Mazak

IVS

SERIES

High Productivity for Mass Production Applications

- Inverted spindle design for exceptional versatility.
- Convenient automatic workpiece handling thanks to traveling headstock.
- Wide variety of work stockers available to meet any production requirement.
- Minimal floor space requirement.

IVS-300M
Shown with optional equipment

Inverted Vertical Spindle Turning Centers

IVS SERIES

IVS-200 series

- 7000 min^{-1} (rpm) spindle with 8" chuck designed to provide high-productivity aluminum machining.
- Rapid traverse rates of 110 m/min (4330 ipm) for the X-axis and 60 m/min (2362 ipm) for the Z-axis minimize non-cutting time.

IVS-300 series

- High-rigidity, 443 ft·lbs (600 N·m) [40% ED/30-min. rating] high-torque spindle.

IVS-400

- Powerful spindle designed for high-efficiency machining of large workpieces.

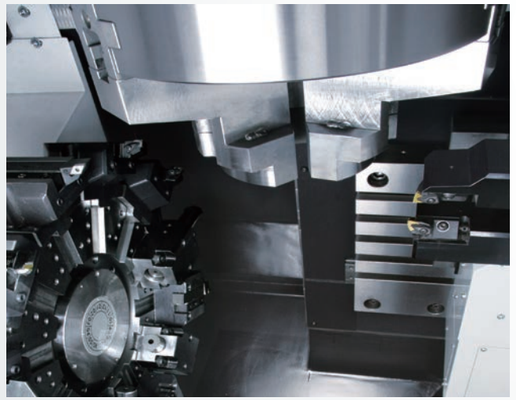
	IVS-200	IVS-200M	IVS-300	IVS-300M	IVS-400
Chuck size	8"		10", 12"		12", 15", 18"
Feedrate: X-axis	110 m/min (4330 ipm)		60 m/min (2362 ipm)		60 m/min (2362 ipm)
Feedrate: Z-axis	60 m/min (2362 ipm)		45 m/min (1771 ipm)		36 m/min (1417 ipm)
Spindle	7000 min^{-1} (rpm) 35 hp (26 kW) [40% ED/30-min. rating]		4000 min^{-1} (rpm) 35 hp (26 kW) [40% ED/30-min. rating]		3300 min^{-1} (rpm) 40 hp (30 kW) [40% ED/30-min. rating]
Rotary tool spindle	–	4500 min^{-1} (rpm) 7.5 hp (5.5 kW) [10-min. rating] *6000 min^{-1} (rpm) 7.5 hp (5.5 kW) [10-min. rating]	–	4500 min^{-1} (rpm) 7.5 hp (5.5 kW) [10-min. rating]	–

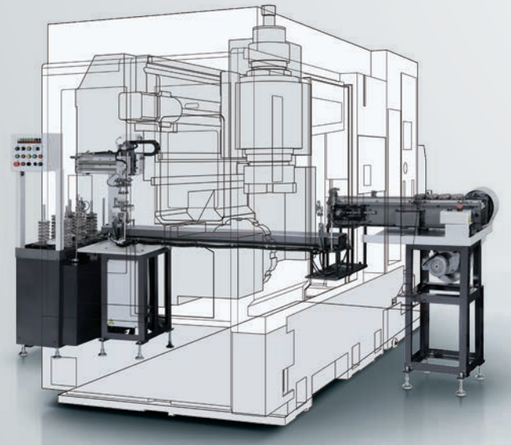
*Option

Designed for High Productivity

Smooth chip disposal

Thanks to the inverted vertical spindle machine design, machined chips fall smoothly into the chip conveyor and are removed from the machine. Since the machining area does not have to be frequently cleaned, it allows for very effective automatic operation.



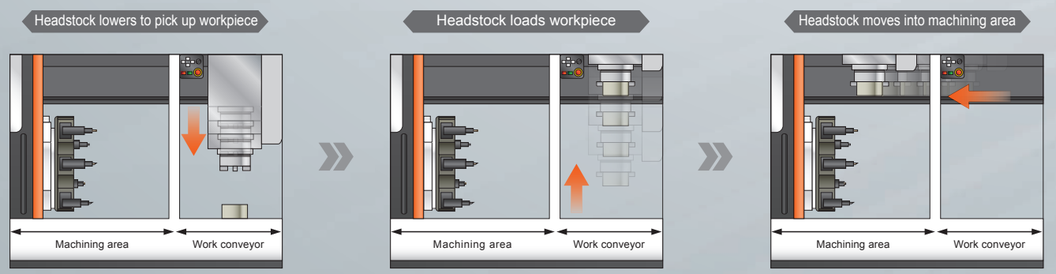


High-rigidity, double-column machine construction

The IVS series is designed using high-rigidity machine construction. The inverted spindle headstock is mounted on a double column. The turret is fixed to the bottom of the machine base, and the X and Z-axis ball screws are located outside of the machining area. Thanks to the bridge-type column, a work conveyor can be conveniently put through the machine.

Headstock work handling capability for automation

The movable headstock that functions as a workpiece loader/unloader comes standard and results in a lower initial installation cost for an automated system.



Automation

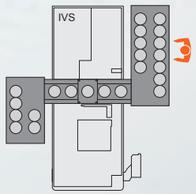
Wide range of automation systems available

A wide variety of work stockers is available for the IVS series that comprises compact systems for unmanned operation. Based on production requirements, systems can consist of single or multiple machines.

IVS Conveyor types

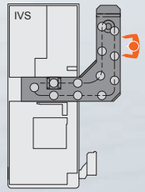
Shuttle type

Raw material is loaded at front of the machine, and finished workpieces are shuttled to rear of the machine.

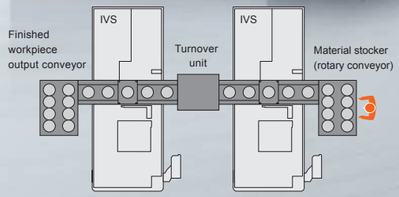


Rotary type conveyor

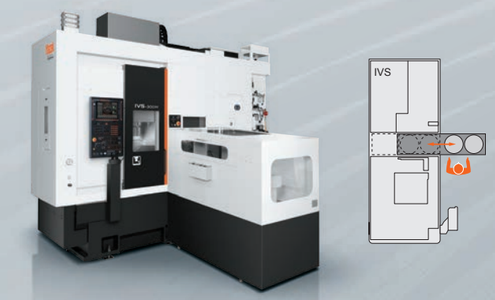
Raw material and finished workpieces are loaded/unloaded at front of the machine. Maximum workpiece material diameter is Φ7.09" (Φ180 mm).



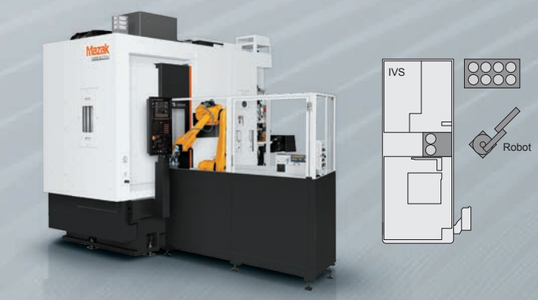
Double line



IVS Shuttle type



IVS System with robot



Applications

IVS-200, 200M

IVS-200
Workpiece: Pulley
Material: FC330
Machining time: 2 min. 52 sec.

IVS-200M
Workpiece: Cylinder
Material: FC230
Machining time: 50 sec.

IVS-300, 300M

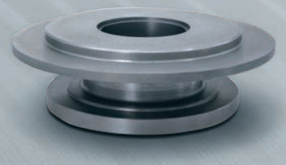
IVS-300
Workpiece: Piston
Material: S45C
Machining time: 4 min. 37 sec.

