

CNCmakers Limited

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980MDc Milling and Drilling CNC System

Brief Introduction

980MDc is a new product upgraded from GSK980MDa (including software and hardware). Its structure is divided into horizontal and vertical type, with 8.4" colored LCD, 5 feed axes (including C axis) and 2 analog spindles. The minimum command unit is $0.1\mu\text{m}$. It has graphic auxiliary programming, multiple time-limit stop functions, supports MDI multi-block execution, common parameter customization, PLC ladder on-line display and real-time monitoring. As an upgraded product of GSK980MDa, GSK980MDc CNC Milling system is the best choice for CNC milling machine technology upgrade.



980MDc



980MDc-V

Characteristics

- X, Z, Y, 4th, 5th; axis name and axis type of Y, 4th, 5th can be defined
- 2ms interpolation period, control precision $1\mu\text{m}$, $0.1\mu\text{m}$
- Max. speed 60m/min (up to 24m/min in $0.1\mu\text{m}$)
- Drilling/boring, circle groove/rectangular groove roughing, full-circle/rectangular finishing, linear/rectangular/arc continuous drilling and so on, spiral interpolation, cylindrical interpolation and polar coordinate command
- Adapted to servo spindle can realize spindle continuously positioning and rigid tapping
- Built-in multi PLC programs, the currently running PLC program can be selected
- Display on-line, monitor in real-time PLC
- Adapting to the servo spindle to realize the spindle continuously positioning, rigid tapping
- Graphic auxiliary programming
- multiple time-limit stop function
- MDI multi-block execution
- Counter
- Built-in multi PLC programs, PLC ladder on-line display, and real-time display
- Controllable disc tool magazine and umbrella-type tool magazine

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- Support the programming of macro command in sentence type and the calling of macro program with parameter.
- Metric/inch programming, scaling, programmable image, automatic chamfer, tool life management function
- 8.4" color LCD, Chinese, English, Spanish, Russian and Portuguese display can be selected by parameter
- With USB interface, it supports file operation in USB, system configuration and software upgrade.
- High-speed DNC, real-time transmitting part programs to machine
- 2-channel 0V~10V analog voltage output, analog input/output can be extended
- 1-channel handwheel input, handheld electronic MPG
- Panel size, mounting holes position, command system are compatible with GSK980MDa, mounting holes dimension has minor difference.

Technical Specification

◆ Control axes

- Control axes: 5 (X, Z, Y , 4th,5th)
- Interpolation axes: X, Y, Z, 4th, 5th linear interpolation; X, Y, Z spiral interpolation, two of X, Y, Z arc interpolation
- PLC control axes: 5

◆ Feeding axes function

- Min. input/output unit

ITEM		μ grade (IS-B)		0.1 μ grade (IS-C)	
		min. input unit	min. output unit	min. input unit	min. output unit
Machine tool (metric system)	metric input (G21)	0.001 (mm)	0.001 (mm)	0.0001 (mm)	0.0001 (mm)
		0.001 (deg)	0.001 (deg)	0.0001 (deg)	0.0001 (deg)
	inch input (G20)	0.0001 (inch)	0.001 (mm)	0.00001 (inch)	0.0001 (mm)
		0.001 (deg)	0.001 (deg)	0.0001 (deg)	0.0001 (deg)
Machine tool (inch system)	metric input (G21)	0.001 (mm)	0.0001 (inch)	0.0001 (mm)	0.00001 (inch)
		0.001 (deg)	0.001 (deg)	0.0001 (deg)	0.0001 (deg)
	inch input (G20)	0.0001 (inch)	0.0001 (inch)	0.00001 (inch)	0.00001 (inch)
		0.001 (deg)	0.001 (deg)	0.0001 (deg)	0.0001 (deg)

- Position command range

ITEM		Position command range
μ grade (IS-B)	metric input (G21)	-99999.999 ~ 99999.999 (mm)
		-99999.999 ~ 99999.999 (deg)
	inch input (G20)	-9999.9999 ~ 9999.9999 (inch)
		-9999.999 ~ 9999.999 (deg)
0.1 μ grade (IS-C)	metric input (G21)	-9999.9999 ~ 9999.9999 (mm)
		-9999.9999 ~ 9999.9999 (deg)
	inch input (G20)	-999.99999 ~ 999.99999 (inch)
		-999.9999 ~ 999.9999 (deg)

