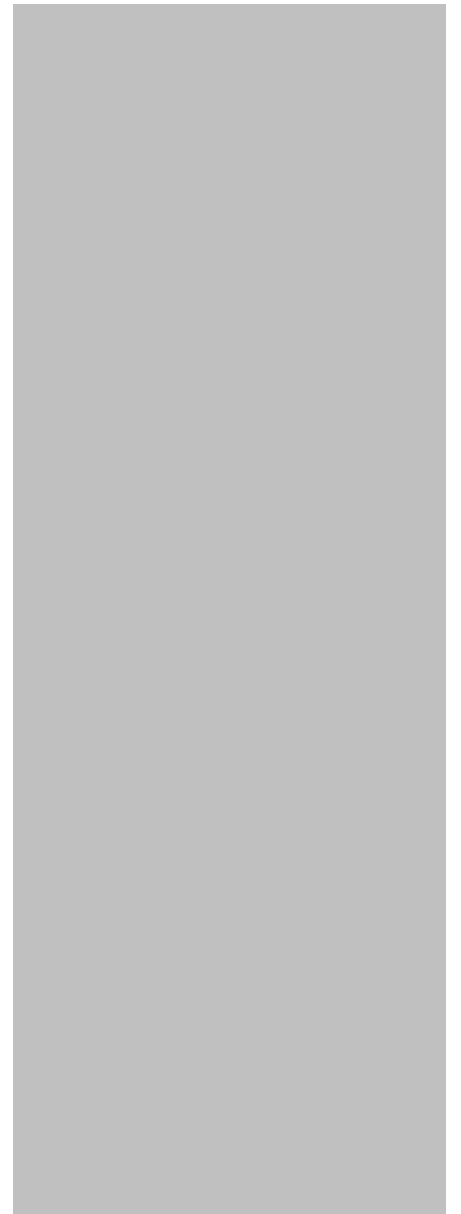
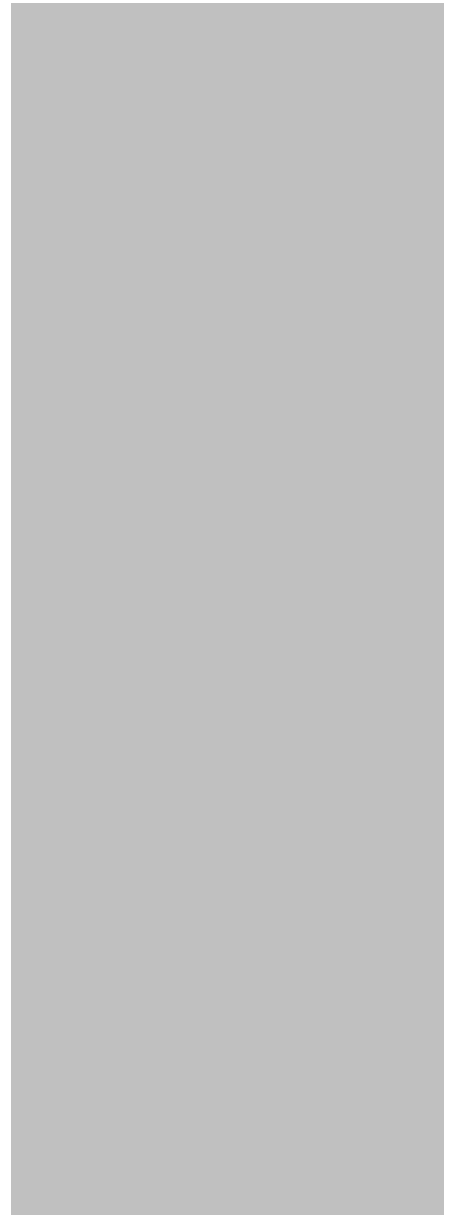


CHAPTER **1**

General Specification



Machine Specification (FANUC)



MV-206BA MH-206BA

MACHINE SPECIFICATION

MCV-206 MCH-206

TABLE

Table size	2500x610mm
Tee slots(width x No.)	18x5x100 mm
Table load (maximum)	1000 kg

TRAVEL

X-axis	2000 mm	
Y-axis	610 mm	
Z-axis	560 mm	
Spindle nose to table surface	180--740mm	155--460
Spindle center to column surface	675 mm	125--685
Pre-tensioned ball screw	50 mm (63mm Optional)	

SPINDLE

Spindle nose	ISO #40	ISO#50
Spindle diameter	85mm	110 mm
Spindle speed	80~10000 min ⁻¹	45-6000 min ⁻¹
(Opt.)	80~12000 min ⁻¹	45-8000 min ⁻¹
Tool Clamping system	Germany clamping jaws	

FEEDRATE

Cutting feed rate	5000 mm/min
Rapid traverse rate (X,Y axes)	30000 mm/min
Rapid traverse rates (Z axis)	30000 mm/min

ATC

Capacity (double arm)	24 pcs	30 pcs
Max. tool weight	8kgs	15 kgs
Max. tool diameter		
Full storage	80mm	125 mm
Adjacent pocket empty	160mm	220 mm
Max. tool length	350mm	400 mm
Tool selection	Random, Bi-directional	
Tool shank	DIN69871A(BT40•50T optional)	
Pull stud	DIN69872(P40T-45°•P50T-45° optional)	

MOTOR

Spindle drive motor (α 8)	7.5kW (11Hp)
X, Y, Z axes servo motor (α 30)	4.0 kW (5.4Hp)
Air pressure	6 bar
Positioning accuracy/full stroke	0.015mm
Repeatability	±0.005 mm

MISCELLANEOUS:

Machine Weight (N.W.)	13000 kg
(G.W.)	15000 kg

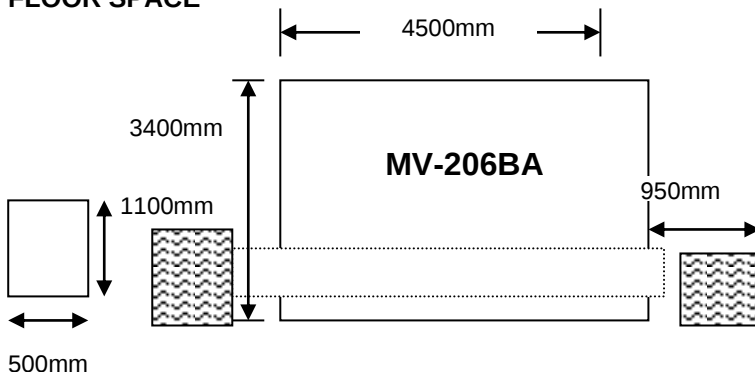
STANDARD ACCESSORIES

- Foundation kits
- Service tool box
- Spindle air blow system
- Coolant equipment
- Machine light
- Manually pulse generator
- Slideway lubricating unit
- Fully enclosed cover
- Spindle oil cooling system
- Rigid tapping
- Chips conveyor x 2sets
- Auto power off & alarm light

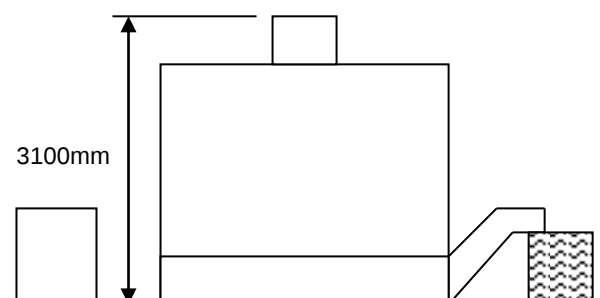
OPTIONAL ACCESSORIES

- High horse power spindle motor
- Coolant through tool adaptor
- Air blow system for chips
- Tool breakage-detecting device
- Job completion buzzer
- Optical scale feed back system
- Lift up type chips conveyor
- Large capacity coolant tank
- Raised column design (200mm)
- **CNC 4th** rotary table
- CTS system
- Spindle coolant ring
- Tilting rotary table
- Automatic door
- Fanuc 18i

