

CNC SYSTEMS

OSP5020L

OSP5000L-G

LR Series CNC Lathes

MAINTENANCE MANUAL (3rd Edition)

TABLE OF CONTENTS

	<u>PAGE</u>
SECTION 1 SPECIAL FEATURES OF OSP5020/OSP5000 SERIES	1
SECTION 2 SUMMARY OF OPERATION	2
SECTION 3 STRUCTURE OF OSP5020L/OSP5000L-G	3
1. CPU and Power Supply Unit	3
2. Servo Drive Unit	3
3. Relay and Magnet Switch Circuits	3
4. Spindle Drive VAC Motor Control	4
5. Control Enclosure	4
6. Operation Panel	4
7. Absolute Position Feedback Encoders	4
8. Cooling Unit	4
9. Turret Control Unit	5
SECTION 4 MAINTENANCE AND INSPECTION	6
1. Inspection during Installation	6
1-1. Installation Site	6
1-2. Environmental Requirements	6
1-3. Power Supply Voltage Inspection	7
2. Periodical Inspection	7
3. Operation and Structure of the NC	8
3-1. Example of Operation	8
3-2. Description on Each Major NC Unit	9
4. Self-Diagnostics	11
4-1. Alarm Display and Error Display	11
4-2. Check Data Display	11

	<u>PAGE</u>
SECTION 5 TROUBLE AND TROUBLESHOOTING	30
1. Analysis of Trouble	31
2. Machine-Mounted Electricals	32
2-1. Inspection of Limit Switches (Check Method by Multi-Meter)	33
2-2. Inspection of Limit Switches and Proximity Switches Using Self-diagnostic Function	34
3. Inspection of Position Encoder	35
4. CPU	36
4-1. Operation and Structure of the CPU	36
4-2. Checking CPU Operations	38
4-3. Loading Control Software through Floppy Disk	39
4-4. CPU Power Supply	42
5. Relay and Magnet Switch Circuits	44
5-1. Operation and Structure of a Relay and Magnet Switch Circuit	44
5-2. Inspection of Relays and Magnet Contactors	45
SECTION 6 COOLING UNIT	48
1. Maintenance and Inspection	48

	<u>PAGE</u>
SECTION 7 C-AXIS OF MULTIPLE-MACHINING MODEL	49
1. C-Axis Joint Mechanism	49
2. C-Axis Joint Methods	50
2-1. Checking C-axis Joint Method	50
2-2. Spindle Driven by C-axis During C-axis Joint	51
2-3. High Speed C-axis Joint A	53
2-4. High Speed C-axis Joint B	54
2-5. Supplements to Joint Method Explanations	56
3. C-Axis Joint Parameters	57
3-1. Spindle Orientation Position Parameter	57
3-2. Zero Position in Spindle Orientation for C-axis Joint	58
3-3. How to Set Zero Position of Spindle Orientation for C-axis Join	59
4. Trouble and Troubleshooting for C-Axis Joint Operation	60
4-1. Machine Condition Checking Procedure	60
4-2. Troubles and Troubleshooting	63
SECTION 8 ELECTRICAL SPARE PARTS LIST	65
SECTION 9 POWER REQUIREMENTS	69
APPENDIX	
Layout Diagrams of Machine-mounted Electricals	77
Operation Panel	82
Internal Layouts of CNC Unit	84
SUPPLEMENT 1 BRUSHLESS SERVOMOTOR DRIVE UNIT (BL-D**A Series)	96
1. Configuration of BL-D**A	96
2. Construction	97
3. Protection and Alarm Monitoring Function	99
4. Trouble and Troubleshooting	101
5. Checking Power Transistor	106

	<u>PAGE</u>
SUPPLEMENT 2 SPINDLE DRIVE UNIT FOR VAC MOTOR (OKUMA MAKE)	107
1. Outline	107
2. VAC Drive Unit Construction	107
3. Operation Status Indication	112
3-1. Control PCB Operation Status Indicating Lamps	112
3-2. Operation Status Indicating Lamps	113
4. Troubleshooting	124
4-1. Confirmation of Power Supply, Connectors and Signals	124
4-2. Trouble and Troubleshooting	125
4-3. Recovery from Failure Status	133
5. Fuse Replacement	134
6. Inspection and Maintenance	138
7. Input/Output Signal Table	140
SUPPLEMENT 3 TURRET CONTROL UNIT (TCU)	142
1. General	142
2. Composition	143
3. LED Indications	144
3-1. Indication by LEDs 1 - 5 while the TCC is Operating Correctly	145
3-2. Indication of LEDs 1 to 5 under Error Status	145
4. Troubleshooting	146
5. Replacing Fuse	146
SUPPLEMENT 4 OVERVIEW OF TURRET CONTROL CARD (TCC)	150
1. Features	150
2. Turret Index Control/Mechanism Diagram	151
3. Status Indication	152
3-1. Indication by LEDs 1 - 5 while the TCC is Operating Correctly	152
3-2. Indication by LEDs 1 - 5 when An Error Occurred	152
4. Troubleshooting	153
4-1. Turret Problems Not Sounding Alarm	153
4-2. Alarm Code List	154

	<u>PAGE</u>
SUPPLEMENT 5 PCB TYPE RELAY BOARD PARTS ARRANGEMENT DRAMINGS	157