

SFP-560A3C

SFP-560A3C-FA

Operation Manual



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Safety Precautions

This manual shows the following symbols for proper and safety operation of SFP-560A3C / FA 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 physical damage.

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."



WARNING



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.



WARNING



Do not touch Auto clamp when press Start
Do not touch Auto clamp during operation.
Do not remove cover during operation.
Do not touch inside cover during operation.





CAUTION

Never perform the following actions. Otherwise, fire, electric shock, accident or failure may occur.



- Please wear proper uniform and safety shoes when you work
- Please place the polishing machine on flat and rigid work table.
- Do not place any object on the polishing machine
- Do not place or leave the polishing machine outdoor or at the place here the polishing machine is exposed to water.
- Be careful not to fall the polishing machine in transport condition.
- Do not apply shock or drop the polishing machine.
- Do not place any objects on the power cable.
- Do not twist or pull the cable strongly.
- Do not operate the polishing machine in unmanned.
- Turn off the switch when leaving from the polishing machine.
- Keep away any flammable substances or explosives from the polishing machine.
- Do not place any objects within 30cm from the cooling fan.
- Do not put anything inside the polishing machine.
This may cause accident or failure.
- To prevent corrosion, remove any liquid completely from the polishing machine and avoid using and keeping the polishing machine in humid condition.
- Do not blow air into the service trench. Water entering between the turntable, the support ring and the baseplate will cause serious damage to the polishing machine and require repair.
Since there is no waterproof function due to the structure, wipe off the surrounding water with a waste cloth.
- Use compressed air that meets the requirements to the polishing machine. Check the operation manual for the required values.



Do not disassemble the polishing machine more than described in the manual.

Seikoh Giken does not assume any responsibility for products manufactured with the polishing machine.

Introduction

–Thank you for purchasing SFP-560A3C / FA Polishing Machine –

This operating manual covers operating procedures for SFP-560A3C / FA polishing machine in depth. Before use, read this manual carefully and familiarize yourself with the various features and functions of this machine.

The SFP-560A3C / FA has Auto clamp function, and the polishing holder is clamped automatically. This function offers extra convenience in operation but also requires extra safety precaution. Please be sure to keep hands off from the Auto clamp when press Start as described on the WARNING on Page 3. Touching the Auto clamp with hands or fingers when press Start and during polishing may result in serious injury. In case of emergency, press the Emergency button.

The FA series also includes a remote operation function. When using the communication function, please refer to the separate Modbus TCP Connection Manual.

High Productivity and High Performance

Capability of quick polishing up to 72 ferrules at once provides high productivity and low cost performance. And 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

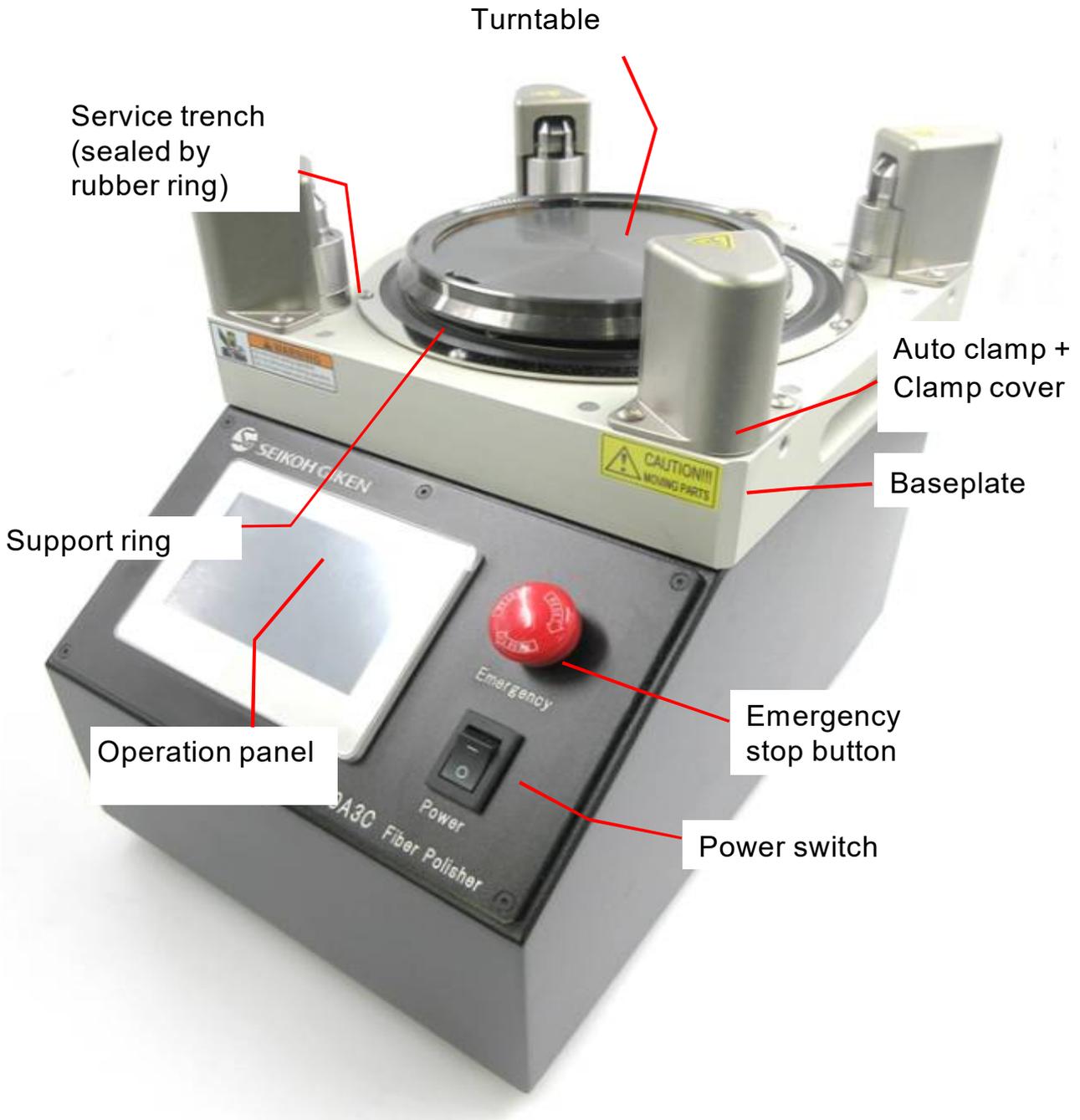
Applicable to FC, SC, ST, LC, MU, E2000, MT and other various connector types in high precision polishing of physical contact, angled physical contact or flat contact, simply by changing the polishing holders.

* * * * * Table of Contents * * * * *

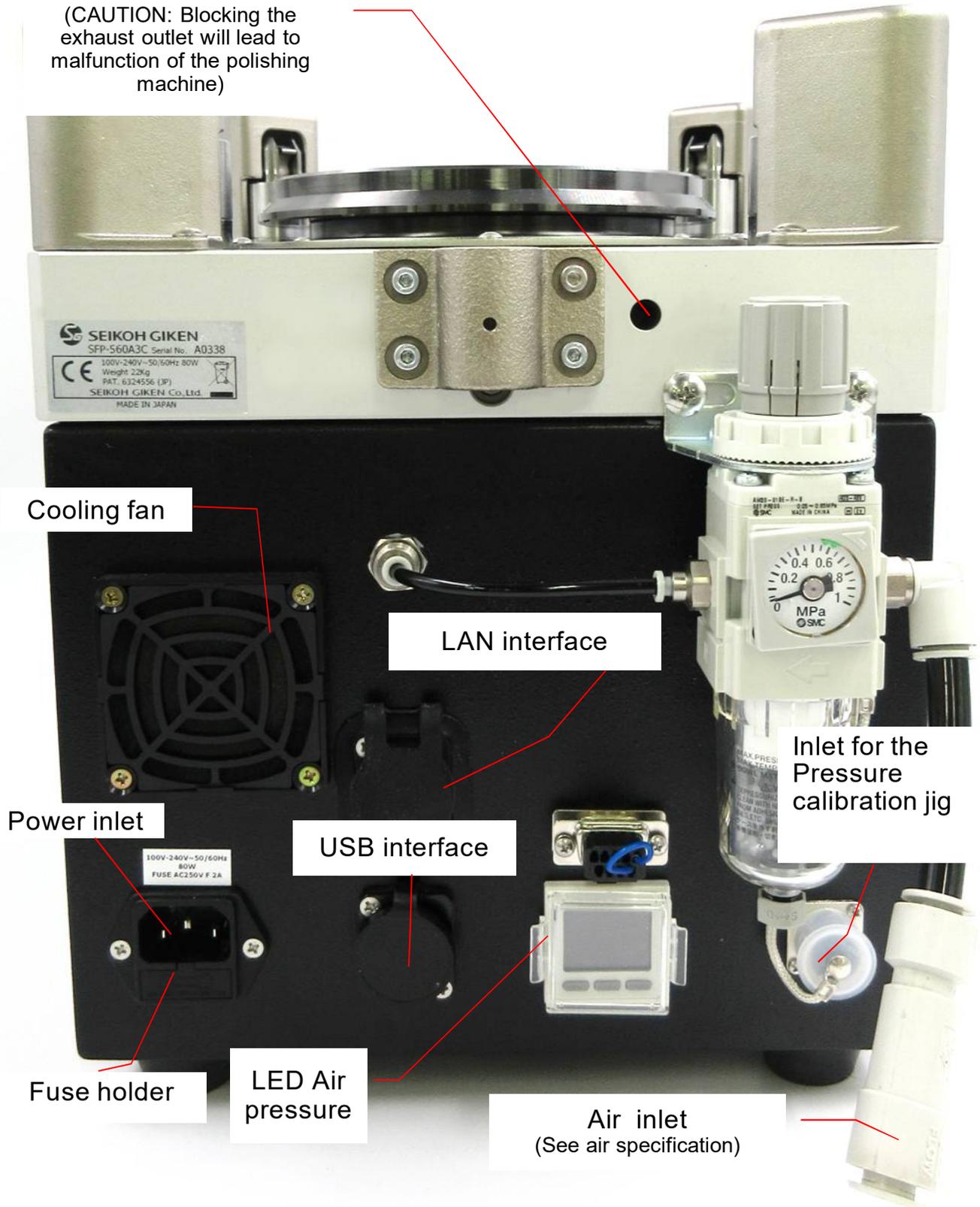
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1. Specification

1.1 Structure and Parts



Air exhaust outlet
(CAUTION: Blocking the exhaust outlet will lead to malfunction of the polishing machine)



Cooling fan

LAN interface

Inlet for the Pressure calibration jig

Power inlet

USB interface

Fuse holder

LED Air pressure

Air inlet
(See air specification)

1-2 Standard Specification

Item	Specification
Power supply, Voltage, Frequency	AC100-240V 50/60Hz, 80VA
Required air	0.6 to 0.8MPa (use dry air meets the specification)
Drive Unit	
Revolution Motor	50W motor with reduction gear
Revolution Speed	10-200 rpm
Rotation Motor	30W motor with reduction gear
Rotation Speed	0.1-2.0 rpm (1/100 of rev. speed automatically adjusted)
Cooling Fan	φ60 mm propeller fan
Operating unit	
Touch Panel	
Power Switch	Rocker switch
Emergency Stop Button	
Pressurizing Unit	
Pressurizing Method	Pressure is by air pressure push up from the Turntable 2N to 200N in DPC mode
Polishing time range	5-600 (sec)
Polishing Materials	Outer diameter: 127mm, plastic base
Polishing Film	Outer diameter: 127mm, plastic base
Polishing Pad	Glass pad for flat polishing Synthetic rubber pad for PC/APC polishing
Performance	
PC Polishing(φ2.5 Pre-Domed)	4 processes, 2.0min approx. (HPC polishing)
Angled PC Polishing(φ2.5 Step)	5 processes, 3.0min approx. (APC polishing)
Dimensions and Weight	W230 x D310 x H295 21.5kg

Note: Above specifications are subjected to change without notice.

