

MANUAL No.4773GB ©

SERIES No.172

PARTS No. 383229

PH-3500

Profile Projector

User's Manual

Read this User's Manual thoroughly
before operating the instrument. After reading,
retain it close at hand for future reference.

Mitutoyo

CONTENTS

PRECAUTIONS	i
1. OUTLINE	2
1.1 Outline	2
1.2 Features	2
1.3 Nomenclature	3
1.3.1 Front view	3
1.3.2 Right side view	4
1.3.3 Left side view	4
1.3.4 Angle counter unit (front)	5
1.3.5 Control panel (front)	5
1.3.6 Power panel (rear)	6
2. UNPACKING, INSTALLATION, ASSEMBLY, INSPECTION, AND ADJUSTMENT	8
2.1 Unpacking	8
2.2 Setup	10
2.2.1 Carrying-in	10
2.2.2 Environmental conditions	11
2.2.3 Installation	12
2.3 Assembly	13
2.3.1 Mounting the microstage	13
2.3.2 Mounting the surface illuminator	15
2.3.3 Mounting the lens	16
2.3.4 Connecting the external counter unit	18
2.3.5 Setting the power voltage	20
2.3.6 Connecting the power cord	20
2.4 Initial Check	21
2.4.1 Function check	21
2.4.2 Performance check	23
2.5 Adjustment	28
2.5.1 Centering the protractor screen	28
2.5.2 Adjustment of the direction of the filament	29

3. OPERATION	30
3.1 Projection Lens Selection	30
3.2 Positioning the Workpiece	31
3.3 Projecting Methods	32
3.3.1 Projection by contour illumination	32
3.3.2 Projection by surface illumination	33
3.3.3 Projection by both the contour and surface illumination	35
3.4 Preparation for Measurement (Positioning and Focusing)	36
3.5 General Measurement and Inspection	38
3.5.1 Dimensional measurement using a scale	38
3.5.2 Comparison with an overlay chart	39
3.6 Measurement Using an External Counter Unit	40
3.6.1 Measurement with an K Σ counter	40
3.6.2 Measurement with a GEO-CHEK counter	42
3.6.3 Measurement with a PM counter	44
3.7 Angle Measurement	46
3.7.1 Protractor screen	46
3.7.2 Angle counter	47
3.7.3 Measurement	48
3.8 Troubleshooting	52
4. MAINTENANCE	56
4.1 Maintenance of Optical Components	56
4.1.1 Projection lens and condenser lens	56
4.1.2 Half-reflecting mirror for surface illuminator	56
4.1.3 Mirror (surface reflection mirror)	56
4.1.4 Screen glass	57
4.2 Maintenance of Mechanical Components	57
4.2.1 Projector main unit	57
4.2.2 Microstage	57
4.3 Replacing Disposable Parts	58
4.3.1 Fuse	58
4.3.2 Bulbs for contour and surface illuminators	58
4.3.3 Surface illuminator lamp	60
4.4 Periodic Inspection	61
4.5 List of Parts for Maintenance	61

5. SPECIFICATIONS	62
5.1 Specifications of the Main Unit	62
5.2 Projection Specifications	64
5.3 Optical Path	65
5.3.1 Optical system of the contour illuminator	65
5.3.2 Optical system of the surface illuminator	65
5.4 Dimensions	66
5.5 Accessories	67
5.5.1 Standard accessories	67
5.5.2 Optional accessories	68
5.6 System Configuration	70
5.6.1 System block diagram	70
APPENDIX	72
MSPC (Mitutoyo Statistical Process Control) System	74