

Series 31i -B CNC for Turning
STANDARD FEATURES

Axis Control

Digital Servo Function
1 Controlled Path
2 (up to maximum of 4) Simultaneously Controllable Axes (J801) (J803)
Serial Encoder Interface
Axis Names Selected from X,Y,Z,A,B,C
Least Input Increment of 0.001mm, 0.0001", 0.001deg
Inch/Metric Conversion (J876)
Interlock per Axis
Machine Lock
Emergency Stop
Overtravel Signal
Stored Stroke Check 1
Mirror Image
Follow-up Function
Servo Off
Mechanical Handle Feed
Backlash Compensation
Stored Pitch Error Compensation (J841)

Operation

Memory Operation
DNC Operation
MDI Operation
Program Number Search
Sequence Number Search
Buffer Register
Dry Run Mode
Single Block Mode
Manual Feed Mode (Jog)
Manual Reference Point Return
Manual Handle Feed (J835) *(requires MPG)*
Incremental Feed

Interpolation

Positioning (G00)
Linear Interpolation
Circular Interpolation
Dwell (G04)
Threading
Skip Function (G31)
Torque-limit Skip
Automatic Reference Point Return (G28, G29)
Reference Point Return Check (G27)
2nd Reference Point Return (G30)

Series 31i-B CNC for Turning

Feed Function

Rapid Traverse Feedrate 240m/min (100m/min @0.0001mm increment)
Rapid Traverse Feedrate Override (preset value, 25%, 50%, 100% settings)
Feed per Minute
Feed per Revolution
Tangential Speed Control
Cutting Feedrate Clamp
Automatic Acceleration/Deceleration (Rapid Traverse: Linear; Cutting Feed: Linear or Exponential)
Rapid Traverse Bell-Shaped Acceleration/Deceleration
Feedrate Override 0-254%
Jog Override 0-655.34 %
Override Cancel
Manual Synchronous Feed

Programming

EIA/ISO Automatic Identification
Label Skip
Parity Check
Control In/Out
Optional Block Skip
Maximum Programmable Value - 8 digits
Program Number - O with 4 digits
Sequence Number - N with 5 digits
Absolute or Incremental Command
Programmable Data Input (G10)
Decimal Point Input
Setting in Diameter or Radius
Plane Selection (G17, G18, G19)
Rotary Axis Setting
Rotary Axis Rollover
Coordinate System Setting (G50)
Automatic Coordinate System Setting
Coordinate System Shift
Direct Coordinate System Shift Setting
Manual Absolute On/Off
G Code System A
Subprogram Calling
Canned Cycles
Multiple Repetitive Canned Cycles (G70-G76) (J877)
Specifying the Radius of an Arc

Auxiliary and Spindle Functions

Miscellaneous Function - M with 8 digits
Miscellaneous Function Lock
High Speed M/S/T Interface
Multiple Commands of Miscellaneous Functions (up to 3)
Spindle Function - S with 5 digits
Serial Spindle Interface (J850)
Constant Surface Speed Control (J855)
Spindle Override 0-254%

Series 31i-B CNC for Turning

Tool Functions and Tool Compensation

Tool Function - T7+1/T6+2
32 Tool Offsets
Tool Position Offset
Tool Nose Radius Compensation (J930)
Tool Compensation Counter Input
Tool Compensation Measurement Value Input A

Part Program Storage & Editing

256KB Part Program Storage (J945)
63 Stored Part Programs
Part Program Editing
Part Program Protection
Multi Part Program Editing (J956)
Extended Part Program Editing

Display

Status Display
Clock Function
Current Position Display
Program Display
Parameter Setting Display
Self Diagnosis
Alarm Display
Alarm History Display
Help Function
Run Time/Part Count Display (J971)
Actual Cutting Speed Display
Actual Spindle Speed/T Code Display
Servo Adjustment Screen
System Configuration Display
English Language
Data Protection Key

Data Input/Output and Communications

I/O Link or I/O Link i Interface
Punch Panel with 2m Cable A02B-0236-C192 in LCD Mount, A02B-0120-C192 in Stand Alone.
Reader/Punch Interface 1 (RS-232) (J900)
External Workpiece Number Search
External Data Input (J913)
 includes External Tool Offset
 External Message
 External Machine Origin Shift
 External Program Number Search
Status Output Signal