1.3 Standard Accessories for Polishing Set

Parts Name	P/N	Qty
Standard Accessories		
2A fuse (in fuse holder)	RP55-56	1
M3×60-SUS bolt	M14-00096	2
Power cable	RP55-30	1
Cable hanger	FP-CH	1
USB memory	FP-USB	1
Check valve	RP56A-24	1
Protective ring	FP-PR56	1
Scanner P/N	FP-SCN56-A	1
Leveling adjuster (A3C-FA only)	FP-LAJST56-A	4
Manual		
Operation manual	FP-IM56A3CFA	1
Process manual	FP-MM56A3CFA	1
Maintenance manual	FP-PM56A3CFA	1
SFP Series Modbus Network Manual	FP-NM56A3CFA	1

Note: Above specifications are subjected to change without notice.

1.4 Preparation

This is an instruction before start polishing.

- 1 Open polishing machine carton box and remove the machine.
- 2 Keep the polishing machine on flat and rigid work table.
- 3 Remove the turntable strap from polishing machine.

Do not dispose the strap. You need to use it when you transport the polishing machine.



- 4 Place the Protective ring FP-PR56



5 Connect the Check valve to the air regulator inlet



Air hose of factory compressed air is connected to this end; make sure to supply dry air meets the specification

One end of the Check valve is already connected with a short hose.
The side with the short hose goes to the air regulator's inlet.
It is because the Check valve allows the flow of the compressed air in one direction.
The short hose is to identify correct connecting direction

Compressed air specification for the polishing machine

Use dry compressed air that meets the following requirements when supplying dry compressed air to the polishing machine.

Compressed air requirement level

JIS B 8392-1:2012[3:5:3]

Applicable standard

Compressed air: Contaminants and purity classes

JIS B 8392-1:2012 (ISO 8573-1:2010)

Requirements

- A** Maximum number of particles per 1 m^3 corresponding to particle diameter d (μm)

	$0.1 < d \leq 0.5$	$0.5 < d \leq 1.0$	$1.0 < d \leq 5.0$
Grade 3	-	$\leq 90,000$	$\leq 1,000$

- B** Humidity and moisture compressed air cleanliness grade
Pressure dew point in $^{\circ}\text{C}$
Grade 5 $\leq +7^{\circ}\text{C}$ (at 0.69MPa)

- C** Clean grade of oil in compressed air
Oil (liquid oil, oil mist and oil vapor)
Total concentration in mg / m^3
Grade 3 $\leq 1\text{mg} / \text{m}^3$

CAUTION

The polishing machine is using high performance air control equipment. Foreign matters, moisture or oil entering the air control equipment may cause a malfunction. Use of compressed air contains moisture or oil accumulates water in the drain of the air regulator (photos can be referred on the Maintenance manual Detail 2-7). If the water is confirmed in the drain, please immediately check the quality of your compressed air in use .

Use of compressed air that does not meet the required quality level may cause serious damage to the polishing machine. If damaged, the polishing machine will malfunction or stop working. The cost of repairs, round-trip fares, alternative aircraft, etc. required for such repairs will not be covered by the warranty and will be paid by the customer. In addition, the repair requires time for repair other than the transportation period. Please control the quality of compressed air used in the

- 6 Connect air hose of factory compressed air to the inlet of the Check valve.
Air hose's outer diameter is 10mm.



- 7 Pull up air regulator's handle and turn clockwise to introduce compressed air into the polishing machine. Recommended air pressure is between 0.6Mpa and 0.7Mpa.
- 8 Push down regulator's handle to the bottom once pressure value is set.

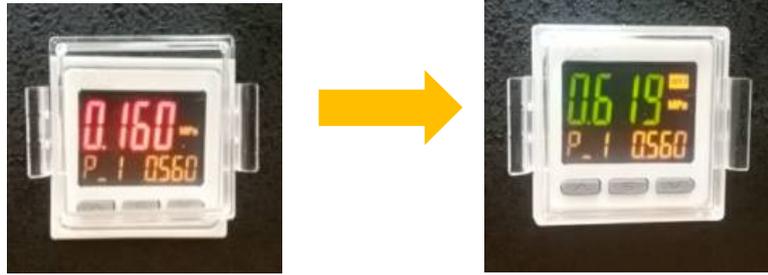


Pull up this handle

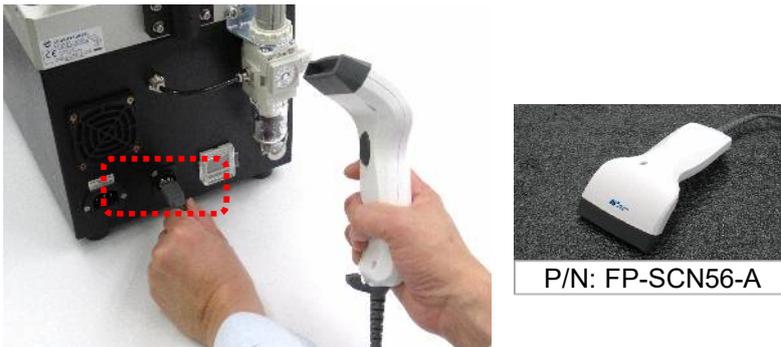


Push down this handle

- 9 After power is on, you can also confirm current air pressure value by the monitor located under the regulator. When LED is lit in green, pressure is OK.



- 10 Set up scanner (Optional). Other than key pad on touch panel, SFP-560A3C / FA is able to load polishing PGM and enter PGM information such as process name, polishing holder P/N, consumables information with barcode scanner. If you prefer using the barcode scanner, connect the scanner to the polishing machine when power is ON, then the machine will beep and the scanner will be activated. Detailed instruction is explained on the Ref 2 and Ref 3.



- 11 Rubber feet screws looseness check (A3C-FA only)

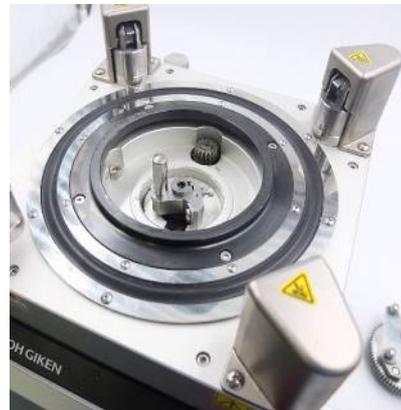
Since the SFP-560A3C-FA can be replaced with the adjusters, the rubber feet are secured with screws only, and no nuts are used to hold the screws from inside the housing. Therefore, the rubber feet may loosen due to vibration during transportation. If they loosen, tighten the screws to secure them in place.



1.5 How to install the leveling adjusters (A3C-FA only)

The SFP-560A3C-FA comes with four leveling adjuster. A purpose of the adjusters is in case of adjusting height / level of the SFP-560A3C-FA such as installing the polisher to an automatic machine. The height of the polisher can be adjusted by replacing the rubber feet on the bottom of the polisher with the adjusters provided. When using the adjusters, please follow the instruction below.

1) Remove the turntable, the positioning plate, the eccentric support plates (3pcs) and 80T gear from the polisher. Since the Polishing machine is tilted down for operation, the above parts must be removed or they will fall off.

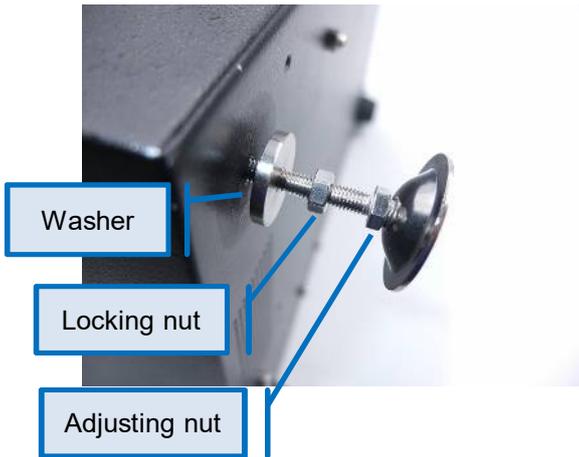


2) Tilt down the Polishing machine and remove the rubber feet. The rubber feet are secured with hexagon socket head cap screws. Tilt the Polishing machine to the side.



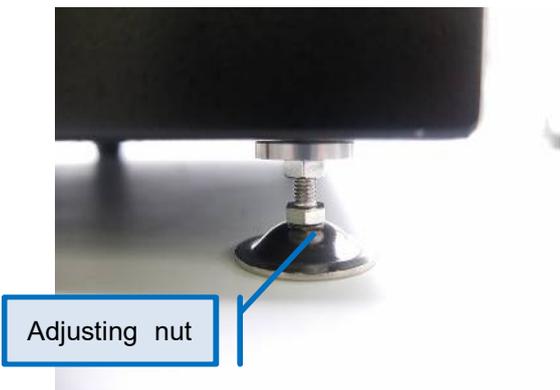
3) Prepare the supplied adjusters and washers. The size of the attached nut is M5; use an 8 mm wrench.

!!! Caution!!!
Be sure to install washers. Fixing without washers may result in the housing deformation.

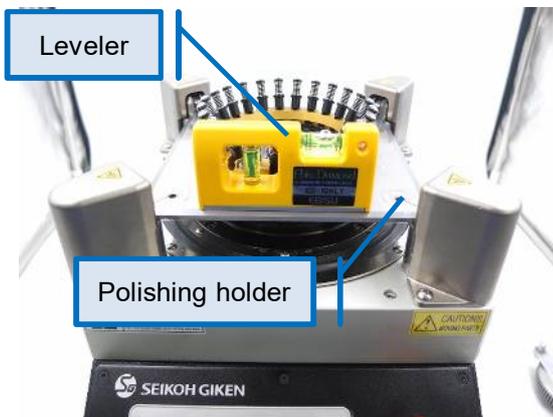


3) Attach the movable nuts and washers to the adjuster in the order shown in the photo, and install the adjuster in the screw hole where the rubber foot was attached.

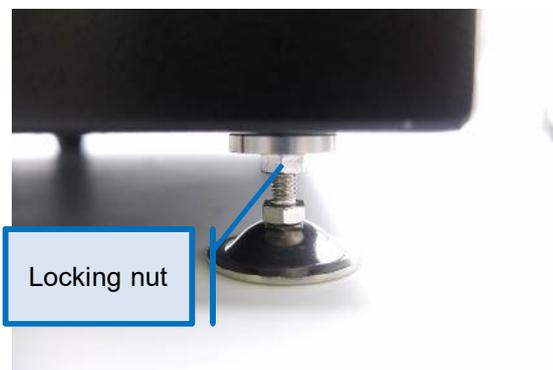
By turning adjusting nut, adjust to the desired height. Install this in four places.



4) After the adjusters are installed, stand the Polishing machine. After standing, check that the four adjusters are in contact with the installation surface. If there is any variation in the height of the four feet, turn the adjusting nuts to adjust the height.



5) The reference plane for leveling the Polishing machine should be on the Polishing Holder. If the machine is not level, adjust the adjuster height by turning the fixing nut and adjusting the level in the same manner as in the 4).



6) After the level adjustment is completed, turn the locking nuts at the four positions to secure the adjusters. The work is completed when the locking nuts are tightened.

2. Operating Procedures

2.1 Operation 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.

② Machine Operation

Polishing machine is operated by the Touch panel screen. Detail for the operation with the Touch panel is described on the next Section 2.2 Touch Panel.

③ Barcode scanner

Other than key pad on touch panel, SFP-560A3C / FA is able to load polishing PGM and enter PGM information such as process name, polishing holder P/N, consumables information with barcode scanner. On Appendix of the process manual, it contains a barcode list of our typical polishing holders and consumables. You can also scan your own consumables names and P/Ns as long as you follow character number limitation and use

Scanner P/N	FP-SCN56-A (included as standard accessory)
Type	USB
Barcode type	Code 39
Format	Scanner can only read Code 39 barcode
Setup	Insert to the USB interface located back side of the machine

④ Emergency Stop Button

As soon as the Emergency stop button is pushed (ON) during polishing, the machine is immediately stopped; the turntable is stopped, operating air is discharged, the clamping of the polishing holder is released. So please use the emergency stop for any emergency situation. During the Emergency stop is on, the following screen is displayed and the machine does not function. To resume machine in function (emergency stop OFF), press



⑤ Power Switch OFF

When you finish operation, make sure to turn off the Power switch.

