

**MACO**

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# Double Column Machining Center DV Series

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## DV Series

DV 13 / 16 / 20 / 24 / 28 / 32

DV Series are designed to achieve the high-efficient cutting of double column machining centers. Provided with high-rigidity structural design to ensure precision in transmission. DV Series adopts a new generation of feeding mechanism design to enhance XY axes transmission precision substantially. This Series is the best choice for customers aiming for high- efficient cutting need with high speed and precision.

**DV 13 / 16** Series focus on heavy cutting performance: The beam is molded in integrally-formed box type with high rigidity. XY axes are equipped with extra heavy-loading roller type linear guideways with low friction and high rigidity, and Z axis is adopted with high-rigidity box way. Therefore, an optimal dynamic accuracy can be ensured.

**DV 20 / 24 / 28 / 32** Series adopts 3axis roller type linear guideways to ensure machine precision and high performance. Suitable for mold machining, this Series reduces cutting issues arised from long arbors usage. Y-axis slideway is designed with maximum span: Upper slideway is placed above the beam to make sure the maximum slideway supporting rigidity.

All DV Series use standard two-section gear head. Z-axis is adopted with dual oil cylinder counter-balance to eliminate commutation delay phenomenon caused by traditional mechanical hydraulic design. Z-axis acceleration is up to 0.5G to prevent Z-axis from dropping down due to external power off, providing the most stable performance of mold machining.



DV 13 Series  
Model: DV-2013 with Gear Head 6,000 rpm.  
Refer to P.11-13 for other specs.



DV 32 Series  
Model: DV-5232 with Gear Head 6,000 rpm.  
Refer to P.11-13 for other specs.

Y-axis Travel with 1,300~1,600 mm  
use precisely-polished box way on Z axis.  
Y-axis Travel above 2,000 mm  
use roller type linear guideway on 3 axes

**Spindle**

DV Series is standard with Gear Head 6,000 rpm.  
Other options are also available:

- OPT** Belt-Type 6,000 rpm
- Direct-Type 10,000 rpm
- Built-in 15,000 rpm

**Table**

The table is full travel supported,  
no hanging weight problem.  
DV 28 / DV 32 Series adopted  
3 axes linear guideway,  
increase rigidity and stability.

X-axis Travel : 2,100 ~ 6,200 mm  
Y-axis Travel : 1,300 ~ 3,200 mm  
Z-axis Travel : 800 ~ 1,000 mm

**Y axis 1.3M~3.2M**

**OPT** 3 axes linear scale

Spindle is consistent with the center  
of linear guideway to get the best  
structural rigidity and precision.

**OPT** Refer to P5-6 for various  
milling heads.

Model : DV-5232

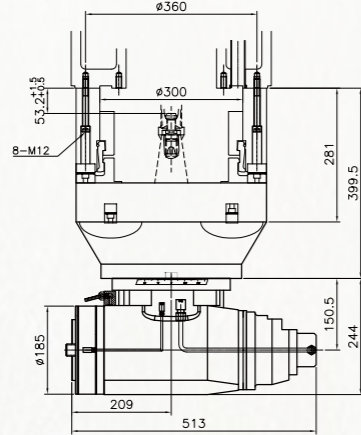
**Base**

The integrally-formed base adopts  
strong rib design to efficiently absorbs  
machining vibrations and increases  
cutting stability of the equipment.

DV 20 ~ 32  
L type column design, strengthens the  
entire structural rigidity.  
DV 13 / 16  
The beam is molded in integrally-formed  
box type with high rigidity.

