

CHEVALIER®

Grinding / Turning / Milling



FVM-DCL Series Double Column Bridge Machine

FVM-3022 • 4022 DCL
FVM-3026 • 4026 DCL
FVM-4034 • 5034 DCL

FVM-22 • 26 • 34 DCL Series

Bigger Capacity and 5-Face Machining Options

Chevalier's FVM-DCL Series vertical machining center offers bigger capacity, automatic angular head change and automatic tool change magazine.

The heavily ribbed cast-iron base with Meehanite casting ensures the machine's rigidity and stability. The oversized column and box-type beam construction provide better support and damping character. Plus the 400 x 400mm RAM design on Z-axis gives the machine excellent support during the cutting process. The whole travel of table is fully supported. The heavy-duty roller guide ways adopt on XY-axis, providing a better acceleration and preventing stick-slip problem.

5-Face machining function offers a 90-degree angular head and the spindle shifts from vertical to horizontal direction. It gives more capability to machine more complex parts. The automatic head exchange system simply performs by M code control that dramatically eliminates the machine downtime. The automatic tool change provides not only vertical direction but also horizontal direction of tool change for angular head. The indexing of angular head can be programmed by M code control. The horizontal spindle is a BT/CT 50 taper with 3,500 maximum rpm and the minimum-indexing interval is 5 degree.

The FVM-DCL Series is perfectly suited for machining large parts with 5-face machining application. With the automatic head and tool changer, these features are a significant time saver.





FVM-3022 DCL

Table Size : (W) 1,800mm x (L) 3,100mm (70.8" x 122")

Table Load : 10,000kgs (22,000 lbs.)

XYZ Travel : 3,100mm x 2,200mm x 1,000mm (122" x 86.6" x 39.3")

Spindle Taper : BT or CT #50

Machine shown with optional accessories

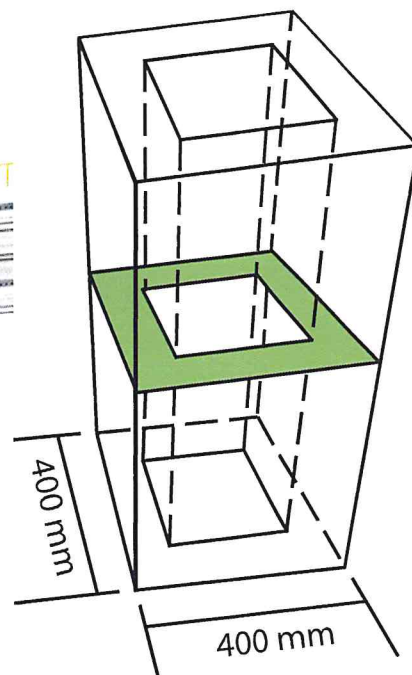
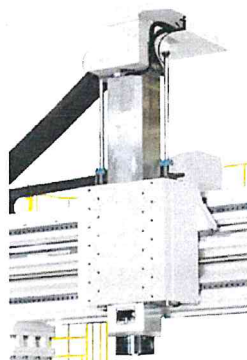
FVM-22 • 26 • 34 DCL Series

Machine Construction

Extremely Rigid Casting

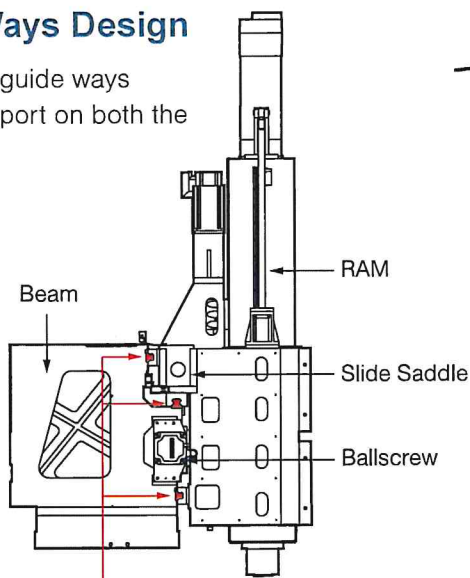
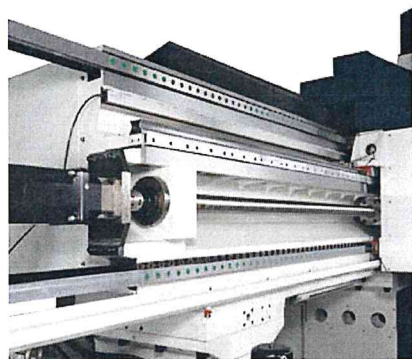
The heavily ribbed cast-iron base with high-quality casting ensures best rigidity and stability of the machine. The oversized column and box-type beam construction provide better support and damping character.

The 400 x 400mm RAM box-in-box design on Z-axis gives the machine excellent support during cutting. Low vibration and superior excelleration ensures cutting accuracy under all conditions.



Three Piece Linear Guide Ways Design

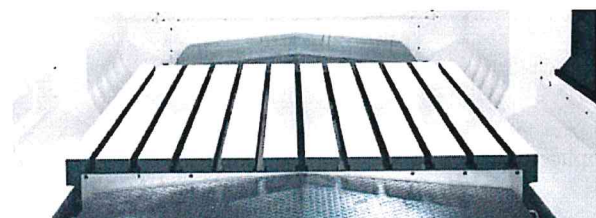
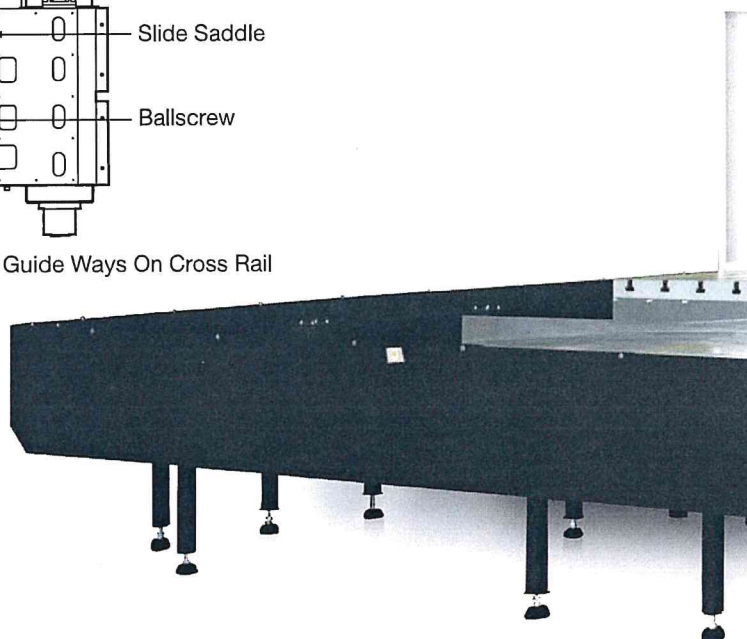
The Series features a three piece linear guide ways design on the Y-axis providing solid support on both the vertical and horizontal directions.

