## MC-L SERIES OPTIONS

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPT-2116</td>
<td>SPIDER COOL PROGRAMMABLE COOLANT NOZZLE</td>
<td>Programmable nozzle moves automatically to adjust for differences in tool length. Can also be set to oscillate mode for flushing action.</td>
</tr>
<tr>
<td>OPT-2165</td>
<td>10-MICRON COOLANT FILTRATION SYSTEM</td>
<td>10-micron coolant filtration system features up to 10- GPM flow rate with a replaceable element.</td>
</tr>
<tr>
<td>OPT-2112</td>
<td>SPRAY MIST COOLANT SYSTEM</td>
<td></td>
</tr>
<tr>
<td>OPT-2169</td>
<td>MIST COLLECTION SYSTEM</td>
<td></td>
</tr>
<tr>
<td>OPT-2114</td>
<td>AIR BLAST SYSTEM</td>
<td>Programmable air nozzle for plastic, graphite and other dry materials</td>
</tr>
<tr>
<td>OPT-9220</td>
<td>AUTOMATIC DOOR</td>
<td>Electric operated automatic door opener.</td>
</tr>
<tr>
<td>OPT-9233</td>
<td>ELECTRICAL CABINET AIR CONDITIONER</td>
<td>Replaces standard fan vented cabinet with a sealed cabinet. Air conditioning unit keeps inside temperature at the desired set temperature regardless of what the outside temperature is. Recommended for area where ambient temperature exceeds 100 degrees Fahrenheit.</td>
</tr>
<tr>
<td>OPT-2132</td>
<td>AUTOMATIC PALLET SHUTTLE SYSTEM</td>
<td></td>
</tr>
<tr>
<td>OPT-2120</td>
<td>ABRASIVE MATERIAL MACHINING PACKAGE</td>
<td>Includes one piece sealed way covers that protect the ways from abrasive contaminates. Includes a sealed electrical cabinet with an high efficiency heat exchanger.</td>
</tr>
</tbody>
</table>

### EXTENDED TRAVEL

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPT-4340</td>
<td>EXTENDED 38&quot; Z TRAVEL (MC-60)</td>
<td>Spindle nose to table increases to 2&quot; - 40&quot;</td>
</tr>
<tr>
<td>OPT-5313</td>
<td>EXTENDED 35&quot; Y TRAVEL (MC-60)</td>
<td>Spindle to column is increased to 36&quot;</td>
</tr>
</tbody>
</table>

### CHIP REMOVAL

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPT-2102</td>
<td>CHIP AUGER SYSTEM</td>
<td></td>
</tr>
<tr>
<td>OPT-8039</td>
<td>CHIP CONVEYOR SYSTEM</td>
<td></td>
</tr>
<tr>
<td>OPT-2104</td>
<td>HIGH PRESSURE WASHDOWN SYSTEM &amp; WASHDOWN HOSE</td>
<td>Flushes chips into auger or conveyor system.</td>
</tr>
</tbody>
</table>

### SPINDLE OPTIONS

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPT-2202</td>
<td>12,000 RPM 40 TAPER IN-LINE SPINDLE</td>
<td>Includes refrigeration unit and air purge seal.</td>
</tr>
<tr>
<td>OPT-2204</td>
<td>15,000 RPM 40 TAPER IN-LINE SPINDLE</td>
<td>Includes refrigeration unit and air purge seal.</td>
</tr>
<tr>
<td>OPT-2205</td>
<td>21,000 RPM 30 TAPER ELECTRIC SPINDLE</td>
<td>Includes refrigeration unit, air purge seal, conversion of ATC to 30 taper.</td>
</tr>
<tr>
<td>OPT-2206</td>
<td>30,000 RPM 30 TAPER ELECTRIC SPINDLE</td>
<td>Includes refrigeration unit, air purge seal, oil/air lube system, conversion of ATC to 30 taper.</td>
</tr>
<tr>
<td>OPT-2213</td>
<td>350 PSI COOLANT THRU SPINDLE SYSTEM</td>
<td>High pressure, adjustable 100-350 PSI thru spindle coolant system. Includes high volume 8-gallon / minute pump and 10-micron replaceable filter. Features full pressure even with tool coolant holes up to .200&quot; diameter. Includes top cover. 40 or 50 taper spindles.</td>
</tr>
<tr>
<td>OPT-2212</td>
<td>1,000 PSI COOLANT THRU SPINDLE SYSTEM</td>
<td>High pressure, adjustable 300-1,000 PSI thru spindle coolant system. Includes high volume 8-gallon / minute pump. This allows full pressure even with tool coolant holes up to .100&quot; diameter. System includes 10-micron replaceable filter cartridge. Includes top cover. 40 or 50 taper spindles.</td>
</tr>
<tr>
<td>OPT-2216</td>
<td>BIG PLUS TAPER SPINDLE FOR CAT OR BT</td>
<td>Dual contact Big Plus spindle improves cutting performance with use of special Big plus holders. Also accepts standard 40 taper holders for normal performance.</td>
</tr>
</tbody>
</table>
BT-40 SPINDLE   For Japanese style BT-40 tooling.

