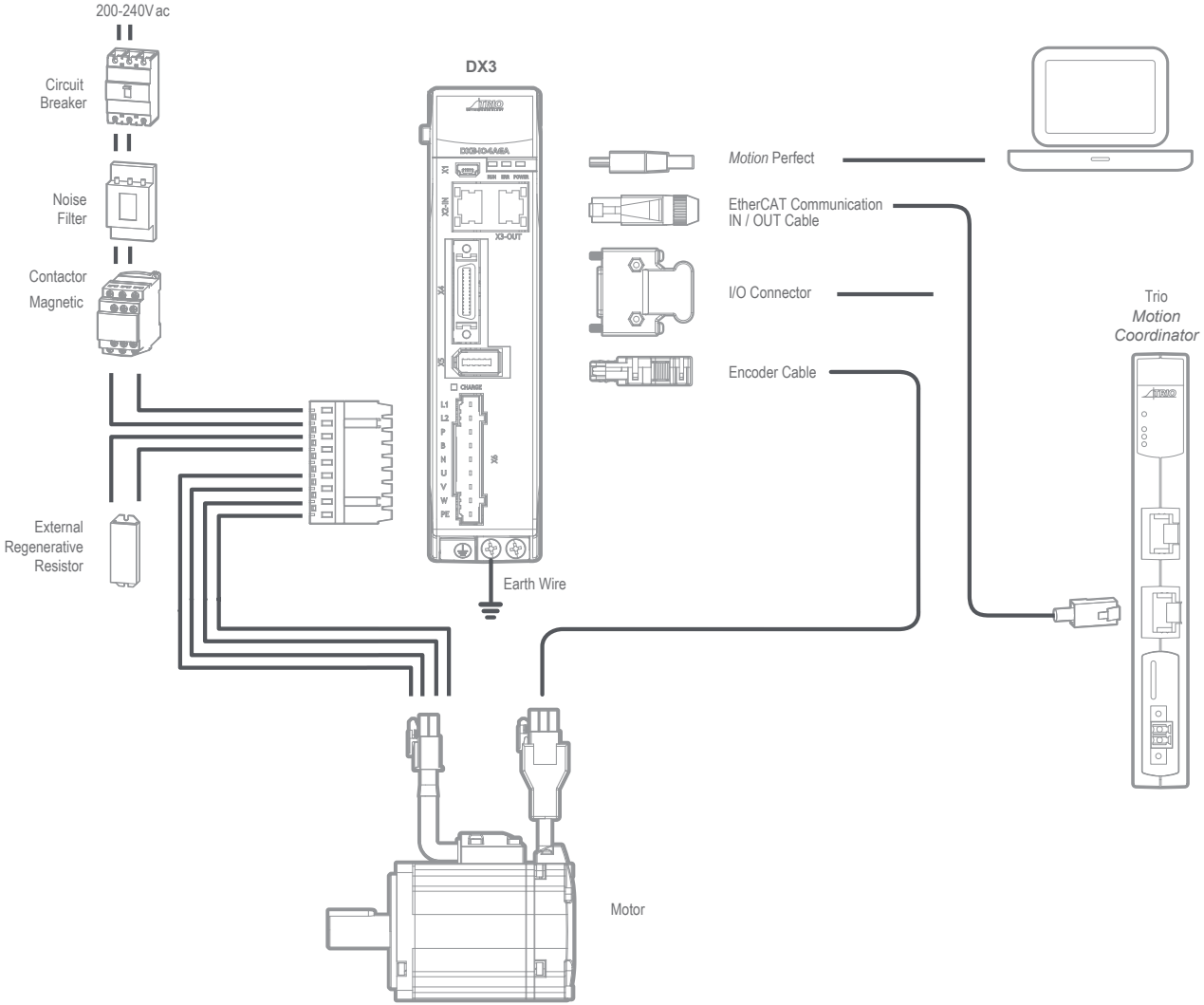
DX3-150DEA/DMA

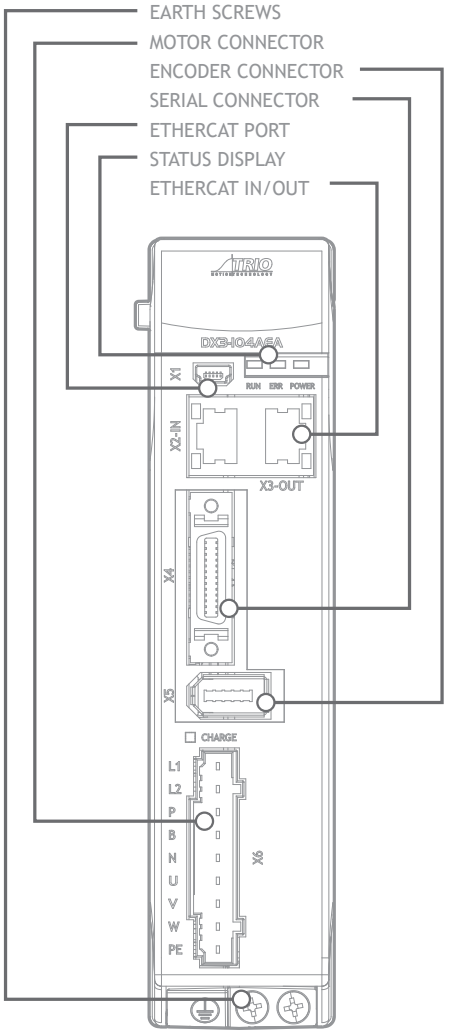
DX3-175DEA/DMA

Products ending with **AEA / DEA** = **EtherCAT**
Products ending with **AMA / DMA** = **Conventional**

DX3
Wiring Solution Example

EtherCAT Model Configuration (50W - 400W)

