SFP-550E3 Operating Manual FP-IM55E3 (Ver. 2.0)

# SFP-550E3 Operating Manual



# **Safety Precautions**

This manual shows the following symbols for proper and safety operation of SFP-550E3 polishing machine and for prevention of damages to the polishing machine.

Below explains meanings of each symbol. Please read and have your understanding and follow the instructions indicated by the markings.

Warning	Improper handling with negligence of this precaution may result in death or serious injury
Caution	Improper handling with negligence of this precaution may result in injury or material

# Examples of Symbols



This symbol refers to any caution (including danger and warning). Example in the left shows "Warning or Precaution" for safety.



This symbol refers to any prohibition. Example in the left shows "No disassembly."



This symbol refers "Unplug the power cable from the outlet."



Never touch or gain access to moving parts, the arm of the fiber holder hand or finger during operation. Otherwise, you may injure.



Do not touch the polishing machine during operation. Do not replace polishing holder during operation. Please unplug power cable after work.



Do not touch the operation panel or the switch with wet hand or Do not connect or disconnect the power cable with wet hand. Otherwise, you may get electric shock, accident or failure may occur.



Be sure to use specified voltage and connect grounding terminal (Class 3 or greater grounding). Otherwise, fire, electric shock, accident or failure may occur



Turn off the power and unplug the cable from the outlet for the following cases. Otherwise, fire, electric shock, or accident may occur.

- When fuse is replaced (use 2A)
- When any abnormalities such as abnormal odor, smoke or abnormal noise are occurred.



# Introduction

-Thank you for purchasing SFP-550E3 Polishing Machine -

This operating manual covers operating procedures for SFP-550E3 Polishing Machine in depth. Before use, read this manual carefully and familiarize yourself with the various features and functions of this machine.

# Features of SFP-550E3

Designed to polish the ferrule end faces of fiber-optic connectors with high quality and productivity, the SFP-550E3 offers the following features:

# High Productivity and Low Cost Performance

Capability of quick polishing up to 48 ferrules\* at once provides high productivity and low cost performance.

(\*The number of ferrules varies slightly depending on the types of connectors.)

High quality polishing as back reflection of 50dB min (HPC polishing) by right-angled convex polishing and 60dB min (Angled PC) by angled convex polishing can be obtained.

# Easy Operation

Both operation and maintenance are remarkably easy and require no special skills.

# Wide Range of Application

Applicable to FC, SC, ST, LC, MU, E2000, MT and other various connector types in high precision polishing of physical contact, angled physical contact or flat contact, simply by changing the polishing holders.

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# 1. Specification

# 1.1 Structure and Parts





# 1.2 Standard Specifications

Item	Specification
Power Supply Voltage, Frequency Power Consumption	AC100-240V, 50Hz/60Hz 80VA
Drive Unit Revolution Motor Revolution Speed Rotation Motor Rotation Speed Cooling Fan	50W motor with reduction gear 70-200 rpm 30W motor with reduction gear 0.7-2.0 rpm (1/100 of revolution speed automatically adjusted) $\phi$ 80 mm propeller fan
Operating Unit Touch Panel Power Switch Emergency Stop Button	Rocker switch
Pressurizing Unit Pressurizing Method	By clamps on the four corners with coil springs.
Polishing Materials Polishing Film	Outer diameter: 127mm, plastic base
Polishing Pad	Glass pad for flat polishing Synthetic rubber pad for PC/APC polishing
Performance PC Polishing ( $\phi$ 2.5 Pre-Domed Ferrule) Angled PC Polishing ( $\phi$ 2.5 Step Ferrule)	4 processes, 2.0min approx. (HPC polishing) 5 processes, 3.0min approx. (APC polishing)
Dimensions and Weight Dimensions Weight	W230 x D310 x H295 18.5kg

Note: Above specifications are subjected to change without notice.

# 1.3 Standard Accessories for Polishing Set

Parts Name	P/N	Qty
Other Accessories		
Coil spring	RP55C-14	4
2A fuse	RP55-56	2
Hexagon wrench L	RP55C-71	1
Hexagon wrench S	RP55C-72	1
M5-45 bolt	RP55C-73	1
Power cable	RP55-30	1
Cable hanger	FP-CH	1
Manual		
Operation manual	FP-IM55E3	1
Process manual	FP-PM55E3	1
Maintenance manual	FP-MM55E3	1

Note: Above accessories are subjected to change without notice.