IVS-300M
Workpiece: Disk brake
Material: FCD250
Machining time: 3 min. 30 sec.

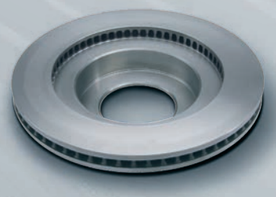
IVS-300
Workpiece: Cylinder liner
Material: FC230
Machining time: 50 sec.

IVS-300M
Workpiece: Piston
Material: S45C
Machining time: 2 min. 10 sec.

IVS-400



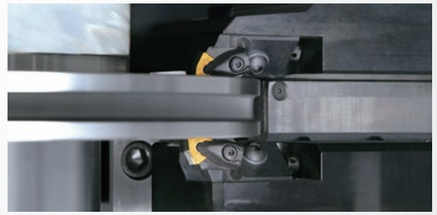
IVS-400
Workpiece: Adapter
Material: FCD300
Machining time: 7 min. 28 sec.



IVS-400
Workpiece: Disk brake
Material: FC250
Machining time: 3 min.

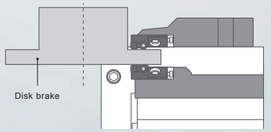
Straddle cutting unit

OPTION



High-accuracy parallelism is ensured thanks to straddle cutting—simultaneous turning of both sides of the workpiece. Since the open/close movement of the straddle cutting unit is controlled by program command, this application is extremely effective for disk brake production.

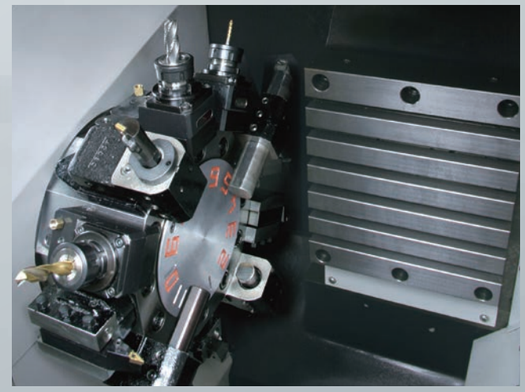
Straddle unit image



Tool plate

OPTION

The tool plate, on which multiple tools can be mounted, is attached to the machine column. Tools are mounted using a T-slot nut (M16) (5/8 UNI) on the tool plate. (IVS-200 and 200M only)

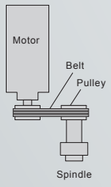


Higher Productivity

High-performance, integral spindle/motor

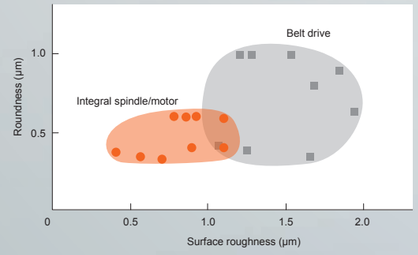
The integral spindle/motor provides the optimum cutting conditions over a wide range of spindle speeds. This advanced unit ensures high acceleration/deceleration as well as unsurpassed workpiece roundness and surface finish.

The faster the pulley speed, the more vibration generated by the belt drive system.



Sources of vibration, such as belts and gears, are eliminated.

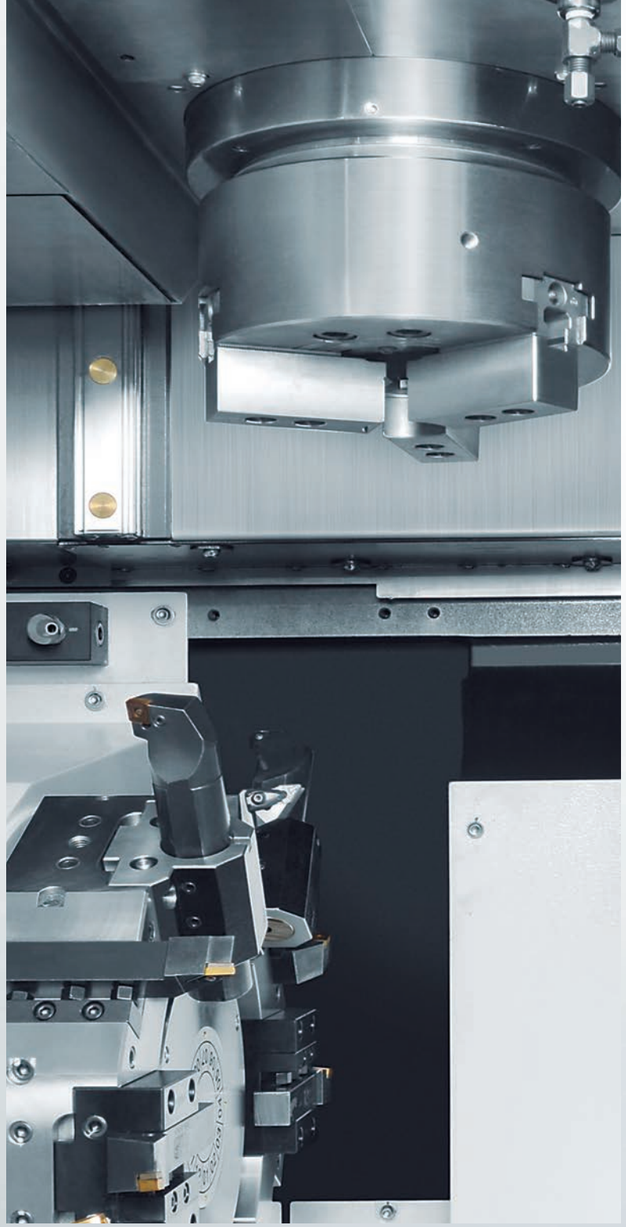
Roundness and surface finish

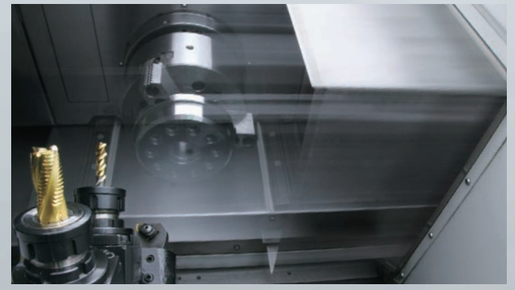


High-speed rapid traverse

High-speed rapid traverse ensures higher productivity.

	X-axis	Z-axis
IVS-200, 200M	110 m/min (4330 ipm)	60 m/min (2362 ipm)
IVS-300, 300M	60 m/min (2362 ipm)	45 m/min (1771 ipm)
IVS-400	60 m/min (2362 ipm)	36 m/min (1417 ipm)





Highest spindle speed for this machine class with 8" chuck

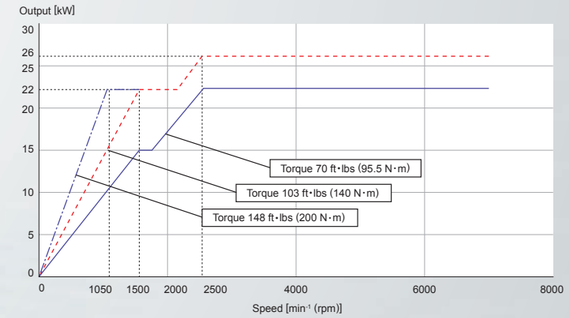
The IVS-200 and 200M are equipped with a high-speed 7000 min^{-1} (rpm) spindle, which is effective for cutting aluminum workpieces.

IVS-200, 200M spindle output / torque diagram

Spindle bore: Φ 2.05" (Φ52 mm)

15-min. rating 30-min. rating Cont. rating

Max. spindle speed	7000 min^{-1} (rpm)
Output	35 hp (26 kW) [40% ED/30-min. rating] 30 hp (22 kW) [Cont. rating]
Torque	148 ft·lbs (200 N·m) [15-min. rating]
Spindle acceleration	0 → 4250 min^{-1} (rpm) (1.8 sec.) 0 → 5950 min^{-1} (rpm) (2.9 sec.)