Other

CD-ROM containing Product Manuals	included in the BOM of the Root CNC
Operation and Maintenance Handbook	B-64487EN FS30i/31i/32i-Model B Oper and Maint Handbook
Miscellaneous Conn:	Qty 2 A02B-0120-K301 HONDA CONNECTOR
	Qty 1 each A02B-0120-K323 & A02B-0120-K324 CONNECTOR AND PINS
Spare Fuses	A02B-0236-K100 LCD or A02B-0265-K100 Stand Alone
Cable Clamps	A02B-0303-K001 8 CABLE CLAMPS
Grounding Bar	44B295864-001 GROUNDING BAR 11 SLOT

Series 31i-B CNC for Turning

SERIES 31i-B PACKAGE CHOICES

Package A	Package B	
2 Axes 2 Slot Rack LCD Mount Embedded Ethernet 10.4" LCD A Color PMC 24K Steps Serial Spindle CPU Card B2 Basic Function G401 Sep Vert Type MDI Axis Card B11	2 Axes 2 Slot Stand Alone HSSB Embedded Ethernet PMC 24K Steps Serial Spindle CPU Card B2 Basic Function G401 Axis Card B11	<p>This Form assumes the use of HRV2. If HRV3, HRV4 or additional servo motors are required, please complete this form as close as possible to your desired configuration, then e-mail the form and your requested changes to: cnc_express@fanucamerica.com</p> <p>CNC Express will modify the form per your request and return the form to you.</p> <p>G401 => Supports 2 Paths, 12 axes (12 per path), 4 spindles (4 per path). => A02B-0323-C128 or equivalent</p>

PACKAGE DEPENDENT OPTIONS

PROFIBUS DP Master PROFIBUS DP Slave HSSB Fast Ethernet Data Server 2nd Fast Ethernet Brd	PROFIBUS DP Master PROFIBUS DP Slave Fast Ethernet Data Server Remove HSSB 10.4" LCD A Color Tch 15.0" LCD Col w/ Tch CNC HSSB Card Sep MDI 2nd Fast Ethernet Brd	Automatic Data Back-up, 3 Sets of Back-up Data, SRAM + PPS
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USB Memory I/O is available on LCD Mount CNCs & the LCD for S.A.

