Nanjing Wind CNC Technology Co., Ltd.

Wind CNC

Focusing on the research and development design of CNC

(Ver.9)

Nanjing Wind CNC Technology Co., Ltd

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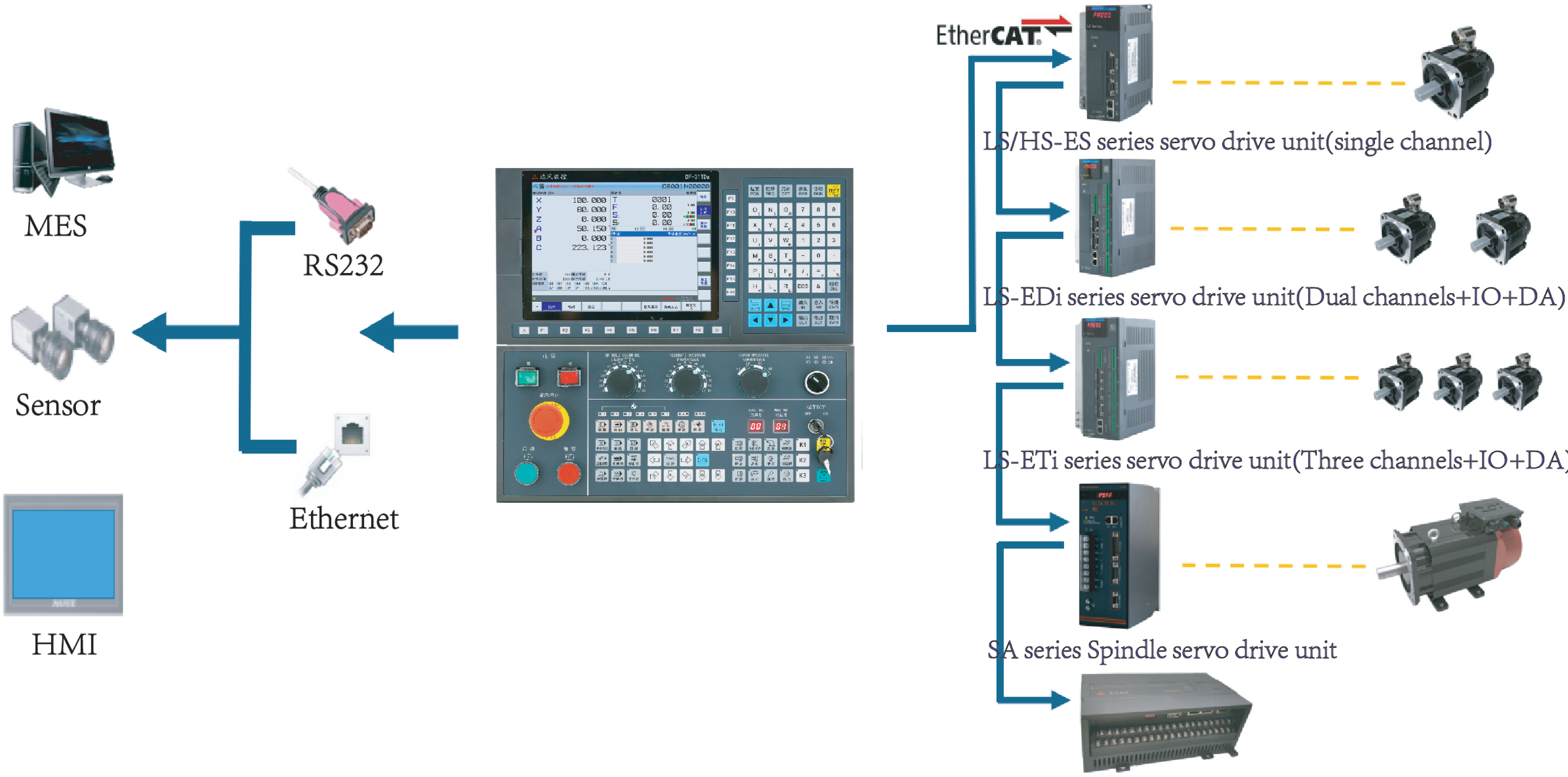
DF-31 Series High Performance Universal Controller

Overview

The DF-31 series controllers are based on new hardware architecture, connected to servo drive units and remote I0 units through EtherCAT bus.
Supports turning and milling compound machining, high-speed and high-precision small line segment machining,
G code A/B-system programming, multi-channel and multi axis control, spindle synchronization control,tilt axis control, feed axis synchronization control gear hobbing, electronic cam, touch screen.
Adapt to various machine tool layouts to meet complex application functional requirements.



Specifications

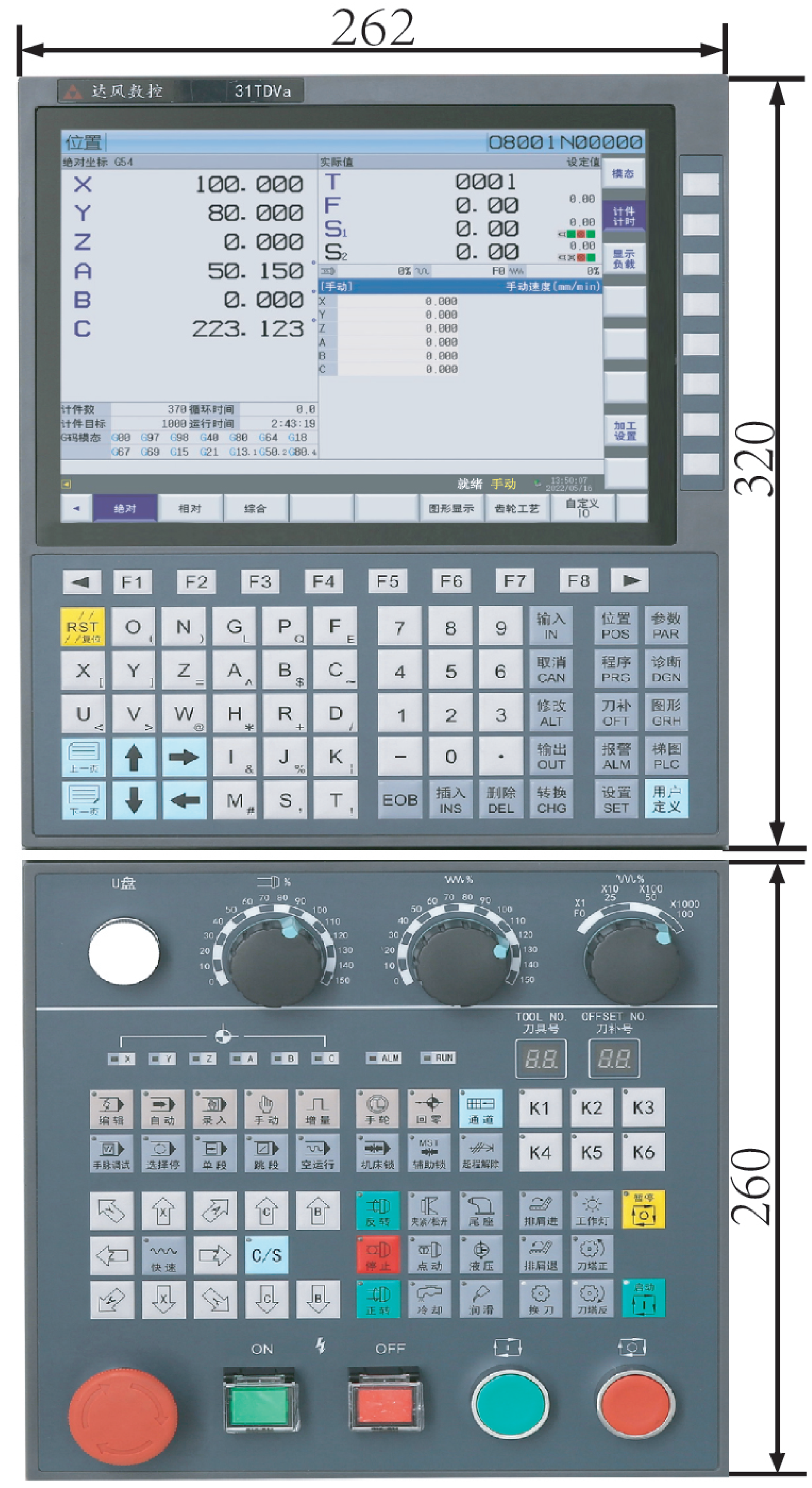
Max axes/channels	200/64
Max spindles	3×channels(Analog quantity/position/servo)
Control cycle	0.5ms ～ 4ms
Bus protocol	EtherCAT
Control method of axis	Position/Speed/Torque
Screen size	10.4 inches, 12.1 inches(Optional touch screen)
Max simultaneously controlled axes	16
IO	IN:32×Modules(MAX:32×5)　OUT:24×Modules(MAX:24×5)
PLC	Open external PLC, built-in PLC, supporting multiple PLCs for storage and switching
External communication protocol	ModbusRTU / ModbusTCP
Communication interface	RS232(9 needles),EtherNET(RJ45)
Acceleration and deceleration	Linear, S-curve
DA/AD	DA:2×Module(MAX:2×5)　AD:1×Module(MAX:1×5)
Pre read segments	10 ～ 100
Storage capacity	256M

DF-31 Series High Performance Universal Controller

Appearance/Size

DF-31TDa/31MDa/31GDa(10.4 inches)

(10.4 inches)
DF-31TDVa/31MDVa/31GDVa



DF-31TDb/31MDb/31GDb(12.1 inches)

Application

1.Turning and milling composite machine tools

2.Machining center, drilling and tapping center

3.Multi channel (multi station machine)

