980TDc TURNING MACHINE CNC SYSTEM

# 980TDc TURNING MACHINE CNC SYSTEM

## Brief Introduction

GSK980TDc is a new product upgraded from GSK980TDb.It has two structural types: horizontal and vertical, adopting 8.4 " colored LCD, controls 5 feeding axes (including Cs axis), 2 analog spindles. The minimum command unit is 0.1ěm. Newly-added soft function press keys, graphical interface design, dialogue box operation, friendly human machine interface, PLC ladder diagram on-line display, real time monitoring, MPG trial-cut and multiple time-limit stop function, auxiliary programming and program path review function. As an upgraded product of GSK980TDb, GSK980TDc is the best choice for CNC turning machine technology upgrade.

GSK980TDc

GSK980TDc-V

## Characteristics

- X, Z, Y, 4th, 5th, axis name and axis type of Y, 4th, 5th can be defined
- 2ms interpolation period, control precision 1μm, 0.1ěm
- Max. speed 60m/min（up to 24m/min in 0.1ěm）
- Adapted servo spindle can realize spindle continuous positioning, rigid tapping
- Built-in multi PLC programs, the currently running PLC program can be selected.
- PLC ladder diagram on-line display, real time monitoring.
- MPG trial-cut
- Auxiliary programming
- Editing path preview
- Counter
- Multiple time-limit stop
- Tool offset measured value directly input function
- G71 command supports the cycle cutting of groove shape outline
- Support the programming of macro command in sentence type and the calling of macro program with parameter.
- Support circular arc(3points), cylindrical and polar coordinate interpolation, etc.
- Support programming in metric system/inch system, with functions of auto tool-setting, auto chamfering, tool life management.
- Displays in Chinese/ English/ Spanish/ Russian, which can be set with parameter.
- With USB interface, it supports file operation in flash disk, system configuration and software upgrade.
- Analog voltage output of 0v～10v in two channels, support two spindles.
- One channel for MPG input, supporting external MPG.
- Common input in 41 points/common output in 36 points, I/O contacts can be extended
- Panel size, mounting holes position, command system are compatible with GSK980TDb, mounting holes dimension has minor difference.

## Technical Specification

### Number of control axes

- Number of control axes: 5 (X, Z, Y, 4th and 5th )
- Number of linkage axes: 3
- Number of PLC control axes: 5
- Feeding axes function
- Minimum input/output increment

| ITEM | | μ grade（IS-B） | | 0.1μ 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)<br>-99999.999 ~ 99999.999 (deg) |
| | inch input (G20) | -9999.9999 ~ 9999.9999 (inch)<br>-9999.999 ~ 9999.999 (deg) |
| 0.1μ grade（IS-C） | metric input (G21) | -9999.9999 ~ 9999.9999 (mm)<br>-9999.9999 ~ 9999.9999 (deg) |
| | inch input (G20) | -999.99999 ~ 999.99999 (inch)<br>-999.9999 ~ 999.9999 (deg) |

### Rapid traverse speed

| ITEM | μ grade（IS-B） | 0.1μ 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） | 0.1μ grade（IS-C） |
|---|---|---|---|
| Machine tool（metric system） | Feed/rev.(G98) | 0 mm/min ~15000 mm/min | 0 mm/min ~15000 mm/min |
| | feed/min.(G99) | 0.001 mm/r ~500 mm/r | 0.0001mm/r ~500mm/r |
| Machine tool（inch system） | feed/rev.(G98) | 0 inch/min ~5800 inch/min | 0 inch/min ~5800 inch /min |
| | feed/min.(G99) | 0.0001inch/r ~ 50inch/r | 0.00001inch/r~50inch/r |

- Feedrate: 0~150% 16 grades tunning in real time
- Interpolation mode: linear, circular arc (3 points), thread, ellipse, parabola, and rigid tapping
- Auto chamfering
- MPG trial-cut function

## Thread function

- Types: equal pitch straight thread/tapper thread/end face thread, variable pitch straight thread/tapper thread/end face thread
- Number of thread: 1~99
- Single/multiple thread, metric and inch system straight thread/tapper thread/end face thread, equal pitch thread and variable pitch thread
- Thread retraction length, angle, and speed can be set
- Thread pitch: 0.01mm~500mm or 0.06 gear/inch~25,400 gear/inch

## Acceleration and deceleration function

- Cutting feeding: Linear type
- Rapid traverse: Linear type or S type
- Thread cutting: Linear type or index type is selectable.
- The starting speed, finishing speed and time of acceleration and deceleration are set by the parameter.