High-torque at low spindle speeds plus high-speed acceleration/deceleration

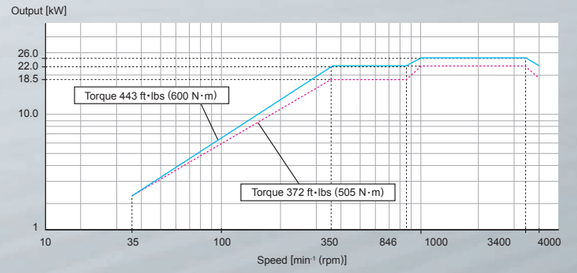
The IVS-300, 300M and 400 spindles are designed with high-rigidity and provide high torque at lower spindle speeds for heavy-duty cutting performance. Additionally, higher productivity is ensured thanks to their high-speed acceleration/deceleration.

IVS-300, 300M spindle output / torque diagram

Spindle bore: Φ3.46" (Φ88 mm)

30-min. rating Cont. rating

Max. spindle speed	4000 min^{-1} (rpm)
Output	35 hp (26 kW) [40% ED/30-min. rating] 30 hp (22 kW) [Cont. rating]
Torque	443 ft·lbs (600 N·m) [40% ED/30-min. rating]
Spindle acceleration	0 → 3400 min^{-1} (rpm) (3.2 sec.)

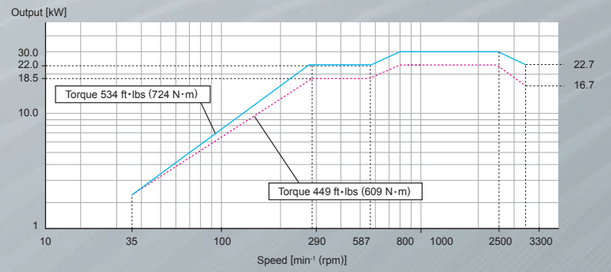


IVS-400 spindle output / torque diagram

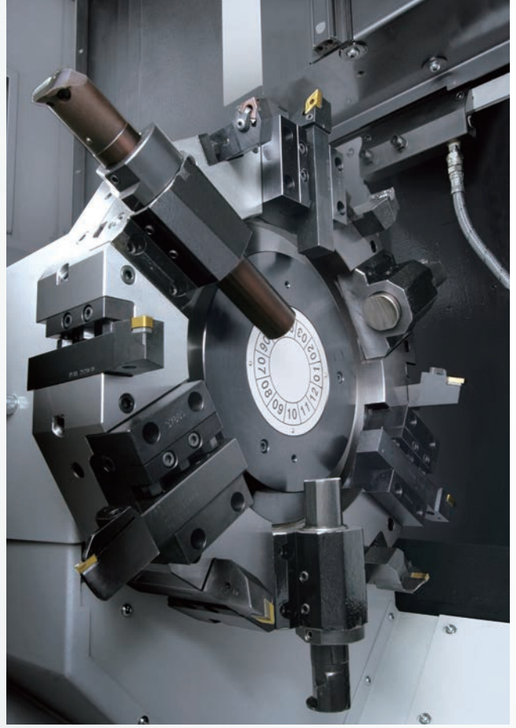
Spindle bore: Φ4.41" (Φ112 mm)

30-min. rating Cont. rating

Max. spindle speed	3300 min^{-1} (rpm)
Output	40 hp (30 kW) [40% ED/30-min. rating] 30 hp (22 kW) [Cont. rating]
Torque	534 ft·lbs (724 N·m) [40% ED/30-min. rating]
Spindle acceleration	0 → 3300 min^{-1} (rpm) (4.9 sec.)



Higher Productivity



Turret

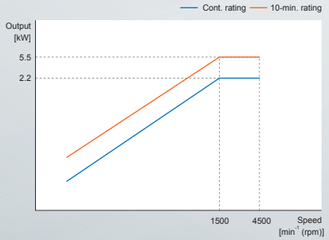
The IVS series utilizes a high-speed, non-lift indexing 12-tool drum turret designed with minimal tool interference.

		IVS-200 IVS-300	IVS-400	IVS-200M IVS-300M
Turret type		Bolt-on-type drum turret	Bolt-on-type drum turret	VDI- Bolt-on-type drum turret
Number of tools		12 (O.D.: 6 + I.D.: 6)	12	12
Tool size	O.D. tool	□1.00" (□25 mm)	□1.00" (□25 mm)	□1.00" (□25 mm)
	I.D. tool	Φ1.50" (Φ40 mm)	Φ1.50" (Φ40 mm)	Φ1.50" (Φ40 mm)
Turret indexing time		0.2 sec./1 step (0.17 sec./1 step for IVS-200)		

Rotary tool spindle

The rotary tool spindle of the IVS-200M and 300M is designed to provide a wide range of machining from high-speed drilling to milling.

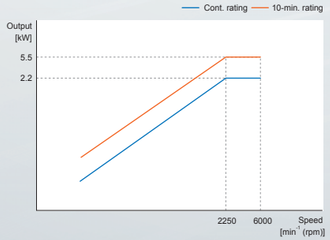
4500 min^{-1} (rpm) spindle



Spindle speed		4500 min^{-1} (rpm)
Spindle output		AC 7.5 hp (5.5 kW) [10-min. rating]
Max. torque		26 ft•lbs (35 N•m) [10-min. rating]
Machining capacity	Drill	Φ0.79" (Φ20 mm)
	End mill	Φ0.79" (Φ20 mm)
	Tap	M12 (1/2 UNC)

6000 min^{-1} (rpm) spindle OPTION

IVS-200 only



Spindle speed		6000 min^{-1} (rpm)
Spindle output		AC 7.5 hp (5.5 kW) [10-min. rating]
Max. torque		18 ft•lbs (24 N•m) [10-min. rating]
Machining capacity	Drill	Φ0.79" (Φ20 mm)
	End mill	Φ0.79" (Φ20 mm)
	Tap	M12 (1/2 UNC)

Higher Accuracy

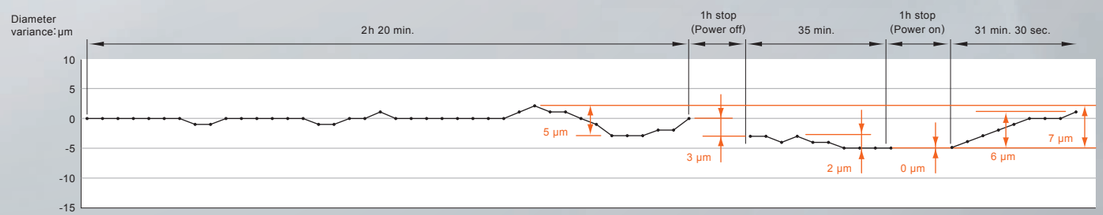
To ensure high-accuracy machining, the IVS series features a headstock cooling system and ball screw core cooling system, as well as X-axis scale feedback.

