

Installation & Operation

USER-MANUAL

MODEL: FC-S760 SERIES

TABLE OF CONTENTS

PART I	INTRO	PAGE
	I-1. COMPLIMENT	3
	I-2. SAFETY PRECAUTIONS	3
	I-3. POSITION OF SAFETY LABEL	4 – 6
	I-4. LOCKOUT / TAGOUT SYSTEM	7
	I-5. PRODUCT LIST	8 – 9
	I-6. PART NAMES	10 – 12
	I-7. CLEANING MACHINE INSTALLATION AND CONVEYOR ASSEMBLY METHOD	13 – 15
	I-8. CLEANING MACHINE MECHANISM	15 – 17
PART II	SPECIFICATION	PAGE
	II -1. CLEANING MACHINE SPECIFICATION	18
	II -2. ADHESIVE ROLL SPECIFICATION	19
	II -3. CLEANING ROLLER SPECIFICATION	19 - 21
PART III	OPERATION	PAGE
	III-1. CONTROL PANEL NAMES AND FUNCTIONS	22
	III-2. GAP CONTROL DEVICE	23
	III-3. MENU	24 – 28
	III-4. OPERATION SELECTION	29 – 33
PART IV	MAINTENANCE	PAGE
	IV-1. CLEANING METHOD OF CLEANING ROLLER	34 – 42
	IV-2. ADHESIVE ROLL REPLACEMENT AND REMOVAL OF SHEET	43
PART V	TROUBLE SHOOTING	PAGE
	V-1. SELF-INSPECTION AND SELF-REPAIR	44 – 45
	V-2. AFTER SERVICE CHECK SHEET	46 – 47
PART VI	MACHINE LAYOUT	PAGE
	VI-1. ELECTRIC CIRCUIT OF THE CLEANING MACHINE	48
	VI-2. PNEUMATIC WIRING DIAGRAM OF THE CLEANING MACHINE	50

PART I. INTRO

I-1. COMPLIMENT

Deeply thank you for purchasing TECH-LINE's product. FC-S series cleaning machine(C/M) is developed with digital method of the multi-function for the convenience of the operator and considered for our customers to make maximum profit with low budget from the conventional operating panel of the CM. The CM has various types of work area and the operator can control these tasks easily with the simple switches of the control panel. Also, the operator can monitor the speed of work and the consumables' amount of the time used. This operating manual tells you detailed information of the cleaning machine to use properly. Please read this manual carefully and put the manual near by the machine to use.

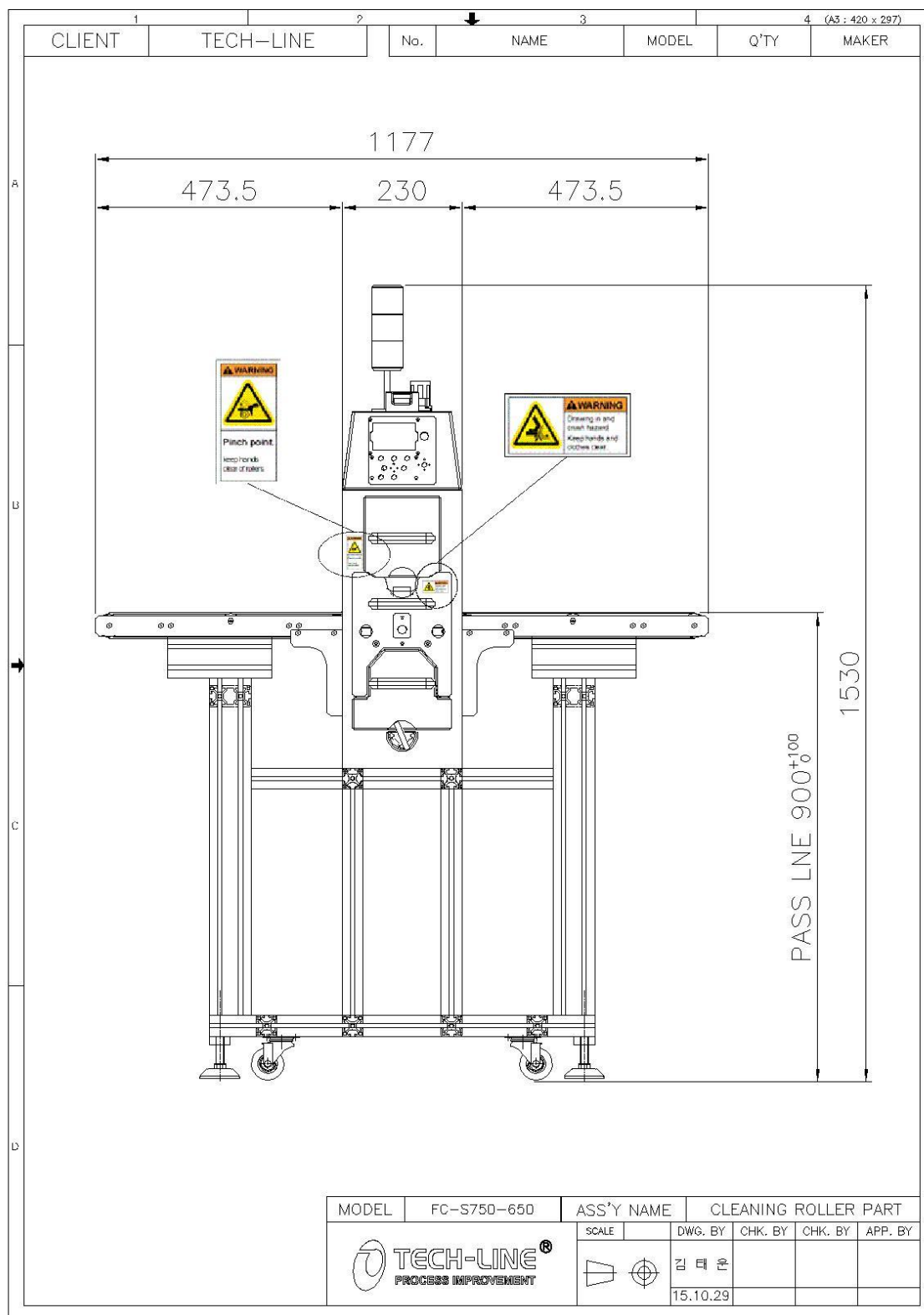
I-2. SAFETY PRECAUTIONS

Before you operate the cleaning machine, carefully read this safety precautions and use the machine properly. This safety precautions contains important contents for you to prevent injury or property damage from occurring. After you read it, place it conspicuously. Below pictures and explanations are to be followed by cleaning machine users.

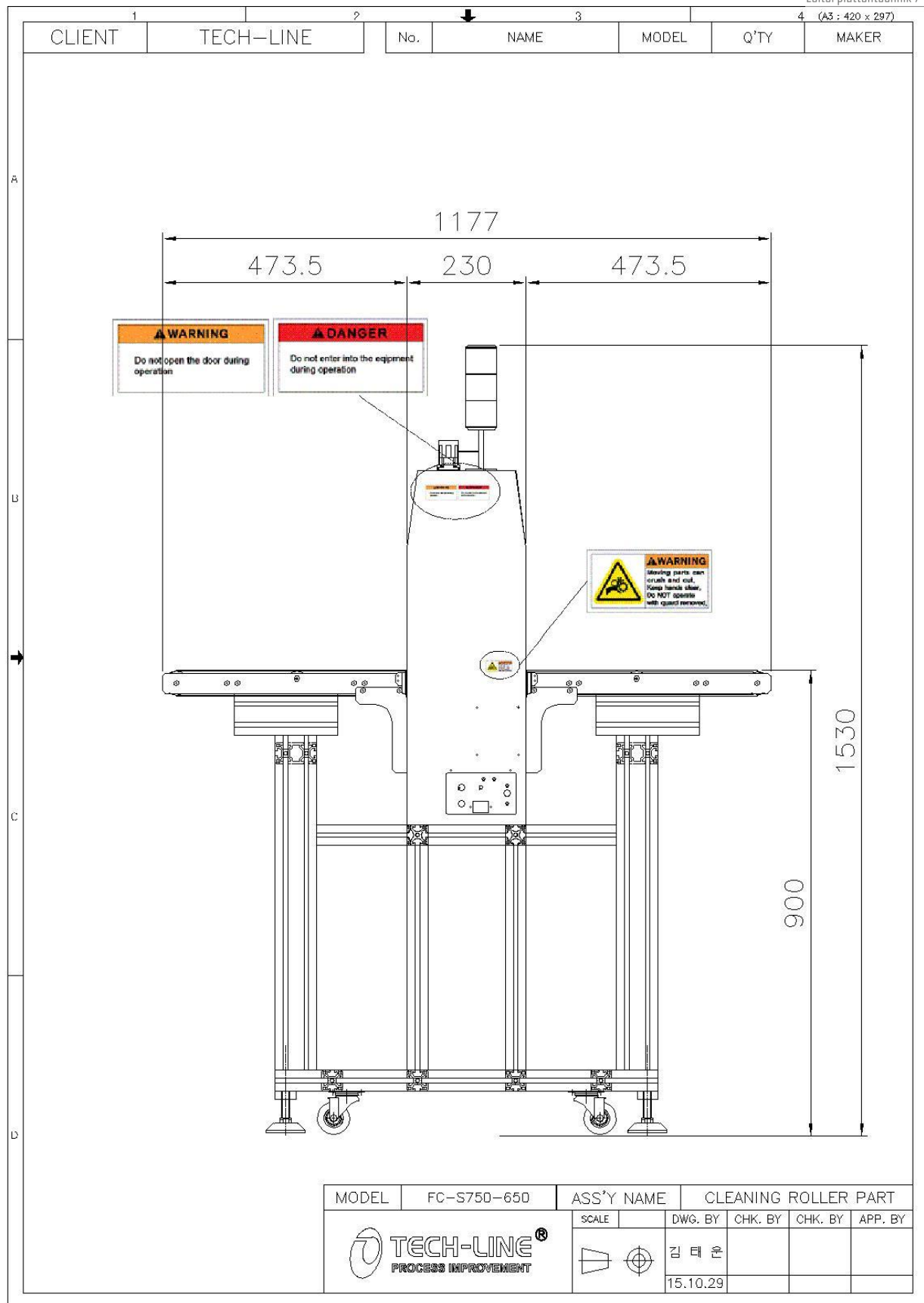
	DANGEROUS indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.
	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
	This product is equipped with the high voltage circuit, therefore careful attention is required.
	Moving parts can crush and cut. Keep hands clear. Do not operate with guard removed.
	Please ground where this indication is placed.
	For safety and security purposes, keep this enclosure locked at all times.
	 Drawing in and crush hazard. Keep hands and clothes clear.
	 Tech-Line's product quality assurance mark
	 High voltage flows so do not get close to it
	 Pinch point. Keep hands clear of rollers.

I-3. POSITION OF SAFETY LABEL

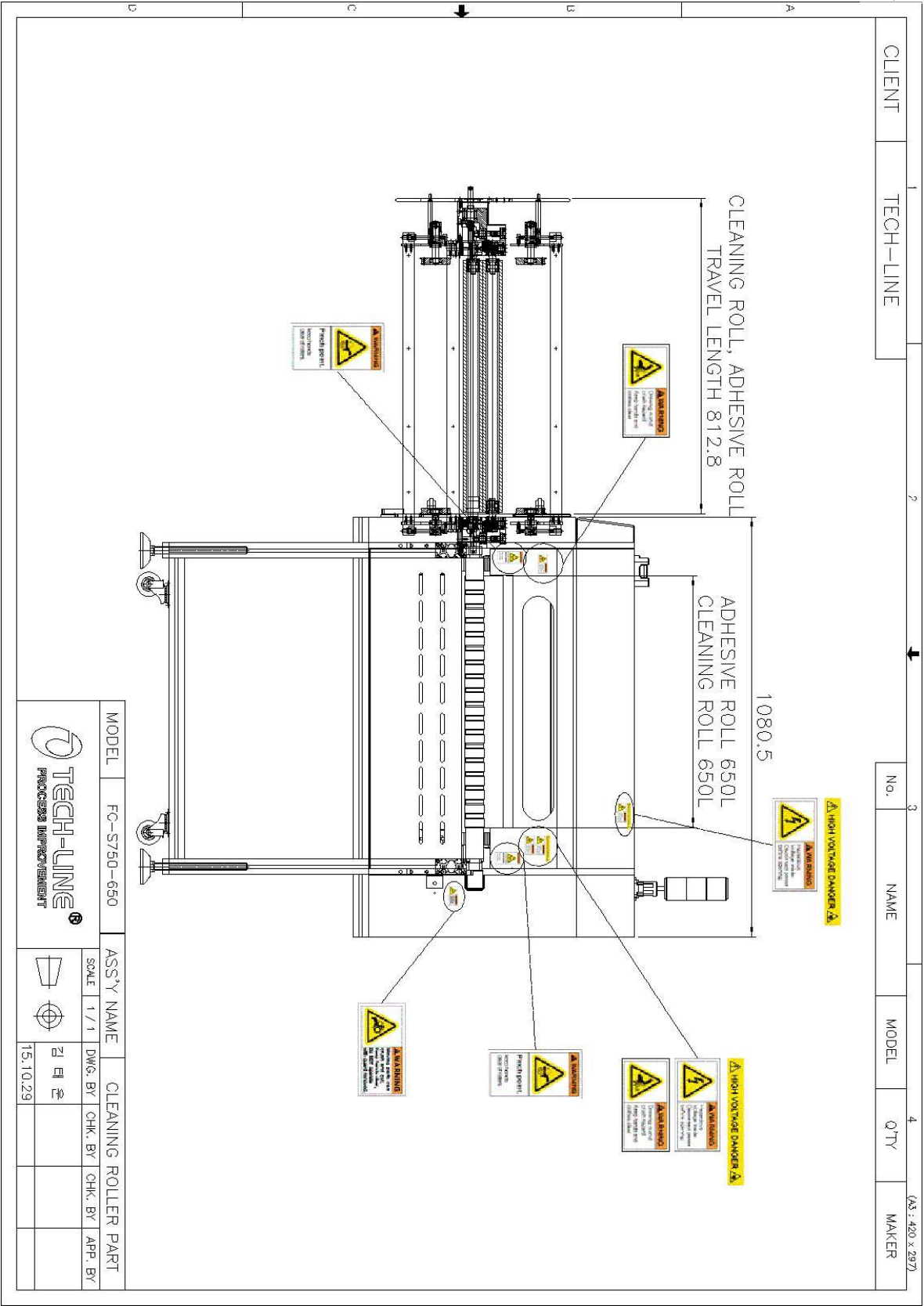
1. FRONT OF THE CLEANING MACHINE



2. REAR OF THE CLEANING MACHINE

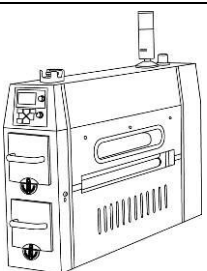
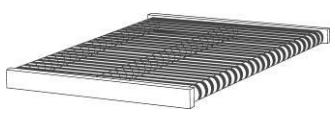
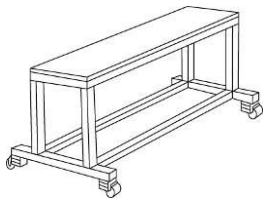
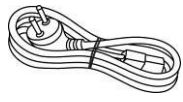
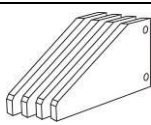


3. SIDE OF THE CLEANING MACHINE



I-5. PRODUCT LIST

1) After you receive Tech-Line's product, please check if there is any missing parts.

ITEM	PICTURE	MODEL	SIZE	QUANTITY	REMARK
MAIN BODY		FC-S730 Series			
		FC-S750 Series			
		FC-S760 Series			
		SMT			
		ETC			
CONVEYOR		ROUND BELT TYPE			
		FLAT BELT TYPE			
		ROLL			
		SPECIAL ROLL			
		SLIP ROLL + O-RING			
		FLAT & ROUND BELT TYPE			
WORKING TABLE		FOOT			
		CASTER			
		CASTER & FOOT			
		FOOT MASTER			
		Etc.			
PART		POWER CODE			
		RIB			
		WRENCH			
		MANUAL			
		M5*15			
		M5*25			
	Etc.				

