[Features]

■ Color LCD enables to show various information
As well as current position, the high resolution color LCD can show the running program, motor information and more.

■ Easy to input a program
In editing program, interactive display screen prevents easy mistakes.

■ Reduce indexing time
Adopting EtherCAT enables high speed communication and shortens the time of indexing.

■ Easy to manage programs
Input/output programs and parameters can be managed by MMC (Multi Media Card) that is on the market.
Two types of panels with different operational feeling
Touch panel type that follows up soft operation and quick operation.
Click emboss panel type (CS) that offers a sense of security with a firm click feeling.

Select motors in accordance to a use or environment.
There are many variations of motors, and a motor suitable for a particular machining condition can be selected.

[Selectable motor list]

<table>
<thead>
<tr>
<th>Quinte</th>
<th>Single Axis</th>
<th>Double Axis</th>
<th>Powered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>QTC100/QTC100CS</td>
<td>QTC200/QTC200CS</td>
<td>QTC300</td>
</tr>
<tr>
<td>200W</td>
<td>○</td>
<td>○</td>
<td>−</td>
</tr>
<tr>
<td>400W</td>
<td>○</td>
<td>○</td>
<td>−</td>
</tr>
<tr>
<td>750W</td>
<td>○</td>
<td>○</td>
<td>−</td>
</tr>
<tr>
<td>1000W</td>
<td>○</td>
<td>○</td>
<td>−</td>
</tr>
<tr>
<td>1200W</td>
<td>○</td>
<td>○</td>
<td>−</td>
</tr>
<tr>
<td>1800W</td>
<td>−</td>
<td>−</td>
<td>○</td>
</tr>
<tr>
<td>2000W</td>
<td>−</td>
<td>−</td>
<td>○</td>
</tr>
<tr>
<td>3500W</td>
<td>−</td>
<td>−</td>
<td>○</td>
</tr>
</tbody>
</table>

Compatible with a battery-less absolute encoder
Batteries are unnecessary with the adoption of a battery-less absolute encoder\(^1\). Coordinates never deviate even with reconnection after removal of cables for Quinte and the rotary table.

To use extension I/O enables a variety of usage.
To use extension I/O option enables to select programs and to output WZRN position and M signal from machines.

Manual pulse generator is available.
Manual pulse generator is available to all models as option.

Compatible with a remote control function
Remote control function by serial communication with machine is available as an option.
Operation confirmed CNC manufacturer and machine manufacturer.
FANUC CORPORATION, Mitsubishi Electric Corporation, Okuma Corporation, Yamazaki Mazak Corporation, BROTHER INDUSTRIES, LTD.

Conforming to CE and KC standard
As well as EMC Directive, all models conform to KC mark.

\(^1\) Quinte battery is used for the system. However, since power consumption is very small, battery replacement is unnecessary.
Outside view / Dimensions

■ QTC100 / QTC100CS

※External view is QTC100.
※External dimensions of the QTC100 and QTC100CS are the same.

■ QTC200 / QTC200CS

※External view is QTC200.
※External dimensions of the QTC200 and QTC200CS are the same.

