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Momentum MVL-20HD Investment Summary

98” Swing Heavy-Duty Vertical Turning Lathe

HEAVY-DUTY BASE MACHINE

Each MVL-series model is built on a standard heavy-duty base platform. This platform includes more than a dozen exceptional features, either unavailable or expensive options from other builders. Momentum alone includes them all in its base machine.

CUSTOM CONFIGURATIONS

Momentum’s flexible production system completes the base MVL to your application needs, drawing from an extensive list of available options. Configurations that other brands require up to a year to deliver or do not even offer, Momentum often ships in months.

EXCEPTIONAL SUPPORT

Having a well-supported machine requires selecting the right distributor, foremost, because most service interaction is with your dealer. Momentum’s distribution has a demonstrable history of top support. Additionally, the company is American-owned and has service offices in Houston. It assembles all machines in-house, at the factory it wholly owns in Taichung, Taiwan, using only prominent component brands known for reliability. All of this adds up to the best-supported VTL.

100% SATISFACTION COMMITMENT

More than a hundred happy users worldwide with the most demanding applications in aerospace, oil and gas, bearings, gears, and heavy equipment, among other industries, can attest to the MVL’s construction and support quality. Momentum strives to earn the business of its customers both before and after the every sale.

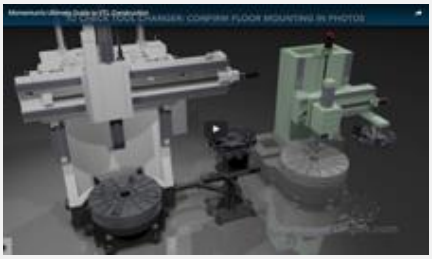
(Master quote revised date: 11/01/23)

1) HEAVY-DUTY BASE MACHINE

The base MVL-series machine includes more than a dozen exceptional, standard features. These items are often options or unavailable from other VTL brands, and no other brand offers all of them. There are two convenient ways to learn more about these features:

CONSTRUCTION VIDEO

To watch Momentum's Ultimate Guide to VTL Construction that shows side-by-side the features separating heavy-duty from lighter VTLs, either click the hyperlink above, Google that video title, or scan the QR code at the right.



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LIST OF STANDARD FEATURES

Each feature below is detailed on the subsequent pages:

- **ALL MVL's –**

1.1 Massive components
1.2 Full-wrap, arc-shaped column
1.3 Minimal ram overhang distance
1.4 Full-length cross rails and -X travel
1.5 Powerful tool retention, anti-rotation
1.6 Robust cross rail positioning
1.7 Extended saddle
1.8 Floor-mounted ATC
1.9 Heavy-duty powertrain
1.10 Geared X and Z-axis motors
1.11 Thrust and radial table bearings
1.12 More machine mass
1.13 Greater machining capacity
1.14 More turning spindle power

MOMENTUM MACHINE TOOL COMPANY

HEAVY DUTY FEATURES – ALL MVL's

1.1 MASSIVE COMPONENTS

No VTL out-specs the MVL, and few can match its dimensions. Consider one easy-to-compare characteristic, the ram size. The MVL-20HD's hydraulically balanced, standard ram is 254mm (10.00-inches) square. The bigger the ram, the more rigid the base for cutting.

By comparison, rams of typical, lighter VTLs are often 220 mm (8.66-inches) or less. That makes them cheaper to produce but provides at least 30% less inertia for rigidity.

How to compare: Check ram size in brochures or quotes; it makes a good point of dimensional comparison because it is usually given in VTL specifications.

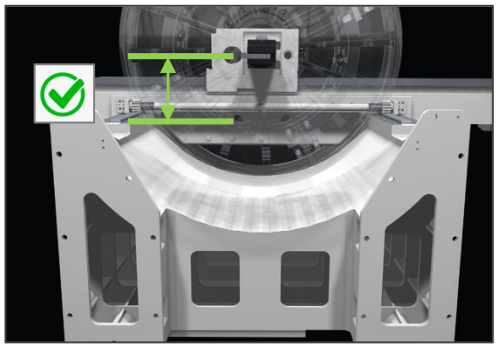
1.2 FULL-WRAP, ARC-SHAPED COLUMN

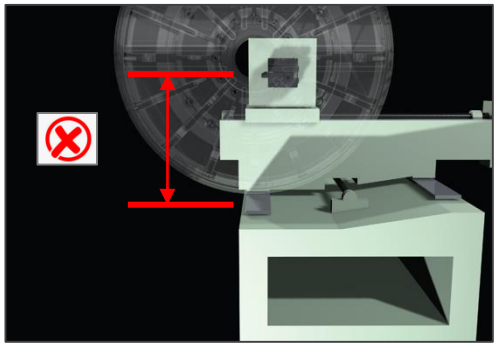
The MVL features a full-wrap, arc-shaped column. Full-wrap means that it curves fully around the table; this maximizes mass, rigidity, and dampening. Arc-shaped refers to the face nearest to the table; this shape best absorbs cutting loads.

By contrast, lighter VTLs often use a cantilevered design. The column stands primarily to one side of the table centerline and may have just half the mass of the MVL's column.

How to compare: To confirm column construction, look at casting photos or check a machine's weight. One having just 1/2 to 2/3rds of the MVL's mass doesn't have a full-wrap column.

1.3 SHORT RAM-OVERHANG





An additional benefit of a full-wrap column is that it minimizes the distance between the column's box ways and the cutting insert suspended from them. For the MVL-20HD, this overhang is only 700 mm (28-inches). This stubbiness improves the machine's rigidity.

A cantilever design instead forces a much larger overhang. So for competitive VTL's of the same size (a 1.2-meter table and a 1.6-meter swing diameter), this unsupported distance is commonly more than 1,375 mm (54-inches).

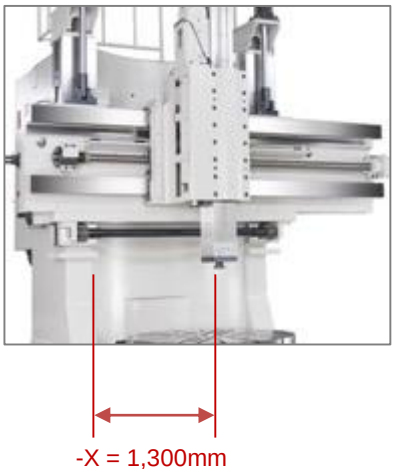
How to compare: The column-construction type dictates this feature, so look at casting photos to confirm that the machine has a full-wrap around column. The images at right show the perspective of looking up from the shop floor at the machine's column, ram, and table. Note how the MVL's full-wrap column positions the supporting box ways near the ram, while the cantilever-type machine requires an overhang spanning more than half the machine's swing to reach the table centerline.

1.4 FULL-LENGTH CROSS RAIL AND X-AXIS TRAVEL

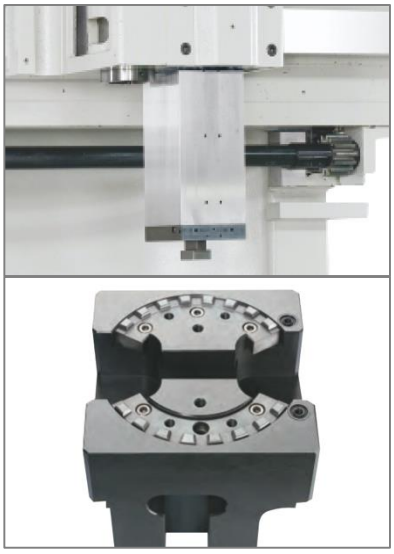
The MVL is a full-length cross rail machine, which means that the cross rail extends fully to both sides of the spindle center. The MVL-20HD's rail permits 1,300 mm (>51-inches) of travel in the negative X direction. This complete travel allows probing part diameters. It also allows using left and right inserts on each turning tool holder, effectively doubling ATC capacity.