shading indicates restrictions, see Package Options for details

Series 31i-B CNC for Turning
ORDER FORM

Series 31i-B CNC Express Package A for Turning - 10.4" LCD Mount w/o Touch Screen.		Pick One
Series 31i-B CNC Express Package B for Turning - 2 Slot Stand Alone. Choose Only 1.		Pick One
Package A Options		
PROFIBUS DP Master Board (J311, S731, J562#6552)	Choose no more than two	
PROFIBUS DP Slave Board (J313, S732, J563#655C)	Option Boards	
PROFIBUS Application Software, J535#655B, required for all PROFIBUS		
HSSB Board (High Speed Serial Bus) (J202) (includes Extended D/L Function, 10m F/O cbl)		
1st Fast Ethernet Board (J147) Requires Communication Option Below:		
Fast Ethernet Function (S707) (Uses FOCAS Protocol)		
Data Server Funct (S737,R953)(req's ATA Flash Mem Card)(Uses FTP for data transfer)		
Ethernet/IP Adapter Function (R967), Data Server requires a separate Ethernet Board		
Ethernet/IP Scanner Function (R966), Data Server requires a separate Ethernet Board		
2nd Fast Ethernet Board (J147)(Add'l Enet Port) Requires 2 of 3 (S707 or S737,R966,R967).		
Manual Guide i in Package A - Requires Custom Macro (J873) for full functionality.		
Manual Guide i (S790) 10.4" Color LCD Type A - Large Screen Animation not supported.		
Manual Guide i Multi Path Lathe (S786) for 2 or 3 paths.		Requires (S790).
Package B Options		
PROFIBUS DP Master Board (J311, S731, J562#6552)	Choose no more than two	
PROFIBUS DP Slave Board (J313, S732, J563#655C)	Option Boards	
PROFIBUS Application Software, J535#655B, required for all PROFIBUS		
1st Fast Ethernet Board (J147) Requires Communication Option Below:		
Fast Ethernet Function (S707) (Uses FOCAS Protocol)		
Data Server Funct (S737,R953)(req's ATA Flash Mem Card)(Uses FTP for data transfer)		
Ethernet/IP Adapter Function (R967), Data Server requires a separate Ethernet Board		
Ethernet/IP Scanner Function (R966), Data Server requires a separate Ethernet Board		
2nd Fast Ethernet Board (J147)(Add'l Enet Port) Requires 2 of 3 (S707 or S737,R966,R967).		
Do not use HSSB from Package B. (Removes A02B-0207-J900). For LCD or Ethernet Display.		
10.4" LCD A Color w/ Tch Scrn (C084)(290x220mm), J682, Pen & 10m F/O cbl, A02B-0120-K323, A02B-0120-K324, A02B-0319-K191	Only one LCD	
15.0" LCD Color w/ Tch Scrn (C092)(400x320mm), J682, Pen & 10m F/O cbl, A02B-0120-K323, A02B-0120-K324	Req MDI below.	
CNC Side HSSB Board (incl's A02B-0207-J900, 10m F/O cbl) Requires one Option Slot		
Without Standard CNC Display Unit - HSSB (J389) to Panel i or PC side HSSB, 10m F/O cbl.		
Without Standard CNC Display Unit - Embedded Ethernet (J390) connects to iPendant only		
Ethernet Display Function (R950 & J573#658N) Embedded Ethernet to PC, not for iPendant		
Sep Type MDI (Vert PC Type) (QWERTY) (290x160mm)	A02B-0323-C128 or equivalent	
Sep Type MDI (QWERTY Type B)(400x145mm) No 10.4" LCD	A02B-0303-C129 or equivalent	
Sep Type MDI (ONG Type) (Vertical) (290x220mm)	A02B-0323-C126#T or equivalent	
Sep Type MDI (ONG Type) (Horizontal) (230x220mm)	A02B-0323-C125#T or equivalent	
Manual Guide i in Package B - Requires Custom Macro (J873) for full functionality.		
Manual Guide i (S790)		
Manual Guide i Multi Path Lathe (S786) for 2 or 3 paths.		Requires (S790).
10.4" Color LCD A w/ Touch Screen does not support "Large Window Animation" in Manual Guide i.		
High Speed Serial Bus (HSSB) includes: Extended D/L Function J900 & 10m F/O Cable		

Series 31i-B CNC for Turning

SERIES 31i-B TURNING OPTIONS

The following options may be ordered for Packages A or B

Basic Function		0
G411 Basic S/W for up to 4 paths, 20 controlled axes, 12 per path, and 6 spindles, 4 per path		
Number of Paths		
Two Control Paths	Minimum of 4 Axes	
Three Control Paths, requires G411 Basic Function	Minimum of 6 Axes	
Four Control Paths, requires G411 Basic Function	Minimum of 8 Axes	
Axis Control: up to 20 axes and 6 spindles are possible.		
3rd Axis		
4th Axis		
5th Axis		
6th Axis		
7th Axis changes to B12 Servo Card, 1 FSSB Servo Line		
8th Axis		
9th Axis		
10th Axis		
11th Axis		
12th Axis		
13th Axis, Requires G411 Basic SW, changes to B13 Servo Card, 1 FSSB Servo Line		
14th Axis		
15th Axis		
16th Axis		
17th Axis		
18th Axis		
19th Axis changes to B24 Servo Card, 2 FSSB Servo Lines		
20th Axis		
Number of Serial Spindles (default is one). >1 Spindle per path requires Multi Spindle Control.		
2 Spindles		
3 Spindles, includes A13B-0180-B001, Spindle Signal Divider & cable, A02B-0236-K845.		
4 Spindles		
5 Spindles, Requires G411 Basic SW.		
6 Spindles		
Multi Spindle Control. Required if more than one spindle is used per path.		
Analog Spindle.		
Analog Spindle (J860) replaces Serial Spindle (J850). Having Serial Spindle requires R584.		
Serial/Analog Spindle Control - includes Multi Spindle Control.		
1 Serial Spindle and 1 Analog Spindle (R584, J850, J860)		
2 Serial Spindles and 1 Analog Spindle		
3 Serial Spindles and 1 Analog Spindle, Spindle Signal Divider & cable		
4 Serial Spindles and 1 Analog Spindle, Requires G411 Basic SW.		
5 Serial Spindles and 1 Analog Spindle		