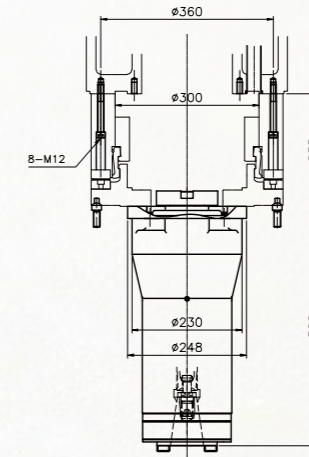
● Milling Heads

Auto. Change 90° Angle



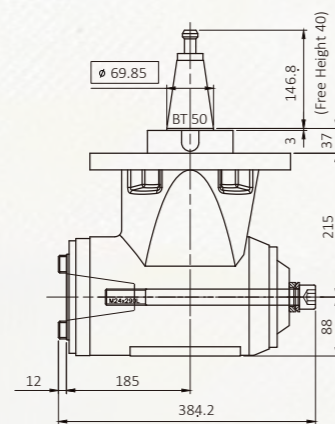
Head Exchange	Hydraulic
Tool Clamping	Auto.
Max. Speed	3,500 rpm
Division Angle	5° (OPT= 1°)
Tool Taper	BT-50
CTS	OPT.

Auto. Change Extend (500mm)



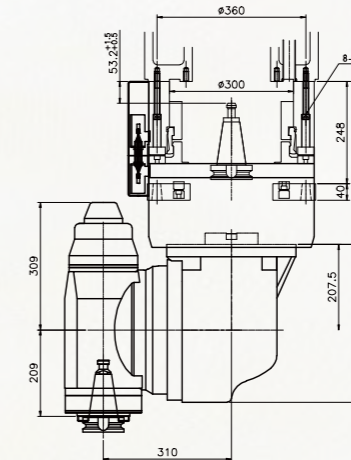
Head Exchange	Hydraulic
Clamped Method	Auto.
Max. Speed	3,500 rpm
Indexing	N/A
Tool Shank	BT-50
Length	300L / 500L

Semi-Auto. Change 90° Angle



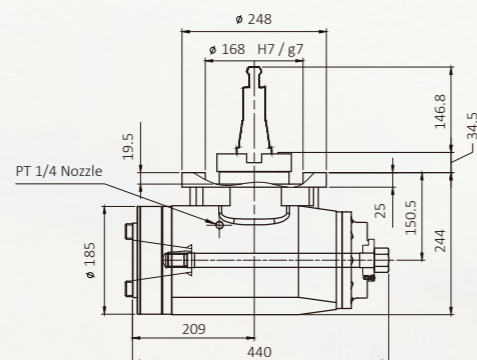
Head Exchange	Bolt
Tool Clamping	Auto.
Max. Speed	3,500 rpm
Division Angle	5°
Tool Taper	BT-50
CTS	OPT.

Auto. Change Orthogonal



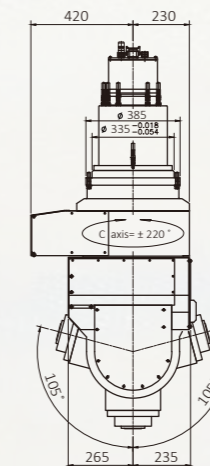
Head Exchange	Hydraulic
Clamped Method	Auto.
Max. Speed	3,500 rpm
Indexing	5° (OPT= 1°)
Tool Shank	BT-50
CTS	OPT.

Manual Change 90° Angle



Head Exchange	Bolt
Tool Clamping	Manual
Max. Speed	2,500 rpm
Division Angle	5°
Tool Taper	BT-50
CTS	OPT.

