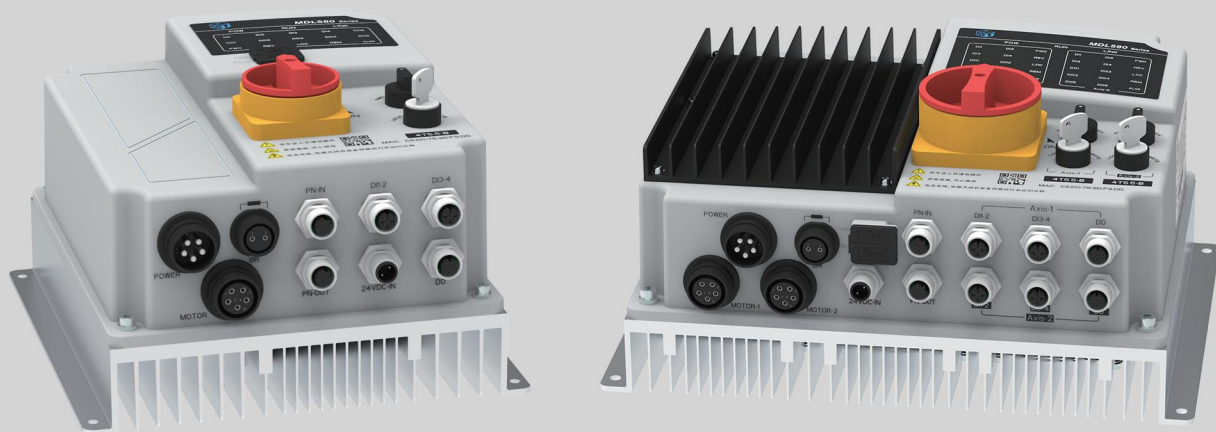


Highly Integrated, Elevate Industrial Efficiency

MDL580 Series Drive-IO All-in-One Controller



MDL580 Series Drive-IO All-in-One Controller

The MDL580 Series Drive-IO All-in-One Controller is a dedicated drive developed by MT-Drive for automated conveyor line applications in photovoltaics, new energy, ceramics, glass and other industries. It operates on three-phase AC380V~440V, covers a power range of 0.75kW~7.5kW, and is available in single-axis and dual-axis configurations.

Featuring high IP54/IP65 protection ratings, the unit eliminates the need for installation in a control cabinet. All external interfaces adopt plug-and-play design, integrating local/remote control, 4DI+6DO digital I/O, and STO (Safe Torque Off) safety functions. It serves as a drop-in replacement for distributed variable frequency cabinets and traditional I/O boxes, with the benefits of compact structure, fast deployment, and easy maintenance.

The MDL580 Series supports asynchronous motors, permanent magnet synchronous motors, and motorized pulleys, with both vector control and V/F control modes. It supports PROFINET and EtherCAT fieldbus protocols. Its unique dual-axis design significantly reduces installation space and controller resource usage, making it ideal for industrial production scenarios including lithium batteries, photovoltaics, ceramics, glass, and tobacco.



MDL580-1 Axis



MDL580-2 Axis

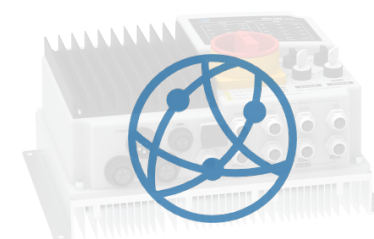
Safety & Reliability

- ◆ Compliant with EU CE certification;
- ◆ High protection ratings: IP54 and IP65;
- ◆ Wide operating temperature range of -25~45°C, ensuring stable equipment operation in both high-temperature and low-temperature environments;
- ◆ Redundant system power supply design reduces downtime caused by single-point power failures, significantly improving system reliability and availability.



Efficiency & Integration

- ◆ Supports PROFINET and EtherCAT protocols. Compared with traditional I/O communication and serial communication, bus communication delivers high real-time performance, strong scalability, more flexible network topology, and more efficient configuration;
- ◆ Compatible with asynchronous motors, permanent magnet synchronous motors and motorized pulleys, supporting both vector control and V/F control;
- ◆ Integrates remote/local switching control, local forward/reverse control. It comes standard with an external braking resistor interface, optional brake interface, built-in 4DI+6DO digital I/O, and STO (Safe Torque Off) function, serving as a drop-in replacement for distributed variable frequency cabinets and traditional I/O boxes.