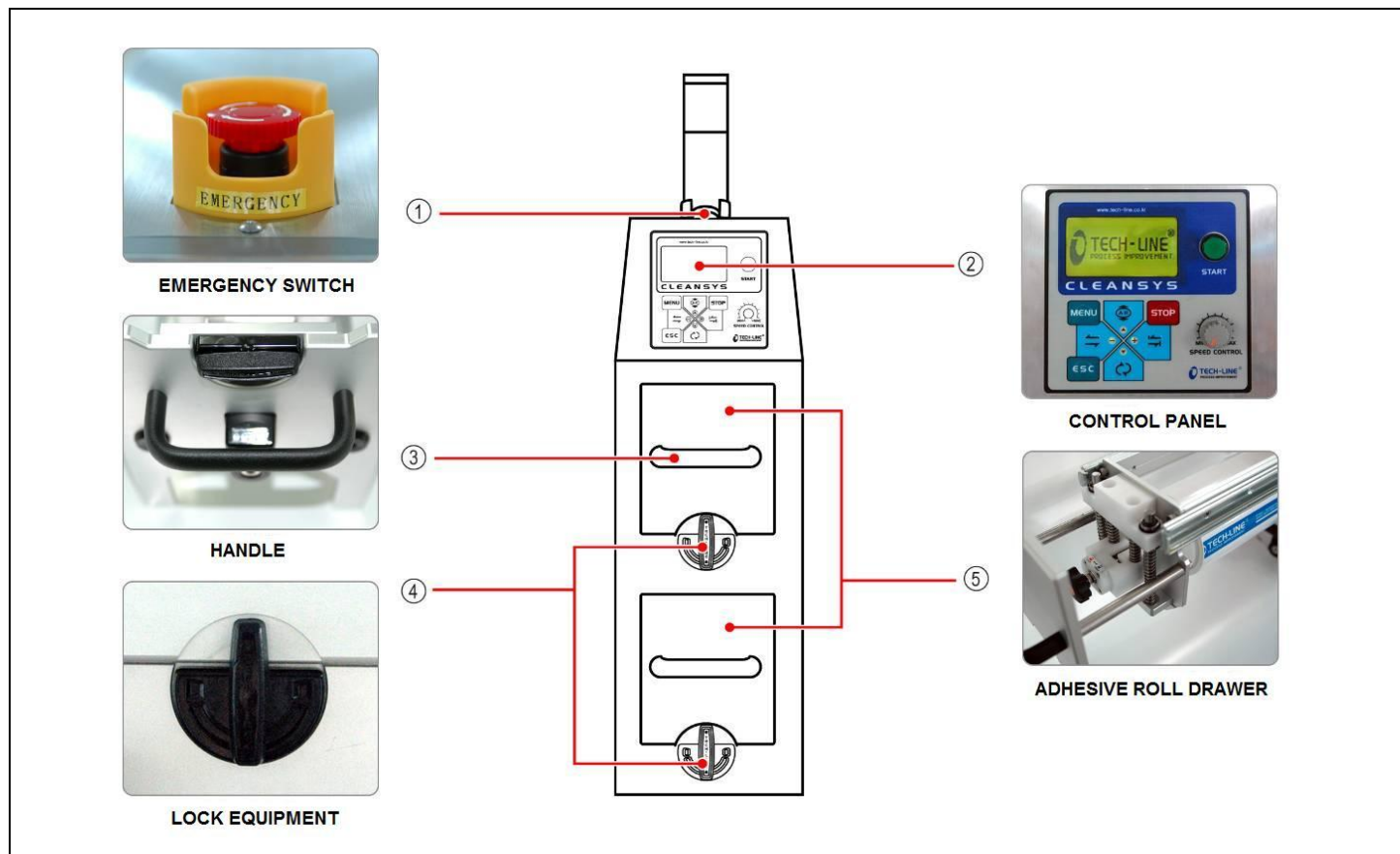
- PLEASE FILL THIS PRODUCT LIST FORM OUT IN NUMBERS.

2) PART LIST

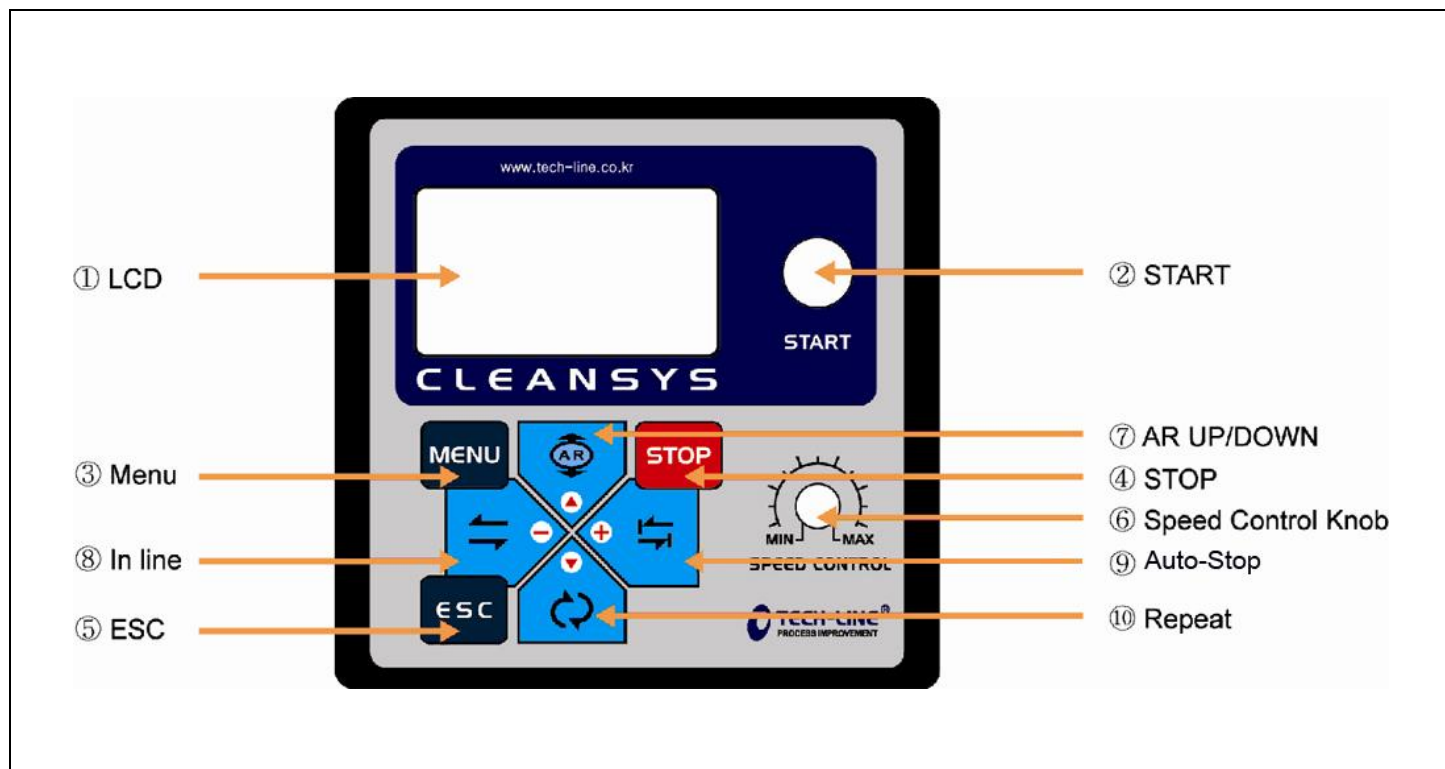
ITEM		SPECIFICATION	SIZE	QUANTITY	REMARK
ELECTRICITY	MOTOR	GM-SSYF-RH(0.2Kw I-7.5)		1PC	
	INVERTER	FR-D720-0.2k		1PC	
	DC SMPS	DC		1PC	
	PHOTO SENSOR	SB-32WS		2PCS	
	CONTROLLER FUSE	250V/3A/20mm		1PC	
	MAIN FUSE	250V/5A/20mm		2PCS	
AIR	AIR CYLINDER	Cq2B20-50D		4PCS	
	SOLENOID VALVE	SY5120-5G-01		2PCS	
BEARING	CLEANING ROLLER	6800ZZ		2PCS	
		2202ZZ		2PCS	
		6001ZZ		12PCS	
		51100		4PCS	
	MOTOR	6003ZZ		1PC	
		6902ZZ		2PCS	
		6901ZZ		3PCS	
		698ZZ		4PCS	
	CONVEYOR	6902ZZ		8PCS	
		2202ZZ		2PCS	
		6904ZZ		18PCS	
PART	ANTI-STATIC BAR	SB-521 AND OTHER		2 PCS	
	IONIZER CONTROLLER	SBC-571 AND OTHER		1 PC	
	ADHESIVE ROLL	Φ97 * (L) AND OTHER		2 PCS	
	CLEANING ROLLER	Φ50 * (L) AND OTHER		4 PC	
ETC.					

I-6. PART NAMES

1) FRONT

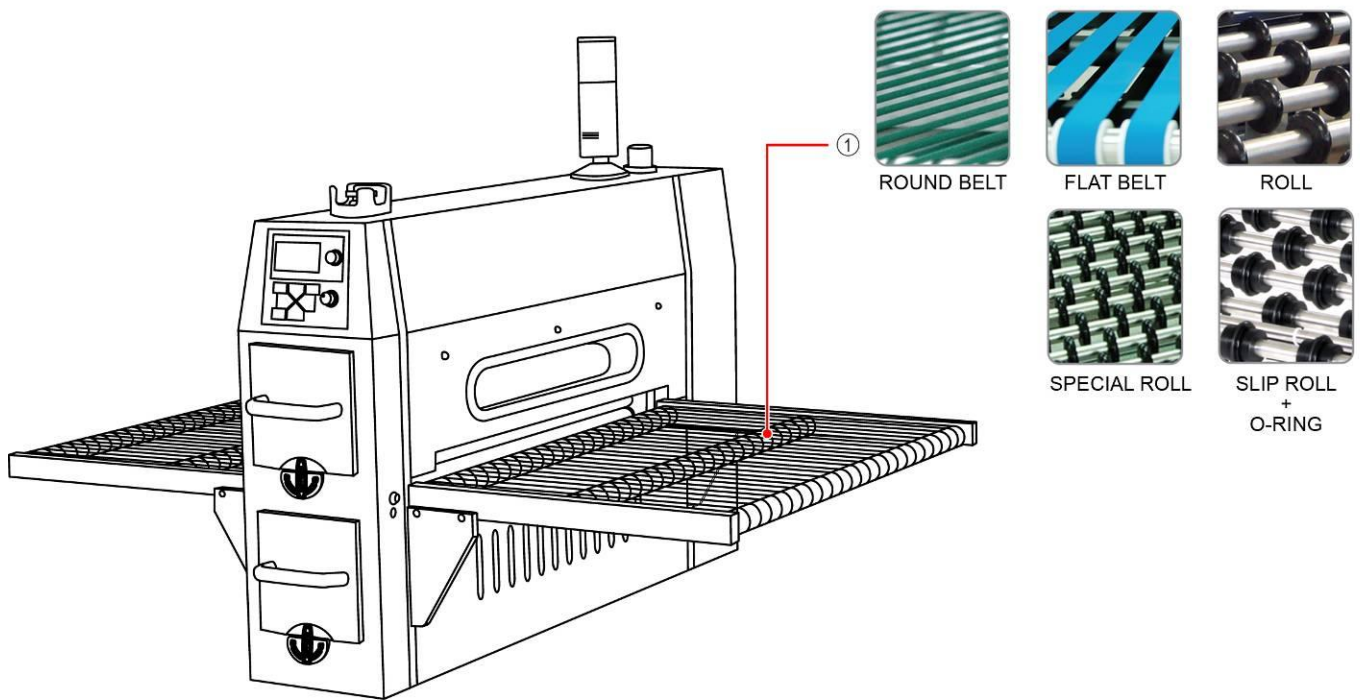


< Front >



< Control panel detailed names >

2) SIDE

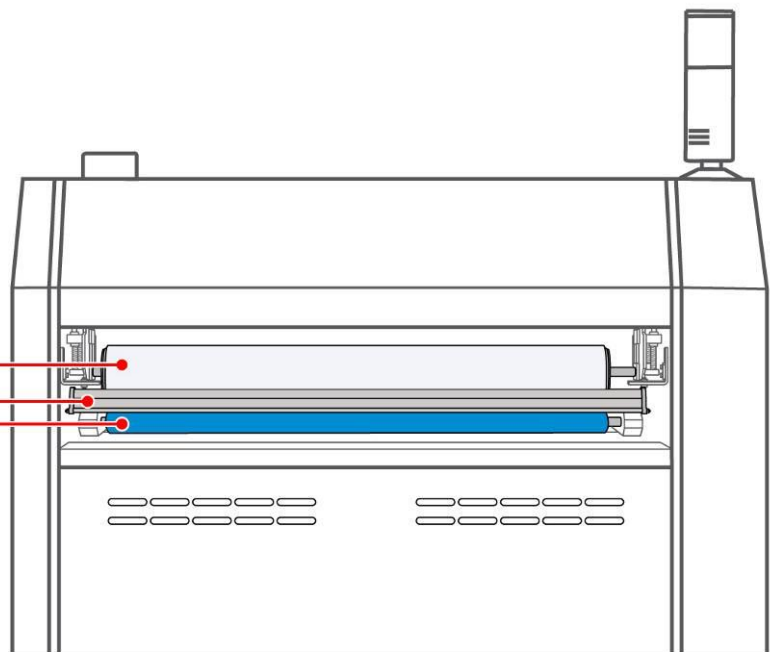


< Side >

① ADHESIVE ROLL

② ANTI-STATIC BAR

③ CLEANING ROLL

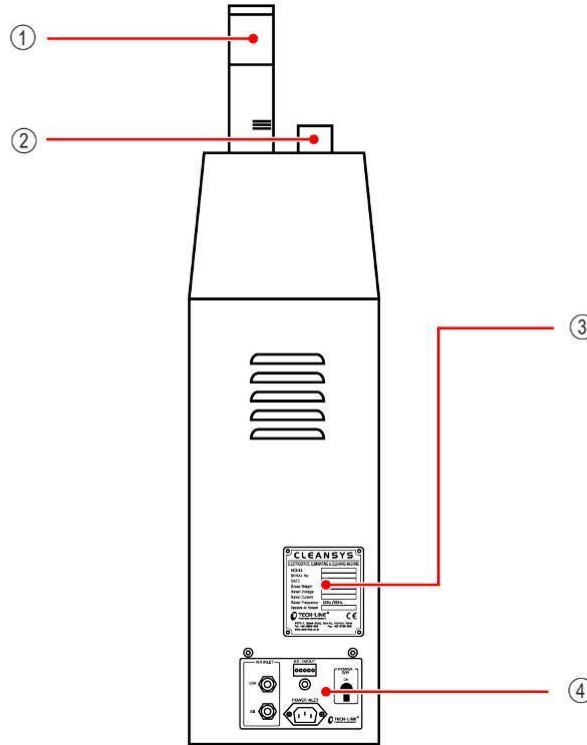


< Picture of uncovered side cover >

3) BACK



SIGNAL TOWER & AIR UNIT

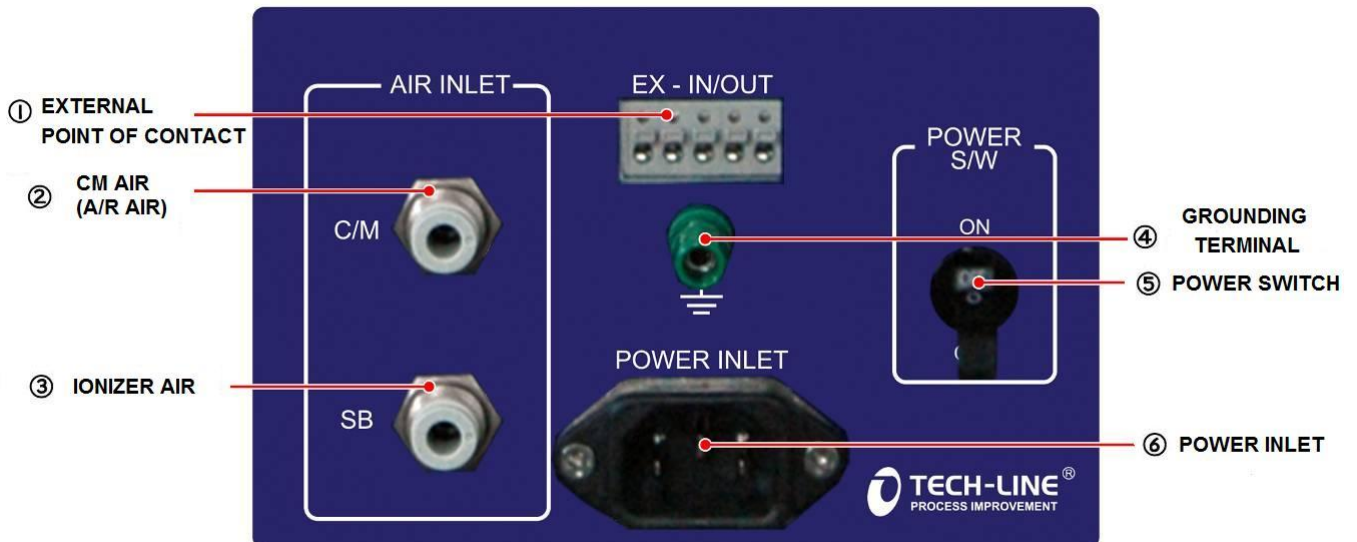


MACHINE INFORMATION STICKER



POWER & AIR INPUT

< Back >



I-7. CLEANING MACHINE INSTALLATION AND CONVEYOR ASSEMBLY METHOD

Please check Tech-Line's product first and see if there is any defects or not. Place the product at the suitable spot for the installation of the machine.