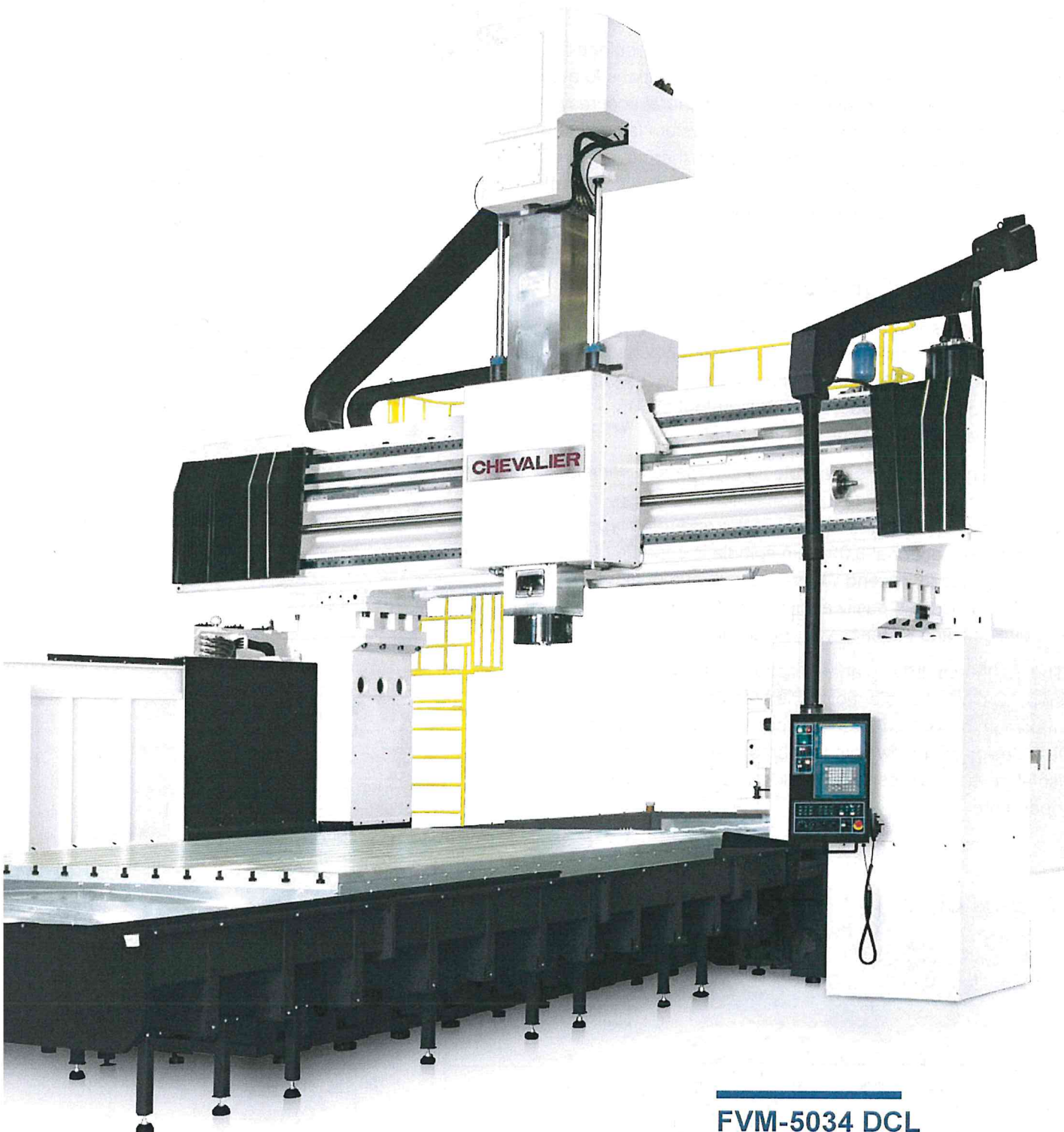


Three Linear Roler Guide Ways On Cross Rail

Rigid Table

The whole travel of table is fully supported. The heavy-duty roller guide ways adopt a XY-axis, providing a better acceleration and preventing stick-slip problem. The table size is up to 5,100 x 3,000mm (201" x 118") with a table load of 18,000kgs (39,600 lbs).





FVM-5034 DCL

Machine shown with optional accessories

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Spindle Design

Spindle

The spindle motor, ball screw and double counter-balancing cylinders are all properly located at the best positions to avoid unequal torque while ensuring the best structural accuracy. A forced circulation cooling and lubrication system is applied to the spindle, bearing and gearbox to reduce thermal strain on the spindle and extend the life span. The exclusive design of 10,000rpm direct drive spindle is optional.

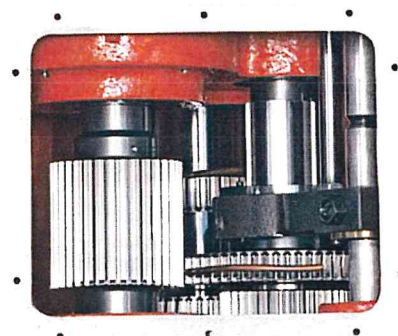


High-Speed, High-Reliability

The 6,000rpm spindle is standard with a 2-step gear transmission. The spindle incorporates roller type spindle bearings for extremely high-cutting rigidity. The 2-step gear transmission provides 609N-m torque output at 345rpm, which is ideal for machining hard material.

