

THE HEAVY DUTY CNC VTL

MVL-10HD-SR / 10iM-SR / 10M-SR

MVL-12HD-SR / 12iM-SR / 12M-SR

MVL-15-SR / 15iM-SR / 15M-SR

MVL-16-SR / 16iM-SR / 16M-SR

MVL-20-SR / 20iM-SR / 20M-SR



HEAVY DUTY ADVANTAGES

HEAVIER CUTS GREATER RIGIDITY LONGER LIFESPAN

All MVL Models

Full Wrap Around, Arc-Shaped Column

MVL Series

- Column wraps full left to right
- Arc shaped to absorb forces
- More mass for dampening

Lighter VTLs

- Column offset to side of table
- Far less mass for dampening
- Poor cutting force mechanics

Large and Purpose-Built Gearbox

MVL Series

- Designed for the purpose
- Uses oversize, helical gearing
- Handles high motor powers
- Ensures lasting reliability

Lighter VTLs

- Off-the-shelf planetary gearbox
- Significantly smaller gears
- Undersized, even at less power
- Less likely to last over time

Shortened Ram Overhang

MVL Series:

- Minimal overhang of ram
- Greatly increases rigidity
- Improves alignment

Lighter VTLs

- Too much ram overhang
- Reduces structural rigidity
- Hampers alignment

Dedicated Thrust and Radial Table Bearings

MVL Series

- Thrust bearing: horizontal loads
- Radial bearing: radial loads
- Allows heaviest workpiece mass
- Preloaded for maximum rigidity

Lighter VTLs

- Single cross roller bearing
- Must handle all loads
- Limits part mass allowed
- Less rigidity

Full Length Cross Rail and Ram Travel

MVL Series:

- Full ram travel, from -X to +X
- Allows probing parts on diameter
- Allows left and right tooling

Lighter VTLs

- Ram travel very limited in -X
- Cannot probe on diameters
- Only one insert per toolholder

Floor Mounted, Heavy Capacity ATC

MVL Series

- ATC stands bolted to floor
- Allows longest, heaviest tools
- Allows extended ATC capacity
- Ergonomic tool loading height

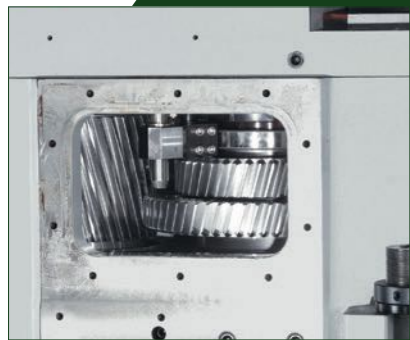
Lighter VTLs

- ATC moves with cross rail
- Limits weight and length
- Limits tool quantity
- Tool loading at tall height

MILLING ADVANTAGES

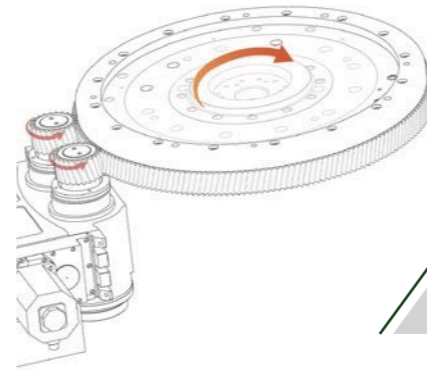
INCREASED TORQUE
IMPROVED PRECISION
ENHANCED DURABILITY

-M and -iM Models



Two Speed Milling Gearbox (-M models)

- Standard heavy-duty, two-speed milling spindle gearbox
- Optimizes cutting speeds and torques
- Available torque: 820 N-m (604 ft-lbs), with standard 22/18.5 kW milling motor
- Other brand VTLs: often offer a 2-step gearbox optionally or not at all



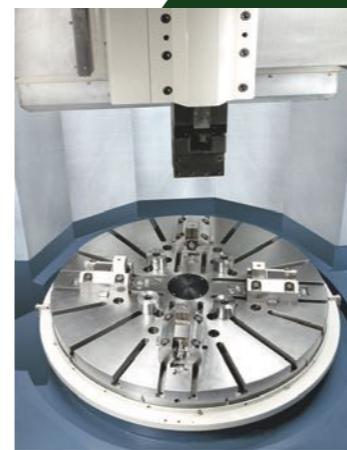
Cf-Type Table Rotation (-M models)

- Dedicated servo motor and dual-input gearbox
- Optimal for table rotations and reversals, such as thread milling
- Heidenhain position detector mounted directly on table rotation centerline
- Position accuracy: +/- 10 arc seconds or better
- Other brand VTLs: may lack dual-input Cf



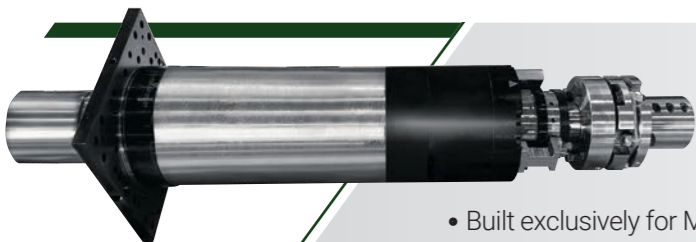
Timing Belt Reduction (-iM models)

- Standard heavy-duty timing belt spindle drive
- Single, 1.72:1 reduction ratio
- Available torque: 620 N-m (455 ft-lbs), with standard 22/18.5 kW milling motor
- Other brand VTLs: may lack reduction ratio, resulting in less torque