1
X-axis scale feedback - standard equipment

2
Ball screw core cooling system for X and Z-axes - standard equipment

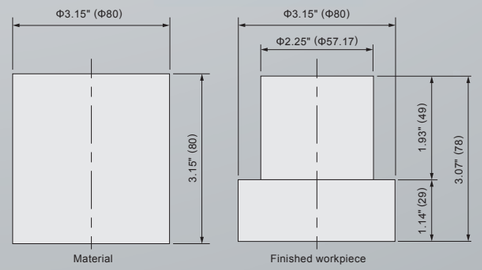
IVS-300M
Shown with optional equipment

IVS-200 continuous machining accuracy



[Test workpiece configuration]

Unit: inch (mm)



[Cutting conditions]

Process	Cutting speed [m/min (SFM)]	Feedrate [mm/rev (IPR)]	D.O.C. [inch (mm)]	No. of passes
Rough facing	300 (984)	0.3 (0.012)	0.031" (0.8)	1
O.D. rough	300 (984)	0.3 (0.012)	0.039" (1)	11
Finish facing	250 (820)	0.15 (0.006)	0.008" (0.2)	1
O.D. finish -1	250 (820)	0.15 (0.006)	0.008" (0.2)	1
O.D. finish -2	250 (820)	0.15 (0.006)	0.0085" (0.215)	1

[Tool]

Rough	Holder	PCLNR2525M-12
	Insert	CNMG120412HQ
Finish	Holder	PCLNR2525M-12
	Insert	CNMG120408GP

Note : For reference only

Ease of Maintenance

Designed for convenient daily maintenance

Regular maintenance

The home screen of the MAZATROL CNC displays the status of when each maintenance procedure is required.

Chuck pressure adjustment

The knob used to adjust check pressure is located near the operation panel.

Maintenance area

Items requiring frequent access for maintenance are conveniently located at a central position.

Environmentally Friendly

Designed with environmental considerations

IVS-300M
Shown with optional equipment

The environment and our impact on our natural surroundings have always been important concerns of Yamazaki Mazak. All factories in Japan where Mazak machine tools are produced are ISO 14001 certified, an international standard confirming that the operation of our production facilities does not adversely affect air, water or land.

Reduction of power consumption in stand-by

Power consumption is reduced when the machine is in the stand-by state by automatically turning off the work lights and the CNC display.

Automatic power-off of chip conveyor

The optional chip conveyor is automatically shut off 5 minutes after completion of automatic operation.

MAZATROL CNC system

Simplified operation and key input operation

Following traditional conversational MAZATROL programming, this new system is designed for ease of operation by simplified key operation.

USB interface

Transfer programs and tool data
Connect USB keyboard

SD-card slot

Transfer programs and tool data

Menu keys

Menu keys under the display can be pressed to go to other pages for program data input and editing

Keypad

Compact keypad with unique design for ease of data input

Home screen key

Press to return to home screen from any display

Home screen

Comprehensive status display on one screen

The home screen displays overall process status in an easy-to-understand manner.

Programming

Displays the simulation time and machining time

Tool data

Displays status of tool layout

Setup

Displays status of workpiece coordinate setting

Maintenance

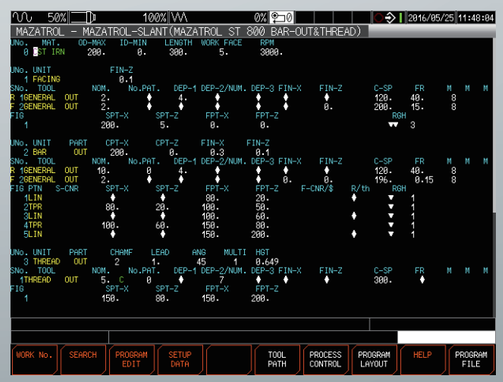
Overview of items requiring maintenance

Machining

Displays axes in operation and load on motors

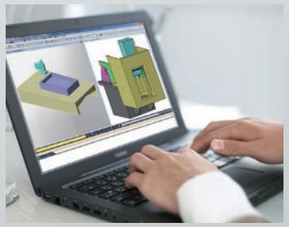
MAZATROL conversational programming

MAZATROL interactive programming uses conversational language and automatically determines cutting conditions, M-codes and G-code so even beginner operators can quickly make programs.



3D machine model

A 3D machine model is available to perform program interference checks with other CAD/CAM simulation software.



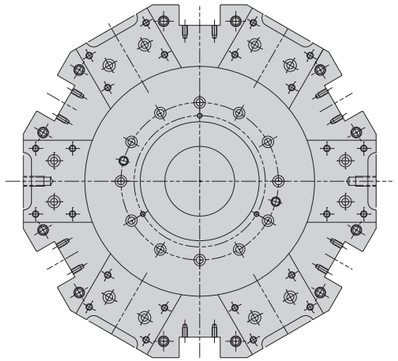
4-axes simultaneous CNC system

MAZATROL SMOOTH C

Tooling System

Unit: inch (mm)

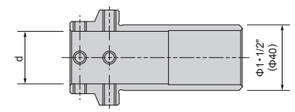
IVS-200, 300



TURNING HOLDER

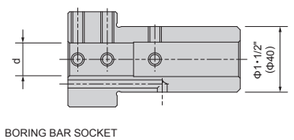
O.D. turning holders directly mounted on the turret.

	STD. QTY
Forward and Reverse	2



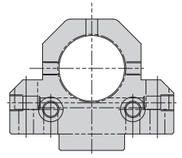
BORING BAR SOCKET

d	STD. QTY
Φ1•1/4" (Φ32)	1
Φ1" (Φ25)	1



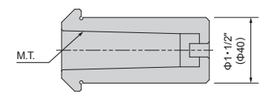
BORING BAR SOCKET

d	STD. QTY
Φ3/4" (Φ20)	
Φ5/8" (Φ16)	
Φ1/2" (Φ12)	
Φ3/8" (Φ10)	
Φ5/16" (Φ8)	



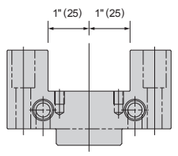
BORING BAR HOLDER

STD. QTY
3



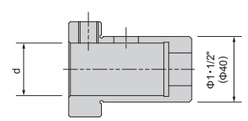
M.T. DRILL SOCKET

M.T.	STD. QTY
No.3	
No.2	1
No.1	



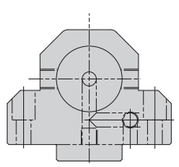
FACING HOLDER

STD. QTY
1



U DRILL SOCKET

d	STD. QTY
Φ1•1/4" (Φ32)	
Φ1" (Φ25)	
Φ3/4" (Φ20)	



U DRILL HOLDER

STD. QTY

IVS-400

1" x 1" x 6"
(25 × 25 × 150)

1" x 1" x 6"
(25 × 25 × 150)

Φ1•1/2" (Φ40)
BORING BAR

Φ5/16" (Φ8) ~
Φ1•1/4" (Φ32) BORING BAR

M.T. No.1 ~ M.T. No.3 DRILL

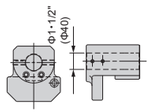
U DRILL

TURNING HOLDER

STD. QTY
1

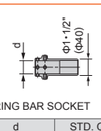
FACING HOLDER

STD. QTY
1



BORING BAR HOLDER

STD. QTY
2



BORING BAR SOCKET

d	STD. QTY
Φ1•1/4" (Φ32)	1
Φ1" (Φ25)	1

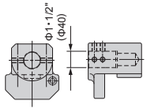
d	STD. QTY
Φ3/4" (Φ20)	
Φ5/8" (Φ16)	
Φ1/2" (Φ12)	
Φ3/8" (Φ10)	
Φ5/16" (Φ8)	

DRILL SOCKET

M.T.	STD. QTY
No. 1	
No. 2	1
No. 3	

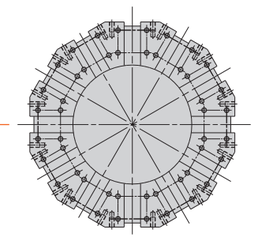
U DRILL SOCKET

d	STD. QTY
Φ1•1/4" (Φ32)	
Φ1" (Φ25)	
Φ3/4" (Φ20)	