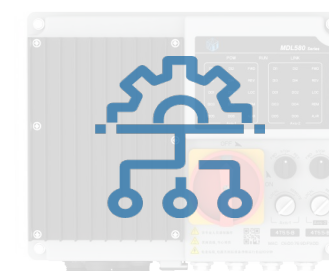
Easy Installation & Maintenance

- ◆ Cabinet-free installation with flexible mounting options including wall-mount and bracket installation;
- ◆ All external interfaces are plug-and-play with foolproof design, enabling efficient wiring and easy maintenance;
- ◆ The controller can directly access data from the Drive-IO All-in-One unit, including operating status, output voltage, output current, and alarm codes. Faults can be cleared both remotely and locally, improving operational efficiency.



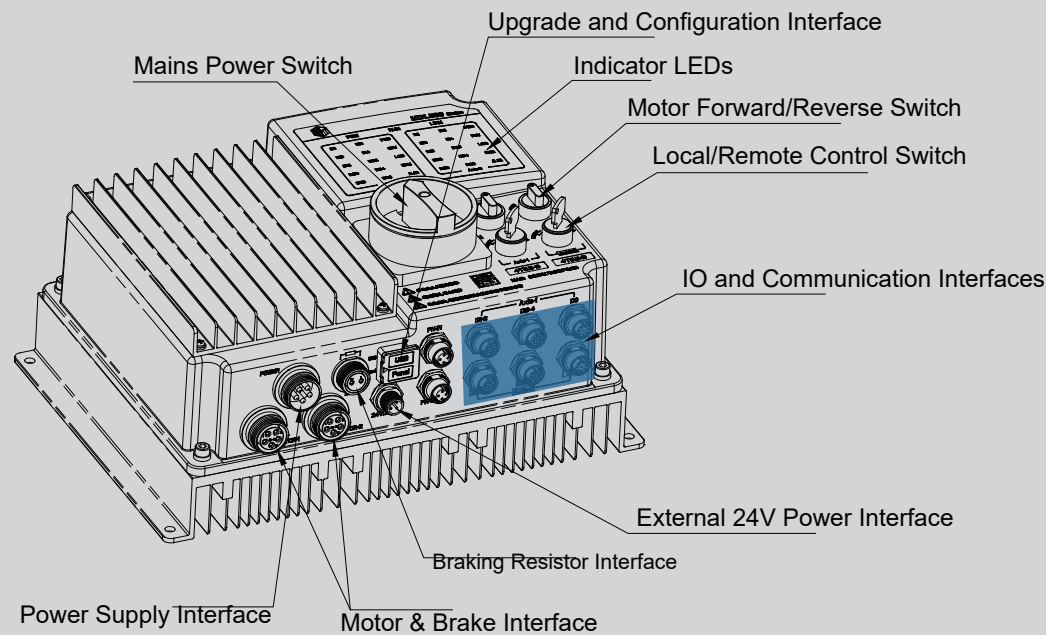
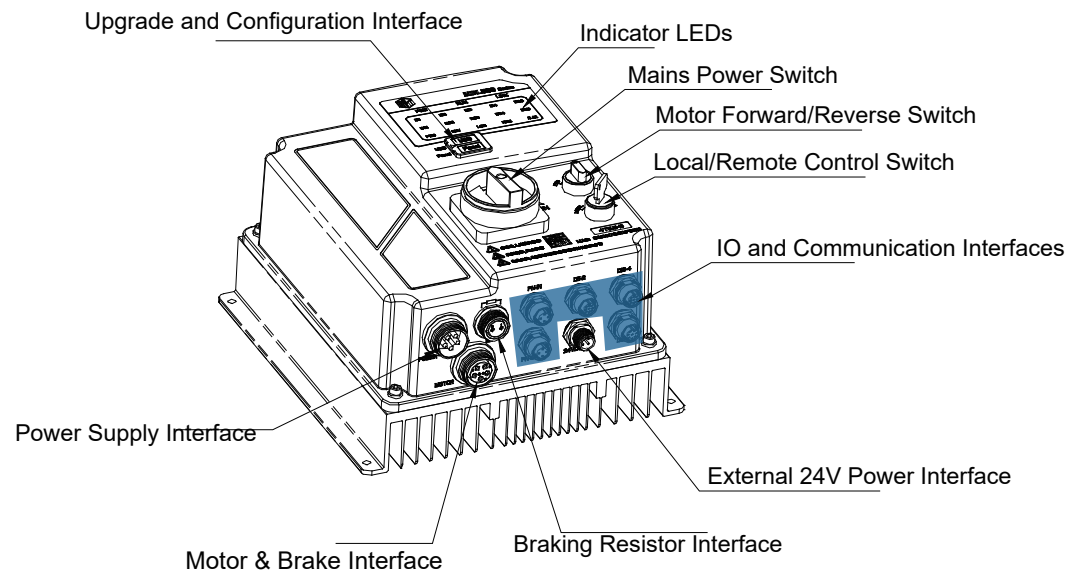
Space & Cost Saving