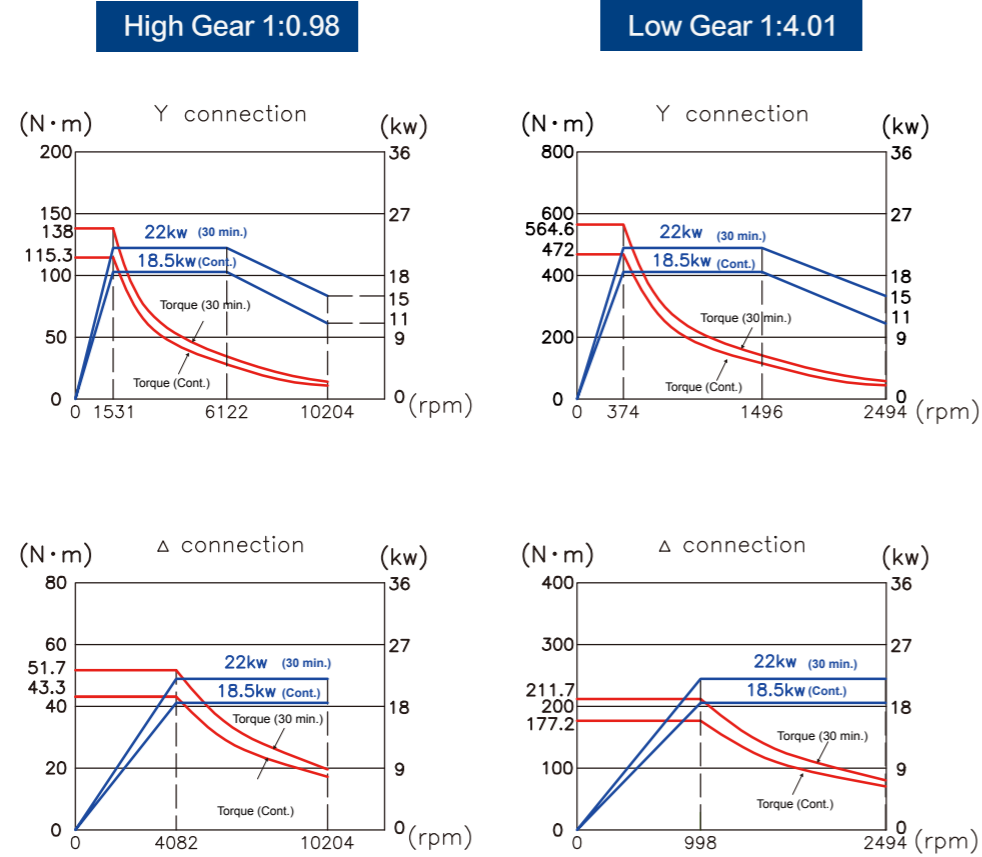
5 Axes Head



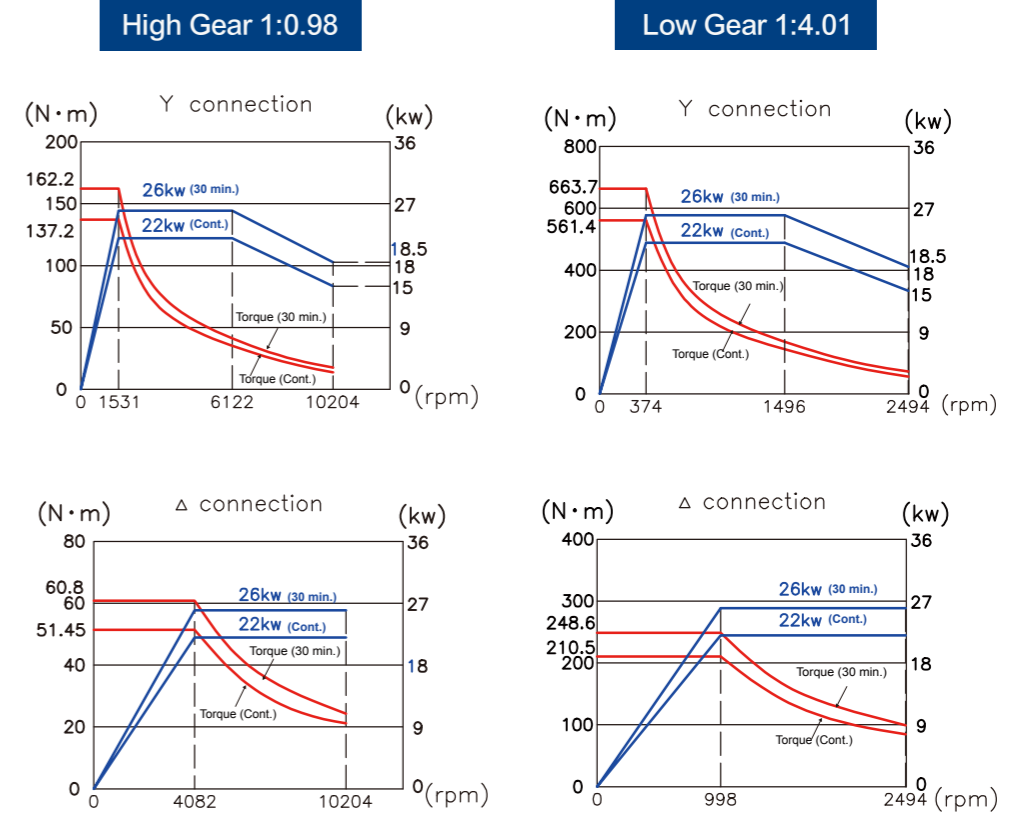
Head Exchange	Hydraulic
Tool Clamping	Auto.
Max. Speed	18,000 rpm
Division Angle	N/A
Tool Taper	HSK-A63
CTS	STD.

