

SMEC

MCV 420UL

VERTICAL MACHINING CENTER



SMEC
SMEC CO.,LTD.

SMEC Co., Ltd.
157-10, Goldenroot-ro, Juchon-myeon,
Gimhae-si, Gyeongsangnam-do, Korea
Tel +82 55 340 4800
Fax +82 55 340 4740

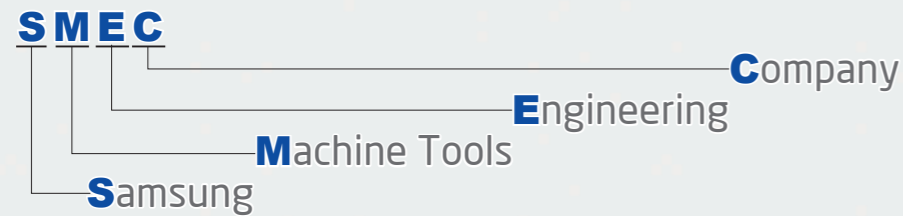


SMEC
Smart One,
Global One

<https://www.youtube.com/c/smecmachinetools>

SMEC
SMEC CO.,LTD.

- 1988 - Started as Samsung Heavy Industries Machine Tools Business
- 1989 - Horizontal and vertical machining center technology partnership with OKK Japan
- 1991 - Turning center and vertical machining center technology partnership with Mori Seiki
- 1996 - 5-sided processing center technology partnership with Toshiba
- 1999 - Spun out from Samsung Aerospace Industries and established SMEC Co., Ltd



MCV 420UL

Offers high productivity and efficiency while meeting the various needs of the production floor with its unique structural design

- Able to handle customer's work size
- Incomparable non-cutting time for large machining center
- Significantly reduced non-cutting time with the ATC attached directly to the column



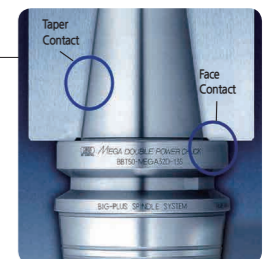
Designed for high speed and productivity also ultra precision machining - **MCV 420UL**

| Item | MCV 420UL |
|------------------------|-----------------|
| Table Size | 6,600 x 460mm |
| Travels (X/Y/Z) | 6,200/420/450mm |
| Spindle Speed | 10,000rpm |
| Spindle Motor | 7.5/11kW |
| Tool Shank | BT40 |
| Rapid Traverse (X/Y/Z) | 24/30/30 m/min |

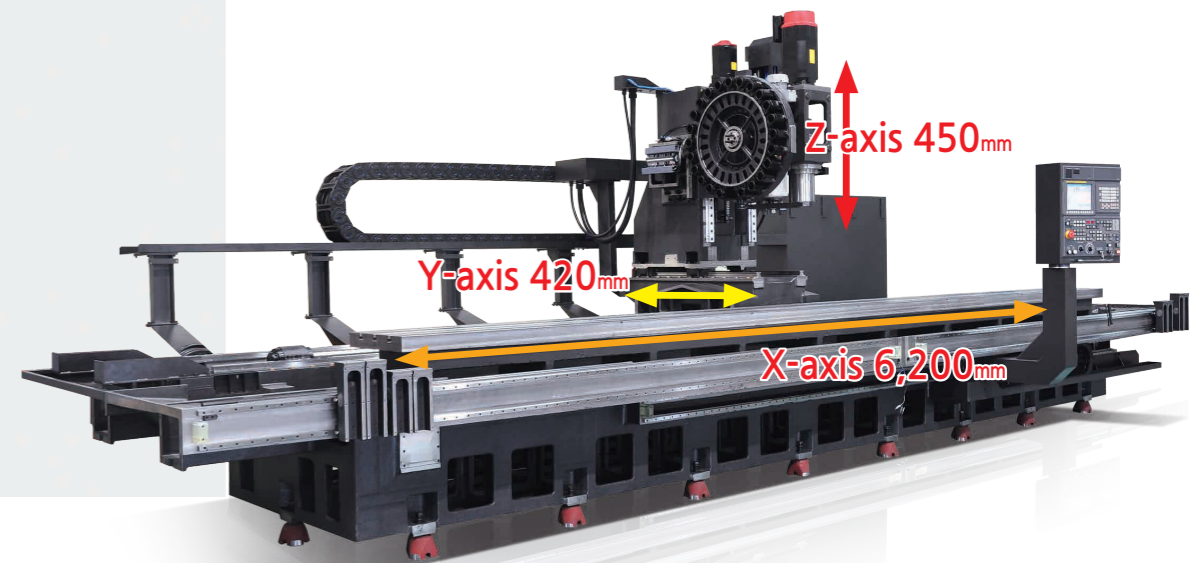
Dual Contact Spindle (BBT 40)