- ◆ Perfectly replaces distributed variable frequency cabinets and traditional I/O boxes, saving over 50% of installation space;
- ◆ Effectively reduces on-site installation and wiring labor hours, lowering installation costs;
- ◆ The dual-axis design conserves controller resources, with two motors occupying only one node/slave device;
- ◆ Significant reduction in overall application costs.



Product Diagram

Single Axis



Dual Axis

Ordering Code Definition

MDL580-PN-2-4T0.75-BZS

Product Series	
MDL580	Product Series

Communication Protocol	
PN	Profinet
EC	EtherCAT

Number of Axes	
1	Single-axis
2	Dual-axis

Voltage Class	
2S	Single-phase 220V
4T	Three-phase 380V

Power Rating	
0.75	0.75kW
1.5	1.5kW
2.2	2.2kW
3.0	3.0kW
4.0	4.0kW
5.5	5.5kW
7.5	7.5kW

Brake & Safety Unit	
BZS	With Brake, Holding Brake & STO
B	With Brake Unit
Z	With Holding Brake Unit
S	With STO (Safe Torque Off) Unit
缺省	No Optional Unit

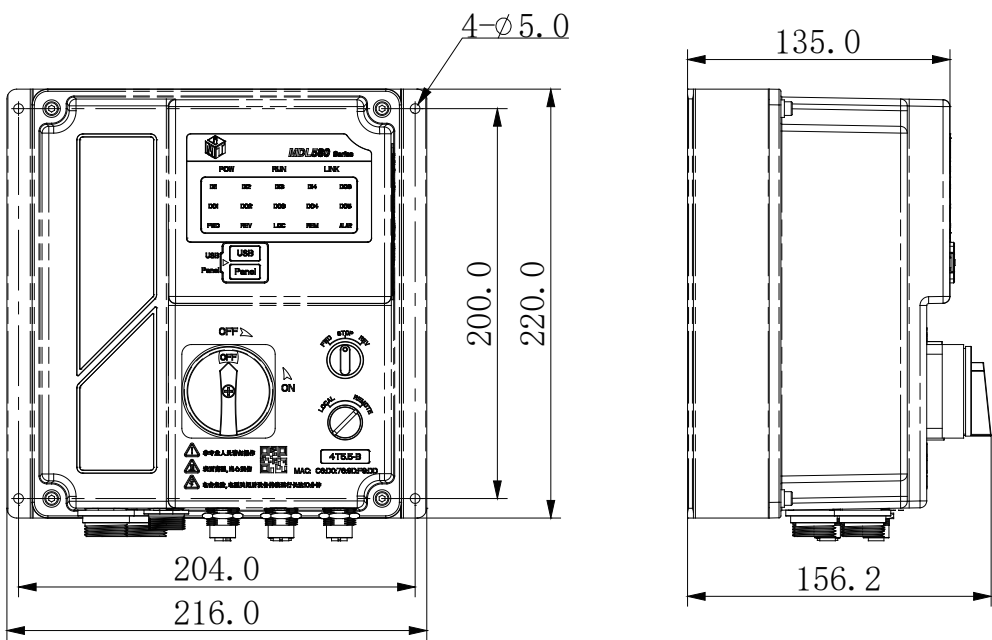
Selection List

Number of Axes	Model	Power (kW)	Output Current (A)
Single-axis	MDL580-PN-1-4T0.75-B	0.75	2.5
	MDL580-PN-1-4T1.5-B	1.5	3.8
	MDL580-PN-1-4T2.2-B	2.2	5.4
	MDL580-PN-1-4T3.0-B	3	7.6
	MDL580-PN-1-4T4.0-B	4	9.5
	MDL580-PN-1-4T5.5-B	5.5	12.7
	MDL580-PN-1-4T7.5-B	7.5	16.5
Dual-axis	MDL580-PN-2-4T0.75-B	Power and output current refer to the single-axis specifications	
	MDL580-PN-2-4T1.5-B		
	MDL580-PN-2-4T2.2-B		
	MDL580-PN-2-4T3.0-B		
	MDL580-PN-2-4T4.0-B		
	MDL580-PN-2-4T5.5-B		
	MDL580-PN-1-4T7.5-B		