Series 31i -B CNC for Turning

Axis Control Options

<input type="checkbox"/>	Axis Control by PMC (up to 16 axes) (J804)	
<input type="checkbox"/>	Synchronous Axis Control (up to 6 pairs axes) (J843)	
<input type="checkbox"/>	Controlled Axis Detach (J807)	
<input type="checkbox"/>	Least Input Increment of 0.0001mm, 0.00001", 0.0001deg (J805)	
<input type="checkbox"/>	Dual Position Feedback (J704)	
<input type="checkbox"/>	Stored Stroke Check 2/3 (J840)	
<input type="checkbox"/>	Stored Limit Check Before Move (J749)	
<input type="checkbox"/>	Interpolation type pitch error compensation (S644)	
<input type="checkbox"/>	Bi-directional pitch error compensation (S656)	
<input type="checkbox"/>	Straightness Compensation (J747) (4 points)	
<input type="checkbox"/>	Interpolation Type Straightness Compensation (S639) (128 points)	
<input type="checkbox"/>	Position Switch (J846)	
<input type="checkbox"/>	Rotary Axis Control (J743)	

Operation

<input type="checkbox"/>	Program Restart (J838)	
<input type="checkbox"/>	Tool Retract & Recover (J823)	
<input type="checkbox"/>	Manual Handle Retrace (J998)	
<input type="checkbox"/>	Manual Handle Feed 2/3 Units (J836)	
<input type="checkbox"/>	Manual Handle Interruption (J837)	
<input type="checkbox"/>	Change Active Offset Value with Manual Move (S825)	

Interpolation

<input type="checkbox"/>	Polar Coordinate Interpolation (J815)	
<input type="checkbox"/>	Cylindrical Interpolation (J816)	<i>(requires 3rd Axis)</i>
<input type="checkbox"/>	Helical Interpolation (J819)	<i>(requires 3rd Axis)</i>
<input type="checkbox"/>	Thread Cutting Retract (J825)	
<input type="checkbox"/>	Variable Lead Threading (G34) (J827)	
<input type="checkbox"/>	Polygon Turning (J817)	
<input type="checkbox"/>	High Speed Skip (J848)	
<input type="checkbox"/>	Multi Step Skip (J849)	
<input type="checkbox"/>	3rd, 4th Reference Point Return (J830)	
<input type="checkbox"/>	Reference Point Setting with Mechanical Stopper (J729)	
<input type="checkbox"/>	Linear Scale I/F w/ absolute address reference mark (J670). Requires Separate Detector I/F.	

Feed Function

<input type="checkbox"/>	Bell Shaped Acc/Dec After Interpolation for Cutting Feed (J829)	
<input type="checkbox"/>	2nd Feedrate Override (J810)	

Grinding Options

<input type="checkbox"/>	Canned Cycles for Grinding (S974)	<i>(selectable per path with multiple repetitive cycles)</i>
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Series 31i -B CNC for Turning