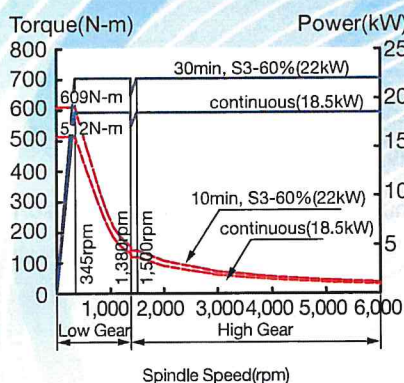
The 6,000rpm spindle is available for diverse requirements. The design of a 2-step gear transmission is complimented with a powerful AC digital spindle motor and roller type bearings. The optional 6,000rpm spindle is capable of reaching up to 26kW and 719N-m torque output at 345rpm. The DCL series can easily achieve 1,000 cc/min. chip removal rate and increase your productivity.

The 10,000rpm IDD spindle is optional. Driven by 22kW dual step AC digital spindle motor, the spindle is able to reach maximum of 165N-m torque output at 1500rpm. The unique IDD design offers low spindle vibration and optimal heat isolation that features excellent accuracy after long-term operation.

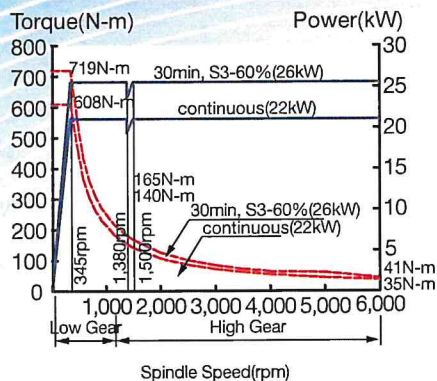


Torque Chart

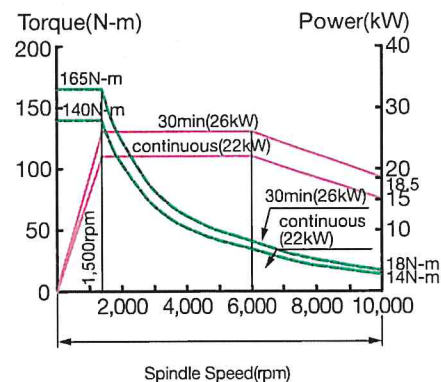
FANUC (α 18/7000i)
Gear Head 6,000rpm Spindle



FANUC (α 22/7000i)
Gear Head 6,000rpm Spindle (Opt.)



FANUC (α 22/10000i)
Direct Drive 10,000rpm (Opt.)



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Machine Construction

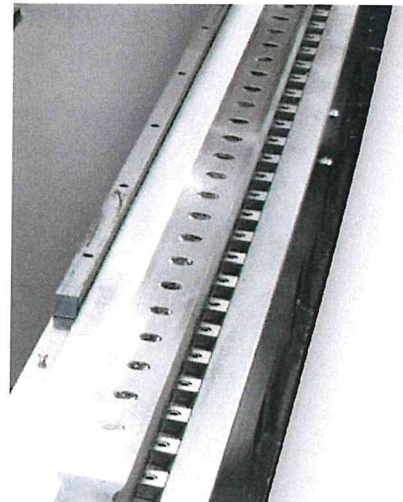
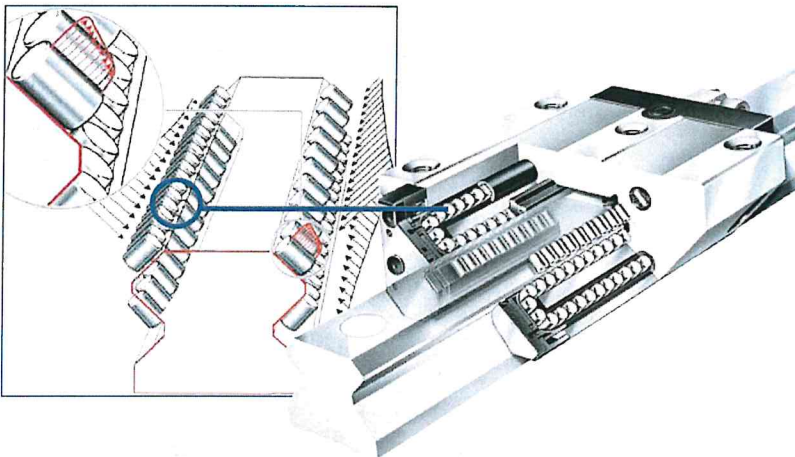
Guide Way Design

The design of the guide way enables the table to bear loads for high-speed operations up to 20,000kgs (44,000 lbs). The box way Y and Z-axis features smooth movement up to 3,400mm (133.8") and excellent cutting rigidity. Extra wide box ways are coated with Turcite-B and then meticulously cross-scrapped by hand to ensure sufficient lubrication and as a result, smooth movement reduce drag and optimum wear-resistance. Motor is directly mounted to ballscrew and gear box for more power and increased axel thrust.



High-Precision Linear Guide Ways

The linear guideways in the X and Y-axes run with large 80mm (3.1") roller type linear bearings for heavier load capacity and to increased feedrate and minimize vibration and stick-slip.

