CNCmakers Limited

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GSK983M Milling Machine CNC System

Introduction

GSK983M-S is employed with 640×480 high resolution and high light LCD display about 7.5 inch, and GSK983M-V with 640×480 high resolution and high light 16 colors display about 10.4 inch. The two CNC systems are high speed, high precise and high efficient with high performance-cost and high reliability.

GSK983M-S   **GSK983M-V**

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Characteristics：

High Precise Machining

It is adopted with high performance position closed-loop control chip and high precise position detection components to realize the high precise and high response position control. The machinery errors such as the pitch error of ball lead can be corrected by the memory pitch error compensation. The federate override can be automatically regulated at the corner.

High Speed Machine

When the resolution is 1μm, max. rapid speed is up to 60m/min and max. feedrate to 30m/min, which are applied to the control of milling machine and machining center. The system is adopted with many high speed CPUs to dispersedly process it, which has realized the continuously high speed machining for the tiny block. It can execute 1000 blocks in a second, which is specially applied to high speed mold machining, auto component machining, wool machinery and laser machining machine tool control.

High speed DNC Function

The exclusive high speed buffer serial DNC interface with 38,400 baud rate is connected with the computer or U disk to realize the high speed DNC machining.

Abundant Control Function

It is employed with 3（up to 5） feed axes, 1 spindle, tool life management, direct drawing dimension programming, scale zoom, coordinate system rotating, compound fixed cycle, back stage edit, graphic display, exclusive user macro program to realize the special machinery machining.

Powerful Built-in PLC

Built-in machine tool sequence control and large capacity PLC for the peripheral equipment.
 Maximum I/O: 192 input signals and 128 output signals (I/O points include I/O on the operation panel and I/O unit)， I/O unit includes 64 input signals and 40 output signals, and program capacity is up to 2,000 steps (PLC-A type).

Compact and Ultra-thin CNC

 It is adopted with the latest high integrated FPGA, CPLD chip to reduce the dimension of the control units.

IT IS CONNECTED WITH CNC BY THE HIGH SPEED SERIAL COMMUNICATION TO SAVE THE ASSEMBLY LINE.

Machine Operation Panel

 It has up to 44 mechanical keys with a LED indicator for each. Their function specified by PLC programming and also they can correspondingly be connected with the selection switches of feedrate override, spindle override, MPG override and coordinate axis. Separated structure: it is connected with CNC by the high speed serial communication interface to save the wire.

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Specification

NC function		
Controlled axis	Controlled axis and link axis: up to 5 feed axes, 1 spindle and 5 link axes	
	Standard allocation: 3 axes and 3 links, optional allocation:4 axes and 3 links, 4 axes and 4 links, 5 axes and 3 links, 5 axes and 4 links, 5 axes and 5 links.	
	Interpolation method: linear（G01）, arc（G02, G03），sine（G07）	
	Max. stroke: metric:±99999.999mm；inch:±9999.9999inch	
	Setting increment：	Least input increment：0.001mm/metric 0.0001inch/inch
		Least increment：X axis：0.001mm/metric 0.0001inch/inch
		Y axis：0.001mm/metric 0.0001inch/inch
		Z axis：0.001mm/metric 0.0001inch/inch
	Max. traverse rate	60,000mm/min or 2400inch/min
	Max. feedrate	G94：30,000mm/min or 1200.00inch /min
		G95: 500.00mm/rev or 50.0000inch/rev
	Automatic acceleration/deceleration: the system automatically executes the linear acceleration/deceleration to shorten the positioning time when the rapid feed is executed in Jog or Auto mode	
	Automatic acceleration/deceleration in cutting feed mode: the exponential automatic acceleration/ deceleration is executed in the cutting feed or manual continuous feed mode, and its time constant can be set by the related parameters from 8ms to 4000ms.	
	Soft tapping function (standard allocation function); rigid tapping function (optional function).	
	Buffer register: advance to read the commands of the following two blocks to eliminate the interruption of NC command caused by reading the commands to improve the working efficiency.	
G commands	66 kinds of G command: G00, G01, G02, G03, G04, G07, G09, G10, G17, G18, G19, G20, G21, G22, G23, G27, G28, G29, G30, G31, G33, G40, G41, G42, G43, G44, G45, G46, G47, G48, G49, G50, G51, G54, G55, G56, G57, G58, G59, G60, G61, G62, G64, G65, G66, G67, G73, G74, G76, G80, G81, G82, G83, G84, G85, G86, G87, G88, G89, G90, G91 G92, G94, G95, G98, G99	
MSTB function	Tool function：●T2 digit/T4 digit ●99 groups tool offset ●tool position offset ●tool length compensation ●tool nose radius compensation B/C	
	● communication input of tool offset value ● tool length measure	
	Spindle function S：●S2 digit/ S4 digit A(12 digit BCD output/analog output) ●S4 digit B(12 digit BCD output/analog output）（4-grade gear input）● max. spindle speed limit.	
	auxiliary function M：specified by the sequential 2 digits after address M.	
	End of program：M02, M30，program stop：M00，optional stop：M01，subprogram call：M98，end of subprogram：M99. Other M functions can exclusively be defined by user.	
	The second auxiliary function B: it is specified by the sequential 3 digitals behind B, and BCD signals of the three digitals are transmitted to the machine side. The function is used for the positioning of graduation worktable,	
Precision compensation	●stored pitch error compensation: compensate the error caused by machine position to improve the processing precision and the compensated data is stored to the memory.	
	●backlash compensation: compensating the loss momentum of machine	