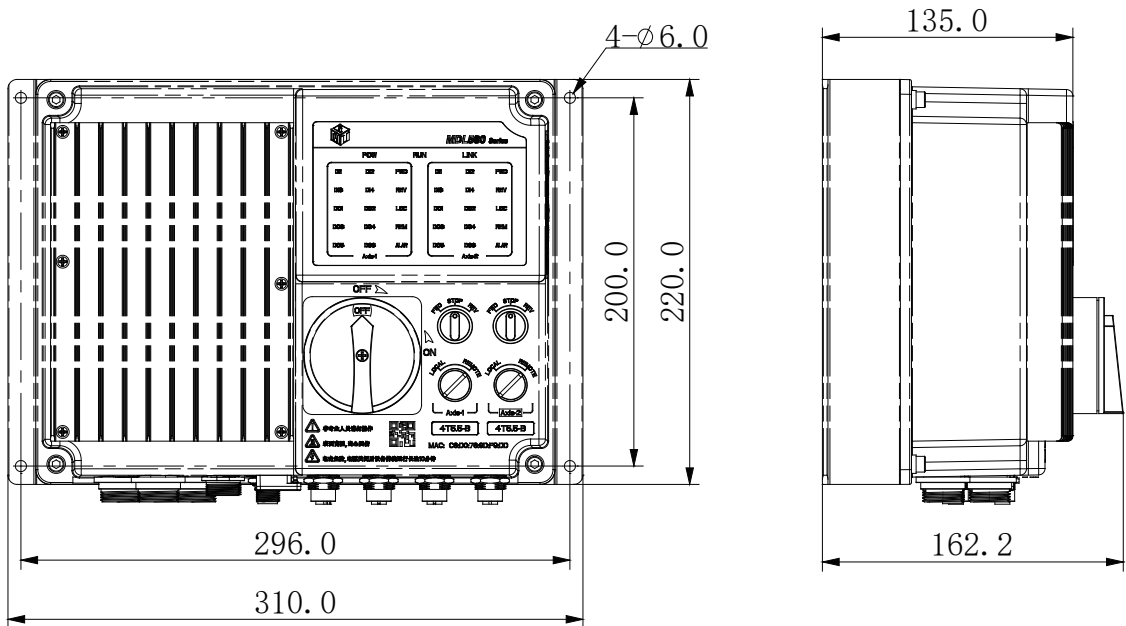
Technical Specifications

Item		Specifications
Power (kW)		0.75, 1.5, 2.2, 3, 4, 5.5, 7.5
Continuous Output Current (ARMS)		2.5, 3.8, 5.4, 7.6, 9.5, 12.7, 16.5
Instantaneous Maximum Current (ARMS)		4.5, 6.84, 9.72, 13.68, 17.1, 22.86, 29.7
Input Power	Main Circuit Power	Three-phase AC (380V~440V) ±10%, 50/60Hz
	Control Circuit Power	DC 20.4V~28.8V
Compatible Motor Types		Asynchronous motors, permanent magnet synchronous motors
Basic Functions	Max Frequency	Vector control: 0~300Hz V/F control: 0~550Hz
	Carrier Frequency	0.75kHz~15kHz (max carrier frequency varies by model)
	Input Frequency	Digital setting: 0.01Hz
	Control Mode	Open-loop vector control (SVC) V/F control
	Starting Torque	G-type: 0.5Hz/180% (SVC) P-type: 0.5Hz/100%
	Speed Regulation Range	1:100 (SVC)
	Speed Regulation	±0.5% (SVC)
	Torque Control Accuracy	±5% (SVC)
	Overload Capacity	G-type: 150% rated current for 60s; 180% rated current for 3s P-type: 120% rated current for 60s; 150% rated current for 3s
	Torque Boost	Auto torque boost / Manual torque boost: 0.1%~30.0%
	V/F Curve	3 options: Linear, Multi-point, Square V/F
	Accel/Decel Curve	Linear or S-curve acceleration/deceleration. Accel/decel time range: 0.0~3200.0s
Operation	Command Source	Operation panel, local switches, PROFINET bus
	Frequency Source	Main frequency source: Operation panel, PROFINET bus
	Input Terminals	4 digital input terminals
	Output Terminals	6 digital output terminals
Protection Functions		Motor short-circuit detection, input/output phase loss protection, overcurrent protection, overvoltage protection, undervoltage protection, overheat protection, overload protection, etc.
Environmental Specifications	Temperature	Operating: -25~45℃ Storage: -25~65℃
	Humidity	Operating: 20~85%RH (non-condensing) Storage: 20~85%RH (non-condensing)
	Altitude	Derate required above 1000m; 10% derating per additional 1000m
	Vibration	5.8 (0.6G) or below, 10~60Hz (not for continuous use at resonant)
Overvoltage Category		III
Protection Class		IP54