FLOOR SPACE



MACHINE HEIGHT



MV-306BA MH-306BA

MACHINE SPECIFICATION

MV-306 MH-306

TABLE

Table size	3650x610mm	
Tee slots(width x No.)	18x5x100 mm	
Table load (maximum)	1500 kg	
TRAVEL		
X-axis	3000 mm	
Y-axis	610 mm	
Z-axis	560 mm	
Spindle nose to table surface	180--740mm	155--460
Spindle center to column surface	675 mm	125--685
Pre-tensioned ball screw	50 mm (63mm Optional)	

SPINDLE

Spindle nose	ISO #40	ISO#50
Spindle diameter	85mm	110 mm
Spindle speed	80~10000 min ⁻¹	45-6000 min ⁻¹
(Opt.)	80~12000 min ⁻¹	45-8000 min ⁻¹
Tool Clamping system	Germany clamping jaws	

FEEDRATE

Cutting feed rate	5000 mm/min
Rapid traverse rate (X,Y axes)	30000 mm/min
Rapid traverse rates (Z axis)	30000 mm/min

ATC

Capacity (double arm)	30 pcs	40 pcs
Max. tool weight	8kgs	15 kgs
Max. tool diameter		
Full storage	80mm	125 mm
Adjacent pocket empty	160mm	220 mm
Max. tool length	300mm	350 mm
Tool selection	Random, Bi-directional	
Tool shank	DIN69871A(BT40•50T optional)	
Pull stud	DIN69872(P40T-45°•P50T-45° optional)	

MOTOR

Spindle drive motor (α T15)	11kW (15Hp)
X, Y, Z axes servo motor (α 30)	4.0 kW (5.4Hp)
Air pressure	6 bar
Positioning accuracy/full stroke	0.015mm
Repeatability	±0.005 mm

MISCELLANEOUS:

Machine Weight (N.W.)	15000 kg
(G.W.)	17000 kg

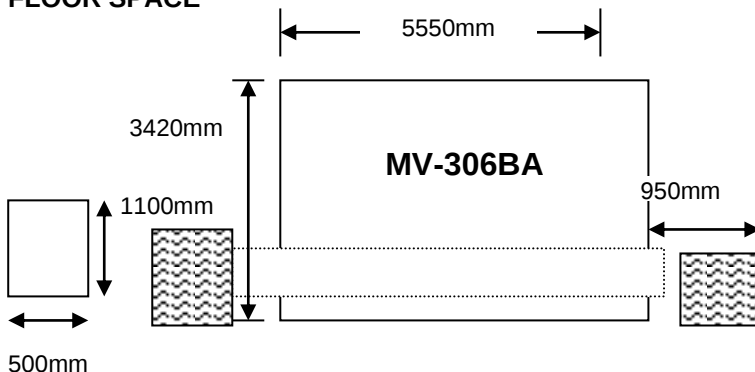
STANDARD ACCESSORIES

- Foundation kits
- Service tool box
- Spindle air blow system
- Coolant equipment
- Machine light
- Manually pulse generator
- Slideway lubricating unit
- Fully enclosed cover
- Spindle oil cooling system
- Rigid tapping
- Chips conveyor x 2sets
- Auto power off & alarm light

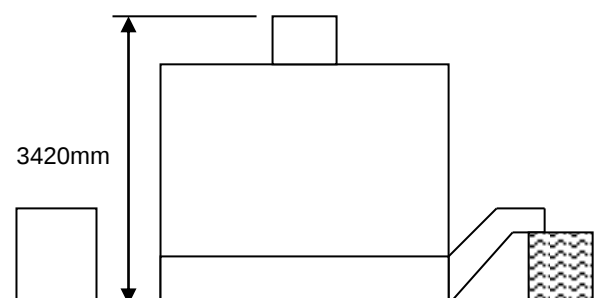
OPTIONAL ACCESSORIES

- High horse power spindle motor
- Coolant through tool adaptor
- Air blow system for chips
- Tool breakage-detecting device
- Job completion buzzer
- Optical scale feed back system
- Lift up type chips conveyor
- Large capacity coolant tank
- Raised column design (200mm)
- **CNC 4th** rotary table
- CTS system
- Spindle coolant ring
- Tilting rotary table
- Automatic door
- Fanuc 18i