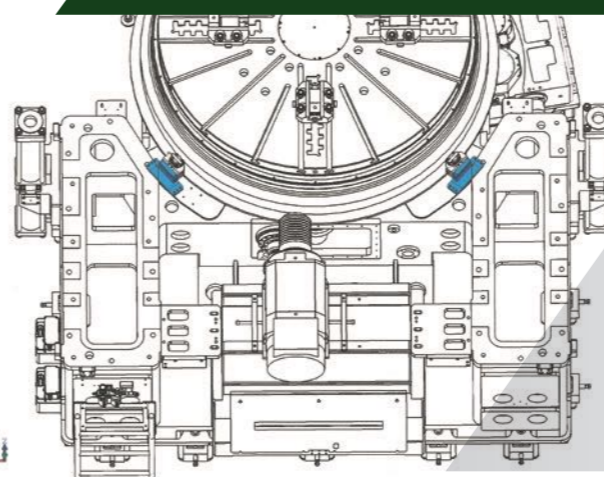
Cs-Type Table Rotation (-iM models)

- Uses main spindle motor for table positioning
- Light drag brake provides smooth, accurate rotation
- Fanuc AiCZ position detector unit mounted directly on table rotation centerline
- Position accuracy: +/- 10 arc seconds or better
- Other brand VTLs: may use lesser detector unit



Robust SKF Milling Spindle (-M and -iM models)

- Built exclusively for Momentum by the specialized SKF spindle factory
- Uses NN3020 (100 mm ID) and NN3018 (90 mm ID) double row cylindrical roller bearings
- Provides highest spindle stiffness and longevity
- Other brand VTLs: use cheaper, smaller-sized angular contact ball bearings, 7018 or 7016



Hydraulic Table Brake (-M and -iM models)

- Two available clamping pressures, for best results
- Full force clamping when table is stopped
- Medium force for precise control during milling cuts
- Other brand VTLs: often omit dual force brake clamping system