## Tool function

- Tool length compensation (tool offset)32 sets
- Tool nose radius compensation (C type)
- Tool wearing compensation 32 sets
- Tool life management 8 type per set
- Method of setting tools: Tool-setting in fixed position, trial-cut tool-setting, return to reference point, auto tool-setting
- Tool offset executing mode: Rewriting coordinate mode, tool traverse mode
- Tool offset measured value directly input function

## Precision compensation

- Backlash compensation (mode and rate are set with parameter, range: 0mm ~ 2mm or 0 inch ~ 0.2 inch)
- Pitch error compensation in memory type: 1024 points in total, points of each axis are set with parameter

## Human machine interface

- 8.4" colored LCD
- Display in Chinese, English, Spanish, Russian, and Portuguese, etc.
- Support soft function button operation
- Real time clock
- Counter

## PLC function

- 2 grades PLC function, 5000 steps at most, the refresh cycle of the 1st program is 8ms
- PLC program download
- PLC program on-line display, real time monitoring
- Support PLC warning and PLC alarming
- Support multiple PLC program (16 at most), current running PLC program can be chosen
- Basic I/O: 41 input/ 36 output

## Program auxiliary

- Graph programming assistance
- Grammar inspection
- 2D tool path display
- Graph preview



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## Operation management

- Operation mode: Edit, Auto, MDI, Machine zero-return, MPG Single step, Manual,
- Program Zero-return, MPG trial-cut
- Multiple time-limit stop
- Multi-level operation authorization management

## Program editing

- Program capacity: 40M, 384 programs (including subprograms, macro programs)
- Editing function: program/block/characters research, rewriting and deleting
- Program format: ISO code, support macro command programming in sentence type, programming of relative coordinate, absolute coordinate and hybrid coordinate.
- Program calling: Support macro program with parameter, subprogram nesting of 4 layers.

## 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: U-disk File operation and DNC processing, support PLC programs, system software U-disk upgrade

## Safety function

- Emergency stop
- Hardware travel limit
- Software travel limit
- Data backup and recovering

## List of G codes

| List of G codes | | | |
|---|---|---|---|
| G00 | Rapid positioning | G36 | Auto tool compensating and measuring X |
| G01 | Linear interpolation | G37 | Auto tool compensating and measuring Z |
| G02 | CW arc interpolation | G40 | Cancel tool nose radius compensation |
| G03 | CCW arc interpolation | G41 | tool nose radius left compensation |
| G04 | Dwell, exact stop | G42 | tool nose radius right compensation |
| G05 | Arc interpolation of three points | G50 | set coordinate system for workpiece |
| G06.2 | CW ellipse interpolation | G52 | partial coordinate system |
| G06.3 | CCW ellipse interpolation | G54~G59 | coordinate system of workpiece |
| G07.1 | Cylindrical interpolation | G65 | macro command non-mode calling |
| G07.2 | CW parabola interpolation | G66 | Macro program mode calling |
| G07.3 | CCW parabola interpolation | G67 | Cancel macro program mode calling |
| G10 | Data input mode is valid | G70 | Finishing cycle |
| G11 | Cancel data input mode | G71 | Axial roughing in cycle (support groove) |
| G12.1 | Start polar coordinate interpolation mode | G72 | Radial roughing cycle |
| G13.1 | Cancel polar coordinate interpolation mode | G73 | Close cutting cycle |
| G15 | Cancel polar coordinate command mode | G74 | Axial grooving cycle |
| G16 | Start polar coordinate interpolation mode | G75 | Radial grooving cycle |
| G17 | XY plane selection | G76 | Multiple thread cutting cycle |
| G18 | ZX plane selection | G80 | Cancel rigid tapping state |
| G19 | YZ plane selection | G84 | Axial rigid tapping |
| G20 | Select unit in inch system | G88 | Radial rigid tapping |
| G21 | Select unit in metric system | G90 | Axial cutting cycle |
| G28 | Auto return to mechanical zero point | G92 | Thread cutting cycle |
| G30 | Reference point 2nd, 3rd and 4th return on machine | G94 | Radial cutting cycle |
| G31 | Jumping function | G96 | Constant surface speed control |
| G32 | Equal thread pitch cutting | G97 | Cancel constant surface speed control |
| G32.1 | Rigid thread cutting | G98 | Feeding/min |
| G33 | Z axis tapping in cycle | G99 | Feeding/rev |
| G34 | Variable thread pitch cutting | | |