Many VTLs are of a half-rail construction. That means that -X stroke is severely limited. A half rail does not allow probing parts on their diameters or using two inserts per tool holder.

How to compare: To see if a machine has a full or half rail, check its negative X-Axis travel specification. If it approximates the positive X specification, the machine has a full-length rail. But if -X is far less than the +X specification, for example just 100 or 200 mm, it is only a half-rail design.



2-Axis Model Ram and Toolholder:



Milling Model Ram and Toolholder:

1.5 POWERFUL TOOL RETENTION AND ANTI-ROTATION

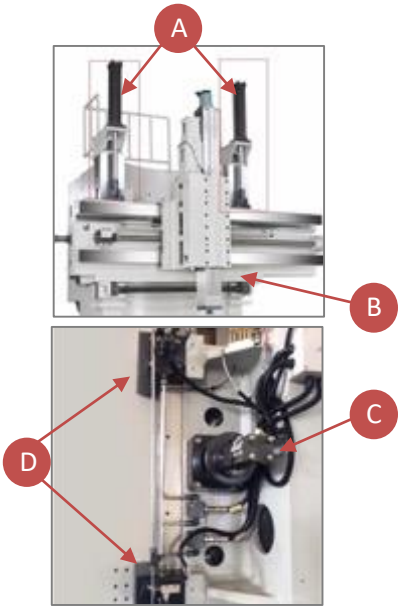
All MVL models provide powerful tool holder retention and anti-rotation. The method differs slightly between two-axis and milling model types. Two-axis MVL models draw-up the tool holder using a T-puller. This system provides 50kN of draw-up force for model sizes MVL-12HD and larger. Additionally, a 16-tooth curvic-coupling mechanism provides the anti-rotation function. The T-puller and curvic-coupling combination is the most robust tool holder-to-ram connection approach available for 2-axis VTLs. It offers extreme rigidity for heavy turning cuts.

For MVL models with milling, instead of using a T-puller, the ram draws-up the tool holder's center retention knob plus a retention knob at each of the four tool holder corners. The five total retention knobs provide 47kN of draw-up force. As with 2-axis models, the anti-rotation function is provided by a curvic-coupling mechanism, in this case having 24-teeth. After being commanded to use a milling tool (such as an end mill), the MVL automatically picks up the "dummy cover" plate from its ATC. This dummy cover protects the ram's four corner retention and curvic-coupling mechanisms. It leaves exposed only the 50-taper center spindle. Then the machine picks up and uses the commanded milling tool.

By contrast, most VTL's, whether 2-axis or with milling, retain turning tool holder blocks with only one pull stud in the tool holder's center. These commonly deliver only 25 kN of draw-up force. And they provide just a single, small pin or a pair of keys for anti-rotation. Overall, this approach significantly limits the size and rigidity of turning tool blocks.

How to compare: Check a photograph of a VTL's ram to ensure either a T-puller or five draw-up points, as well as an anti-rotation curvic-coupling.

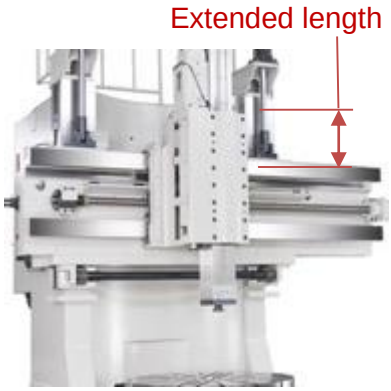
1.6 ROBUST CROSS RAIL ELEVATION AND LOCKING



Raising the cross rail moves the entire mass of the rail, saddle, and ram. On the MVL, a pair of hydraulic cylinders (A) perform the lifting and counterbalancing. Two rack and pinion sets (B), synchronized by a torsion bar, ensure level movement. Then, on each side, a hydraulic pin (C) sets the vertical position on precision ground steps. Finally, two hydraulic clamps (D) pull the rail tight to the guideways. This system provides reliable elevation and locking, year after year.

Less reliable approaches include using a ball screw instead of the pair of hydraulic cylinders to move the rail, skipping counterbalancing, or omitting the synchronizing rack and pinion.

How to compare: To ensure years of reliable use, confirm by viewing brochure photographs that all illustrated elements (A), (B), (C), and (D) are present as shown here.



1.7 OVERSIZE, EXTENDED-LENGTH SADDLE

The MVL's standard saddle is massive and extra-long. The saddle supports the ram during cutting, so it is crucial to cutting rigidity. Extending its length well above the cross rail gives the most ram support, again maximizing rigidity. An oversize, extended-length saddle optimizes cutting stability.

Many VTLs also have an undersized, and short saddle that doesn't extend above the cross rail. Again, this saves money but costs rigidity.

How to compare: It is easy to confirm a large, full-length saddle from machine pictures. The saddle should extend well above the top of the rail.

1.8 FLOOR-MOUNTED AUTOMATIC TOOL CHANGER

The MVL and similar caliber VTL's use an automatic tool changer that stands bolted to the floor. A floor-mounted ATC allows the longest and the heaviest tools as a standard and enables easy fitting of extended size magazine options.

Instead, some VTLs hang the ATC from the cross rail. Doing so requires the entire tool magazine's weight to rise with the rail, limiting standard tool length and mass. It also makes fitting higher tool-count magazines difficult.

How to compare: When evaluating a VTL, confirm visually that the ATC is bolted to the floor, not hanging off the cross rail.

1.9 HEAVY-DUTY POWERTRAIN

The MVL's two-speed main spindle gearbox is built explicitly for this purpose and features oversized components. All gears have helical teeth for smooth power transmission. These elements create a long-lasting powertrain.

Lighter approaches include using an off-the-shelf planetary gearbox that entails undersized gears or using straight instead of helical teeth. These attributes are common on machines with less power. But even coupled to the smaller motors, they don't as well stand the test of time.

How to compare: The literature for better-built machines should explicitly show the approach to power transmission. If not, ask the salesperson to disclose it via pictures.

1.10 GEARED AXIS MOTORS

The MVL's X and Z-axis motors are equipped with gear reduction to transmit maximum torque through heavy feeds. Note the planetary gearbox on this X-Axis motor, shown at left.

This element is routinely omitted on other VTLs, reducing the feed torque.

How to compare: Checking is easy. The picture of any axis motor should clearly show a gearbox between that motor and its ball screw.

1.11 THRUST AND RADIAL TABLE BEARINGS

Any heavy-duty VTL, such as the MVL, should provide two spindle-bearings. The first one is a large diameter thrust bearing, which takes the gravitational force on the work-piece and the table. The MVL-20HD uses a high-precision NSK model having a 1,250 mm diameter. The second is a dedicated radial bearing that handles rotational and cutting forces. For the MVL-20HD, that is a super-precision NSK model with a 400 mm diameter. Then, the entire spindle assembly is pre-tensioned before installation into the machine. This two-bearing approach maximizes part capacity, rigidity, and spindle life.