# 2. Operating Procedures

# 2.1 Operating Panel

# Front Panel



# < Operation Procedure >

① Power Switch ON

Ensure that the emergency stop button is off and then turn on the power switch. After the power switch is turned on, the cooling fan will start running and the main menu screen appears. Maintenance screen will appear when the total polishing time has been over the limit for regular inspection/maintenance. Detail for the maintenance screen is on page 19-20.

#### 0 Machine Operation

SFP-550E3 is operated by the screen of the touch panel. Detail for the operation with the touch panel is in page 12-18.

#### ③ Emergency Stop Button

The machine is stopped when the emergency stop button is pushed (ON) during polishing. During the emergency stop is on, the following screen is appeared and the machine does not function. To resume machine in function (emergency stop OFF), press and turn the emergency stop button slightly in clockwise.



④ Power Switch OFF

When you finish operation, make sure to turn off the power switch. Also ensure to go back to "Main Menu" screen before turning off the power switch. Do not turn it off during polishing or the programs may be erased.

#### ♦<u>Rear Panel</u>

<Fuse Holder>

To change fuse, pull out the Fuse Holder and take out the fuse from the Fuse Holder.

<Power inlet>

Insert the plug of the power cable.



#### 2.2 Touch Panel

The operation of the touch panel is described in this section. The following screen is the main menu that appears right after the power switch is on.



The main menu consists with four functions: "POLISHING PGM" (Program Polishing), "PGM SETTING" (Program Setting), "MANUAL POLISHING" and "MAINTENANCE." Operating method for each function is explained as follows.

# POLISHING PGM (Program Polishing)

Polishing is performed as per the polishing processes programmed in advance. When you select POLISHING PGM, the following screen (program list) is appeared.



Select the desired polishing process from the program list from 12 programs. After you press one of polishing processes, the following screen is appeared.



#### Explanation of symbols

Step:	This indicates polishing step. There are 8 steps in max in one process. # of step
	you are on is indicated in black color. During polishing, Speed and Time on your
	step are flashing.
On/Off:	On indicates activated step. Taking the above page as an example, 3 polishing
	steps are activated.
Speed:	This indicates revolution speed of each step
Time:	This indicates polishing time of each step
START	This is to start polishing as per input condition of the polishing step you are on
>>>	This is to change polishing step you are on (forward)
<<<	This is to change polishing step you are on (backward)

If you wish to change content of programmed polishing processes, next explains how to change.

## PGM SETTING (Program Setting)

Polishing programs can be written and changed at PGM SETTING on the main menu.

Contents you can edit are Program name, Turntable revolution speed and Polishing time for each step. You can store 12 different programs (processes) and each process can contain up to 8 steps.

When you press PGM SETTING button, the following screen is appeared.



Select desired  $\overrightarrow{PGM*}$  button from the program list and the following screen is appeared. This page is to confirm content of each programmed steps and also you can edit.

On the touch panel, from STEP1 to STEP4 is shown in one page. And from STEP5 to STEP8 is shown in next page which you can go by pressing <u>NEXT STEP</u>. If you want to go back to previous page for STEP1 to STEP4, then press <u>BACK</u>.



#### PGM NAME

PGM SETTING PGM ** (1/2) PGM NAME D250HPC								Ð	ЯП	
Q	₩	Ε	R	Т	Y	U	Ι	0	Р	Γ
A	S	D	F	G	Н	J	К	L	BS	
ES	Z	Х	C	۷	В	Ν	M	ENT	≁	

#### Select Polishing STEP to be activated

Next step is to decide how many polishing steps you want to activate. For polishing step you want to activate, press On/Off box and select ON. For the steps selected as ON, input boxes for Speed and Time selections are appeared. For example, if you want to make a polishing process consist with 3 steps, then activate (ON) from STEP 1 to STEP3 and the rest of steps to be OFF. On the touch panel, from STEP1 to STEP4 is shown in one page. And from STEP5 to STEP8 is shown in next page which you can go by pressing NEXT STEP. If you want to go back to previous page for STEP1 to STEP4, then press BACK.



#### Speed and Time setting

For Speed and Time setting, press numeric boxes and then numeric key is appeared to input. After enter desired speed or time, please make sure to press ENT to fix entry.

PGMSET	FING PG	M 5 (1 /2) зм маме <sub>D</sub>	250HPC	7	8	9
STEP1	On/Off on	Speed 110	<b>Time</b> 20	4	5	6
STEP2	on	110	20	1	2	3
STEP3 STEP4	on off	110	20	0	ESC	ENT
PGM SETT		VI 01 (27) D2 Speed	2) 50HPC Time		Đ	r]

- Speed; you can input turntable revolution speed range between 70rmp and 200rpm. Note: Rotation speed is automatically adjusted as per revolution speed (1/100 of revolution speed
- Time: you can input polishing time range between 5 sec and 600sec.