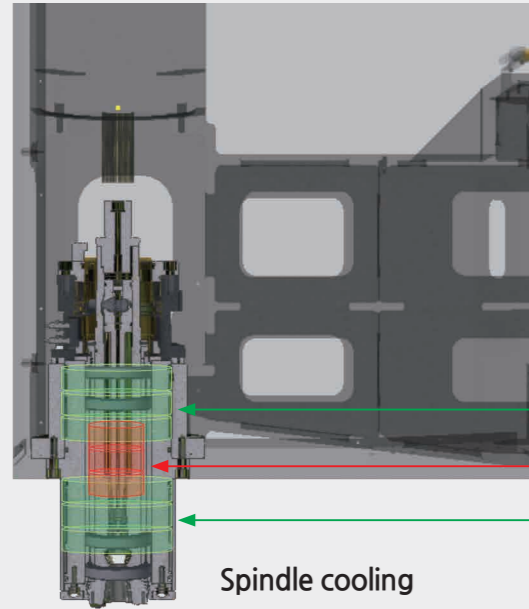
Dual contact system to contact both main spindle surface and taper surface dually by measuring elastic deformation of spindle surface that occurs when main spindle is clamped.

- Simultaneous contact to both main spindle surface and taper increases rigidity and reduces vibration.
- Increases machining capacity and surface roughness even under harsh condition.
- 100% compatible with existing tools.(BT40)



Big Plus BBT40(Opt.)
(Simultaneous Dual Contact)

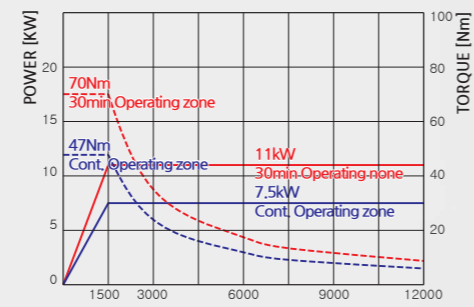




Spindle cooling

Adopting semipermanent grease to bearing, minimizing thermal displacement by jacket circulation cooling through oil cooler to bearing housing which is root of the heat, realizing spindle life longer through stable performances.

Spindle torque diagram Unit : mm



- Housing outer ring circulation(Above)
- Housing inner ring circulation
- Housing outward circulation(Below)

SPLASH GUARD(Standard)

Even if moving spindle head up to full z axis stroke head can be covered by splash guard to prevent coolant or chips go to outside.

Option design considered user's way of moving(Optional)

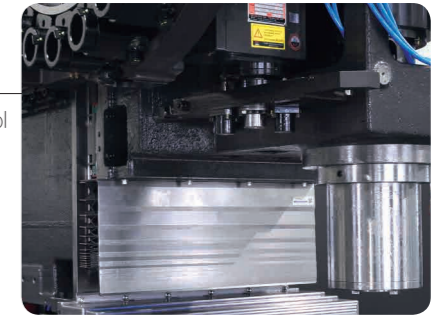
- Air gun can be moved with stand
- Coolant gun can be installed in right and left side
- Installing second control panel is possible when using additional axis



MEMORY RANDOM Type Quick Tool Changer

Double Arm Swing Type offers the fastest tool change time

Tool to Tool Time
1.3sec at 60Hz



Oil Bath Cam Type

In general, BT30 sized machines use Drum Type tool changing. But due to the vibration from the heavy head of Drum Types, SMEC implemented a self-developed high-speed CAM system.