Some machines use just one combination bearing of a cross-roller type. That almost always lowers the allowable table load. It's also a sign of a lighter spindle likely to wear out sooner.

How to compare: An easy way to confirm spindle bearing robustness is to check maximum work-piece weight. For a 2,000 mm (78-inch) table machine, the allowable work-piece load should be at least 15,000 kg (33,000+ lbs.). A lesser specification is an indication of a weaker bearing design.

1.12 MORE MACHINE MASS

The structural components of the MVL, including its base, column, and cross rail, are from the highest-quality cast iron and stress-relieved for deformation-free performance year after year. All axis ways are of box-type construction, high frequency induction-hardened, and Turcite-B coated for wear resistance.

The completed MVL-20HD weighs more than 50,000 kg (110,000+ lbs.) All of that iron resists cutting forces in a way that lighter designs just cannot. There is simply no substitute for mass in building a heavy-duty machine tool.

How to compare: Check literature for machine mass. Many models weigh just 1/2 to 2/3rds of what the MVL does. Also, confirm the use of box ways instead of linear rails on all axis.

1.13 GREATER MACHINING CAPACITY

The MVL-20HD features a 2,000 mm (78-inch) table as a standard. It will both swing and turn up to 2,500 mm (98+-inches) and has a maximum turning height of 1,800 mm (70+-inches), or optionally, 2,100 mm (82+-inches).

As noted, the MVL-20HD will handle a work-piece weighing 15,000 kg (33,000+ lbs.). Even if you will never put a part that heavy on the table, that type of heavy-duty capacity means a longer-lasting machine.

How to compare: Check literature for capacities. Many VTLs in a similar size-class have a lesser swing and turning diameter and shorter height capability. Further, the majority will an 12,000 kg (26,400 lbs.) work-piece due to lighter bearings and other construction constraints.

1.14 MORE MAIN SPINDLE POWER

The MVL-20HD's Fanuc spindle motor offers 75 / 60 kW of 30-minute / continuous power rating (i.e., 100 / 80 horsepower). Larger and smaller spindle motors are available. As long as the machine has enough mass and rigidity to handle it, as the MVL does, more horsepower means faster metal removal.

Many VTLs in the same size-class, including some with higher prices, offer only 45 / 37 kW (60 / 50 horsepower) as a standard. They provide less productivity.

How to compare: Check literature for spindle power.

EXCEPTIONAL FEATURES SUMMARY

The MVL includes more than a dozen exceptional features, and Momentum alone includes them all in its base machine. The chart on the following page offers an easy-to-complete cheat sheet to facilitate comparison with any other brand.

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VTL COMPARISON CHEAT-SHEET SUMMARY

Key machine feature:	Benefit (i.e., why it is needed), and how to tell:	MVL-20HD vs. _____	
1) Massive components	Cutting rigidity, vibration dampening, and long-term reliability. Ram size is an easy comparison proxy.	254 mm ram	
2) Full-wrap, arc-shaped column	Dampening mass. The column should be solid and arc-shaped, and it should wrap mostly around the work table.	Yes	
3) Minimal ram overhang distance	Machining rigidity. The overhang from column ways to ram should be small (for this one attribute, less is more).	700 mm	
4) Full-length cross rail and X-axis travel	Two inserts per toolholder and full diameter probing. The -X-axis travel should be greater than the table radius.	-X= 1300mm	
5) Powerful tool retention and anti-rotation	Rigid turning. The ram should have significant tool holder retention force and an anti-rotation curvic coupling.	50 kN	
6) Robust cross rail elevation and locking	Reliability. Lifting and clamping cylinders and synchronizing rack and pinions should position the rail.	Yes	
7) Oversize, extended saddle	Ram support. The saddle should be heavy duty and 25%+ taller than the cross-rail.	Yes	
8) Floor-mounted tool changer (ATC)	Longer and heavier tools. The tool changer should be free-standing and bolted to the floor, not hanging.	Yes	
9) Heavy-duty powertrain	More powerful motors and longer life. Gears should be oversize and with helical teeth, not planetary or straight.	Yes	
10) Geared X and Z-axis motors	Increased axis torque and heavier cuts. Each linear axis motor should transmit power via a gearbox.	Yes	
11) Thrust and radial table bearings	Heavier table loads and longer bearing life. The spindle should feature two bearings instead one cross-roller.	Yes	
12) More machine mass	Heaviest cuts and long machine life. A VTL with a 12,000mm table diameter should weigh 50,000+ kg.	54,000 kg	
13) Greater machining capacity	Long lastingness. A VTL with a 2,000mm table diameter should be able to handle at least 15,000 kg.	15,000 kg	
14) More turning spindle power	Faster metal removal. The main spindle motor should be at least 55 kW on an S2, 30-minute duty rating.	75 kW	

2) DETAILED SPECIFICATIONS

Category	Item	Unit	MVL-20HD Standard
Capacities	Max. Swing Diameter	mm [inch]	Ø 2,500 [98.42]
	Max. Turning Diameter	mm [inch]	Ø 2,500 [98.42]
	Ram Bottom to Table-Top, Max.	mm [inch]	2,050 [80.71]
	Max. Turning Height (Std. Holder)	mm [inch]	1,800 [70.87]
	Max. Workpiece Mass	kg [lb.]	15,000 [33,069]
Controller and Motors	CNC Control	-	FANUC 0i-TF
	Main Spindle Motor	kW [HP]	75 / 60 [100.5 / 80.4]
	X and Z Axis Servo Motors	kW [HP]	7 [9.4]
	Milling Spindle Motor	kW [HP]	-
	Cf Axis Motor	kW [HP]	-
Table	Table Diameter (Std. Manual)	mm [inch]	Ø 2,000 [78.74]
	Low Gear Table Speed	RPM	13 ~ 50
	High Gear Table Speed	RPM	52 ~ 200
	Max. Table Torque	Nm. [ft.lb]	55,800 [41,155]
Tool Changer	Tool Capacity	# of Tools	12
	Turning Tool Holder Type	-	T-Puller + Curvic
	Milling Tool Type	-	N/A
Ram	Cross Sectional Area	mm [inch]	254 x 254 [10 x 10]
Travels	Horizontal Travel (X Axis)	mm [inch]	-1,300 ~ 1,500 [-51.18 ~ 59.05]
	Vertical Travel (Z Axis)	mm [inch]	1,250 [49.2]
	Cross Rail Travel, Steps, Positions	mm [inch] and #	1,120 [44.08], 4 steps, 5 pos.
Feed Rates	Rapid Traverse Rate, X and Z Axis	m/min [inch/min]	10 [393.7]
	Cutting Feed Rate	mm/min [inch/min]	1 ~ 2000 [0.03937 ~ 78.74]
Coolant	Pressure through Milling Spindle	Bar [PSI]	N/A
	Pressure to Turning Tool Holder	Bar [PSI]	6 [87]
Facility	Electrical Rating	kVA	120
	Required Air Pressure and Volume	Bar [PSI] and L/min [GPM]	5.9 [85] – 7.9 [114] bs 200 [52]
Size	Approx. Floor Space (L x W)	mm [inch]	7,060 x 6,050 [278 x 238]
	Machine Max. Height	mm [inch]	7,070 [278]
	Machine Net Weight	kg [lb.]	50,000 [110,231]

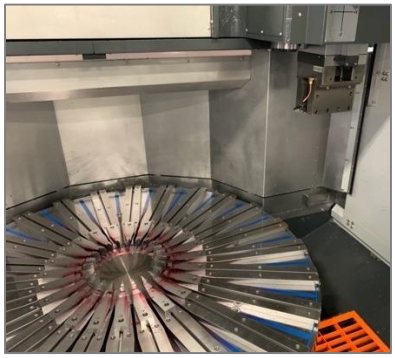
3) CUSTOM CONFIGURATIONS

Momentum's flexible production system completes the MVL's base platform to meet your specific application needs. You can draw from an extensive list of available options, and Momentum can deliver in months some configurations that others promise a year or longer to complete, or don't offer at all.