1) INSTALLATION LOCATION

Please keep these cautions in mind when installing the cleaning machine. If the machine is not installed at suitable place, machine may not operate properly.



Avoid direct sunlight



Flat and no vibration



Place where it is not dusty



Keep the temperature of 5 ~ 35°C and less humid place (Relative humidity: below 60%),

2) ELECTRIC POWER

The standard electric power of the Tech-Line's product is AC 220V/60Hz and the other power sources are available to suit your environment. (For China: 220V/50Hz)



Make sure the power supply is the same as the power of this machine.



Plug the AC power cord into the outlet properly.



Be careful with the plug so it won't be pressed or folded.

3) GROUNDING

Be sure to ground for safety and unexpected danger.

① Possible grounding place



Grounding terminal of electric outlet

Grounding Resistance	Ground Wire Thickness	Application Place
Below 100Ω	Above 1.6mm	Second side of potential transformer Outside of underground electric wire route Outside of electric wire protection cable Outside of neon transformer

Grounding terminal

② Impossible grounding place



Never ground at the terminal of the gas pipe, the water pipe, and the telephone.



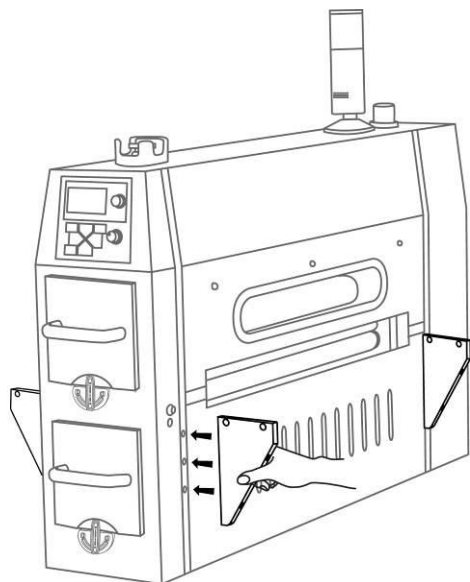
Right way to ground

4) OTHER PRECAUTIONS

To prevent damage from the lightning strikes, turn off the power switch and unplug the power cord.

5) Conveyor assembling procedure

- ① Set 4 ribs like the picture below.



TIP.

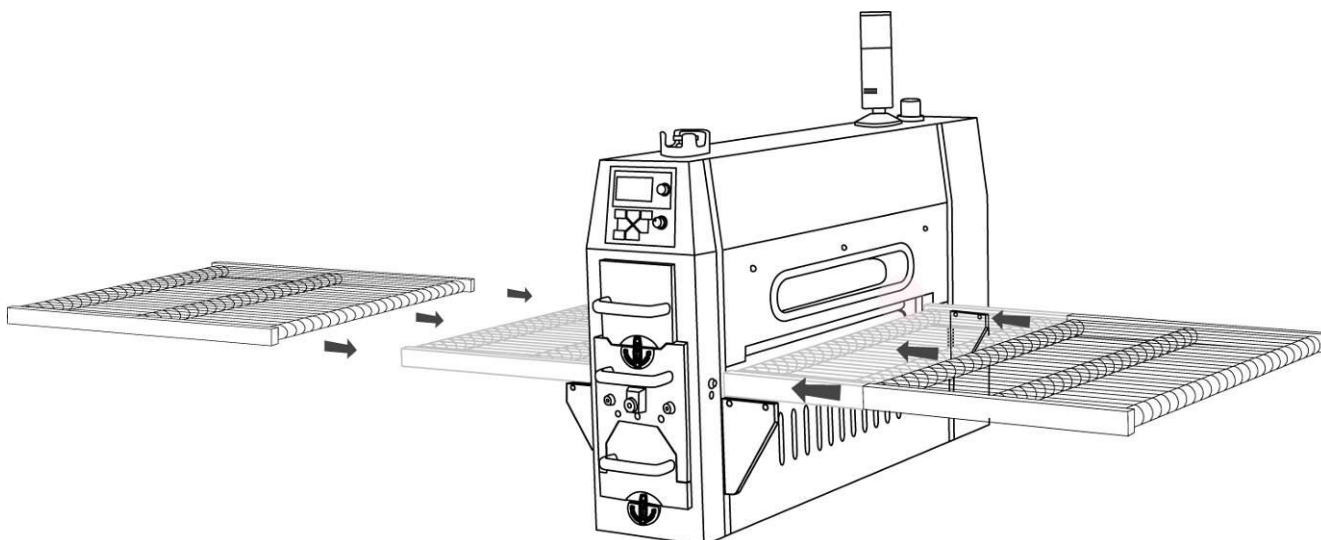


Fix 4 ribs to the machine with M5*25 bolts like below picture.

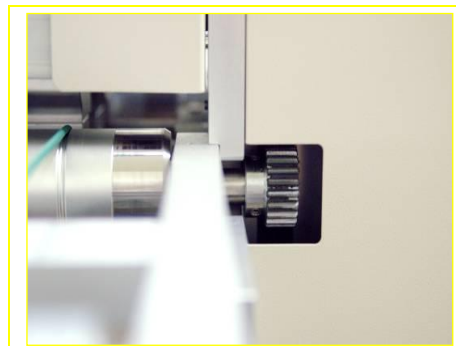
<Picture>



- ② Fix conveyors to the main body like below picture so the conveyor's gear engages with the main body's gear.

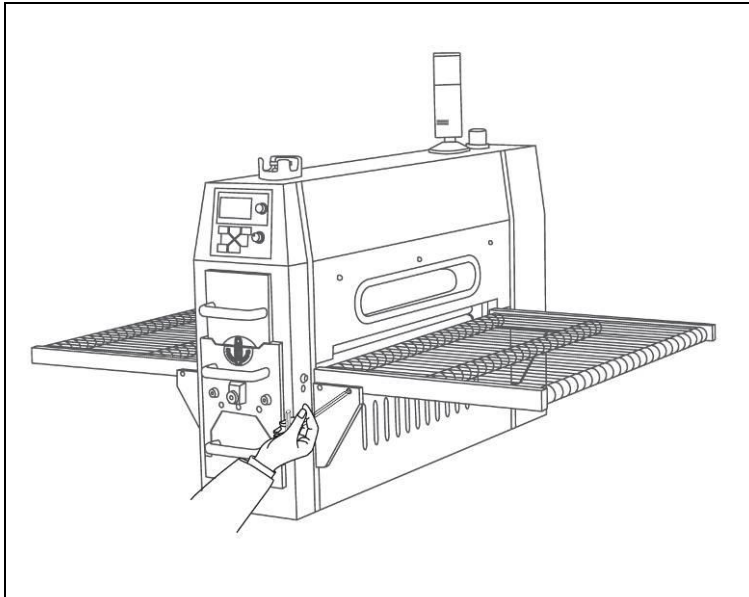


Before conveyor assembling

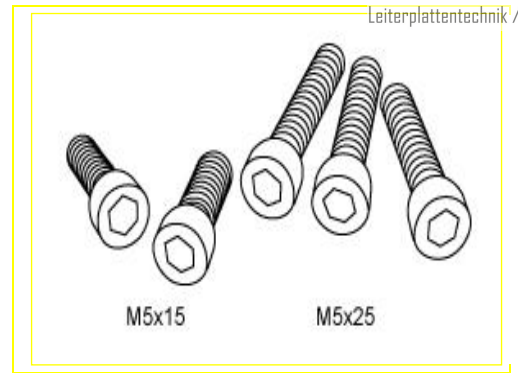


It shows you that the conveyor's gear engaged with the main body's gear well.

- ③ Fix ribs and conveyor with M5*15 bolts.

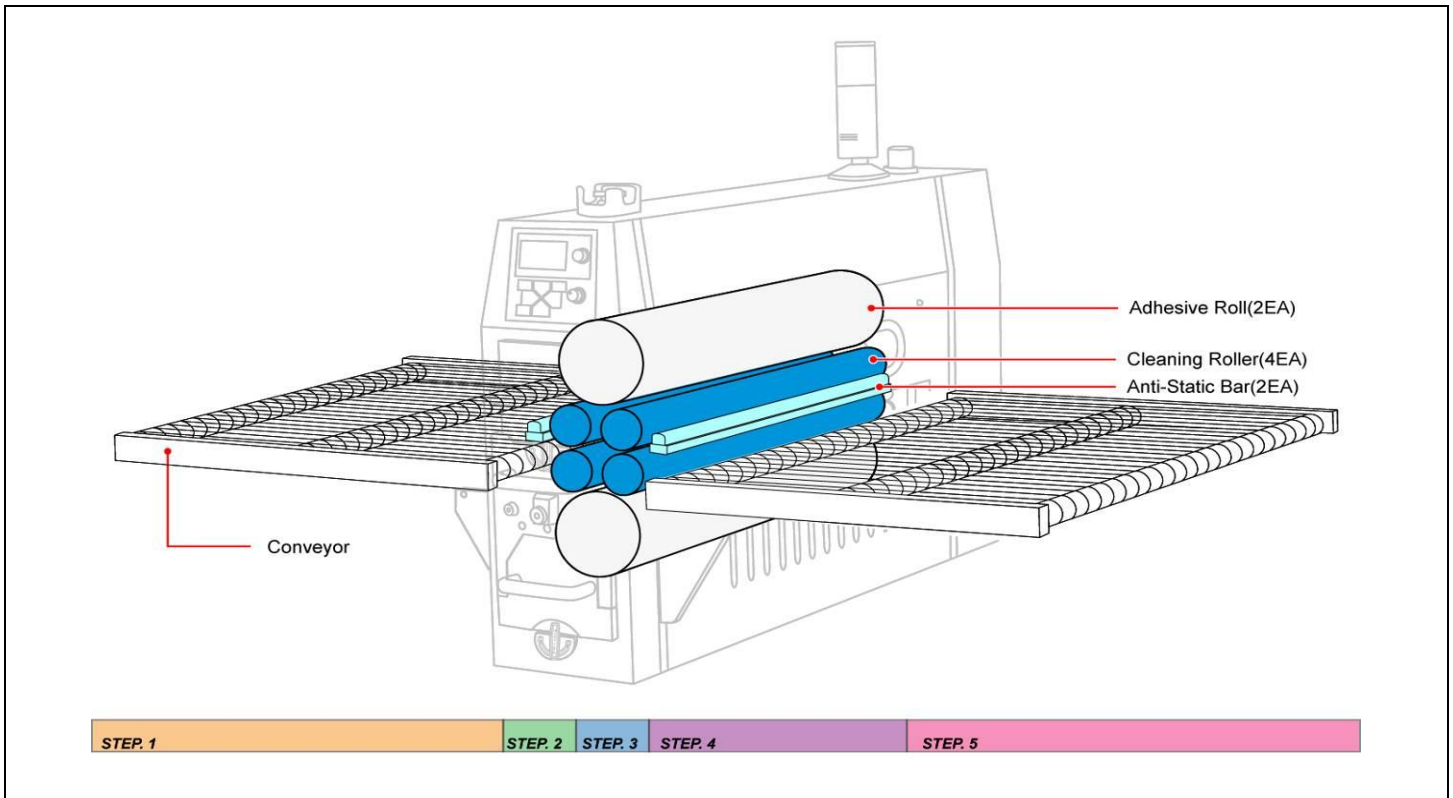


TIP.

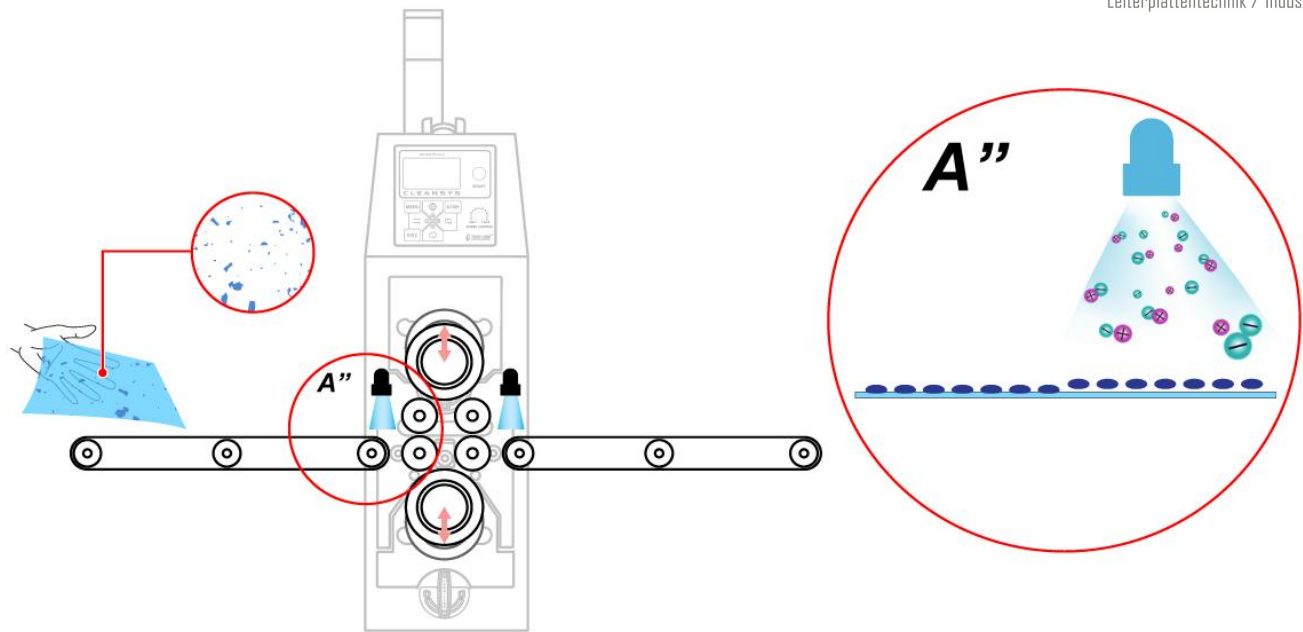


I-8. CLEANING MACHINE MECHANISM

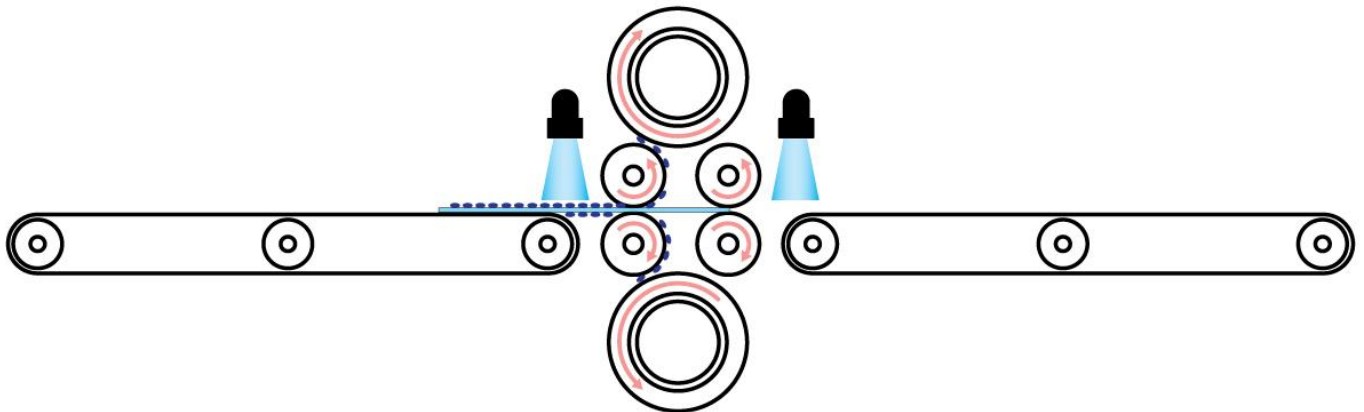
Methods of removing particles and static electricity with adhesive rolls and anti-static bars are applied to the cleaning machine. The cleaning machine consists of 4 cleaning rollers, 2 adhesive rolls and 4 ionizers. Most of the dust and particles on the objects are generated by static electricity. Therefore, first of all, the cleaning machine separates particles from the object electrically through the first anti-static bar, and the 4 specialized cleaning rollers get rid of dust and particles, then the contaminants sticking on the cleaning rollers are moved to adhesive rolls. Lastly, the cleaning machine eliminates static-electricity from the object one more time through the second anti-static bar.