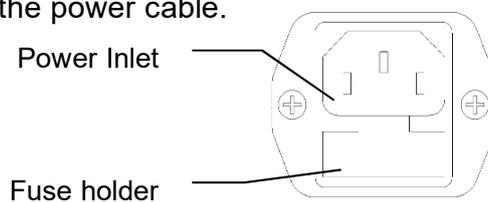
In order to turn off the Power switch, please make sure to go back to "Main Menu" screen before turning off the Power switch.

Do not turn it off during polishing or the programs may be erased by accident.

Rear Panel

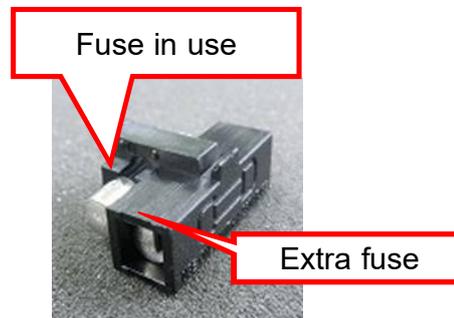
<Power Inlet>

Insert the plug of the power cable.



<Fuse Holder>

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



2.2 Touch Panel

◆ Main Menu

The operation of the touch panel is described in this section.

The following is the main menu that appears right after the power switch is on.



The main menu consists of six functions: "Operation," "Polishing PGM," "Manual Polishing," "Data Transfer," "Maintenance" and "Configuration." The following sections explain how to operate each function.

◆ Operation (Program polishing)

Polishing is done on this Operation screen. The polishing process appeared on the Operation is a process selected on the Polishing PGM.

The Operation screen displays the following information and controls:

- PGM 01 MT DEMO**: Selected polishing process (PGM) number and name.
- QTY. 24 / DPC 24**: Under DPC mode, you can enter Qty of ferrule / connector to polish. In IPC mode, Qty is not displayed.
- StandAlone**: This is pressure mode of this process. In DPC mode, polishing holder capacity, which was entered in process setting, is displayed. In IPC mode, Qty is not displayed.
- Holder MT-24SQ1-B**: Holder information.
- Time 0 / 30**: Polishing time.
- Speed 0 / 110**: Polishing speed.
- Press. 0.0 / 84.0**: Polishing pressure.
- Pad PG5X-490-SR2 / Film GC5D / Liquid D. I. WATER**: Consumables information.
- Film Count 0 / 1**: Film usage count.
- 10/17/21 12:50**: Date and time.
- Status-**: Current status.
- Buttons**: Stop, Start, Reset, Main Menu, Consumables List, Scan Data.

Callouts provide additional details:

- Stop**: Stop polishing on polishing step you are on and release clamping of the holder.
- Start**: The Start button requires a long press to prevent accidental start & clamping. Press down the Start for 0.5 seconds to engage the Auto-clamping, and at the same time, a beep will sound to start polishing.
- Reset**: Long press allows to reset film usage count of this step.
- Main Menu**: To go to Main Menu.
- Consumables List**: View consumables information of entire process (see detail on the next page Ref 1).
- Scan Data**: You can load polishing PGM with barcode scanner (see Ref 2).

Continues from the previous page, below also explains the Operation screen.

Indicates polishing step you are on now

To go back to previous polishing step

To go to next polishing step

Ongoing polishing parameters are displayed during polishing,
 - Polishing time in sec
 - Speed in rpm
 - Press in N (switchable to lb.)

Consumables information entered in the process entry is reflected in this area.
 - Polishing pad
 - Film
 - Liquid

PGM 01 MT DEMO Operation
 Step 1/1 QTY. 24 / DPC 24 Stand Alone
 Holder MT-24SQ1-B Main Menu
 Time 0/30 Speed 0/110 Press. 0.0/84.0
 Pad PG5X-490-SR2 Film GC5D Liquid D.I. WATER
 Consumables List
 Film Count 10/17/21 12:50
 -Status-
 Stop Start Reset Scan Data

Ref 1: Consumables List

This is to view consumables info of entire process This helps operator to prepare consumables for coming steps.

Blinks on the step you are on right now.

Back to the Operation screen

Reset film usage record of this process (PGM) at once

PGM 01 EX. FOR MT Consumables List
 Active Step 1/5 Reset all film usage Reset Back

Step	On/Off	Pad	Film	Life	Liquid
1	ON	PG5X-490-SR3	GC5D	0/0	D.I. WATER
2	ON	PG5X-490-SR3	GC5D	0/1	D.I. WATER
3	ON	PG5X-490-SR3	AR5D	0/1	D.I. WATER
4	ON	PG5X-490-SR3	GH5D	0/1	D.I. WATER
5	ON	PG5X-490-SR3	FM5D-SORP-2	0/1	D.I. WATER
6	OFF				
7	OFF				
8	OFF				

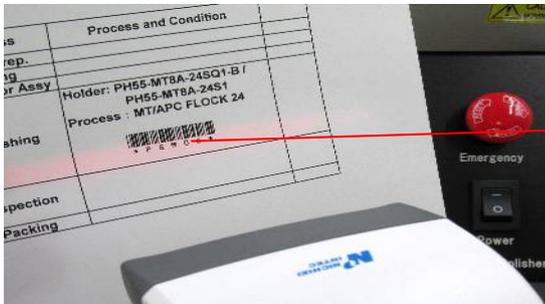
Ref 2: Scan Data

On the scan data screen, various items can be entered manually keypad or with a bar code scanner. Also, by entering the polishing process number, you can select the polishing process on the operation screen. The scanner can read barcode composed of "PGM" + "." (dot) + "XX" (polishing process number) created as per Code 39 format. Examples of barcode information are "PGM.01" and "PGM.12". To read barcode information, press "scan data" and then "scanner". Select the item you wish to enter and scan it with the barcode scanner. keypad" also allows you to enter information on the touch panel.

How to operate is press Scan Data and then press Scanner. Imputable areas becomes highlighted in blue. Press on PGM box and you can scan PGM. Number. Every time you scan a barcode, press the box and scan.



Scan Data	
Item	Scan Data
PGM	PGM.01
Group	SEIKOH GIKEN
Operator	*****
Production No.	2021****_MT24
Holder P/N	MT-24SQ1-B
Holder S/N	9999



Scan Data	
Item	Scan Data
PGM	PGM.01
Group	SEIKOH GIKEN
Operator	*****
Production No.	2021****_MT24
Holder P/N	MT-24SQ1-B
Holder S/N	9999

2 Polishing PGM (Program setting)

Polishing process can be written and changed at the Polishing PGM.

Contents you can edit are as follows.

Program name, Polishing holder P/N,

Consumables info: Pad name, Film name, Pad name, Liquid name

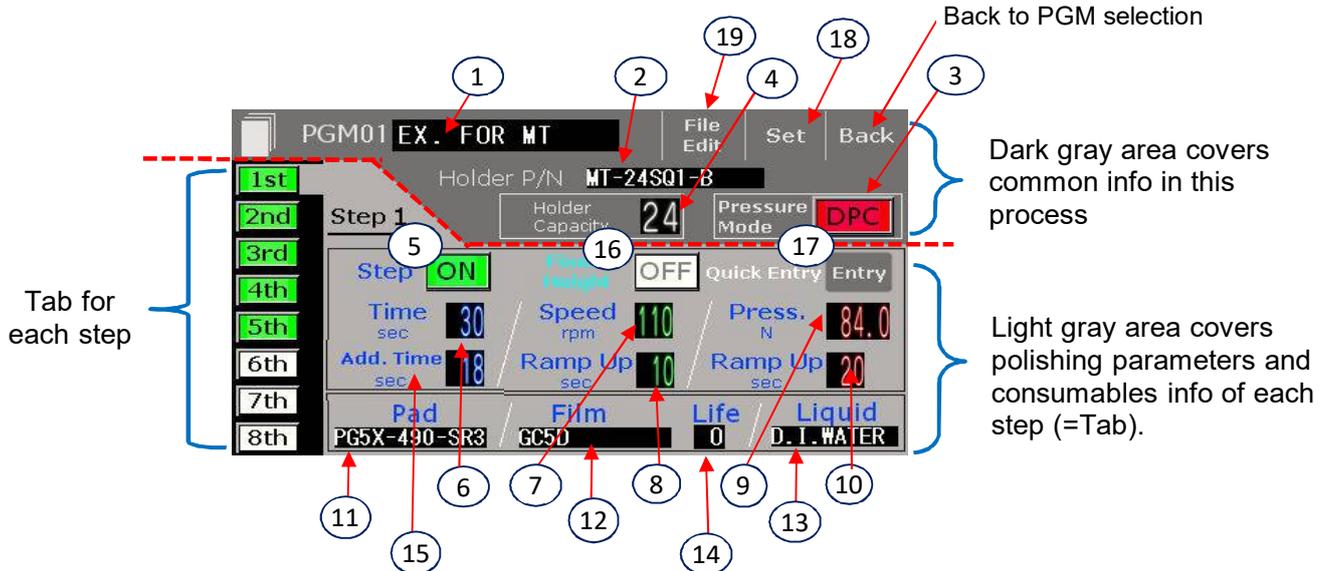
Parameters: Polishing time, Revolution speed, Pressure (DPC mode only), Film service life

When you press the Polishing PGM button, the following screen will appear. You can store 48 different programs (processes) and each program (process) can contain up to 8 steps.



Select desired PGM number from the list and the following screen will appear.

Upper dark gray area is for common information in the selected process: process name, holder P/N, holder capacity and pressure mode. Bottom light gray area is for information of each polishing step, which is classified by tab. One tab covers consumables information and polishing parameters of each polishing step.



① Polishing process name

Pressing this box will allow you to enter a process name of up to 14 characters.

② Holder P/N

Pressing this box will allow you to enter a polishing holder P/N of up to 14 characters.

③ Pressure mode

When using a fixed type polishing holder, such as MT polishing, fiber array polishing, select "DPC" as the active pressure mode. If you are using an IPC holder, select "IPC".

④ Holder Capacity (DPC mode only)

In the "DPC" mode, you also need to enter the capacity of the holder to be used. For example, if you use 24-axis MT holder: PH55-MT-24, enter 24.

⑤ Step ON/ OFF

This activates and deactivates polishing step you selected. The polishing machine recognizes the number of selected steps as the overall number of steps.

(continued from previous page)

For example, a program setting of 1st OFF, 2nd ON, 3rd OFF, 4th ON and 5th ON, the polishing machine displays this setting in operation mode as a process composed of 3 polishing steps. In this case, 2nd on the program setting becomes the 1st step on the Operation window. Also, please be noted if polishing condition is not input correctly (parameters and numeric range etc.), STEP can not turned ON. Examples of incorrect entries are 0 sec polishing time, 0 rpm turntable speed, zero pressure value.

⑥ Time

Pressing this box will allow you to enter polishing time from 5 to 600 sec.

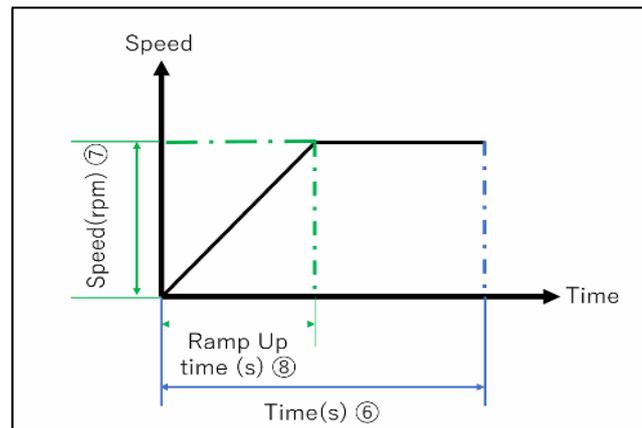
⑦ Speed

Pressing this box will allow you to enter revolution speed from 10 to 200rpm.

Rotation speed is always 1/100 of the revolution speed.