U DRILL HOLDER

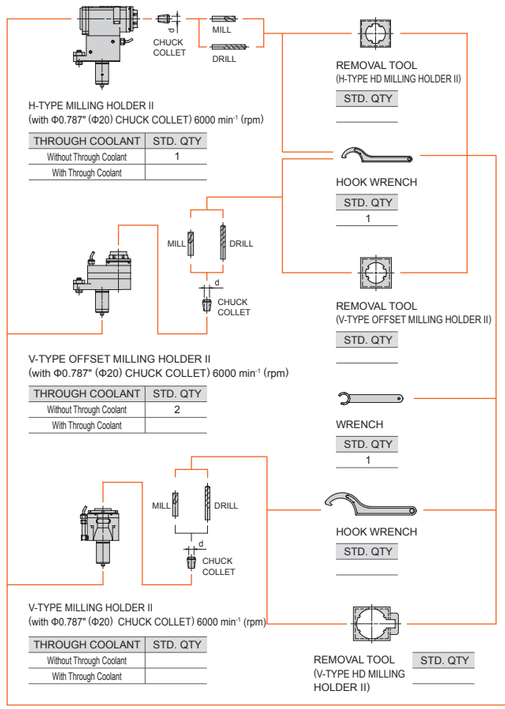
STD. QTY



Tooling System

Unit: inch (mm)

IVS-200M



H-TYPE MILLING HOLDER II
(with Φ0.787" (Φ20) CHUCK COLLET) 6000 min⁻¹ (rpm)

THROUGH COOLANT	STD. QTY
Without Through Coolant	1
With Through Coolant	

REMOVAL TOOL
(H-TYPE HD MILLING HOLDER II)

STD. QTY

HOOK WRENCH

STD. QTY
1

REMOVAL TOOL
(V-TYPE OFFSET MILLING HOLDER II)

STD. QTY

V-TYPE OFFSET MILLING HOLDER II
(with Φ0.787" (Φ20) CHUCK COLLET) 6000 min⁻¹ (rpm)

THROUGH COOLANT	STD. QTY
Without Through Coolant	2
With Through Coolant	

WRENCH

STD. QTY
1

HOOK WRENCH

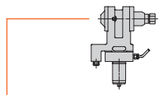
STD. QTY

V-TYPE MILLING HOLDER II
(with Φ0.787" (Φ20) CHUCK COLLET) 6000 min⁻¹ (rpm)

THROUGH COOLANT	STD. QTY
Without Through Coolant	
With Through Coolant	

REMOVAL TOOL
(V-TYPE HD MILLING HOLDER II)

STD. QTY

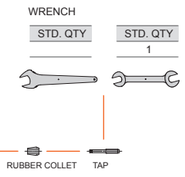


H-TYPE TAPPER

RUBBER COLLET	TORQUE LIMITER	STD. QTY
M4 ~ M12 (NO.8 UNC ~ 1/2 UNC)	Without Torque Limiter	
M4 ~ M12 (NO.8 UNC ~ 1/2 UNC)	With Torque Limiter	

V-TYPE TAPPER

RUBBER COLLET	TORQUE LIMITER	STD. QTY
M4 ~ M12 (NO.8 UNC ~ 1/2 UNC)	Without Torque Limiter	
M4 ~ M12 (NO.8 UNC ~ 1/2 UNC)	With Torque Limiter	



RUBBER COLLET

RUBBER COLLET	STD. QTY
M4 ~ M10 (NO.8 UNC ~ 3/8 UNC)(J420)	
M10 ~ M12 (3/8 UNC ~ 1/2 UNC)(J422)	

BORING BAR SOCKET

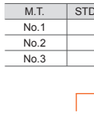
d	STD. QTY
Φ5/16" (Φ8)	
Φ3/8" (Φ10)	
Φ1/2" (Φ12)	
Φ5/8" (Φ16)	
Φ3/4" (Φ20)	
Φ1" (Φ25)	1
Φ1‧1/4" (Φ32)	1

U DRILL SOCKET

d	STD. QTY
Φ3/4" (Φ20)	
Φ1" (Φ25)	
Φ1‧1/4" (Φ32)	

DRILL SOCKET

M.T.	STD. QTY
No.1	
No.2	1
No.3	

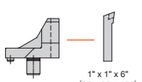


U DRILL HOLDER

D	STD. QTY
Φ40 (Φ1‧1/2")	1

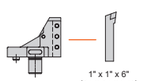
BORING BAR HOLDER

D	STD. QTY
Φ1‧1/2" (Φ40)	2



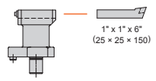
FACING HOLDER (RIGHT)

	STD. QTY
FORWARD	



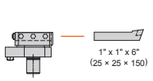
FACING HOLDER (LEFT)

	STD. QTY
REVERSE	1



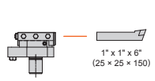
TURNING HOLDER (LEFT)

	STD. QTY
FORWARD	



TURNING HOLDER (LEFT)

	STD. QTY
FORWARD	1



TURNING HOLDER (RIGHT)

	STD. QTY
REVERSE	3

CHUCK COLLET

SPECIFICATION	STD. QTY
ER32 Φ0.079" (Φ2)	
ER32 Φ0.098" (Φ2.5)	
ER32 Φ0.118" (Φ3)	
ER32 Φ0.138" (Φ3.5)	
ER32 Φ0.157" (Φ4)	
ER32 Φ0.177" (Φ4.5)	
ER32 Φ0.197" (Φ5)	
ER32 Φ0.236" (Φ6)	
ER32 Φ0.276" (Φ7)	
ER32 Φ0.315" (Φ8)	
ER32 Φ0.354" (Φ9)	
ER32 Φ0.394" (Φ10)	
ER32 Φ0.433" (Φ11)	

SPECIFICATION	STD. QTY
ER32 Φ0.472" (Φ12)	1
ER32 Φ0.512" (Φ13)	
ER32 Φ0.551" (Φ14)	
ER32 Φ0.591" (Φ15)	
ER32 Φ0.630" (Φ16)	1
ER32 Φ0.669" (Φ17)	
ER32 Φ0.709" (Φ18)	
ER32 Φ0.748" (Φ19)	
ER32 Φ0.787" (Φ20)	

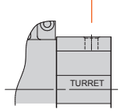
CHUCK COLLET
(FOR THROUGH TOOL COOLANT)

SPECIFICATION	STD. QTY
ER32 Φ0.315" (Φ8)	
ER32 Φ0.335" (Φ8.5)	
ER32 Φ0.354" (Φ9)	
ER32 Φ0.374" (Φ9.5)	
ER32 Φ0.394" (Φ10)	
ER32 Φ0.413" (Φ10.5)	
ER32 Φ0.433" (Φ11)	
ER32 Φ0.453" (Φ11.5)	
ER32 Φ0.472" (Φ12)	
ER32 Φ0.492" (Φ12.5)	
ER32 Φ0.512" (Φ13)	
ER32 Φ0.532" (Φ13.5)	
ER32 Φ0.551" (Φ14)	

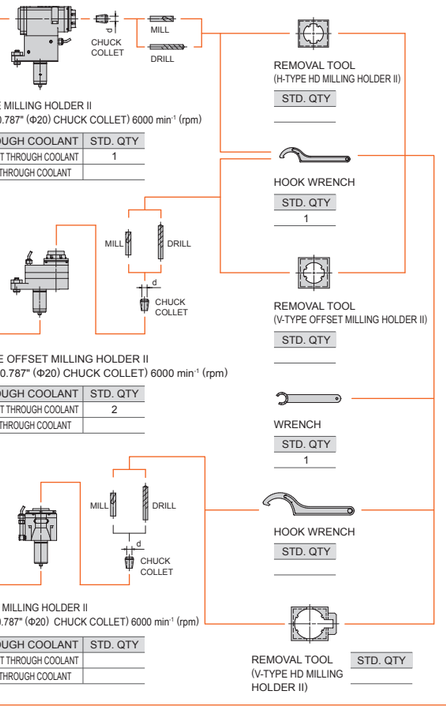
SPECIFICATION	STD. QTY
ER32 Φ0.571" (Φ14.5)	
ER32 Φ0.591" (Φ15)	
ER32 Φ0.610" (Φ15.5)	
ER32 Φ0.630" (Φ16)	
ER32 Φ0.650" (Φ16.5)	
ER32 Φ0.669" (Φ17)	
ER32 Φ0.689" (Φ17.5)	
ER32 Φ0.709" (Φ18)	
ER32 Φ0.728" (Φ18.5)	
ER32 Φ0.748" (Φ19)	
ER32 Φ0.768" (Φ19.5)	
ER32 Φ0.787" (Φ20)	