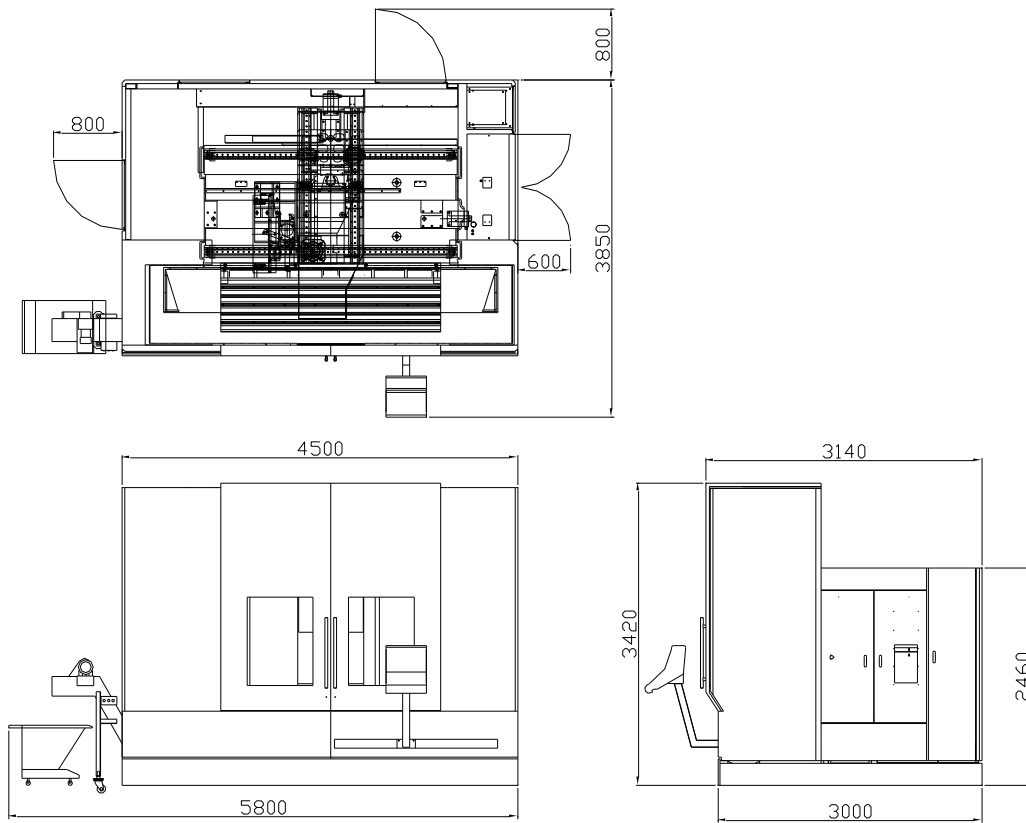
FLOOR SPACE



MACHINE HEIGHT

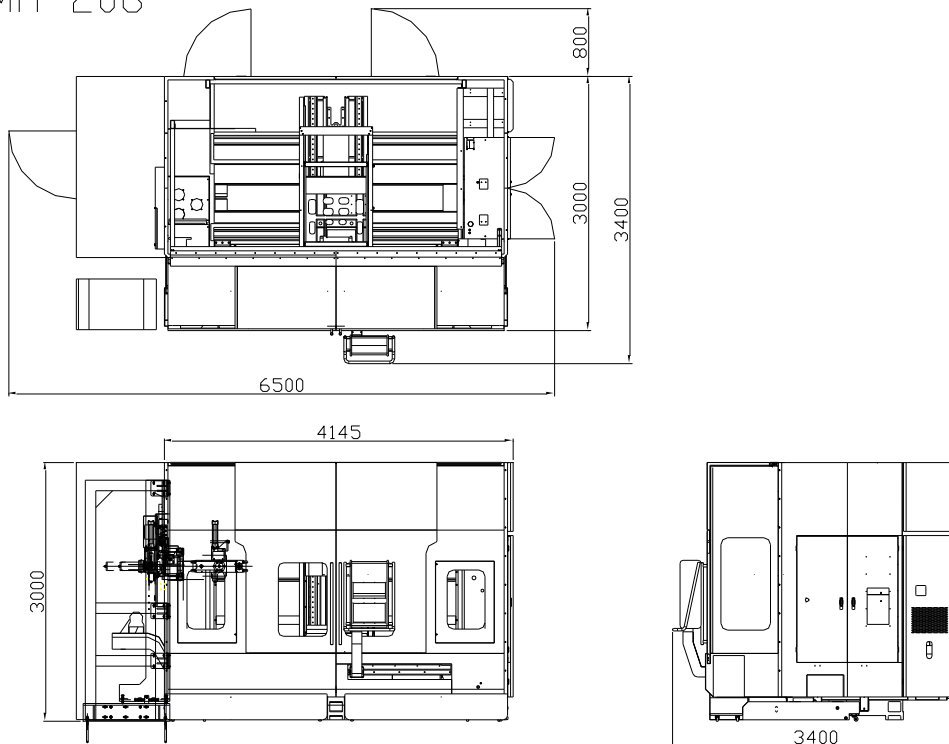


Machine Dimension of MV-206BA

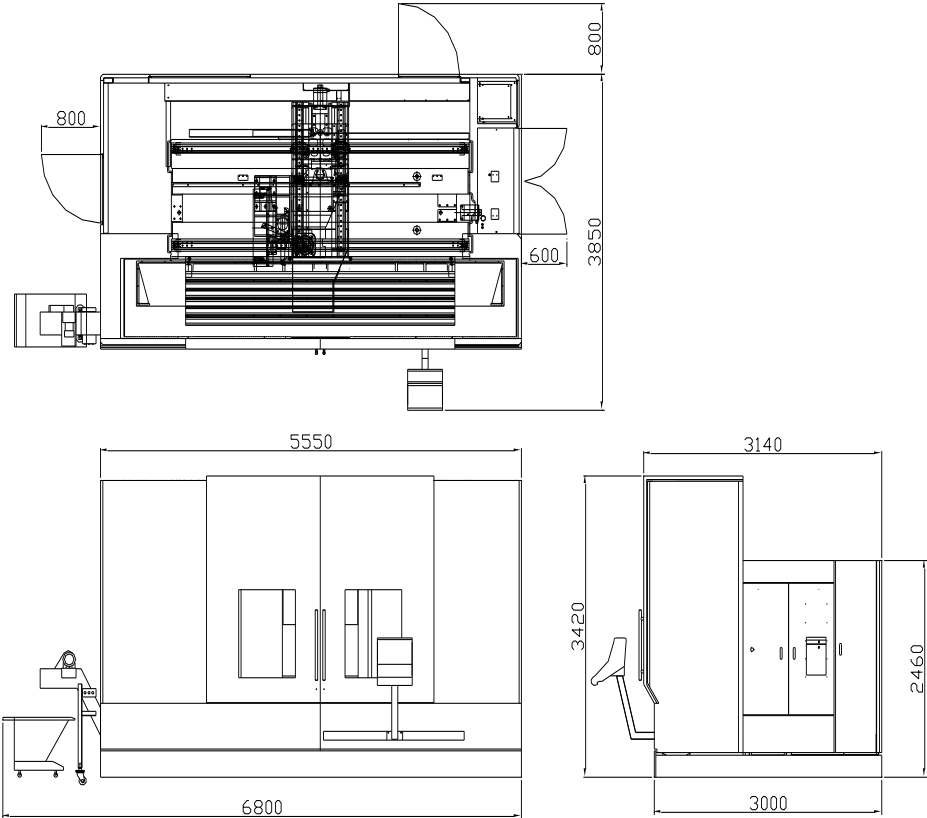


Machine Dimension of MH-206BA

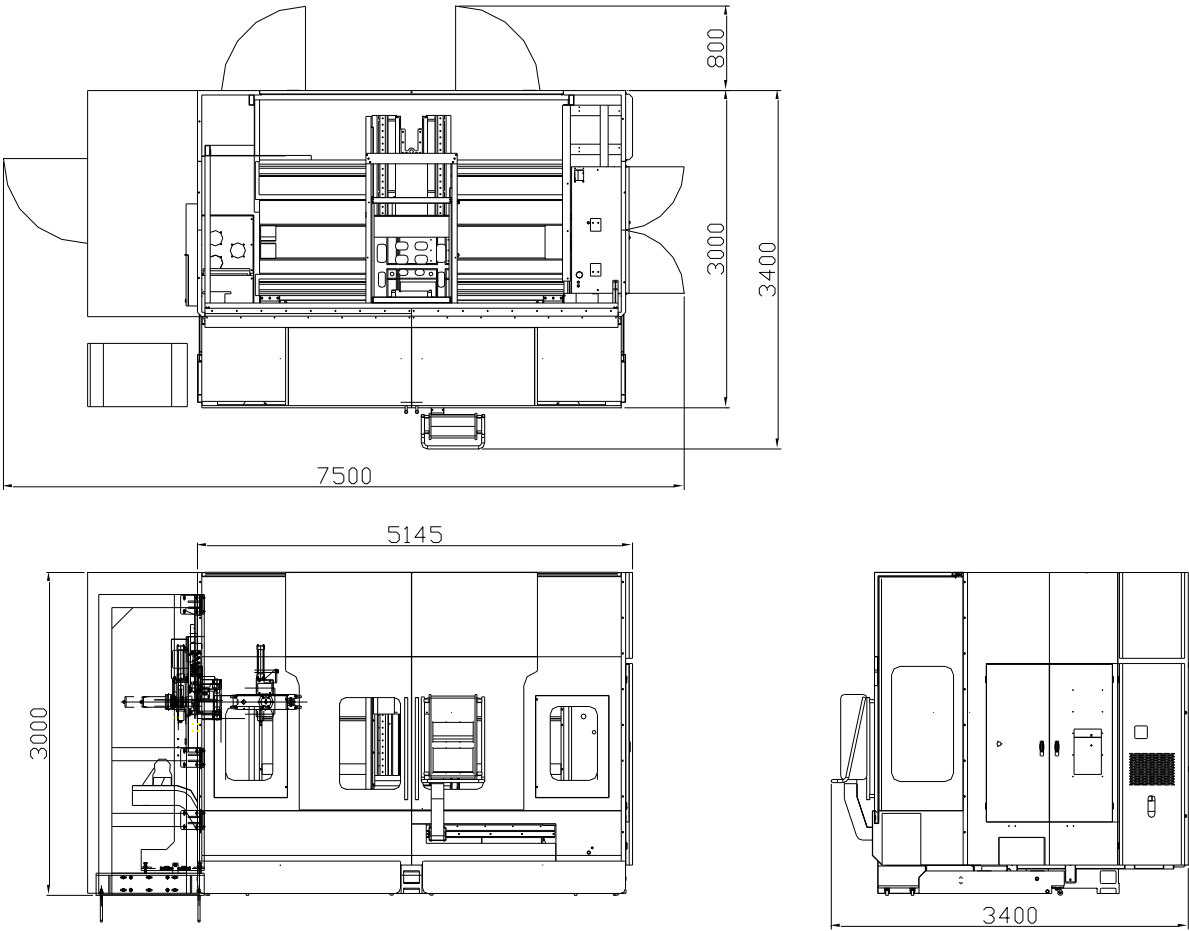
MH-206

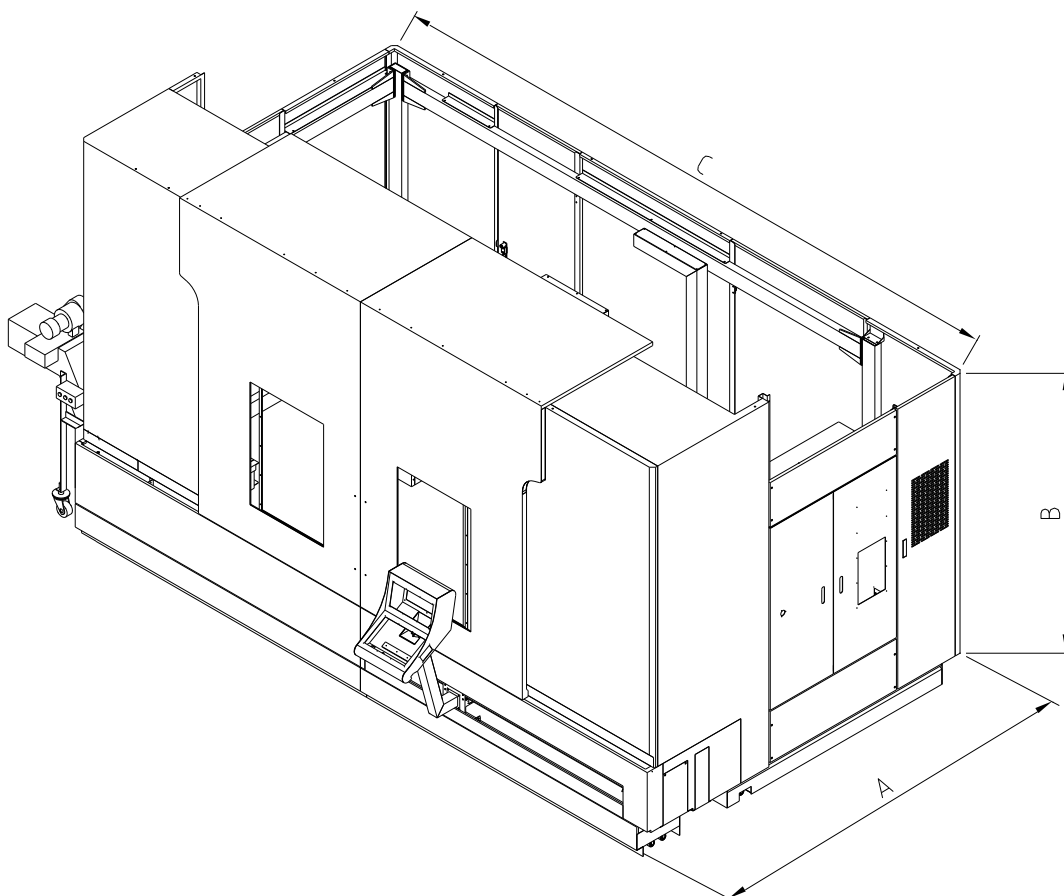


Machine Dimension of MV-306BA