- Rapid traverse speed

ITEM	μ grade (IS-B)	0.1 μ grade (IS-C)
Machine tool (metric system)	0 mm/min ~ 60000 mm/min	0 mm/min ~ 24000 mm/min
Machine tool (inch system)	0 inch/min ~ 6000 inch/min	0 inch/min ~ 2400 inch/min

- Rapid rate: F0, 25%, 50%, 100% 4 grades of real time trimming

- Feedrate:

ITEM		μ grade (IS-B)	0.1 μ grade (IS-C)
Machine tool (metric system)	Feed/rev.(G98)	0 mm/min ~ 30000 mm/min	0 mm/min ~ 24000 mm/min
	feed/min.(G99)	0.001 mm/r ~ 500 mm/r	0.0001 mm/r ~ 500 mm/r
Machine tool (inch system)	feed/rev.(G98)	0 mm/min ~ 1200 inch/min	0 mm/min ~ 1200 inch /min
	feed/min.(G99)	0.0001 inch/r ~ 50 inch/r	0.00001 inch/r ~ 50 inch/r

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◆ Feeding axes function

- Feedrate override: 0~150%, 16 grades tuning in real time
- Interpolation mode: linear interpolation, arc interpolation, spiral interpolation, cylindrical interpolation, and rigid tapping
- Automatic chamfer function

◆ Acceleration/Deceleration Function

- Cutting feeding: linear
- Rapid traverse: linear
- Tapping cutting: exponential or linear
- Initial speed, termination speed, the time of acceleration/deceleration can be set by parameter

◆ Spindle Function

- 2-channel 0V~10V analog voltage output, two-spindle control
- 1-channel spindle encoder feedback, spindle encoder line can be set (100p/r~5000p/r)
- Transmission ratio between encoder and spindle: (1~255) : (1~255)
- Spindle speed: it is set by S or PLC, speed range: 0r/min~9999r/min
- Spindle override: 50%~120% divided into 8-grade tuning
- Tapping cycle/rigid tapping
- Analog spindle M type function

◆ Tool Function

- Tool length compensation: 32 sets
- Tool nose radius compensation(C) : 32 sets
- Tool wear compensation: 32 sets
- Tool life management: 32 sets(8 types/sets)

◆ Precision Compensation

- Backlash compensation: backlash compensation mode and compensation frequency is set by parameter, compensation range: (0 mm~2 mm) or (0 inch~0.2 inch)
- Memory pitch error compensation: 256 compensation points per axis, compensation range of each point (-255~255)×least output equivalent

◆ PLC Function

- Two-level PLC program, up to 5000 steps, the 1st program refresh period 8ms
- PLC programs being displayed on-line and monitored in real time
- PLC program communication download
- PLC warning and PLC alarm
- Basic I/O: 41 input signals /36 output signals, I/O contacts can be extended

◆ Human machine interface

- 8.4 " color screen LCD
- Display in Chinese, English, Spanish, Russian, Portugal, etc.
- Machining path display, machining path scaling up/down, translation, viewpoint shifting
- Real-time clock
- Soft function key operation
- Counter
- Support MDI multi-block execution

◆ Communication Function

- RS232: Files of part program and parameter, etc can be transmitted in two-way,
- support PLC program, software upgrade of Serial Ports
- USB: USB operation, USB directly machining, DNC processing, PLC program, system software ,can be upgraded by USB

◆ Safety Function

- Emergency stop
- Hardware travel limit
- Software travel check
- Data backup and recovery

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◆ Operation Management

- Operation mode: edit, auto, MDI, machine zero return, MPG/step, Manual, DNC
- Multi-level operation authorization management
- Multiple time-limit stop
- Alarm log
- Common parameter customization

◆ Program Edit

- Program capacity: 40MB, 1000 programs(including subprograms and macro programs)
- Edit function: search, modify and delete programs/blocks/words
- Program format: ISO command, statement macro command programming, relative coordinate, absolute coordinate and hybrid coordinate programming
- Program calling: Support macro program with parameter, subprogram nesting of 4 layers.