Precision compensation	Tool length compensation and tool nose radius compensation：the tool length compensation is executed by G commands（G43，G44，G49）and the tool nose radius compensation by (G40，G41，G42), the compensation value for every tool is stored to the memory. Max. compensation value: ±999.999mm or ±99.9999inch.
Reliability and safety	●emergency stop；●overtravel；●stored stroke limit；●NC ready signal；●servo ready signal； ●MST functional completion signal；●start signal in automatic run；●automatic running signal；●feed hold indicator signal；●safety door interlock signal；
	NC alarm：●program error and operation error；●overtravel error；●servo system error；●connection error, data transmission error between MDI and CRT, PLC error；●memory（ROM and RAM）error； More than 1,000 alarm signals to provide for the system to get the stable operation and troubleshooting.
	Self-diagnosis: execute the following checks：●system abnormity；●position control abnormity；●servo system abnormity；●CPU abnormity；●ROM abnormity；●RAM abnormity；●data transmission between MDI and the machine operation panel；●RS232 read abnormity；●PC data transmission abnormity and so on.
Operation	●dry run ●interlock● single block ● optional skip block ●manual absolute value ON/OFF ●auxiliary function lock(M. S.T lock) ●machine lock ●feed hold ●cycle start ●overtravel release ●emergence stop ●external reset signal ●external power supply ON/OFF ●manual continuous feed ●incremental feed ●MPG ●skip ●additional optional block skip ●rapid feed overshoot ●manual insertion function ●sequence number search ●program number search ●external workpiece number research ●external data input ●sequential number comparison stop ●program start again ●menu switch ●graph display ●external position display
Display	●983M-S: 7.4inch 640×480 homochrome LCD screen
	●983M-V: 10.4 inch 640×480
	●system parameter, diagnosis number, alarm number, macro variable value, tool offset setting, MDI command, MST state ● actual axis speed, ● machining path graph ● Run time and other NC commands and state information
PLC function	Control method：cycle run; run speed:15us/step for basic command
	Input/output：192/128,PLC capacity 2000 steps
	Development method: PLC command or ladder diagram
	Command amount: 34 including 12 basic commands and 22 function
DNC function	Serial DNC can be connected with U disk (option)

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Ordering Type and Configuration

Ordering Type

Type	Explanation
GSK983M-S-3	3-axle linkage
GSK983M-S-3R	3-axle linkages, with rigid tapping function.
GSK983M-S-4	There are two forms: one is 4-axle linkage, the other is 3-axle linkage and index worktable, which are determined by factory parameter. If the user does not require for the parameter, the factory parameter is then 4-axle linkage.
GSK983M-S-4R	The rigid tapping function applies. There are two forms for 4-axle linkage or 3-axle linkage and index worktable (The details are determined by the factory parameter, if the user does not require for the parameter, the factory parameter is then 4-axle linkage)
GSK983M-V-3R	3-axle linkage, with rigid tapping functions.
GSK983M-V-4R	With rigid tapping function. There are two forms of 4-axle linkage or 3-axle linkage and index worktable (The details are determined by the factory parameter, if the user does not require for the parameter, the factory parameter is 4-axle linkage)

Note: All types are contain the spindle function, if a type with rigid tapping function is ordered by user, do let the user match a servo spindle of our company.