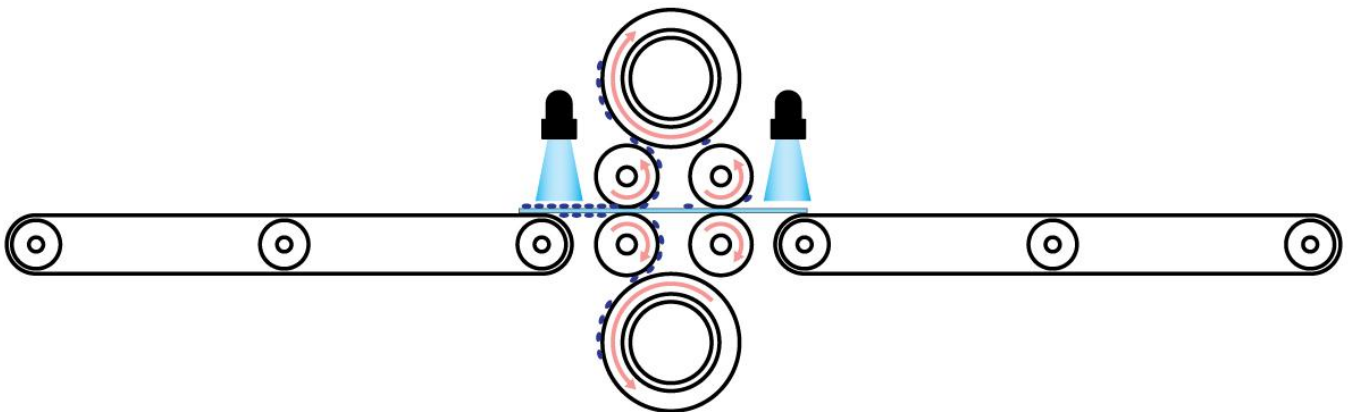
STEP. 1



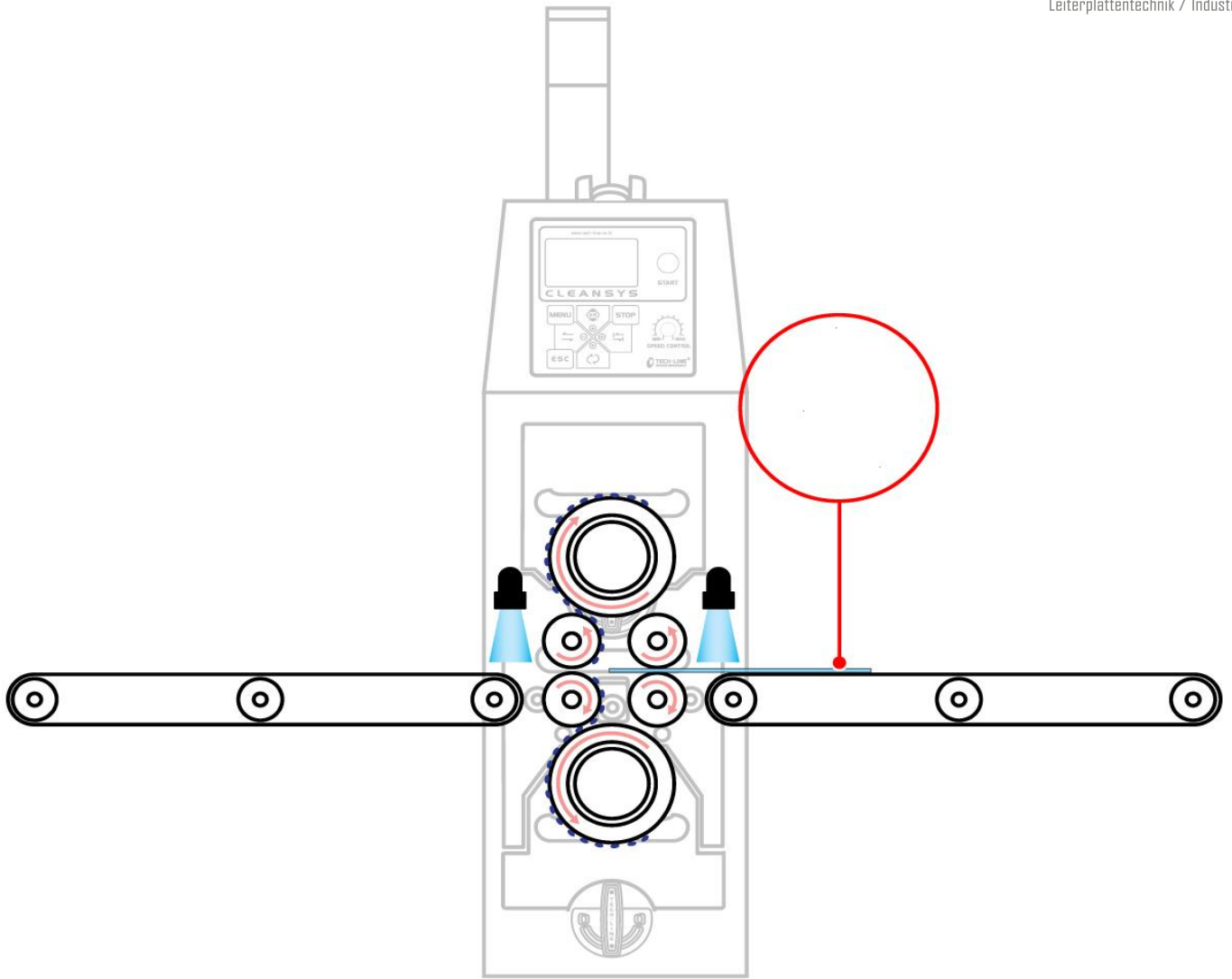
STEP. 2



STEP. 3



STEP. 4



STEP. 5 (COMPARATIVE ANALYSIS DATA)

Before Cleaning	After Cleaning

PART II. SPECIFICATION

II-1. CLEANING MACHINE SPECIFICATION

FC-S730 ☐	FC-S750 ☐	FC-S760 ☐	ETC. ☐
			

ITEM	SPECIFICATION
APPLICATION OF THE PRODUCTS	Width(mm) : mm Thickness(mm) : mm
CONTROL METHOD	8bit Micro processor
CLEANING ROLLER	OD = Φ50, Width =1000 □ 0.05 ~ 2.5mm, □ 0.1 ~ 2.5mm, ■ 0.1 ~67mm
ADHESIVE ROLL	ID = Φ76.2 (3 Inch) OD = Φ96 * L1000
ANTI STATIC BAR	Pulse DC
PDC CONTROLLER	2 ch
WORKING SPEED	0 ~ 40 M/min
INLET AIR(Kg/cm2)	□ 2.5 ~ 3.5 □ 3.5 ~ 4.5 ■ 4.5 ~ 5
SIZE OF MAIN BODY(mm)	□ 650 series : 1119(W) x 931(H) x 230(D) □ 850 series : 1280(W) x 931(H) x 230(D) ■ 1000 series : 1571(W) x 1210(H) x 230(D) □ 1300 series : 1779(W) x 931(H) x 230(D)
CONVEYOR	Input: □ 510mm, □ 750mm, ■ 1000mm □ Type: Round belt Type Output: □ 510mm, □ 750mm, ■ 1000mm □ Type: Round belt Type
PASS LINE(mm)	850+100
MAIN BODY WEIGHT(kg)	□ 650 series: kg □ 850 series: kg ■ 1000 series: 245kg □ 1300 series: kg
CONVEYOR WEIGHT(kg)	□ 650 series: kg □ 850 series: kg ■ 1000 series: 49 kg □ 1300 series: kg
CASE MATERIAL	■ Ivory003 CASE □ SUS CASE
MAIN FUSE	220Vac, 5A
POWER	Single-phase 220Vac 50/60Hz
COMSUMPTION OF ELECTRICITY	300W
OPTION	1. ADHESIVE ROLL & CLEANING ROLL OPEN TYPE 2. COUNTER FUNCTION 3. GAP CONTROL DEVICE & DRIVING UPPER ROLLER TYPE

II- 2. ADHESIVE ROLL SPECIFICATION



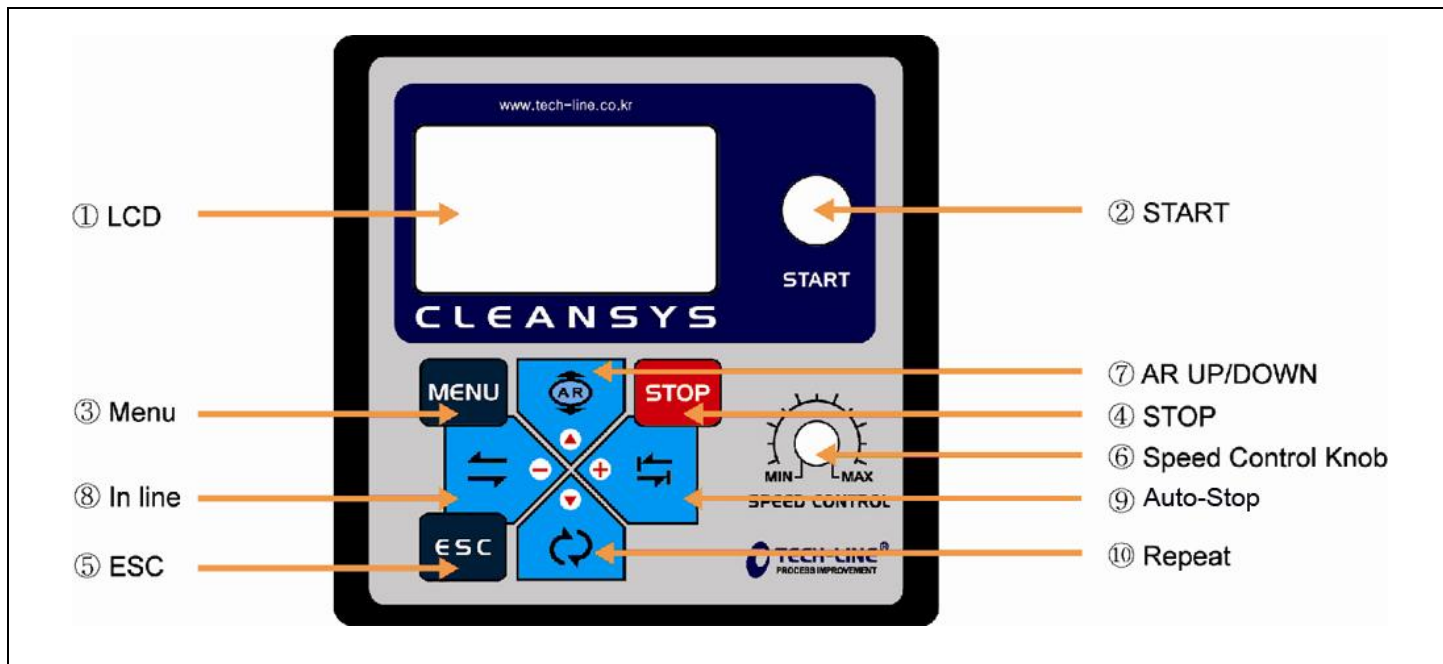
ITEM		LOWER FORCE ADHESIVE ROLL (NORMAL, PRE-CUT TYPE)	HIGH FORCE ADHESIVE ROLL (NORMAL, PRE-CUT TYPE)
Color(logo)		White	White
Adhesive Material		Synthetic Film	Synthetic Film
Size(mm)		100~1600	100~1300
Thickness(mm)		0.08	0.095
I.D(inch)		3	3
Length(mm)		20	20
Strength of Adhesive(gf/25mm)		600±50	550±70
BALL TACK	INCLINED ANGLE(30°)	1	6

II - 3. CLEANING ROLLER SPECIFICATION



ITEM	Roller hardness (shore 'A')	Adhesive Power (gf/gf25mm)	Thickness of Applied Object (Anti-Curling device)	Size(mm)	Application
CR				Ø50 * L1000	