List of G codes



List of G codes			
G00	Rapid traverse (positioning)	G69	Coordinate rotation cancel
G01	Linear interpolation(cutting feed)	G73	High-speed peck drilling
G02	CW circular / spiral interpolation	G74	left-hand tapping cycle
G03	CCW circular / spiral interpolation	G76	Finishing boring cycle
G07.1	Cylindrical interpolation	G80	Fixed cycle cancel
G04	Dwell, exact stop	G81	Drilling cycle (spot drilling cycle)
G10	Programmable data input	G82	Drilling cycle (stepped hole boring cycle)
G15	Polar coordinate command cancel	G83	Peck drilling cycle
G16	Polar coordinate command	G84	Tapping cycle
G17	XY plane selection	G85	Boring cycle
G18	ZX plane selection	G86	Drilling cycle
G19	YZ plane selection	G87	Back boring cycle
G20	Inch input	G88	Boring cycle
G21	Metric input	G89	Boring cycle
G28	Reference point return	G90	Absolute programming
G29	Return from reference point	G91	Incremental programming
G30	2nd, 3rd, 4th reference point return	G92	Coordinate system setting
G31	Skip function	G94	Feed per minute
G40	Tool radius compensation cancel	G95	Feed per rotation
G41	Tool radius compensation left	G98	Return to initial plane in canned cycle
G42	Tool radius compensation right	G99	Return to R point in canned cycle
G43	Tool length compensation +	G110	Inner circle groove roughing (CCW)
G44	Tool length compensation -	G111	Inner circle groove roughing (CW)
G49	Tool length compensation cancel	G112	Inner circle finishing (CCW)
G50	Scaling cancel	G113	Inner circle finishing (CW)
G51	Scaling ON	G114	Circular outer finish milling (CW)
G50.1	Programming image cancel	G115	Outer circle finishing (CCW)
G51.1	Programming image	G134	Rectangular groove roughing (CCW)
G52	Local coordinate system setting	G135	Rectangular groove roughing (CW)
G53	Machine coordinate system selection	G136	Rectangular groove inner finishing (CCW)
G54	Workpiece coordinate system 1	G137	Rectangular groove inner finishing (CW)
G55	Workpiece coordinate system 2	G138	Rectangular outer finishing (CCW)
G56	Workpiece coordinate system 3	G139	Rectangular outer finishing (CW)
G57	Workpiece coordinate system 4	G140	Rectangular continuous drilling (CW)
G58	Workpiece coordinate system 5	G141	Rectangular continuous drilling (CCW)
G59	Workpiece coordinate system 6	G142	Arc continuous drilling (CW)
G65	Macro command	G143	Arc continuous drilling (CCW)
G68	Coordinate rotation		

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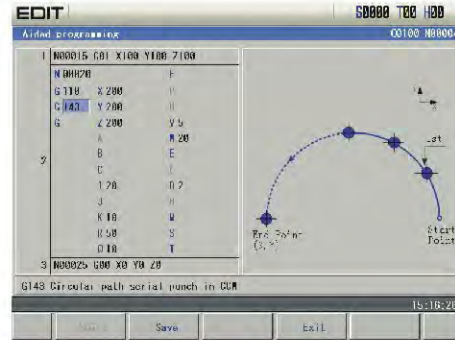
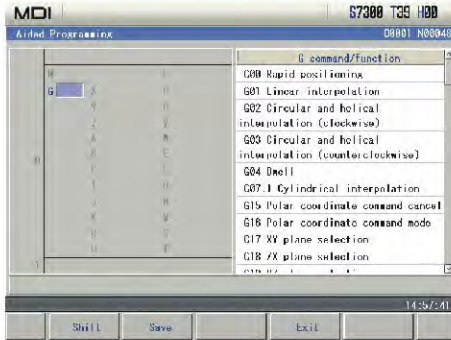
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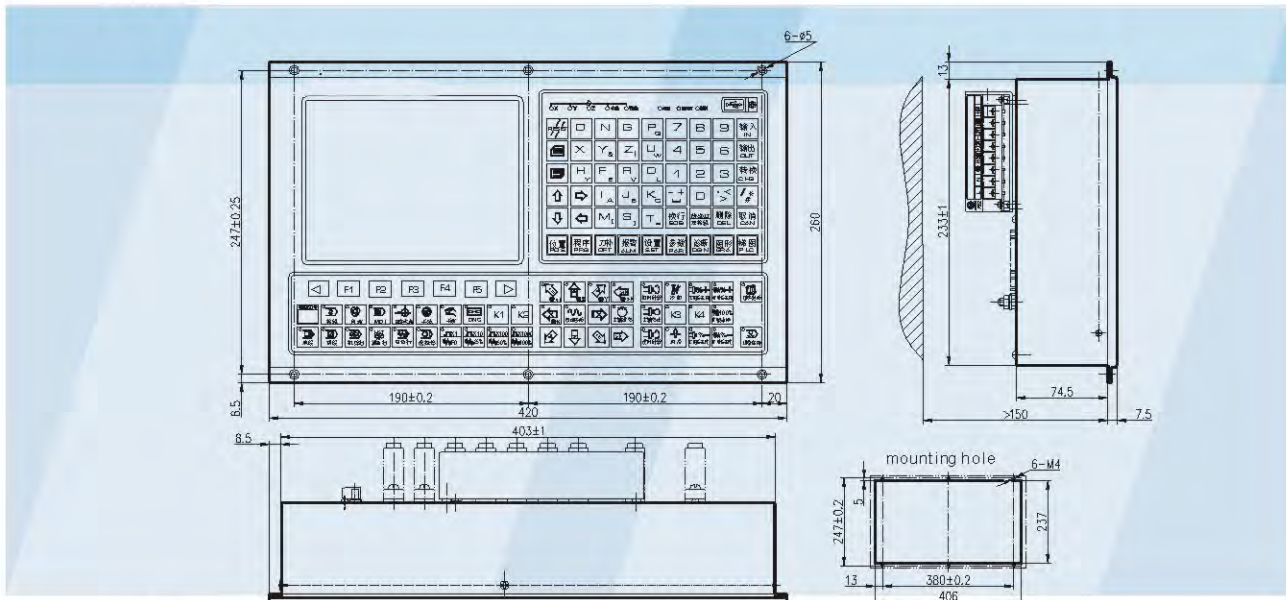
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Edit programming