After all parameters are set, press EXIT button to finish setting

## MANUAL POLISHING (Multi timer)

Revolution Speed and Polishing Time can be set in 4 different timers for Manual Polishing. Press MANUAL POLISHIGN on the main menu page and the following screen is appeared.

• START is start button to polish as per input Time and Speed.

Button to start		<sup>[imer-2</sup>		imer-3	ART	Timer S1	-4 Fart	EXIT-	Button for
polishing	20	1	2	3	4	5	CLR	20/	Main menu
	Speed 110	6	7	8	9	0	ENT	sec Speed	
	10 Reset	10 🖪	eset	10	Reset	10	Reset	110 դրա	

 If you want to change value of each parameter (Time and Speed), press the button of desired parameter box and numerical key is appeared as follows. Input desired number and press ENT button. Then, the value is set and the screen goes back to "Manual Polishing" screen.



Applicable input value for each program is as follows.

Polishing Time:	5-600 (sec)
Revolution Speed:	70-200 (rpm)

Note: Rotation speed is automatically adjusted as per revolution speed (1/100 of revolution speed)

• Counter is film usage counter. After each polishing round, number in counter goes up. Reset is to reset count to 0.

		START	Timer-2		fimer-3	ART	Timer S1	-4 TART	
RESET	] —	20	1	2	3	4	5	CLR	20/
button			6	7	8	9	0	ENT	/ sec Speed
	J	10 Reset	10 8	eset	10	Reset	10	Reset	110 npma

 In case you want to use film that is already used, you can start the counter from desired used times. By pressing number of each counter, numeric key is appeared as follows and you can enter desired used times.

Timer-1	imer-2		imer-3	ART	Timer S1	-4 FART	EXIT
1 me 20	1	2	3	4	5	CLR	Time
Speed 110	6	7	8	9	0	ENT	sec Speed
Counter 10 Reset	10 🖪	eset	10	Reset	10	Reset	110 <b>гр</b> т

• Press EXIT button, then the screen goes back to main menu screen.

#### ◆ <u>MAINTENANCE</u>

In "MAINTENANCE" screen, you can see accumulated polishing time, accumulated running time and progress time from the last maintenance for every 100 and 500 hours.

Press button for desired parameter. Each maintenance pages are following.



 ACCUMULATED POLISHINGTIME is accumulated polishing time since start of machine and cannot be reset. POLISHING TIME is polishing time since after last rest.



 ACCUMULATED RUNNING TIME is accumulated power-on time since start of machine and cannot be rest. RUNNING TIME is power-on time since last rest.



• Progress time" from the last Maintenance

In each timer, the time count can be reset as 0 (zero) by pressing **RESET** button. When the time has passed each designated maintenance time, the following screens are appeared

#### 100-hours-maintenance



After passing 100 operating hours, the maintenance for 100 hours is appeared.

If you do not wish to apply maintennance, then just press OK (the same message will be appeared after little while)

When the maintenance is done, press FINISH MEAINTENANCE. And then, as for confimration of maintenance work, below message is appeared. When maintenance is done, press  $\underline{YES}$ . If maintenance is not done, press  $\underline{NO}$  and then you go back to the previous menu for 100 hours maintenance and press  $\underline{OK}$ .



Procedure is same for 500-hours-maintenance



#### Battery Replacement for PLC and Touch Panel

When the batteries become time for replacement, the following message is appeared.

We recommend that batteries are sourced locally.

PLC battery:	OMRON	P/N: CP1W-BAT01
Touch panel battery	OMRON	P/N: NVBAT01

If the batteries can not be sourced locally, please return the touch panel or polishing machine to Seikoh Giken.

MAINTENANCE	OK	
Please change battery for PLC		
MAINTENANCE	ОК	
MAINTENANCE	OK	
MAINTENANCE Please change battery for Front Pan	OK el	
MAINTENANCE Please change battery for Front Pan	OK	

After the replacement, press OK. Also, please be noted, replacement shall be done within one week after the message is appeared. For repalcement work, the polishing machine shall be tunred on power for more than 30 minutes beofre replacement work starts. But power must be off and power cable must be pluged out duing the replacement work. The replacement work shall be done with in 5 minutes.

Battery location for PLC (located inside of the Housig)



Battery location for the Touch panel (located back side of the Touch pane)







## 2.3 Turntable Assembly

#### Turntable Structure

The turntable rotates by 30W motor with reduction gear and also moves in eccentric circular motion and revolves by 50W motor with reduction gear.