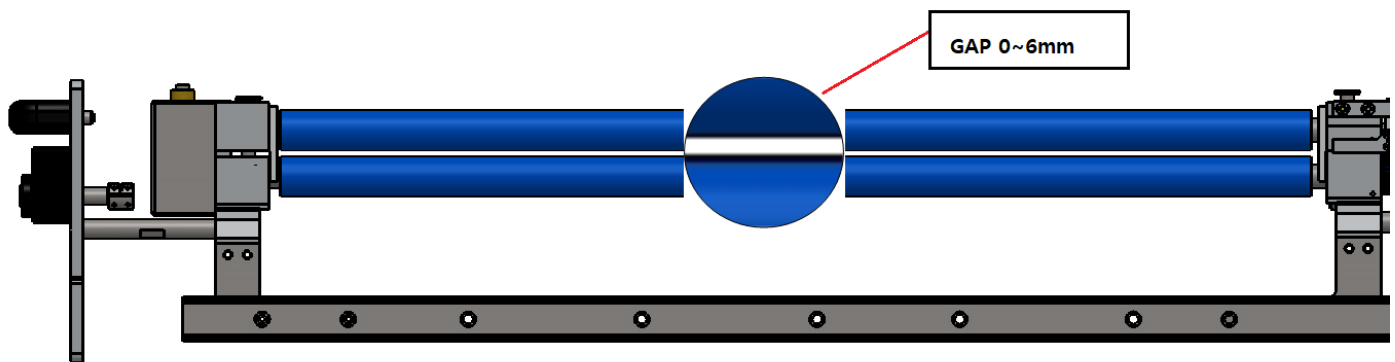
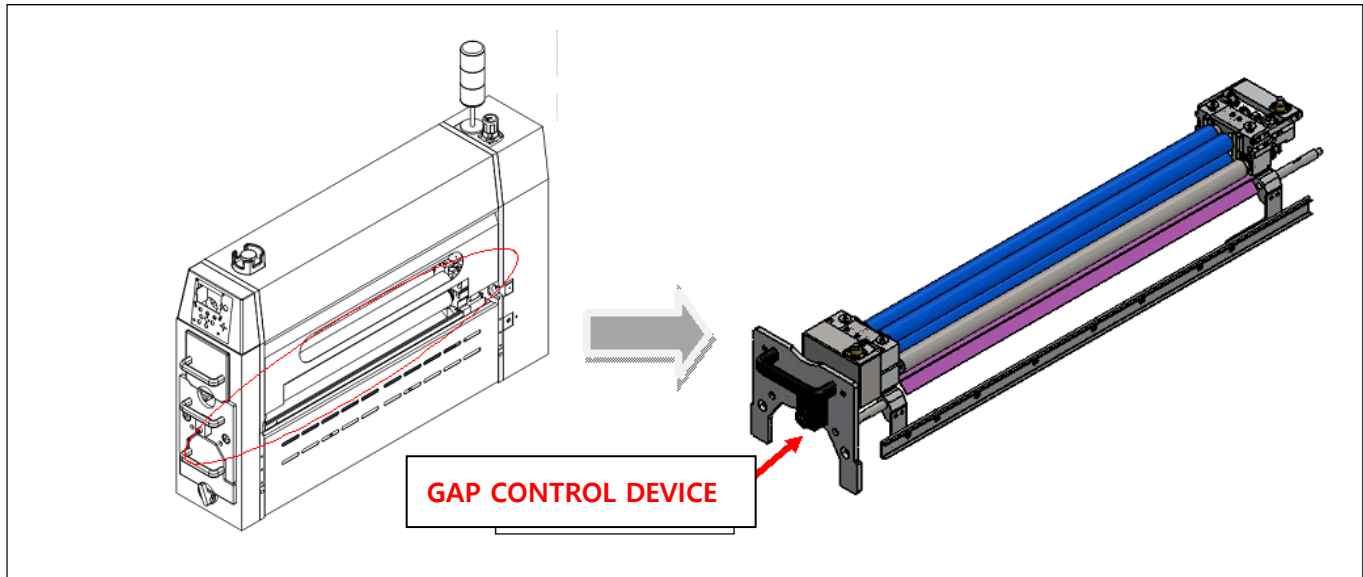
III - 1. CONTROL PANEL NAMES AND FUNCTIONS



NO	NAMES	FUNCTIONS
①	LCD	- Operating condition, count number, working speed, and menu indication
②	Start S/W	- In case of emergency, press EMG switch, then C/M will stop. "EMERGENCY" will appear on the LCD screen and start switch lamp will flicker. - To cancel emergency, pull out the EMG switch, then press start switch to initialize the machine.(CE regulation item)
③	Menu	- A/R Cycle, RepeatNo, Language setting - Possible to get into the menu when cleaning machine is not in use.
④	STOP	- To stop cleaning machine, press stop button.
⑤	ESC	- Use it to exit from the menu screen - If you press this button while cleaning machine is not operating, count number will be initialized.
⑥	Speed control knob	- Function to control speed of cleaning machine Speed : 0 ~ 40
⑦	A/R UP/DOWN	- Able to move A/R up and down only when cleaning machine is in In-line mode. - Use this button as a up/down button on menu mode
⑧	In-line	- Possible to set the conveyor movement(forward/inverse) - Every time you press this button, working direction will be changed. - On menu mode, this button is used to decrease the number.
⑨	Auto-Stop	- Cleaning machine stops automatically according to the sensor detection. - In menu mode, this button is used as + (increase) button.
⑩	Repeat	- Function for repetition work(No settings for forward or inverse direction) - This button is used as a down switch on menu mode.

PART III-2 GAP CONTROL DEVICE

- Gap control device is applied **only** to **FC-S750,FC-S760 series**. (option)
- Gap control device is for high operation efficiency and effective range is 0 ~ 6mm.
(Gap adjustment of cleaning roller according to thickness of films)



○ Operation Method

STEP 1 : Turn off the power.

STEP 2 : Adjust the gap with the M8 wrench. (+0.25mm/Rev.)

STEP 3 : After the value has been set, operate the machine.

※ Notice : 1) Do Not turn the gap controller counterclockwise when the setting value is zero.

2) Do Not use it as the handle to open the Cleaning Roller drawer.

※ **If the setting value is zero, DO NOT turn the thickness controller to the counterclockwise.**

※ **When you open the cleaning rollers, DO NOT use thickness controller as your handle by holding or touching.**

2) GAP How to Set the Thickness of the GAP Adjuster

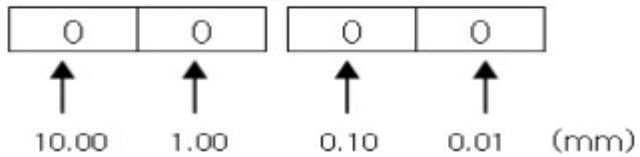
WORKPIECE THICKNESS(mm) – 0.5mm = ACTUAL GAP

Example) If the operator cleans the material 4mm thick

Actual gap -> 4mm + 0.5mm = 3.5mm

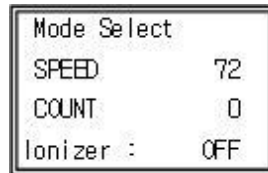
- The upper cleaning roller reduces the actual GAP by 0.5mm due to the pressure on the adhesive roll.

※ **INDICATOR**



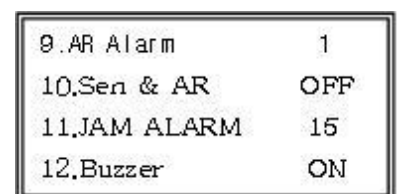
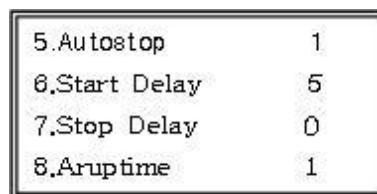
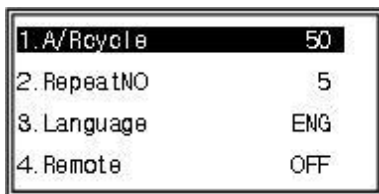
Figures displayed on the indicator	Actual GAP gap value mm
[00 00]	0.00mm
[00 02]	0.08mm
[00 04]	0.16mm
[00 06]	0.24mm
[00 08]	0.32mm
[00 10]	0.40mm
[00 12]	0.48mm
[00 14]	0.56mm
[00 16]	0.64mm
[00 18]	0.72mm
[00 20]	0.80mm
[00 25]	1.0mm

When power is turned on, Tech-Line logo appears on the LCD screen and then the mode selection screen will appear.



< Figure 1. Mode select screen >

Speed range is from 0 to 100 and you can change the speed by spinning speed control knob. (Manufacturer speed range: 0 to 40M/min.) When you press **MENU** button, you will get into the main menu. When the cleaning machine is turned on for the very first time, all the settings are temporary. Once you set the machine, the settings will be stored in the machine. And when you press **ESC** button on main menu, it will exit from the main menu.



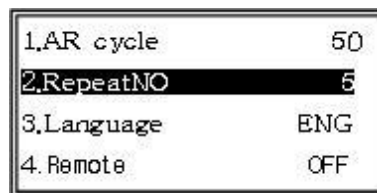
1) A/R cycle

- Function to set adhesive roll cutting period

The range of A/R cycle is from 0 to 9999. Use **MENU** button to move cursor and use  and  buttons to set A/R cycle from 0 to 9999. When assigned workload finishes, the machine works according to the set menu 9 and the count number will be initialized to 0 to recount. At this time, the cleaning machine will be operating.

2) RepeatNO

- Function to set the repetition number of the repetition work



< Figure 2. Repeat NO setting screen >

On main menu, use  and  buttons to move the cursor down to RepeatNO. The range of repeat number is from 0 to 99. Use  and  buttons to set repeat number.

The repeat number decreases as repetition work performs. When repeat number turns to 0, the repeat number automatically resets. The cleaning machine stops and is ready for next repetition work. (When you set repeat number to 0, the cleaning machine repeat infinitely.)

3) Language

- Language setting function (English, Japanese, Chinese, Korean)

1.AR cycle	50
2.RepeatNO	5
3.Language	ENG
4.Remote	OFF

< Figure 3. Language setting screen >

Use  and  buttons to move the cursor down to language like figure 3 above and use  and  buttons to select language.

4) Remote

- Remote function is to control cleaning machine when the cleaning machine is used with external machine.

1.AR cycle	50
2.RepeatNO	5
3.Language	ENG
4.Remote	OFF

< Figure 4. Remote setting screen >

On menu screen, use  and  buttons to move the cursor down to remote and then use  and  buttons to set remote mode. There are 4 remote modes, IN →, IN ←, AT2 →, and AT2 ←.

5) Autostop

- Autostop mode setting

5.Autostop	1
6.Start Delay	5
7.Stop Delay	0
8.Aruptime	1

< Figure 5. Autostop setting screen >

Use  and  buttons to move the cursor to autostop like figure 5 above and then use  and  buttons to select either autostop 1 or 2.

6) Start Delay

- Operation start time setting on autostop 2 mode

5.Autostop	1
6.Start Delay	5
7.Stop Delay	0
8.Aruptime	1

< Figure 6. Start Delay setting screen >

Start delay is applied when the cleaning machine is in autostop 2 mode. After sensor detects the object, the machine starts to operate according to "start delay time". The range of start delay is from 0~99 seconds.

7) Stop Delay

- Operation stop time setting on autostop 2 mode

5.Autostop	1
6.Start Delay	5
7.Stop Delay	0
8.Aruptime	1

< Figure 7. Stop Delay setting screen >

Stop delay is applied when the cleaning machine is in autostop 2 mode. After sensor detects the object, the machine stops the operation according to "stop delay time". The range of stop delay is from 0~99 seconds.

8) Aruptime

- Adhesive roll separation time setting on autostop 1 mode

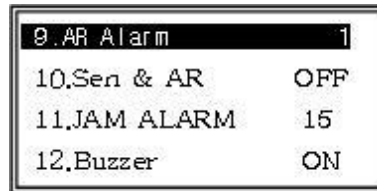
5.Autostop	1
6.Start Delay	5
7.Stop Delay	0
8.Aruptime	1

< Figure 8. Stop Delay setting screen >

Aruptime is applied only when the cleaning machine is in autostop 1 mode. When output sensor detects the cleaning object, the operation stops, and adhesive roll stays down. Adhesive roll will automatically goes up according to "Aruptime". Aruptime range:0~99 seconds

9) AR Alarm

- Function to let the operator to know after the machine operates as set AR cycle value.



< Figure 9. AR Alarm setting screen >

There are 3 AR alarm mode

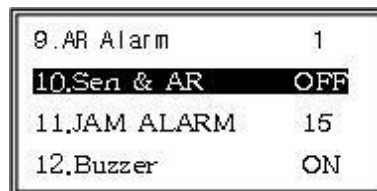
Mode 1 – When product count number is the same with the AR cycle value, buzzer will go off 2 times. The cleaning machine keeps operation.

Mode 2 - When product count number is the same with the AR cycle value, buzzer will go off 2 times and start button flickers. Until the operator push the start button, buzzer keep go off. Even though the buzzer keep go off, the cleaning machine keep operation.

Mode 3 - When product count number is the same with the AR cycle value, buzzer will go off 2 times and start button flickers. Also, "START PUSH!" message appears on the LCD screen. At this time, the operation stops, and when the operator pushes the start button, the cleaning machine starts operation.

10) Sen & AR

- Function to set AR down time on inline mode



< Figure 10. Sen & AR setting screen >

Use  and  buttons to select sen & ar like figure 10 above, and use  and  buttons to set either on or off.

OFF: With the operation of the conveyor while inline operations, adhesive roll goes down.

ON : With the operation of the conveyor while inline operation, adhesive roll stays up. When the input sensor detects the cleaning object, adhesive roll goes down. When output sensor detects the cleaning object, adhesive roll goes up.

11) JAM ALARM

- Function to let the operator to know when the cleaning object is jammed or fall down from the conveyor or cleaning roller.

9.AR Alarm	1
10.Sen & AR	OFF
11.JAM ALARM	15
12.Buzzer	ON

< Figure 11. JAM ALARM setting screen >

If the output sensor does not detect a cleaning object according to the jam alarm time setting, start button flickers and "PLEASE JAM" message appears on the LCD screen. At this time, the machine stops operation. When the operator pushes start button, the mode select screen appears. Use  and  buttons to set the range of jam alarm from 0~99 seconds.

12) Buzzer

- Buzzer setting

9.AR Alarm	1
10.Sen & AR	OFF
11.JAM ALARM	15
12.Buzzer	ON

< Figure 12. BUZZER setting screen >

Use  and  buttons to select buzzer like the figure 12 above and then use  and  buttons to set either buzzer on or off.

III - 4. OPERATION SELECTION

1) In-line mode

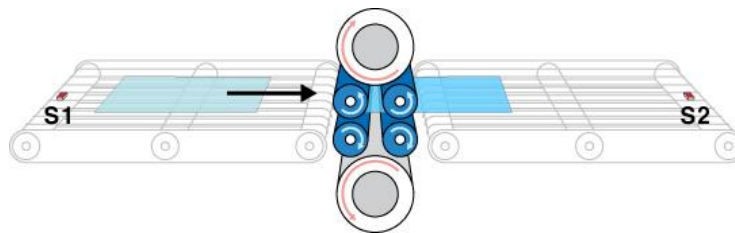
- In-line work: In-Line forward or inverse working mode

STEP 1 : When you push  button on mode select screen, cleaning machine starts in-line work.

Inline	<-
SPEED	72
COUNT	0
Ionizer :	ON

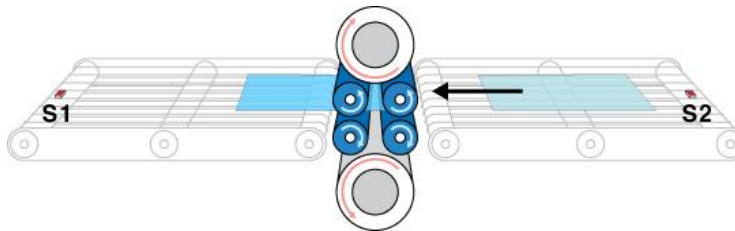
< Figure 13. In-line working mode screen >

STEP 2 : When the operator push  button, the operation direction will be left to right. When the sensor 2 detects the cleaning object, the machine starts to count.



< Figure 14. Forward working >

STEP 3 : When you push  button again, the operation direction will be right to left. When the sensor 1 detects the cleaning object, the machine starts to count.



< Figure 15. Inverse working >

※ If the output sensor does not detect a cleaning object according to the set jam alarm time, the machine stops and "PLEASE JAM!" message appears on the LCD screen.

Mode Select	
SPEED	100
COUNT	0
PLEASE JAM!	

2) Repeat Mode

Repeat work is used where there are a lot of particles on the cleaning object or minute cleaning is necessary when one operator is working with the cleaning machine. Cleaning machine performs repetition work according to the repetition work Setting. After repetition work finishes, the cleaning machine stops. (There is not forward or inverse working setting.)

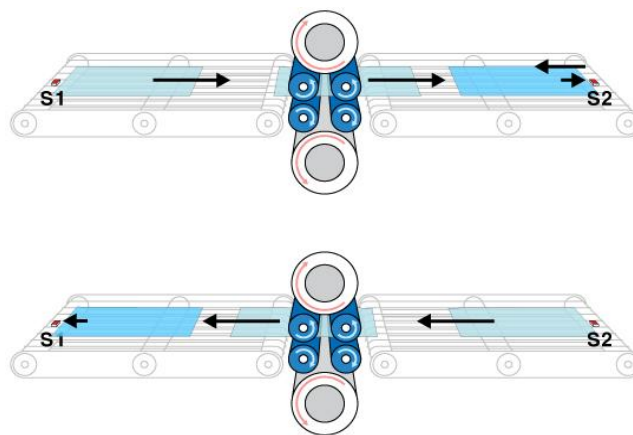
STEP 1 : Use **MENU** button to set RepeatNo and then push **ESC** button to exit from the main menu.