Tool Magazine

Servo motors are used to operate the ATC and MG, ensuring problem-free high-speed ATC operation. High speed magazine rotation helps reduce non-cutting time.

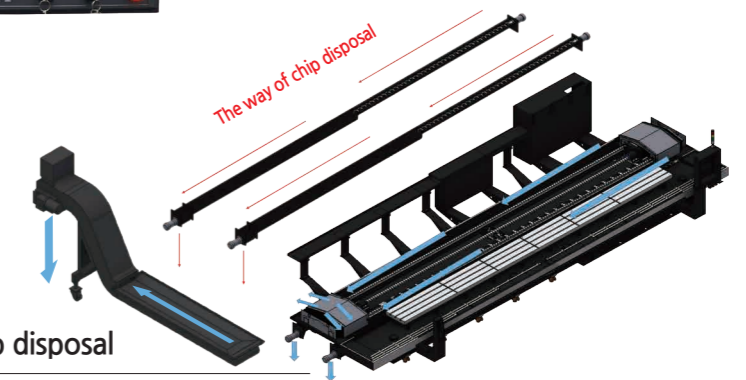
24 ea



Main Operation Panel

Mounted on a guide rail, the OP panel can be moved from the right edge of the table to the very center, allowing the operator to look closely at the workpiece.

Perfect chip disposal

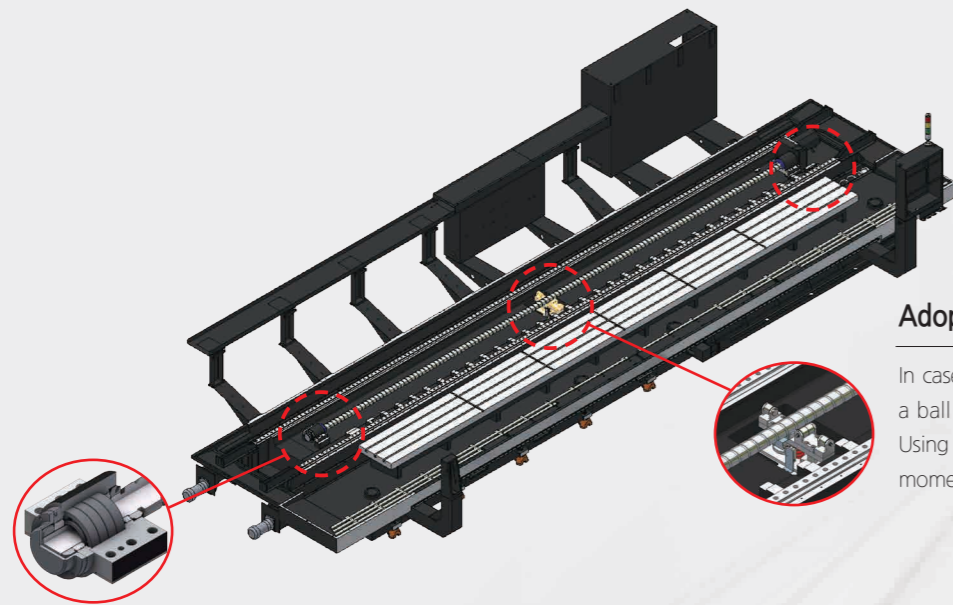


Enable to chip disposal to X axis direction by 4 rows coil conveyor. Realizing appropriate chip disposal structure by locating the way of disposal is behind the saddle. Chip can be fallen into the coil conveyor directly by slant slide cover.



Moveable Column

With the workpiece fixed, the column travels in the X and Y-axis and machines, so even if the workpiece is large and heavy, there is no overhang of the X and Y axis, enabling precise machining.