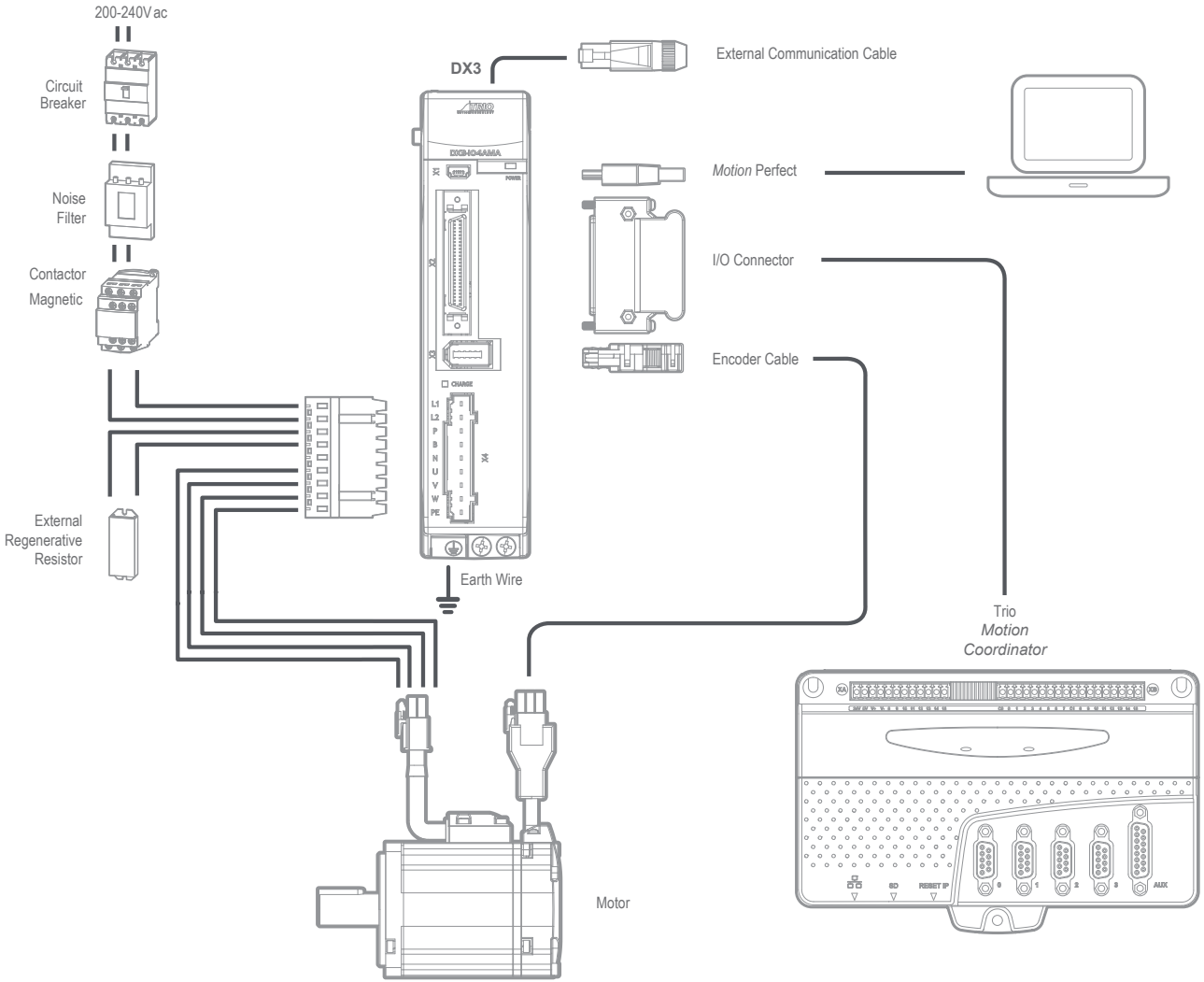


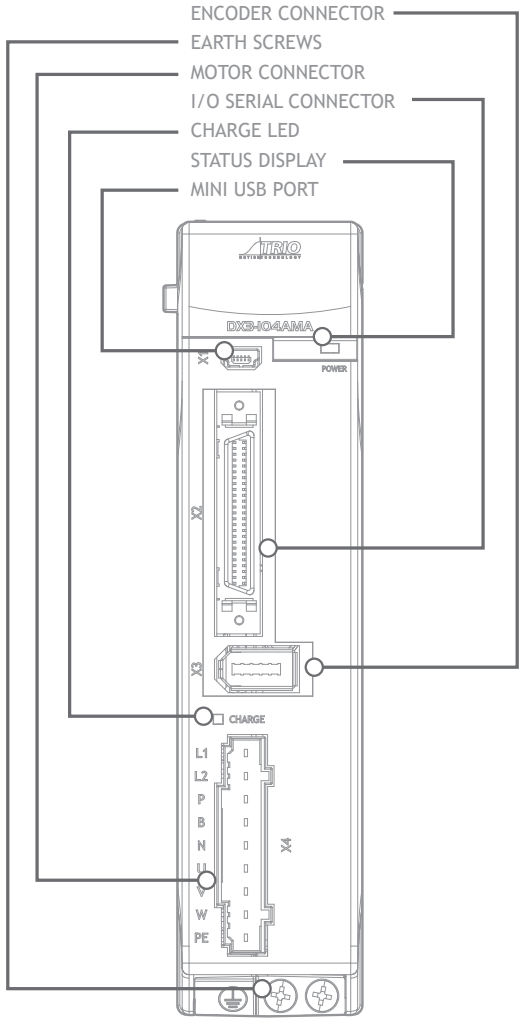


Example illustration showing **AEA** / **DEA** = **EtherCAT**

DX3
Wiring Solution Example

Pulse / Dir Model Configuration (50W - 400W)