⑧ Ramp Up sec (Speed ramp up time)

Pressing this box will allow you to enter a desired ramp-up time to reach the entered speed. For example, if you set the polishing time to 30 seconds, the polishing speed to 100 rpm and the ramp-up time to 10 seconds, the polishing machine will reach the set speed of 100 rpm in 10 seconds after startup and will run at 100 rpm for another 20 seconds.

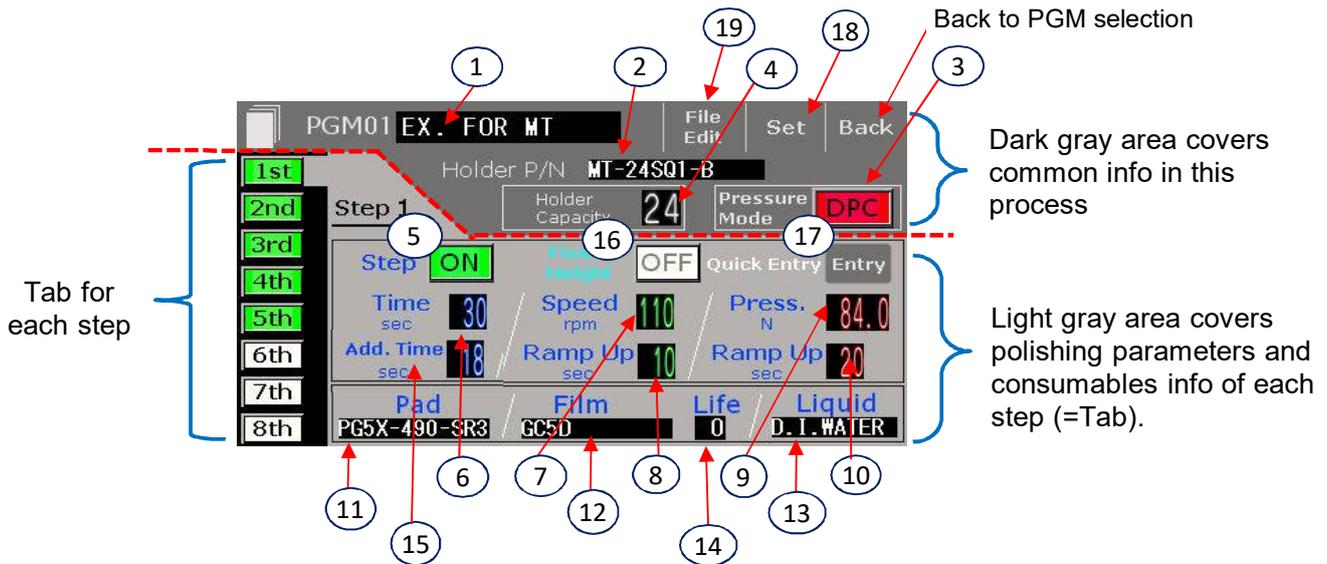


On the Operation window, speed window will be highlighted in green during speed ramp up and will be back in black after the ramp up is done. Normally, the recommended speed ramp up time is 1 sec.

Also, please note that ramp up time can not be set longer than polishing time. Entering ramp up time longer than polishing time will be adjusted to the same time as polishing time.

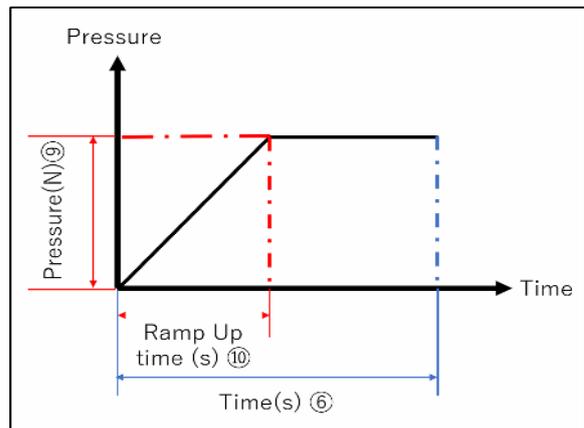
⑨ Pressure (DPC mode only)

Pressing this box will allow you to enter polishing pressure from 2 to 200N. The value you need to enter is the pressure value of total holder capacity. For example, MT polishing requires 3.5N per ferrule and use 24-axis holder so that you need to enter 84N (3.5 x 24) as the pressure value. The pressure unit can also be displayed in lb. (refer Configuration).



⑩ Ramp Up sec (Pressure Ramp Up)

Pressing this box will allow you to enter a desired ramp-up time to reach the entered pressure. For example, if you set the polishing time to 30 seconds, the polishing pressure to 84N, and the ramp-up time to 10 seconds, the polishing machine will reach the set pressure of 84N in 10 seconds after startup and will run at 84N for another 20 seconds



On the Operation window, pressure window will be highlighted in red during pressure ramp up and will be back in black after the ramp up is done.

Normally, the recommended pressure ramp up time is 0 sec except for adhesive removal. Also please note that ramp up time can not be longer than polishing time. Entering ramp up time longer than polishing time will be adjusted to the same time as

⑪ Pad ⑫ Film ⑬ Liquid

Pressing these boxes will allow you to enter a polishing pad P/N of up to 12 characters, a polishing film P/N of up to 12 characters and Liquid info of up to 10 characters. After the entry and pressing ENT brings to next consumables info entry and repeat: Pad⇒ Film ⇒ Liquid ⇒ Pad. Press ESC to go back to the PGM setting.

⑭ Life

Pressing this box will allow you to enter a polishing film service life from 0 to 99. During operation, when the life is set to 1 or more and the usage exceeds the entered number, Film count window will flash red. Moreover, in this circumstances, if usage Interlock is ON,



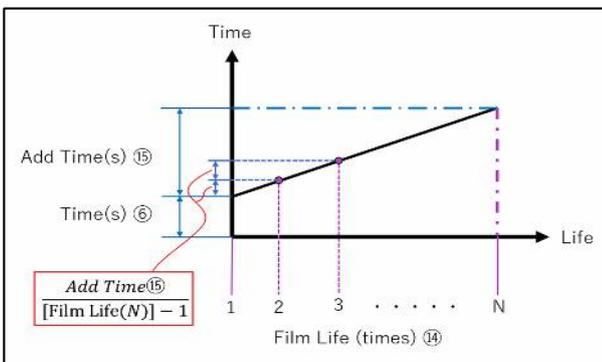
you can not proceed polishing unless reset the film usage. Long press of Rest will allow to reset film usage count of this step. In case you want to disable the film usage counting, please enter the life as 0. Also you can disable the film usage Interlock on the Configuration.

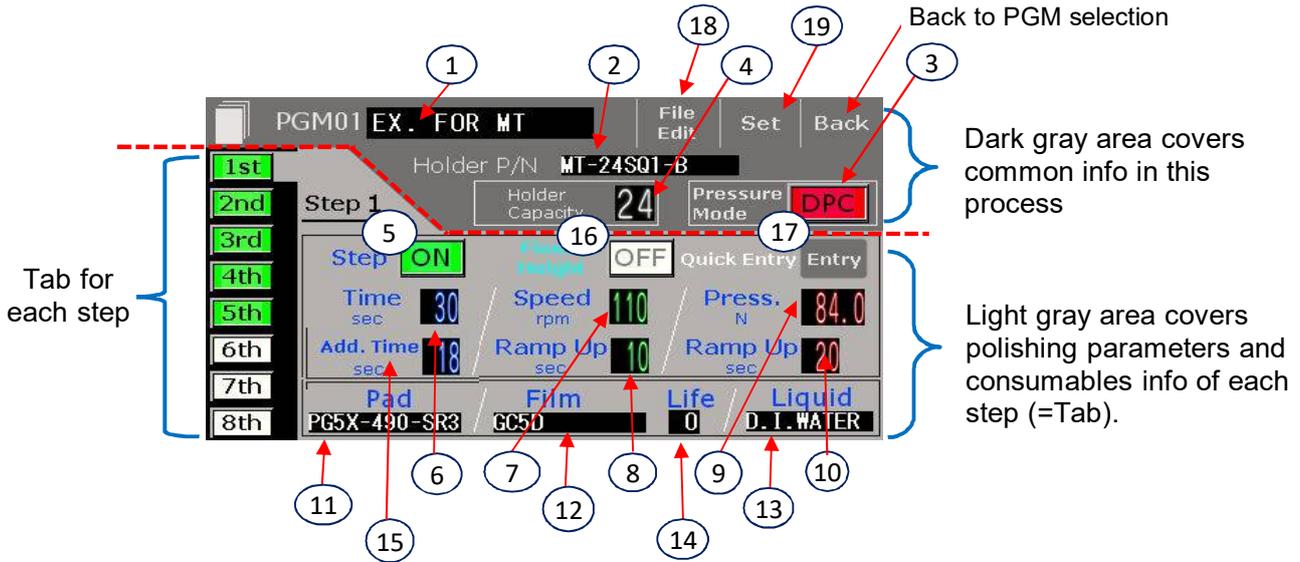
⑮ Add Time

Pressing this box will allow you to enter extended polishing time up to 120 sec (additional polishing time on top of normal polishing time). Polishing film grinding force is weaken as it is used so that the feature increases polishing time as per film usage count in order to assist having uniformed endface geometry. Entered Add time is divided by the film usage count after 1st time and allocated to each polishing time after 1st time. For example, if you set the polishing time to 20 sec and the Add time to 18 sec and Life as 10 times. Then, the Add time of 18 sec is divided by the usage after the 1st time (18 sec / (10-1) = +2 sec after the 1st step): 1st use 20 sec, 2nd use 22 sec, 3rd use 24 sec, 4th use 26 sec, 5th use 28 sec. ,,,, ,10th use 38 sec (20 +18 sec).

When the Add time is in use, on the Operation window, polishing time is displayed with "+" as total polishing time including additional time of a step you are in.

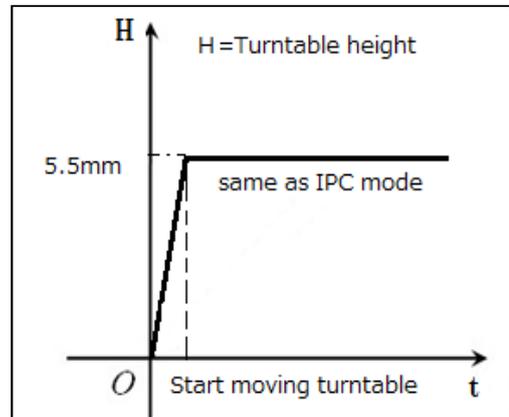
You can select use of this feature on the Configuration. Also, even when the Add time is activated, entering 0 will turn off the feature.





⑩ Fixed Height

When this is ON, polishing is done in the fixed height (5.5mm). After start, the turntable reaches to the 5.5mm distance. During polishing, the turntable keeps the 5.5mm distance. For this SP1 version, under the Fixed height, you can also set your preferred pressure value; the turntable try to polish to the 5.5mm distance with the set pressure. This allows finer tuning in Fixed height feature.



Also, the Fixed Height feature is convenient to align ferrule length with fixed type holder especially at first polishing step. Normally, use this feature in OFF.

⑪ Quick Entry

Pressing "Entry" button will bring you quick entry list which allows you to enter polishing parameters of not only a single step but also entire process. Very convenient feature.

Back	Fixed Height	Time sec	Speed rpm	Ramp Up sec	Press. N	Ramp Up sec
1	ON	20	110	5	40.0	10
2	OFF	30	110	0	100.0	0
3	OFF	30	110	0	100.0	0
4	OFF	30	110	0	100.0	0
5	OFF	30	110	0	100.0	0
6	OFF	30	110	0	100.0	0
7	OFF	30	110	0	100.0	0
8	OFF	30	110	0	100.0	0

⑩ File Edit

File Edit will allow you to delete the process you are editing, or copy / move the process you are editing to another PGM No.

Delete Delete the polishing PGM you are editing. Also, if the same PGM had been selected in the Operation, then it will be deleted.

Copy Copy the polishing PGM you are editing to your desired PGM No. However, film usage record will not be copied

Move Move the polishing PGM you are editing to your desired PGM No. However, film usage record will not be moved and also reset the usage record of the PGM No. you are editing.