**AUTOMATIC TOOL CHANGERS - 40 TAPER**

**OPT-4103** UPGRADE TO 40 STATION ARM TYPE AUTOMATIC TOOL CHANGER   Column mounted, twin arm, 40 + 1 Station tool changer holds up to 3.55” (adjacent) and 6.00” (empty pocket) diameter tools, 11” long, 17.50 lbs. Tool change time 3 seconds.

**ROTARY TABLE CONTROLLERS**

**OPT-4306** 4TH AXIS DRIVE AND WIRING for 6” to 10” Rotary Tables   Add this option to any Fryer machine in order to control the 4th axis rotary tables as a full contouring 4th axis. Includes drive, wiring and 4th axis software.

**OPT-4305** 4TH AXIS DRIVE AND WIRING for 12” to 32” Rotary Tables   Add this option to any Fryer machine in order to control the 4th axis rotary tables as a full contouring 4th axis. Includes drive, wiring and 4th axis software.

**OPT-4349** 5TH AXIS DRIVE AND WIRING for 6” to 12” Trunnion Tables   Add this option to any Fryer machine in order to control the two axis rotary tables as a full contouring 4th and 5th axis. Includes drives, wiring and special 5 axis software. Requires 4th axis Drive and Wiring.

**4th AXIS ROTARY TABLES**

*Fryer made rotary tables feature exceptional quality and accuracy. Dual worm gear drive, high torque disc brake, AC brushless motor, coolant tight motor housing, quick disconnect cable set, table clamp set and ground locating keys.*

**OPT-1002** RT-170   6” 4TH AXIS ROTARY TABLE

**OPT-1003** 6” TAILSTOCK

**OPT-1004** 6” ROTARY TABLE CHUCK

**OPT-4310** RT-200   8” 4TH AXIS ROTARY TABLE

**OPT-4311** 8” TAILSTOCK

**OPT-4306** 8” HEAVY DUTY TAILSTOCK Tailstock includes a cast iron body, keyed table and features a faceplate to hold a 3-jaw chuck or a center. Also includes high torque pneumatic disc brake.

**OPT-4312** 8” ROTARY TABLE CHUCK

**OPT-4313** RT-250   10” 4TH AXIS ROTARY TABLE

**OPT-4314** 10” TAILSTOCK

**OPT-4315** 10” HEAVY DUTY TAILSTOCK Tailstock includes a cast iron body, keyed table and features a faceplate to hold a 3-jaw chuck or a center. Also includes high torque pneumatic disc brake.

**OPT-4316** 10” ROTARY TABLE CHUCK

**OPT-4317** RT-320 12” 4TH AXIS ROTARY TABLE

**OPT-4318** 12” TAILSTOCK

**OPT-4319** 12” HEAVY DUTY TAILSTOCK Tailstock includes a cast iron body, keyed table and features a faceplate to hold a 3-jaw chuck or a center. Also includes high torque pneumatic disc brake.

**OPT-4320** 12” ROTARY TABLE CHUCK

**5th AXIS TRUNNION ROTARY TABLES**

*Fryer made 5th axis rotary tables are perfect for multisided machining as well as full 5 axis contouring. Ultra precise ring and worm gear set ensure dead-on accuracy. All tables feature trunnion style full support for heavy duty cutting, hydraulic disc brake, table clamp set, quick disconnect cable set and ground locating keys.*

**Requires 4th & 5th axis rotary table controllers above.**

**OPT-8503** TRT-100   6” 5TH AXIS TRUNNION ROTARY TABLE

**OPT-8505** TRT-200   8” 5TH AXIS TRUNNION ROTARY TABLE
OPT-8507  TRT-250  10”  5TH AXIS TRUNNION ROTARY TABLE
OPT-8509  TRT-320  12”  5TH AXIS TRUNNION ROTARY TABLE

**GLASS SCALES**

OPT-1102  HEIDENHAIN GLASS SCALE FEEDBACK 0.000050” RESOLUTION - X & Y AXIS (MODELS UP TO 40” X TRAVEL)  This is a super accurate system using dual feedback. The standard encoders provide a stable servo loop while the ultra precision scales provide final position accuracy.