■ QTC300
## Quinte Specification

<table>
<thead>
<tr>
<th>Item</th>
<th>Single Axis</th>
<th>Double Axis</th>
<th>Powered</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Controlled axes</strong></td>
<td>1 axis</td>
<td>2 axes</td>
<td>1 axis</td>
</tr>
<tr>
<td><strong>Servo Motor</strong></td>
<td>AC servo motor with battery-less absolute detector</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Setting Unit</strong></td>
<td>0.001° / 0.0001° (Can be changed by parameters) : 0.001°</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Controlled unit</strong></td>
<td>0.0001°</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max. setting angle</strong></td>
<td>9999 rotation +360° ±999.999°</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Equal partition</strong></td>
<td>0~9999 partition (divisible to sector)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Program capacity</strong></td>
<td>Max program No. 999, Max. 2000 blocks per program (depending on program capacity)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Command method</strong></td>
<td>Absolute / incremental method (selectable G90/G91)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Zero position return</strong></td>
<td>Machine zero return and Workpiece zero return (commandable by external input)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Manual feed</strong></td>
<td>Rapid traverse, slow speed feed, step feed</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EM Stop</strong></td>
<td>Emergency stop button or forced servo stop by the external interlock input+master stop</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Halt</strong></td>
<td>Halt of rotary table by key input or external SP input</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Feedrate override</strong></td>
<td>Settable to 1-200% (Can be notched to 1-100%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Preparatory function (G code)</strong></td>
<td>Dwell, Lead Cutting, Buffer function, Clamp presence, Deviation check function, Interlock start, continuous start, Machine zero return, Workpiece zero return, Repeating function, Loop jump function, Absolute/Incremental, Fin signal control command</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sub-program function</strong></td>
<td>Enable at M98 command</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Uni-directional approach</strong></td>
<td>Even if rotary direction is changed, positioning from uni-direction is available</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Software limit function</strong></td>
<td>Software limit can be set from machine zero position to prevent interference with the machine by mounting jigs or workpiece.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Over travel stop function</strong></td>
<td>The hard limit mode can control the rotary range of rotary table</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Backlash compensation</strong></td>
<td>The backlash compensation of rotary table can be set.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Remote notch function</strong></td>
<td>The rotary table is operated by transferring program data for the machine and starting the transferred program.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Auto notch filter function</strong></td>
<td>Notch filter is automatically detected and can be set up to four stages to suppress machine vibration.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Alarm function</strong></td>
<td>In case of Error detected, alarm No. and alarm message are automatically displayed. 100 Alarms history log are displayed</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Angle display</strong></td>
<td>Machine coordinate, Work coordinate, Relative coordinate Remained shift, Overall coordinate</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment display function</strong></td>
<td>Comments can be added to program data files and programs, and can be displayed on the screen.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Input power</strong></td>
<td>Single / 3 phases AC200-230V±10% 50/60Hz (Std. 3 phases)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Power requirement(A)</strong></td>
<td>10</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td><strong>Dimensions(mm)</strong></td>
<td>320(W)×190(H)×250(D)</td>
<td>320(W)×190(H)×400(D)</td>
<td>400(W)×270(H)×400(D)</td>
</tr>
<tr>
<td><strong>Mass of product(kg)</strong></td>
<td>10.0</td>
<td>13.0</td>
<td>19.0</td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td>Use temperature : 0 ~ 45°C Store temperature : −10°C ~ 60°C Use humidity : 20~80% Rh or less (dew condensation, freezing not to be found) Vibration proof : 0.5G or less Shock resistant : 1G or less Ambient atmosphere : to pollution level 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td>TFT color liquid crystal 480x272 dot</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>External I/O signal</strong></td>
<td>(Input) : Start, Stop, External EMG Stop1, External EMG Stop2 (Output) : Block completed, EMG Stop output signal1, EMG Stop output signal2, alarm output signal(B-contact)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Multiple choice I/O signal (Option)</strong></td>
<td>(Input) : 6 Ext Workpiece zero return request 1, Ext Workpiece zero return request 2, Ext Machine zero return request 1, Ext Machine zero return request 2, Ext Program select 1-5, Ext Program set, Ext Auto operation function, Ext reset, Over travel, M Fin signal 1-6 (Output) : 6 Workpiece zero return completed 1, Workpiece zero return completed 2, Machine zero return completed 1, Machine zero return completed 2, Workpiece zero return position confirmation 2, Machine zero return position confirmation 1, Machine zero return position confirmation 2, Alarm signal output(A-contact), AUTO mode selected, External program select completed, External program No. output 1-6, M signal output1-6 ※Can be used from the above signals by parameter layout.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MMC Slot</strong></td>
<td>Programs and parameters can be uploaded or downloaded by memory card</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Quinte Series OPTION

- **Manual Pulse Generator (Holder attached)**
  This pulse generator can operate the table at 0.1°, 0.01° and 0.001°, and it adjusts the jig easily. One pulse generator can operate QTC200 (2 axes) by changing the shaft.

- **Manual pulse generator internal cable**
  **[HC1-IC-Q]**
  A relay cable for the inside of the Quinte panel is necessary for use of the manual pulse generator. A dust cap and 4 installation screws are included with the HC1-IC-Q.

- **Extended I/O cable (5m)**
  With the Expansion I/O cable, extended functions like External program selection, M signal output and more are enabled.
  ※For the enable signals, refer to multiple choice I/O signal on the Quinte Specification page.
  ※Cable length can be changed.

- **Remote control function cable (5m)**
  - **RS232C Cable [RSCB0909/RSCB0925]**
    In order to use the remote control function, a RS232C Cable (for use between machines) is required. RSCB0925 is 9-25 pin, and RSCB0909 is 9-9 pin. Please select according to the shape of the RS232C port on the machine side. ※Cable length can be selected from 2m/3m/5m.
  - **Remote relay cable [RC2-IC-Q]**
    In order to use the remote control function, a relay cable for inside the Quinte panel is required. A dust cap and 4 installation screws are included with the RC2-IC-Q.
Quinte front surface

1. Emergency stop button
   Stop the table during operation in an emergency.

2. Power switch
   Turn ON/OFF controller power.

3. Color LCD screen
   Display current position, programs, parameters and more.

4. APP box
   Battery and MMC slot are in the APP box.

5. Auto operation key
   The key to start and stop the program.

6. Reset key
   Reset programs and alarms.

7. Line feed key/Manual axis feed key
   The key is for cursor movement and for jog feed operation in manual mode.

8. Confirm (ENTER) key/Manual rapid forward key
   Determine and confirm things that have been selected and perform a Manual rapid forward by sliding from the manual axis feed key in the manual mode.