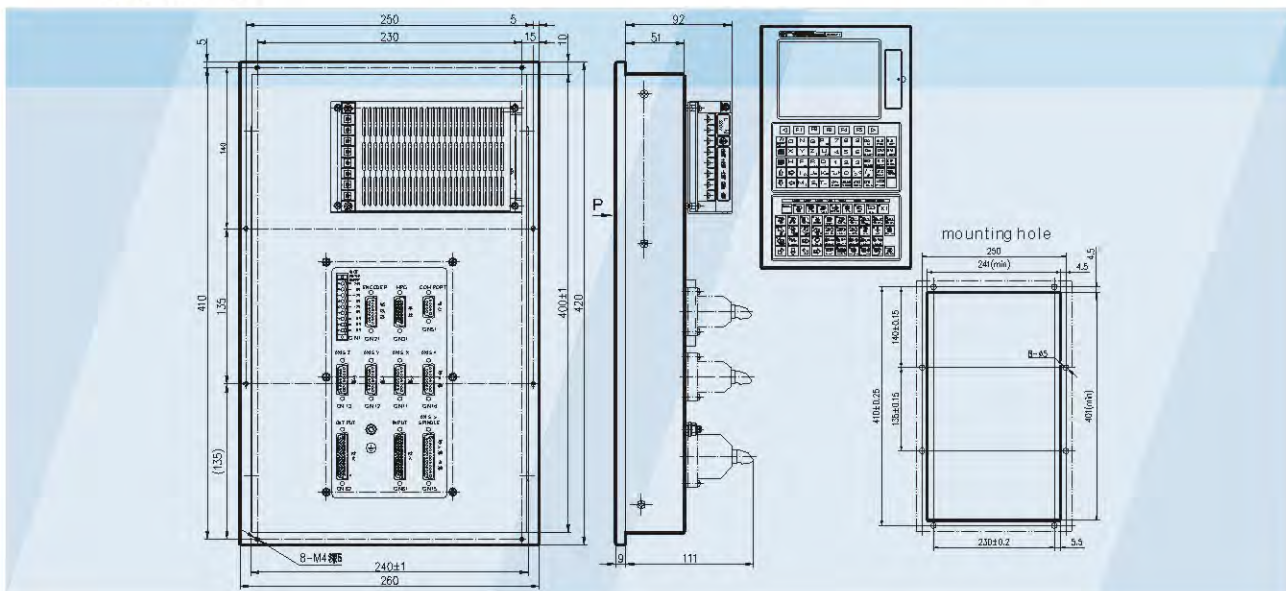


Installation Dimension of System Panel

980MDc



980MDc-V



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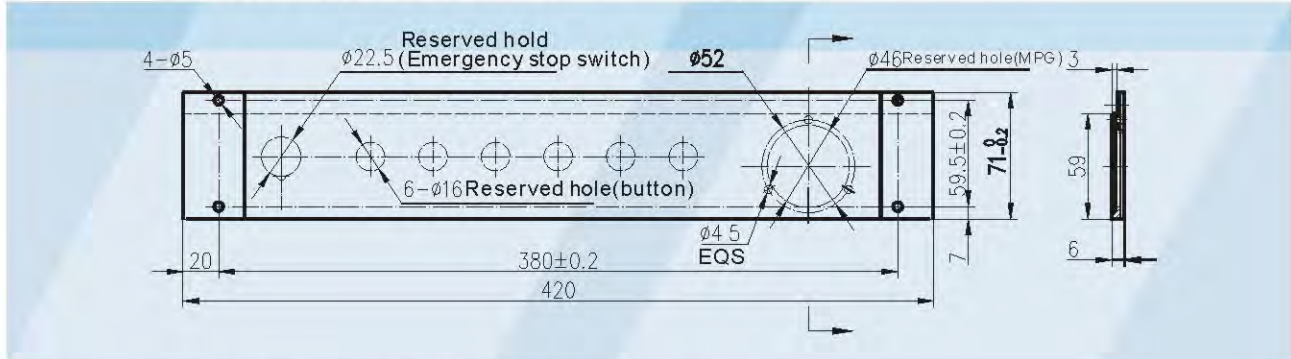