● Spindle Torque

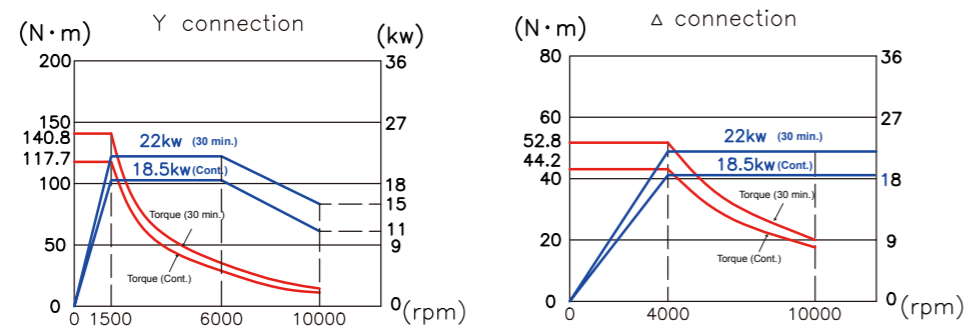
**FANUC ai18 10,000 rpm Gear Head**



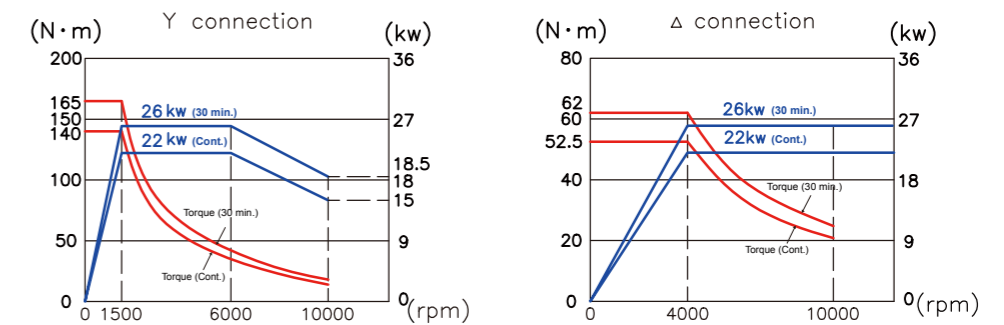