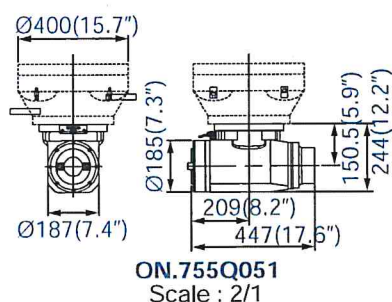


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5-Face Machining Function

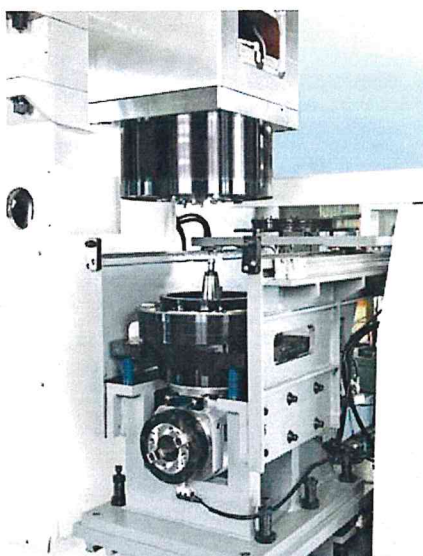
Angular Head Change (Option)

With a 90-degree angular head, the spindle shifts from a vertical to horizontal direction and is able to machine more complex parts. The automatic head exchange simply performs by an M-code control that dramatically eliminates machine down-time. The automatic tool change provides not only vertical direction but also horizontal direction of tool change for the angular head. The indexing of the angular head can be programmed by an M-code control. The minimum indexing interval is five degrees. The horizontal spindle is a CT-50 taper with 3,500 maximum RPM.

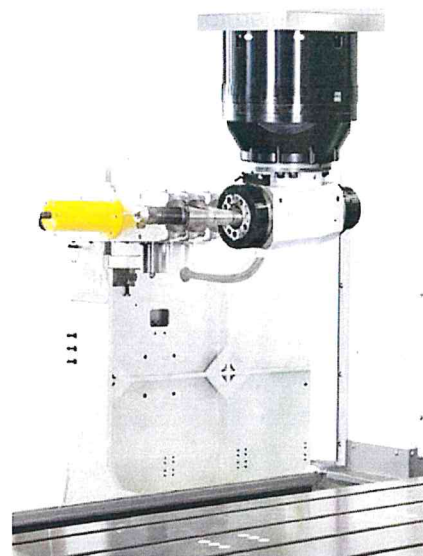


90 DEGREE ANGLE AHC SPEC.

| | |
|----------------|-------------------------|
| Tool Interface | BT50 |
| Spindle Speed | 3,500rpm |
| Clamping Force | 1200~1500 kgf |
| Bearing | Ø90mm-4 pc |
| Bearing | Ø70mm-2 pc |
| Division Angle | 15° (Std) / 5° (Opt) |
| Lubrication | Grease |
| Oil Pressure | 65 kg / cm ² |
| Volume (LxWxH) | 450 x 415 x 620 mm |
| Weight | 300 kg |



Automatic angular head exchange system



Auto 90-degree angular head with minimum 5-degree indexing

Horizontal and Vertical Tool Change (Option)

- Standard 32 tool magazine capacity
- Optional 40 or 60 tool magazine capacity available
- Maximum tool sizes : Ø225mm x 350mm (Ø8.8" x 13.7")



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Machining Capacity



An extra-long, extra-wide work space facilitates easy loading and unloading of large workpieces. Series offer load capacities up to 20,000Kg (44,000 lbs.)

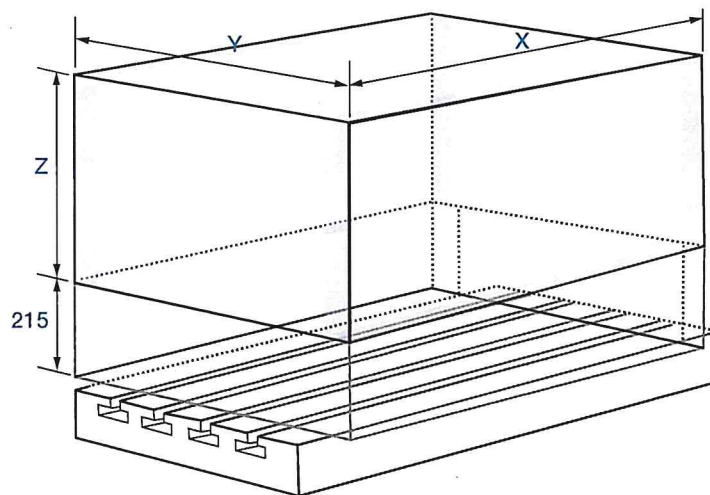
FVM-DCL Series Work Space

Unit: mm (")

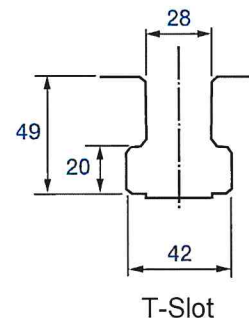
| MODEL | X / Y / Z Travel | Distance Between The Columns |
|-------------|---|------------------------------|
| FVM-3022DCL | 3,100 (122") x 2,200 (86.6") x 1,000 (39.4") | 2,200 (86.6") |
| FVM-4022DCL | 4,100 (161") x 2,200 (86.6") x 1,000 (39.4") | 2,200 (86.6") |
| FVM-3026DCL | 3,100 (122") x 2,600 (102.3") x 1,000 (39.4") | 2,800 (110") |
| FVM-4026DCL | 4,100 (161") x 2,600 (102.3") x 1,000 (39.4") | 2,800 (110") |
| FVM-4034DCL | 4,100 (161") x 3,400 (133.8") x 1,000 (39.4") | 3,600 (142") |
| FVM-5034DCL | 5,100 (201") x 3,400 (133.8") x 1,000 (39.4") | 3,600 (142") |

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Table and T-Slots



Unit: mm (")



X/Y/Z Machining Capacity without considering (tool dimension)

Unit: mm (")

| MODEL | X | Y | Z |
|-------------|----------------|----------------|---------------|
| FVM-3022DCL | 3,100 (122") | 1,900 (74.8") | 1,000 (39.3") |
| FVM-4022DCL | 4,100 (161.4") | 1,900 (74.8") | 1,000 (39.3") |
| FVM-3026DCL | 3,100 (122") | 2,500 (98.4") | 1,000 (39.3") |
| FVM-4026DCL | 4,100 (161.4") | 2,500 (98.4") | 1,000 (39.3") |
| FVM-4034DCL | 4,100 (161.4") | 3,300 (129.9") | 1,000 (39.3") |
| FVM-5034DCL | 5,100 (200.7") | 3,300 (129.9") | 1,000 (39.3") |