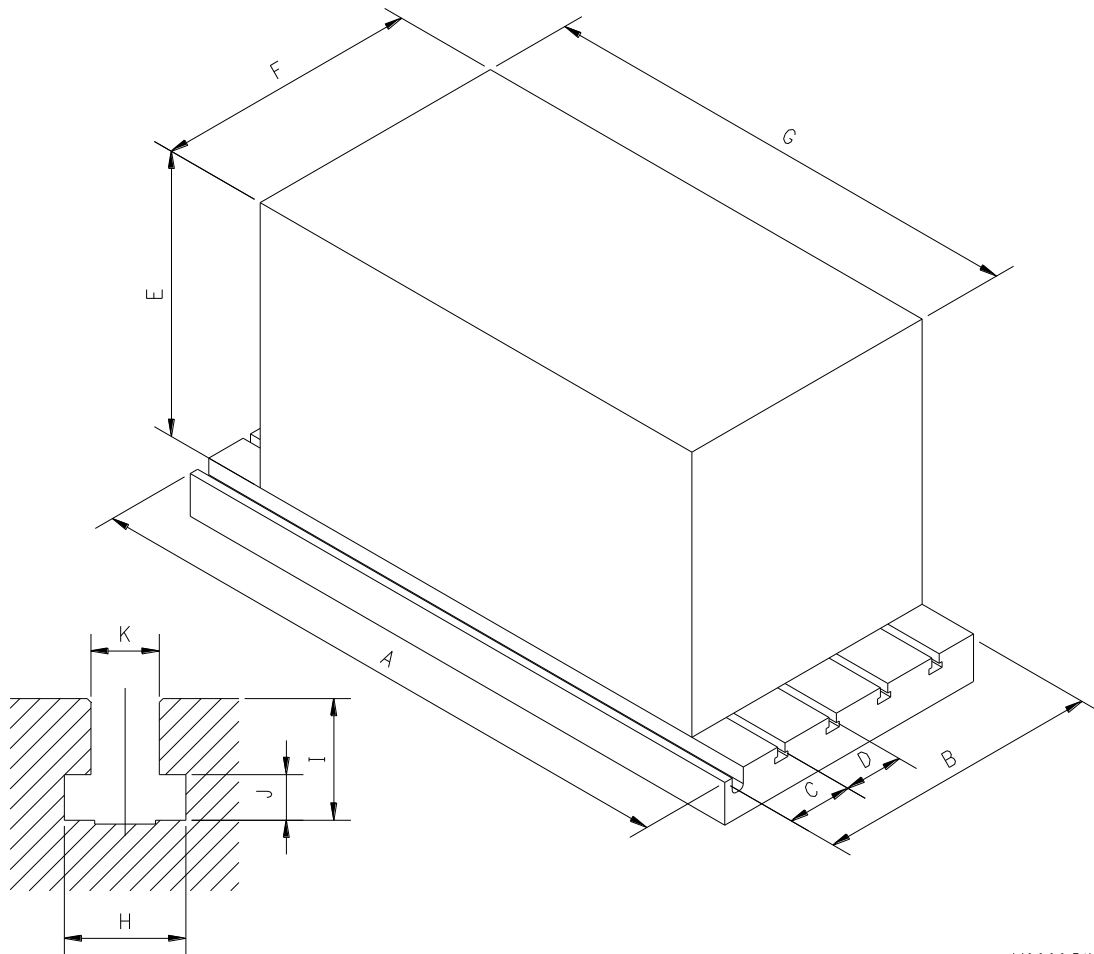
Machine Dimension of MH-306BA





MODEL DIMENSION	MV-206BA	MH-206BA	MV-306BA	MH-306BA	
A	3140	3140	3140	3140	
B	3420	3000	3420	3000	
C	5800	5800	6800	6800	

1.2 Table Workpiece Area



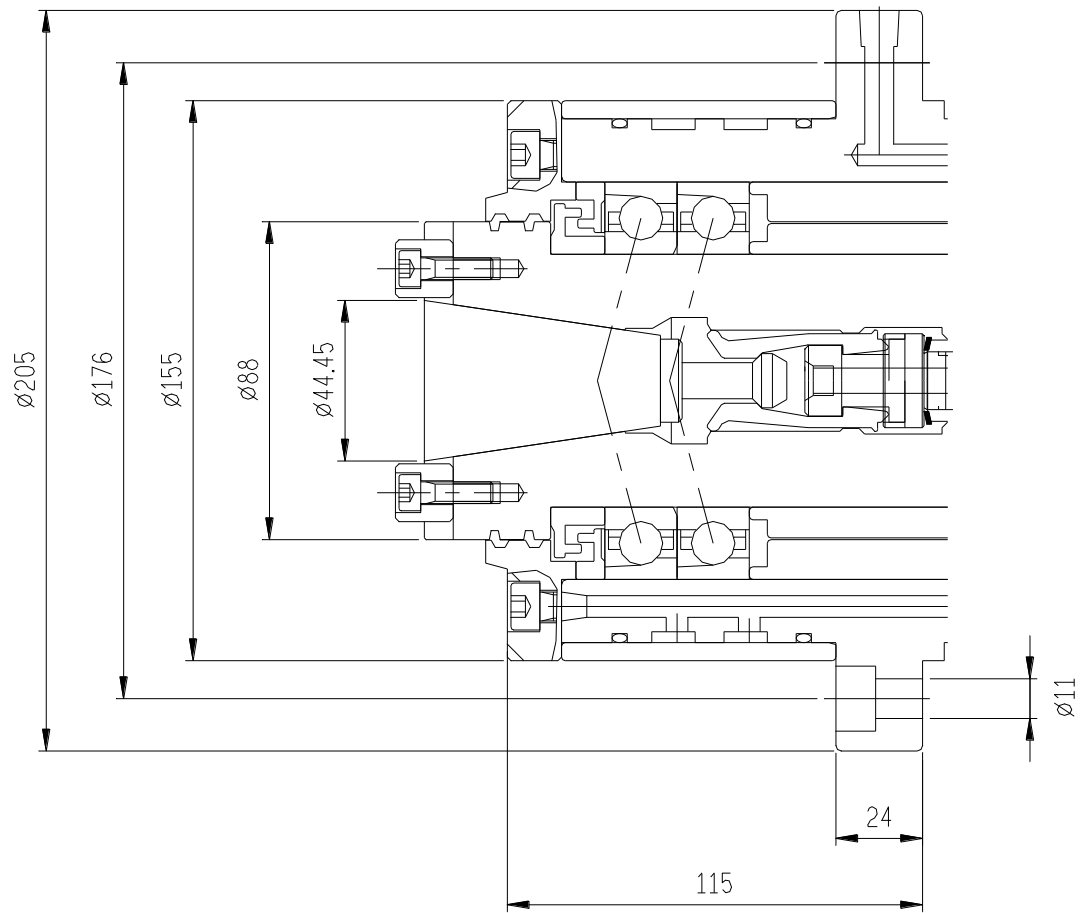
M0008.DWG

Remark: Please refer to Machine Specification previously for load capacity.