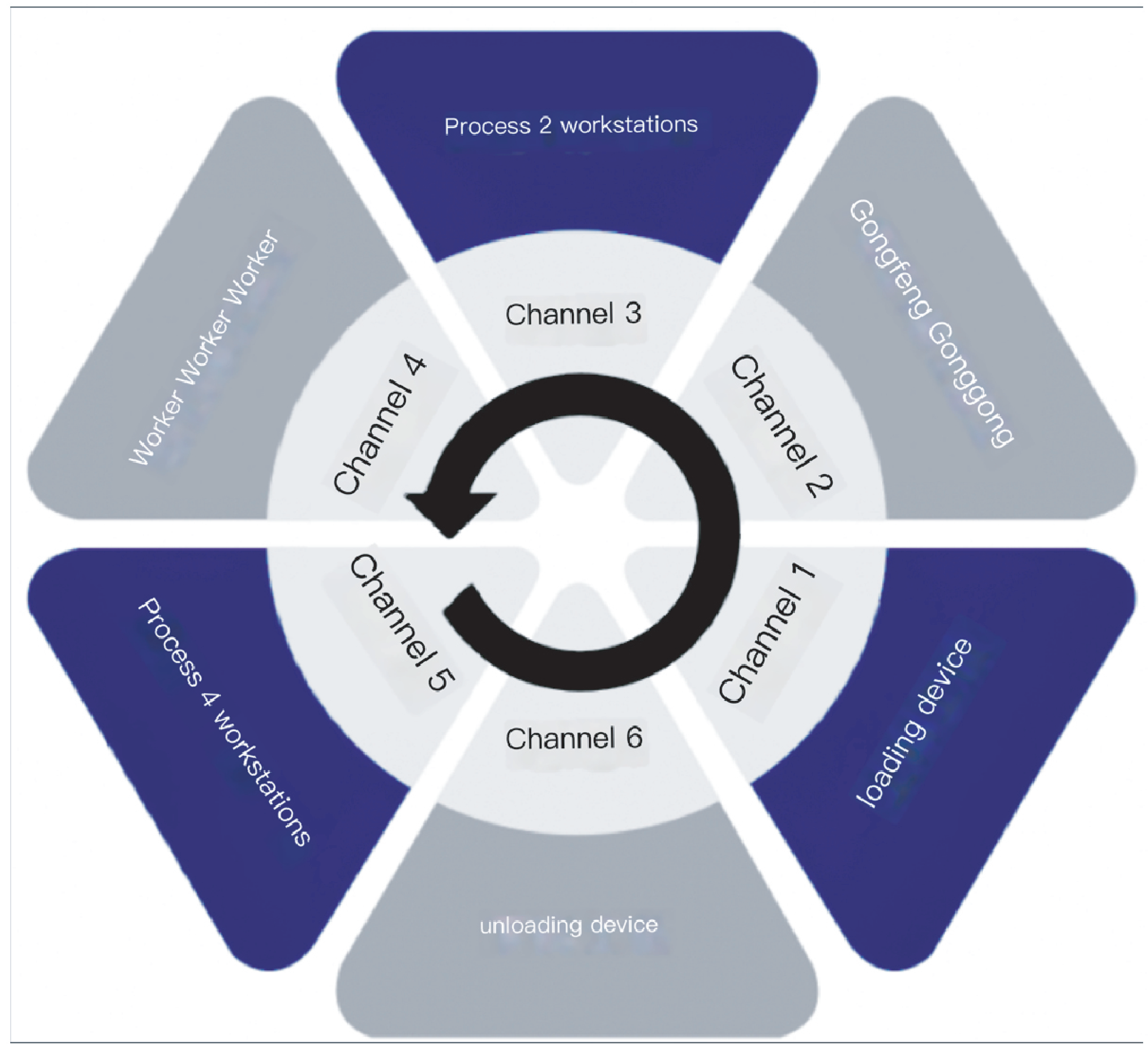
4.Gear processing (hobbing, slotting)

5.Grinding machine

DF-31 Series High Performance Universal Controller

Multi channel

- Maximum execution of 64 channels
- Maximum control of 200 axis
- Shared operating interface (expandable)
- Independently runs the NC program
- Independently programming style(Lathe/Milling)
  Synchronization, waiting, and data transmission between executable channels



DF-31 Series Controller

Channel 1	Channel 2	Channel 3	Channel 4	......	Channel 16
01000	01000	01000	01000		01000
CH1	CH2	CH3	CH4		CH16
T0101	T0101	T0101	T0101		T0101
......	......	......	......		......

DF Multi-channel Tech

- Macro Var Sharing
- PLC Var Sharing
- Program Mutual Calling
- Axis Synchronization
- Axis Exchange

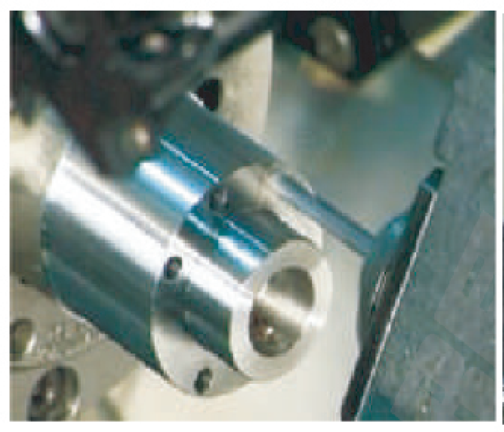
Action Implementation

- Turnning-milling Process
- Automatic Loading
- Pipeline Control
- Synchronous Processing

DF-31 Series High Performance Universal Controller

Machining of turning, milling, drilling and tapping

Each channel can be configured with a maximum of 10 feed axes and 4 spindles; The lathe series supports G code A/B system; programming and supports multi spindle control and CS axis control. Based on the operating habits of users, convenient and practical drilling, tapping, and milling related instructions have been expanded.

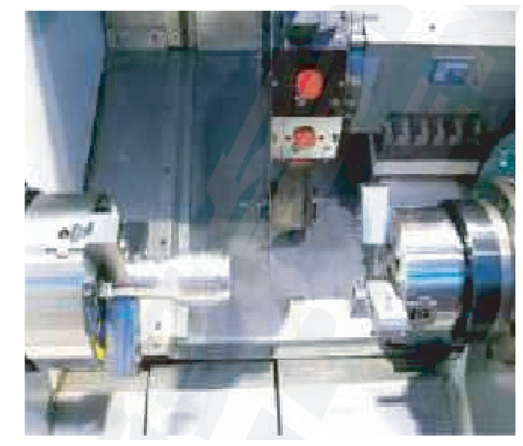
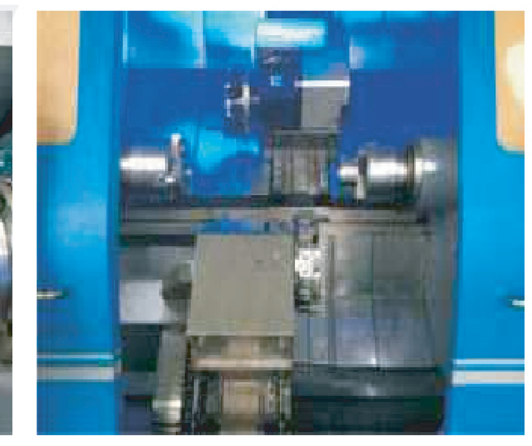



Diverse path control

Flexibly applied to various machines such as dual spindle/dual turret, single spindle/dual turret, dual spindle/single turret, etc

Supports multi-channel control, tool interference inspection, channel synchronization,balanced cutting, and axis synchronization/Mixing/overlap/exchange;

Support functions such as inter path spindle control and spindle synchronization control.

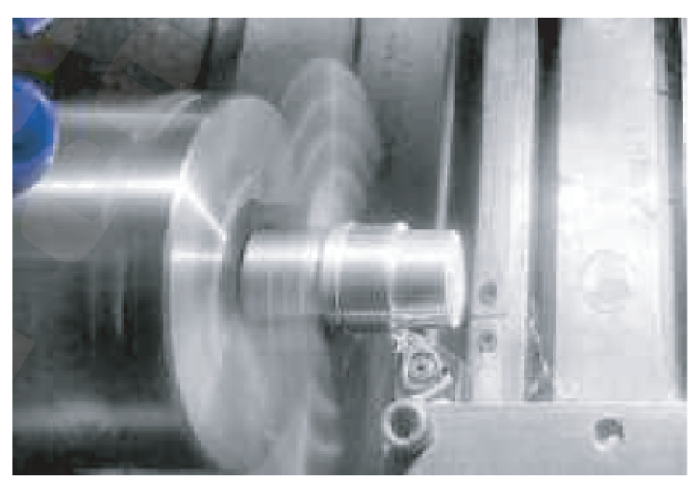
Chip breaking function

Support intermittent oscillation/pause of feed axis, floating spindle speed for chip breaking;

Execute chip breaking mode using G98.1, G99.1, or SPSV instructions;

Supporting chip breaking with instructions such as straight line, arc, and composite cycle;

Thread instructions G92 and G76 support thread chip breakage;

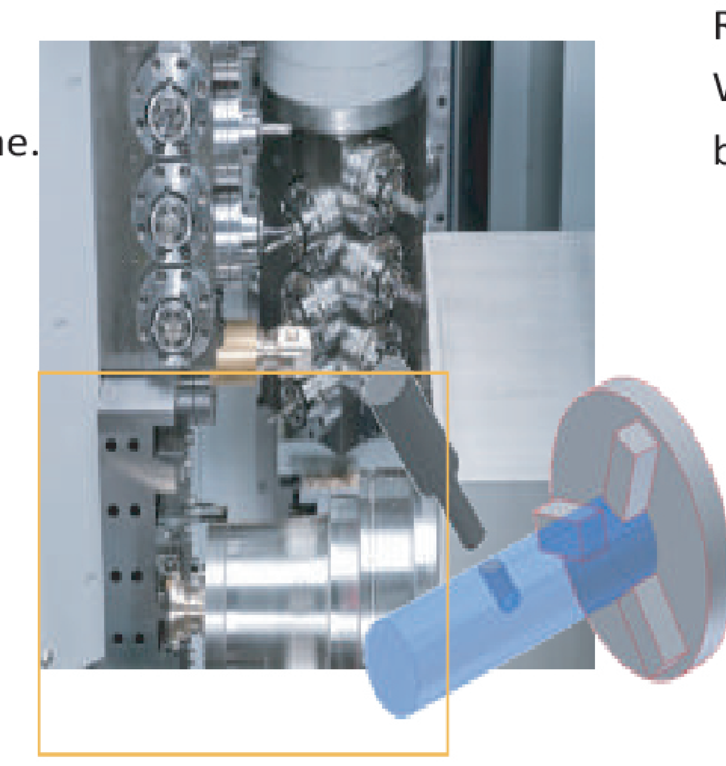


Tool load function

The tool load function is learned by the CNC through trial machining, and the CNC automatically generates the wear and damage values of the tool based on preset coefficients. After the learning is completed, the CNC will compare the current load of the motor with the learning value in real time to determine whether the tool is working properly. If it is judged to be worn or damaged, an alarm will be prompted;

Inclined plane machining

In case of workpiece tilting caused by uneven workbenches, or direct machining, drilling, tapping, etc. on the inclined plane. According to the planar machining design program, the coordinate tilt angle is set through instructions to facilitate CNC program machining on the inclined plane, solving the problem of shared machining programs caused by machine assembly and clamping tilting.