Products ending with **AMA** / **DMA** = **Conventional**

DX3
200V - 400V Servo Solutions

All Models Specification

Universal specifications			Description
Input power		200VAC	Single-phase AC 200V ~ 240V, -15% ~ +10%, 50Hz/60Hz
			Three-phase AC 200V ~ 240V, -15% ~ +10%, 50Hz/60Hz (rated power ≥0.75kW)
		400VAC	Three Phase AC 380V ~ 440V, -15% ~ +10%, 50Hz/60Hz
Control the power supply		200VAC	Single phase AC 200V ~ 240V, -15% ~ +10%, 50Hz/60Hz
		400VAC	Three phase AC 200V ~ 440V, -15% ~ +10%, 50Hz/60Hz
Control mode			SVPWM control
Feedback			Serial communication encoder with MX motors
Terms of use	Working environment	Temperature	When using a single device: -5°C ~ 55°C When multi-device is installed closely: -5 °C ~ 40 °C
		Humidity	5% to 95% RH (no condensation)
	Storage environment	Temperature	-20°C ~ 85°C
		Humidity	5% to 95% RH (no condensation)
	Protection class		IP20
	Altitude		1000m or less
	Vibration resistant		4.9m/s2
	Impact resistant		19.6m/s2
	Power system		TN system
Installation structure			Base mounting
Performance	Speed control range		1:5000
	Speed volatility		The rated speed ± less than 0.01% (when the load fluctuates: 0% to 100%) 0% of the rated speed (voltage fluctuations: at ± 10%) The rated speed is ± below 0.1% (temperature fluctuations: 25°C±25°C)
	Soft-start settings		0 ~10s (acceleration and deceleration can be set separately)
	Input signal		Operating voltage range: 24 VDC±20% Number of input channels: 5 on AEG/DEG, 10 on AMG/DMG
	Output signal		Operating voltage range: 5 VDC to 30 VDC Number of output channels: 3 on AEG/DEG, 5 on AMG/DMG
USB port	Communication standards		Conforms to USB 2.0 standard (12 Mbps), OTG
Commissioning Ports			USB
			EtherCAT (CoE) (only avaliable on AEG/DMG)
Commisioning Software			*Motion* Perfect
Display			5-digit
Operator Panel			4 buttons
Indicator Lamps			CHARGE, POWER
Regenerative braking			Products with rated power of 50W to 400W do not have built-in braking resistors Products with a power rating of 750W to 7.5kW have built-in braking resistors
Protection features			Overcurrent, overvoltage, undervoltage, overload, regeneration anomaly, overspeed, etc
Accessibility			Alarm recording, Jog operation, load inertia identification, mechanical analyzer, automatic tuning tools, etc

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EtherCAT Model (AEA, DEA) Specification

EtherCAT Specifications	Description
Applicable communication standards	IEC 61158 Type12, IEC 61800-7 CiA402 Drive Profile
Physical layer	100BASE-TX (IEEE802.3)
Bus connection	X2-IN (RJ45): EtherCAT Signal IN
	X3-OUT (RJ45): EtherCAT Signal OUT
Cable	Category 5 twisted pair (4 pairs of shielded twisted pairs).
Sync Manager	SM0: Output mailbox, SM1: Enter mailbox
	SM2: Output process data, SM3: Input process data
FMMU	FMMU0: Maps to the Process Data (RxPDO) output area
	FMMU1: Maps to the Process Data (TxPDO) send zone
	FMMU2: Maps to mailbox status
EtherCAT Commands (Data Link Layer)	APRD, FPRD, BRD, LRD, APWR, FPWR, BWR, LWR, ARMW, FRMW
PDO data	Dynamic PDO mapping
MailBox(CoE)	Emergencies, SDO requests, responses, SDO information (TxPDO/RxPDO and remote TxPDO/ RxPDO are not supported)
MailBox(FoE)	Support FOE firmware upgrade
Distributed Clock (DC)	Free-run mode and DC mode (switchable)
	DC synchronization period: 125 μ s to 8ms
Slave Information Interface	2048 bytes (read-only)
CiA402 Drive Profile	Homing mode, Profile position mode,Profile velocity mode, Profile torque mode, Interpolated position mode, Cyclic synchronous position mode, Cyclic synchronous velocity mode, Cyclic synchronous torque mode, Touch probe function, Torque limit function
FoE (File Over EtherCAT)	Download new firmware via FoE