STEP 2 : On mode select screen, when you push  button, repeat working screen appears on LCD screen like the figure 16 below and repeat work performs.

Repeat	10
SPEED	72
COUNT	0

< Figure 16. Repeat working screen >

STEP 3 : There is no forward or inverse working setting for repetition work so the cleaning machine will be in stop condition (separated adhesive roll, stopped motor and stopped anti-static bar) until input sensor detects the cleaning object. When S1 (input sensor) detects the cleaning object as shown in the figure 17, the cleaning object moves from the left to the right and when S2 (output sensor) detects the cleaning object, the cleaning object moves from the right to the left. This process of round work is one cycle. At this time, the 1 count number increases and the 1 repeat number decreases. When repetition work is done, the RepeatNo will be initialized to zero and the cleaning machine will be in stop condition for the next repetition work. (When the RepeatNo is set to zero, the cleaning machine operates infinitely.)



< Figure 17. Repeat working screen >

3)

AutoStop Mode

- There are 2 autostop modes, autostop 1 and autostop 2.

① Autostop 1

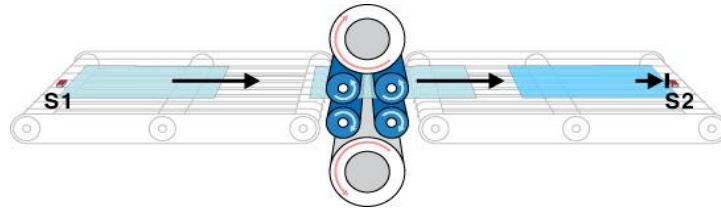
- Auto-stop function is to stop the cleaning machine automatically according to the work condition of the outputs while 2 operators are working with the cleaning machine. To change the working direction, push  button.

STEP 1 : On mode select screen, when you push  button, autostop work starts. (Anti-static bars and motor operates, and adhesive rolls comes in contact with the cleaning rollers.)

STEP 2 : The cleaning machine operates according to working direction setting. When output sensor detects the cleaning object, the motor stops and 1 count number increases. (Adhesive rolls are still in contact with the cleaning rollers, anti-static bars operates and motor stops.)

STEP 3 : Adhesive roll goes up according to the aruptime of menu 8.

STEP 4 : As soon as the cleaning object is removed from the conveyor, the cleaning machine starts to operate again.(Anti-static bars and motor operates, and adhesive rolls comes in contact with the cleaning rollers.)



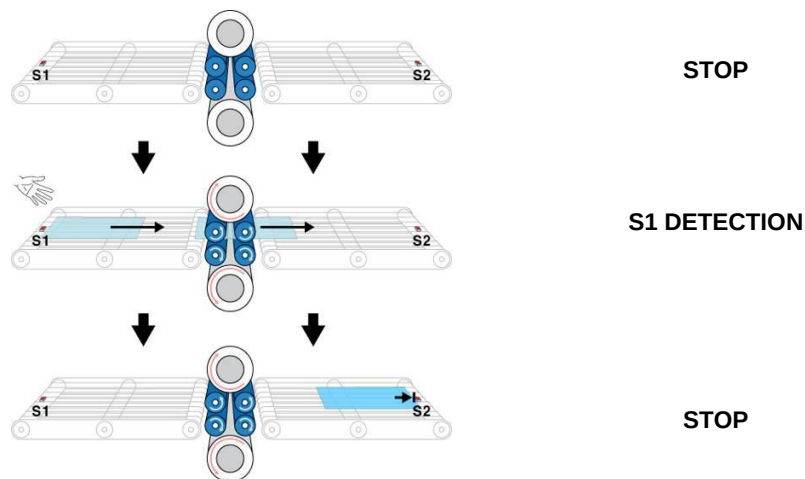
< Figure 18. Picture is indicating stopped C/M when C/M operates forward direction and S2 detects the cleaning object >

② Autostop2 mode

STEP 1 : On mode select screen, when you push  button, the cleaning machine will be in stop condition. (Separated adhesive rolls, and stopped anti-static bars and the motor)

STEP 2 : When sensor on the input conveyor detects the cleaning object, the cleaning machine operates according to the start delay of menu 6 and then starts to operate. (Adhesive rolls come in contact with the cleaning rollers, anti-static bars operates and motor stops.)

STEP 3 : When sensor on the output conveyor detects the cleaning object, the cleaning machine operates according to the stop delay of menu 7 and will be in a stop condition for the next work. At this time, 1 count number increases.

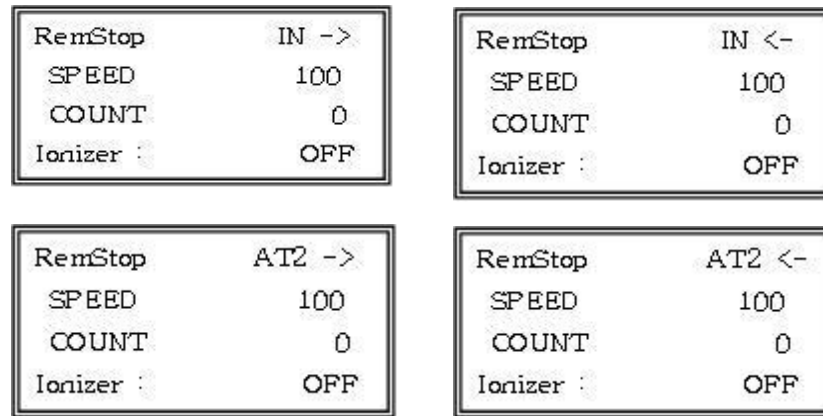


< Figure 19. Autostop2 work process >

4) Remote Mode

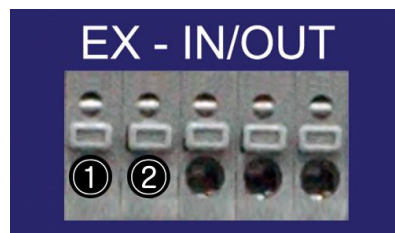
- Remote function is to control the cleaning machine externally. There are 4 remote modes, IN →, IN ←, AT2 → and AT2 ←. IN → and IN ← operations are the same with the inline functions. AT2 → and AT2 ← operations are the same with the autostop 2 functions. Remote mode operates according to the external inputs to the cleaning machine.

STEP 1 : Push **MENU** button to select Remote and set working operating mode and then push **ESC** button to exit the screen. The cleaning machine will be in ready condition as shown in the figure 20 below.



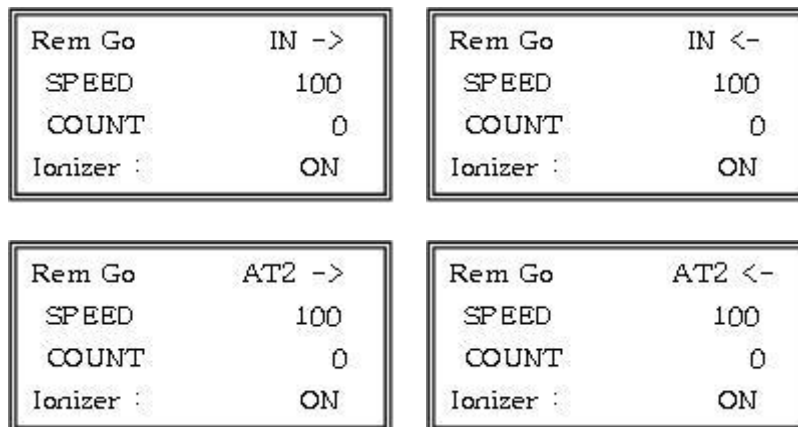
< Figure 20. Remote screen >

STE 2 : Connect 1 and 2 of EX-IN/OUT terminal located on the back of the cleaning machine.



< Figure 21. External input/output terminal >

STEP 3 : The cleaning machine operates when the cables are connected and stops when the cables are disconnected.



< Figure 22. Cleaning working screen >

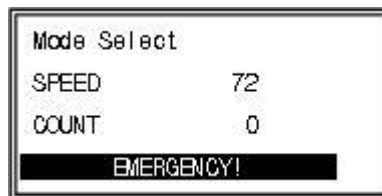
5) Emergency Function

Emergency function is to stop the cleaning machine in case of emergency.

STEP 1 : Press emergency switch during in-line, repeat, or auto-stop work.



STEP 2 : When emergency switch is locked, the motor and anti-static bars stops, and adhesive rolls separate from cleaning roller. Signal tower's light turns on and cleaning machine's alarm goes off. Also, the 'EMERGENCY' message appears on LCD screen and start switch flickers.



< Figure 23. Emergency mode >

STEP 3 : To revoke emergency mode, unlock the emergency switch and press start switch. After revoke of emergency mode, mode select screen will appear on LCD and all the setting will be initialized.

PART IV. MAINTENANCE

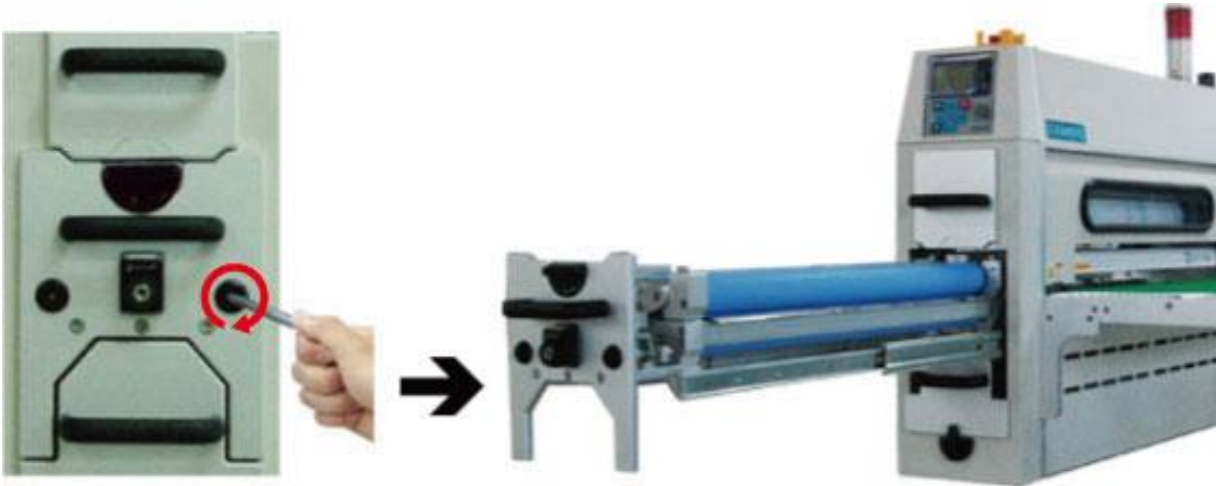
IV - 1. CLEANING METHOD OF CLEANING ROLLER

The next steps are the methods of keeping cleaning roller clean. Please clean cleaning roller more than once a day. If cleaning roller is contaminated, the cleaning effect could be considerably low.

※ Following steps are only for 730 and 750 series cleaning machine.

STEP 1: Turn off the power.

STEP 2: To unlock, turn lock equipment counterclockwise with a tool. Then pull out the drawer.



STEP 3: Wet the soft cotton with IPA(Iso Propyl Alcohol) and clean the upper and lower cleaning roller with it.



STEP 4: Let the cleaning roller to dry completely and then operate the machine.(To lock, turn it clockwise with a tool.)

※ **Caution:** Always allow Iso Propyl Alcohol to evaporate completely before allowing the adhesive rolls to come in contact with the cleaning roller. If you do not dry cleaning roller completely, adhesives might stick to the cleaning roller.

● CLEANING ROLLER REPLACEMENT PROCEDURE

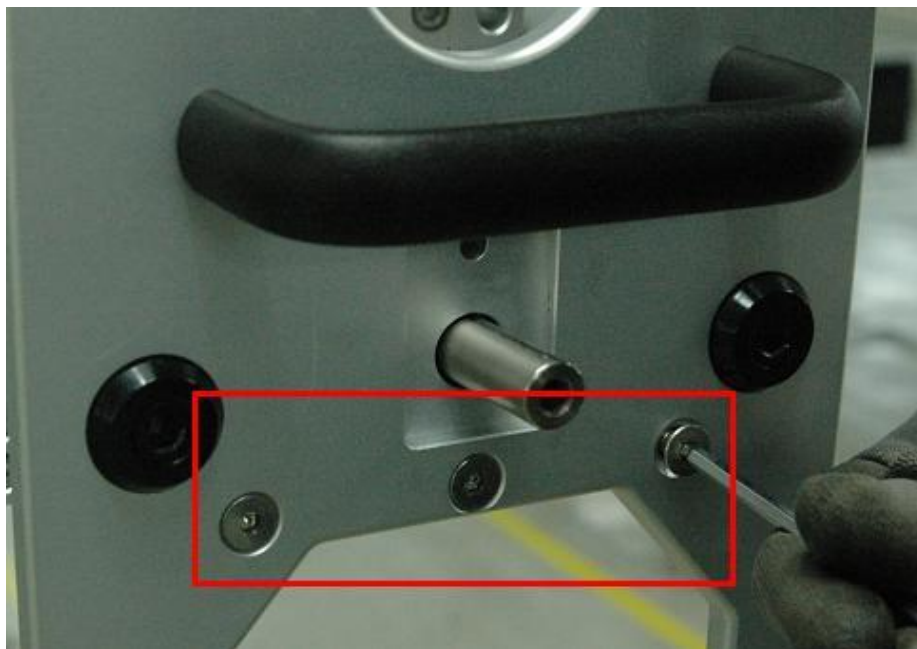
※ Please keep that in mind that the cleaning rollers in the pictures may look different from yours, but the replacement procedures are the same. During cleaning roller's replacement, keep all the bolts and parts at one place so that you do not lose them.

HOW TO REPLACE CLEANING ROLLER

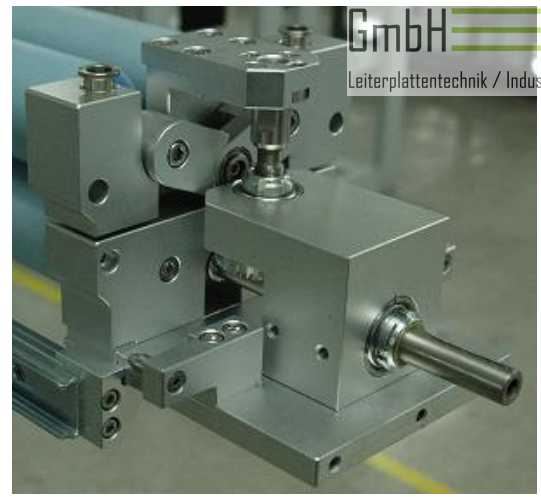
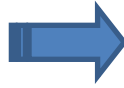
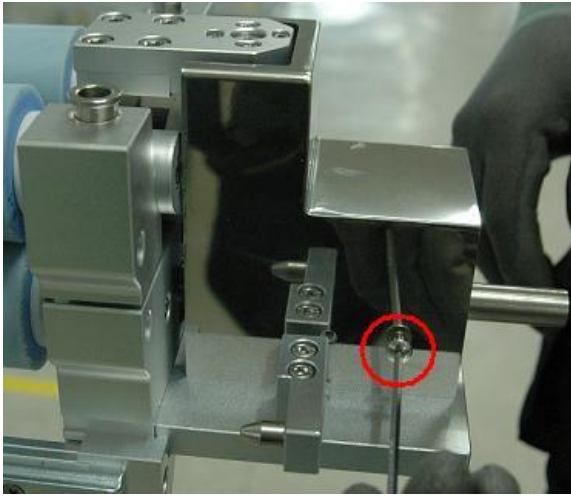
1. Pull out the cleaning roller and upper adhesive roll drawers. Take out upper adhesive roll from the drawer.
2. As shown in the below picture, set point to 0, loosen the set screw with a wrench, and then pull the gap indicator outward to disassemble it from the cleaning roller door.