9. Confirm (ENTER) key
   Determine and confirm input for each part, popup etc., in various ways.

10. Page change key
   The key to change the page.

11. Menu key
    Display menu window.

12. Return key
    Return to the previous screen.

13. Feed override change mode key
    Adjust the feed speed.

14. Date input key
    Input program and data.

15. Delete key
    Delete one letter of numerical values input such as program or parameter.
[Screen for Auto mode]
Monitoring the present coordinate (machining coordinate), programming and condition of the Rotary table in real-time.

[Present coordinate screen at manual mode]
Enlarged to show present coordinate
At the bottom of the screen, the wizard for origin return and Jog operation are displayed.

[Program edit screen]
Reducing the mistakes and shortening the programing time are expected through inserting the section corresponding to the code

[Alarm history screen]
This screen displays history of the past 100 alarms.
PROGRAM EXAMPLES

- **ANGLE INDEX**
  
  N0000  A 45.000  F0  
  N0001  A90.000  M30  
  Rotates 45° at rapid traverse and returns to N0000 after rotating 90°

- **EQUIPARTITION**
  
  N0000  A360.000  F0  D4  M30  
  Rotates with circle of 360° divided into 4-partition (every 90) at rapid traverse and returns to N000 after operating 4 times.

- **UNEQUAL PARTITION**
  
  N0000  A 30.000  F0  
  N0001  A 90.000  
  N0002  A120.000  
  N0003  A 45.000  
  N0004  A 75.000  F5.000  M30  
  Rotates 45° at rapid traverse, 90°, 120°, 45° and 75° at federate 5.000 min⁻¹ before returning to N000.

- **ABSOLUTE / INCREMENTAL**
  
  N0000  G90  A45.000  F0  
  N0001  A225.000  
  N0002  G91  A45.000  
  Rotates 45° at rapid traverse under absolute mode, Rotates 225°. Rotates 45° under incremental mode.

- **SUBPROGRAM**
  
  PRG001  
  N0000  A90.000  F0  
  N0001  G90  A270.000  M98  P003  L1  
  Program No.1  
  Rotates 90° at rapid traverse and jumps to PRG002  
  Rotates 270° at rapid traverse under absolute mode and jumps to PRG003

  PRG002  
  N0000  G91  A30.000  
  N0001  A40.000  M99  
  Program No.2  
  Rotates 30° under incremental mode  
  Rotates 40° and returns to original subprogram command point

  PRG003  
  N0000  G91  A30.000  
  N0001  A40.000  M99  
  Program No.3  
  Rotates 20° under incremental mode  
  Rotates 50° and returns to original subprogram command point
Connection

Supply power to controller. 
Customer shall prepare exclusive circuit breaker. 
Specifications of circuit breaker are as follows:

<table>
<thead>
<tr>
<th>Type</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>QTC100</td>
<td>10A</td>
</tr>
<tr>
<td>QTC200</td>
<td>15A</td>
</tr>
<tr>
<td>QTC300</td>
<td>20A</td>
</tr>
</tbody>
</table>

Connect an earth wire of Class D (Class No. 3). Moreover, when the earth leakage breaker is used, it is recommended to use the breaker for which sensitivity current is 100mA or more, an operation time is 0.1 second or more, or a high frequency measure is taken in order to prevent the motor from the malfunction caused by a motor's high frequency.

Connection for external interlock
When the rotary table is interlocked with the external equipment, it is need to be controlled with M signals from the external equipment. The external equipment must be equipped with the connection (terminal board) for M signal OUTPUT, M signal completed INPUT etc., by machine maker.

Air Supply
The rotary table is clamped by air. Therefore, please prepare the following components.
- Air combination
- Drain unit
- Air hoses or air tubes (incombustibility)
- Couplers for connection

Air Diagram

MX160, GT series, TMX series (TRX, TLX), TBX series, TU series (TUX), TT182 and TT200 are 0.6MPa. TT251 and TT321 are 0.45Mpa.

Four-piece air unit (with auto drain) 
AC2SC-02CG-A(SMC)

Drain catch (with auto drain) 
AMG150C-02BC(SMC)
Mutual Connection diagram

The power for output signal must be supplied from the machine. Provide a surge protection on the external load connected to the output.

Use no-voltage contacts for input signals.