SUPER RAM™ ADVANTAGES

POWERFUL CLAMPING
DO-ANYTHING FLEXIBILITY
EXTENSIVE TOOLING CHOICES

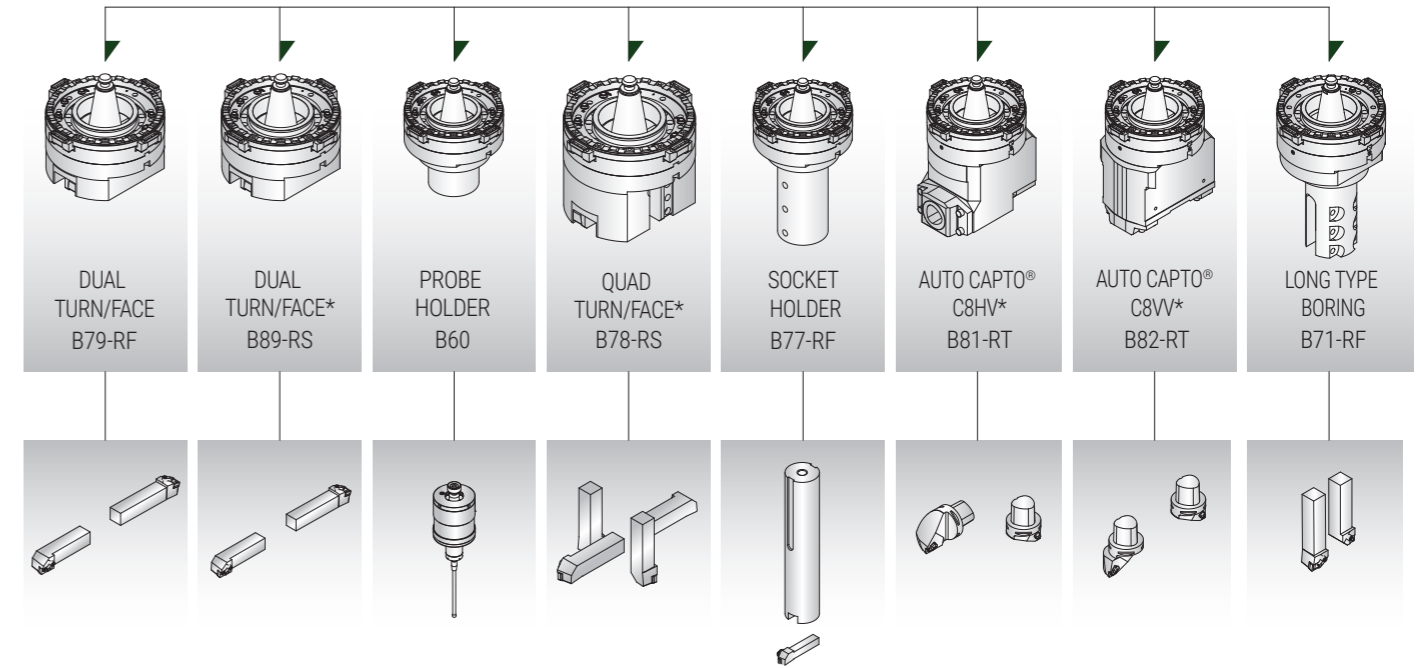


-SR Models

Flexible Tooling Attachment System for all Models

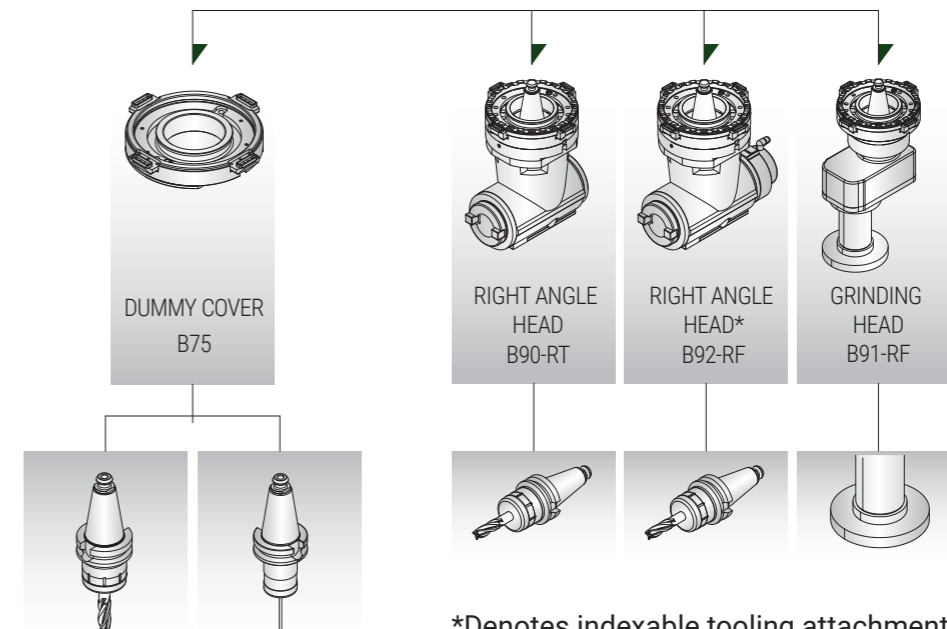
Features and Benefits

	-M & -iM MVL Models	2-Axis MVL Models	Other Brand VTLs
8-Ton Clamping Force Provides 78 kN clamping force, tripling the 25kN industry norm		Standard	Standard
Automatic Tool Indexing Saves cycle time and ATC spots; M-code index up to four inserts		Indexable Ram Option	Indexable Ram Option
Automatic Capto® Change Automatically changes Capto® heads stored in the ATC		Hydraulic Ram Option	Hydraulic Ram Option
Angle Head Live Tool Change Automatically changes angle head live tools stored in ATC		Hydraulic Ram Option	N/A



*Denotes indexable tooling attachment

Additional system for -M and -iM Super Ram™ Models



*Denotes indexable tooling attachment

COOLANT/CHIP ADVANTAGES

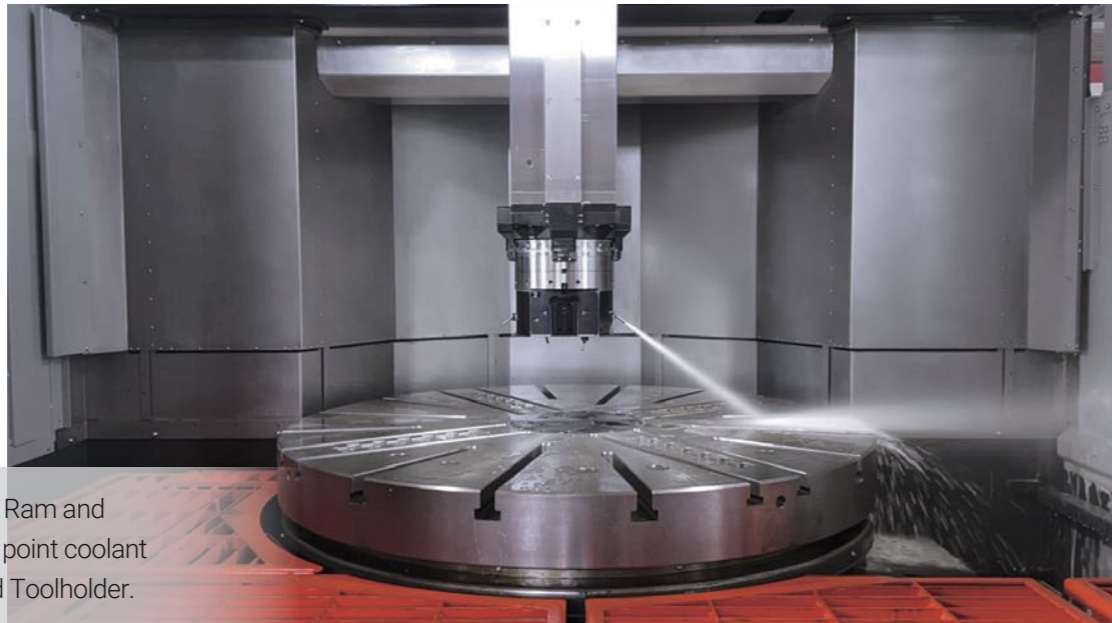
COOLANT OUTPUT CHOICES

MULTIPLE PUMP OPTIONS

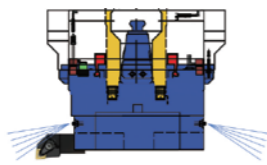
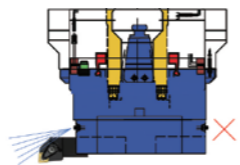
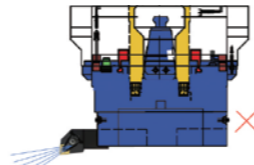
EFFICIENT FILTRATION