CAP

	STD. QTY
PLUG	1



IVS-300M



H-TYPE MILLING HOLDER II
(with Φ0.787" (Φ20) CHUCK COLLET) 6000 min⁻¹ (rpm)

THROUGH COOLANT	STD. QTY
WITHOUT THROUGH COOLANT	1
WITH THROUGH COOLANT	

REMOVAL TOOL
(H-TYPE HD MILLING HOLDER II)

STD. QTY

HOOK WRENCH

STD. QTY
1

REMOVAL TOOL
(V-TYPE OFFSET MILLING HOLDER II)

STD. QTY

V-TYPE OFFSET MILLING HOLDER II
(with Φ0.787" (Φ20) CHUCK COLLET) 6000 min⁻¹ (rpm)

THROUGH COOLANT	STD. QTY
WITHOUT THROUGH COOLANT	2
WITH THROUGH COOLANT	

WRENCH

STD. QTY
1

HOOK WRENCH

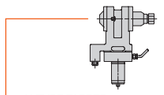
STD. QTY

V-TYPE MILLING HOLDER II
(with Φ0.787" (Φ20) CHUCK COLLET) 6000 min⁻¹ (rpm)

THROUGH COOLANT	STD. QTY
WITHOUT THROUGH COOLANT	
WITH THROUGH COOLANT	

REMOVAL TOOL
(V-TYPE HD MILLING HOLDER II)

STD. QTY

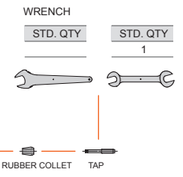


H-TYPE TAPPER

RUBBER COLLET	TORQUE LIMITER	STD. QTY
M4 ~ M12 (NO.8 UNC ~ 1/2 UNC)	WITHOUT TORQUE LIMITER	
M4 ~ M12 (NO.8 UNC ~ 1/2 UNC)	WITH TORQUE LIMITER	

V-TYPE TAPPER

RUBBER COLLET	TORQUE LIMITER	STD. QTY
M4 ~ M12 (NO.8 UNC ~ 1/2 UNC)	WITHOUT TORQUE LIMITER	
M4 ~ M12 (NO.8 UNC ~ 1/2 UNC)	WITH TORQUE LIMITER	



RUBBER COLLET

RUBBER COLLET	STD. QTY
M4 ~ M10 (NO.8 UNC ~ 3/8 UNC)(J420)	
M10 ~ M12 (3/8 UNC ~ 1/2 UNC)(J422)	

BORING BAR SOCKET

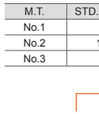
d	STD. QTY
Φ5/16" (Φ8)	
Φ3/8" (Φ10)	
Φ1/2" (Φ12)	
Φ5/8" (Φ16)	
Φ3/4" (Φ20)	
Φ1" (Φ25)	1
Φ1‧1/4" (Φ32)	1

U DRILL SOCKET

d	STD. QTY
Φ3/4" (Φ20)	
Φ1" (Φ25)	
Φ1‧1/4" (Φ32)	

DRILL SOCKET

M.T.	STD. QTY
No.1	
No.2	1
No.3	

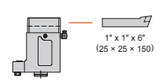


U DRILL HOLDER

D	STD. QTY
Φ1‧1/2" (Φ40)	1

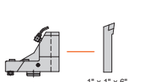
BORING BAR HOLDER

D	STD. QTY
Φ1‧1/2" (Φ40)	2



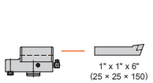
LONG TURNING HOLDER
(RIGHT AND LEFT)

STD. QTY



FACING HOLDER
(RIGHT AND LEFT)

STD. QTY
1



TURNING HOLDER
(RIGHT AND LEFT)

STD. QTY
4

CHUCK COLLET

SPECIFICATION	STD. QTY
ER32 Φ0.079" (Φ2)	
ER32 Φ0.098" (Φ2.5)	
ER32 Φ0.118" (Φ3)	
ER32 Φ0.138" (Φ3.5)	
ER32 Φ0.157" (Φ4)	
ER32 Φ0.177" (Φ4.5)	
ER32 Φ0.197" (Φ5)	
ER32 Φ0.236" (Φ6)	
ER32 Φ0.276" (Φ7)	
ER32 Φ0.315" (Φ8)	
ER32 Φ0.354" (Φ9)	
ER32 Φ0.394" (Φ10)	
ER32 Φ0.433" (Φ11)	

SPECIFICATION	STD. QTY
ER32 Φ0.472" (Φ12)	1
ER32 Φ0.512" (Φ13)	
ER32 Φ0.551" (Φ14)	
ER32 Φ0.591" (Φ15)	
ER32 Φ0.630" (Φ16)	1
ER32 Φ0.669" (Φ17)	
ER32 Φ0.709" (Φ18)	
ER32 Φ0.748" (Φ19)	
ER32 Φ0.787" (Φ20)	

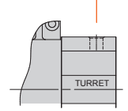
CHUCK COLLET
(FOR THROUGH TOOL COOLANT)

SPECIFICATION	STD. QTY
ER32 Φ0.315" (Φ8)	
ER32 Φ0.335" (Φ8.5)	
ER32 Φ0.354" (Φ9)	
ER32 Φ0.374" (Φ9.5)	
ER32 Φ0.394" (Φ10)	
ER32 Φ0.413" (Φ10.5)	
ER32 Φ0.433" (Φ11)	
ER32 Φ0.453" (Φ11.5)	
ER32 Φ0.472" (Φ12)	
ER32 Φ0.492" (Φ12.5)	
ER32 Φ0.512" (Φ13)	
ER32 Φ0.532" (Φ13.5)	
ER32 Φ0.551" (Φ14)	

SPECIFICATION	STD. QTY
ER32 Φ0.571" (Φ14.5)	
ER32 Φ0.591" (Φ15)	
ER32 Φ0.610" (Φ15.5)	
ER32 Φ0.630" (Φ16)	
ER32 Φ0.650" (Φ16.5)	
ER32 Φ0.669" (Φ17)	
ER32 Φ0.689" (Φ17.5)	
ER32 Φ0.709" (Φ18)	
ER32 Φ0.728" (Φ18.5)	
ER32 Φ0.748" (Φ19)	
ER32 Φ0.768" (Φ19.5)	
ER32 Φ0.787" (Φ20)	

CAP

	STD. QTY
PLUG	1



Standard Machine Specifications

Unit: inch (mm)