**FANUC ai22 10,000 rpm Gear Head**



**FANUC ai18 10,000 rpm Direct Drive**

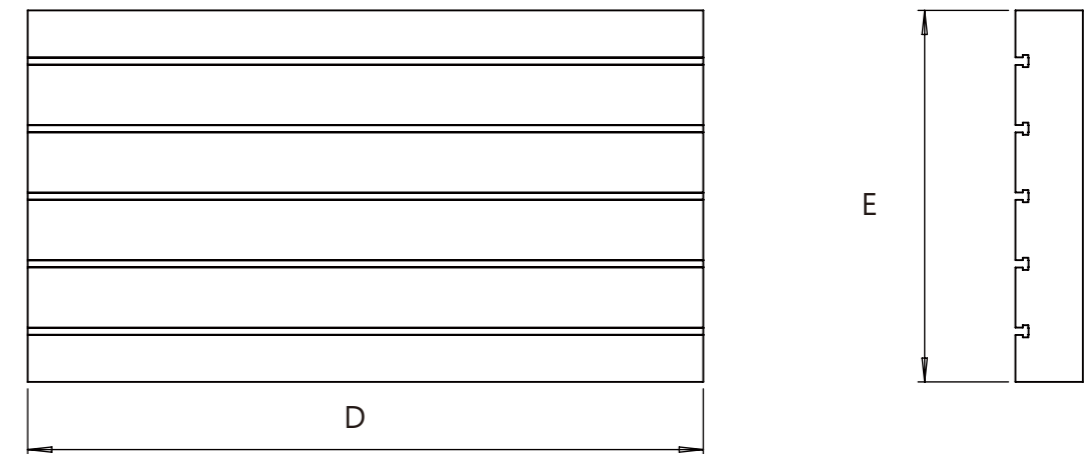
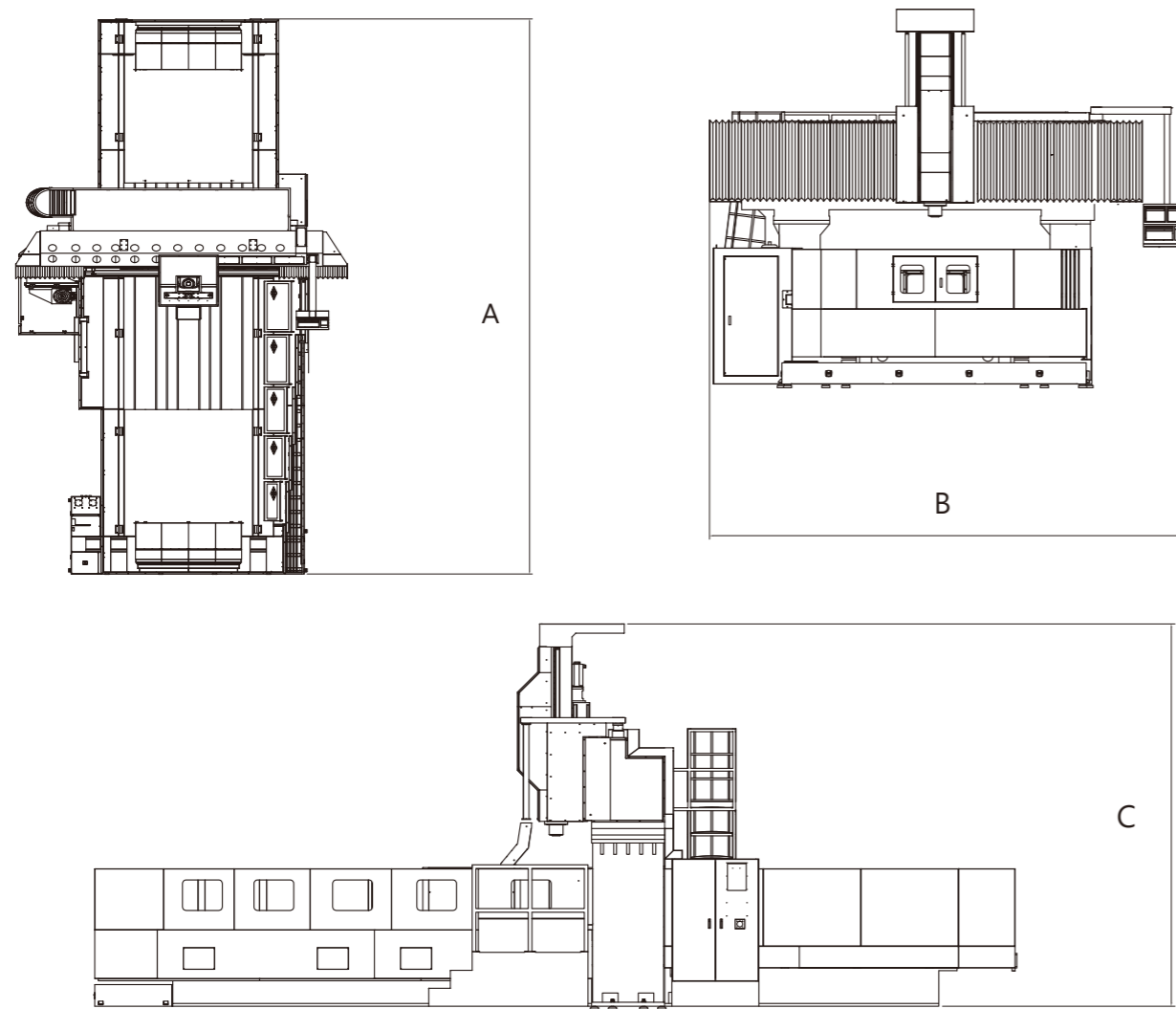