OPT-2124  HEIDENHAIN GLASS SCALE FEEDBACK 0.000050” RESOLUTION – Z AXIS (MODELS WITH UP TO 30” Z TRAVEL)

**CONTROL OPTIONS - FRYER / SIEMENS 828 HS**

OPT-0602  REMOTE ELECTRONIC HANDWHEEL  Handy jog handwheel is located in a portable box. Features axis selector switch and a resolution selector for coarse or fine movement. Remote stop start is also included.

OPT-2146  HANDBHEEL RUN FUNCTION  This feature allows you to control your program execution with the electronic handwheel. Turning the handwheel causes the program to run, with you controlling the feedrate. You can move forwards and even backwards with this handy feature. Designed to make proving-out programs easier with safety and confidence.

OPT-2158  SWIVEL FUNCTION  This innovative function allows the operator to enter the angle of an adjustable right angle toolholder into the control. X and Z axes are then automatically slaved to allow milling and drilling. Addition of the remote handwheel option provides for manual movement.

OPT-2147  DXF FILE IMPORT FEATURE  Allows you to import DXF files and quickly convert to a conversational program. Automatically create points for drilling operations or contours for milling.

OPT-4133  IN-PROCESS PART PROBE MEASUREMENT CYCLES  This feature allows you to measure part features during program execution. Can also be used in MDI mode after cutting the part to then measure certain features and display the measurement.

OPT-9104  HIGH SPEED NETWORK INTERFACE  High speed Ethernet port is the ideal way to connect your machine to your LAN (local area network). Features 10/100 MB/s bandwidth for fast uploads and downloads of part programs. Also features a drip feed option that allows you to run part programs larger than the memory of the machine.

OPT-2140  REMOTE MONITORING  Allows monitoring of the CNC from any remote location where internet access is available. Check cycle times, spindle load, feedrate override position, program being run and more. Requires network interface option.

OPT-2100  SIEMENS OFFLINE PROGRAMMING SOFTWARE  Easy-to-use software package that installs on a standard desktop PC and duplicates the control functions. Allows full programming and part program verification. Single package for lathe and mill. Windows 7-10 compatible.

OPT-2151  EXPANDED MEMORY 100 MB  Standard memory of 6 MB is increased to 100 MB for handling larger CAM programs.

OPT-2142  3D HIGH SPEED MACHINING  Features high speed 1.5ms block processing and 500 block look-ahead. Advance Surface features jerk control and nano smoothing with a compressor mode which determines optimal velocity for programs containing circular and linear blocks. High speed roughing parameters and lower speed finishing parameters provide incredible surface finish at lowest possible cutting time.

OPT-2163  RESIDUAL MATERIAL DETECTION  This software option allows re-machining of pocket milling contours with a tool smaller than the original tool. The control will remember where material has already been machined and will cut only the residual material.

OPT-2156  EXTENDED OPERATOR FUNCTIONS  Includes additional part probing cycles, teach function, the ability to save tool data and tool offset data, save MDI programs and other features.

OPT-2154  4TH AXIS SURFACE CYCLES  Allows programming of XYZ coordinates and cycles like pockets and engraving. These are then automatically projected onto a cylindrical surface. For use with 4th axis rotary tables.

OPT-2156  ADAPTIVE FEED CONTROL  This cycle monitors the spindle load and varies the feed rate accordingly. By entering the maximum spindle load and then entering a range of minimum and maximum feedrate override values, the control monitors these settings and adjusts the feeds automatically. When approaching corners and radii the feed rate will slow down, during straight line moves the feedrate increases to shorten the cutting time and help produce more parts per hour.

OPT-2157  COLLISION AVOIDANCE  Provides protection by monitoring the machine travels, tool offset and a model of the fixture in 3D. Works in every operating mode including Jog, MDI and Automatic. With Collision Avoidance, the potential for machine components colliding is greatly reduced or even eliminated.
FRYER - SIEMENS TOUCH 2300 CNC CONTROL UPGRADE  The 2300 CNC is based on the powerful Siemens 840D platform. This control features a 19" touch screen display, 5 axis expandable and advanced operator functions. Includes Handwheel run and Run verify features as well as probe cycles. Software options for this control are slightly different than the 828-HS control, contact the factory for additional information on these options.

SPARE "M" FUNCTION  Use to connect remote devices like indexers, shuttles, clamps, etc.