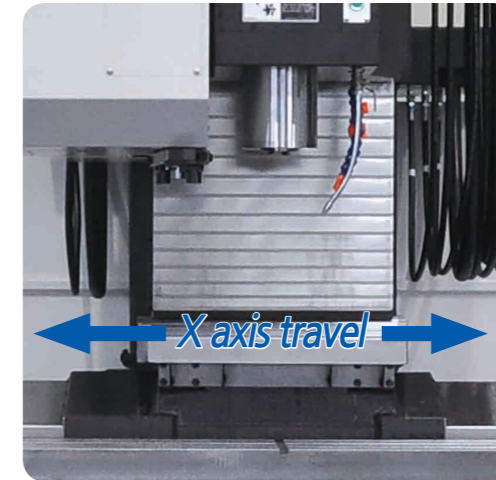
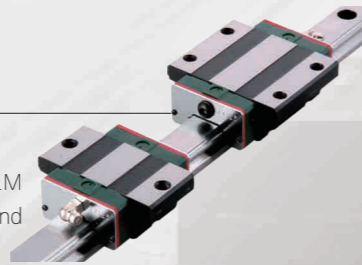


Adopting support

In case of long axis machine there is a ball screw slack by heavy weight. Using support on ball screw to erase moment by causing slack.

Guide Way

- Improved speed, rigidity and durability
- Better wear resistance than BALL LM GUIDES, ensuring better precision travel and extended machine lifetime



Rapid traverse
24/30/30 m/min
X axis ball screw diameter
Ø63
X axis Feed Motor
6 kW

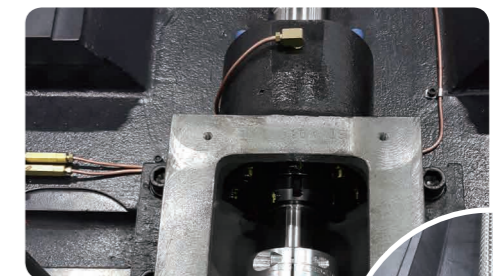
Rapid Traverse Rate

In order to increase traverse rate, L/M Guides were used for all the axis, to offer rapids not normally seen in large machines. To ensure durability and quality assurance during heavy-duty cutting, German-made Schneberger Roller Type LM Guides were used.



Automatic Lubrication Dispenser

Automatic lubrication dispenser uses LHL-X100 oil making strong oil layer to prevent abrasion on guide way. Gel type grease prevent coolant rotten to provide fresh environment. <Extend over three times of coolant life time>



X-Axis Thermal Expansion Prevention

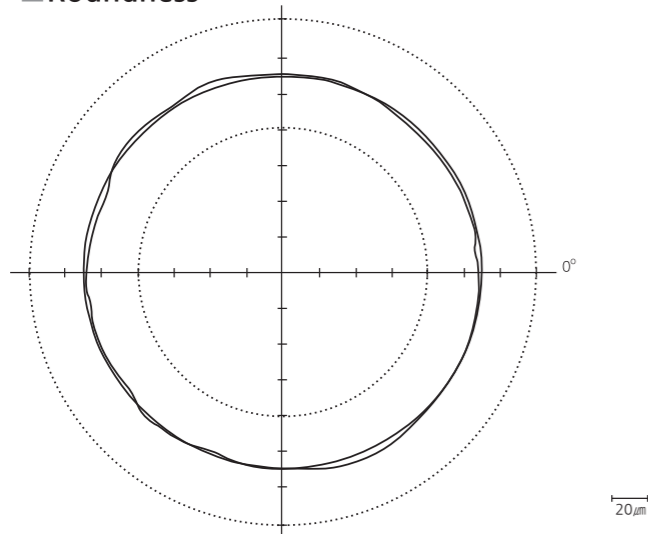
As long workpieces (in the X-Axis) are usually machined, small changes in temperature changes the length of the ballscrew on both ends. SMEC minimizes this change by fixing both ends and applying pre-tension to the ballscrew.