**FANUC ai22 10,000 rpm Direct Drive**



● Floor Space Diagram

● Pallet Dimension



Series	DV 13			DV 16			DV 20			DV 24			DV 28			DV 32		
Model	DV-2013	DV-3013	DV-4013	DV-2016	DV-3016	DV-4016	DV-3220	DV-4220	DV-5220	DV-3224	DV-4224	DV-5224	DV-4228	DV-5228	DV-6228	DV-4232	DV-5232	DV-6232
A	5,900	7,900	9,900	5,900	7,900	9,900	8,460	10,140	12,350	8,460	10,140	12,350	11,110	13,210	15,410	11,110	13,210	15,410
B	4,500			4,700			5,110			5,510			5,830			6,230		
C	4,450						5,180						5,220					
D	2,000	3,000	4,000	2,000	3,000	4,000	3,000	4,000	5,000	3,000	4,000	5,000	4,200	5,200	6,200	4,200	5,200	6,200
E	1,100			1,400			1,800			2,000			2,200			2,400		

APPLICATION : Machines, Die & Mold, Automobile, Aerospace, etc.

Series	DV13 Series			DV16 Series		
Model	DV-2013	DV-3013	DV-4013	DV-2016	DV-3016	DV-4016
Controller	FANUC 0i-MF					
<b>TRAVEL</b>						
X-axis Travel (mm)	2,100	3,100	4,100	2,100	3,100	4,100
Y-axis Travel (mm)	1,300			1,600		
Z-axis Travel (mm)	800			800		
Distance of Column (mm)	1,300			1,600		
Spindle Nose to Table (mm)	150~950			150~950		
Ground to Table (mm)	950			950		
<b>SPINDLE</b>						
Spindle Type	BT-50			BT-50		
Spindle Transmission	Gear Head (OPT: Belt Drive/Direct Drive)			Gear Head (OPT: Belt Drive/Direct Drive)		
Spindle Speed (rpm)	Gear Head: 6,000 (OPT: Belt Drive:6,000/Direct Drive:10,000)			Gear Head: 6,000 (OPT: Belt Drive:6,000/Direct Drive:10,000)		
Spindle Motor (kW)	18.5/22			18.5/22		
<b>FEEDRATE</b>						
XYZ Axes Rapid Traverse (M/min)	20/20/15	15/20/15	15/20/15	20/20/15	15/20/15	15/20/15
XYZ Axes Minimum Unit	0.001			0.001		
Cutting Feedrate (M/min)	7			7		
<b>TABLE</b>						
Table Size (mm)	2,000x1,100	3,000x1,100	4,000x1,100	2,000x1,400	3,000x1,400	4,000x1,400
T-slot (WxNo.xPitch) (mm)	22x5x200			22x7x200		
Table Loading Capacity (kg)	4,000	5,000	6,000	4,000	5,000	6,000
<b>ATC</b>						
Number of Tools	24pcs (OPT: 32pcs/40pcs)			24pcs (OPT: 32pcs/40pcs)		
Tool Shank	BT-50			BT-50		
ATC Changing Time(T-T)	3.8 sec. (Arm type)			3.8 sec. (Arm type)		
Max./Neighboring Tool Diameter (mm)	ø116/ø200			ø116/ø200		
Max. Tool Length (mm)	350			350		
Max. Tool Weight (kg)	18			18		
<b>MISCELLANEOUS</b>						
Machine Length x Width (mm)	5,900 x 4,500	7,900 x 4,500	9,900 x 4,500	5,900 x 4,700	7,900 x 4,700	9,900 x 4,500
Machine Height (mm)	4,450			4,450		
Max. Machine Weight (kg)	17,000	19,000	21,000	18,500	20,500	22,500
Coolant Tank (L)	395			395		
Hydraulic Tank (L)	80			80		
Lubricating Tank (L)	6			6		
Power Requirement (KVA)	40			40		
Air Pressure Requirement	7bar			7bar		
Hydraulic Pressure Requirement	70bar			70bar		