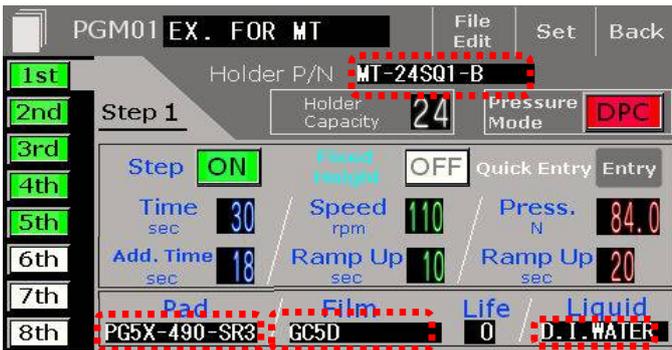
**⑪ Set**

This completes the input of the polishing process and returns to the operation of the edited PGM No.



Ref 3: Process entry with the barcode scanner

In the PGM entry, you can also enter polishing holder P/N and consumable names: pad, film and liquid with the barcode scanner. On Appendix of the process manual, it contains a barcode list of our typical polishing holders and consumables. You can refer the list and also make own consumables names and P/Ns as long as you follow character number limitation and use barcode type CODE39.



Barcode sample from the Appendix on the Process manual

PN	Barcode
PR5X-500-90	 * P R 5 X - 5 0 0 - 9 0 *
PR5X-500-80	 * P R 5 X - 5 0 0 - 8 0 *
PR5X-500-70	 * P R 5 X - 5 0 0 - 7 0 *

Polishing holder: 14 characters

Polishing pad: 12 characters

Polishing film: 12 characters

Polishing liquid: 10 characters

For consumables scanning, unless you press ESC, it brings you to next consumables entry menu Pad ⇒ Film ⇒ Liquid ⇒ Pad (loop unless press ESC)



3 Manual Polishing

This is multi-timer manual polishing mode. First, you select pressure mode: DPC or IPC.

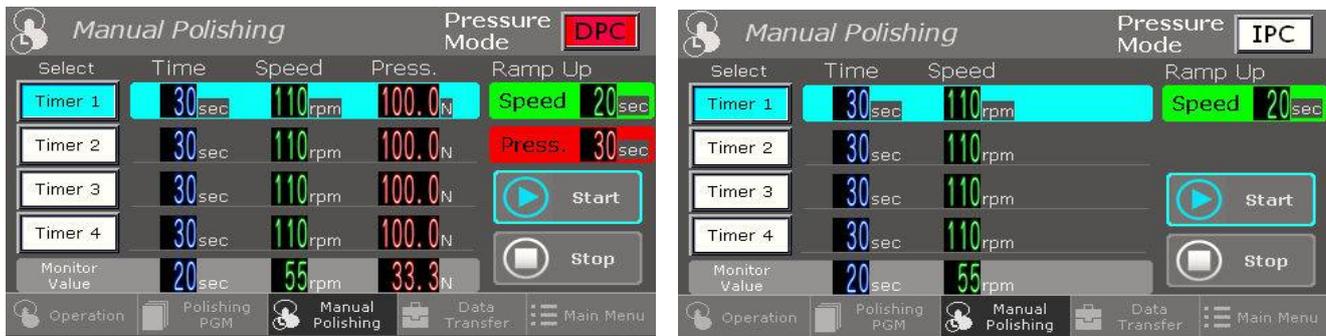
And then, polishing parameters of time, speed and pressure value (when selected DPC) can be set in 4 different timers for Manual Polishing.

Speed ramp up and pressure ramp up settings are available and their settings will be common for all 4 timers. During ramp up, the window for the Speed will be highlighted in green and red for the Pressure.

When you polish, select desired timer number and press "Start" to polish and press "Stop" to stop polishing. Start button requires a long press to prevent accidental start & clamping.

Press down the Start for 0.5 seconds to engage the auto-clamping, and at the same time, a beep will sound to start polishing.

Please note that ramp up time can not be longer than polishing time. Entering ramp up time longer than polishing time will be adjusted to the same time as polishing time.



Applicable input value for each program is as follows.

Polishing time: 5 - 600 (sec)

Revolution speed: 10 - 200 (rpm)

Rotation speed: Automatically adjusted as per revolution speed (1/100 of revolution speed)

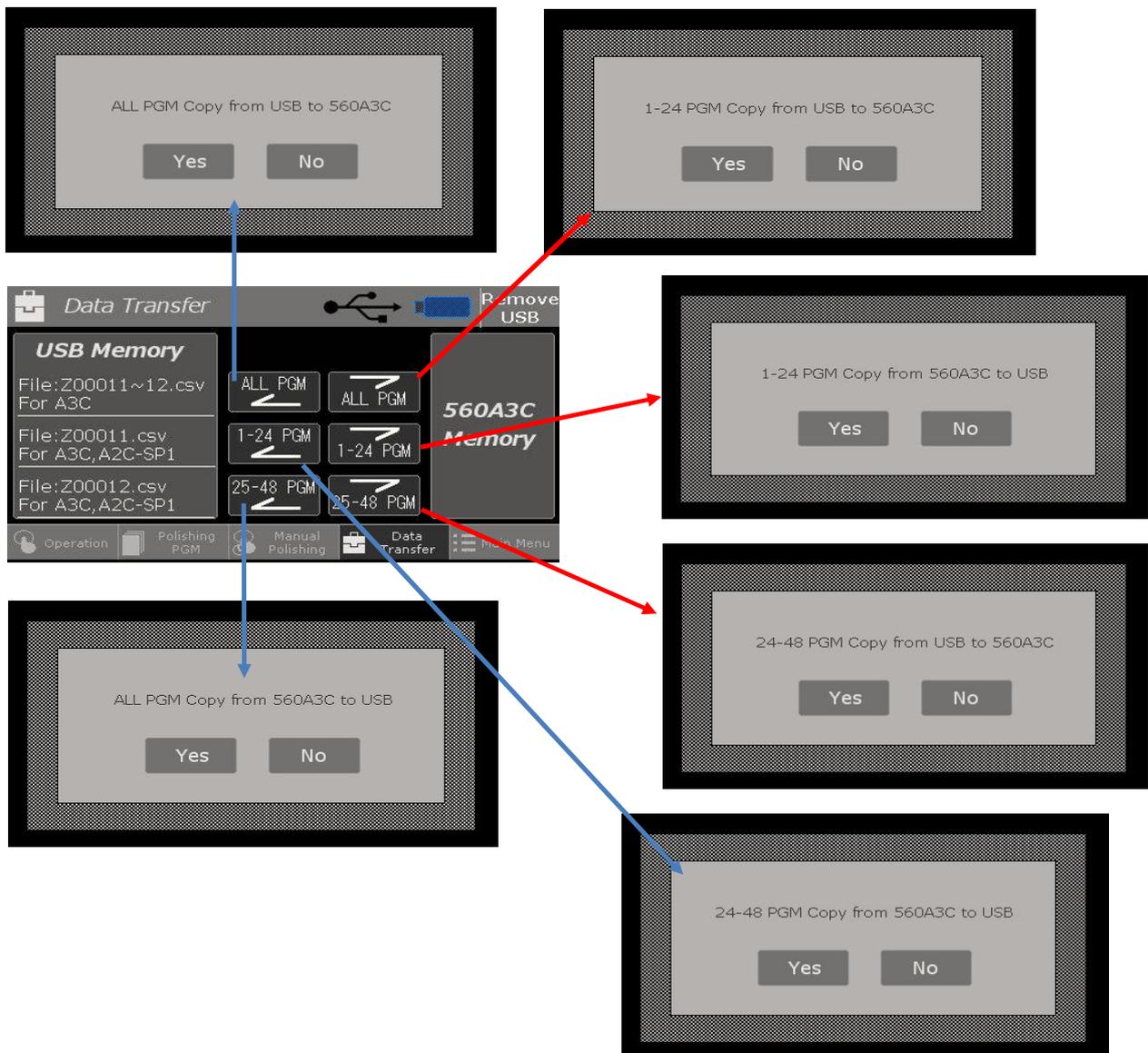
Pressure value: 2 - 200(N)

4 Data Transfer

Press "Data Transfer" on the Main menu and the following screen is appeared. In this function, you can transfer polishing process between SFP-560A3C / FA and USB. Data transfer of SFP-560A3C / FA is available only in all PGM (polishing processes) at once. Transferring polishing process from elder model SFP-560A2C-SP1 is also possible.

Caution

Although data is compatible between SFP-560A2C-SP1 and SFP-560A3C / FA, depending on the version of the touch panel operation software, character strings may change when data is transferred (however, numerical parameters such as polishing time and rotation speed will not change). In this case, please use the conversion software stored in the attached USB memory stick to rearrange the character strings and then transfer the data to SFP-560A3C / FA. For details, please refer to the instructions in the software.



5 Maintenance

Maintenance mode is composed of 1) Alarm, 2) I/O, 3) Elapsed running time, Elapsed polishing time, Maintenance time and Height measurement and Clamp manual operation. The below explains each feature.

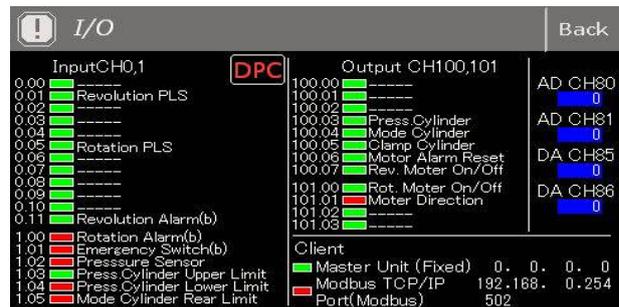
Alarm

"Alarm Check" indicates all alarm history of your SFP-560A3C / FA has sent out. The history can be transferred to USB memory for your record.



I/O

"I/O Check" indicates all connecting status of each electric devices equipped in your polis. You normally do not use this feature but become convenient to diagnose machine's condition in case of repair.



Elapsed Running Time

The "Elapsed running time" is total power-on time since the polisher first started running, which cannot be reset. The "Running time" is the same as above, but can be reset. The time displayed is the power-on time since the last reset.



Elapsed Polishing Time

The "Elapsed polishing time" is accumulated polishing time since the polisher first started polishing, which cannot be reset. The "Polishing time" is the same as above, but can be reset. The time displayed is the polishing time since after last reset.



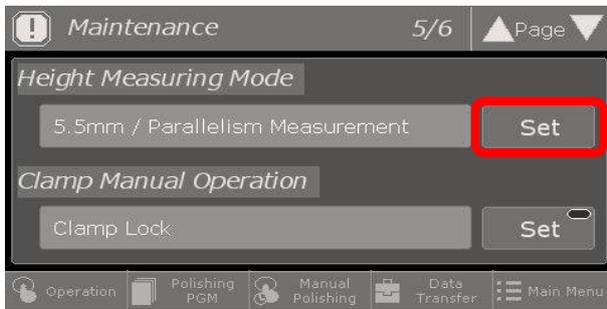
Maintenance Time Management

After passing 100 / 500 operating hours, the maintenance indicator for 100 / 500 hours are displayed.



Height Measurement Mode

When you conduct 5.50mm of the height measurement between the Clamper base and the Turntable, use of this feature is necessary. In order to start, press Set and also Start. Then, the Turntable will go up to the measurement position of the 5.50mm distance.

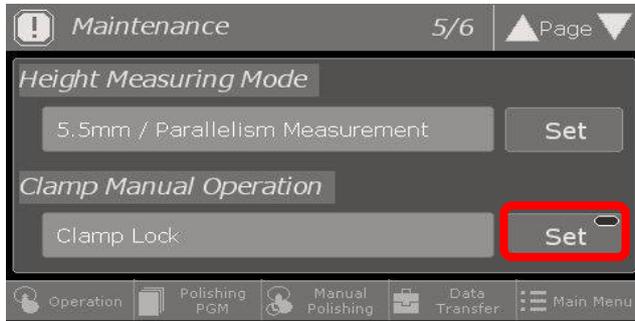


After the measurement is done, press Stop and then the turntable will go back to the original position.