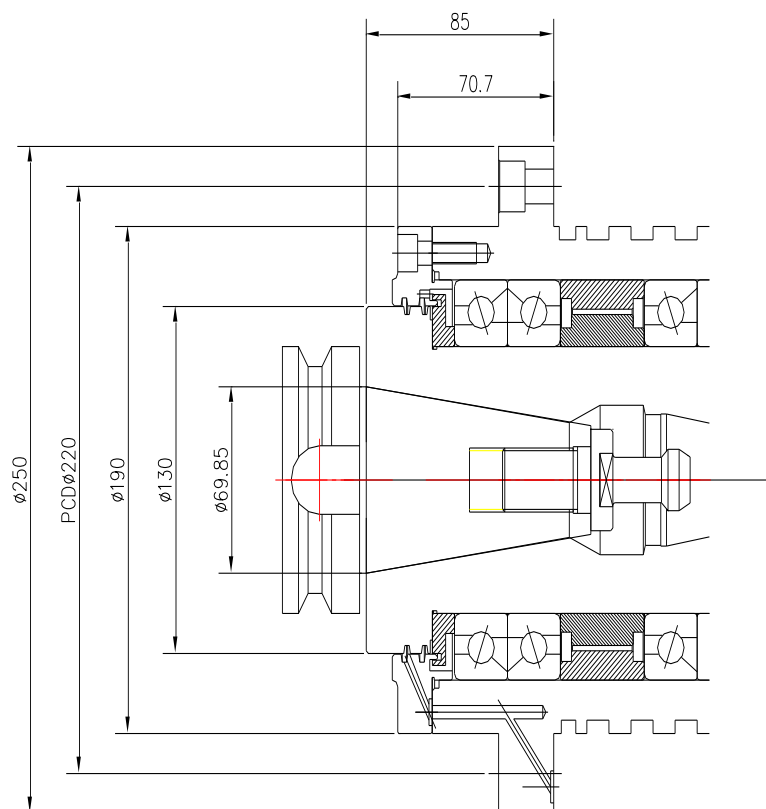
MODEL DIMENSION	MV-206BA	MV-206BA	MV-306BA	MV-306BA		
A	2500	2500	3650	3650		
B	610	610	610	610		
C	105	105	105	105		
D	100	100	100	100		
E	550	550	550	550		
F	560	560	560	560		
G	1800	1800	2800	2800		
H	32	32	32	32		
I	32	32	32	32		
J	12	12	12	12		
K	18	18	18	18		