Tapping overload rollback function

Real time detection of the motor load during tapping to determine if the tapping is normal. When there is an abnormal load, the CNC executes the tapping back action, which can be set by parameters to determine whether to retry tapping or give an alarm prompt;

检测扭矩过大　　返回初始平面

EGB electronic gearbox function

When machining gears on a hobbing machine, it is necessary to rotate the workpiece shaft and the hob shaft in a certain ratio. The electronic gearbox (EGB) function synchronizes the rotation of the workpiece shaft connected to the servo motor with the rotation of the tool shaft connected to the same spindle motor. The synchronization ratio can be specified through the program. Because digital servo is used for direct control, the workpiece shaft can follow the speed changes of the tool shaft without errors, achieving high-precision gear machining.

Power-off retraction and gear phase compensation

Synchronous optimization control is applied to the synchronous control of dual motors, and phase error compensation through algorithms enables them to quickly achieve phase synchronization, thereby achieving high-precision synchronous control of motors or machinery.

Cooperate with a dedicated servo drive unit to achieve abnormal power outage and tool retraction, preventing tool and workpiece scrapping.

Supports tool libraries, turrets, and trusses

In addition to supporting traditional counting type tool libraries, it also supports high-speed servo tool libraries




Easy custom interface development

Convenient customization interface function, which can redefine the process interface and IO interface through TXT text or dedicated HMI software, reducing the technical level and development environment requirements of developers.

DF-31S Series

1 DESCRIPTION

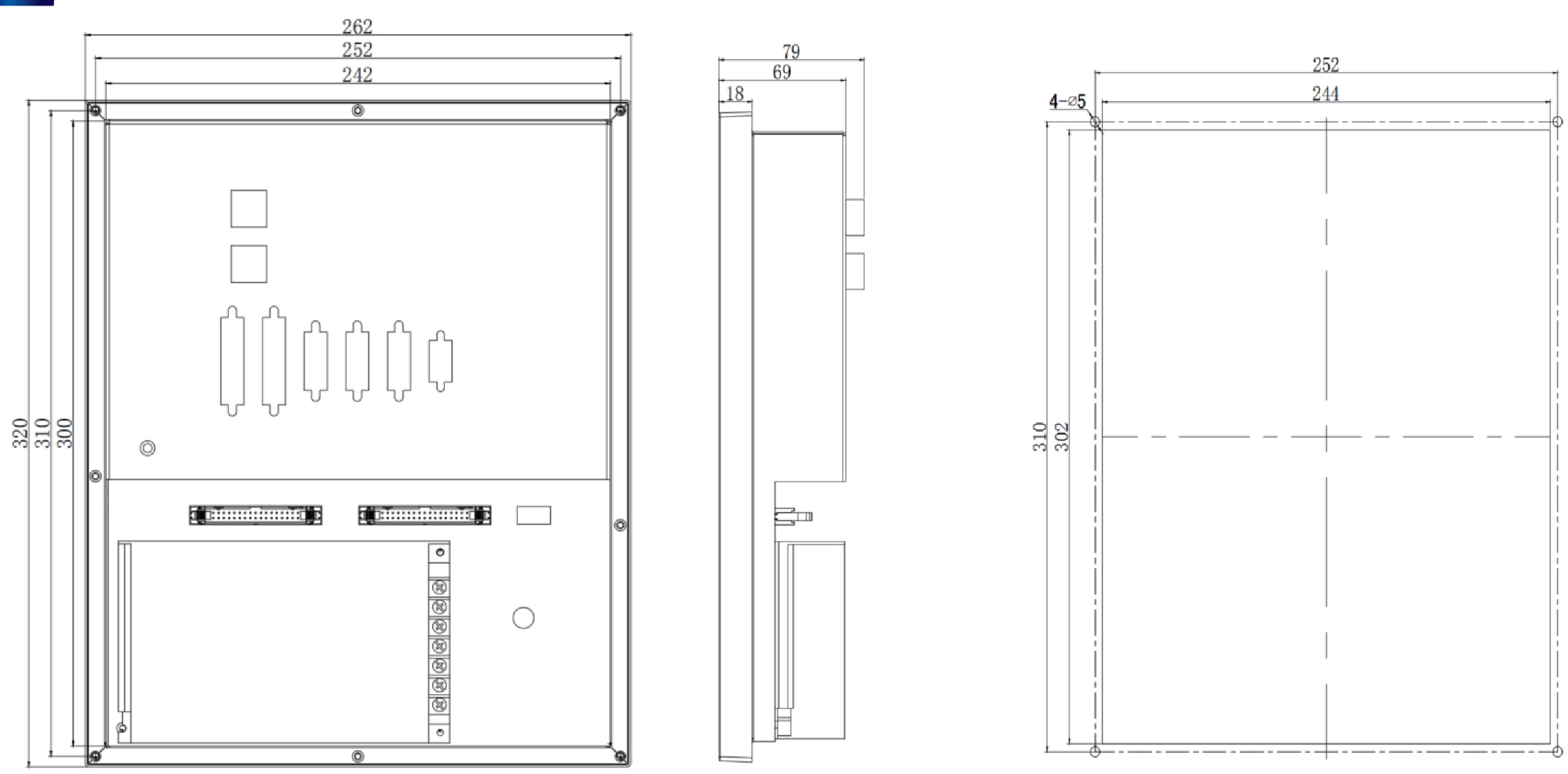
Specific Model:

DF-31S(Bus Type)(Optional touch screen)

Product Positioning:

Drilling and milling equipment, specialized machines, automation

2 SIZE



3 SPECIFICATIONS

Configuration

Max.Controlled Axes	4(Max. 200)
Max.Simultaneous Axes	4(Max. 16)
Max.Channels	1(Max. 64)
Maximum Spindles	4(Max. 48)
DA/AD(motherboard)	2/0
DA/AD(module)	10/5
Transmission	USB/RS232/LAN
Protocol	USB1.1/ModbusRTU/TCP
Drive Interface(plus)	Plus+Dir/AB(1)
Drive Interface(bus)	EtherCAT
I/O(motherboard)	36/14
I/O(module)	512/512
Absolute Value Function	EtherCAT
Screen Size	10.4 inches
Operating System	DFOS
Storage Capacity	256M
Instruction Efficiency	1000B/S
Min. Control Unit	0.000001mm
Max. Tool Compensation Number	256

Program Function

Instructions(G/M Code)	Compatible with ISO
Macro Function	Macro B(Enhanced)
Syntax Highlight/Annotation Function	Supported
BG Editing Function	Supported
Program Name	O+4 digits, any name
DXF Vector Graphics import	Supported
Teach Programming Function	Supported
Program Transmission	U disk, NC assistant software
Program Lock Function	Supported

Axis Control Function

Spindle Synchronization	Supported
Axis/Gantry Synchronization	Supported
Axis Overlap/Exchange/Mixing	Supported
Axis Oscillation	Optional
EGB Synchronization	Optional

Compensation Function

Backlash Compensation	Supported
Screw Error Compensation(two-way)	Supported
Dynamics Screw Error Compensation(Programmable)	Supported
Arc Sharp Angle Compensation	Optional
Forward Compensation	Supported

High Speed And High Precision

Closed Loop Control	Speed control closed-loop (AB feedback/EtherCAT)
Number Of Pre-read Unit	10 ~ 100
Five-Axis Simulataneous(RTCP)	Optional