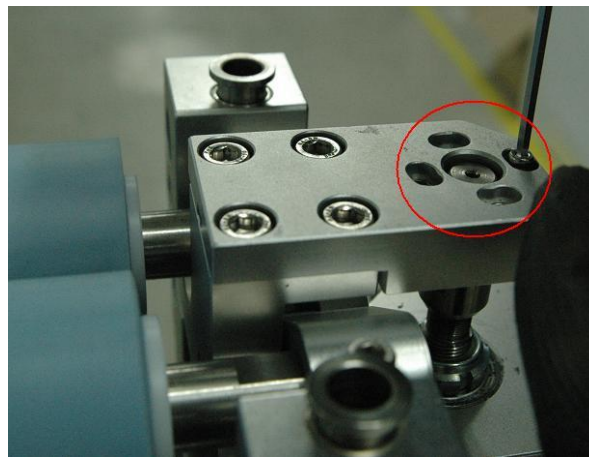
3. Loosen the bolts indicated in red, then take off the cleaning roller door.



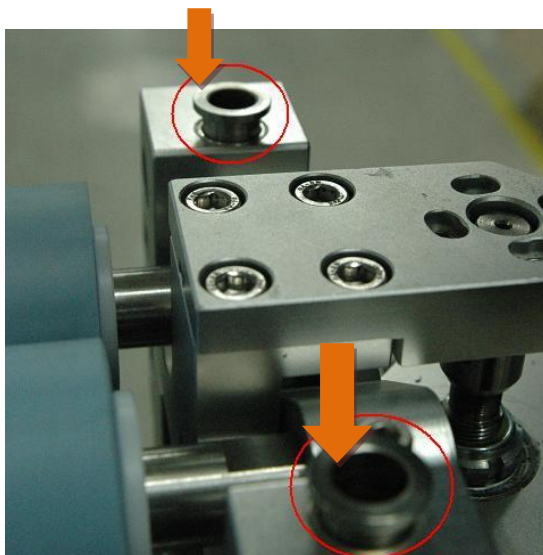
4. Loosen the bolts fixed to the gap device cover, and then remove the cover.



5. Loosen all of the bolts then remove the block.(both OP and motor part)

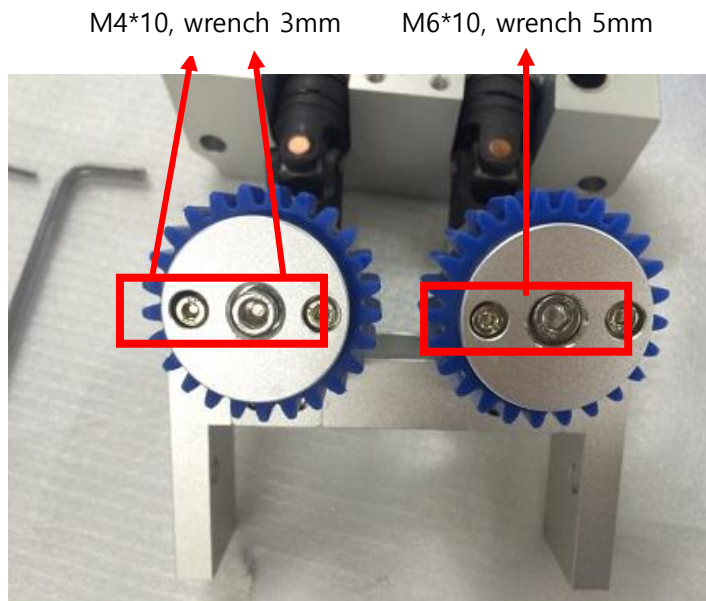


6. Loosen the bolts inside of shaft like red circle of below left picture and the bolts (M5*12, wrench 4mm) of upper and lower cleaning roller fixing bracket like below right picture. After removing bolts, lift the upper cleaning roller unit and separate it from the machine.

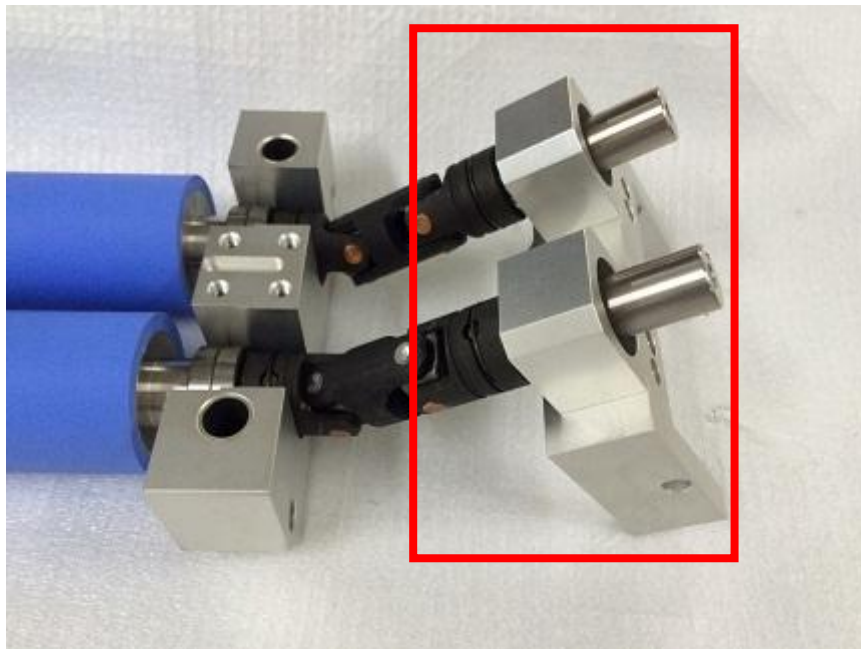


The method to replace upper cleaning rollers

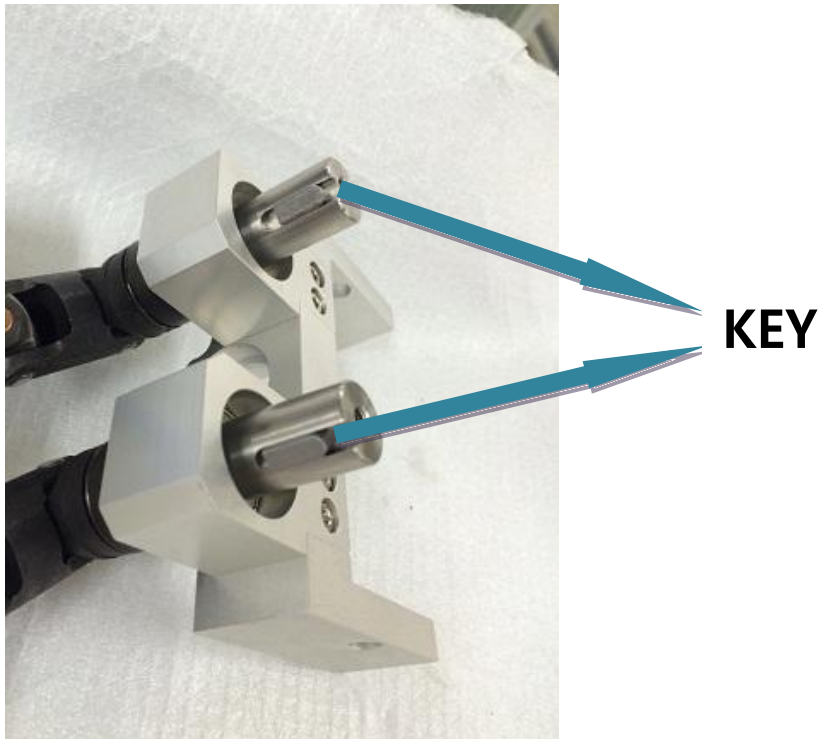
1. Loosen the bolts like below red boxes and remove the brackets.



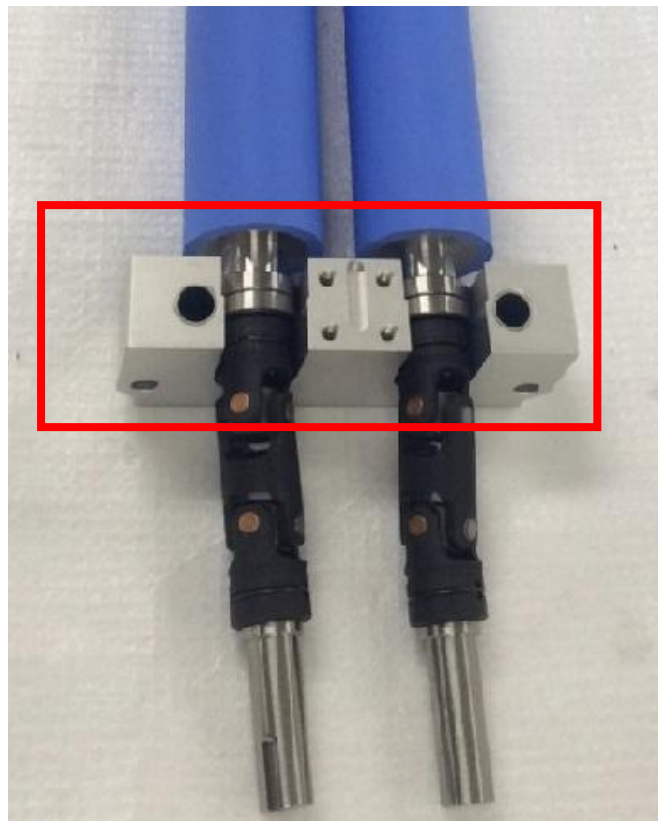
2. Remove the gears of upper cleaning rollers.



3. After removing gear, remove the keys.



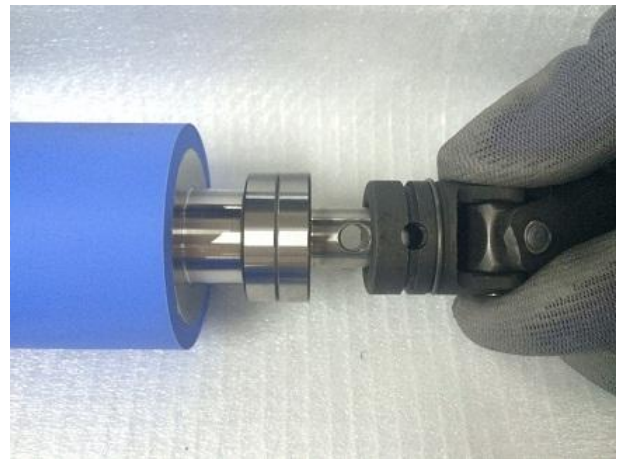
4. Remove the bracket like below red box which is installed with shafts of cleaning rollers.



5. Release the snap ring on universal joint.



6. Remove the pin, universal joint, and bearing, and then replace the cleaning roller.



The method to replace lower cleaning rollers

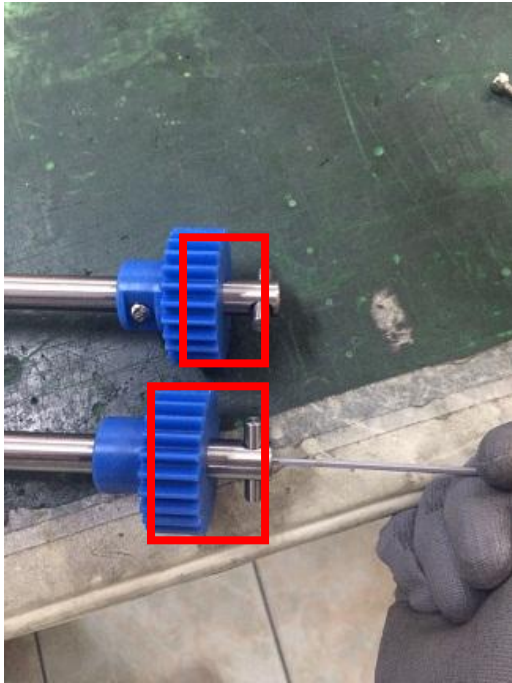
1. Loosen the bolts (M5*12, wrench 4mm) of lower cleaning roller gap unit which is installed in both door part and motor part. After then, remove the lower cleaning roller unit bracket.



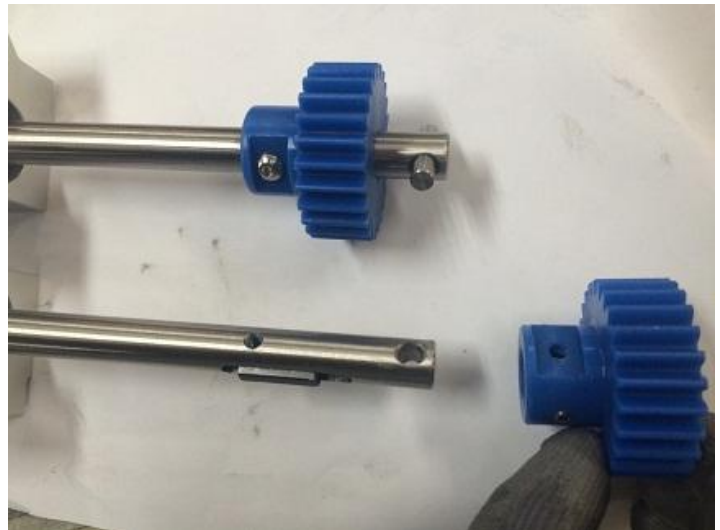
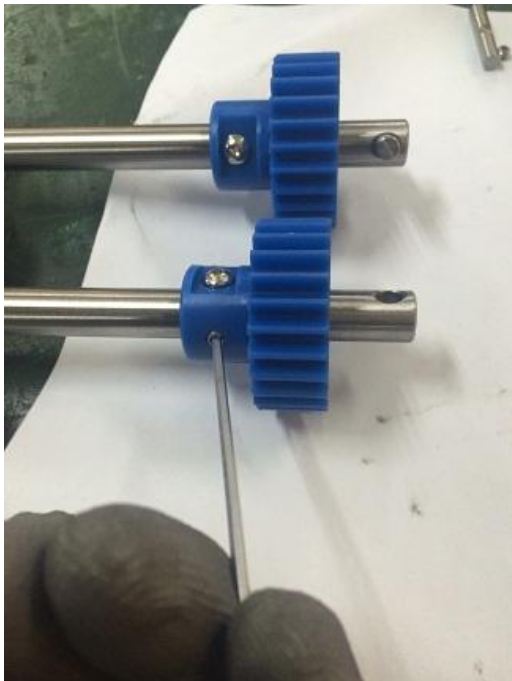
2. Loosen the bolts (M8*12, wrench 6mm) which fix lower cleaning roller bracket in both door part and motor part and separate lower cleaning roller unit from the machine.



3. Loosen the set screw on shaft of lower cleaning roller and remove the pin.



4. Loosen the bolts on gear of upper cleaning roller and remove the gear.



5. Remove the key on the shaft of the upper cleaning roller, release the bracket, and replace the cleaning roller.

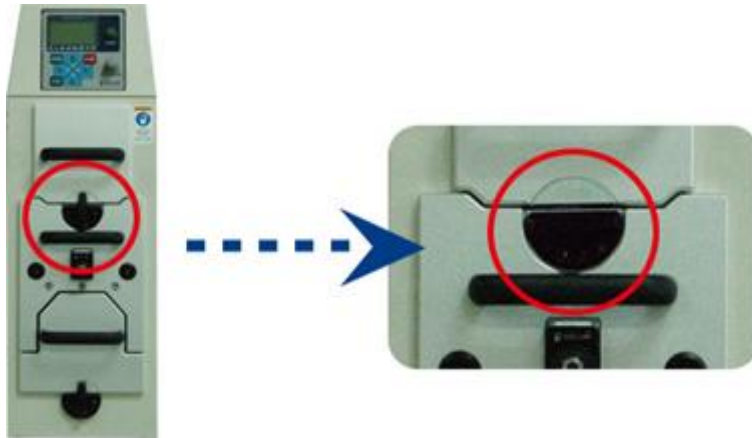


※ The method to assembly of cleaning roller is in the reverse order.