Machining Precision

Unit : mm

Roundness



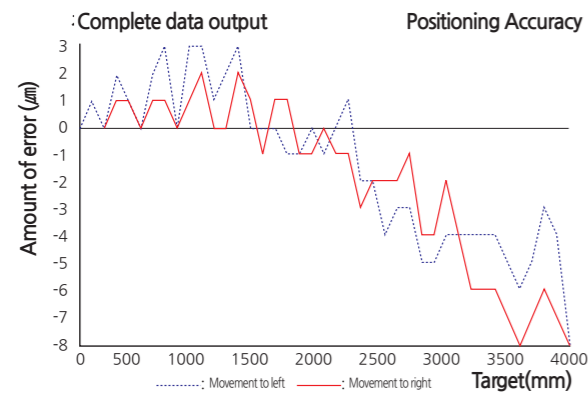
7.80 μm

Roundness

Conditions

| | |
|---------------|-----------|
| Machine | MCV 420UL |
| Material | A 1050P |
| Tool | Ø25×4T |
| Spindle Speed | 1,500RPM |
| Cutting depth | 0.1mm |
| Tool size | Ø180 |
| Feedrate | 300m/min |

X-axis Positioning Accuracy



12 μm/4,000mm

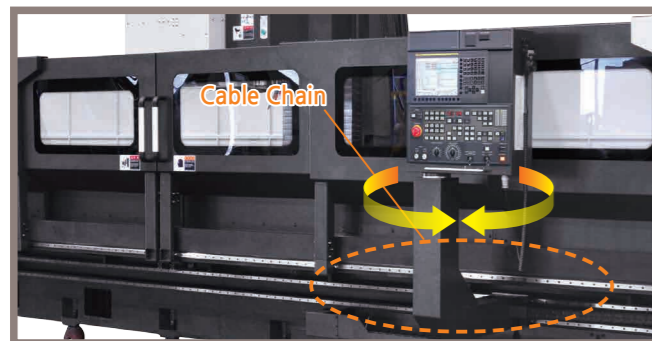
Position Accuracy

Conditions

| | |
|---------------|-----------|
| Measured axis | X-axis |
| Methodology | Roundtrip |

※Measured X-axis ballscrew position accuracy.

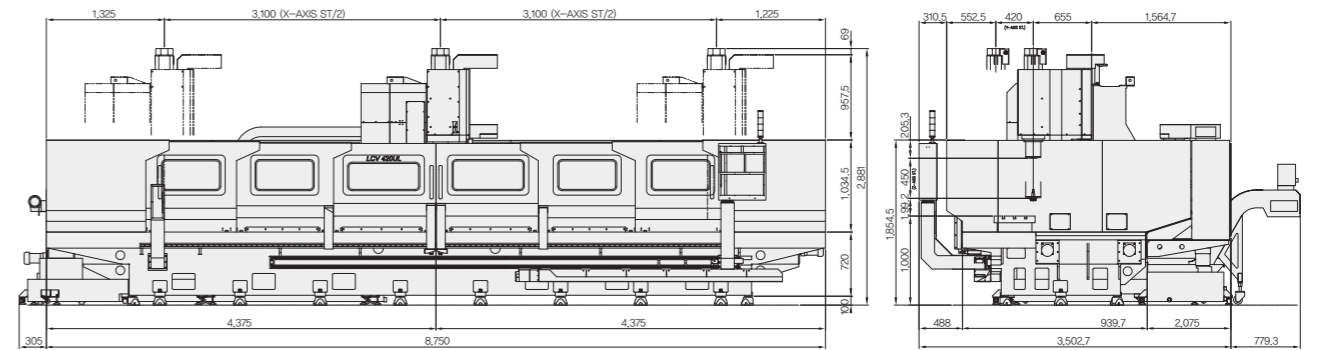
Cable Chain



All wires to the spindle and stranded wires to the OP Panel are protected in the Cable Chain, improving the overall design while protecting the wires from damage caused by repeated movement by the OP Panel.