All MVL Models

Coolant Output Methods



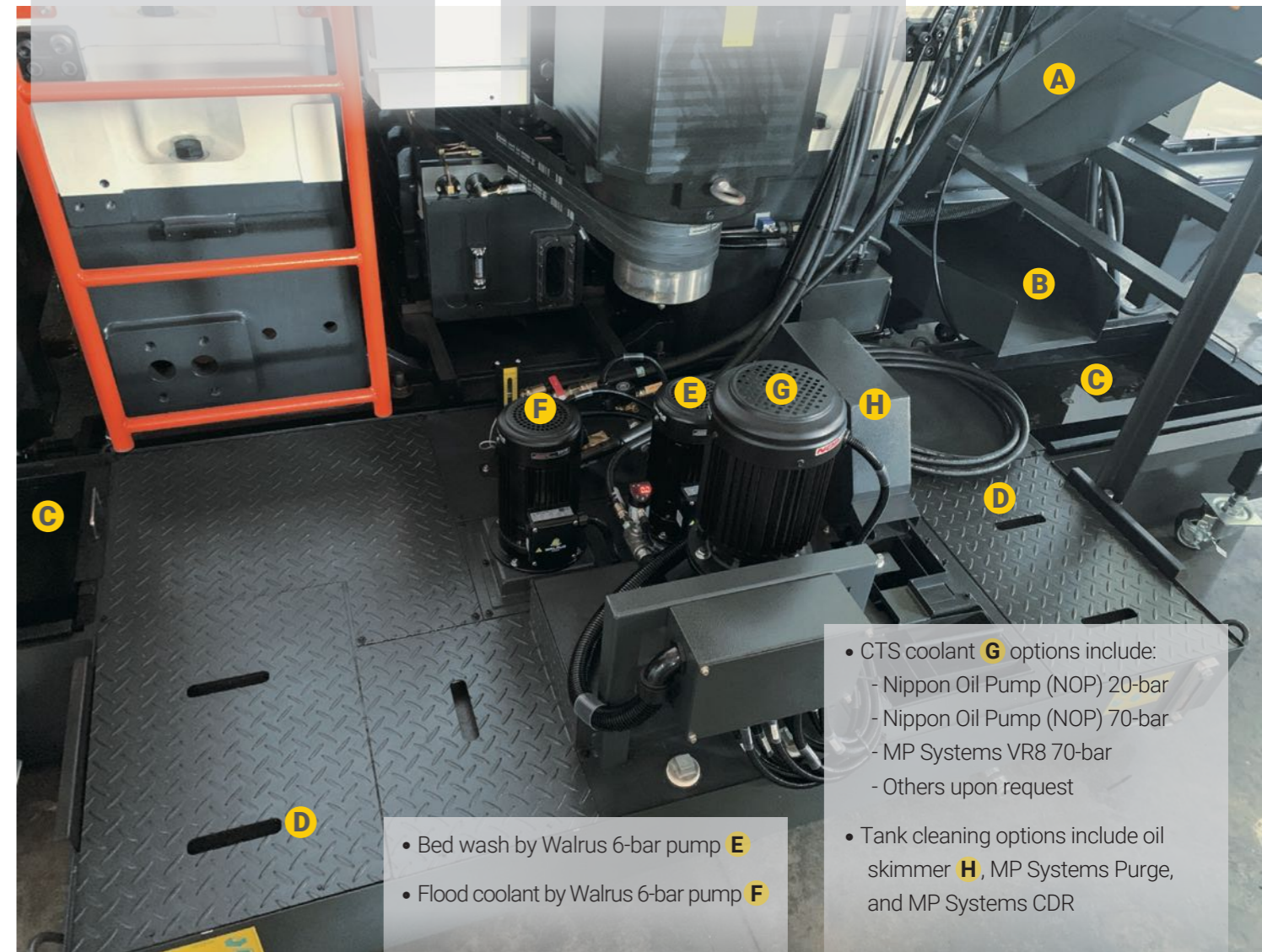
Super Ram™ using Indexable Ram and Left/Right Coolant options to point coolant from specified nozzle in Quad Toolholder.

	All Flood	Directed Flood	Directed TTC
			
Coolant delivery (source is CTS pump for all types)	Simultaneous flow through all flood nozzles on the attachment block	Only through the flood nozzles on the attachment block that point to the work	Only at the cutting insert on the toolholder that points to the work
Tooling attachment type required	Suffix of -RF. For example, B79-RF Dual turn/face	Suffix of -RS. For example, B89-RS Dual turn/face	Suffix of -RT. For example, B78-RT Quad turn/face
Ram option(s) required	No special requirement	Indexable Ram and Left/Right Coolant	
Cutting tool required	No special requirement		TTC-compatible, i.e., SECO JETI or Capto

Effective Chip and Coolant Management

- Chip conveyors **A** are outside of castings; easily removable for cleaning and maintenance
- Footprint up to 20% less than required by competitive models for which conveyors pass through castings

- Coolant gravity drains **B** from chip pans to a large center tank
- Center tank passes coolant through a basket strainer **C** and secondary filtration **D** before entering clean section.



Typical chip conveyor and coolant tank configuration

- Bed wash by Walrus 6-bar pump **E**
- Flood coolant by Walrus 6-bar pump **F**

- CTS coolant **G** options include:
 - Nippon Oil Pump (NOP) 20-bar
 - Nippon Oil Pump (NOP) 70-bar
 - MP Systems VR8 70-bar
 - Others upon request
- Tank cleaning options include oil skimmer **H**, MP Systems Purge, and MP Systems CDR

OTHER ADVANTAGES

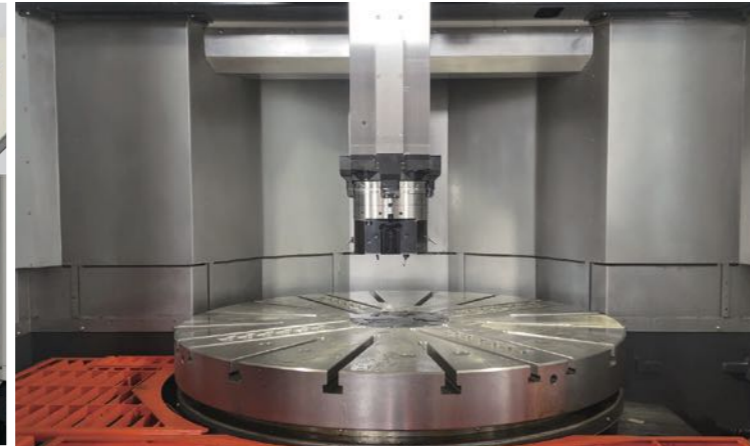
ENHANCED ERGONOMICS

OPTIMIZED ELECTRICAL

PERFORMANCE OPTIONS

All MVL Models

Ergonomic Sheet Metal



MVL-10HD belly-up configuration, standard on 1.0 and optional on 1.5 and 1.2-m sizes.

MVL-15iM interior platform for 2.0, 1.6, 1.5, and 1.2-m table sizes. Grates manually flip up when not in use, for chip flow.

Compact Full Enclosure Options



Enclosure's deep way covers meet doors, prohibiting coolant escapement.