3.1 SPINDLE POWER OPTIONS

MVL models typically feature a spindle motor that is a frame-size larger than those on other VTL's of the same table diameter. To accommodate special requirements, most are also available with optional motors both larger and smaller than the standard one.

For example, the MVL-20HD features a 75/60 kW motor, standard, two full frame sizes above the usual 45/38 kW motor on other 2.0-meter table VTL's. But this can be optionally increased or reduced, to meet your needs.



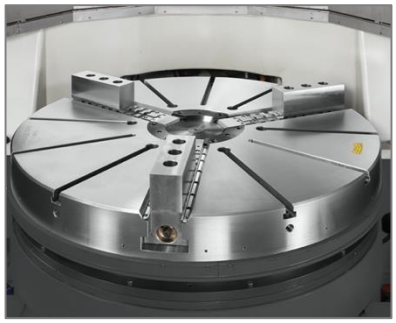
3.2 HIGH-PRECISION OPTIONS

High-precision applications can be accommodated by linear scales on the X and Z axis. These provide direct feedback about the cutting tool's position, irrespective of ball screw system backlash. When linear scales are combined with the extraordinary rigidity of the MVL, terrific precision can be achieved.

Such work may also benefit from special workholding, for example the magnetic chuck shown left, which can help to avoid distortion on the workpiece. Alternatively, five-jaw chucks can lessen that distortion. Momentum works with customers to specify and provide the most effective configurations possible.

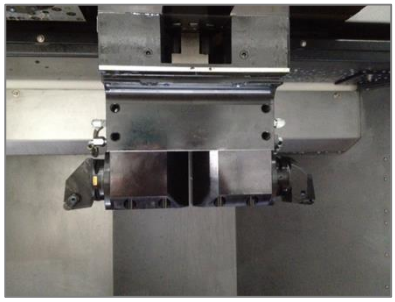
3.3 CHUCKING OPTIONS

A power chuck may reduce the time required to load and unload workpieces. All MVL models are available with optional power chucks, whether Momentum's 3-jaw self-centering chuck for which the machines have already been engineered or your own preferred make and model. Specifying an MVL with a power chuck, or with power chuck preparation, also equips the machine with an A-type mount or other suitable adaptor, a through-hole spindle to accommodate the drawbar, and a hydraulic actuation cylinder. Stroke control or other preferred monitoring functionality is also available.



3.4 SPECIAL TOOLHOLDER DESIGNS

While the MVL's standard toolholders provide good flexibility, some work merits a specially-tailored approach. For example, customers can specify double-sided toolholders with CAPTO quick-change. Combined with the MVL's rare, full-cross rail design, this gives up to 32-cutting edges from a 16-tool ATC. The operator can change the CAPTO heads in the ATC while the MVL cuts. This particularly benefits machining of materials such as high-temp super alloys which shorten insert life.

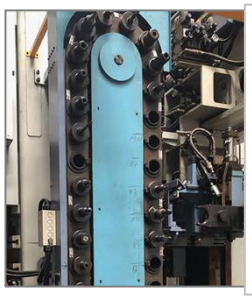


3.5 CAPTO AND OTHER RAM CONFIGURATIONS

The MVL can be configured so that the ram and tool changer natively (i.e., without intermediate tooling blocks) accept CAPTO or other standards. These designs may also replace the horizontal-umbrella rotation style ATC with a vertical chain ATC and a side-arm tool-changer instead, reducing floor space and tool change time. Shown left is a machine having a CAT-60 ram and ATC, permitting the use of expensive and difficult-to-replicate legacy tooling already owned by a customer.

3.6 HIGH-CAPACITY MILLING TOOL ATC

If milling tool capacity beyond that of a standard, right-side ATC is required, then a supplemental left-side, chain-type ATC for milling tools can expand capacity by 30+ tools. Either a side-arm tool-changer or a robot arm exchanges the milling tool in the ram head with the new one from this ATC. This system can also exchange tools in an optional right-angle head. It gives terrific utility. (Scan QR code or visit website for video)



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3.7 TOP-ENCLOSURE, TO 70 BARS COOLANT

The MVL-series offers containment options for high pressure coolant applications that may allow excessive mist or spray to escape from standard VTL sheet metals (which leave a "top window," for ram-traverse, between the doors and X-axis way covers). Shown left, the MVL's top-enclosure option fills the top window. A notch to the left of the ram allows a crane's hoist cable to pass through, for work loading. This enclosure seals at one cross rail position; setup is required to change position.

3.8 COMPACT-FULL ENCLOSURE, TO 206 BARS

MVL's compact full-enclosure features X-axis way covers that are in-plane with the saddle's face and meet the extended door tops, leaving no "top window" for coolant escape. To enable work loading, one side power-retracts, allowing a hoist cable to enter, as shown at right. This enclosure seals at all cross-rail positions. (Scan QR code or visit website for video)

SCAN ME

4) EXCEPTIONAL SUPPORT

4.1 BUILT IN-HOUSE BY MOMENTUM

Momentum is an American-owned producer of vertical turning lathes (VTLs) and flat-bed lathes (FBLs) and maintains executive and technical offices in Houston. The company assembles all models in-house at the factory that it wholly-owns in Taichung, Taiwan.

Elsewhere in the industry, machine tools from even largest names may be produced by a potpourri of third-party contractors and then "badged" with a brand name. When you need answers or parts, someone needs to ask someone, who asks somebody else, delaying responses. By contrast, Momentum's vertical integration gives strict control and enables quick responses to customers.

Taichung and its surrounds produce the largest share of the world's VTL's. This production concentration has given rise to the densest infrastructure of relevant suppliers and support resources. As a result, all of Momentum's major suppliers have nearby offices, fostering close collaboration.

Momentum's wholly-owned factory located in the Taichung area of Taiwan produces all MVL models, allowing strict control and fast response.

4.2 PARTNERING WITH WORLD-CLASS SUPPLIERS

All of the MVL-series' major component systems are by prominent suppliers, well-known for top reliability and service. The brands illustated below provide a mix of standard machine features and optional accessories.

4.3 SUPPORTED BY THE TOP LOCAL SERVICE

Customers need support for machine tools not only at purchase time but also long into the future. Prompt and skilled service in the tenth year contributes as much to investment success as is that on the tenth day after startup. Momentum appreciates this. Its distribution partners have the industry's longest track-records of stability. Specifically, its youngest distributor in the Americas is more than 30-years established.