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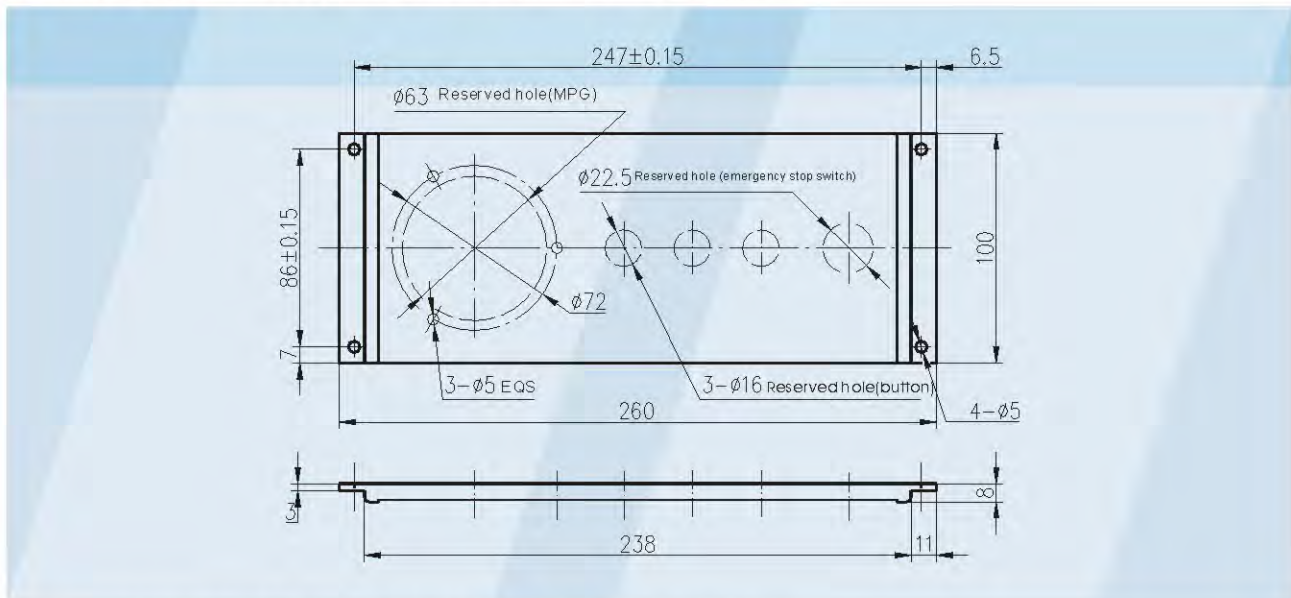
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● Installation Dimension of Additional Panel (Optional part)