Conventional (AMA, DMA) Specification

Step/Pulse Model Specifications			Description
Torque Control	Analogue reference	Reference Voltage	±10VDC at rated torque Max. input voltage: ±12V
		Input Impedance	10MΩ or above
		Circuit Time Constant	10μs
	Torque Selection	Presets	4 torque selections
Speed Control	Analogue reference	Reference Voltage	±10VDC at rated speed Max. input voltage: ±12V
		Input Impedance	10MΩ or above
		Circuit Time Constant	10μs
	Speed selection	Presets	32 speed selections
Position Control	Pulse reference	Type	Pulse + Direction CCW + CW Pulse A/B Quardature
		Voltage	5V
		Max Frequency	500kHz (differential) 200kHz (single ended)
CANopen	CiA402 Drive Profile		Homing mode, Profile position mode, Profile velocity mode, Profile torque mode, Interpolated position mode
Encoder output	Type		A/B/Z Quadrature
	Voltage		5V
	Max Frequency		500kHz (differential)

Everything you need... Nothing more

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TRIO
Worldwide Network

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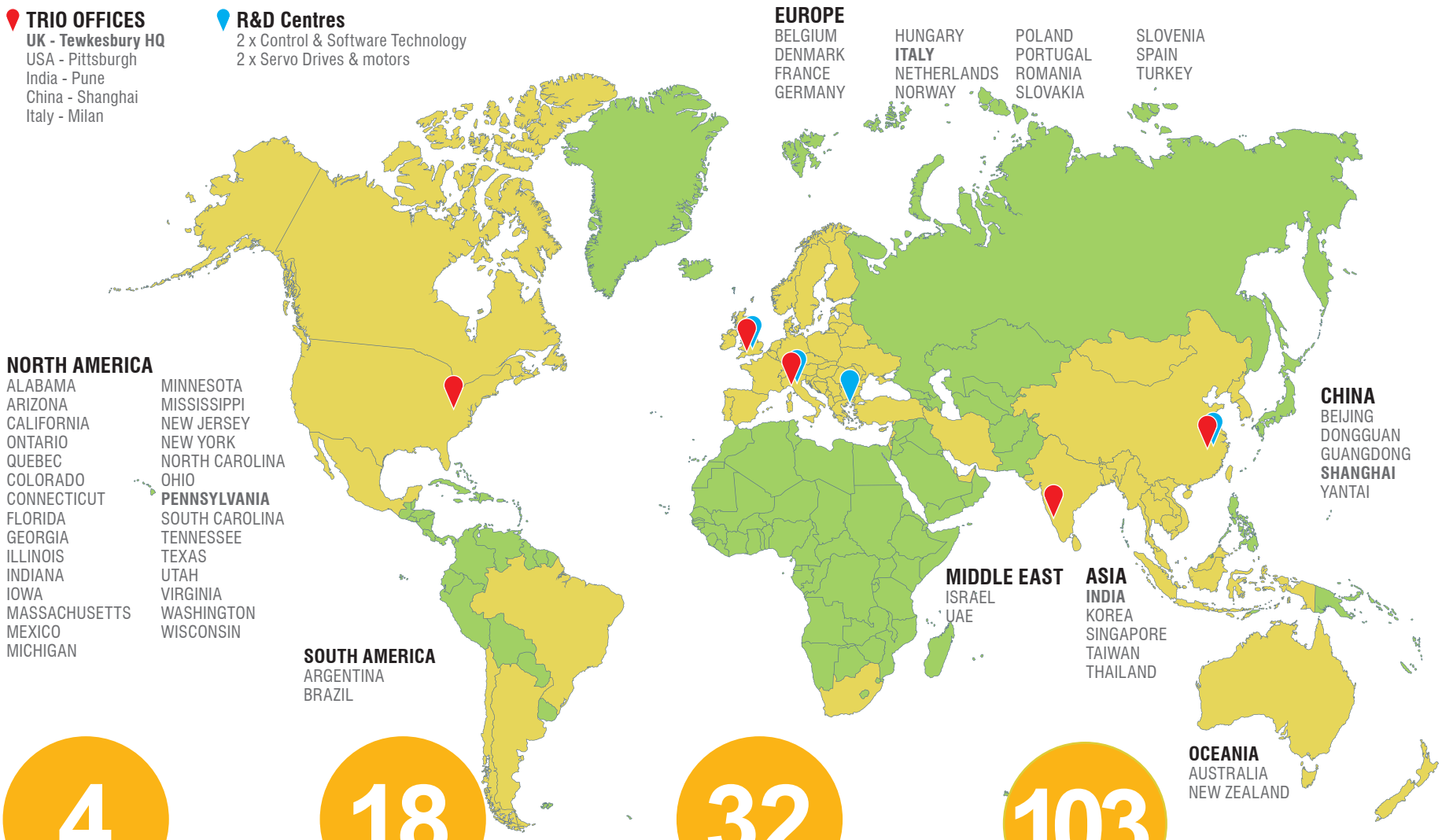