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Configuration

● GSK983M-S Product Configuration

①Unit Configuration

Unit Name		Configuration Type	Configuration Explanation	Remark
System unit	CPU board	Standard	With high speed DNC function	The PLC version can be selected or edited by the user himself.
	I/O board	Standard	With LCD and DNC interfaces	
	Position control board	Standard	GSK983M-S-3: 3-axis board GSK983M-S-3R: 3-axis board GSK983M-S-4: 4-axis board GSK983M-S-4R: 4-axis board	The drive ratio must be considered to shift by setting different skip method on the position control panel before offering to the user.
983 I/O unit		Standard	large I/O unit	A standard configuration is canceled when the user selects a optional configuration
		Standard	Mini I/O unit (with a mini relay)	
MDI/LCD panel unit		Standard	7.4 inch LCD	If the standard configuration is a Chinese interface, the English can be selected; when the standard configuration of a mask is Chinese and when the interface is English, the English mask can be selected correspondingly.
Machine operation panel unit		Standard	Facilitation standard panel (MPG on a panel)	The standard configuration elements are canceled when the user selects an optional configuration. When the interface is English, the mask on the panel can be selected to the English mask correspondingly.
		Optional	Facilitation standard panel (without MPG on a panel) and external MPG box	
USB conversion module		Optional	The machining is performed by connecting the external U disk and reading the machining program.	The 5V power supply, U disk and User manual should be offered to the user when the user selects this configuration element.
Power supply (Mingwei SP-100-24)		Standard	For 983M power supply	Input 100~240VAC Output 24VDC/4.2A

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② Cable Configuration

Cable Name	Configuration Type	Q'ty (pcs)	Length (m)	Explanation	Remark
RS232 communication cable	Standard	1	5	For the connection communication of system RS232 and PC machine	Offering the welded cable
RS232 transit cable	Standard	1	5	The system RS232 connects electric cabinet	
MPG connection cable	Standard	1	5	① Using for the connection of the system and MPG panel ② When the user selects an external MPG, the connection cable system terminal is DB9 male socket welding, and the other terminal is loose cable terminal	
983M-S MPG box transit cable	Standard	1	In terms of the request of user	This cable is standard configuration element as long as a user selects external MPG, or the standard configuration may be canceled.	
Keyboard connection cable	Standard	1	5	Using for the connection of a system a keyboard	
Display connection cable	Standard	1	5	Using for a system and a LCD	
Operation panel communication cable	Standard	1	5	Using for the connection of a system and an operation panel communication	
I/O unit communication cable	Standard	1	2	Using for the connection of a system and a I/O unit communication	
24V cable	Standard	2	2	Using for a system and +24V power supply of a I/O unit	
		2	5	Using for a machine operation panel and +24V power supply of MDI/LCD panel	
983M with drive unit signal cable	Standard	In terms of the number of feed axis	1.5	Using for the connection of a system and a feed axis drive unit	
983M with spindle transformer signal cable	Standard	1	2	For the connection of a system and a spindle transformer, the spindle with or without an encoder is the welding method of cable.	The transformer cable is canceled when the user optionally selects the spindle servo drive unit
983M-S with spindle servo drive unit signal cable	Optional	1	2	Using for the connection of a system and a spindle	

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③ Attachment Configuration

| Attachment Name	Configuration Type	Q'ty	Remark
6-digit socket	Standard	1 piece	Using for the machine miscellaneous panel MT1 interface
3-digit socket	Standard	4 pieces	Using for 24V power supply
2-digit socket	Standard	1pieces	Using for the interface of system position control board PR1
Communication CD	Standard	1 piece	Communication software CD
PLC CD	Optional	1 piece	Programming tool of PLC
PLC programming manual	Optional	1 piece	Offering with PLC CD
983M operation manual	Standard	2 copies	Each copy of volume I and II
983M-S installation connection manual	Standard	1 copy	
DC 5V power supply	Offering with the USB conversion module	1 copy	
Aigo U disk (1G, type: UF-237)		1 copy	
User Manual of USB conversion module		1 copy	