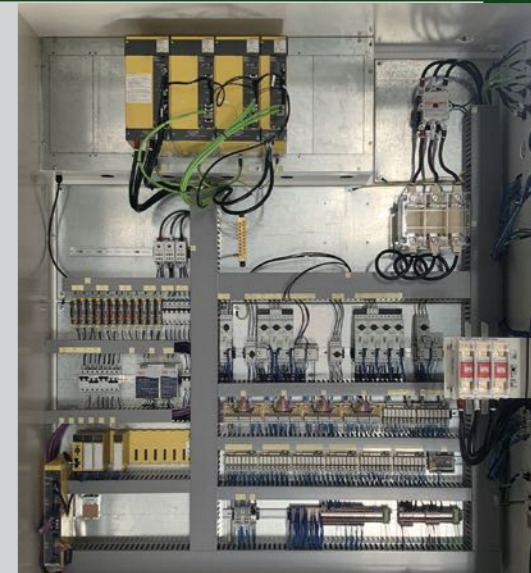
Covers Open For Part Loading



Optimized Electrical Systems

Efficient 460 Volt Fanuc Architecture

- Fanuc OiTF Plus CNC control, with 460V motors and servo amplifiers
- Efficiency gains via reductions in current, wire sizes, energy loss
- Transformer-free hookup for most
- Standard SCCR 10 kA, opt. SCCR 50+ kA
- Fanuc Model A for easy option expandability
- Large, straightforward-to-service electrical cabinet at shop floor level



Standard electrical cabinet

Other Productivity Options

Optional higher power motors



Optional three jaw power chuck



Optional Dual Rams

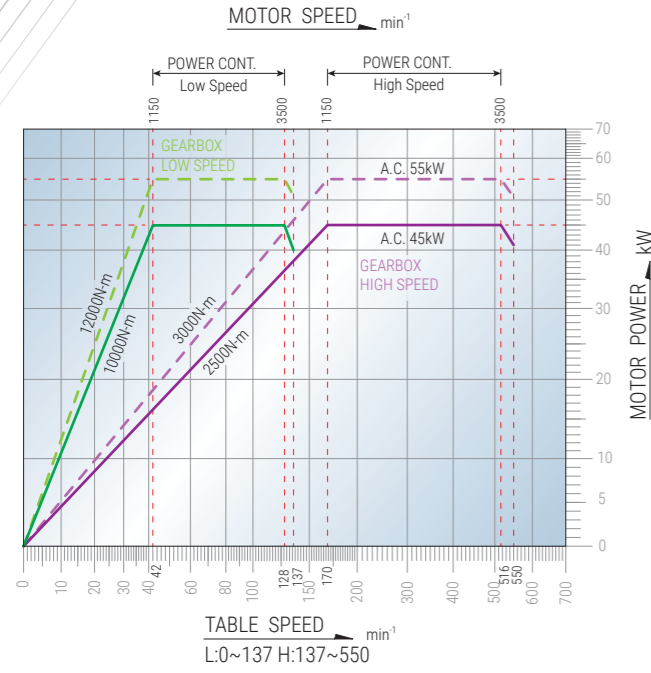
MVL-12HD model with twin rams and ATCs



TABLE TORQUE & POWER DIAGRAM

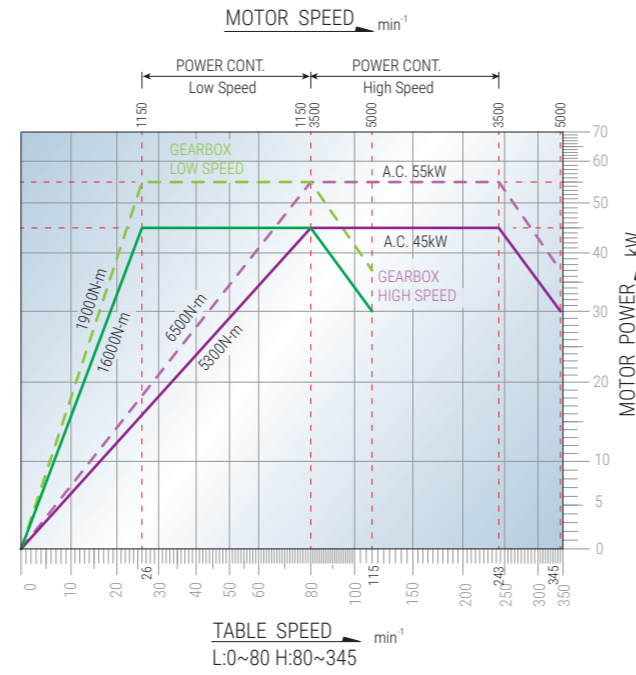
MODEL : MVL-10HD-SR / MVL-10iM-SR / MVL-10M-SR
(A.C. 45 / 55 kW)

FANUC SPINDLE MOTOR
αi150/5000HV High speed ratio: 6.78 Low speed ratio: 27.23



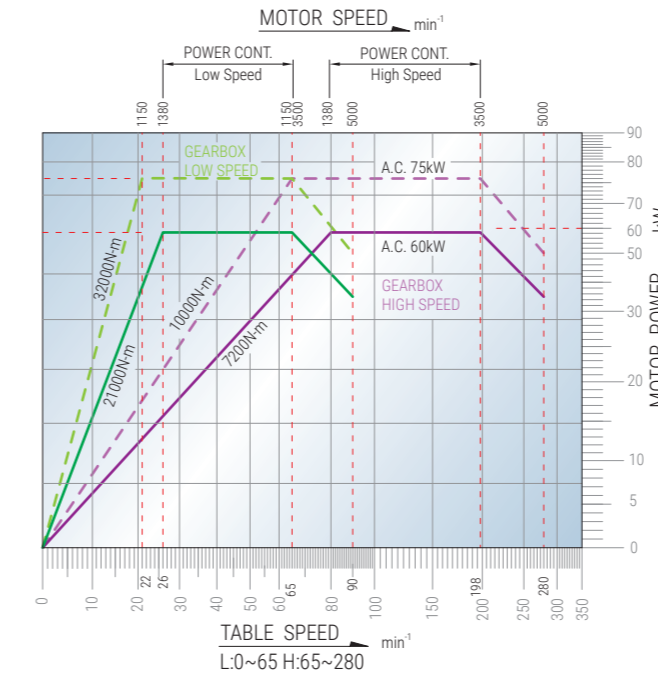
MODEL : MVL-12HD-SR / MVL-12iM-SR / MVL-12M-SR
MVL-15-SR / MVL-15iM-SR / MVL-15M-SR (A.C. 45 / 55 kW)