1.3 Spindle Taper (#40)

A. ISO 40

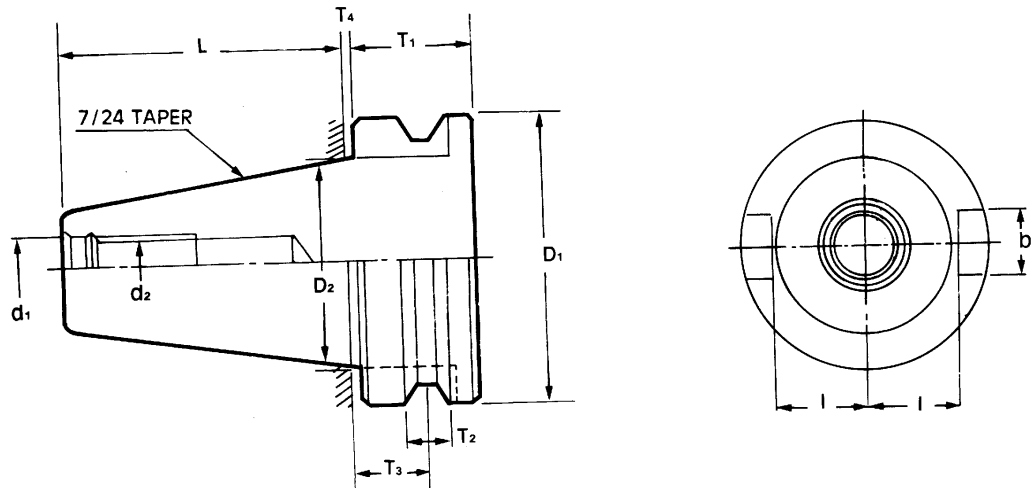


B. ISO 50



1.4 TOOLING SYSTEM

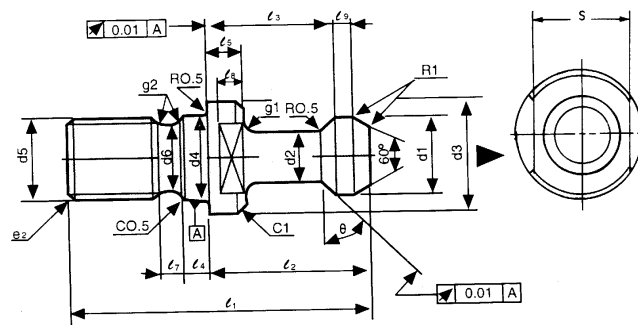
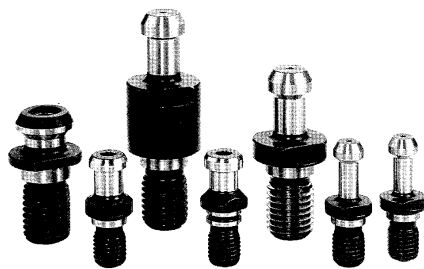
A-1. Tool Shank (BT40/BT50)



(unit: mm)

Model No.	D1	D2	d ₁	d ₂	L	T ₁	T ₂	T ₃	T ₄	b	l
BT-40	63	44.45	17	M16	65.4	25	10	16.6	2	16.1	22.6
BT-50	100	69.85	25	M24	101.8	35	15	23.2	3	25.7	35.4

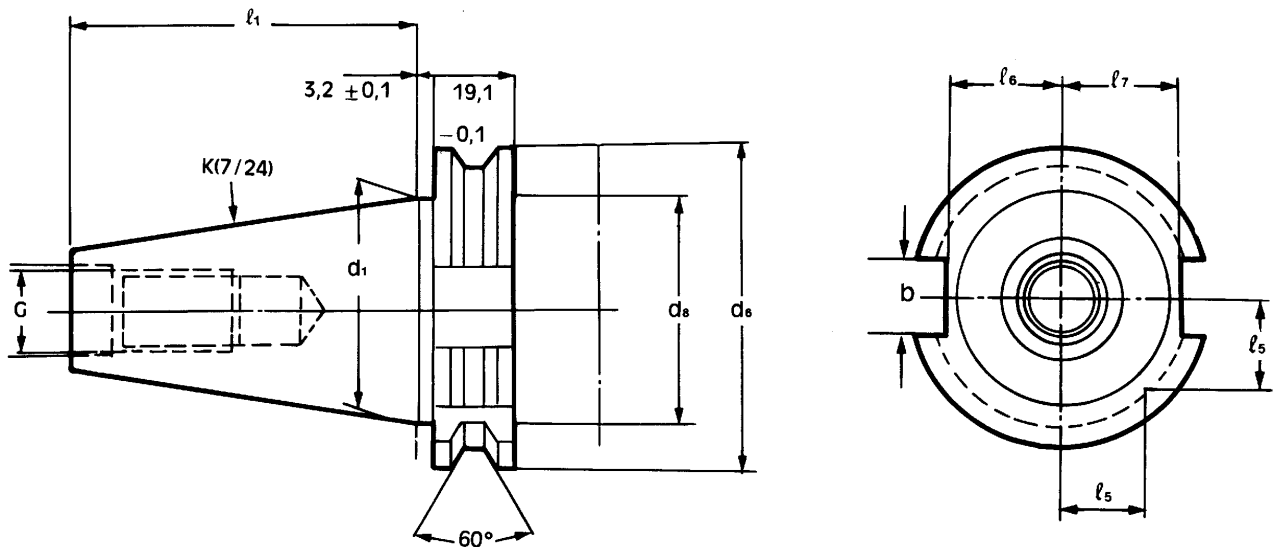
A-2 . Pull Stud(BT40/B50)



(unit: mm)

Model	l_1	d_4	d_5	d_6	e_2	g_2	l_4	l_7	d_3	g_1	l_5	l_6	S	d_1	d_2	l_2	l_3	L_9	θ	For shank
P40T	60	17	M16	13	2	1	5	4	23	3	6	4	19	15	10	35	28	3	30° 45°	BT-40
P50T	85	25	M24	20	3	1.5	8	5	38	5	10	8	30	23	17	45	35	5	60° 90°	BT-50

B-1. Tool Shank (DIN69871A)

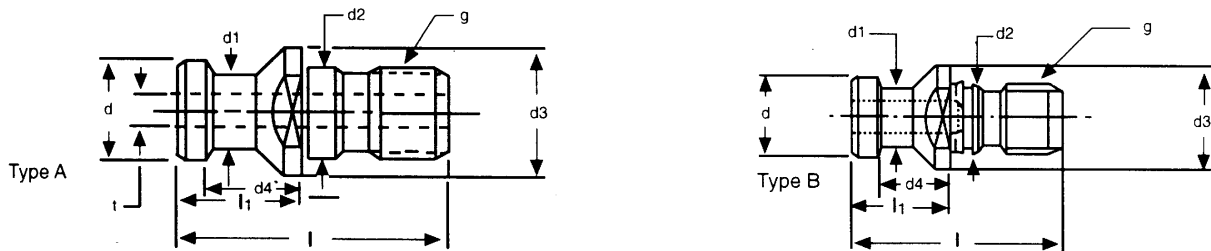


(unit:mm)

BT code	b H ₁₂	d ₁	g	d ₃ H ₇	d ₆ -0.1	d ₈ max	l ₁ -0.3	l ₅ -0.3	l ₆ -0.4	l ₇ -0.4
40	16.1	44.45	M16	17	63.55	50	68.4	18.5	22.8	25
50	25.7	69.85	M24	25	97.50	80	101.75	30	35.5	37.7

B-2. Pull Studs (DIN69872 TYPE A, TYPE B)

DIN 69872



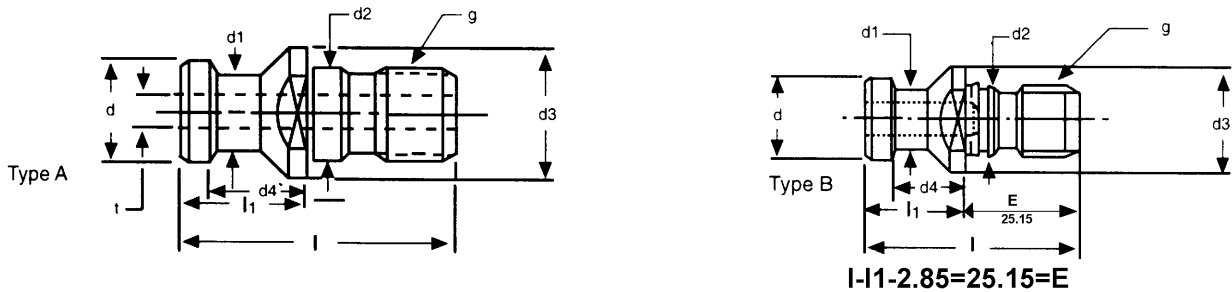
Taper No.	Type	l	l ₁	d	d ₁	d ₂	d ₃	d ₄	t	g
40	A	54	26	19	14	17	23	20	7.5	M16
40	B	54	26	19	14	17	23	20	—	M16
50	A	74	34	28	21	25	36	25	11.5	M24
50	B	74	34	28	21	25	36	25	—	M24

C. BT40/50 + MODIFIED DIN69872

If CTS (Coolant through Spindle) system was equipped on the machine, the tooling system can be choosing as below.