Programming

Dynamic Switching of diameter/radius specification (G10.9) (S630)	
Workpiece Coordinate System (G52-G59) (J894)	
Workpiece Coordinate System Preset (J917)	
Direct Drawing Dimension Programming (J870)	Only one of these options can be active per path.
Chamfering/Corner Rounding (J875)	
Special G Code B/C (J871)	
Custom Macro (J873)	
Additional Custom Macro Common Variables (J887), 100 + 500 = 600 Total	Only One.
Additional Custom Macro Common Variables 1000 (R687), 100 + 1000 = 1100 Total	
Interruption for Custom Macro (J874)	
Pattern Data Input (J884)	
Multiple Repetitive Canned Cycles II (J889)	
Canned Cycles for Drilling (J890)	
Mirror Image for Dual Turrets (G68, G69) (J881)	
Coordinate System Rotation (J893)	
Series 15 Tape Format (J882)	
Macro Executor (J888) 96K Reserved for System S/W.	Choose only one Macro
Macro Executor + C-language Executor (J734) 700K Reserved for System S/W.	
FANUC PICTURE Executor (R644) 2M Reserved for System S/W.	Available with J888/J734.
Custom Software Size 512KB (J738#512K)	Not with J734 or R644.
Custom Software Size 2MB (J738#2M)	Not with R644.
Custom Software Size 4MB (J738#4M)	Choose only one Custom Software Size.
Custom Software Size 6MB (J738#6M)	
Custom Software Size 8MB (J738#8M)	
Custom Software Size 12MB (J738#12M)	

PMC Options

PMC with 32K Steps (H990#32K)	
PMC with 64K Steps (H990#64K)	
PMC with 100K Steps (H990#100K)	24,000 Steps Standard, choose only One upgrade.
PMC with 300K Steps (H990#300K)	
Multi-path PMC function (3 paths) (R855#3)	One PMC Path Standard. Choose Only One.
Multi-path PMC function (5 paths) (R855#5)	
PMC symbol, comment, and message capacity expansion (512KB) (R856#512K)	
PMC symbol, comment, and message capacity expansion (1MB) (R856#1M)	
PMC symbol, comment, and message capacity expansion (2MB) (R856#2M)	Only One.
Function Block Function (R852)	
I/O Link expansion 2nd Channel w/ A20B-1007-0680 and 1m cable.	
I/O Link expansion 2nd/3rd Channel w/ A20B-1008-0360 and 1m cable.	
Dual Check Safety (S661) Req's I/O Link i,I/O Link 3rd Channel or PROFIBUS Master.	1
I/O Link i will be used for Dual Check Safety.	Check here:

Auxiliary and Spindle Functions

1st Spindle Orientation (J853) (Applies to 1st Spindle per Path)	(req's Serial Spindle)
Actual Spindle Speed Output (J856)	(requires Spindle Encoder)
2nd Miscellaneous Function (B8-digit binary) (J920)	
Rigid Tapping (J828)	(requires Canned Cycles, Analog Spindle requires Spindle Encoder.)
See Drives Tab for Spindle Separately Mounted Position Encoder.	

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Tool Functions and Tool Compensation

64 Tool Offset Pairs (J925)	Assignable by parameter per path.	
99 Tool Offset Pairs (J926)		
200 Tool Offset Pairs (J927)		Choose only one if more than 32 offsets needed.
Y-axis Offset (J934)	(3rd or 4th axis required)	
Tool Geometry and Wear Compensation (J931)		
Tool Life Management (J935)		
Automatic Tool Compensation (S618)		
Direct Input of Measured Offset (J933)		

Part Program Storage & Editing Total PPS in the system, available to all paths.

512KB Part Program Storage (J946) (Approx 1280m)	Choose only one	
1MB Part Program Storage (J947) (Approx 2560m)		
2MB Part Program Storage + 1000 Stored Part Programs (J948) (J953) (Approx 5120m)		
4MB Part Program Storage + 1000 Stored Part Programs (J949) (J953) (Approx 10240m)		
8MB Part Program Storage + 1000 Stored Part Programs (J959) (J953) (Approx 20480m)		
Playback (J879)		

FANUC Picture

FANUC Picture Function (S879) Req's LCD w/ Tch Pnl, deletes J682, not w/ J734/J888/R644	
FANUC Picture Function for non-Touch panel display (S944) Not w/ J734, J888 or R644	