FANUC SPINDLE MOTOR
αi150/5000HV High speed ratio: 14.40 Low speed ratio: 43.31



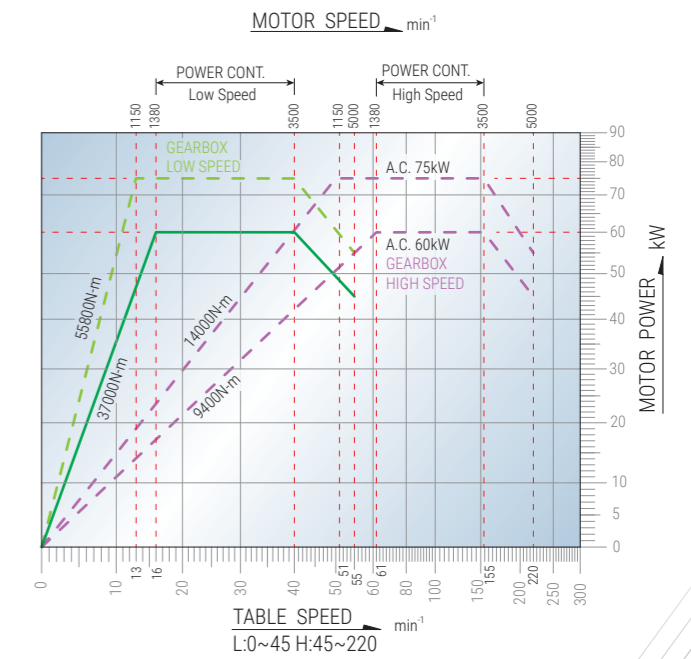
MODEL : MVL-16-SR / MVL-16iM-SR / MVL-16M-SR
(A.C. 60 / 75 kW) Opt.

FANUC SPINDLE MOTOR
αi160/5000HV High speed ratio: 17.62 Low speed ratio: 52.99



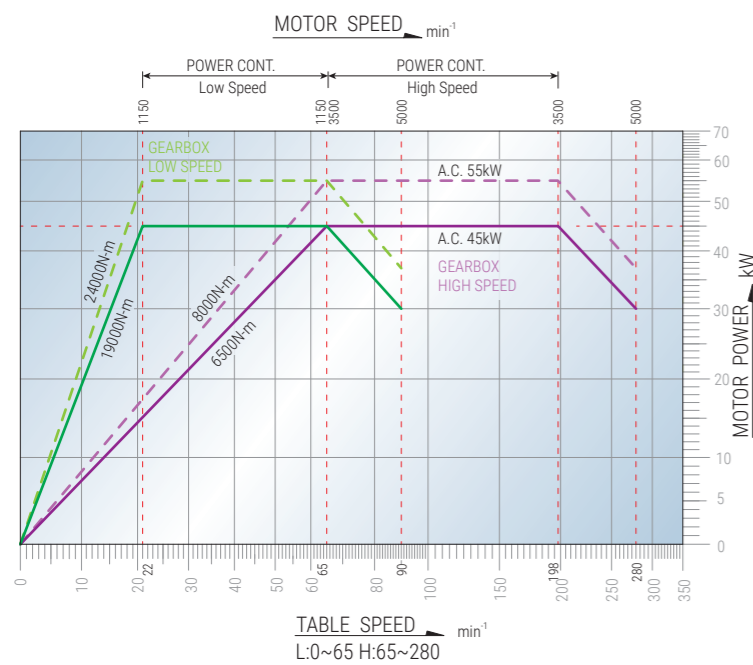
MODEL : MVL-20-SR / MVL-20iM-SR / MVL-20M-SR
(A.C. 60 / 75 kW) Opt.

FANUC SPINDLE MOTOR
αi160/5000HV High speed ratio: 22.72 Low speed ratio: 90.88



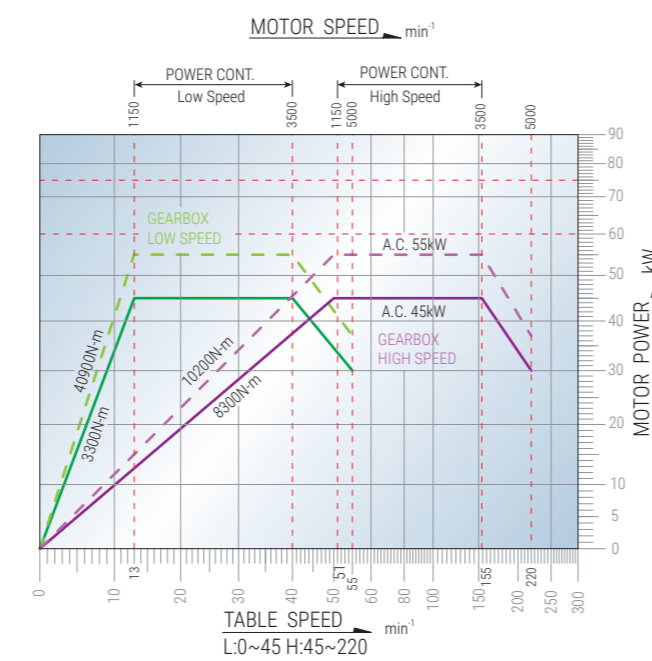
MODEL : MVL-16-SR / MVL-16iM-SR / MVL-16M-SR
(A.C. 45/55 kW)