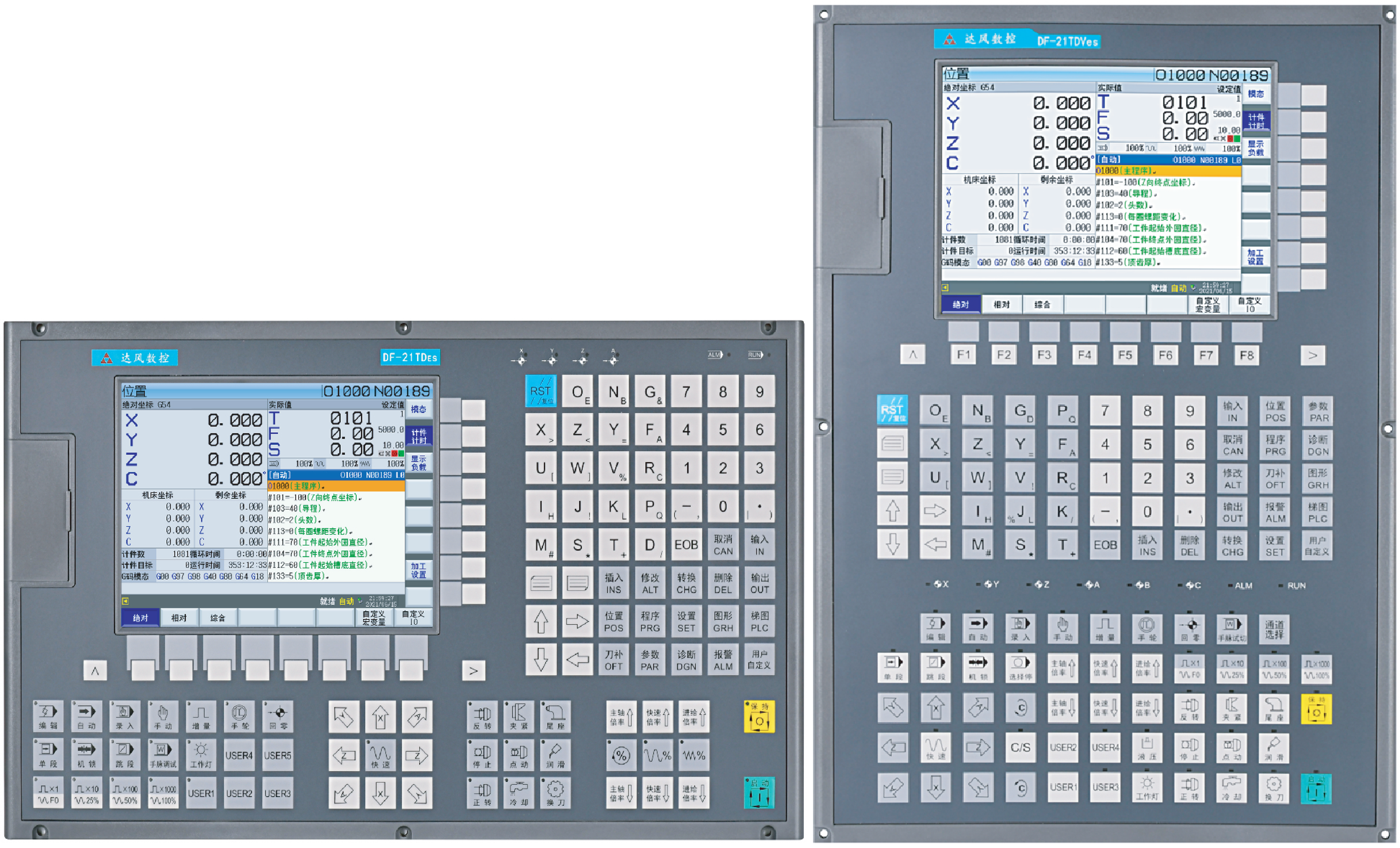
Auxiliary Function

Custom Startup Screen	Supported
Custom M/G Code	Supported
Mixing bus and pulse axes	Supported
IO Redefinition	Supported
Tilted Axis Machining	Supported
Tool Life/Load Management	Supported
Load/speed/tracking error monitoring	Supported
Handwheel Prediction	Supported
Oscilloscope Monitoring	Supported
Authority Management	Operation/Parameter, Program display/Modification
Calendar Lock	Supported、PC/APP
Protection Functions	Safety door, soft/hard limit, dynamic soft limit
Restart Function	Supported
Graphical Simulation	Preview, dynamic drawing, graphic rotation, movement
Multiple Tool Magazines	Disc/Umbrella-Type/Customized Tool Magazine
Automatic Tool Alignment	Supported
Data Backup	Support user data backup

G Code Function

High precision/Smooth Control Mode	Supported
Thread cutting/Thread Milling	Supported
High-speed/Deep Peck Drilling Cycle	Supported
High-speed/Deep eck Tapping Cycle	Supported
Drilling/Tapping Overload Rollback Retry/Pause	Supported
Differential Speed Tapping	Supported
Polar interpolation/Programming mode	Supported

DF-21TD Series



1 DESCRIPTION

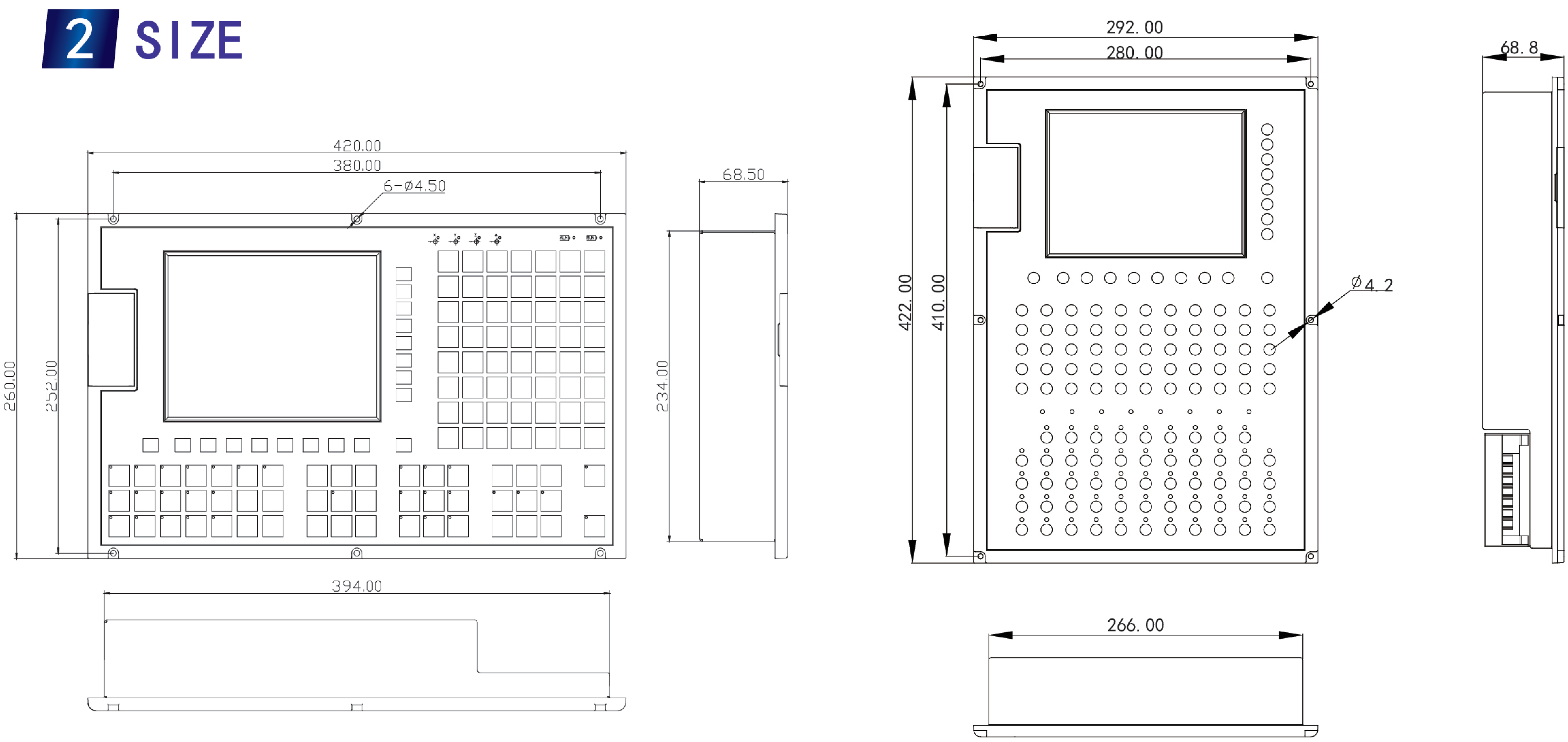
Specific Model: (V indicates vertical style)

DF-21TD(Pulse Type) DF-21TDes(Bus Type)(Multichannel)

Product Positioning :

Standard lathe, Turn-mill composite machine, double head lathe, multi station automation, special machine, ect

2 SIZE



3 SPECIFICATIONS

Configuration

	21TD	21TDes
Max.Controlled Axes	8	64
Max.Simultaneous Axes	8	16
Max.Channels	8	16
Maximum Spindles	8	48
DA/AD(motherboard)	3/0	2/0
DA/AD(module)	Unsupported	10/5
Transmission	USB	USB/RS232/LAN
Protocol	USB1.1	USB1.1/ModbusRTU/TCP
Drive Interface(pulse)	Pulse+Dir(8)	Pulse+Dir/AB(2)
Drive Interface(bus)	Unsupported	EtherCAT
I/O(motherboard)	48/30	64/40
I/O(module)	Unsupported	512/512
Absolute Value Function	Unsupported	EtherCAT
Screen Size	8 inches	
Operating System	DFOS	
Storage Capacity	256M	
Instruction Efficiency	1000B/S	
Min. Control Unit	0.000001mm	
Max. Tool Compensation Number	256	

Program Function

Instructions(G/M Code)	Compatible with ISO
Macro Function	Macro B(Enhanced)
Syntax Highlight/Annotation Function	Supported
BG Editing Function	Supported
Program Name	O+4 digits, any name
DXF Vector Graphics import	Supported
Teach Programming Function	Supported
Program Transmission	U disk, NC assistant software
Program Lock Function	Supported

Axis Control Function

Spindle Synchronization	Supported
Axis Synchronization	Supported
Axis Overlap/Exchange/Mixing	Supported
Axis Oscillation	Optional
EGB Synchronization	Unsupported

Compensation Function

Backlash Compensation	Supported
Screw Error Compensation(two-way)	Supported
Dynamics Screw Error Compensation(Programmable)	Supported
Arc Sharp Angle Compensation	Optional
Forward Compensation	Supported

High Speed And High Precision

Closed Loop Control	Speed control closed-loop (AB feedback/EtherCAT)
Number Of Pre-read Unit	10 ~ 100
Acceleration/Eeceleration Type	Liner/S-Curve

Auxiliary Function

Custom Startup Screen	Supported
Custom M/G Code	Supported
Mixing bus and pulse axes	Supported
IO Redefinition	Supported
Tilted Axis Machining	Supported
Tilted Plane machining	Supported
Tool Life Management	Supported
Tool Load Management	Supported
Load/speed/tracking error monitoring	Supported
Handwheel Prediction	Supported
Handwheel Interrupt	Supported
Multiple Handwheels	Max. 3
Oscilloscope Monitoring	Supported
Authority Management	Operation/Parameter, Program display/Modification
Calendar Lock	Supported、PC/APP
Protection Functions	Safety door, soft/hard limit, dynamic soft limit, overload rollback
Data Backup	Support user data backup
Restart Function	Supported
Graphical Simulation	Preview, dynamic drawing, graphic rotation, movement

Cutting Function

Polar/Cylinder Interpolation	Supported
Polyon Cutting	Supported
Thread Cutting	Cycle、Multi-start、Circular、Helical、Variable Pitch
Tapping	G84/G88、Support Differential Speed Tapping
Chip Breaking Function	Straight Lines, Arcs, And Threads

