

VERTICAL MACHINING CENTER

**PMC-5V T20**

WITH FANUC 0-MC

OPERATION MANUAL



Nov. 1994  
Ver. ①

<b>PREFACE</b> .....	[Page 1]
<b>SAFETY PRECAUTIONS</b> .....	[Page 2/Page 10]
<b>A. MACHINE COMPOSITION</b> .....	[Page a-1]
<b>B. SPECIFICATIONS</b> .....	[Page b-1/b-8]
B-1 Machine Specifications (PMC-5V T20) .....	Page b-1
B-2 Numerical Control System Specifications .....	Page b-2
B-3 Machine Dimensions .....	Page b-4
B-4 Table Dimensions .....	Page b-8
<b>C. OUTLINE OF MACHINE</b> .....	[Page c-1/c-2]
C-1 Description of Machine .....	Page c-1
C-2 Features .....	Page c-2
<b>D. INSTALLATION</b> .....	[Page d-1/d-10]
D-1 Environment .....	Page d-1
D-2 Foundation .....	Page d-1
D-3 Air Source .....	Page d-1
D-4 Hoisting .....	Page d-2
D-5 Unpacking and Cleaning .....	Page d-4
D-6 Removal of Fixings .....	Page d-4
D-7 Electric Wiring and Power Connection .....	Page d-6
D-8 Levelling .....	Page d-10
<b>E. LUBRICATION</b> .....	[Page e-1/e-3]
E-1 Lubrication .....	Page e-1
E-2 Lubrication Points .....	Page e-2
E-3 Coolant Tank .....	Page e-3
<b>F. PREPARATION FOR OPERATION</b> .....	[Page f-1/f-2]
F-1 Starting Test Operation .....	Page f-1
F-2 Operation Procedure (See H.) .....	Page f-1
F-3 Turning Off Power .....	Page f-2
<b>G. SWITCHES ON ELECTRIC BOX</b> .....	[Page g-1/g-3]
G-1 Electric Box of Machine .....	Page g-1
G-2 Details of Part (A) (B) .....	Page g-2

**H. SWITCHES ON OPERATION PANEL OF MACHINE** ..... [Page h-1/h-20]

    H-1 Switches on Operation Panel ..... Page h-3

    H-2 ATC Rotation Pushbutton ..... Page h-20

    H-3 Spindle Clamp/unclamp Switch ..... Page h-20

**I. MANUAL OPERATION** ..... [Page i-1/i-10]

    I-1 Zero Point Return ..... Page i-1

    I-2 Jog Feed ..... Page i-2

    I-3 Rapid Traverse ..... Page i-3

    I-4 Handle Feed ..... Page i-4

    I-5 Spindle Revolution and Stop ..... Page i-5

    I-6 Releasing Overtravel ..... Page i-6

    I-7 ATC Manual Operation ..... Page i-7

        I-7-1 Operation Procedure ..... Page i-9

        I-7-2 Movement of Respective ~~Setp~~ <sup>step</sup> ..... Page i-9

        I-7-3 If Trouble Occurs during ATC Operation ..... Page i-10

**J. MDI OPERATION** ..... [Page j-1/j-4]

    J-1 MDI Operation ..... Page j-1

    J-2 Spindle Revolution ..... Page j-3

    J-3 Spindle Orientation ..... Page j-3

    J-4 Tool Magazine Indexing ..... Page j-4

    J-5 Tool Change ..... Page j-4

**K. AUTOMATIC OPERATION** ..... [Page k-1/k-7]

    K-1 Starting Automatic Operation ..... Page k-1

    K-2 Stopping and Restarting Automatic Operation ..... Page k-3

    K-3 Tool Change ..... Page k-4

    K-4 Tool Registration ..... Page k-5

    K-5 Programming ..... Page k-7

**L. ADJUSTMENT AND MAINTENANCE** ..... [Page l-1]

    L-1 Backlash Compensation ..... Page l-1

**M. PERIODICAL CHECK-UPS AND MAINTENANCE** ..... [Page m-1/m-3]

    M-1 Periodical Check-ups ..... Page m-1

        M-1-1 Check-ups before Operation ..... Page m-1

        M-1-2 Monthly Check-ups ..... Page m-2

        M-1-3 Semi-annual Check-ups ..... Page m-2

        M-1-4 Annual Check-ups ..... Page m-2

    M-2 Operation Panel ..... Page m-3

<b>N. EMERGENCY MEASURES FOR ELECTRIC SERVICE INTERRUPTION AND EMERGENCY STOP .....</b>	<b>[Page n-1/n-2]</b>
<b>O. PNEUMATIC CIRCUIT .....</b>	<b>[Page o-1/o-2]</b>
O-1 Pneumatic Circuit .....	Page o-1
O-2 Solenoid Valve List .....	Page o-2
O-3 Arrangement of Solenoid Valves .....	Page o-2
<b>P. LIMIT SWITCH.....</b>	<b>[Page p-1/p-6]</b>
P-1 Limit Switch List .....	Page p-1
P-2 Arrangement of Limit Switches .....	Page p-2
<b>Q. ATC AREA.....</b>	<b>[Page q-1]</b>
<b>R. TOOL SHANK .....</b>	<b>[Page r-1/r-2]</b>
R-1 BT 40 .....	Page r-1
R-2 CAT40 .....	Page r-2
<b>S. SPINDLE SPEED RANGES.....</b>	<b>[Page s-1/s-3]</b>
S-1 Spindle Speed : 4000 rpm (option) .....	Page s-1
S-2 Spindle Speed : 6000 rpm (option) .....	Page s-2
S-3 Spindle Speed : 10000 rpm (option) .....	Page s-3
<b>T. MISCELLANEOUS FUNCTIONS (M FUNCTIONS) .....</b>	<b>[Page t-1/t-2]</b>

PARTS LIST

P M C - 5 V

(20 ATC)

# CONTENTS

Spindle Head Body	51S90SHB-B	1
X-axis, Table and Carriage	5VT16XTCA	6
Y-axis, Table and Carriage	5VT16YTCA	9
Z-axis and Column (1)	5VT16ZC0(1)	13
Z-axis and Column (2)	5VT16ZC0(2)	15
ATC (Top View)	5VT20ATC	17
Magazine	5VT20M	18
Magazine (Top View)	5VT20MTV	23
Double Arm Box (1)	5VT20DAB(1)	25
Double Arm Box (2)	5VT20DAB(2)	27
Double Arm Box (3)	5VT20DAB(3)	30
Double Arm	5VT20DA	33
X-axis Dog	5VT16XD	35
Y-axis Dog	5VT16YD	36
Z-axis Dog	5VT16ZD	37
Assembly Drawings		