DIN69871A (Tool Shank)+DIN 69872(Pull Stud)

DIN 69872



Taper No.	Type	l	l ₁	d	d ₁	d ₂	d ₃	d ₄	t	g
40	A	54	26	19	14	17	23	20	7.5	M16
40	B	54	26	19	14	17	23	20	—	M16
50	A	74	34	28	21	25	36	25	11.5	M24
50	B	74	34	28	21	25	36	25	—	M24

D. AUTOMATIC TOOL MAGAZINE SYSTEM

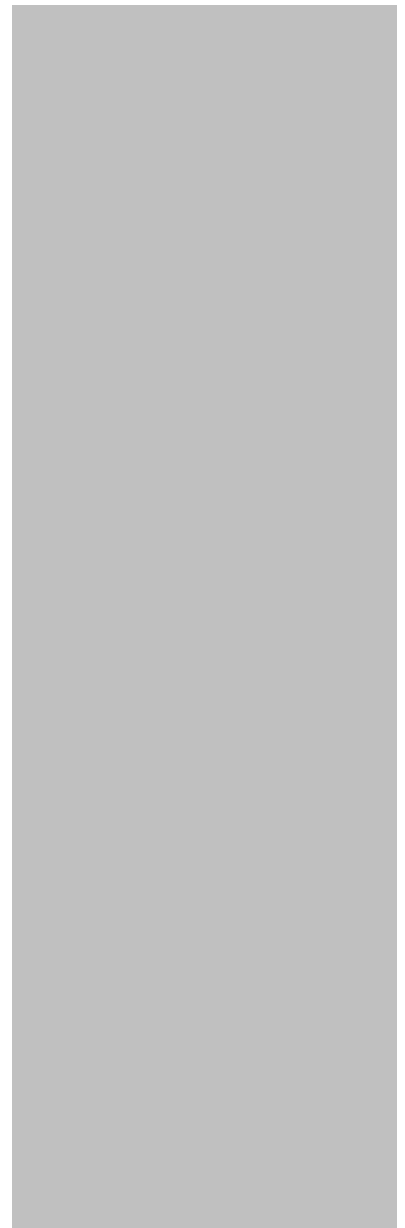
maximum mass: 7kg

moments of inertia $I=r^2m$ (kgm²), r: distance between rotary center and motion center

m: weight of motion part

Model		Moments of inertia (kgm ²)
MV-206BA MV-306BA	40pcs	0.983
	30pcs	2.107
	24pcs	2.107
MH-206BA MH-306BA	40pcs	0.983
	32pcs	2.107

Control Specification (FANUC OIMC)



1.1Control Specification

Basic Functions:

1. CONTROLLED PATH: 1 PATH
2. CONTROLLED AXIS : 3 AXES
3. SIMULTANEOUSLY CONTROLLED AXES : SIMULTANEOUS 2 AXES
4. AXIS NAME:OPTIONAL FROM X,Y,Z,U,V,W,A,B,C
5. LEAST INPUT INCREMENT: 0.001MM,0.001DEG,0.0001 INCH
6. FLEXIBLE FEED GEAR: OPTIONAL DMR
7. FINE ACC & DEC CONTROL
8. HRV CONTROL
9. INTERLOCK: ALL AXES/EACH AXIS/CUTTING BLOCK START
10. MACHINE LOCK:ALL AXES/EACH AXIS
11. EMERGENCY STOP
12. OVERTRAVEL
13. STORED STROKE CHECK 1
14. MIRROR IMAGE:EACH AXIS
15. FOLLOW-UP
16. SERVO OFF/MECHANICAL HANDLE FEED
17. BACKLASH COMPENSATION
18. BACKLASH COMPENSATION FOR EACH RAPID TRAVERSE AND CUTTING FEED
19. AUTOMATIC OPERATION (MEMORY)
20. MDI OPERATION
21. PROGRAM NUMBER SEARCH
22. SEQUENCE NUMBER SEARCH
23. BUFFER REGISTER

24. DRY RUN
25. SINGLE BLOCK
26. JOG FEED
27. MANUAL REFERENCE POSITION RETURN
28. REFERENCE POSITION SETTING WITHOUT DOG
29. INCREMENTAL FEED: X1,X10,X100,X1000
30. JOG AND HANDLE SIMULTANEOUS MODE
31. POSITIONING:G00 (LINEAR INTERPOLATION TYPE POSITIONING IS POSSIBLE)
32. EXACT STOP MODE:G61
33. EXACT STOP: G09
34. LINEAR INTERPOLATION
35. CIRCULAR INTERPOLATION
36. DWELL:DWELL IN SECONDS AND DWELL IN REVOLUTION (IN CASE OF DWELL IN REVOLUTION FOR MC, THREAD CUTTING, SYNCHRONOUS CUTTING OPTION IS REQUIRED)
37. SKIP FUNCTION:G31
38. REFERENCE POSITION RETURN:G28
39. REFERENCE POSITION RETURN CHECK:G27
40. 2ND REFERENCE POSITION RETURN
41. RAPID TRAVERSE RATE:MAX. 240M/MIN (1Mm)
42. RAPID TRAVERSE OVERRIDE:F₀, 25,50,100%
43. FEED PER MINUTE
44. TANGENTIAL SPEED CONSTANT CONTROL
45. CUTTING FEEDRATE CLAMP
46. AUTOMATIC ACCELERATION/DECELERATION:RAPID TRAVERSE:LINEAR/ CUTTING FEED: EXPONENTIAL
47. FEEDRATE OVERRIDE:0~254%
48. JOG OVERRIDE:0~655.34%
49. OVERRIDE CANCEL

- 50. TAPE CODE:EIA RS244/ISO840 AUTOMATIC RECOGNITION
- 51. LABEL SKIP
- 52. PARITY CHECK:HORIZONTAL AND VERTICAL PARITY
- 53. CONTROL IN/OUT
- 54. OPTIONAL BLOCK SKIP:1
- 55. MAX. PROGRAMMABLE DIMENSION: ± 8 -DIGIT
- 56. PROGRAM NUMBER: O4-DIGIT
- 57. SEQUENCE NUMBER:N5-DIGIT
- 58. ABSOLUTE/INCREMENTAL PROGRAMMING:COMBINED USE IN THE SAME BLOCK
- 59. DECIMAL POINT PROGRAMMING/POCKET CALCULATOR TYPE DECIMAL POINT PROGRAMMING
- 60. INPUT UNIT 10 TIME MULTIPLY
- 61. PLANE SELECTION:G17,G18,G19
- 62. ROTARY AXIS DESIGNATION
- 63. ROTARY AXIS ROLL-OVER FUNCTION
- 64. COORDINATE SYSTEM SETTING
- 65. AUTOMATIC COORDINATE SYSTEM SETTING
- 66. MANUAL ABSOLUTE ON AND OFF
- 67. SUB PROGRAM CALL:4 FOLDS NESTED
- 68. CIRCULAR INTERPOLATION BY R PROGRAMMING
- 69. AUXILIARY SPEED FUNCTION:M8-DIGIT
- 70. AUXILIARY FUNCTION LOCK
- 71. HIGH SPEED M/S/T INTERFACE
- 72. MULTIPLE COMMAND OF AUXILIARY FUNCTION:3
- 73. SPINDLE SPEED FUNCTION:S5-DIGIT, BINARY OUTPUT
- 74. TOOL FUNCTION:T8 DIGITS
- 75. TOOL OFFSET PAIRS: ± 6 DIGITS 32
- 76. TOOL LENGTH COMPENSATION