4 R&D Centres

18 Integrators

32 Countries of Sale

103 Sales Partners Globally

Motion iX

Motion Optimal Engineering Technologies

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Trio Machine Automation Technology

Trio has developed powerful rich set of software tools for use with Trio systems. These tools provide all the features necessary for setup and programming to ensure minimum development time.

Development Tools		Motion-iX - Advanced Motion Core			Network / Technologies	
Project Management	3D Visualisation	Motion-iX Programming	64bit Precision	Up to 128 axis Coordination Control	EtherCAT	RTEX
Security Project Encryption	6D Motion Scope	IEC61131	Scalable Motion Technologies	Complex Motion	ETHERNET-IP	PROFINET
Simulation	CAMGen	PLCopen	Kinematic SCARA Delta Cartesian	G-Code and HPGL	MODBUS	DEVICENET
Drive Configuration	CAD2Motion	API - PC Application Development	Path Planning Look Ahead	Advanced Interpolation	CANOPEN	FUNCTIONAL SAFETY (STO)
HMI Design	Program Libraries	MOTION-rX ROBOTICS Programming	GEARING/CAM MOVELINK FLEXLINK	Registration Control	OPC UA	

Combining an advanced motion core with Trio's ease-of-use, Motion-iX offers performance and dependability of packaged solutions, from "The Motion Specialist", where motion is the core and not just a bolt-on capability.

Motion-iX – a unified software engineering framework for machine development, that places the focus on optimising motion and complex kinematics, including robotics such as SCARA, to deliver truly optimal machine control performance.

Motion-iX includes development in IEC61131 and PLCopen, and boasts inverse kinematics capabilities to truly coordinate all machine axes as one, including robots to maintain tight synchronisation or robots and machine as one. Virtualization allows simulation of the mechanics and motion to significantly reduce development and testing, delivering optimal control every time, by minimising machine cycle times.