Series	DV20 Series			DV24 Series		
Model	DV-3220	DV-4220	DV-5220	DV-3224	DV-4224	DV-5224
Controller	FANUC 0i-MF					
<b>TRAVEL</b>						
X-axis Travel (mm)	3,200	4,200	5,200	3,200	4,200	5,200
Y-axis Travel (mm)	2,000			2,400		
Z-axis Travel (mm)	800 / 1,000			800 / 1,000		
Distance of Column (mm)	2,050			2,450		
Spindle Nose to Table (mm)	200~1,200			200~1,200		
Ground to Table (mm)	1,015			1,015		
<b>SPINDLE</b>						
Spindle Type	BT-50			BT-50		
Spindle Transmission	Gear Head (OPT: Direct Drive)			Gear Head (OPT: Direct Drive)		
Spindle Speed (rpm)	Gear Head: 6,000 (OPT: Direct Drive : 10,000)			Gear Head: 6,000 (OPT: Direct Drive:10,000)		
Spindle Motor (kW)	22/26			22/26		
<b>FEEDRATE</b>						
XYZ Axes Rapid Traverse (M/min)	12/12/10	12/12/10	12/12/10	12/12/10	12/12/10	12/12/10
XYZ Axes Minimum Unit	0.001			0.001		
Cutting Feedrate (M/min)	5			5		
<b>TABLE</b>						
Table Size (mm)	3,000x1,800	4,000x1,800	5,000x1,800	3,000x2,000	4,000x2,000	5,000x2,000
T-slot (WxNo.xPitch) (mm)	22 x 9 x 200			22 x 9 x 200		
Table Loading Capacity (kg)	10,000	12,000	15,000	12,000	14,000	18,000
<b>ATC</b>						
Number of Tools	24pcs (OPT: 40pcs/60pcs)			24pcs (OPT: 40pcs/60pcs)		
Tool Shank	BT-50			BT-50		
ATC Changing Time(T-T)	8sec. (Arm type)			8sec. (Arm type)		
Max./Neighboring Tool Diameter (mm)	ø 125/ø200			ø 125/ø200		
Max. Tool Length (mm)	350			350		
Max. Tool Weight (kg)	18			18		
<b>MISCELLANEOUS</b>						
Machine Length x Width (mm)	8,460 x 5,110	1,0140 x 5,110	12,530 x 5,110	8,460 x 5,510	1,0140 x 5,510	12,530 x 5,510
Machine Height (mm)	5,180			5,180		
Max. Machine Weight (kg)	29,000	33,000	37,000	31,000	35,000	40,000
Coolant Tank (L)	395			600		
Hydraulic Tank (L)	80			80		
Lubricating Tank (L)	8			8		
Power Requirement (KVA)	50			50		
Air Pressure Requirement	7bar			7bar		
Hydraulic Pressure Requirement	70bar			70bar		