- 77. PART PROGRAM STORAGE LENGTH:10M
- 78. NUMBER OF REGISTERABLE PROGRAMS:63
- 79. PART PROGRAM EDITING
- 80. PROGRAM PROTECT
- 81. STATUS DISPLAY
- 82. CLOCK FUNCTION
- 83. CURRENT POSITION DISPLAY
- 84. PROGRAM DISPLAY:PROGRAM NAME 31 CHARACTERS
- 85. PARAMETER SETTING AND DISPLAY
- 86. SELF-DIAGNOSIS FUNCTION
- 87. ALARM DISPLAY
- 88. ALARM HISTORY DISPLAY
- 89. OPERATION HISTORY DISPLAY
- 90. HELP FUNCTION
- 91. ACTUAL CUTTING FEEDRATE DISPLAY
- 92. DIRECTORY DISPLAY AND PUNCH FOR EACH GROUP
- 93. SERVO SETTING SCREEN
- 94. DISPLAY OF HARDWARE AND SOFTWARE CONFIGURATION
- 95. MULTI-LANGUAGE DISPLAY:ENGLISH
- 96. DATA PROTECTION KEY:3 TYPES
- 97. ERASE CRT SCREEN DISPLAY
- 98. EXTERNAL WORKPIECE NUMBER SEARCH:9999
- 99. MEMORY CARD INTERFACE:FOR MAINTENANCE
- 100. STATUS OUTPUT SIGNAL:NC READY, SERVO READY,AUTOMATIC OPERATION, AUTOMATIC OPERATION START LAMP, FEED HOLD, RESET, NC ALARM, DISTRIBUTION END, REWINDING, INCH INPUT, CUTTING, INPOSITION, THREAD CUTTING, TAPPING, ETC.
- 101. CONNECTABLE SERVO MOTOR:FANUC AC SERVO MOTOR A SERIES (WITH SERIAL INTERFACE PULSE CODER)

- 102. CONNECTABLE SERVO AMP.:FANUC AC SERVO AMP. A SERIES
- 103. CONNECTABLE POSITION DETECTOR (FOR FULL-CLOSED CONTROL):PULSE CODER/OPTICAL SCALE (2 PHASE PULSE INTERFACE)
- 104. CONNECTABLE SPINDLE MOTOR:FANUC AC SPINDLE MOTOR, ETC.
- 105. SETTING AND DISPLAY UNIT:9" MONOCHROME CRT/MDI
- 106. CONTROL UNIT DIMENSIONS:3 SLOTS
- 107. PMC SYSTEM:PMC-RB5/RB6

(THE FOLLOWING FANUC'S OPTION FUNCTION WILL BE LISTED AS STANDARD SPECIFICATION)

- ※ OPTION ASSEMBLY A1
- ※ SIMPLE HI-PRECISION
- ※ CONTROL AXES EXPANSI
- ※ CONTROL MAIN 4 AXES
- ※ SIMULT CONTROL AXES
- ※ AC/DECEL AFTER INSTALL
- ※ HANDLE 1-AXES CONTROL
- ※ PITCH ERROR COMPENSATION
- ※ SERIAL OUTPUT
- ※ 1ST SPINDLE ORIENTATION
- ※ CUSTOM MACRO B
- ※ INCH/METRIC CONVERSION
- ※ CANNED CYCLE
- ※ WORK COORDINATE
- ※ RDR/PUNCH CONTROL 1
- ※ EXTERNAL MESSAGE
- ※ TOOL OFFEST 64
- ※ CUTTER COMPENSATION C
- ※ TAPE MEMORY 160M

1-1 Spindle motor & Servo motor employed on PING JENG products line

MODEL	SPINDLE MOTOR	SERVO MOTOR		
		X	Y	Z
MV-206BA	α T15, (10000 min^{-1})	α 30i	α 30i	α 40i
MH-206BA	α 12i, (10000 min^{-1})	α 30i	α 30i	α 40i
MV-306BA	α T15, (10000 min^{-1})	α 30i	α 30i	α 40i
MH-306BA	α 12i, (10000 min^{-1})	α 30i	α 30i	α 40i

1-3. Technical specification of Spindle motor

Motor Model		Spindle Motor			
		$\alpha 8i$	$\alpha 12i$	$\alpha 18i$	$\alpha 22i$
Rated output	Cont. rated (kw)	7.5	11	18.5	22
	30 min. rated(kw)	11	15	22	26
Speed	Base speed(min ⁻¹)	1500			
	Power const. Range (min ⁻¹)	8000			
	Max. speed (min ⁻¹)	8000			
Cont. rated torque at const. Torque range (Nm)		47.7	95.4	117.7	140.0
Rotor inertia (kgm ²)		0.0275	0.09	0.128	0.128
Vibration		V5			
Cooling fan (W)		20	56		
Built-in sensor resolution (/rev.)		4096			

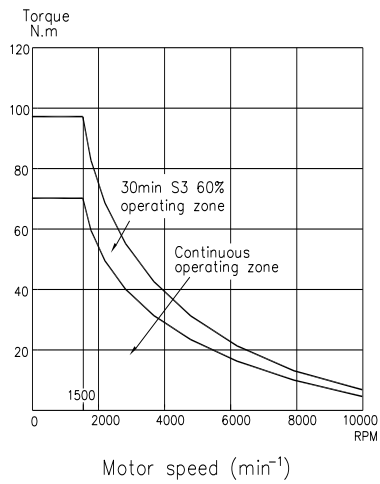
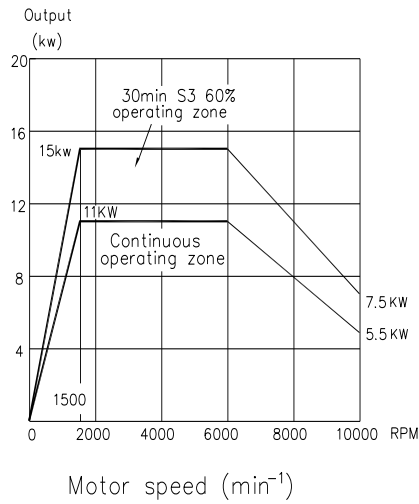
Motor Model		Spindle Motor	
		$\alpha 30i$	$\beta 12i$
Rated output	Cont. rated (kw)	30	11
	30 min. rated(kw)	37	15
Speed	Base speed(min ⁻¹)	1150	1500
	Power const. Range (min ⁻¹)	3500	2000
	Max. speed (min ⁻¹)	4500	7000
Cont. rated torque at const. Torque range (Nm)		249.1	52.5
Rotor inertia (kgm ²)		0.295	0.0275
Vibration		V5	
Cooling fan (W)		84	20
Built-in sensor resolution (/rev.)		4096	

1-4. Technical specification of Servo motor

Motor Model	Servo Motor			
	$\alpha 12i$	$\alpha 22i$	$\alpha 30i$	$\beta 12i$
Rated output	2.1	3.8	4.5	1.8
Stalling torque (Nm)	12	22	30	11
Maximum speed(min^{-1})	2000			
Rotor inertia $GD^2/4$ (kgm^2)	0.0062	0.012	0.017	0.0023
Detector	ABS/INC 65536/REV.(*1)			

Power-Torque chart (FANUC)

MV-206
MODEL $\alpha 12/10000I$



MH-206
MODEL $\alpha 15/7000I$