Motion Perfect

Design, Develop, Test, Deploy and Secure

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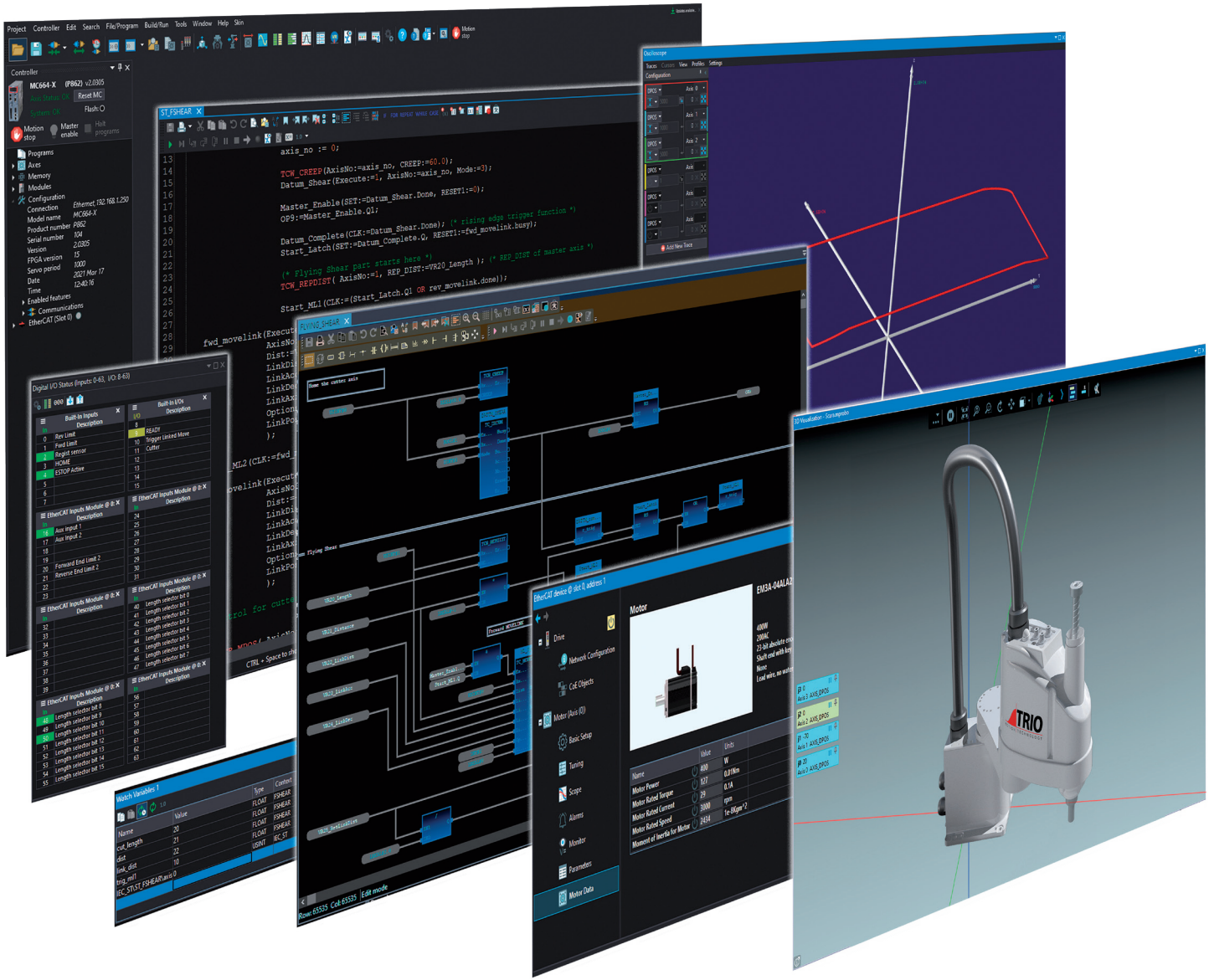
Built on Trio's **Motion-iX** core technology, *Motion* Perfect provides the user with a re-designed easy to understand interface for rapid application development, controller and drive configuration and monitoring of functions.

The commissioning of DX Servo Drives is made simple with a series of Device Configuration Screens allowing access to status information and diagnostics at a glance. All motor axes can be detected, setup, monitored and controlled in real-time from the easy to use dialogue windows.

Motion Perfect includes access to IEC 61131 and PLCopen and the robotics solution; TrioRPS. Advanced visualisation including a 3D oscilloscope and IP protection of your projects are also included within *Motion* Prefect.



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Trio Motion Technology specialises in advanced motion control as a core, providing a range of *Motion Coordinators*, drives and motors, expansion interfaces, I/O modules and HMI's built on *Motion*-ix technologies and designed to enable the control of industrial machines with the minimum of external components.

In support of the Trio concept, we aim to offer the best technical support by telephone, email, our comprehensive website and training courses held throughout the year. Please look at our web site for details.

www.triomotion.com

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