*1 It will be enable to use by using expansion I/O cable.
Machine Connection Diagram (Example)

Input common
Start
Block completed
Block completed common

Start
Clamped
Table rotating
BLKFIN

Input common
External program selection 1
External program selection 2
External program selection 3
External program selection 4
External program selection 5
External program selection set
Block completed
Block completed common

PRGSEL1~5
PRG SET
Program changed execution
BLKFIN

Input common
(#1) General-purpose output 3
(#1) General-purpose output 4
(#1) General-purpose output 5
(#1) General-purpose output 6
Output common
(#1) Output common
Block completed common

PRGSEL
Program changed execution
BLKFIN

*The program available on binary mode are PRG001 through PRG31. PRGSEL PRGSEL

*The channels available on M-signal mode are PRG001 through PRG999.

*For external program selection, extension I/O option is required.
Control Flow-Chart
It is in principle recommended for Kitagawa’s NC rotary table control to turn the servo OFF while clamping.

Semi- Full-Closed Loop

Note1) The delay timing here is a recommended value. It may differ with different parameters or specifications.

Methods for Controlling NC Rotary Table

Additional-Axis Method

- Additional axis
- Z-axis
- Y-axis
- X-axis

[Feature]
◆ NC Rotary Table is controlled as the NC Axis of the machine.
◆ Interpolation machining is possible with X-, Y- and Z-axis of the machine.
◆ Program can be controlled on the machine.

M-Signal Method

- M-Signal

[Feature]
◆ NC Rotary Table is controlled by a separate controller, and not as the NC Axis of the machine.
◆ NC Rotary Table can be fitted with machine with no compatibility for an additional axis, as long as M-signal is available.
◆ NC Rotary Table can easily be transferred to another machine.
Easy holding style with one hand. Enables to operate NC rotary table with watching its movement closer

**Features**
- Enables to operate NC rotary table with watching its movement closer
- Easy holding style with one hand expands operating range
- Lightweight cable allows high-accessibility to fixtures
- OEL display
  - The light-emitting character with a high contrast ratio achieves high visibility even in a dark place or machine.
- Smooth touch operating key switches
  - Achieve smooth operability without moving part in the operation part and key layout by function.
- Water and dust resistance
  - Ensure water and dust resistance by the protection grade IP54.
- Easy installation by a strong magnet
  - Able to be temporarily placed on vertical surface without sudden fall off.
- Able to be additionally installed to Quinte
  - MOP is available with Quinte by installing a dedicated cable to Quinte and updating the F/W of Quinte.

**Dimensions**

**Specifications**

<table>
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<tr>
<th>Display specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display device</td>
</tr>
<tr>
<td>Display type</td>
</tr>
<tr>
<td>Display resolution</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operating specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating type</td>
</tr>
<tr>
<td>Enable switch</td>
</tr>
<tr>
<td>Buzzer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature range</td>
</tr>
<tr>
<td>Operating humidity range</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Structure specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable length</td>
</tr>
<tr>
<td>Protection structure</td>
</tr>
<tr>
<td>Mass</td>
</tr>
</tbody>
</table>

**Option**

- **MOP internal cable [MOP-IC]**
  - When using MOP, a relay cable to the inside Quinte panel must be prepared.
  - 4 screws are supplied with MOP-IC for installation.

- **MOP Dummy Connector [MOP-DCN]**
  - Connector for short-circuiting an emergency stop circuit when not connected to MOP.
  - In case using one MOP to plural Quinte units, MOP-DCN is needed for Quinte which is not connected to MOP.
  - MOP-DCN is needed to cancel the emergency stop.
Manual operation pendant features

1. Emergency stop switch
   Emergency stop for NC rotary table in operation.

2. OEL display
   Display coordinate system, coordinate data and operation state.

3. Operation Enable / Disable selector switch
   Prevent unintended erroneous operations by selecting the Enable / Disable of the MOP operation.

4. Reset switch
   Reset the alarm.

5. Display selection switch
   Switch the coordinate screen and alarm screen.

6. Coordinate switch
   Switch machine coordinate and work coordinate.

7. Axis switch
   In case using MOP for QTC200, switch axis operating (axis A/B)

8. Origin return switch
   Return to original position. ※1

9. Origin setting switch
   Set the origin. ※1

10. Enable switch
    This switch will allow the operation such as JOG, returning to zero position, and origin setting which unintended changes might lead to dangerous. ※2

11. Jog-feeding switch
    JOG operation of the NC rotary table.
    Select 3 levels of the rotating speed.
    While operating reset switch and jog-feeding switch at the same time, the buzzer volume can be adjusted.

12. Manual pulse generator scale selection switch
    Select the pulse magnification.

    Generate pulse for operating NC rotary table.

※1 This switch is for the axis and coordinate systems which selected at 6 and 7.
※2 Simultaneously operated with keys which have the yellow ● marks on the right side.