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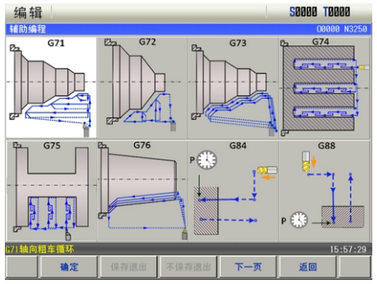
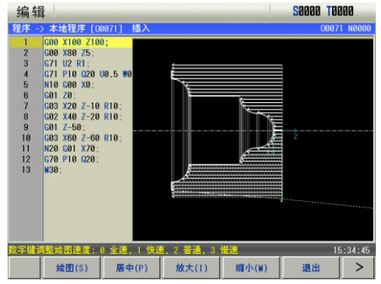
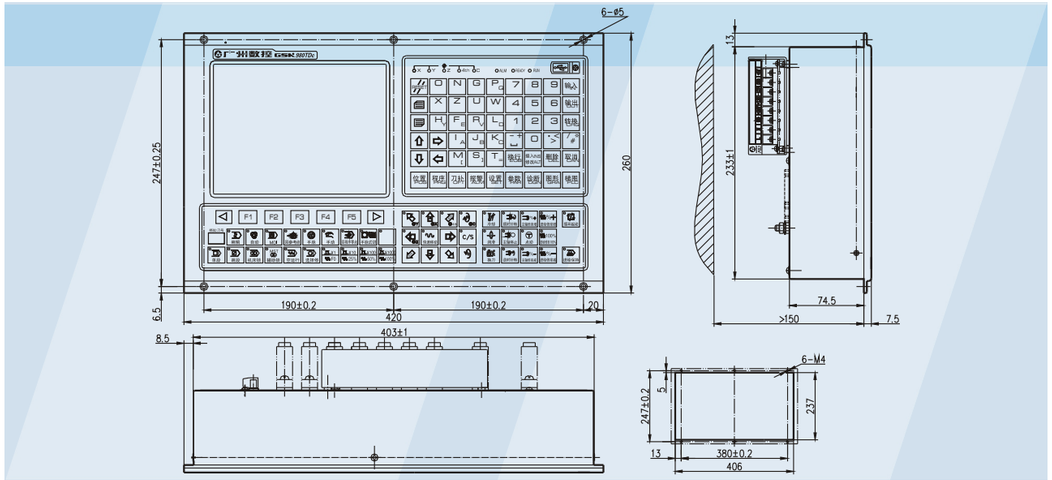
## Auxiliary programming