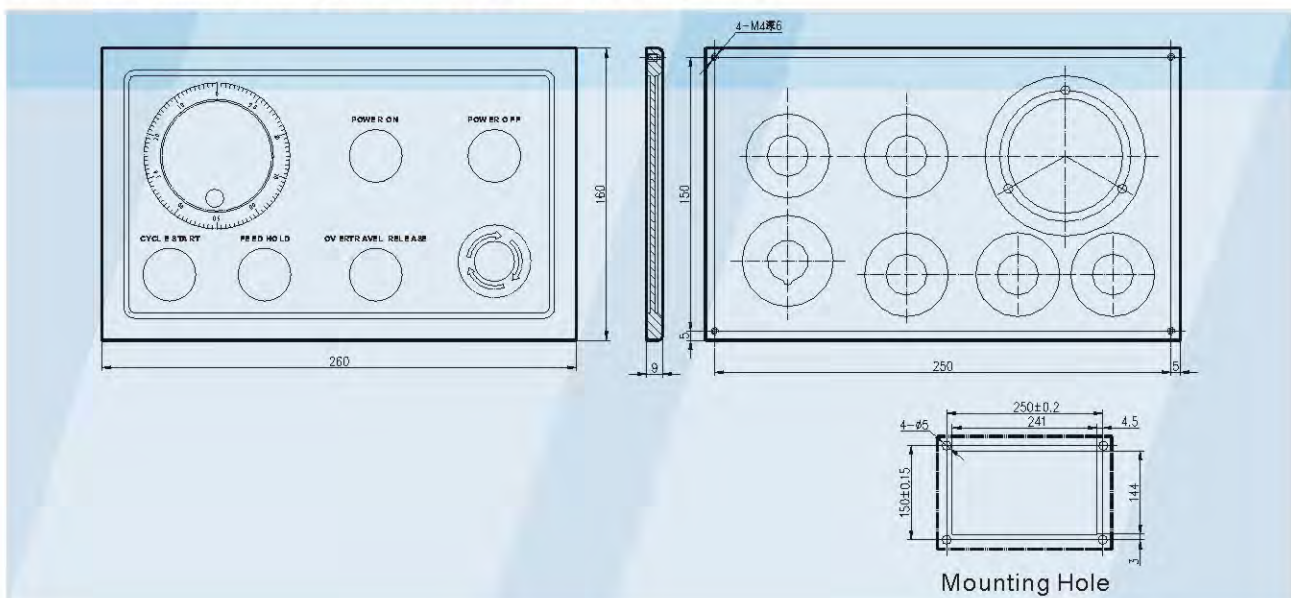
- Additional panel AP01 (opt for GSK980MDc, installing below)



- Additional panel AP02 (opt for GSK980MDc, installing at side)



- Additional panel AP02 (opt for GSK980MDc-V, installing below)