FANUC SPINDLE MOTOR
αi150/5000HV High speed ratio: 17.62 Low speed ratio: 52.99



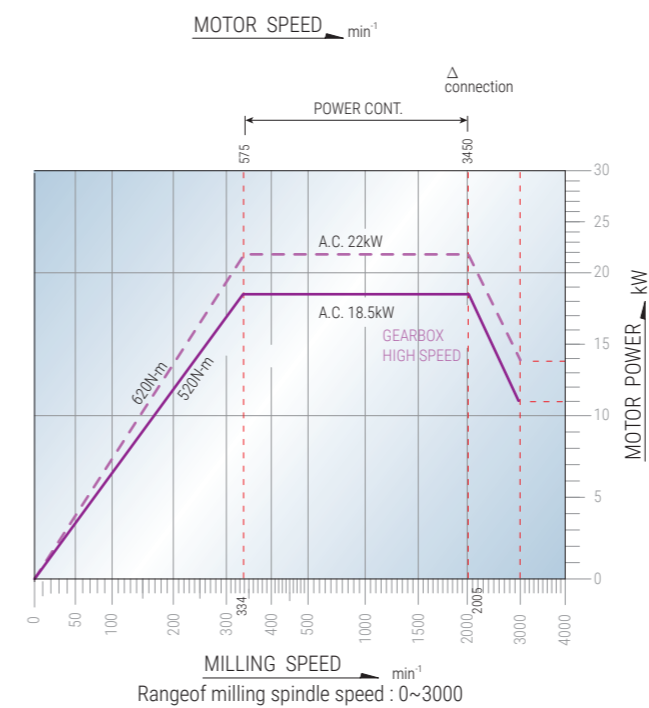
MODEL : MVL-20-SR / MVL-20iM-SR / MVL-20M-SR
(A.C. 45 / 55 kW)

FANUC SPINDLE MOTOR
αi150/5000HV High speed ratio: 22.72 Low speed ratio: 90.88



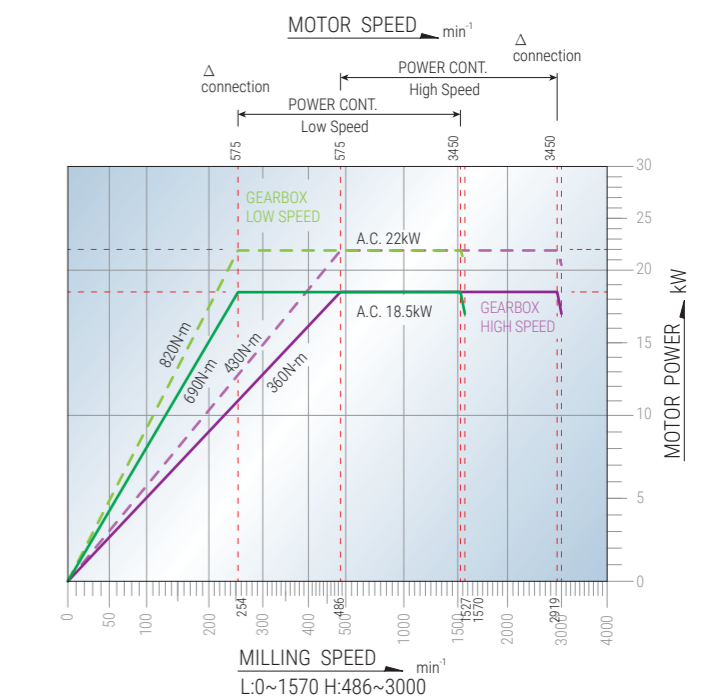
MODEL : All -iM Models
(A.C. 18.5 / 22 kW) Std, -M Opt.

FANUC SPINDLE MOTOR
αiIP40/6000 Timing belt speed ratio: 1.72



MODEL : All -M Models
(A.C. 18.5 / 22 kW) Std, -iM Opt.

FANUC SPINDLE MOTOR
αiIP40/6000 High speed ratio: 1.182 Low speed ratio: 2.259



MOTOR POWER
--- Low speed 30min. operation zone
--- High speed 30min. operation zone

MOTOR POWER
— Low speed continuous operation zone
— High speed continuous operation zone

MOTOR POWER
--- Low speed 30min. operation zone
--- High speed 30min. operation zone

MOTOR POWER
— Low speed continuous operation zone
— High speed continuous operation zone