Note: When GSK983M-S/GSK983M-V is matched with the leading screw for improving the checking precision of a system, and if the corresponding motor type of increment 5000 cable of the encoder has been installed inside the motor (refer to the type of servo motor), then the incremental 5000 cable motor type of the encoder should be selected while an order releases.
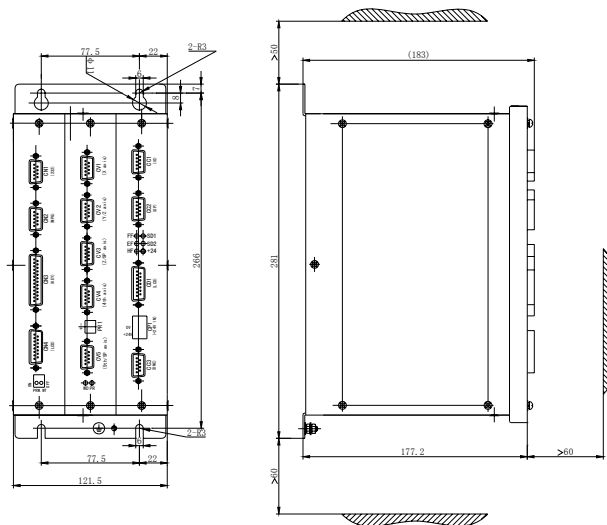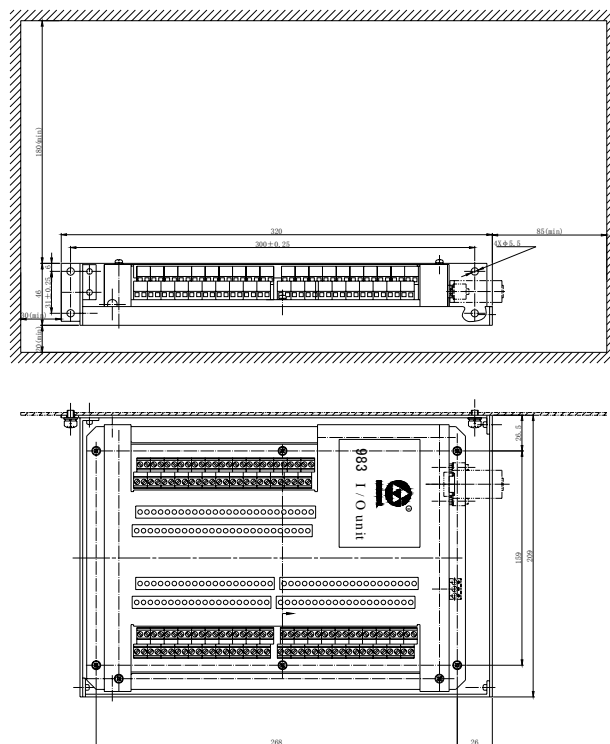
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Installation dimension 983M-S MDI/LCD panel and machine operation panel
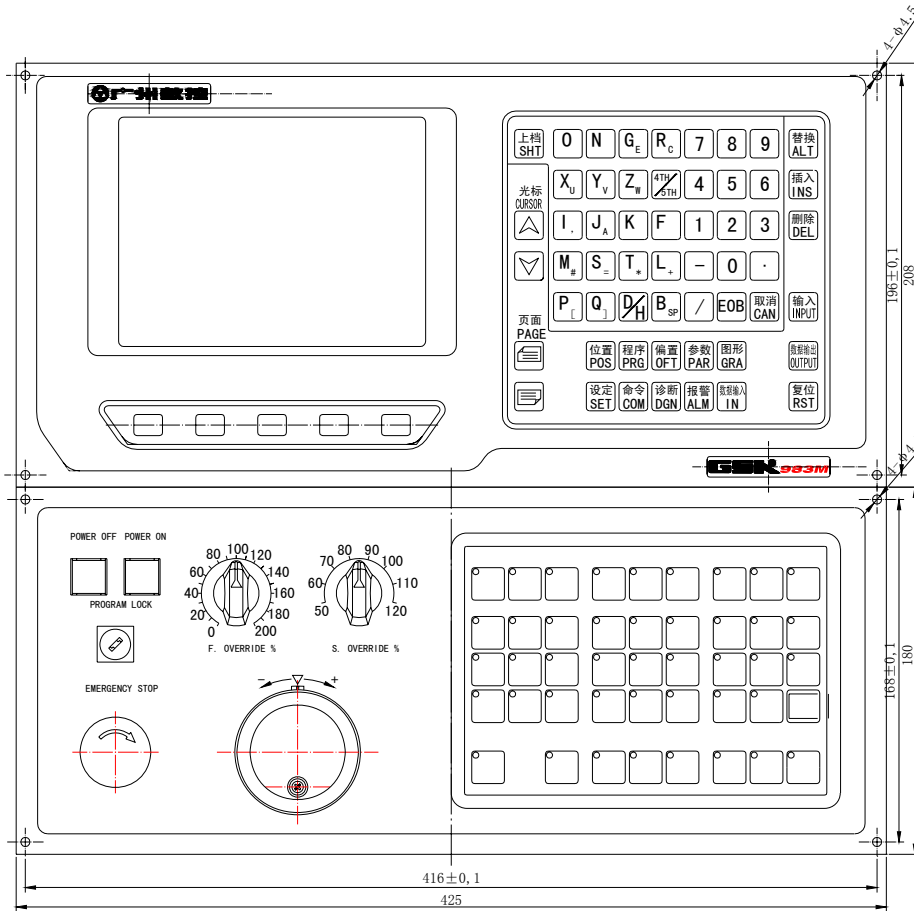
Installation dimension of 983M-S/V system