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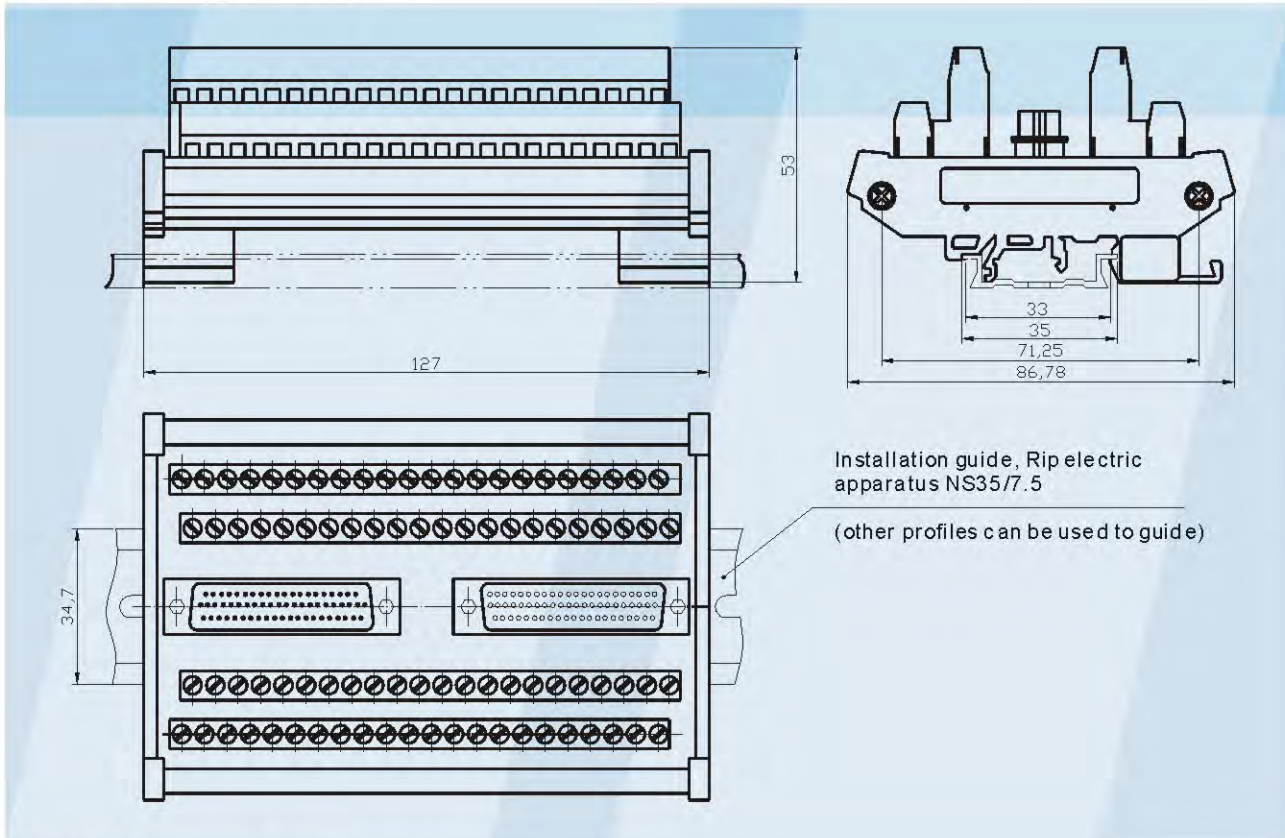
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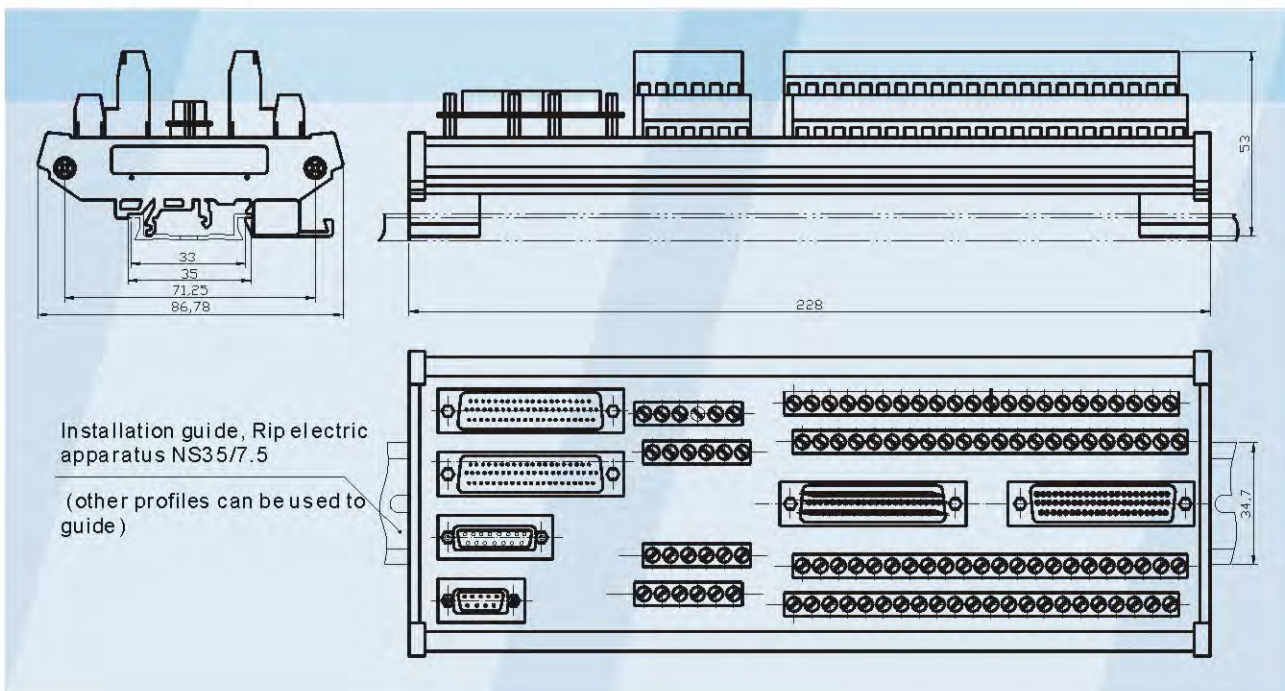
Installation Dimension of I/O Deconcentrator (optional part)