Clamp Manual Operation

This feature is available only when logged on as Administrator. How to log on is explained on the section of Configuration. Long press (0.5 sec) of Set will allow you to clamp and unclamp the Auto clamp's clampers manually. This feature is necessary to check motion of clampers when you conduct maintenance.



Polishing Process Completion Count

This counter is based on how many polishing PGMs (process cycle) have been completed in total. For example, if PGM1 is set from 1st. to 4th. step, the count will be added when all steps from 1 to 4 are completed in a series of polishing. The counter can be reset by holding down the reset button (0.5 seconds).



6 Configuration

Configuration mode is composed of Security, Clock, Language, PGM setting, Repolishing Time Input Setting, Additional Polishing Time Setting, Film Limit Setting, Film Usage Setting, Film Count Manual Input Setting, PGM No setting, Modbus TCP Setting, Remote Control Setting, Origin Return Setting, Process End Pop-Up Setting and Clamper Manual Operation Setting. From next page detail for each feature is explained.

Security

In order to change any settings in the Configuration, you need to log on as Administrator at first. To enter as Administrator, input password 1234. Please be sure to log OFF after your changes are done. For security reason, the administrator mode is automatically logged off 20 minutes after logging in and also when power is turned off.



In case you want to change password to your preferred number, please press PW Set after logging on. And then, press Edit to enter your preferred password and press OK. Be sure not to forget the password you create. If lost and need recovery, please contact Seikoh Giken sales office or distributors.



Do NOT press Delete. If Delete is pressed by mistake, press Cancel to stop the deleting action. However, if you press OK by accident and the password is really deleted, please contact Seikoh Giken sales office or distributor.

Clock Setting

As factory default, the clock is set in JST, please re-set with your local time. Also the Show / Hide button is to select presence of the clock on the Operation window.



Language Setting



By selecting the number shown in the red frame, you can select the language setting. The available languages are Japanese, English, Chinese and Spanish.

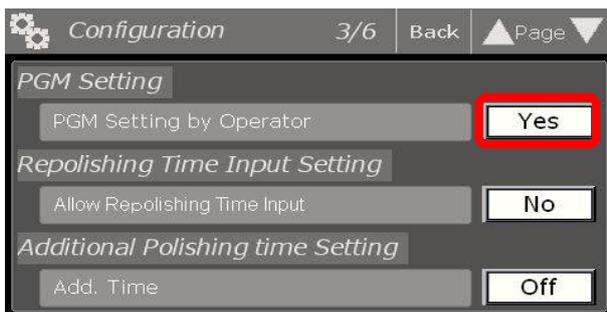
Pressure Unit Setting



You can select unit of pressure value between N and lb. As factory default, only for the North America market, the unit is set in lb. while all other areas are set in N.

PGM Setting

You can choose if operator is allowed to edit polishing program. Your change will be effective once logged-off. Also, when this is selected as "NO" Polishing PGM menu indicates locked symbol. When locked, after you select PGM #, you are skipped PGM setting and go directly to the Operation of the selected PGM #.



Goes directly to the Operation window without entering program setting menu when PGM setting by

Repolishing Time Input Setting

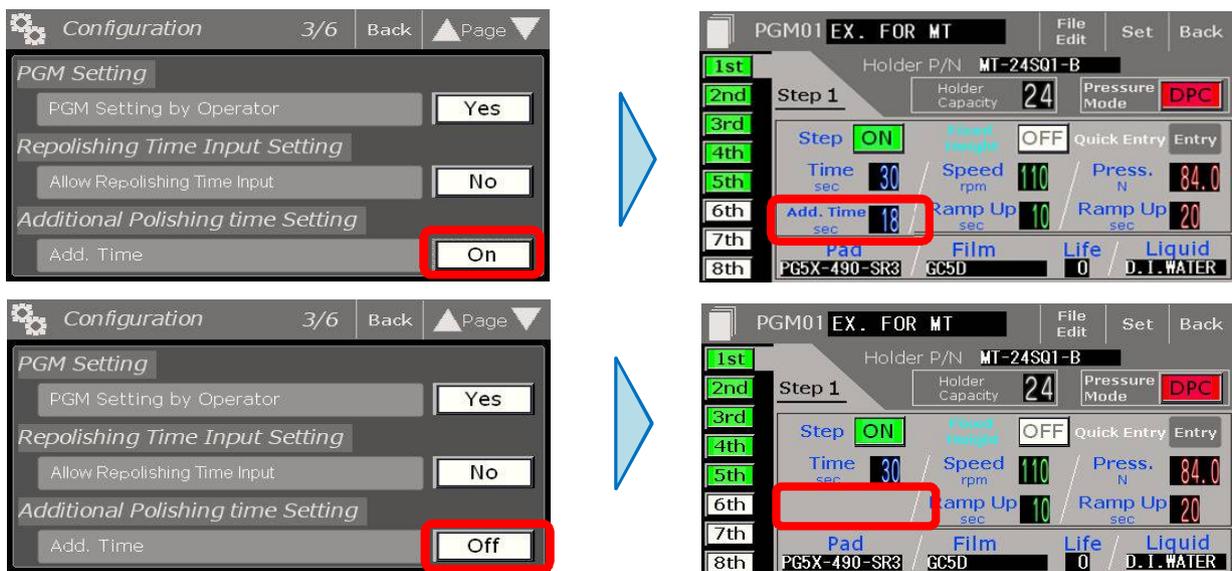
When this item is turned "Yes", the polishing time displayed on the operation screen becomes changeable and the preferred time can be entered. This is used when you want to perform additional polishing after a step is completed or whole process. You can input repolishing time from 5 seconds up to the time entered in the step of polishing process. For example, if 30 seconds is set for the first step and 60 seconds for the second step, the repolishing time can be input from 5 to 30 seconds for the first step and from 5 to 60 seconds for the second step. Note, however, that moving to different step resets the entered time setting and returns to the original programmed polishing time.



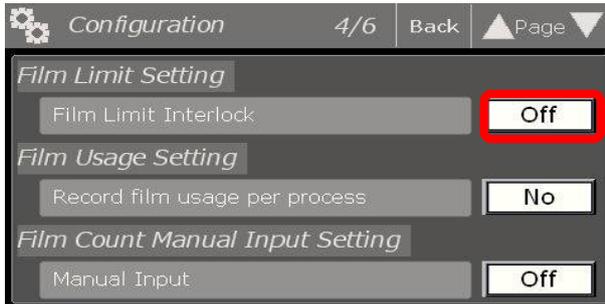
When the setting is set to "Yes," a white frame will be added to the time display on the operation screen to allow selection. Once selected, numeric keypad will be displayed, allowing you to enter the polishing time and fine-tune the polishing amount as necessary.

Additional Polishing Time Setting

This is to activate and deactivate the Add time feature explained on the 15 of the PGM setting. When this item is ON, Film Limit Interlock will be ON automatically because managing film usage is important to manage to use the additional polishing time setting.



Film Limit Setting

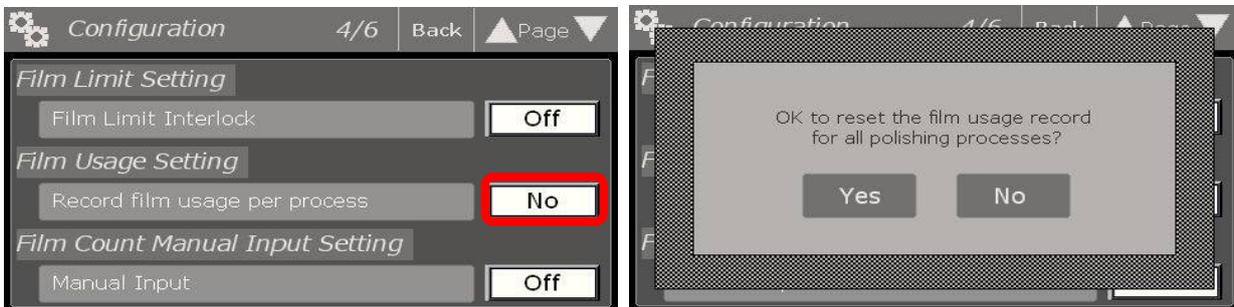


When the Interlock is ON, you are not allowed to use the polishing film beyond the entered film service life. You will need to reset the film usage to resume polishing.

Film Usage Setting

When this item is turned "Yes", the number of times polishing film has been used is recorded for each polishing process and each polishing step, and will continue to be stored even if polishing process is switched or the power is turned off.

If the item is "No" and another polishing process is selected, the number of times the polishing film was used in the previous session will not be saved and will be reset. Also, please note that each time you switch this setting, the number of times the polishing film is used is deleted from the machine's memory. In addition, the resetting of film count is occurred when polishing process is copied or moved.



Film Count Manual Input Setting

When this item is turned ON, a counter value for the number of times the film has been used can be entered manually, and a white frame will be appeared to the film usage counter on the operation screen. This function is used to recount the number of times the polishing film has been used.

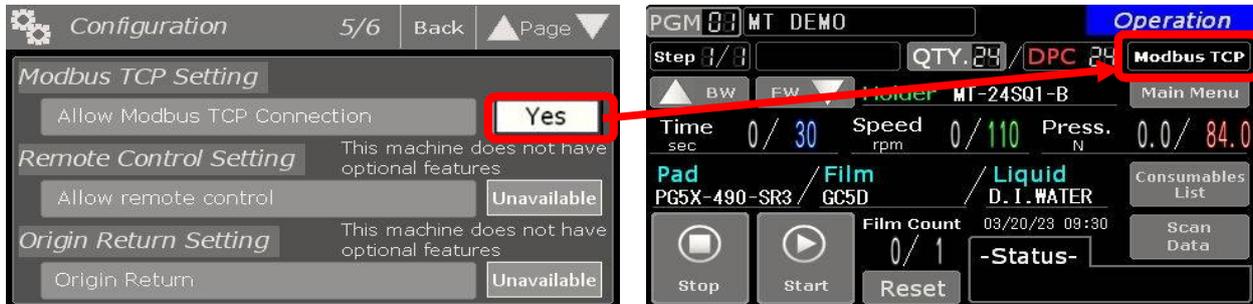
When the film limit setting (Film Limit Interlock) is ON, the counter value can be entered up to the set service life of the film. When the film limit setting is OFF, the number of times the film is used can be entered up to 99, regardless of the film's set life time value. However, if the film's set service life is 0 or 1 regardless of the film limit setting is ON or OFF, then manual input of film count can not be done.

continue to the next page



Modbus TCP Setting

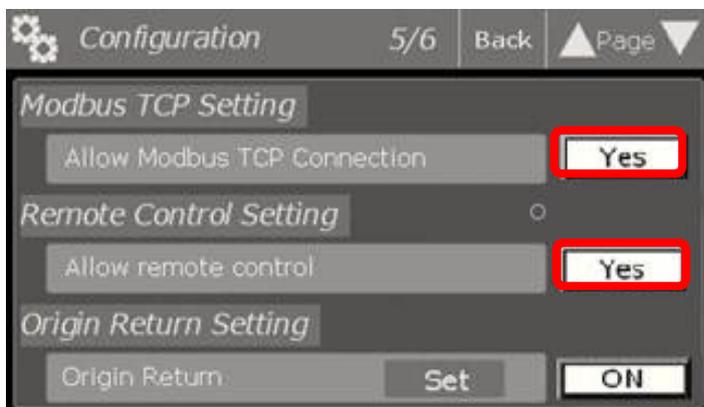
Turning this item "Yes" enables Modbus communication. Customer is responsible for the construction and creation of the network for the polisher (network environment, communication applications, etc.). Please refer to the separate "SFP Series Modbus Network Manual" for an overview of the SFP series network.



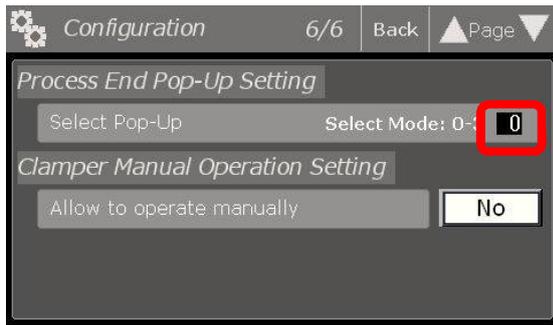
Remote Control Setting

Origin Return Setting

This setting is available only for SFP-560A3C-FA model that supports remote control. Please turn ON the setting when using remote control. For details, please refer to the "SFP Series Modbus Network Manual" in the separate manual.