CONTROL OPTIONS - FANUC

FANUC 0i MF
FANUC 31i A5 - 5 axis CNC
HIGH TORQUE 30 HP SPINDLE MOTOR AND DRIVE
HIGH SPEED ETHERNET NETWORK PORT  (100 MB/SEC)
USB PORT FOR MEMORY STICK DEVICES
REMOTE ELECTRONIC HANDWHEEL WITH AXIS AND RESOLUTION SELECT
2 MB PROGRAM STORAGE MEMORY UPGRADE  (512K STANDARD)
HIGH SPEED MACHINING PACKAGE for 0i (Fanuc AiCC Nano)  This package is designed for die mold applications where the ultimate in performance is desired. Features 2 millisecond block processing speed with 200 block look ahead. Bell shaped ACC/DEC interpolation. Nano smoothing and jerk control included.
HIGH SPEED MACHINING PACKAGE for 31i (Fanuc Ai Nano)  This package is designed for die mold applications where the ultimate in performance is desired. Features 1 millisecond block processing speed with 600 block look ahead. Bell shaped ACC/DEC interpolation. Nano smoothing and jerk control included
WORK OFFSETS – 48 PAIR STANDARD
I ADAPT  Lowers cycle times by up to 40% by automatically optimizing the cutting feedrate based on the actual load on the spindle.
FANUC SPECIAL OPTIONS  Fryer offers all Fanuc available options. Many of these options offer special features and performance and should be discussed with the factory.

PROBES

FRYER AUTOMATIC TOOL AND PART PROBE PACKAGE  This package includes table mounted tool probe to auto set the tool length offset and a wired part probe to auto set pocket centers, bosses, and find edges. The simple graphical interface included gives the operator the fastest set-up possible.
MARPOSS WIRELESS TOOL AND PART PROBE PACKAGE  Includes a wireless (IR) table mounted tool probe that automatically measures and sets your tool length and diameter offsets. Included is an easy to use wireless part probe that works with the ATC and allows you to quickly find edges, hole centers, bosses and many more shapes. Simple graphical menus make operations fast and can also be used to measure part geometry.
MARPOSS IR WIRELESS PART PROBE ONLY  Infrared (IR) probe is ideal for 3-axis applications. The part probe works with the ATC and allows you to quickly find edges, hole centers, bosses and many more shapes. Simple graphical menus make operations fast and can also be used to measure part geometry.
RENISHAW WIRELESS TOOL AND PART PROBE PACKAGE  Includes a wireless (IR) table mounted tool probe that automatically measures and sets your tool length and diameter offsets. Included is an easy to use wireless (IR) part probe that works with the ATC and allows you to quickly find edges, hole centers, bosses and many more shapes. Simple graphical menus make operations fast and can also be used to measure part geometry.
RENISHAW IR WIRELESS PART PROBE ONLY  Infrared (IR) probe is ideal for 3-axis applications. The part probe works with the ATC and allows you to quickly find edges, hole centers, bosses and many more shapes. Simple graphical menus make operations fast and can also be used to measure part geometry.
RENISHAW NC4 LASER TOOL PROBE  The Renishaw NC4 is the latest generation of non-contact tool setter and their most compact design. Repeatability of trigger points (2 sigma) ±1.0 µm at 1 m separation; minimum tool diameter for measurement Ø0.03 mm (0.001 in). Maximum tool diameter is 80mm

TOOLING & WORKHOLDING
SANDVIK #40 V-FLANGE TOOLING PACKAGE  Standard tooling package includes: (6) collet chucks with the following collet sizes; (1) 1/4"; (2) 3/8"; (2) 1/2"; (1) 5/8"; (1) 3/4"; (1) 1". Solid end mill holders as follows: (2) 3/8"; (2) 1/2"; (1) 5/8"; (1) 3/4"; (1) 1"; (1) 1/2" keyless drill chuck with holder, collet chuck wrench & set-up fixture, (14) retention knobs.

PACKAGE OF 12 CAT-40 OR BT-40 RETENTION KNOBS  Specify at time of order.

PACKAGE OF 12 CAT-40 OR BT-40 RETENTION KNOBS FOR THRU SPINDLE COOLANT  Specify at time of order.

6" HIGH PRECISION VISE  KURT BRAND - MADE IN USA

FACTORY SERVICES

FACTORY SET-UP & TRAINING AT YOUR FACILITY  3 Days Contiguous US. Includes travel expenses. Training on Siemens Control only.

TRAINING ONLY -- 1 DAY  Expenses and travel time additional.

RUN-OFF AT FACTORY

ELECTRICAL

380-500 VAC 3 PHASE STANDARD

CHANGE TO 208-250 VAC 3 PHASE POWER 30KVA  Use with 30HP motor.

CHANGE TO 208-250 VAC 3 PHASE POWER 45KVA  Use with 40HP motor.