Ethernet or HSSB Options

Use Embedded Ethernet for BOP2 or Ladder Edit Function	
Basic Operation Package (BOP2) Function (J816) & CD (Also works w/ embedded Ethernet)	
CNC Screen Display Function (J858)	
Application Disk for HSSB (K775)	
Application Disk for Ethernet (K776)	
CNC Screen Dual Display Function (S884)	
CNC Screen Display for 19" Panel i (R624)	19" Panel i requires one of these options
Enlarged CNC Screen Display for 19" Panel i (R673)	
CNC Web Server Function (R728) Reqs Std LCD Disp, No CNC Scrn Disp, No simul iPndnt.	
Ladder Edit Function (J820) (Also works w/ embedded Ethernet)	

Display

Graphic Display (J972)	Requires LCD or CNC Screen Display Function	
Software Operator Panel (J960)		
Software Operator Panel General Purpose Switch (J961)		
Selection of Five Optional Language (R521)		

Data Input/Output and Communications

Compact Flash Card 128MB, Card Adapter B	0	
Compact Flash Card 1GB (suggested for use with Data Server), 2 Card Adapters	0	
2nd Reader/Punch Interface (RS-232) (J901)		

i AdaptS

Check to override required DVD.

<p><i>i</i> AdaptS (S898) maintains a constant load during part processing by modifying the feedrate override. This allows for the fastest possible cycle time based on the condition of the tool, part geometry and material variation. By maintaining the manufacturer's recommended load on the tool, tool life can also be extended. <i>i</i> AdaptS works on the first serial spindle in the first path only. Req's J856, J873, J810, J738#2M, J734.</p>	
<i>i</i> AdaptS S/W DVD D75F-0102-PB00	Each MTB/Retrofitter must purchase a DVD once.
<i>i</i> AdaptS S/W DVD with FANUC Picture (R644). Req's R644 >=J738#6M. D75F-0103-PB00.	

Series 31i-B CNC for Turning

Cables Optional: Replace 10m cable for LCD ordered with Package B with one of the following:

<input type="checkbox"/>	Fiber Optic Cable, CNC to LCD, 1m	
<input type="checkbox"/>	Fiber Optic Cable, CNC to LCD, 5m	
<input type="checkbox"/>	Fiber Optic Cable, CNC to LCD, 20m	
<input type="checkbox"/>	Fiber Optic Cable, CNC to LCD, 30m	
<input type="checkbox"/>	Fiber Optic Cable, CNC to LCD, 40m	
<input type="checkbox"/>	Fiber Optic Cable, CNC to LCD, 50m	

Different MDI's

<input type="checkbox"/>	Separate Type MDI (ONG) (Vertical) A02B-0323-C126#T or equivalent 290x220mm	Replaces Vertical QWERTY in Pkg A (Do not order with Pkg B)	
<input type="checkbox"/>	Separate Type MDI (ONG) (Horizontal) A02B-0323-C125#T or equivalent 230x220mm	Replaces Vertical QWERTY in Pkg A (Do not order with Pkg B)	

Product Manuals

<input type="checkbox"/>	Series 30i/31i/32i-B Descriptions,	B-64482EN	0	
<input type="checkbox"/>	Series 30i/31i/32i-Model B Connection Manual Hardware,	B-64483EN	0	
<input type="checkbox"/>	Series 30i/31i/32i-Model B Connection Manual (Function),	B-64483EN-1	0	
<input type="checkbox"/>	Series 30i/31i/32i-Model B Maintenance Manual *,	B-64485EN	0	
<input type="checkbox"/>	Series 30i/31i/32i-Model B Parameter Manual *,	B-64490EN	0	
<input type="checkbox"/>	Series 30i/31i/32i-B User's Manual Common & Lathe *,	B-64484EN & -1	0	
<input type="checkbox"/>	Series 30i/31i/32i FAST Ethernet/Data Server Operator's Manual,	B-64014EN	0	
<input type="checkbox"/>	Manual Guide i Operator's Manuals & Setup Guide,	B-63874EN, -1 & -2	0	

*This Manual is NOT included on any CD. A complimentary copy is shipped with the CNC.
Extra hard-copy manuals, if required, may be ordered here.*

<input type="checkbox"/>	Series 30i/31i/32i Model B Operation and Maintenance Handbook, B-64487EN	0	
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Check here if no I/O is needed.

<input type="checkbox"/>	Check here if I/O has already been purchased	
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