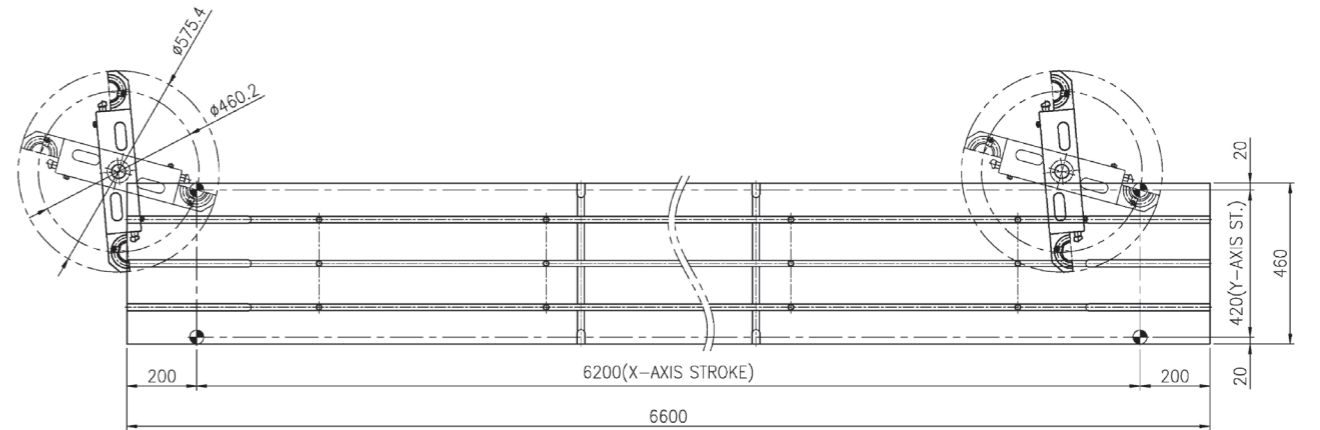
Machine Dimensions

Unit : mm



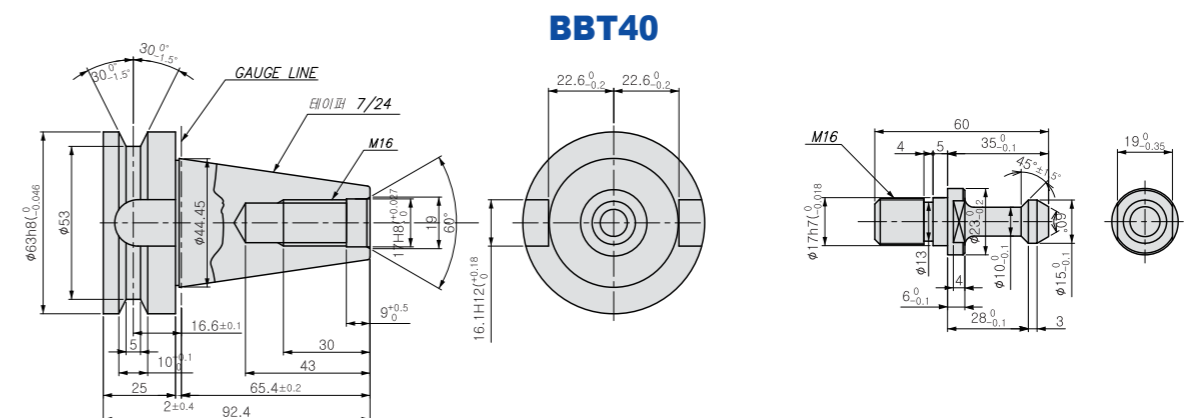
ATC Interference

Unit : mm



Tool Shank

Unit : mm



Machine Specification

| Item | | MCV 420UL | |
|---|---------------------------------|--------------------------|----------------|
| Max. travel distance (X/Y/Z) | mm | 6,200/420/450 | |
| Distance from table surface to spindle nose | mm | 200 ~ 650 | |
| Table size | mm | 6,600×460 | |
| Table surface | | 18H8 T-slot x p125 x 3ea | |
| Spindle | Spindle speed | rpm | 10,000 |
| | Spindle bearing I.D. | mm | 70 |
| | Motor power (Cont./30min) | kW | 7.5/11 |
| Feedrate | Rapid traverse (X/Y/Z) | m/min | 24/30/30 |
| | Cutting feedrate | mm/min | 1 ~ 20,000 |
| | Feed motor(X/Y/Z) | kW | 6/3/3 |
| ATC | Tool shank | | BT40 |
| | Tooling changing method | | Twin arm type |
| | Magazine capacity | ea | 24 |
| | Tool changing time (T-T) | sec | 1.3 |
| | Tool Selection | | Memory random |
| | Max. tool length / weight | mm / kgf | 300×8 |
| | Max. tool dia. (adjacent empty) | mm | ∅90 (∅150) |
| | Pull stud type | | MAS 403 P40T-1 |
| Power supply | KVA | 30 | |
| Floor space (L×W×H) | mm | 9,300×4,680×2,900 | |
| Machine weight | kg | 21,506 | |
| CNC system | | Fanuc 0i-MF | |

※ Design and specifications subject to change without notice.