In each geography, one super-distributor also acts as the importer for itself and nearby dealers. For example, since Momentum's early days, it has partnered with the Morris Group, Inc. (MGI) in the United States. MGI is a 3rd generation, family-owned company with more than 800 employees. Most of them are the customer-facing staff of its local machine-tool distribution outlets. From the beginning, these MGI distribution companies provided Momentum with an anchor dealer network. Subsequently, MGI also created its Select Machining Technologies division. This specialized group provides importation, distribution management, and a local support backstop for machine tools built overseas. Today, Select Machining Technologies imports Momentum on behalf of both MGI's own distribution companies and of those third-party distributors which it has carefully-choosen throughout the remainder of the U.S. and Canada.

In Mexico and Central America, HEMAQ, S.A. de C.V. similarly handles both importation and distribution responsibilities. Established in 1988 and family-owned, the company boasts the area's most extensive installed base of high-value machine tools as well as an unrivaled service capability, including its peerless 24/7 Attention Plus program.

Momentum and its end users are fortunate to have the distinguished partners above. Very few machine tool brands can boast of equivalent distribution and support.

5) PRODUCT SUMMARY

4.1 STANDARD ITEMS INCLUDED:

- Adjustable leveling blocks (w/o J-bolts)
- Automatic tool changer
- Automatic pressurized way lubrication
- Chip conveyor(s)
- Coolant thru-spindle and turning tools
- Coolant tank with filtering
- Heat exchanger for electrical cabinet
- Hydraulic pressure unit (HPU)
- Independent 4-jaw manual chuck
- Manual wash gun
- Red, yellow, green warning light
- Service toolbox and tool kits
- Safety interlocks, on doors and ATC
- Splash guard enclosure, up to 30 bars
- Oil chiller for gearboxes and spindles
- Tool holders (x2), VL22N314-AS
- Tool holder (x1), VL22N676-AS
- Work light inside machine cabinet

Note: differing floor layouts, unique safety committee standards, etc. prevent including a standard work platform. One is typically built-to-suite locally by the end user, but please inquire if assistance is required.

1.2 PARTIAL LIST OF AVAILABLE OPTIONS:

- Air-conditioned cabinet
- Auto doors
- Capto C8 or another ram/tool interface
- CE or CSA certification
- Compact-footprint configuration
- Coolant level readout
- Dual ram heads
- Extended tool-length capacity
- High pressure coolant
- Larger motor sizes
- Larger, or additional, ATC's
- Linear scales
- Oil skimmer
- Part probing
- Power chuck or special chuck
- Siemens or other controllers
- Special enclosure options
- Tool probing
- Transformer

1.3 FANUC CONTROL SPECIFICATION:

- Complete list of control features and specifications is available upon request.

6) INVESTMENT SUMMARY

BASE PRICE FOR MACHINE:

MVL-20HD VTL with Fanuc Oi-TF Control and 10.4” color LCD .....$ 946,990

STANDARD FEATURES:

- Fanuc Oi-TF Control with 10.4” color LCD and “Manual Guide i”..... Standard
- ATC with 12 pockets ..... Standard
- Spindle power as standard, 75/60 kW ..... Standard
- Full wrap column and full length cross rail, with 1,300mm of -X travel ..... Standard
- Programmable cross rail ..... Standard
- “Coolant System 1”: flood coolant to both turning tools..... Standard
- Included turning holders, VL02N314-AS (x2 qty) and VL02N676-AS (x1) ..... Standard

ADDED OPTIONS:

- Package: Electrical Cabinet A/C, Oil Skimmer, and Coolant Level Monitor .....$ 6,990
- Column riser +300 mm, for 2,100 mm maximum turning height w/ std holder.....$39,990

LIST PRICE WITH STANDARD AND ADDED OPTIONS $993,970

LESS: END OF 2023 STOCK SPECIAL DISCOUNT, SN 200013 ..... ($205,000)**

STOCK SPECIAL PRICE, SN 200013.....$788,970**

(** SUBJECT TO PRIOR SALE AND 2023 SHIPMENT)

7) ADDITIONAL OPTIONS

ATC OPTIONS:

- ATC station increased to 16 tools.....$12,990

SPINDLE OPTIONS:

- Higher RPM Spindle.....On request

COOLANT OPTIONS:

- 70-bar coolant pump (MP Systems VR8; dealer installed).....$ 14,790
- Coolant left/right toolholder side selectable (in lieu of standard flow to both).....$ 9,990

ACCURACY OPTIONS:

- Heidenhain Scale feedback C-axis.....Included
- Heidenhain Linear Scale feedback for X and Z axis .....$ 25,990
- Heidenhain Linear Scale feedback for X axis only.....$ 18,990

PROBING OPTIONS:

- Measurement of cutting tool (Renishaw TS-20).....$ 19,990
- Measurement of workpiece (Renishaw RMP-60M).....$ 21,990

WORKHOLDING OPTIONS:

- Power chuck, Ø2,000 mm and 6-jaws (Autostrong VE-279), with cylinder.....$ 96,990

CERTIFICATION OPTIONS:

- Special certification, for either CE or CSA .....$ 6,990

NOTE: All option prices are quoted for factory installation; field installation to be quoted separately.

KEY TERMS

FOR U.S. DELIVERY LOCATIONS:

For deliveries in the United States, Base Price is FOB at port of entry, duty paid. Includes dealer provided installation but excludes inland transportation and rigging costs.

For deliveries outside of the United States, unless otherwise quoted the price is FOB, port of export in Taiwan, and excludes import duties, VAT, and CIF ocean freight.

WARRANTY:

2-Years parts and 1-year labor (see details in the last document section)

PAYMENT TERMS:

For deliveries in the United States: 30% due at order, 30% prior to factory shipment, 30% prior to port arrival, and 10% at completed installation.

For deliveries outside of the United States, 30% due at order, 70% prior to factory shipment.

VALIDITY:

Quote valid for 30 days from transmittal and subject to prior sale.

INSTALLATION:

A qualified technician will be scheduled when the installation site is verified ready. The technician will assemble the machine, check and verify alignment, accuracy, and functions, then conduct basic maintenance training.

The customer is responsible for the following prior to installation:

a) Constructing a foundation in accordance to Momentums foundation plan.

b) Providing electrical and air utilities to machine. (Isolation transformer required)

c) Rigging cost to unload, unpack, and clean Cosmoline from the machine components.

d) Rigging and assisting with the assembly of the machine during installation.

e) Supply labor and materials for grouting.

f) Disposal of all shipping crates and removal of all debris.

Note: Machine accuracy applies only when the machine is installed on a properly poured and cured foundation, constructed in accordance with Momentum's foundation plan.

8) 100% SATISFACTION COMMITMENT

More than a hundred happy customers worldwide have chosen the MVL for their production requirements.

- The machines and their support serve the most demanding organizations and their most difficult machining applications.
- Industries include aerospace, oil and gas, bearings, and heavy equipment.
- Momentum's objective is to earn your business at every encounter, from before your purchase and throughout your ownership.