Cutting Performance

Model : FVM-3022DCL

Spindle : 6,000 rpm, Gear Head, 22kW

Material : S45C mild carbon steel

| | Face Mill | End Mill | Drill | Tapping |
|----------------|---------------|---------------|--------------|-------------|
| | | | | |
| Tool | 125 (4.9") | 63 (2.4") | 75 (2.9") | M42 x P4.5 |
| Feedrate | 3,000 mm/min. | 1,000 mm/min. | 60 mm/min. | 550 mm/min. |
| Depth | 3mm (0.1") | 50mm (1.9") | 100mm (3.9") | 50mm (1.9") |
| Cutting Volume | 900 cc/min. | 500 cc/min. | - | - |

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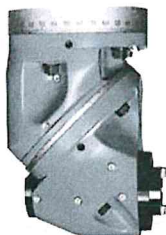
Standard and Optional Accessories

Optional Angular Head



Automatic 90 degree head changer system

- Automatic tool changer, hydraulic clamping
- Spindle taper CT/BT 50
- Max Spindle 3500rpm
- C axis auto indexing function base on high precision straight gear clutch every 15 degree (Std.) / 5 degree (opt.)
- Continuous torque of head 500N-m
- Maximum torque of head (10min.) 650N-m



Universal Head by Manual Positioning (Manual Swivel Arm Available)

- This head is fitted on the spindle manually with any degree positioning.
- Tool change and tool release are manually operated.
- Coolant thru spindle is not applicable on this head.
- Max. speed is 1,200rpm.



90 Degree Head with Power Clamp /Unclamp (Manual Swivel Arm Available)

- This head is fitted in the spindle manually with any degree positioning. The positioning can be manual or automatic adjusted by bevel gear for accurate positioning.
- Tool change is manual, but tool release can be manually or hydraulically controlled for quick tool change.
- Coolant thru spindle is not applicable on this head.
- Max. speed is 2,000rpm.



90 Degree Head by Manual Positioning (Manual Swivel Arm Available)

- This head is fitted on the spindle manually with any degree positioning.
- Tool change and tool release are manually operated.
- Coolant thru spindle is not applicable on this head.
- Max. speed is 2,000rpm.



90 Degree Deep Boring Head

- This head is fitted on the spindle manually with any degree positioning.
- Tool change and tool release are manually operated.
- Coolant thru spindle is not applicable on this head.
- Max. speed is 800rpm.



Straight Extension Head

- This head is fitted on the spindle manually with any degree positioning.
- Tool change and tool release are manually operated.
- Coolant thru spindle is not applicable on this head.
- Max. speed is 2,000rpm.

Standard Accessory

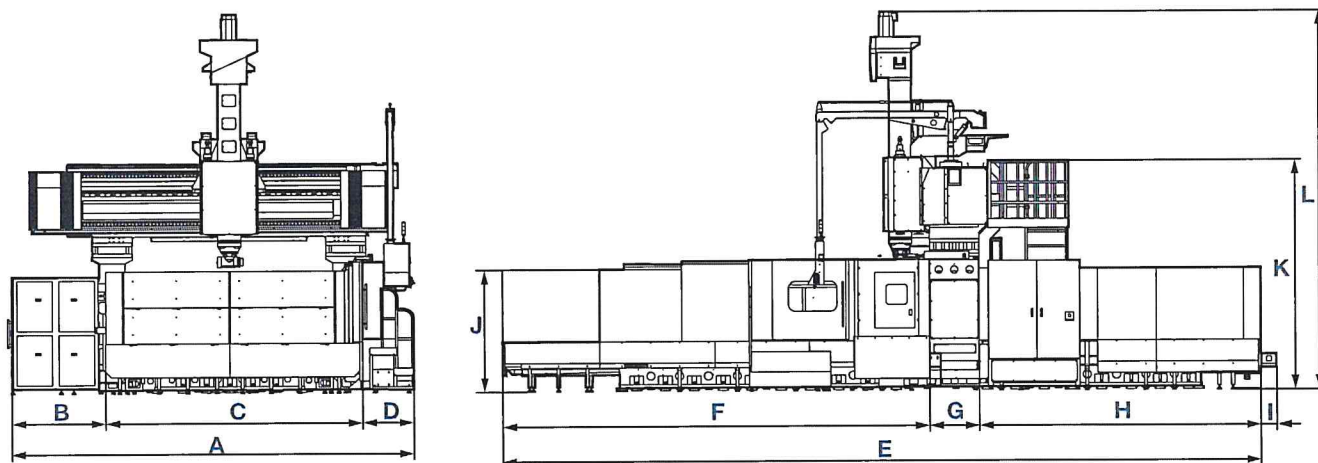
- 32 tools ATC
- Spindle oil chiller
- Spindle air blast system
- Spindle air curtain system
- Chip cutting blast system
- Automatic power off
- Auto. lubrication system
- 3-axes absolute type encoder
- Pilot light
- X, Y-axis with reducer device
- Dual chip auger system on X-axis
- Chain type chip conveyor on Y-axis
- Heat exchanger for electric cabinet
- Coolant system and coolant tank
- Work light
- Simple splash guard (4 pcs sheet metal plate) (XX34DCL)
- Semi-enclosed splash guard (XX22DCL/XX26DCL)
- Tool box with tools
- Leveling bolts and pads
- Operation and maintenance manual
- Foot pedal for tool clamping and unclamping

Optional Accessory

- 60 tools ATC (Horizon and Vertical)
- HEIDENHAIN / SIEMENS control
- Through spindle coolant preparation
- Through spindle coolant system
- Spindle motor increase to 26kW
- Coolant through tool holder
- Oil skimmer
- Water gun
- Air gun
- X, Y, Z-axis linear scale (closed loop)
- CNC rotary table
- 90° milling head
- Multi-degree universal head
- Extension head
- Auto tool length measurement system
- Auto workpiece length measurement system
- Fully enclosed splash guard (3022/4022/3026/4026DCL)
- 20. Z axis travel extended to 1,200mm (47.2")
- Column Height increased by 250mm (9.8")