#### ◆ <u>Maintenance for Turntable Assembly</u>

No maintenance is required on the turntable and on its assembly as a regular basis. However, inspection and cleaning are recommended for every 3000-4000 hours of operation or every one or two years.

#### $\Rightarrow \Rightarrow \Rightarrow CAUTION \Rightarrow \Rightarrow \Rightarrow$

Please refer to the maintenance manual before you work on the maintenance. Please do not disassemble or apply any maintenance on the areas and parts not described on the maintenance manual.

#### 2.4 Polishing Materials

#### Polishing Films

Use the correct polishing film. Polishing films can be easily distinguished by color or label. Service life (limit of use) will varies depending on the type of film used. Store the polishing film in a dry environment after wiping the film dry and clean.

Polishing Film	Identification	Service Life (Limit of Use)
GA5D	Green	1-10
DA5D-30u	Green	15-30
DR5D-9u	Pink	15-30
DH5D-3u	Light green	15-30
DJ5D-1u	Lavender	15-30
XF5D	Translucent	5-10

#### ◆ Polishing Pad

Several polishing pad types are available for various uses. Use only the pad specified for each purpose. The identification mark of each pad is on the center of its reverse side. Attach a polishing film on top of the polishing pad as shown below. Replace the polishing pad with new one regularly as the lifetime of one year. Also replace pad with new one when the pad is damaged or deformed.

#### a. Pad for Convex Polishing

Made of synthetic rubber, this pad has an identification mark at the center of its reverse side. Make sure the top surface of the pad is clean when attaching a polishing film. Please refer Polishing Process Manual for how to attach polishing film. Do not use thinner, acetone, or other solvents, since such solvents will affect to the quality of the pad.



#### b. Pad for Flat Polishing

Made of glass with antiskid rubber film on the reverse (bottom) side. This pad has an identification mark at the center of its reverse side. Make sure the top surface of the pad is clean when attaching a polishing film. Attach a polishing film to this pad with double-sided tape. For mega-axis holders, please use repositionable spray glue or film with PSA backing. Do not use thinner, acetone, or other solvents, since these solvents will affect to the quality of the pad.



#### Important!

Apply the double-sided tape to the center diameter of 30mm on the pad so that the ferrule end faces, during polishing, will not be on the area that the double-sided tape be placed. When changing film, clean the surface of the pad and make sure the pad surface is free of foreign particles. Such particles can cause the film to come loose, or scratch the ferrule

## 2.5 IPC (Individual Pressure Control) Polishing Holder

#### Polishing Holder Design

There are two types of polishing holders; one for right-angled flat or right-angled convex (PC) polishing and the other for angled flat or angled convex (APC) polishing. Each holder is available to suit different connector types. The polishing holders have maximum 48 adapters mounted on the square plate as shown in the right hand figure. (The figure is a holder with 20 adapters mounted.) The polishing holder has round shape cutouts on the four corners to place it onto the clamping posts of the base plate.

When connectors are mounted, the tip of ferrules must protrude at least 0.5mm from the bottom side of the polishing holder after adhesive removal process.



 $\Rightarrow \Rightarrow \Rightarrow \mathsf{CAUTION} \Rightarrow \Rightarrow \Rightarrow$ 

Make sure that the ferrule-reference plane and the ferrule insertion holes are clean. This will ensure that all ferrules protrude to the same height, thereby ensure desired polishing results.

Accuracy of polishing holders affects on polishing result. Thus, please be aware with these points. Before installing ferrules, please make sure to clean ferrules and ferrule insertion holes with lint-free tissues. The polishing holders are made of stainless steel. However, to avoid its rusting, it is recommended that all traces of water must be removed and lubrication oil is sprayed after use. Although the polishing holders are heat-treated, please avoid anything leads to damage such as bending, falling, or applying any shock.

#### 2.6 Pressurizing & Holding Unit

The clamping posts standing on the four corners of the base plate have pressurizing units with coil springs inside. The clamps on the corners hold the polishing holder.



#### 2.7 Operation

- ① Mount optical connectors or ferrules on the polishing holder.
- ② Install the polishing holder on the polishing machine.
- ③ Turn the clamping levers on the four corners so that their pressure pins are clear off the polishing holder area.
- ④ Place the polishing holder on the polishing machine between the clamps.
- 5 Pull up and turn the four clamping levers until their pressure pins are fully over the polishing holder.
- 6 Turn the four clamping levers when the holder is removed



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