DF-21MD Series

1 DESCRIPTION

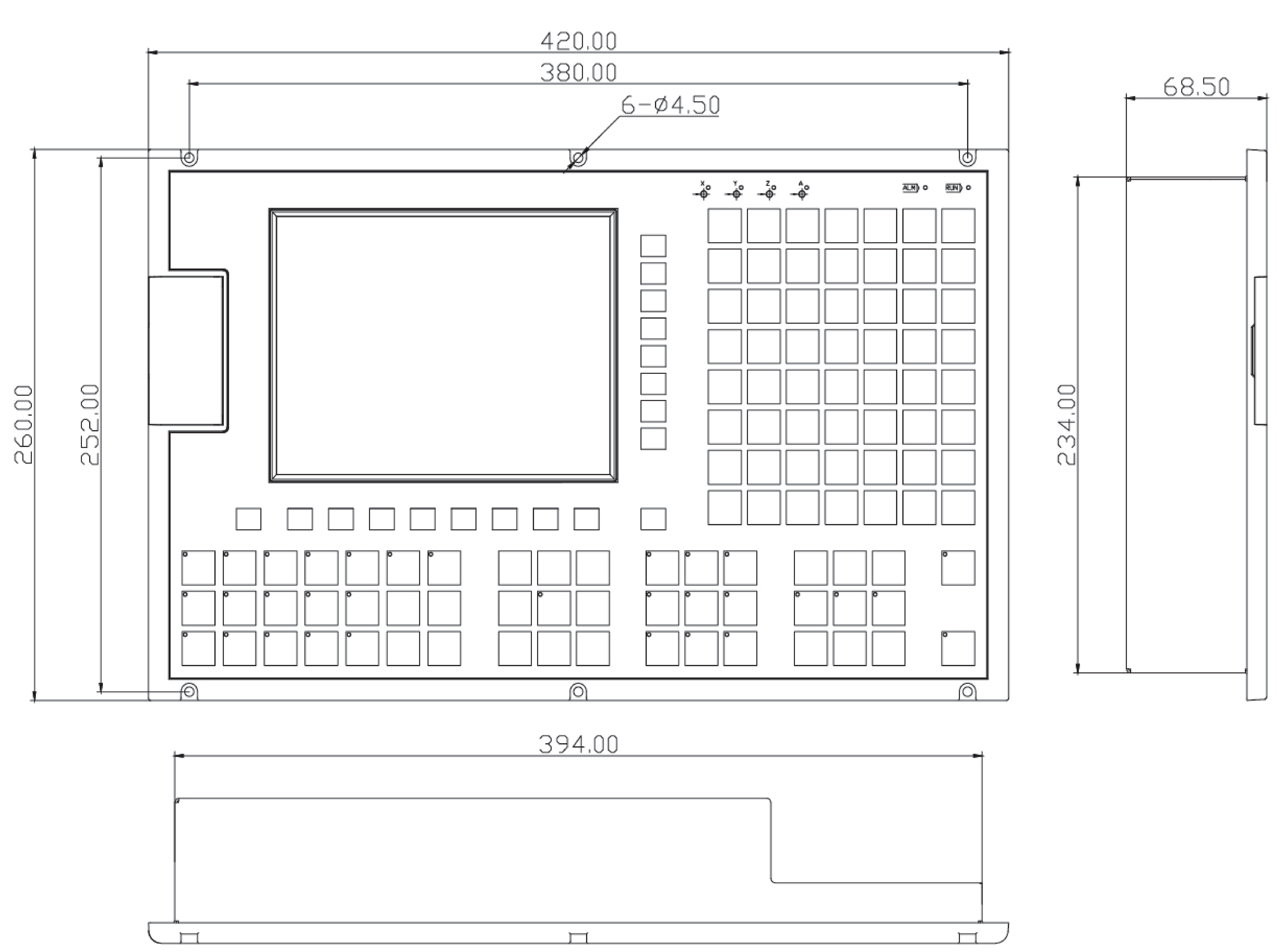
Specific Model: (V indicates vertical style)

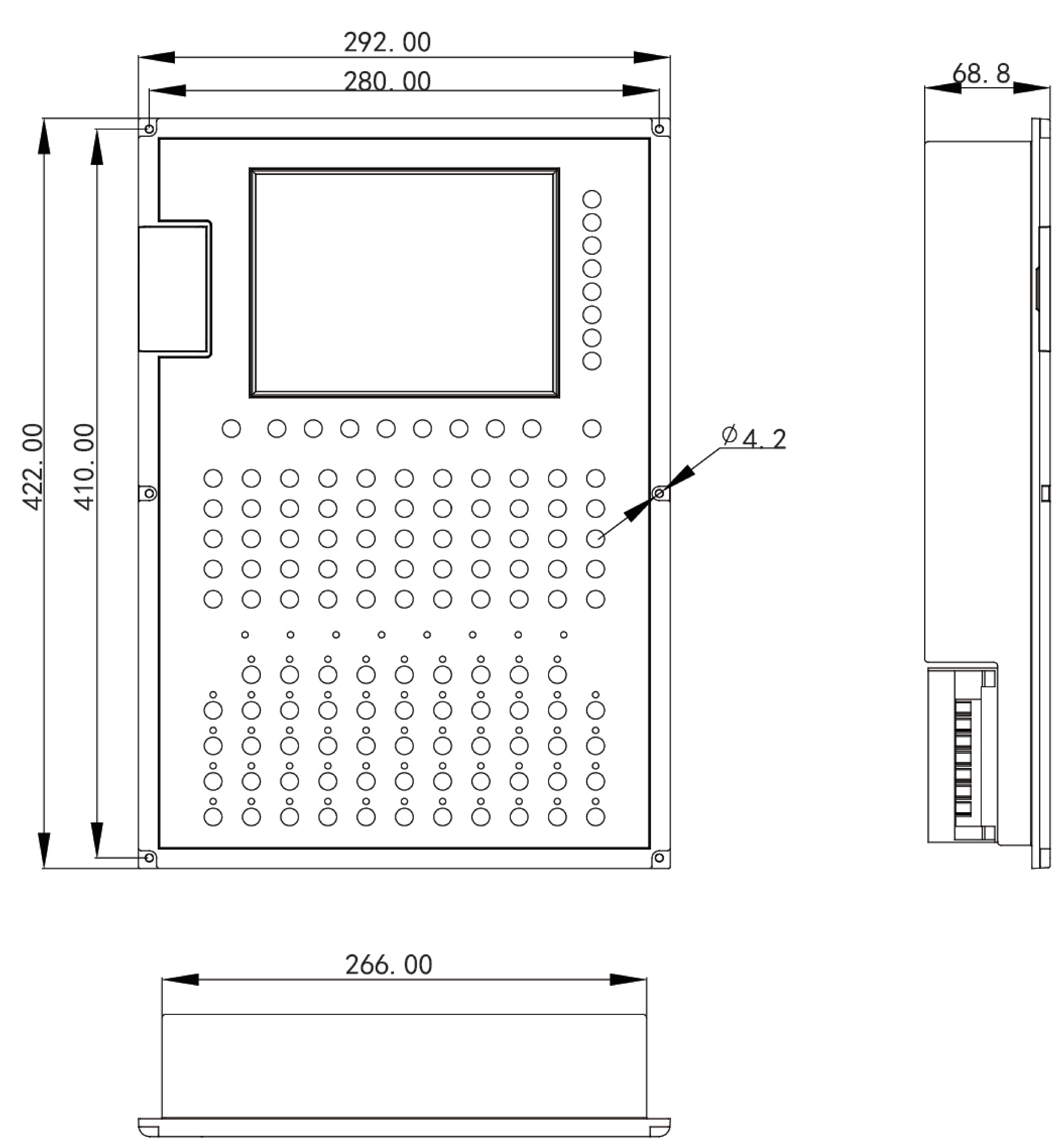
DF-21MD (Pulse Type)   DF-21MDes (Bus Type) (Multichannel)

Product Positioning :

Standard milling machine, machining center, drilling center, multi station automation, specialized machine, etc

2 SIZE





3 SPECIFICATIONS

Configuration

Configuration	21MD	21MDes
Max.Controlled Axes	8	64
Max.Simultaneous Axes	8	16
Max.Channels	8	16
Maximum Spindles	8	48
DA/AD(motherboard)	3/0	2/0
DA/AD(module)	Unsupported	10/5
Transmission	USB	USB/RS232/LAN
Protocol	USB1.1	USB1.1/ModbusRTU/TCP
Drive Interface(pulse)	Pulse+Dir(8)	Pulse+Dir/AB(2)
Drive Interface(bus)	Unsupported	EtherCAT
I/O(motherboard)	48/30	64/40
I/O(module)	Unsupported	512/512
Absolute Value Function	Unsupported	EtherCAT
Screen Size	8 inches	
Operating System	DFOS	
Storage Capacity	256M	
Instruction Efficiency	1000B/S	
Min. Control Unit	0.000001mm	
Max. Tool Compensation Number	256	

Program Function

Instructions(G/M Code)	Compatible with ISO
Macro Function	Macro B(Enhanced)
Syntax Highlight/Annotation Function	Supported
BG Editing Function	Supported
Program Name	O+4 digits, any name
DXF Vector Graphics import	Supported
Teach Programming Function	Supported
Program Transmission	U disk, NC assistant software
Program Lock Function	Supported

Axis Control Function

Spindle Synchronization	Supported
Axis/Gantry Synchronization	Supported
Axis Overlap/Exchange/Mixing	Supported
Axis Oscillation	Optional
EGB Synchronization	Unsupported

Compensation Function

Backlash Compensation	Supported
Screw Error Compensation(two-way)	Supported
Dynamics Screw Error Compensation(Programmable)	Supported
Arc Sharp Angle Compensation	Optional
Forward Compensation	Supported

High Speed And High Precision

Closed Loop Control	Speed control closed-loop (AB feedback/EtherCAT)
Number Of Pre-read Unit	10 ~ 100
Five-Axis Simulataneous(RTCP)	Optional

Auxiliary Function

Custom Startup Screen	Supported
Custom M/G Code	Supported
Mixing bus and pulse axes	Supported
IO Redefinition	Supported
Tilted Axis Machining	Supported
Tool Life/Load Management	Supported
Load/speed/tracking error monitoring	Supported
Handwheel Prediction	Supported
Oscilloscope Monitoring	Supported
Authority Management	Operation/Parameter, Program display/Modification
Calendar Lock	Supported、PC/APP
Protection Functions	Safety door, soft/hard limit, dynamic soft limit, overload rollback
Restart Function	Supported
Graphical Simulation	Preview, dynamic drawing, graphic rotation, movement
Multiple Tool Magazines	Disc/Umbrella-Type/Customized Tool Magazine
Automatic Tool Alignment	Supported
Data Backup	Support user data backup

G Code Function

High precision/smooth control mode	Supported
Thread cutting/thread milling	Supported
High-speed/Deep peck Drilling Cycle	Supported
High-speed/Deep peck Tapping Cycle	Supported
Drilling/Tapping Overload Rollback Retry/Pause	Supported
Differential Speed Tapping	Supported
Polar interpolation/Programming mode	Supported