FVM-22 • 26 • 34 DCL Series

Dimensional Drawings



Unit: mm (")

| Model | 3022DCL | 4022DCL | 3026DCL | 4026DCL | 4034DCL | 5034DCL |
|-------|-------------------|--------------------|-------------------|--------------------|--------------------|------------------|
| A | 5,485 (216") | 5,485 (216") | 5,885 (232") | 5,885 (232") | 6,685 (263") | 6,685 (263") |
| B | 1,335 (52.2") | | | | | |
| C | 3,250 (128") | 3,250 (128") | 3,650 (128") | 3,650 (144") | 4,450 (175") | 4,450 (175") |
| D | 900 (35.4") | | | | | |
| E | 9,140 (360") | 11,140 (438.5") | 9,140 (360") | 11,140 (438.5") | 11,140 (438.5") | 13,140 (517") |
| F | 5,400 (212.5") | 6,400 (252") | 5,400 (212.5") | 6,400 (252") | 6,400 (252") | 7,400 (291") |
| G | 870 (34.25") | | | | | |
| H | 2,870 (113") | 3,870 (152") | 2,870 (113") | 3,870 (152") | 3,870 (152") | 4,870 (192") |
| I | 280 (11") | | | | | |
| J | 2,100 (82.6") | | | | | |
| K | 3,950 (155.5") | | | | | |
| L | 6,520 (257.7") | | | | | |

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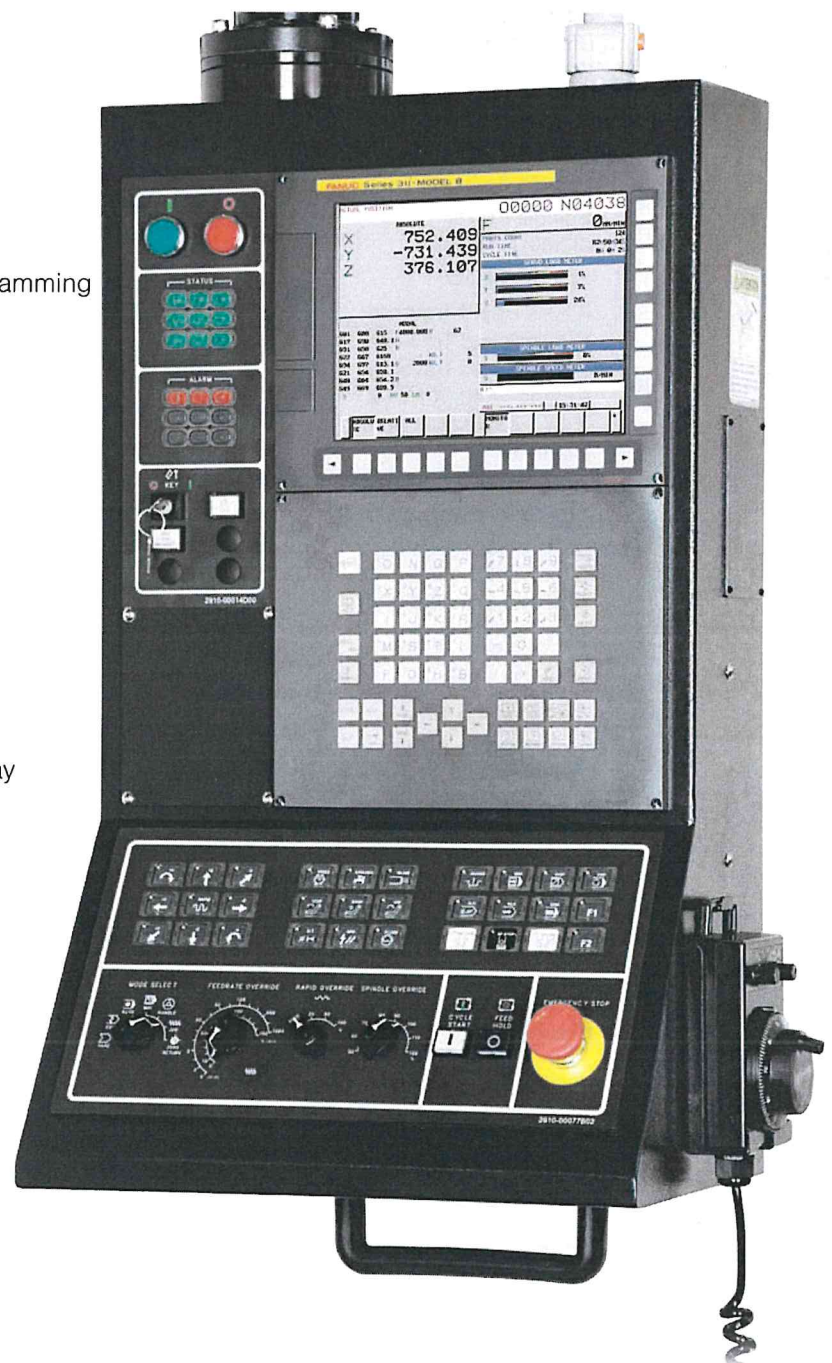
FVM-22 • 26 • 34 DCL Series Control

Control Features

- Simultaneously controllable axes: 4
- Minimum programmable increment: 0.001mm (0.0001")
- Program storage length: 1280M (512K)
- Registerable programs: 400
- Exact stop mode
- Backlash compensation
- Pitch error compensation
- Stored programs
- Memory card interface PCMCIA
- USB function

Programming Features

- Combined use of absolute/incremental programming
- Inch/metric conversion
- Optional chamfering, corner R
- Canned cycles for drilling
- Decimal point programming
- Reference point return check
- Sub-program
- Custom B operation features
- 10.4" color TFT LCD
- Absolute/incremental programming
- Tool offset memory C
- 64 pairs of tool offsets
- Running time display / number of parts display
- Input / output interface RS232 RJ45
- Program protect key
- Rapid travel rate override
- Spindle speed override