[] : Option

Standard Accessories

- Half splash guard
- Coolant system (1.8kW)
- LEVEL BASE PLATES AND BOLTS
- COOLANT TANK
- TOOLS AND TOOL BOX
- Lubrication system
- 3 step patrol lamp
- Rigid tapping
- Spindle override
- Hydraulic units
- Door inter lock
- Spindle cooling system
- Bed flushing
- MPG
- Manual and part list

Optional Accessories

- Air gun
- Air blow
- Coolant gun
- Rotary table
- Oil skimmer

NC Specification (FANUC 0i-MF)

| Item | | Specification | F 0i-MF |
|---------------------------------|--------------------------------------|----------------------------------|---|
| Controlled axis | Controlled axes | | XYZ,(A/B) |
| | Max. controlled axes | | 4(6) AXIS |
| | Max. simultaneously controlled axes | | 4 |
| | Least input increment | 0.001mm / 0.0001" | ○ |
| Operation functions | Manual handle feed | X1, X10, X100 | ○ |
| | Feed per minute | G94 | ○ |
| | Feed per revolution | G95 | ○ |
| Interpolation functions | Linear Interpolation | G01 | ○ |
| | Circular Interpolation | G02, G03 | ○ |
| | Dwell | G04 | ○ |
| | Cylindrical Interpolation | G70.1 | ○ |
| | Reference Position Return | G28 | ○ |
| | Reference Position Return Check | G27 | ○ |
| Feed function | Rapid traverse feedrate override | F0, 25%, 50%, 100% | ○ |
| | Feedrate override | | 0~200% |
| Spindle function | Spindle override | | ○ |
| | Rigid tapping | | ○ |
| Tool functions | Tool function | T4-Digt / T2-Digt | ○ |
| | Tool nose radius compensation | G40 ~ G42 | ○ |
| | Tool offset pairs | | 400 |
| | Tool geometry / wear offset | GEOMETRY & WEAR DATA | ○ |
| | Tool life management | | ○ |
| | Tool path graphic display | | ○ |
| Program input | Automatic tool compensation | | ○ |
| | Absolute / incremental programming | | ○ |
| | Multiple repetitive cycle | G70 ~ G76 | ○ |
| | Canned cycle | G90, G92, G94 | ○ |
| | Inch / metric conversion | G20 / G21 | ○ |
| | Program restart | | ○ |
| | Retraction for rigid tapping | | ○ |
| | Max. programmable dimension | ±99999.999mm/±9999.9999" | ○ |
| | M function | M3 digit | ○ |
| | Custom macro | | ○ |
| | Canned cycle for drilling | | ○ |
| | Direct drawing dimension programming | | ○ |
| | Programmable data input | G10 | ○ |
| | Optional block skip | | ○ |
| | Workpiece coordinate system | G52 ~ G59 | ○ |
| Number of registerable programs | | 400EA | |
| Setting and display | Help function | ALARM & OPERATION DISPLAY | ○ |
| | Run hour / parts count display | RUNNING TIME & PART NO. DISPLAY | ○ |
| | Spindle & servo load display | SPINDLE & SERVO LOAD DISPLAY | ○ |
| | Self-diagnosis function | | ○ |
| | Extended part program editing | COPY, MOVE, CHANGE OF NC PROGRAM | ○ |
| Data input/output | Display screen | | LCV 30LB/XLB : 8.4" color LCV 50XB/420UL : 10.4" color |
| | Memory card input / output | | ○ |
| Editing operation | USB memory input / output | | ○ |
| | Part program storage size | 512Kbyte(1280m) | 1280M |
| Manual guide i | Manual Guide I | | Opt. |