MCT01B (without relay)



MCT01B (without relay)



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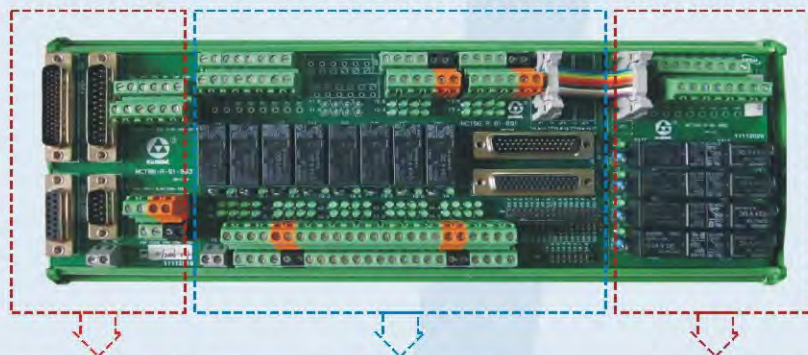
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■ MCT06-R Deconcentrator (with Relay)

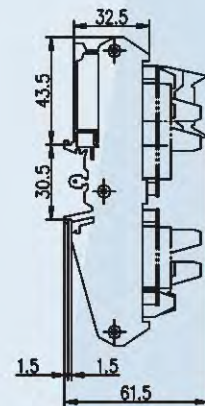
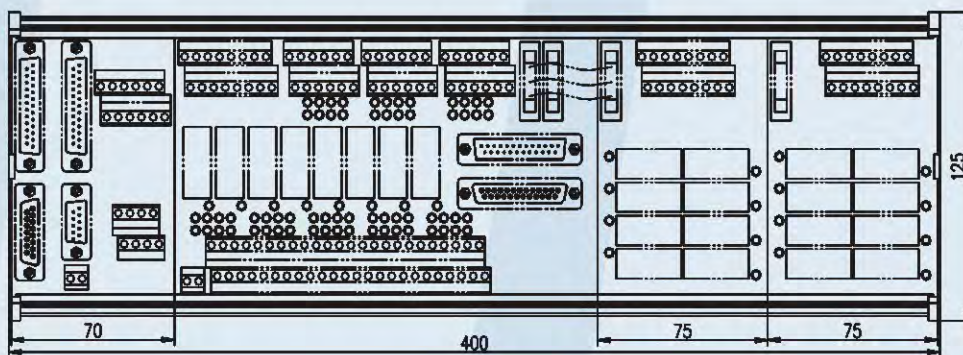
To get convenient installation, debugging and maintenance and reduce abnormal run caused by improper connection and elements to be damaged, GSK has researched I/O Deconcentrator MCT06-R with relay. MCT06-R is composed of one or several of basic module of Deconcentrator, extension module of relay and commutator module of servo spindle, which can configure 8 kind of deconcentrator according to user's requirements.



Commutator module of servo spindle (spindle with C/S axis)

Basic module of deconcentrator

Extension module of relay (up to 3)



Type		MCT06-R1	MCT06-R2	MCT06-R3	MCT06-R4	MCT06-R1S	MCT06-R2S	MCT06-R3S	MCT06-R4S
Contour dimension (mm*mm)		180 × 125	255 × 125	330 × 125	405 × 125	250 × 125	325 × 125	400 × 125	475 × 125
Composition	Basic module of deconcentrator	1PC	1PC	1PC	1PC	1PC	1PC	1PC	1PC
	Commutator module of servo spindle	0PC	0PC	0PC	0PC	1PC	1PC	1PC	1PC
	Extension module of relay	0PC	1PC	2PCS	3PCS	0PC	1PC	2PCS	3PCS