DF-21GD Series

1 DESCRIPTION

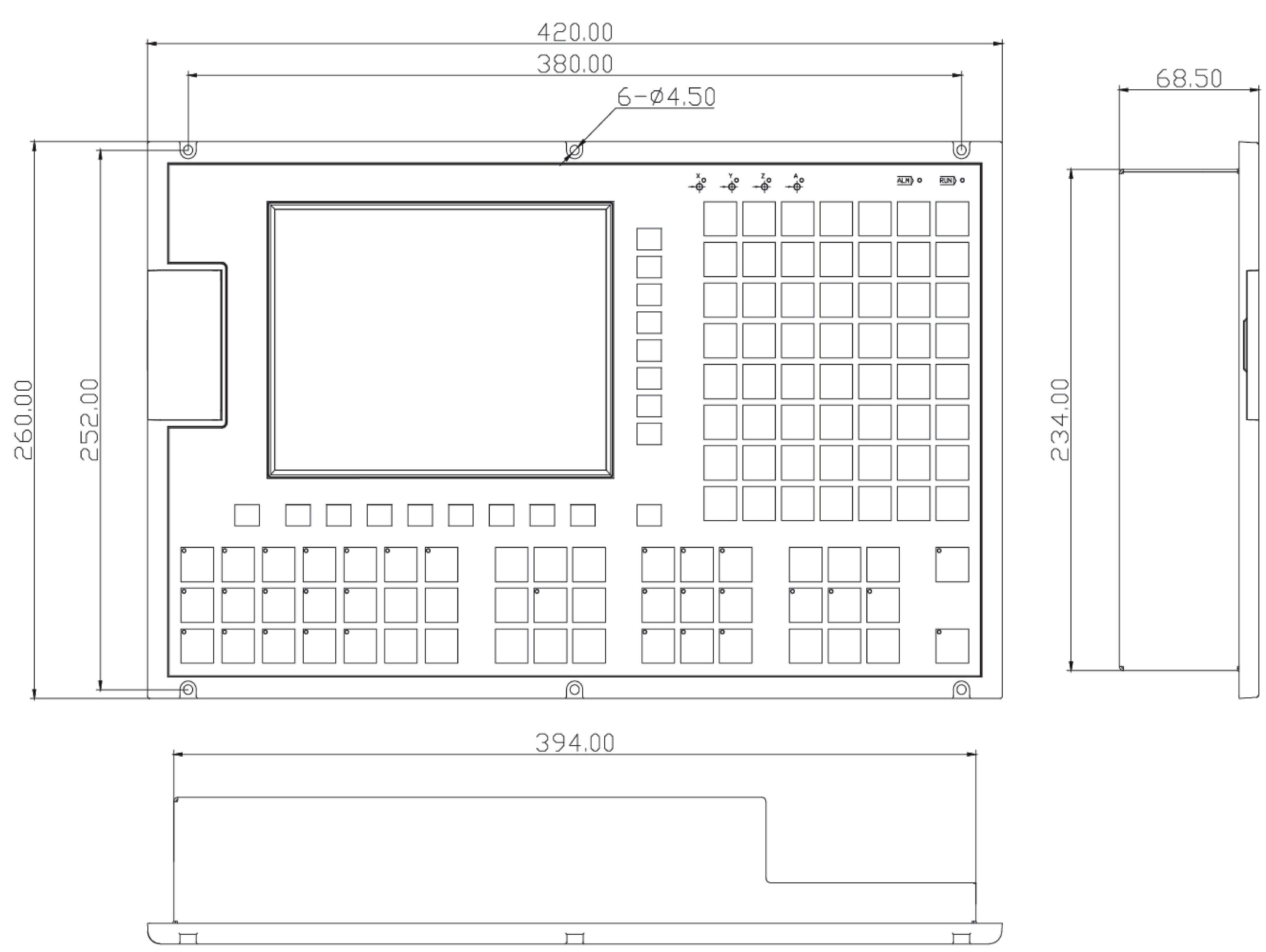
Specific Model:

DF-21GD(Pulse Type)   DF-21GDes(Bus Type)(Multichannel)

Product Positioning:

Internal and external circular grinding, face grinding, tool grinding, circular table grinding, multi station automation, special machine

2 SIZE



3 SPECIFICATIONS

Configuration

	21GD	21GDes
Max.Controlled Axes	8	64
Max.Simultaneous Axes	8	16
Max.Channels	8	16
Maximum Spindles	8	48
DA/AD(motherboard)	3/0	2/0
DA/AD(module)	Unsupported	10/5
Transmission	USB	USB/RS232/LAN
Protocol	USB1.1	USB1.1/ModbusRTU/TCP
Drive Interface(pulse)	Pulse+Dir(8)	Pulse+Dir/AB(2)
Drive Interface(bus)	Unsupported	EtherCAT
I/O(motherboard)	48/30	64/40
I/O(module)	Unsupported	512/512
Absolute Value Function	Unsupported	EtherCAT
Screen Size	8 inches	
Operating System	DFOS	
Storage Capacity	256M	
Instruction Efficiency	1000B/S	
Min. Control Unit	0.000001mm	
Max. Tool Compensation Number	256	

Program Function

Instructions(G/M Code)	Compatible with ISO
Macro Function	Macro B(Enhanced)
Syntax Highlight/Annotation Function	Supported
BG Editing Function	Supported
Program Name	O+4 digits, any name
DXF Vector Graphics import	Supported
Teach Programming Function	Supported
Program Transmission	U disk, NC assistant software
Program Lock Function	Supported

Axis Control Function

Spindle Synchronization	Supported
Axis Synchronization	Supported
Axis Overlap/Exchange/Mixing	Supported
Axis Oscillation	Optional
EGB Synchronization	Unsupported

Compensation Function

Backlash Compensation	Supported
Screw Error Compensation(two-way)	Supported
Dynamics Screw Error Compensation(Programmable)	Supported
Arc Sharp Angle Compensation	Optional
Forward Compensation	Supported

High Speed And High Precision

Closed Loop Control	Speed control closed-loop (AB feedback/EtherCAT)
Number Of Pre-read Unit	10 ~ 100
Acceleration/Eeceleration Type	Liner/s-curve

Auxiliary Functions

Custom Startup Screen	Supported
Custom M/G Code	Supported
Mixing bus and pulse axes	Supported
IO Redefinition	Supported
Tilted Axis Machining	Supported
Load/speed/tracking error monitoring	Supported
Handwheel Prediction	Supported
Handwheel Interrupt	Supported
Multiple Handwheels	Max. 3
Oscilloscope Monitoring	Supported
Authority Management	Operation/Parameter, Program display/Modification
Calendar Lock	Supported、PC/APP
Protection Functions	Safety door, soft/hard limit, dynamic soft limit, overload rollback
Data Backup	Support user data backup
Graphical Simulation	Preview, dynamic drawing, graphic rotation, movement
Measuring Support	End face /outer diameter /data communication
Quick Compensation Function	Supported
Retreat Function	Supported

Grinding Function

Electronic Cam	Supported
Eccentric Circle/ellipse Following Motion	Supported
Fixed Grinding Process	Multi step/rough and fine polishing
Fixed Grinding Cycle	G71~G74
G31 Skip Function	Supported

Digital AC Servo Unit

Model Description:

LS – 30 P S i
① ② ③ ④ ⑤

①: LS-220V HS-380V
HSA-380V (2 axes + 1 spindle)