SPECIFICATION		UNIT	MVL-10HD-SR MVL-10iM-SR MVL-10M-SR	MVL-12HD-SR MVL-12iM-SR MVL-12M-SR	MVL-15-SR MVL-15iM-SR MVL-15M-SR	MVL-16-SR MVL-16iM-SR MVL-16M-SR	MVL-20-SR MVL-20iM-SR MVL-20M-SR
Capacity	Max. Swing Diameter	mm [inch]	Ø1,100 [43.30]	Ø1,600 [62.99]	Ø1,600 [62.99]	Ø2,000 [78.74]	Ø2,500 [98.42]
	Max. Turning Diameter	mm [inch]	Ø1,100 [43.30]	Ø1,600 [62.99]	Ø1,600 [62.99]	Ø2,000 [78.74]	Ø2,500 [98.42]
	Height, Table to Clamp Pitch Line	mm [inch]	1,075 [42.32]	1,320 [51.96]	1,500 [59.00]	1,780 [70.08]	1,985 [78.15]
	Height, Max. Turning (B79 Holder)	mm [inch]	900 [35.43]	1,145 [45.12]	1,325 [52.16]	1,605 [63.18]	1,810 [71.25]
	Max. Workpiece Mass	kg [lb.]	5,000 [11,000]	8,000 [17,637]	8,000 [17,637]	10,000 [22,046]	15,000 [33,069]
Controller and Motors	CNC Control	-	FANUC 0i-TF Plus	FANUC 0i-TF Plus	FANUC 0i-TF Plus	FANUC 0i-TF Plus	FANUC 0i-TF Plus
	Main Spindle Motor	kW [HP]	55 / 45 [73.7 / 60.3]	55 / 45 [73.7 / 60.3]	55 / 45 [73.7 / 60.3]	55 / 45 [73.7 / 60.3]	55 / 45 [73.7 / 60.3]
	X and Z Axis Servo Motors	kW [HP]	7 [9.4] (with 3:1 reduction)	7 [9.4] (with 3:1 reduction)	7 [9.4] (with 3:1 reduction)	7 [9.4] (with 3:1 reduction)	7 [9.4] (with 3:1 reduction)
	Milling Spindle Motor, -iM & -M only	kW [HP]	22 / 18.5 [29.5 / 25]	22 / 18.5 [29.5 / 25]	22 / 18.5 [29.5 / 25]	22 / 18.5 [29.5 / 25]	22 / 18.5 [29.5 / 25]
	Cf Axis Motor, -M only	kW [HP]	7 [9.4] (360:1 reduction)	7 [9.4] (360:1 reduction)	7 [9.4] (360:1 reduction)	7 [9.4] (360:1 reduction)	7 [9.4] (360:1 reduction)
Table	Table Diameter	mm [inch]	Ø1,005 [39.56]	Ø1,250 [49.21]	Ø1,450 [57.08]	Ø1,600 [62.99]	Ø2,000 [78.74]
	Low / High Gear Speed	RPM	0 ~ 137 / 137 ~ 550	0 ~ 80 / 80 ~ 345	0 ~ 103 / 80 ~ 312	0 ~ 65 / 65 ~ 280	0 ~ 45 / 45 ~ 220
	Max. Table Torque	Nm. [ft.lb]	12,000 [8,850]	19,000 [14,014]	19,000 [14,014]	24,000 [17,701]	40,900 [30,1666]
Tool Changer	Tool Capacity, 2-Axis / -iM & -M	# of Tools	16 / 15+1 Cover	16 / 15+1 Cover	16 / 15+1 Cover	16 / 15+1 Cover	16 / 15+1 Cover
Ram	Cross Sectional Area	mm [inch]	254 x 254 [10 x 10]	254 x 254 [10 x 10]	254 x 254 [10 x 10]	254 x 254 [10 x 10]	254 x 254 [10 x 10]
	Tooling Attachment Clamp Force	Ton, kN [lb-f]	8-Ton, 77.5 [17,422]	8-Ton, 77.5 [17,422]	8-Ton, 77.5 [17,422]	8-Ton, 77.5 [17,422]	8-Ton, 77.5 [17,422]
	Tooling Attachment Anti Rotation	-	24 Tooth Curvic Coupling	24 Tooth Curvic Coupling	24 Tooth Curvic Coupling	24 Tooth Curvic Coupling	24 Tooth Curvic Coupling
	Center Retention Stud Force	kN [lb-f]	20 [4,496]	20 [4,496]	20 [4,496]	20 [4,496]	20 [4,496]
Mill Spindle	Low / High Gear Steps, -M only	RPM	0 ~ 1570 / 486 ~ 3000	0 ~ 1570 / 486 ~ 3000	0 ~ 3000	0 ~ 1570 / 486 ~ 3000	0 ~ 1570 / 486 ~ 3000
	Max. Spindle Torque, -M / -iM	Nm. [ft.lb]	820 [604] / 620 [455]	820 [604] / 620 [455]	820 [604] / 620 [455]	820 [604] / 620 [455]	820 [604] / 620 [455]
	Milling Tool Type, -M and -iM	-	Dual Contact CAT-50	Dual Contact CAT-50	Dual Contact CAT-50	Dual Contact CAT-50	Dual Contact CAT-50
Travels	Horizontal Travel, X Axis	mm [inch]	-570 ~ 725 [-22.44 ~ 28.54]	-820 ~ 965 [-3.93 ~ 37.99]	-820 ~ 965 [-3.93 ~ 37.99]	-1,020 ~ 1,165 [-40.15 ~ 45.87]	-1,300 ~ 1,500 [-51.18 ~ 59.05]
	Vertical Travel, Z Axis	mm [inch]	1,000 [39.37] **	1,000 [39.37]	1,000 [39.37]	1,000 [39.37]	1,000 [39.37]
	Cross Rail Travel, Steps, Positions	mm [inch], #	N/A – Fixed	500 [19.68], 2 steps, 3 pos.	500 [19.68], 2 steps, 3 pos.	750 [29.52], 3 steps, 4 pos.	1,030 [40.55], 4 steps, 5 pos.
Feed Rates	Rapid Traverse Rate, X and Z Axis	m/min [in/min]	10 [393.7]	10 [393.7]	10 [393.7]	10 [393.7]	10 [393.7]
	Cutting Feed Rate	mm/min [in/min]	1 ~ 2,000 [0.039 ~ 78.74]	1 ~ 2,000 [0.039 ~ 78.74]	1 ~ 2,000 [0.039 ~ 78.74]	1 ~ 2,000 [0.039 ~ 78.74]	1 ~ 2,000 [0.039 ~ 78.74]
Coolant Tank	CTS / Flood / Bed Wash Pumps	Bar [PSI], L/min	6 [87] and 100 [26]	6 [87] and 100 [26]	6 [87] and 100 [26]	6 [87] and 100 [26]	6 [87] and 100 [26]
	Tank Volume	Liters [gallons]	592 [157]	592 [157]	592 [157]	592 [157]	592 [157]
	Tank Filtration, Basket / Secondary	um [inch]	1000 [0.040] / 600 [0.024]	1000 [0.040] / 600 [0.024]	1000 [0.040] / 600 [0.024]	1000 [0.040] / 600 [0.024]	1000 [0.040] / 600 [0.024]
Facility Related	Required Electrical Power	-	3-Ph 460V ±10%; 60Hz ±1%	3-Ph 460V ±10%; 60Hz ±1%	3-Ph 460V ±10%; 60Hz ±1%	3-Ph 460V ±10%; 60Hz ±1%	3-Ph 460V ±10%; 60Hz ±1%
	Main Breaker Size	-	175 amp, 139 kVA @ 460V	175 amp, 139 kVA @ 460V	175 amp, 139 kVA @ 460V	175 amp, 139 kVA @ 460V	175 amp, 139 kVA @ 460V
	Machine Net Weight	kg [lb.]	18,000 [39,000]	28,850 [63,603]	28,850 [63,603]	36,800 [81,130]	54,000 [119,049]

▪ ALL specification, design and characteristics shown on this catalogue are subject to change without prior notice.



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