		IVS-200	IVS-200M	IVS-300	IVS-300M	IVS-400
Capacity	Max. swing	Φ11.02" (Φ280 mm)	Φ11.02" (Φ280 mm)	Φ13.78" (Φ350 mm)	Φ13.78" (Φ350 mm)	Φ19.69" (Φ500 mm)
	Max. machining diameter*1	Φ7.09" (Φ180 mm)	Φ7.09" (Φ180 mm)	Φ13.78" (Φ350 mm)	Φ13.78" (Φ350 mm)	Φ17.72" (Φ450 mm)
	Max. machining length*1	3.94" (100 mm)	3.94" (100 mm)	7.09" (180 mm)	7.09" (180 mm)	11.81" (300 mm)
Travel	X-axis travel	12.60" (320 mm) + 22.05" (560 mm)	12.60" (320 mm) + 22.05" (560 mm)	9.25" (235 mm) + 25.39" (645 mm)	9.25" (235 mm) + 25.39" (645 mm)	16.73" (425 mm) + 28.54" (725 mm)
	Z-axis travel	11.02" (280 mm)	11.02" (280 mm)	11.02" (280 mm)	11.02" (280 mm)	21.65" (550 mm)
Spindle	Chuck size*2	8"	8"	10"/12"	10"/12"	12"/15"/18"
	Max. spindle speed*3	7000 min^{-1} (rpm)	7000 min^{-1} (rpm)	4000 min^{-1} (rpm)	4000 min^{-1} (rpm)	3300 min^{-1} (rpm)
	Number of spindle speed ranges	Stepless	Stepless	Stepless	Stepless	Stepless
	Spindle nose	A2-6	A2-6	A2-8	A2-8	A2-11
Turret	Turret type	12-position drum turret (Bolt-on type)	12-position drum turret (VDI and Bolt-on types)	12 position drum turret (Bolt-on type)	12 position drum turret (VDI and Bolt-on types)	12 position drum turret (Bolt-on type)
	Number of tools	12 tools	12 tools	12 tools	12 tools	12 tools
	Turning tool size	1.00" (25 mm)	1.00" (25 mm)	1.00" (25 mm)	1.00" (25 mm)	1.00" (25 mm)
	Boring bar shank diameter	Φ1.50" (Φ40 mm)	Φ1.50" (Φ40 mm)	Φ1.50" (Φ40 mm)	Φ1.50" (Φ40 mm)	Φ1.50" (Φ40 mm)
	Turret indexing time	0.17 sec./1 step	0.2 sec./1 step	0.2 sec./1 step	0.2 sec./1 step	0.2 sec./1 step
Rotary tool spindle	Max. rotary tool spindle speed	—	4500 min^{-1} (rpm)	—	4500 min^{-1} (rpm)	—
	Rotary tool spindle capability	—	Drill Φ0.79" (Φ20 mm) End mill Φ0.79" (Φ20 mm) Tap M12 (1/2 UNC) × 2	—	Drill Φ0.79" (Φ20 mm) End mill Φ0.79" (Φ20 mm) Tap M12 (1/2 UNC) × 2	—
Feedrate	Rapid traverse rate: X-axis	110 m/min (4330 ipm)	110 m/min (4330 ipm)	60 m/min (2362 ipm)	60 m/min (2362 ipm)	60 m/min (2362 ipm)
	Rapid traverse rate: Z-axis	60 m/min (2362 ipm)	60 m/min (2362 ipm)	45 m/min (1771 ipm)	45 m/min (1771 ipm)	36 m/min (1417 ipm)
	Rapid traverse rate: C-axis	—	400 min^{-1} (rpm)	—	400 min^{-1} (rpm)	—
Motors	Spindle motor (30-min./Cont. rating)	35 hp (26 kW)/ 30 hp (22 kW)	35 hp (26 kW)/ 30 hp (22 kW)	35 hp (26 kW)/ 30 hp (22 kW)	35 hp (26 kW)/ 30 hp (22 kW)	35 hp (26 kW)/ 30 hp (22 kW)
	Rotary tool spindle motor (10-min. rating)	—	5.5 kW (7.5 hp)	—	5.5 kW (7.5 hp)	—
	Coolant pump motor	0.33 hp (0.25 kW)	0.33 hp (0.25 kW)	0.33 hp (0.25 kW))	0.33 hp (0.25 kW)	0.33 hp (0.25 kW)
Power requirement	Motor (30 min./Cont. rating)	45.2 kVA/39.5 kVA	45.3 kVA/39.6kVA	45.7 kVA/39.9 kVA	45.7 kVA/40.0 kVA	51.5 kVA/40.1 kVA
	Air supply	0.5 MPa (73 psi), 200 L/min (7.06 ft^3/min)	0.5 MPa (73 psi), 200 L/min (7.06 ft^3/min)	0.5 MPa (73 psi), 200 L/min (7.06 ft^3/min)	0.5 MPa (73 psi), 200 L/min (7.06 ft^3/min)	0.5 MPa (73 psi), 200 L/min (7.06 ft^3/min)
Coolant	Tank capacity	290 L (76.62 gal)	290 L (76.62 gal)	350 L (92.47 gal)	350 L (92.47 gal)	450 L (118.89 gal)
Machine size	Machine height	110.51" (2807 mm)	110.51" (2807 mm)	110.51" (2807 mm)	110.51" (2807 mm)	133.18" (3382.8 mm)
	Floor space requirement	125.98" × 48.62" (3200 mm x 1235 mm)	125.98" × 48.62" (3200 mm x 1235 mm)	125.98" × 54.53" (3200 mm x 1385 mm)	125.98" × 54.53" (3200 mm x 1385 mm)	146.14" × 66.34" (3712 mm x 1685 mm)
	Weight	15432 lbs (7000 kg)	15432 lbs (7000 kg))	17637 lbs (8000 kg)	17637 lbs (8000 kg)	26455 lbs (12000 kg)
Sound	Equivalent continuous sound pressure level at operator position (depend on equipment options)	less than 80db (A)				

*1Max. machining diameter and max. machining length vary according to chuck specifications.
*2Chucks are optionally available.
*3Spindle speed depends on chuck specifications.

MAZATROL SmoothC Specifications

	MAZATROL	EIA
Number of controlled axes	Simultaneous 2 ～ 4 axes	
Least input increment	0.0001 mm, 0.00001 inch, 0.0001 deg	
High-speed, high-precision control	Shape compensation, Smooth corner control, Rapid traverse overlap	
Interpolation	Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Cylindrical interpolation, Polar coordinate interpolation, Constant lead threading, Thread start point compensation*, Thread cut-speed override*, Synchronous tapping*	Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Spiral interpolation, Helical interpolation, Constant lead threading, Variable lead threading, Threading (C-axis interpolation type), Cylindrical interpolation*, NURBS interpolation*, Polar coordinate interpolation*, Thread start point compensation*, Thread cut-speed override*, Synchronous tapping*
Feedrate	Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution), Dwell (time/rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate limitation, Variable acceleration control, G0 slope constant*	Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution), Inverse time feed, Dwell (time/rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate limitation, Time constant changing for G1, Variable acceleration control, G0 slope constant*
Program registration	Number of programs: 256 (Standard)/960 (Max.), Program memory: 2 MB, Program memory expansion: 8 MB*, Program memory expansion: 32 MB*	
Control display	Display: 10.4", Resolution: VGA	
Spindle functions	S-code output, Spindle speed limitation, Spindle speed override, Spindle speed reaching detection, Multiple position orient, Constant surface speed, Spindle speed command with decimal digits, Synchronized spindle control, Spindle speed range setting	
Tool functions	Number of tool offset: 4000, T code output for tool number, Tool life monitoring (time), Tool life monitoring (number of machined workpieces), Tool life monitoring (wear)	Number of tool offset: 4000, T code output for tool number, T code output for group number, Tool life monitoring (time), Tool life monitoring (number of machined workpieces), Tool life monitoring (wear)
Miscellaneous functions	M-code output, Simultaneous output of multiple M codes	
Tool offset functions	Tool position offset, Tool length offset, Tool diameter/tool nose R offset, Tool nose shape offset, Tool wear offset, Fixed amount offset, Simple wear offset	Tool position offset, Tool length offset, Tool diameter/tool nose R offset, Tool wear offset, Fixed amount offset, Simple wear offset
Coordinate system	Machine coordinate system, Work coordinate system, Local coordinate system, MAZATROL coordinate system, Additional work coordinates (300 sets)	
Machine compensation	Backlash compensation, Pitch error compensation	
Protection functions	Emergency stop, Interlock, Pre-move stroke check, Barrier	
Automatic operation mode	Memory operation	Memory operation, Tape operation, MDI operation, EtherNet operation*, SD card operation
Automatic operation control	Optional stop, Dry run, Manual handle interruption, MDI interruption, TPS, Restart, Single process, Machine lock	Optional block skip, Optional stop, Dry run, Manual handle interruption, MDI interruption, TPS, Restart, Restart 2, Collation stop, Machine lock
Manual measuring functions	Tool-setting data teach, Tool length teach, Touch sensor coordinates measurement, Workpiece offset measurement, Tool eye measurement	Tool-setting data teach, Tool length teach, Tool offset teach, Touch sensor coordinates measurement, Workpiece offset measurement, Tool eye measurement
Automatic measuring functions	Workpiece measurement, Sensor calibration, Tool eye auto tool measurement, Tool breakage detection	
Peripheral network	PROFIBUS-DP*, EtherNet/IP*, CC-Link*	
Interface	SD card interface, USB	
EtherNet	10 M/100 M/1 Gbps	