9) TECHNICAL ILLUSTRATIONS

The subsequent pages contain the diagrams below:

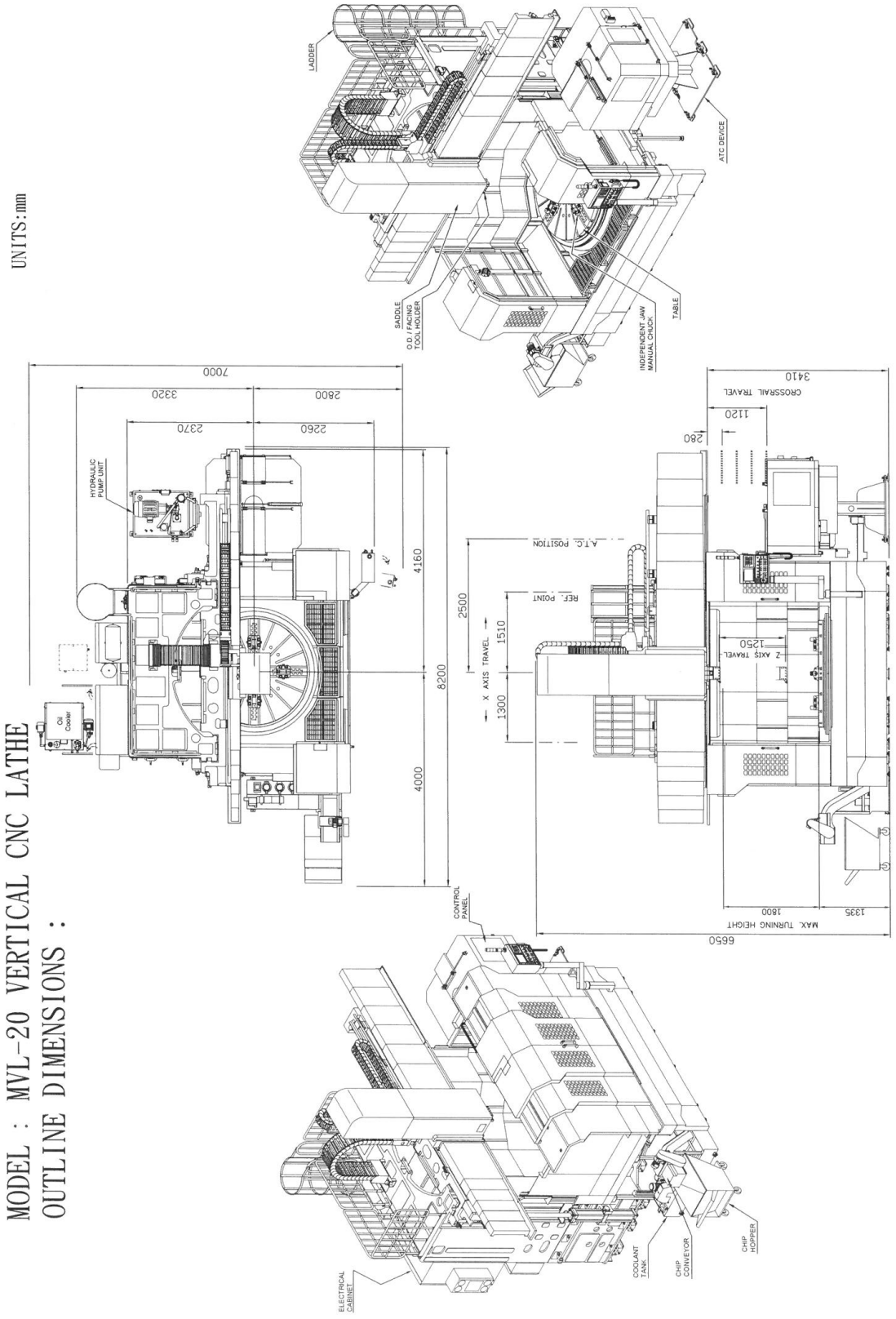
- **List of MVL-20HD Standard Illustrations:**

8.1 Outline dimensions, standard footprint
8.2 Outline dimensions, compact footprint option
8.3 Working capacity dimensions, standard
8.4 ATC dimensional capacity, standard
8.5 Tool setter dimensional capacity, typical option
8.6 Power and torque, standard 55/45 kW main spindle
8.7 Power and torque, optional 300 RPM main spindle

- **Special Illustrations:**

8.X (None added)