②: Module Power(0.1 KW), 30、50、75

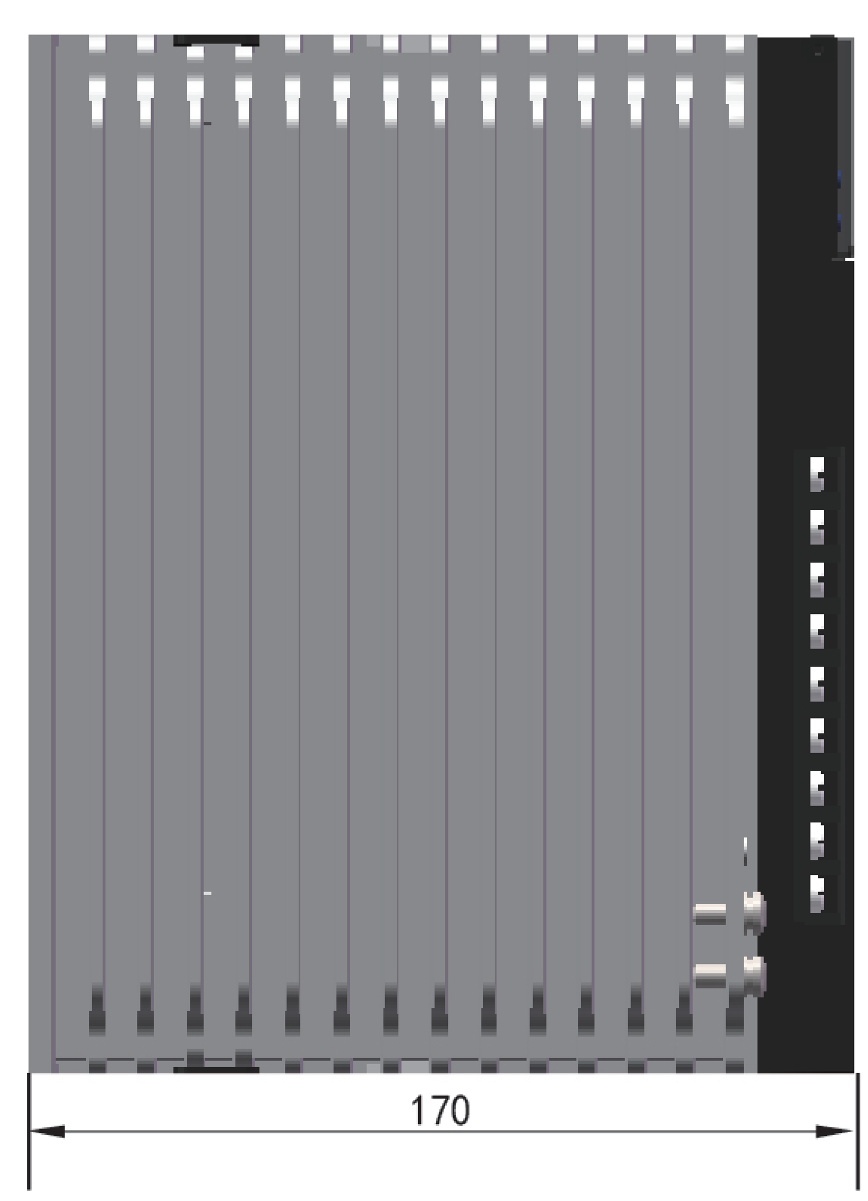
③: P-Pulse
E-EtherCAT

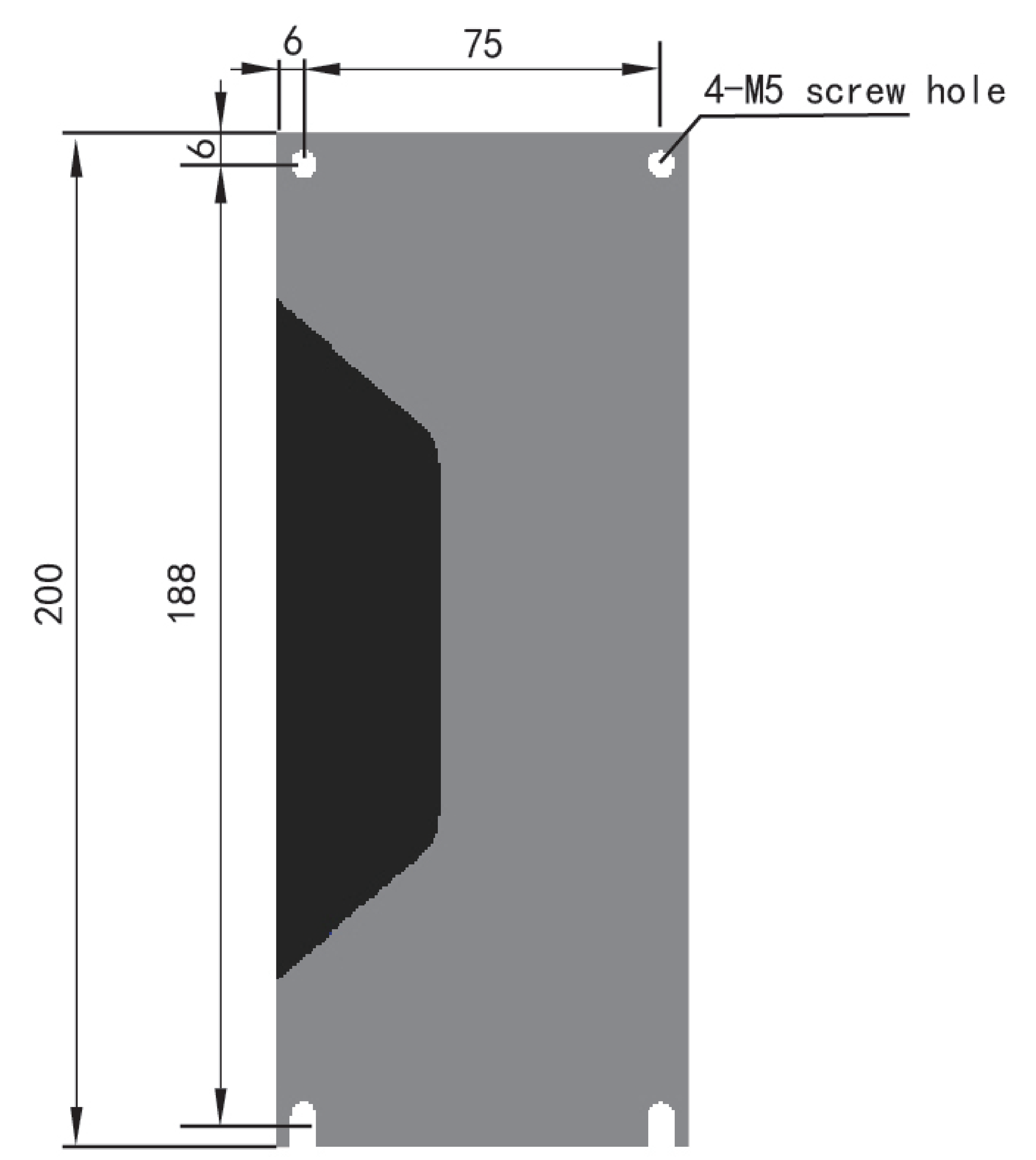
④: S-Single channel
D-Dual channel
T-Three channels