Installation dimension of 983M-S/V external I/O unit
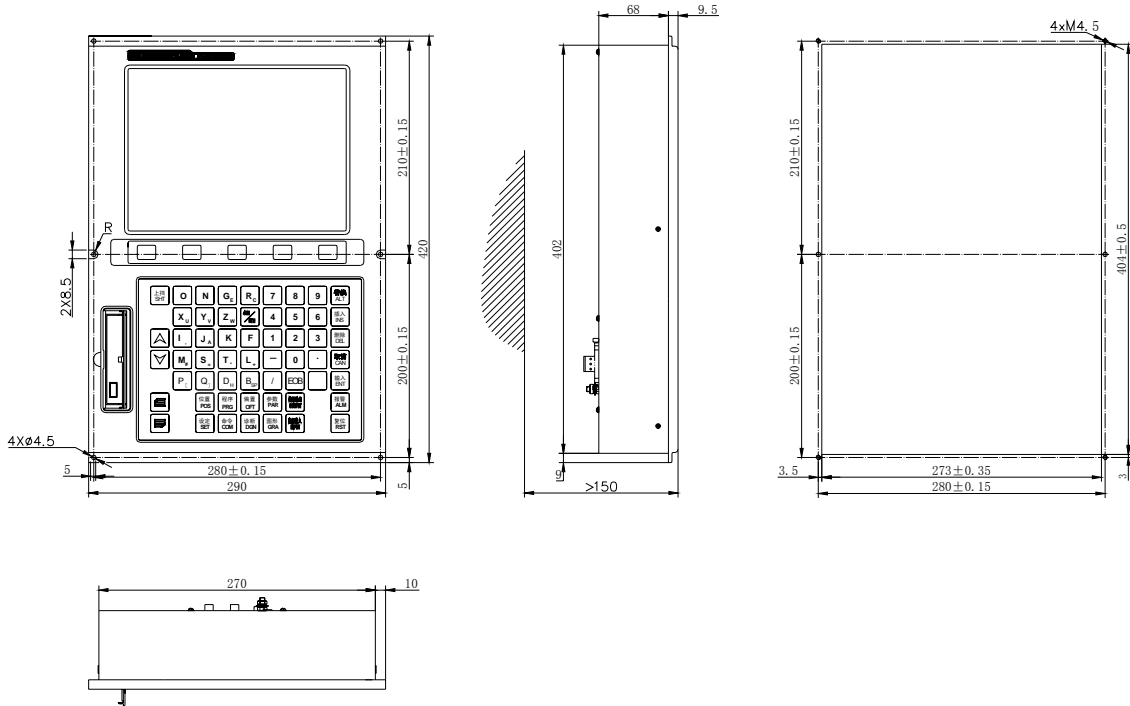
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Installation dimension of 983M-V MDI/LCD panel

Installation dimension of 983M-V machine operation panel