Series	DV28 Series			DV32 Series		
Model	DV-4228	DV-5228	DV-6228	DV-4232	DV-5232	DV-6232
Controller	FANUC 0i-MF					
<b>TRAVEL</b>						
X-axis Travel (mm)	4,200	5,200	6,200	4,200	5,200	6,200
Y-axis Travel (mm)	2,800			3,200		
Z-axis Travel (mm)	1,000 /1,200			1,000 /1,200		
Distance of Column (mm)	2,850			3,250		
Spindle Nose to Table (mm)	200~1,200			200~1,200		
Ground to Table (mm)	1,055			1,055		
<b>SPINDLE</b>						
Spindle Type	BT-50			BT-50		
Spindle Transmission	Gear Head (OPT: Direct Drive)			Gear Head (OPT: Direct Drive)		
Spindle Speed (rpm)	Gear Head: 6,000 (OPT: Direct Drive:10,000)			Gear Head: 6,000 (OPT: Direct Drive: 10,000)		
Spindle Motor (kW)	22/26			22 26		
<b>FEEDRATE</b>						
XYZ Axes Rapid Traverse (M/min)	10/12/10	10/12/10	10/12/10	10/12/10	10/12/10	10/12/10
XYZ Axes Minimum Unit	0.001			0.001		
Cutting Feedrate (M/min)	5			5		
<b>TABLE</b>						
Table Size (mm)	4,200x2,200	5,200x2,200	6,200x2,200	4,200x2,400	5,200x2,400	6,200x2,400
T-slot (WxNo.xPitch) (mm)	22 x 11 x 200			22 x 11 x 200		
Table Loading Capacity (kg)	16,000	20,000	24,000	16,000	20,000	24,000
<b>ATC</b>						
Number of Tools	24pcs (OPT: 40pcs/60pcs)			24pcs (OPT: 40pcs/60pcs)		
Tool Shank	BT-50			BT-50		
ATC Changing Time(T-T)	8 sec. (Arm type)			8 sec. (Arm type)		
Max./Neighboring Tool Diameter (mm)	ø125/ø200			ø125/ø200		
Max. Tool Length (mm)	350			350		
Max. Tool Weight (kg)	18			18		
<b>MISCELLANEOUS</b>						
Machine Length x Width (mm)	11,110 x 5,830	13,210 x 5,830	15,410 x 5,830	11,110 x 6,230	13,210 x 6,230	15,410x 6,230
Machine Height (mm)	5,220			5,220		
Max. Machine Weight (kg)	49,000	54,000	59,000	55,000	60,000	65,000
Coolant Tank (L)	700			700		
Hydraulic Tank (L)	80			80		
Lubricating Tank (L)	8			8		
PowerRequirement (KVA)	50			50		
Air Pressure Requirement	7bar			7bar		
Hydraulic Pressure Requirement	70bar			70bar		

**Standard Option Accessories**

● : STANDARD ○ : OPTION

**SPINDLE**

Gear Type 6,000 rpm	●
Direct Drive 10,000 rpm	○
Built-in 15,000 rpm	○
Spindle Oil Coolant System	●
Coolant Through Spindle 20 bar	○
Pedal Spindle Unclamping System	●
Rigid Tapping	●

**COOLING**

Spindle Air Blast System	●
Spindle Oil Cooler	●
Coolant System	●

**CHIP REMOVAL**

Chain Type Chip Conveyor	●
Scraper Type Chip Conveyor	○
Cart	●
Coolant Gun & Air Gun	●
Full Enclosure (W/O Top)	●
Full Enclosure	○

**WORKING TABLE**

Secondary Table	○
Rotary Table	○

**LUBRICATION SYSTEM**

Axial Hydraulic System	●
Auto - Lubrication System	●

**SAFETY**

Front / Side Door	●
CE Mark	○

**OTHERS**

Oil Mist Collector	○
Disc Type Oil Skimmer	○

**ATC SYSTEM**

Arm Type	●
Chain Type	○
Tool Capacity: 24 T	●
Tool Capacity: 32 T	○
Tool Capacity: 40 T	○
Tool Capacity: 60 T	○

**AXIAL DRIVE SYSTEM**

XYZ Roller Type Linear Guideway (DV13/16 Z Axis Boxway)	●
XYZ Linear Scale	○
Z Axis Cylinder Counter-Balance	●

**ELECTRIC ELEMENTS**

LED Working Light	●
Alarm Light	●
M30 Automatic Power Off	●
Heat Exchanger	●
Air Conditioner	○

**CONTROL UNIT**

Fanuc 0iMF	●
Fanuc 3i1MB	○
Arm Type Controller Operation Panel	●
Pendant Type Controller Operation Panel	○

**MEASUREMENT SYSTEM**

Automatic Tool Length Measurement	○
Automatic Workpiece Measurement	○

**MILLING HEAD**

Auto Change 90° Angle Milling Head	○
Semi-Auto Change 90° Angle Milling Head	○
Manual 90° Angle Milling Head	○
Auto Change Orthogonal Milling Head	○
Auto Change Extend Milling Head (500mm)	○
5 Axes Head	○

● Design and specification are subject to change without prior notice.