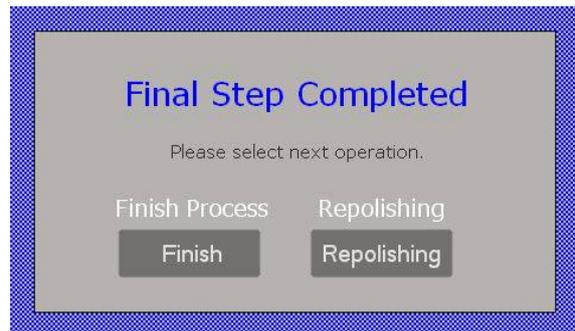


Process End Pop-Up Setting



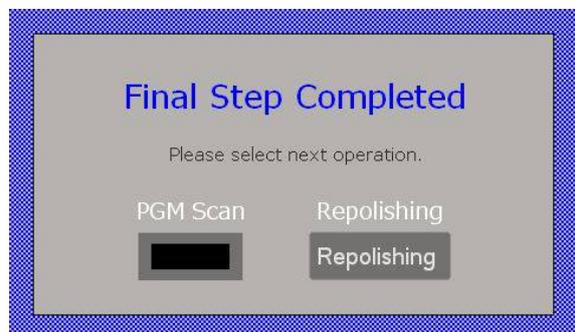
- In case of Select Mode 1

You can select "Finish" or "Repolishing". When "Finish" is selected, the completion count of the polishing process (Page 6/6 of the maintenance screen) is counted and the operation screen at the 1st step of the same polishing process is displayed. When "Repolishing" is selected, the completion count of the polishing process is not counted and the operation screen is displayed.



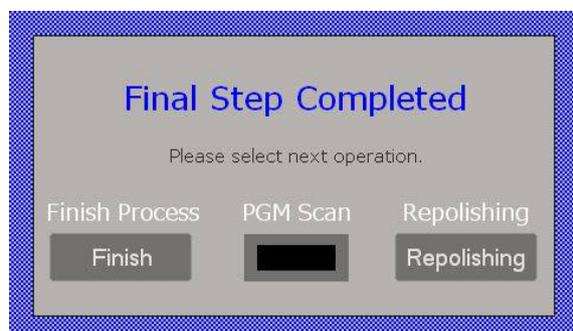
- In case of Select Mode 2

You can select "PGM Scan" or "Repolishing". "PGM Scan" means you need to select polishing process for next polishing even though you will continue with same polishing process.



- In case of Select Mode 3

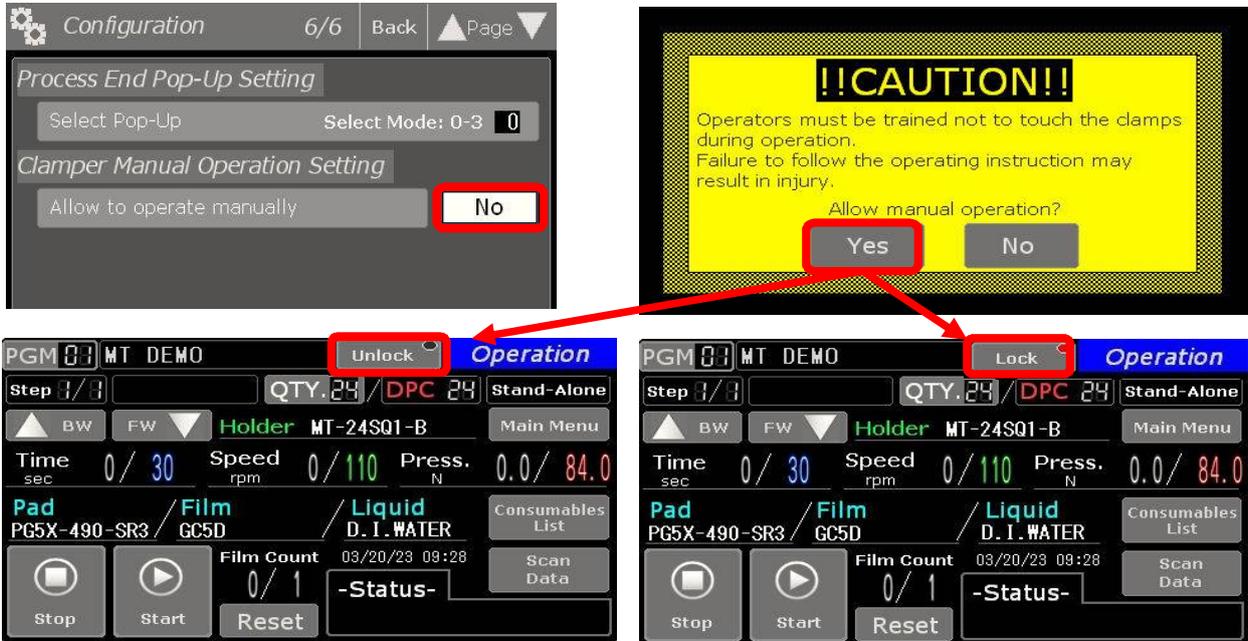
You can select "Finish", "PGM Scan" or "Repolishing".



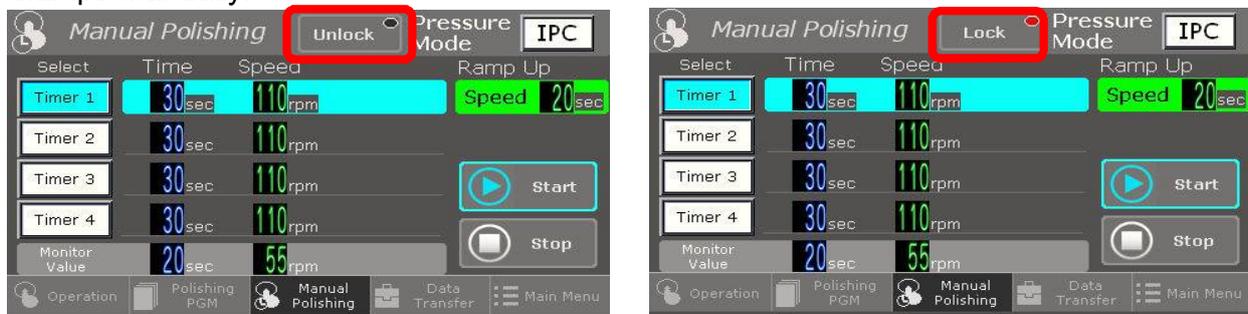
This function can be used to display subsequent operation options (pop-up) after one polishing process cycle is completed. There are four modes to select: 0 to 3. When Select Mode is set to "0", No popup will be displayed.

Clamper Manual Operation Setting

When this setting is turned ON, operator can lock and unlock the clamper manually on the Operation screen and the Manual polishing screen. As the clamper is dangerous device, that improper may result in serious injury, a warning message will be displayed and requires to press Yes to continue. After pressing Yes, Unlock / Lock buttons will appear on the operation screen. Long press allow you to lock / unlock the clampers.



Manual polishing mode as well has Lock / Unlock button that allows to operate only the clamps manually.



Other (Version check)

Press "Version" on the main menu to check the version of the polishing machine.



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.

◆ Maintenance for Turntable Assembly

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.

Caution

Please refer 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 vary 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
GA5D	Green	1~10
DA5D-30u / EDA5D-30U	Green	15~30
DR5D-9u / EDR5D-9U	Pink	15~30
DH5D-3u / EDH5D-3U	Light green	15~30
DJ5D-1u / EDJ5D-1U	Lavender	15~30
XF5D	Translucent	5~10

◆ Polishing Pad

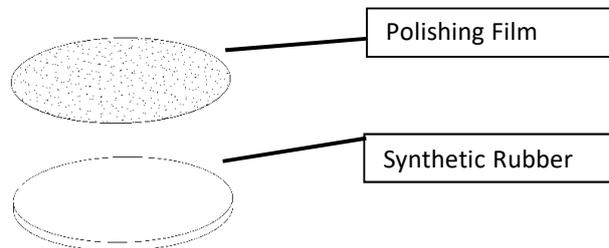
Several polishing pad types are available for various uses. Use only the pad specified for each purpose. The identification mark of each pad is on the center of its reverse side.

Attach a polishing film on top of the polishing pad as shown below.

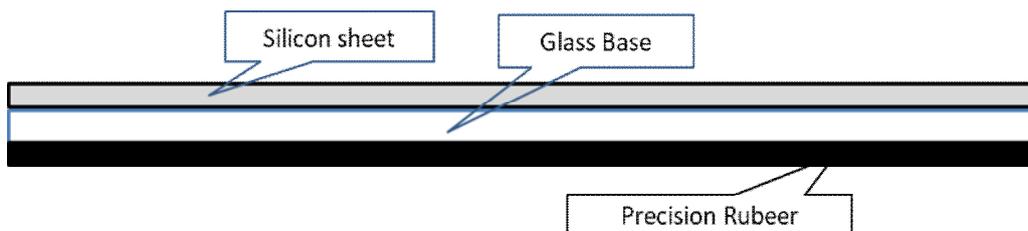
Replace the polishing pad with new one regularly as the lifetime of one year.

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. For flat polishing, we provide glass pad having silicon rubber on the film attaching side and antiskid rubber on the reverse (bottom) side with an identification mark at the center. This glass pad requires no double-sided tape, spray glue nor PSA backing because the silicon rubber which contacts with polishing film is tacky. So you can simply place polishing film with rubber roller (P/N: FP-RR). Reference product P/N of the glass pad is PG5X-490-SR3.



Caution

Make sure the top surface of the pad is clean when attaching a polishing film.

Contaminations on the pad may cause the unstable polishing condition or damage the polishing film during polishing.

2.5 Polishing Holder

◆ Polishing Holder Design

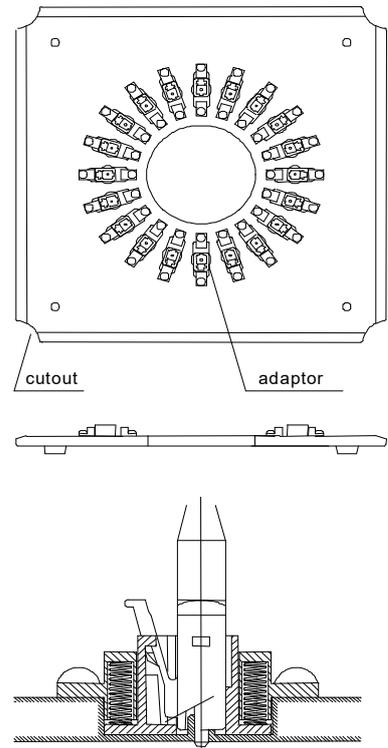
There are two types of polishing holders; one for right-angled flat or right-angled convex (PC) polishing and the other for angled flat or angled convex (APC) polishing.

Each holder is available to suit different connector types.

The polishing holders have maximum 72 adapters mounted on the square plate as shown in the right hand figure. (The right 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.



☆☆☆ CAUTION ☆☆☆

Make sure that the ferrule-reference plane and the ferrule insertion holes are clean.