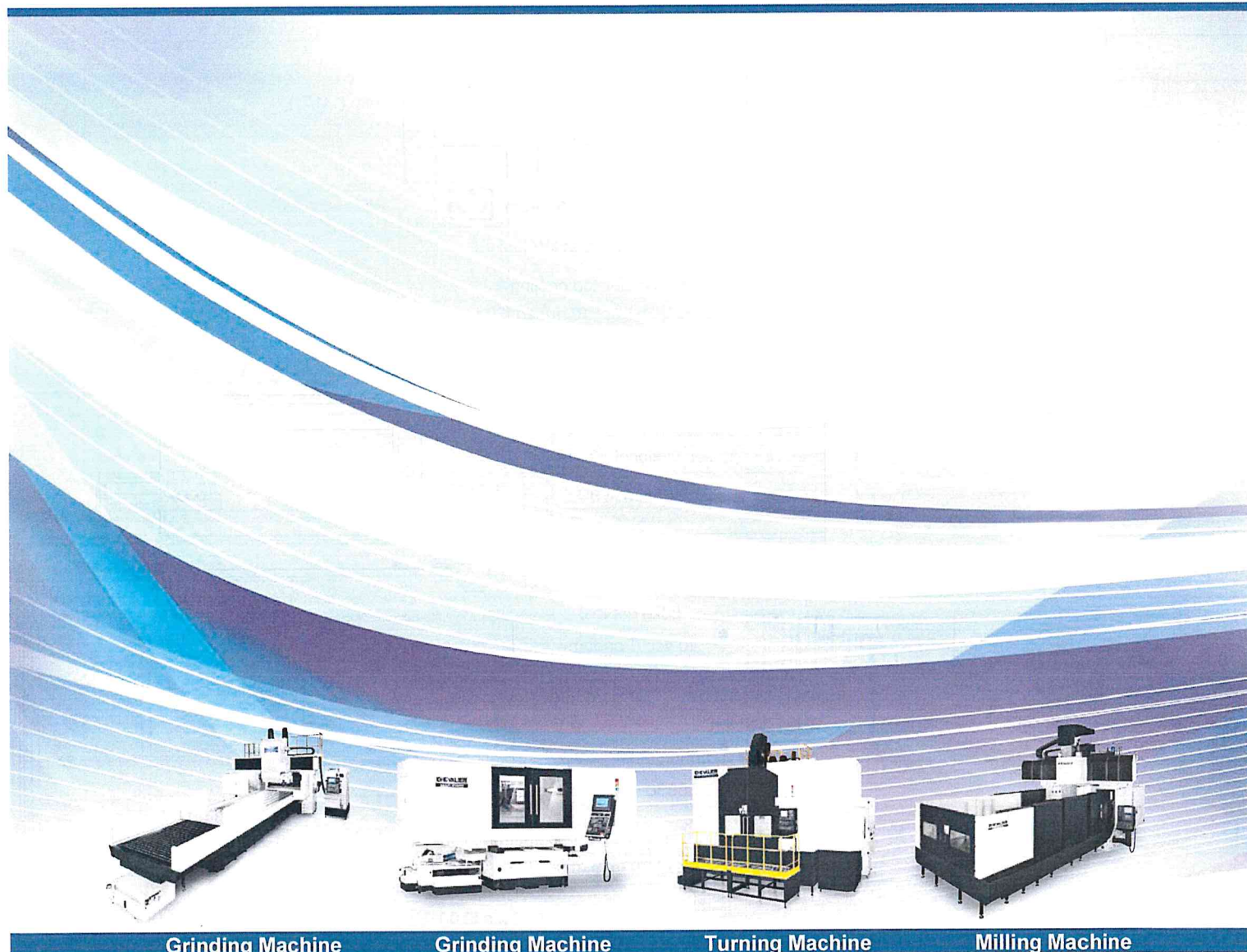
FVM-22 • 26 • 34 DCL Series

Specifications

| Item | Description | FVM-3022DCL | FVM-4022DCL |
|------------------|---|---|--|
| Table | Table Size | 3,100 x 1,800mm (122" x 70.8") | 4,100 x 1,800mm (161.4" x 70.8") |
| | Table Loading | 10,000kg (22,000 lbs) | 12,000kg (26,400 lbs) |
| | T Slots (W × Pitch / P.C.) | 28 x 200mm (1.1" x 7.8") / 9 pc | |
| Travel | X Axis | 3,100mm (122") | 4,100mm (161.4") |
| | Y Axis | 2,200mm (86.6") | |
| | Z Axis | 1,000mm (39.3") / Optional 1,200mm (47.2") | |
| | Spindle Nose To Table Surface | 230~1,230mm (9"~48.4") | |
| | Distance Between The Columns | 2,200mm (86.6") | |
| | Table Height From Floor | 850mm (33.4") | |
| Spindle | Spindle Taper | BT50 / CAT50 / DIN50 | |
| | Spindle Speed | 6,000rpm / Optional 10,000rpm | |
| | Spindle Power (30min, S3-60%) | 22.5kW (30HP) / Optional 26kW (35HP) | |
| | Spindle Chiller | With 32# Oil circulated cooling | |
| Feed Rate | X Axis Rapid Traverse | 12 m/min (472 inch/min) | |
| | Y Axis Rapid Traverse | 10 m/min (393 inch/min) | |
| | Z Axis Rapid Traverse | 12 m/min (472 inch/min) | |
| | Cutting Feed (X / Y / Z) | 1~10 m/min (39.3~393 inch/min) | |
| | X / Y / Z Axis Ball Screw Diameter | X: 80mm (3.1") / Y: 80mm (3.1") / Z: 50mm (1.9") | |
| Tool Changer | A.T.C | 32 set, Optional 40 / 60 set | |
| | Max. Tool Diameter (With adjacent tool) | 125mm (4.9") | |
| | Max. Tool Diameter (Without adjacent tool) | 215mm (8.4") | |
| | Max. Tool Length | 350mm (13.7") | |
| | Max. Tool Weight | 20kg (44 lbs) | |
| | Tool Change Time | 10 sec (Random) | |
| Guide Way | Linear Guide Size (W / P.C.) | 55mm (2.28") x 2 pc | |
| | Sliding Block P.C. | 6 set | 10 set |
| | Y -Axes Box Way Width | 55mm (2.28") x 3 pc | |
| Accuracy | Positioning Accuracy | JIS6338 ±0.005/300 | |
| | Positioning Accuracy | VDI 3441 P: 0.030mm (0.0012") | VDI 3441 P: 0.035mm (0.0014") |
| | Repeatability | JIS6338 ±0.003mm (0.0001") | |
| | Repeatability | VDI 3441 Ps: 0.028mm (0.0011") | |
| Motor | Axis Motor (X / Y / Z) | 9kW / 7kW / 7kW | |
| | Coolant Unit Motor | 2 kW | |
| Tank Capacity | Lub. Tank (2 sets) | 4L / 12L | |
| | Hydraulic Tank Capacity | 150L | |
| | Coolant Tank | 700L | |
| Air Supply Power | Air System Pressure | 6 kg/cm ² | |
| | Consumption | 60 kVA | |
| Machine Size | Floor Space (L x W x H) | 9,140 x 5,485 x 6,520mm (359.8" x 215.8" x 256.6") | 11,140 x 5,485 x 6,520mm (438.8" x 215.9" x 256.6") |
| | Machine Weight | 39,000kg (85,000 lbs) | 44,000kg (97,000 lbs) |