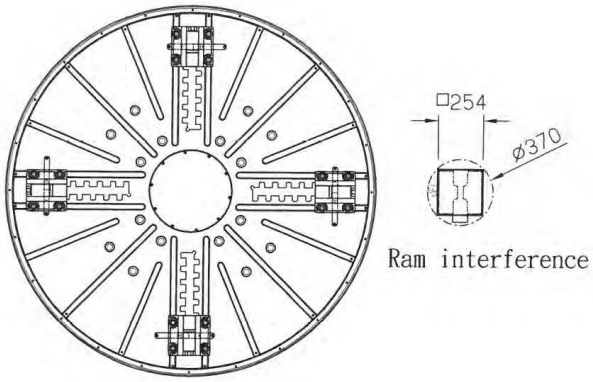
9.1 OUTLINE DIMENSIONS, STANDARD FOOTPRINT

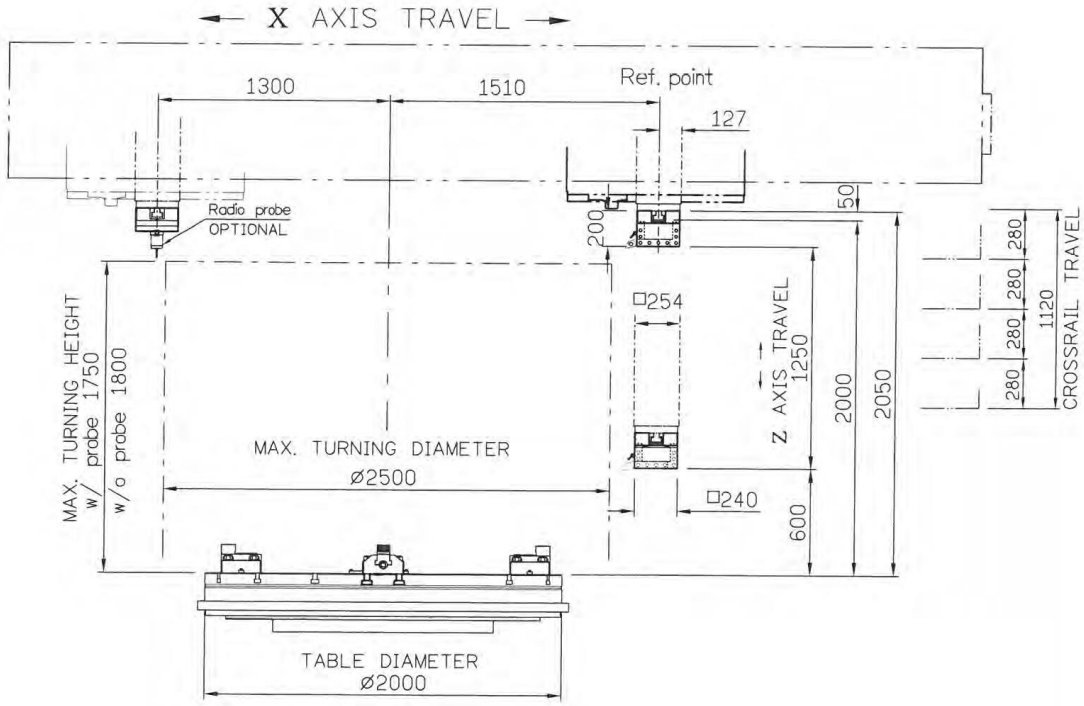


9.2 OUTLINE DIMENSIONS, COMPACT FOOTPRINT OPTION

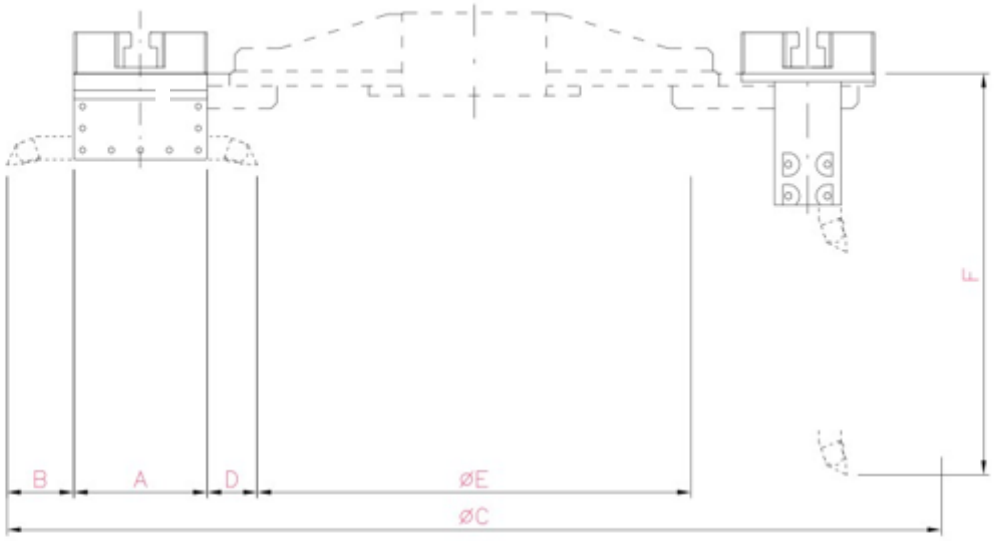
(Page is out for design update. Please inquire if needed urgently)

9.3 WORKING CAPACITY DIMENSIONS, STANDARD





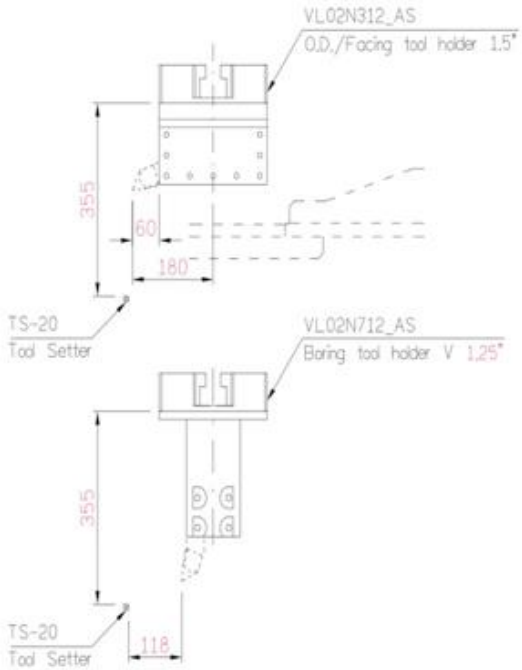
9.4 ATC DIMENSIONAL CAPACITY, STANDARD



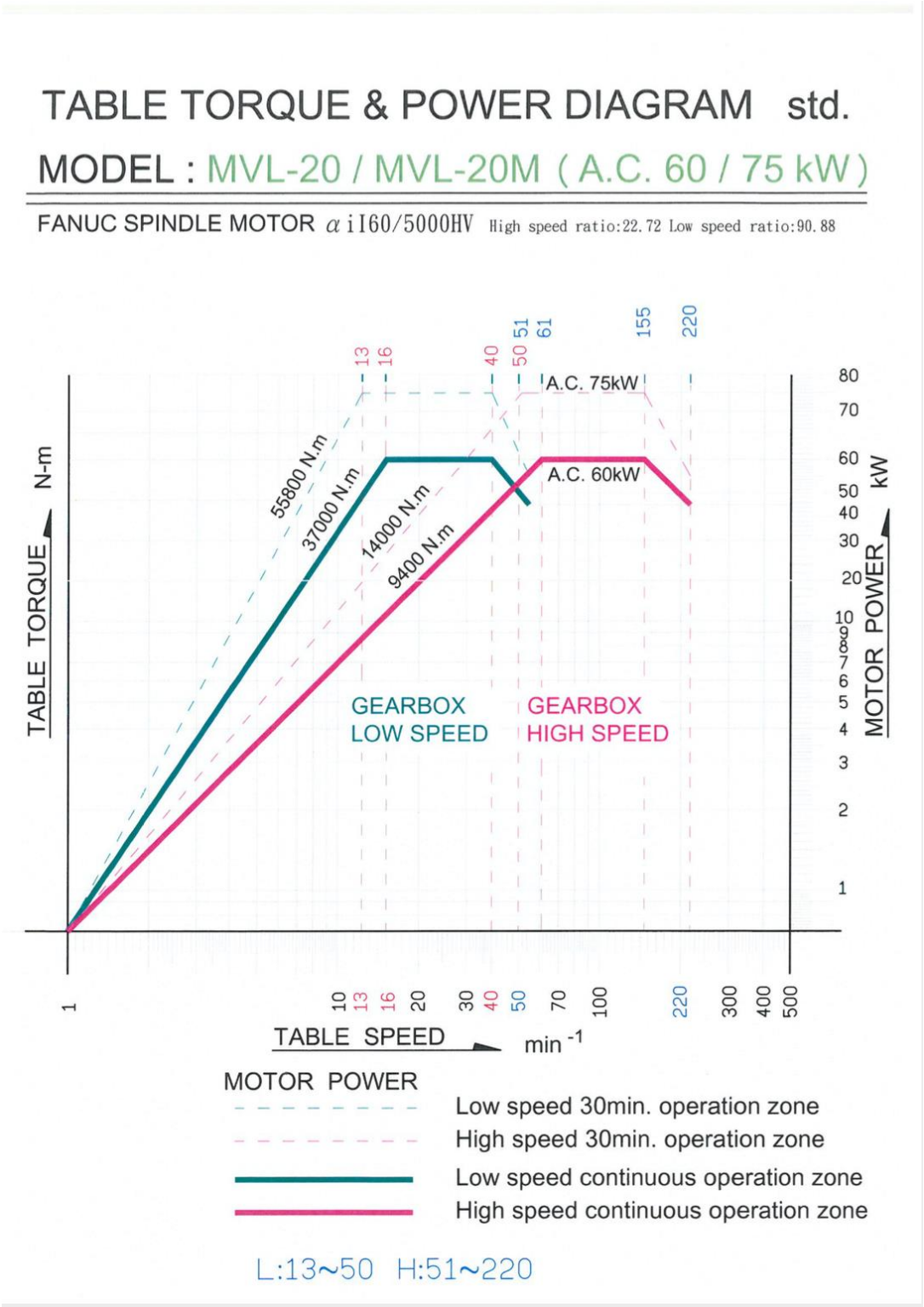
unit : mm

Specification \ Machine model		MVL-12	MVL-12HD		MVL-12M		MVL-16	MVL-16M	MVL-20	MVL-20M
Number of Tools		12T	12T	16T	12T	16T	16T		16T/18T	
Width of Tool Holder	A	200	240							
Maximun outside diameter extension of tool shank of O.D. tool holder	B	70	120							
Inside the tool magazine, maximun outside diameter of swing diameter	C	1500	1680	1980	1680	1980	1980			
Maximun inside diameter extension of tool shank of O.D. tool holder	D	50								
Inside the tool magazine, maximun inner diameter of swing diameter	E	860	860	1160	860	1160	1160			
Maximun length of tool	F	550	700				850			