Single-axis Outline Dimensions



Dual-axis Outline Dimensions



About Us

MT Drive & Control (Shenzhen) Co., Ltd. We are a national high-tech enterprise focusing on core components and turnkey complete solutions for advanced manufacturing. Upholding the core values of Focus, Innovation, Leadership, we have built a three-tier industrial product architecture covering control, servo and sensors. We are committed to delivering more advanced, reliable, efficient and competitive full-set industry solutions.

Headquartered in Shenzhen, China's innovation hub, the company operates a R&D Center, Quality Center, Production Center, Administration Center, Marketing Center and a Suzhou Sales Branch. As a pioneer and leader in multi-axis transmission technology, our product portfolio includes motion PLCs, servo systems, integrated drive-control systems, remote I/O modules and other core components.

Our products support mainstream industrial fieldbus protocols including PROFINET, EtherCAT and EtherNet/IP. With proprietary technical architecture and outstanding performance, they are widely applied in photovoltaic, lithium battery, robotics, CNC & metalworking/woodworking/glass/semiconductor processing, logistics warehousing, 3C, automotive manufacturing, printing & packaging, tobacco and other industries.

Adhering to long-term value-oriented development, MT-Drive synchronously develops core industrial components and customized industry turnkey solutions. As our product lineup continues to expand, we provide all-round industrial services and actively drive the development of the manufacturing sector.

Corporate Vision

To become a leading brand in the field of multi-axis transmission

Core Values

Focus | Innovation | Leadership

Patents & Qualifications

Independent R&D with multiple core key technologies in transmission field

- Over 85 intellectual property rights obtained
- Certified by CE, UL, RoHS, FCC and other international product standards
- ISO9001 quality management system certified

MT-Drive Product Portfolio

Control Layer



MSC9 Series Drive-Control Integrated System



EPC501 Series All-Electric Injection Molding Machine Controller



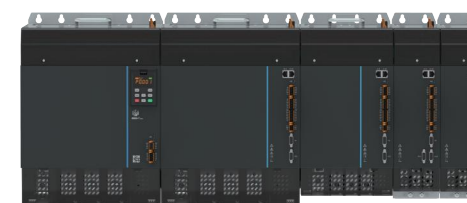
MC500 Series Motion PLC 8/16/36-Axis



MC800 Series Motion PLC 16/32/64/128-Axis



Drive Layer



M900T



M900



D900



M800



R910-S



R920-S



R920-T



MDL580 (Single-Axis)

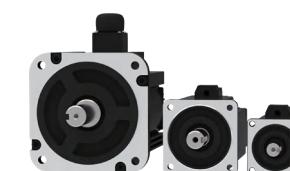


MDL580 (Dual-Axis)

Actuation/-Sensing Layer



25-bit Optical Encoder



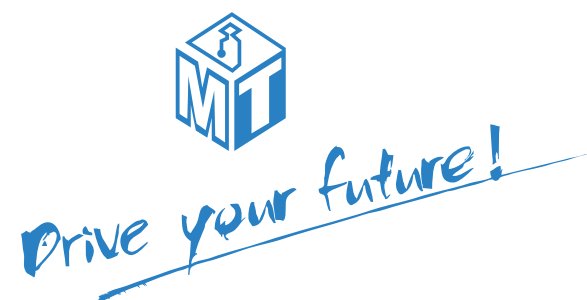
Servo Motors 50W-75kW



Integrated Remote I/O Module



Plug-in Remote I/O Module



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