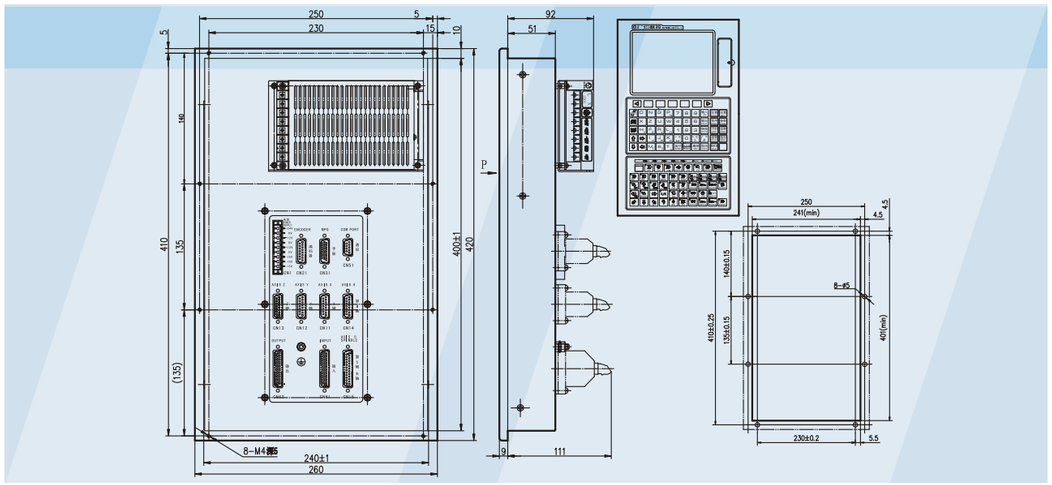




## Installation Dimension of System Panel

■ GSK980TDc

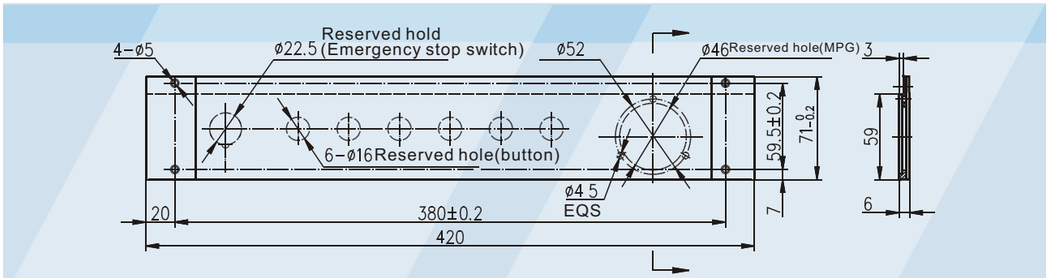



■ GSK980TDc-V

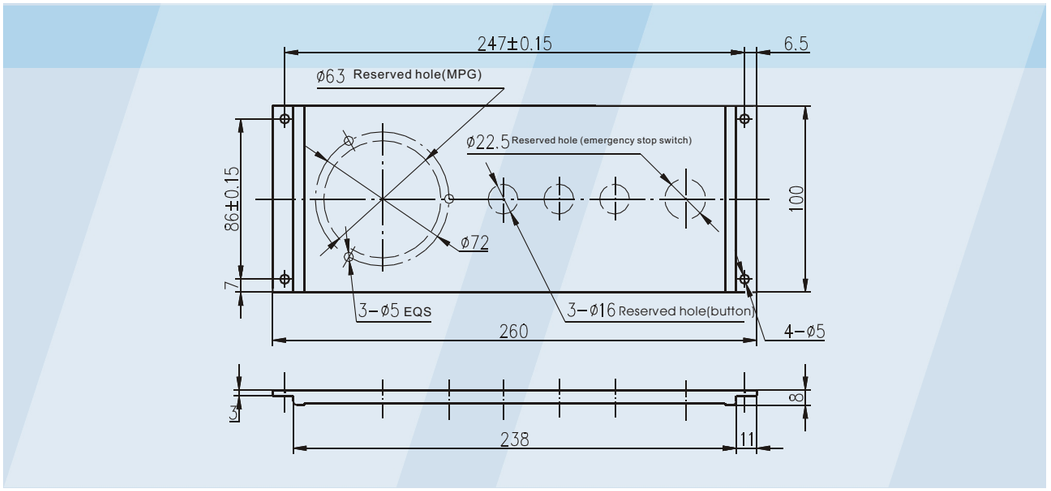



## Installation Dimension of Additional Panel (Optional part)

Additional panel AP01（opt for GSK980TDc，installing below）




Additional panel AP02（opt for GSK980TDc，installing at side




Additional panel Ap03（opt for GSK980TDc-V，installing below）