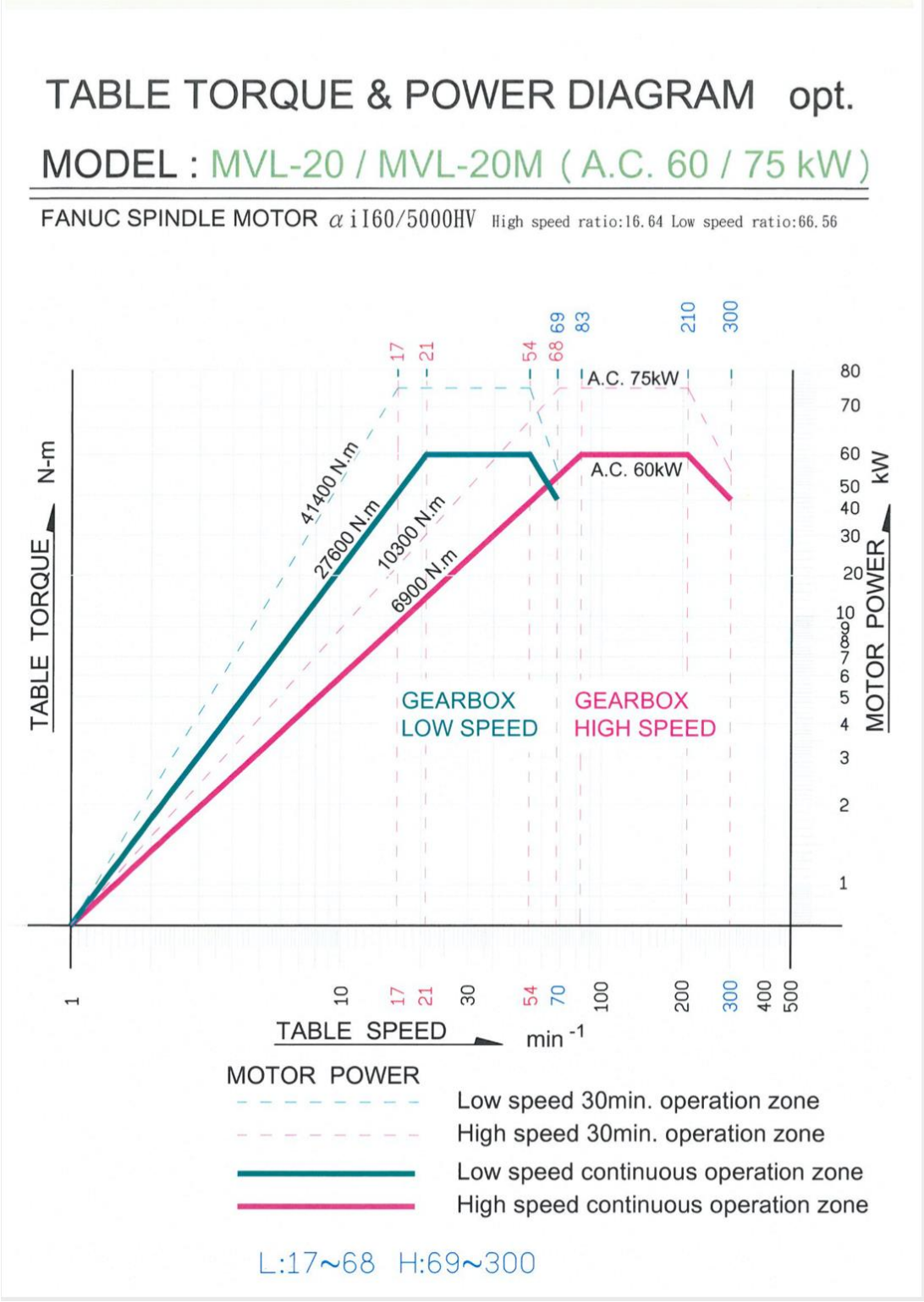
9.5 TOOL SETTER DIMENSIONAL CAPACITY, TYPICAL OF OPTION



9.6 POWER AND TORQUE, STANDARD 75/60 KW MAIN SPINDLE



9.7 POWER AND TORQUE, OPTIONAL 300 RPM MAIN SPINDLE



10) LIMITED WARRANTY, DISCLAIMER OF IMPLIED WARRANTIES, AND LIABILITY LIMITATION

MOMENTUM LIMITED WARRANTY: Momentum warrants that its machine tools shall be free of defects in materials and workmanship. Momentum extends this non-transferrable, Momentum Limited Warranty to the end user who buys the new machine from an authorized Momentum reseller, for other than resale.

a) For Momentum-brand machine tools, Momentum or its authorized designee shall replace or repair, at its discretion, any machine part defective in material or workmanship during the earlier of two (2) years from the completion of installation, thirty (30) months from title transfer, and 6,000 operation hours. This parts-warranty coverage includes replacement-parts EXW (DAP in the U.S.) terms. In addition, during the earlier of one (1) year from the completion of installation, fifteen (15) months from title transfer, and 3,000 operation hours, this warranty coverage also includes distributor-provided technician travel and labor. The end user is responsible to provide lifting or rigging capacity as required.

b) For any third-party peripheral device, only the peripheral manufacturer's own limited warranty applies.

c) For Fanuc and other brand CNC control packages, including controls, motors, and drives for spindles and axis, only the control manufacturer's own limited warranty applies.

d) Defective parts must be returned, at Momentum's freight cost, if it or its authorized agent requests. All Momentum Limited Warranty repairs must be authorized by Momentum or its authorized agent.

e) Neither the distributor nor Momentum have any warranty obligation if owed any sums for the equipment or service. This Momentum Limited Warranty is nullified by: equipment use or maintenance not following the instruction documents or warning labels from Momentum or peripheral manufacturers; tampering with safety or recording functions; or failure to grant access as requested by Momentum or its authorized agent to make any determinations. It excludes: machines sold, installed, or transferred outside of North America; peripherals not purchased from Momentum, or results of them; modifications not authorized in writing by Momentum, or results of them; neglect, accident, or other cause beyond Momentum's control; paint, batteries, filters, fluids, fuses, light bulbs, or expendable items; and use for materials which may be hazardous or contribute to premature failure, such as radioactive, chemically active, corrosive, or abrasive materials.

f) Momentum makes no guarantees or representations, explicit or implied, concerning the equipment, except as set forth this Momentum Limited Warranty. Momentum alone may modify this Momentum Limited Warranty.

THIS WARRANTY IS IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE OR PURPOSE, WHICH ARE EXPRESSLY EXCLUDED. MOMENTUM'S LIABILITY UNDER THIS MOMENTUM LIMITED WARRANTY IS EXPRESSLY LIMITED TO ITS PROMISE TO REPAIR OR REPLACE THE DEFECTIVE GOODS