⑤: i-Equipped with extended module

Specification: LS-30PS LS-30ES

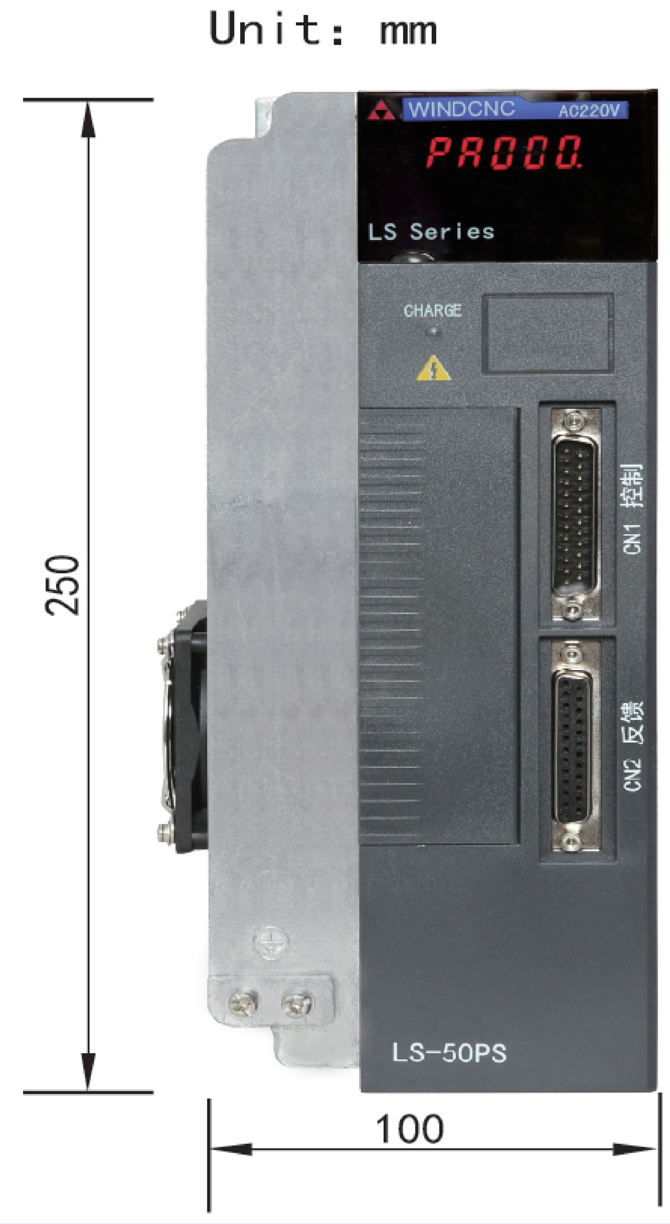
Unit: mm

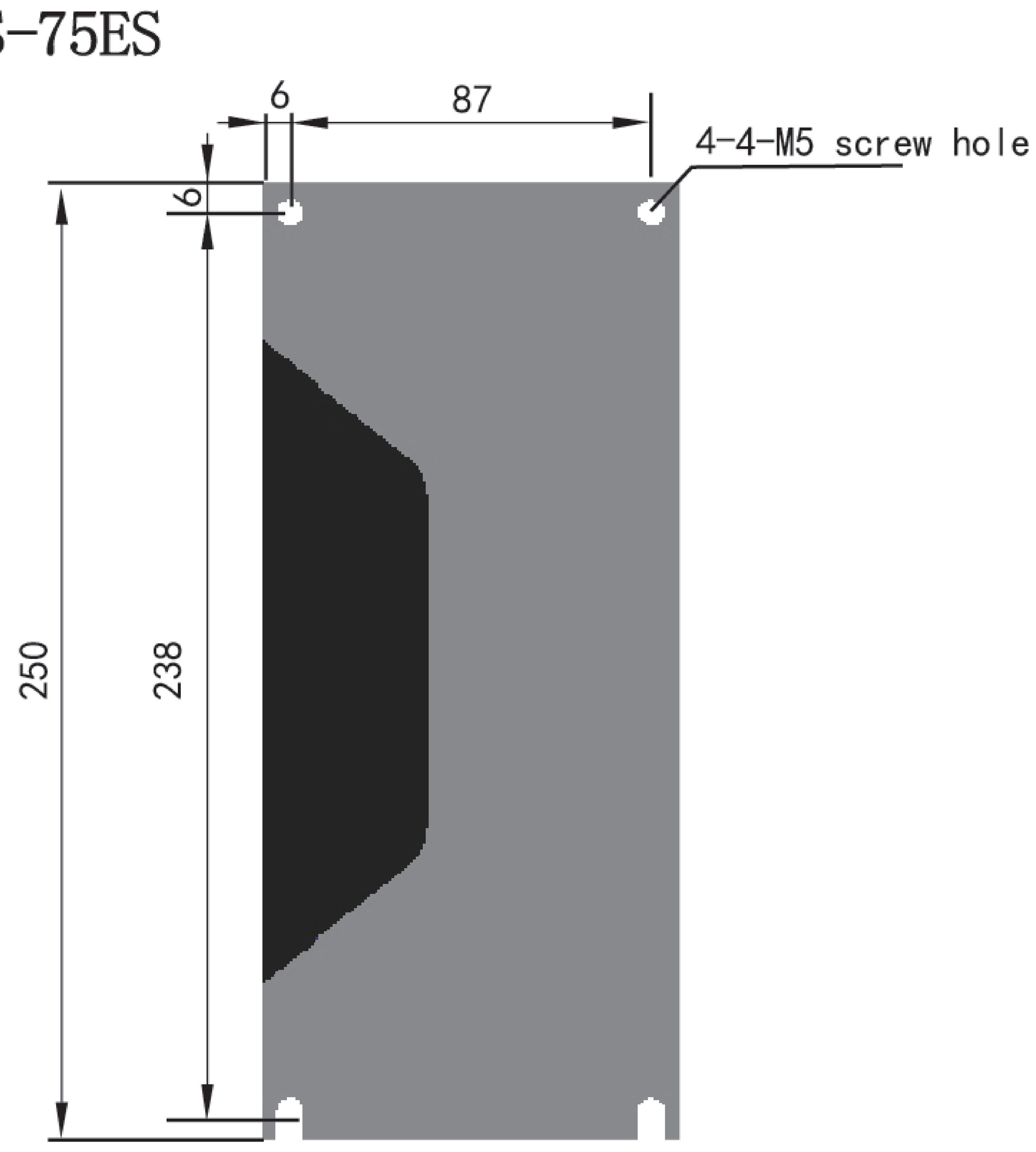




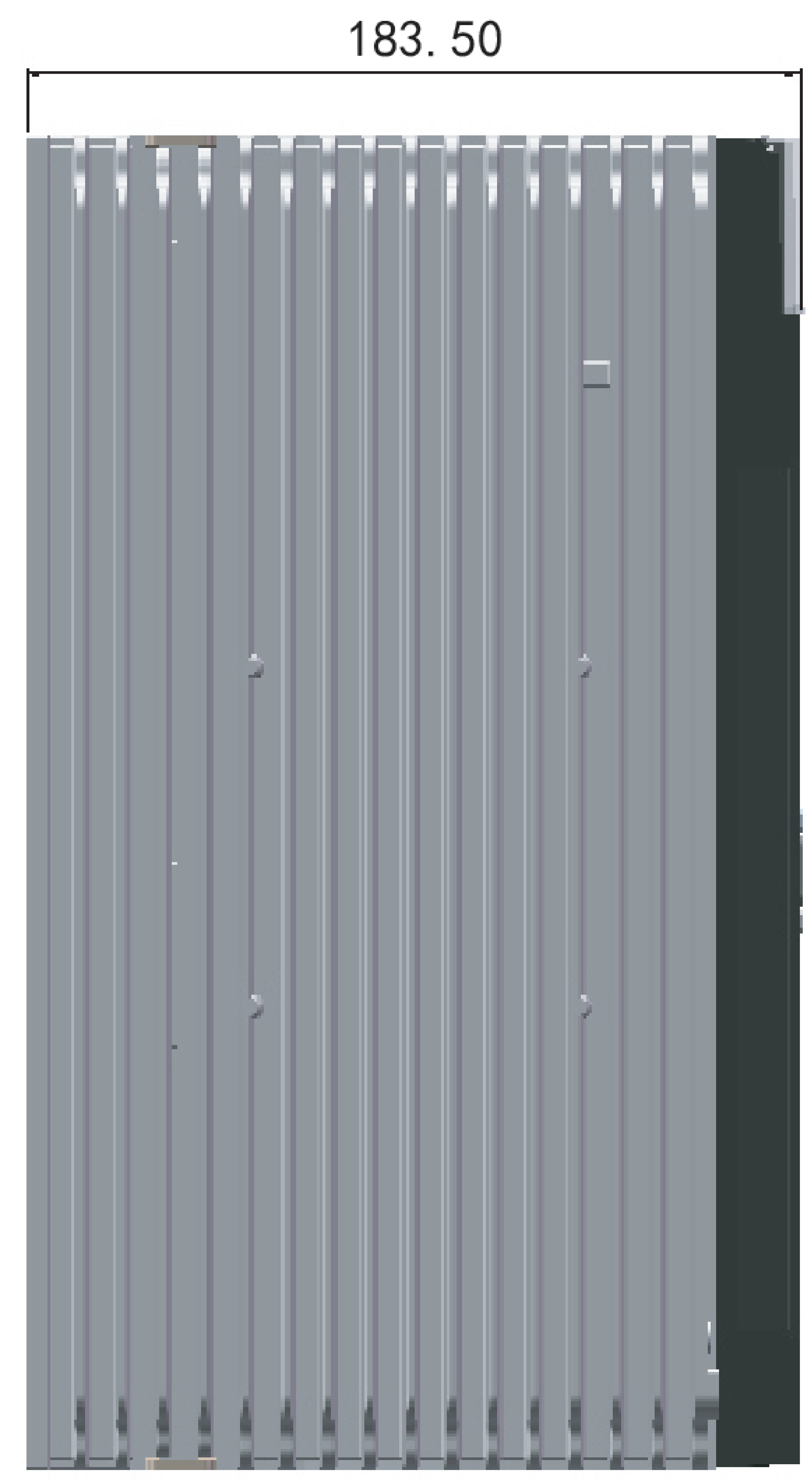
Specification: LS-30PD LS-50PD LS-75PD LS-30ED LS-50ES LS-75ES

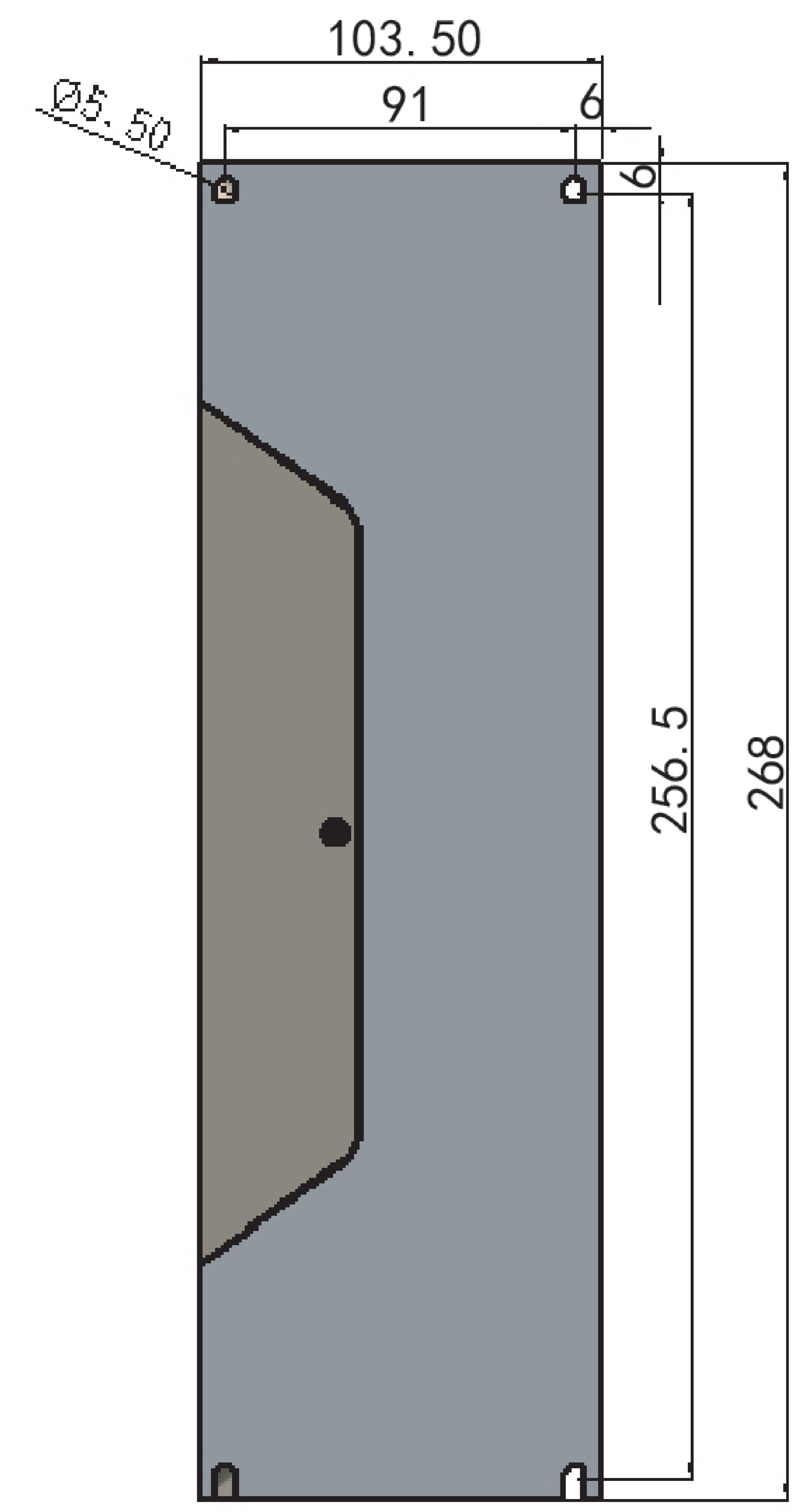
Unit: mm





Specification: LS-20ET LS-30ET





Specification List

Project		Content
Control Mode		Pulse position control, bus position and torque control, JOG , analog speed mode control
Encoder Feedback		Incremental(2500 lines, supports line saving). Tamagawa/nemicon 17/23 bit absolute value encoder
Control Characteristic	Speed Control Range	1: 10000 (the lower limit of the speed control range is stable operation without crawling at rated load)
	Velocity Response	1K Hz
	Velocity Fluctuation (℃)	25±25℃: below±0.01%(rated speed)
	Velocity Fluctuation (V)	At rated voltage ± 10%: 0% (at rated speed)
	Velocity Fluctuation (%)	At 0-100% load: ± 0.01% or less (at rated speed)
Position Control	Pulse Input Type	Direction+pulse, CW+CCW pulse, AB orthogonal pulse
	Pulse Input Frequency	≤ 500K Hz
	Pulse Input Form	Support linear drive and open collector
Analog Control		DC voltage input, 0-10V
Encoder Frequency Division Pulse Output		A-phase, B-phase, C-phase: divided pulse output: can be set arbitrarily
Protection Function		Overcurrent, overvoltage, undervoltage, overload, overspeed, regeneration fault, etc
Monitoring Function		Speed, current position, accumulated command pulses, position deviation, motor current, etc
Auxiliary Functions		Gain adjustment, alarm recording, JOG operation, origin search, etc
Intelligent Functions		Adaptive filter, gain self-learning, inertia self-learning
Applicable Load Inertia		Less than 5 times the inertia of the motor
Adapt Motor		Frame: 60, 80, 90, 110, 130, 150, 180. Motor brands: Mig, Huada, etc

Expansion Module Project	Content
Input/Output	16 inputs (NPN/PNP), 18 outputs (NPN, transistor type)
Analog Output	1 channel, DC 0~10V
Power Supply	DC 24V