*Option

Standard and Optional Equipment

●: Standard ○: Option –: N / A

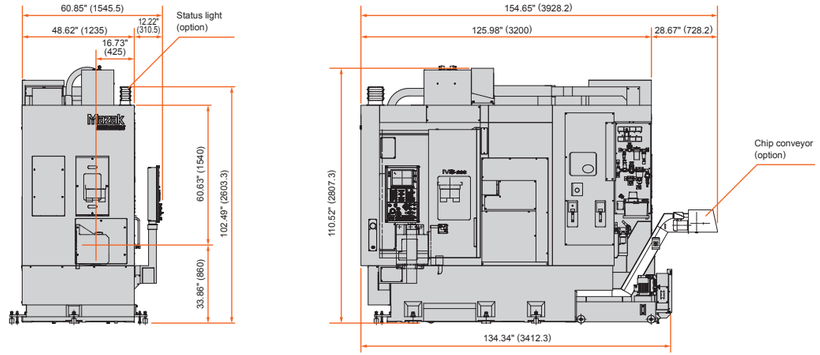
		IVS-200	IVS-200M	IVS-300	IVS-300M	IVS-400
Machine	Work light	●	●	●	●	●
	8" through-hole chuck B-208	○	○	–	–	–
	10" through-hole chuck B-210	–	–	○	○	–
	12" through-hole chuck B-212	–	–	○	○	○
	15" through-hole chuck B-15	–	–	–	–	○
	18" through-hole chuck B-18	–	–	–	–	○
	Spindle orientation	○	○	○	○	○
	Spindle 0.001° indexing (without C-axis contouring)	–	●	–	●	–
	6000 min^{-1} (rpm) rotary tool spindle	–	○	–	○	–
	Tool plate	○	○	–	–	–
Factory automation	Tool eye (automatic)*1	○	○	○	○	○
	Automatic chuck jaw open/close	●	●	●	●	●
	Chuck jaw open/close confirmation	●	●	●	●	●
	Chuck jaw air blast	●	●	●	●	●
	Double foot pedal switch*2	○	○	○	○	○
	Automatic power ON/OFF	●	●	●	●	●
	Calendar-type power ON/OFF + warm-up system	○	○	○	○	○
	Machining finish buzzer	○	○	○	○	○
	3 color machine status light	○	○	○	○	○
	1 color machine status light	○	○	○	○	○
	Absolute position detection	●	●	●	●	●
	Work conveyor interface	●	●	●	●	●
High accuracy	X-axis scale feedback system	●	●	●	●	●
	Z-axis scale feedback system	○	○	○	○	○
	Coolant temperature control system	○	○	○	○	○
Safety equipment	Hydraulic pressure interlock	●	●	●	●	●
	Operator door interlock	●	●	●	●	●
	Ground leakage breaker*3	○	○	○	○	○
	Overload detector	○	○	○	○	○
	Automatic fire extinguisher	○	○	○	○	○
Coolant/ Chip disposal	Coolant system (250 W)	●	●	●	●	●
	Coolant through spindle system	○	○	○	○	○
	Shower coolant	○	○	○	○	○
	Powerful coolant (520 W)	○	○	○	○	○
	Powerful coolant (1.1kW (1.5 hp))	○	○	○	○	○
	SUPERFLOW coolant system (7.0MPa (1015 psi))	○	○	○	○	○
	Handheld coolant nozzle	○	○	○	○	○
	Mist collector	○	○	○	○	○
	Turret air blast	○	○	○	○	○
	Chip conveyor (hinge)	○	○	○	○	○
	Chip conveyor (ConSep)	○	○	○	○	○
	Chip bucket (fixed)	○	○	○	○	○
	Chip bucket (rotating)	○	○	○	○	○

Standard and optional equipment vary by market.
*1Standard equipment in USA/European markets.
*2Standard equipment in European market.
*3N/A in USA/European markets.

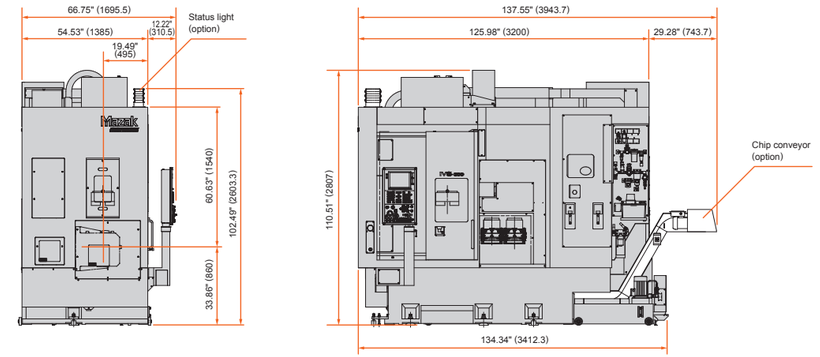
Machine Dimensions

Unit: inch (mm)

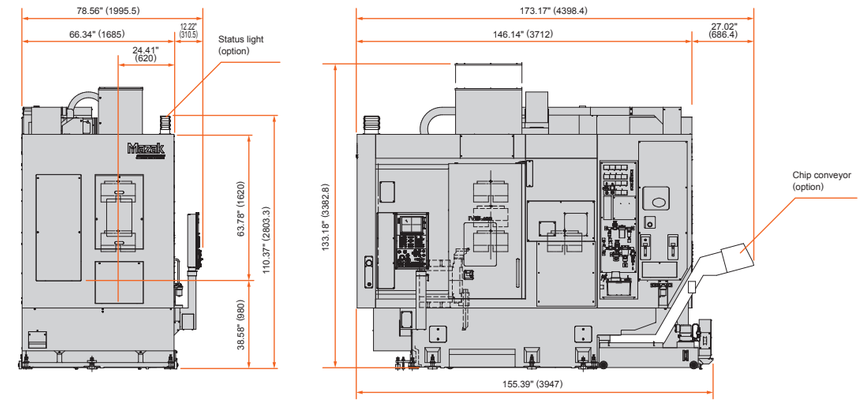
IVS-200, 200M



IVS-300, 300M



IVS-400



IVS SERIES

Mazak

YAMAZAKI MAZAK CORPORATION
1-131 Takeda, Oguchi-cho, Niwa-gun, Aichi-pref., Japan
TEL : +(81)587-95-1131
www.mazak.com

E

IVS SERIES 19.06.0 G 99J1A7119E0