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| | FVM-3026DCL | FVM-4026DCL | FVM-4034DCL | FVM-5034DCL |
|--|---|--|--|--|
| | 3,100 x 2,200mm (122" x 86.6") | 4,100 x 2,200mm (161.4" x 86.6") | 4,100 x 3,000mm (161.4" x 118.1") | 5,100 x 3,000mm (200.7" x 118.1") |
| | 11,000kg (24,200 lbs) | 13,000kg (28,600 lbs) | 15,000kg (33,000 lbs) | 18,000kg (39,600 lbs) |
| | 28 x 200mm (1.1" x 7.8") / 11 | | 28 x 200mm (1.1" x 7.8") / 15 | |
| | 3,100mm (122") | 4,100mm (161.4") | 4,100mm (161.4") | 5,100mm (200.7") |
| | 2,600mm (102.3") | | 3,400mm (133.8") | |
| | 1,000mm (39.3") / Optional 1,200mm (47.2") | | | |
| | 230~1,230mm (9~48.4") | | | |
| | 2,800mm (110.2") | | 3,600mm (141.7") | |
| | 850mm (33.4") | | | |
| | BT50 / CAT50 / DIN50 | | | |
| | 6,000rpm / Optional 10,000rpm | | | |
| | 22.5kW (30HP) / Optional 26kW (35HP) | | | |
| | With 32# Oil circulated cooling | | | |
| | 12 m/min (472 inch/min) | 10 m/min (393 inch/min) | | 8 m/min (314 inch/min) |
| | 10 m/min (393 inch/min) | | | |
| | 12 m/min (472 inch/min) | | | |
| | 1~10 m/min (39.3~393 inch/min) | | | |
| | X: 80mm (3.1") / Y: 80mm (3.1") / Z: 50mm (1.9") | | | |
| | 32 set, Optional 40 / 60 set | | | |
| | 125mm (4.9") | | | |
| | 215mm (8.4") | | | |
| | 350mm (13.7") | | | |
| | 20kg (44 lbs) | | | |
| | 10 sec (Random) | | | |
| | 55mm (2.28") x 2 pc | 55mm (2.28") x 2 pc, 45mm (17.5") x 2 pc | 55mm (2.28") x 4 pc | 55mm (2.28") x 4 pc |
| | 14 set | 12 set / 12 set | 24 set | 28 set |
| | 55mm (2.28") x 3 pc | | | |
| | JIS6338 ±0.005/300 | | | |
| | VDI 3441 P: 0.030mm (0.0012") | VDI 3441 P: 0.035mm (0.0014") | VDI 3441 P: 0.035mm (0.0014") | VDI 3441 P: 0.040mm (0.0016") |
| | JIS6338 ±0.003mm (0.0001") | | | |
| | VDI 3441 Ps: 0.028mm (0.0011") | | VDI 3441 P: 0.028mm (0.0011") | VDI 3441 P: 0.030mm (0.0012") |
| | 9kW / 7kW / 7kW | | | |
| | 2 kW | | | |
| | 4L / 12L | | | |
| | 150L | | | |
| | 700L | | 1,000L | |
| | 6 kg/cm ² | | | |
| | 60 kVA | | | |
| | 9,140 x 5,885 x 6,520mm (359.8" x 231.6" x 256.6") | 11,140 x 5,885 x 6,520mm (438.8" x 231.6" x 256.6") | 11,140 x 6,685 x 6,520mm (438.8" x 263.1" x 256.6") | 13,140 x 6,685 x 6,520mm (517.3" x 263.1" x 256.6") |
| | 43,000kg (94,000 lbs) | 47,000kg (103,000 lbs) | 55,000kg (121,000 lbs) | 62,000kg (136,000 lbs) |



Grinding Machine

Grinding Machine

Turning Machine

Milling Machine

Headquarters

FALCON MACHINE TOOLS CO., LTD.

No. 34, Hsing Kong Road, Shang Kang, Chang Hua
TAIWAN 50971

Tel: +886 4 799 1126 Fax: +886 4 798 0011

www.chevalier.com.tw

overseas@chevalier.com.tw

U.S.A. Headquarters

CHEVALIER MACHINERY INC.

9925 Tabor Place, Santa Fe Springs, CA 90670 U.S.A.

Tel: (562) 903 1929 Fax: (562) 903 3959

www.chevalierusa.com

info@chevalierusa.com