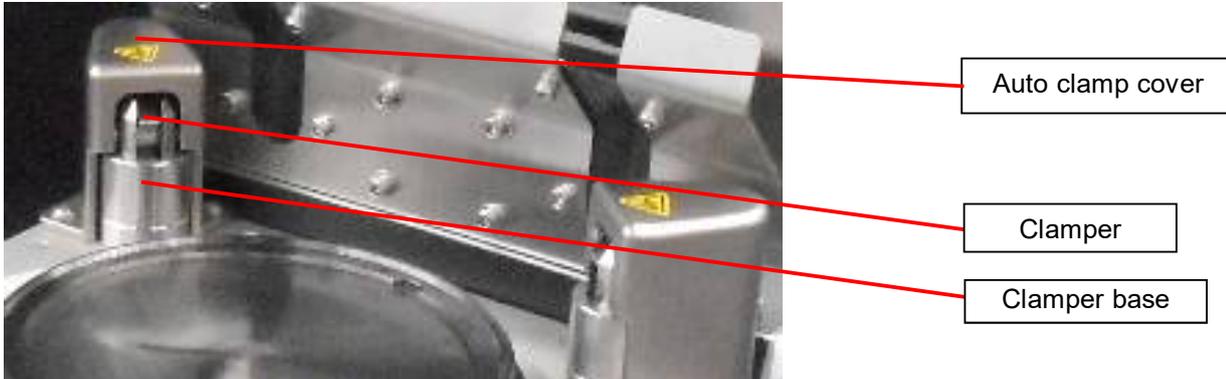
This will ensure that all ferrules protrude to the same height, thereby ensure desired polishing results.

◆ Polishing Holder Maintenance

Accuracy of polishing holders affect on polishing result. Thus, please be aware of 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 Auto Clamping Unit

Air cylinder-operated Auto clamp units are located on the four corners of the baseplate.



Unlike conventional four posts type polishing machine, the SFP-560A3 / FA clamps polishing holder automatically. Start button requires a long press to prevent accidental start & clamping. Pressing down the "Start" for 0.5 sec and then the Auto clamp is engaged and beeps at the same time to start polishing. This function offers extra convenience in operation but also requires extra safety precaution. Please be sure to keep hands off from the Auto clamp when press Start as described on the WARNING on Page 3. Touching the Auto clamp with hands or fingers when press Start and during polishing may result in serious injury. In case of emergency, press the emergency button. For the maintenance of the Auto clamp unit, please refer the maintenance manual.

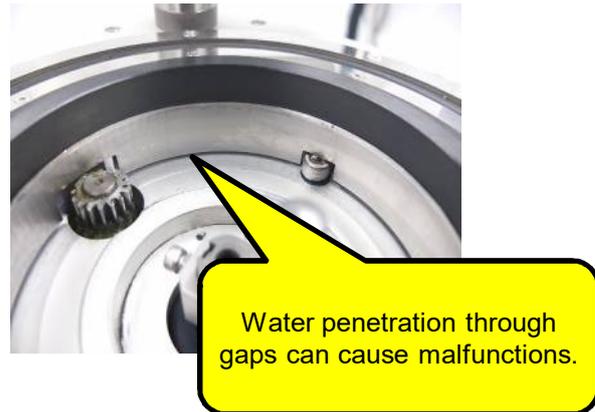
2.7 Operation & Prohibited Action

This is a sequence of polishing operation.

- ① Mount optical connectors or ferrules on the polishing holder.
- ② Select suitable polishing program or input new one if necessary
- ③ Place the polishing holder on the polishing machine
- ④ Press down the Start for 0.5 seconds to engage the Auto-clamping, and at the same time, a beep will sound to start polishing.
- ⑤ Remove the polishing holder after polishing is done.

Prohibited Action

- Blowing compressed air to the service trench is prohibited even the water resistance rubber ring is installed.
- Because of the structure, there is no waterproof function around the service trench, so wipe off the surrounding water with a waste cloth.
- Although guards are installed inside, they do not completely protect against water, so never use air jet



If the above becomes worse, the spline shaft will corrode and the polisher will stop working.

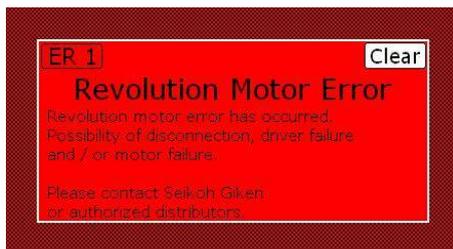
2.8 Instruction for Emergency (ER) and Alarm (AL) Messages.

Emergency (ER) and Alarm (AL) Messages

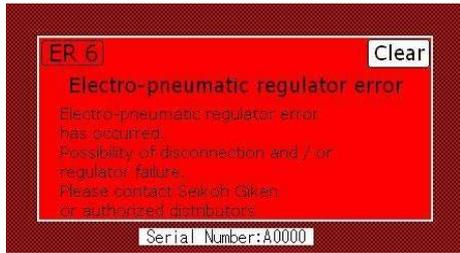
The followings are the list of Emergency and Alarm messages.

When each message is appeared, please follow the instruction on each message.

Emergency (ER)

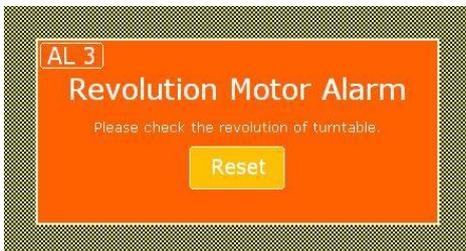


Code	Condition
ER1	Revolution Motor Error Revolution motor error has occurred. May driver failure or motor failure.
ER2	Rotation Motor Error Rotation motor error has occurred. May driver failure or motor failure.
ER3	Lower Limit Sensor Error Lower Limit Sensor Error has occurred. May sensor failure or sensor position misalignment.
ER4	Upper Limit Sensor Error Upper Limit Sensor Error has occurred. May sensor failure or sensor position misalignment.
ER5	Rear Sensor Error Rear Sensor Error has occurred. May sensor failure or sensor position misalignment.



Code	Condition
ER6	Electric-pneumatic regulator error Possibility of disconnection and/or some kind of regulator failure.

Alarm (AL)

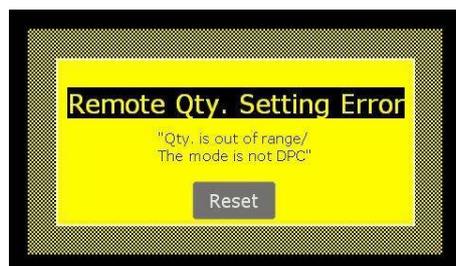
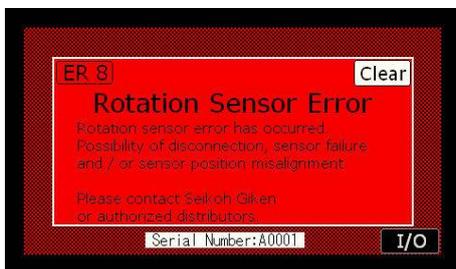
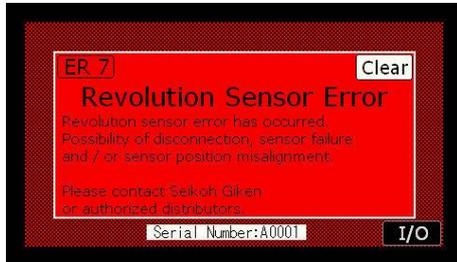


Code	Condition
AL1	Low air pressure Please check air pressure connection / level.
AL2	Low battery Please change the PLC battery. Please refer the Maintenance manual
AL3	Revolution Motor Alarm. Please check the revolution of turntable.
AL4	Rotation Motor Alarm. Please check the rotation of turntable.
AL5	Turntable Up Alarm Please check if there is anything obstructing the turntable during "Turntable-UP" motion.



Code	Condition
AL6	Upper Limit Please check if the clamp levers are clamped or check if polishing holder is installed.
AL7	Upper Limit Please check the length of ferrule. Ferrule might be polished too short.
AL8	Upper Limit Please check if the calibration jig is installed and the clamp levers are located.
AL9	Turntable Down Alarm Please check bottom of the "support ring" <u>Attention!</u> <u>DO NOT USE COMPRESSED AIR FOR CLEANING IN THE TURNTABLE AREA.</u>

In addition to the above error messages, SFP-560A3C / FA displays the following error messages. Please check this when using Modbus communication. For details, please refer to the attached "Modbus TCP Connection Manual".



Code	Condition
ER7	This error occurs when the sensor cannot detect the turntable home orbit position. Please contact us for the possibility of wire breakage, sensor failure, or sensor misalignment.
ER8	This error occurs when the sensor cannot detect the turntable origin rotation position. Please contact us for the possibility of wire breakage, sensor failure, or sensor misalignment
ER9	This message is displayed when an error occurs in the safety relay. Please contact us for possible disconnection of internal wiring, relay failure or contact welding.
	When PGM is set by remote operation, if PGM No is outside the input range or no grinding conditions are entered, an error is displayed.
	When Qty (number of ferrule polishes) is set by remote operation, an error is displayed if Qty is out of input range or in IPC mode.



Code	Condition
	Displays a code when an error occurs in Modbus TCP communication.

2.9 Troubleshooting

When the machine does not function properly or does not function at all, please check the following points before you contact your service provider.

Symptom	Possible Cause and solution
Power can not be on Does not operate	<p>Is the power cable connected?</p> <p>Is the air hose connected with a regulator? Is the regulator's valve opened? Is air pressure adjusted in appropriate pressure level? Isn't the regulator's filter contaminated? Isn't emergency stop button pressed? Is the power switch on? Is LED of the digital pressure meter lit in green?</p>
Can't start polishing	<p>Are polishing film and pad installed correctly? Is ferrule length long enough? Is polishing holder clamped? Is there any substances stuck on the Turntable? Is Start pressed down long enough? The Start button requires a long press to prevent accidental start & clamping. Pressing down the "Start" for 0.5 sec and then the Auto clamp is engaged and beeps at the same time to start polishing.</p>
Endface geometry is not satisfactory	<p>Is the polishing condition appropriate? Did you choose correct pressure mode (IPC /DPC) for the polishing you used ? Do you follow the maintenance every 100H/500H? Is confirmation of the height between the Clamp posts and the Turntable is being done? Is the length of spring of the post being confirmed? Is polishing pressure adjusted according to the Qty of connector / ferrule to be polished?</p>

Symptom	Possible Cause and solution
Can't clear off Emergency and / or Alarm messages	Did you check error code and follow the instruction? Isn't the emergency stop switch being on?
Data Transfer; can't send / receive polishing process data	Is a USB inserted to the USB port? Is USB Key recognized by a polishing machine? Is batch-transfer or all-transfer chosen appropriately?
Can't tell how to choose DPC mode and IPC mode	<p>First, please check what kind of holder you use</p> <p>1. MT Ferrule holder ⇒ Use DPC mode </p> <p>2. Single fiber holders using IPC technology such as Seikoh Giken polishing holders for SC / FC / ST LC / MU /E2000 / D2.50mm ferrule / D1.25mm ferrule. ⇒ Use IPC mode </p> <p>3. Fixed type holder Seikoh Giken holder not using IPC technology such as Fiber array, SMA905 etc. , please contact us or our authorized distributors for recommended polishing process.</p>

3. Limited Warranty on polishing machine

3.1 Warranty

If the polishing machine you purchased have defects during the warranty period, either one year after purchased, we will repair or, at our option, replace the defects with free of charge.

3.2 Exemption

In the following cases, limited warranty does not cover the repair or replacement cost.

- 1) Damages or defects resulted from misuse, improper operation except written by manuals of the polishing machine, ex: blowing compressed air to the service trench, use of compressed air which does not meet the required specification, etc.
- 2) Damages or defects resulted by the lack of recommended maintenance according to manuals.
- 3) Damages or defects resulted from the use of the inapplicable expendables and products those are not approved Seikoh Giken, ex: polishing film, polishing pads, polishing holder, etc.
- 4) Damages or defects resulted from the refurbishment or modification that is done by third parties other than Seikoh Giken.
- 5) Damages or defects caused by any event of Force Majeure such as earthquakes, fires, floods, thunder, war, etc. and other causes beyond our control.
- 6) Damages or defects of resold polishing machine.
- 7) Expendables, wear of the sliding parts.

3.3 Scope of Limited Warranty

Free refurbishment or, at our option, replacement will be made, except that the cases specified in Clause 3.1. All defective parts that are replaced with new ones should come into Seikoh Giken possession. The limited warranty does not cover any lost profits or other consequential or special losses, damages, expenses, or charges of any kind customer incurred as a result of such defects, refurbishments, or other work done to the polishing machine. Also, this limited warranty only covers the actuation / defect but does not guarantee the quality of the production.

July, 2024

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