IV - 2. ADHESIVE ROLL REPLACEMENT AND REMOVAL OF SHEET

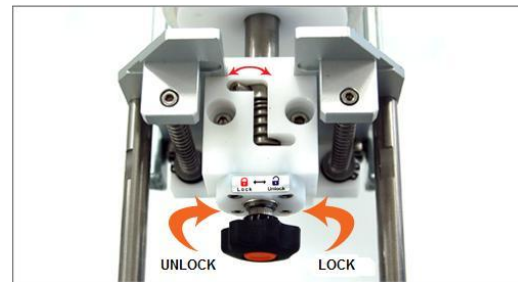
When adhesive roll is all used up, replace it according to the following steps.

STEP 1: Turn off the power switch and unlock.



STEP 2: Pull out the adhesive roll drawer.

STEP 3: Uninstall the adhesive roll by using lock/unlock knob.



STEP 4: After unlock the adhesive roll knob, remove adhesive roll from the drawer, and replace it with a new one like the pictures below.

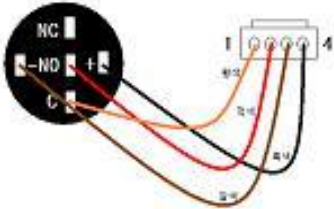


STEP 5: If the adhesive roll is contaminated, then cut off a sheet of adhesive roll with a knife like the pictures below.



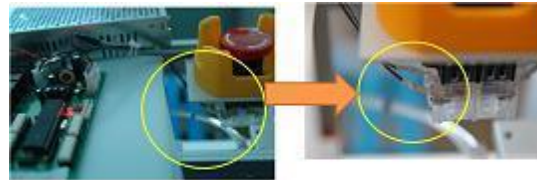
※ Caution : Adhesive roll replacement cycle should be followed by the operation condition or environment

V - 1. SELF-INSPECTION AND SELF-REPAIR

NO	PROBLEM	SOLUTIONS
1	LCD back light is not on when power is on	① Check the power cable connection ② Check both T1 and R on AC power input terminal with the tester and see whether voltage output is 220 or not. ③ Check AC fuse1 and AC fuse2 on relay board. If the fuse has blown out, replace the fuse. (220V, 5A)
2	Machine operates, but nothing appears on LCD screen	① Adjust the LCD screen by turning the variable resistance that is on the LCD board. ② Check the LCD screen after replacement LCD1 (74HC32) and LCD2 (74HC574) IC that is on the LCD board. ③ If the LCD screen still does not work after replacement of IC, replace the LCD board.
3	Operation status are not clearly displayed on LCD screen	① Turn off the power of the cleaning machine and then turn it back on. ② Operate the cleaning machine after turn off the power of the PDC controller. ③ Replace the LCD board.
4	Start switch on control panel keep lighting	① Check the connection status of start switch that is on the LCD board. ② Check the cable connection of start switch. The cable connection should be like the below picture.  ③ Replace the switch related IC(ULN2803) that is on the LCD board.
5	Buttons on the control panel do not work properly	→ Replace KEY PAD1 or KEY PAD2 (TLP521 or PC817) that is on the LCD board and then check whether the buttons work or not.
6	Speed of the cleaning machine is not adjustable	① Check whether the speed control knob for speed adjustment is correctly connected to the variable resistance connector or not. ② Replace the speed control knob
7	LCD screen indicates that the cleaning machine operates, but the cleaning machine does not actually operates.	① Check whether the connection of the relay board and the LCD board communication cable are connected properly. ② Replace the anti-static bar, adhesive roll, and PDC controller related IC, and buzzer related IC(TLP521 or PC817) that are on relay board. ③ Replace the communication IC(Max232) that is on the LCD board and relay board.
8	PDC controller's power does not on	① Check whether the IONIZER and IONIZER_R2 cables are correctly connected to the ionizer terminal. ② Check the status of the HVG fuse(220V, 3A) that is on the relay board.
9	When the power is on and the control panel screen works properly, but the motor does not work.(The inverter power does not on.)	① Check whether the connectors of control, ionizer, inverter, SMPS 220V, SMPS 24V, emergency switch, and communication are connected properly or not. ② Remove the emergency switch connector and then short two terminals shown in the picture below with the conductive object, such as driver.



③ Check whether the contact point 'B' that is connected to the relay board, of



emergency switch cable is connected properly or not.

10

Counter does not work

① Remove the sensor from the cleaning machine



② While repeating the connection and disconnection of male connector's 1(SEN) and 2(G1) on main body, watch the LCD screen to see whether the counter increases or not.

② If the problem occurs while following the above instruction, repeat the connection and disconnection of GND1 and SEN4, or GND1 and SEN1 that are on the terminal. While repeating the connection and disconnection, watch the LCD screen to see whether the counter increases or not.



- If the counter works properly while following ② above, sensor is the one that causes the counter malfunction. At this time, check the female connector of the sensor and then replace the sensor.
- If the problem occurs while following ② and ②, the relay board is the one that causes the counter malfunction. At this time, replace the SENSOR INPUT IC(PC1).

※ If there is a difficulty finding possible causes, please do not separate the machine on your own and follow the Tech-Line staff's instruction, then request after service.

V - 2. AFTER SERVICE CHECK SHEET

This after service check sheet is for the Tech-Line's prompt action.

1. Company information

A/S requested company name	Department/Tile of a position	Name	Contact information	Remarks
	/			

2. Equipment information

Manufacturer name	Model	Serial number	Date of delivery goods	Trouble starting date
TECH-LINE CO., LTD				

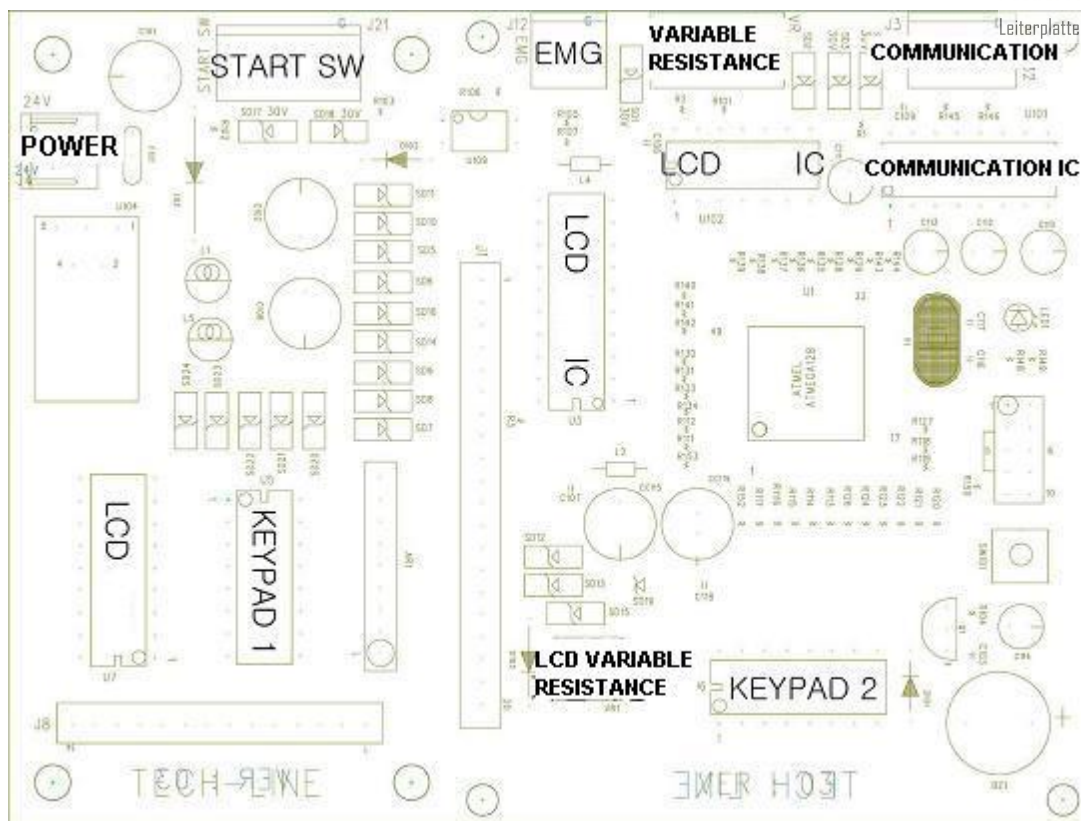
3. After service information

- Please fill this form out specifically for the prompt action. If there is a difficulty explaining the part names, please enclose the photographs of the broken parts.

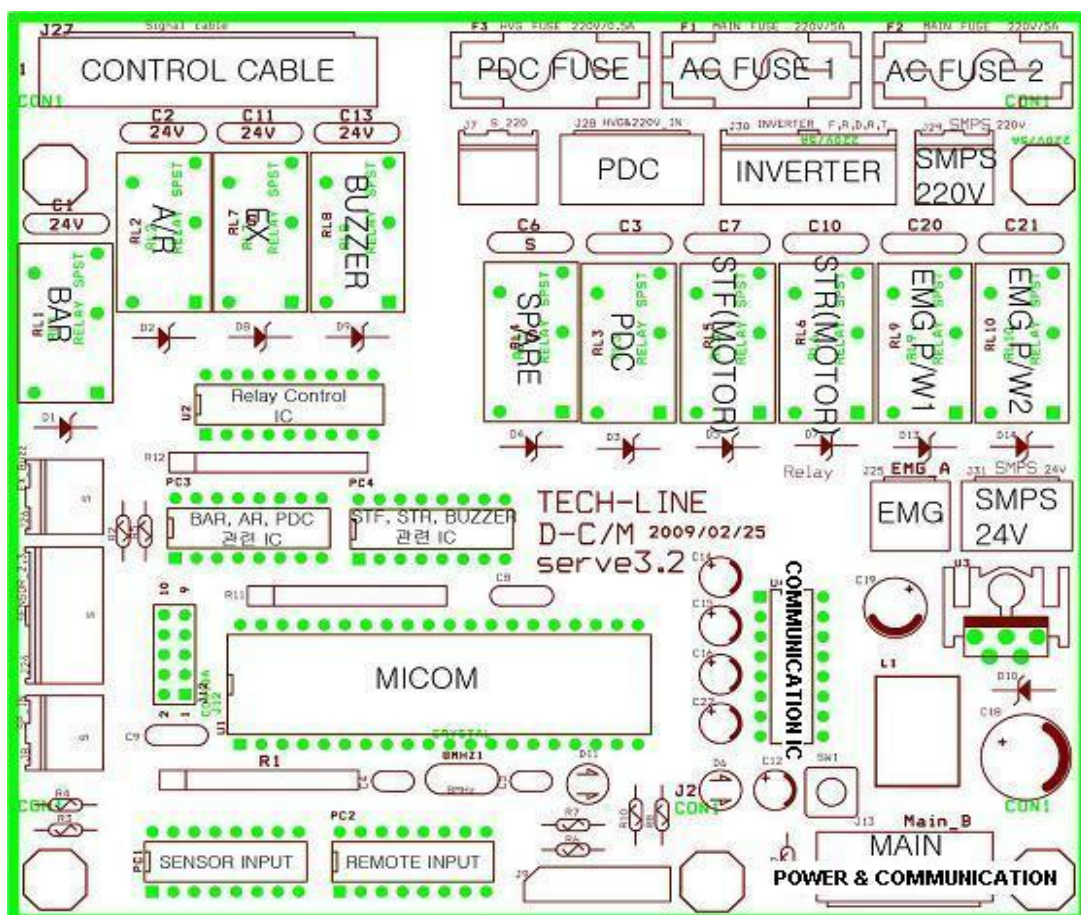
Problem(specifically)	Enclosure(Accompanying photographs)
Possible causes	
Possible A/S starting date	
Other request	

4. After service contact information

Office	Phone/Fax	Web site/E-mail address	Sales support dept.	Domestic sales dept./Customer service
South Korea	Tel: 82-32-868-6865 Fax: 82-32-876-6893	http://www.tech-line.co.kr / os_us@tech-line.co.kr	82-32-868-6865 Extension number: 600	82-32-868-6865 Extension number: 200~207
China	Tel: 86-25-8555-0056 Fax: 86-25-8557-9847	http://www.tech-line.cn / h1038@paran.com	86-25-8557-9842	



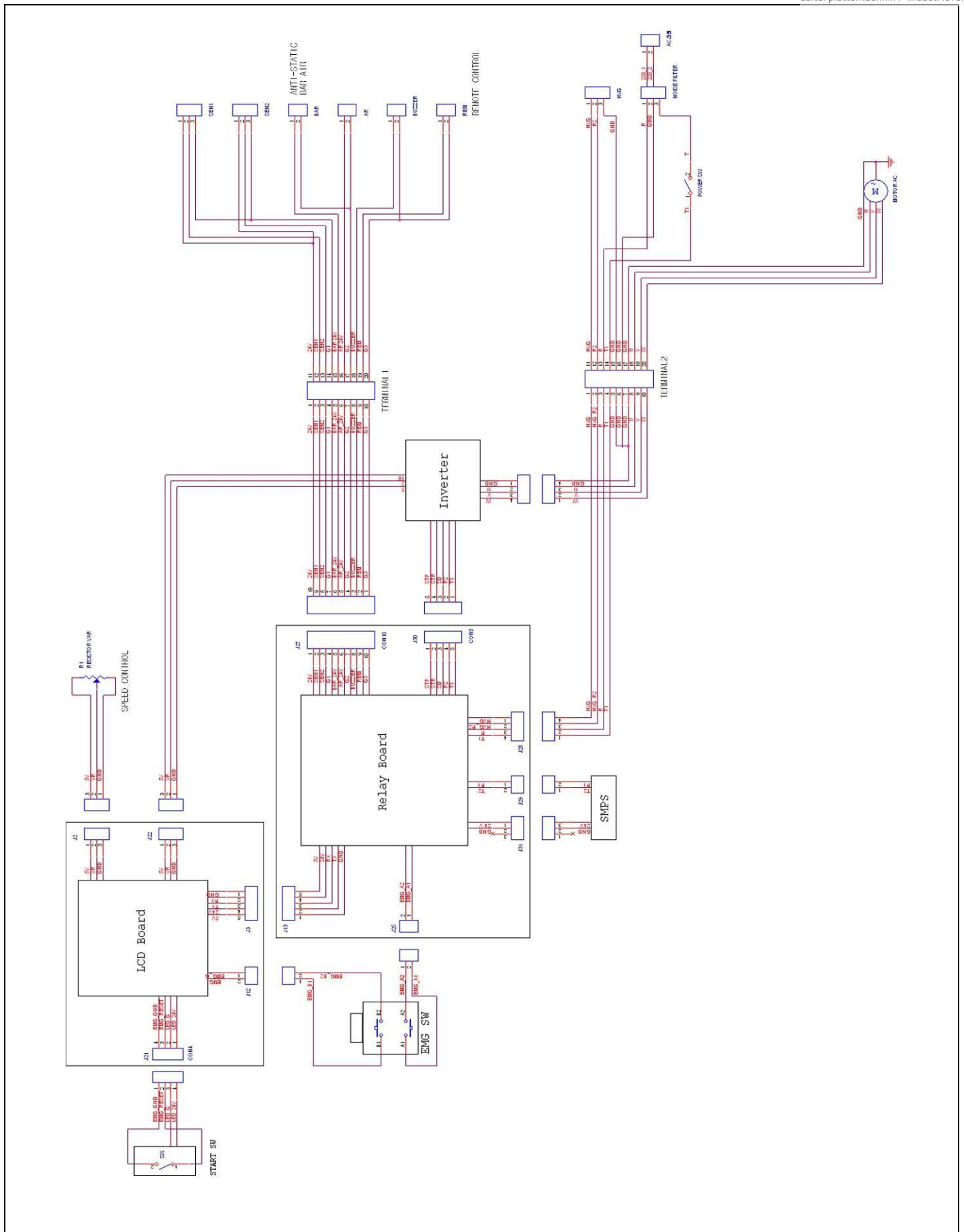
<LCD BOARD>



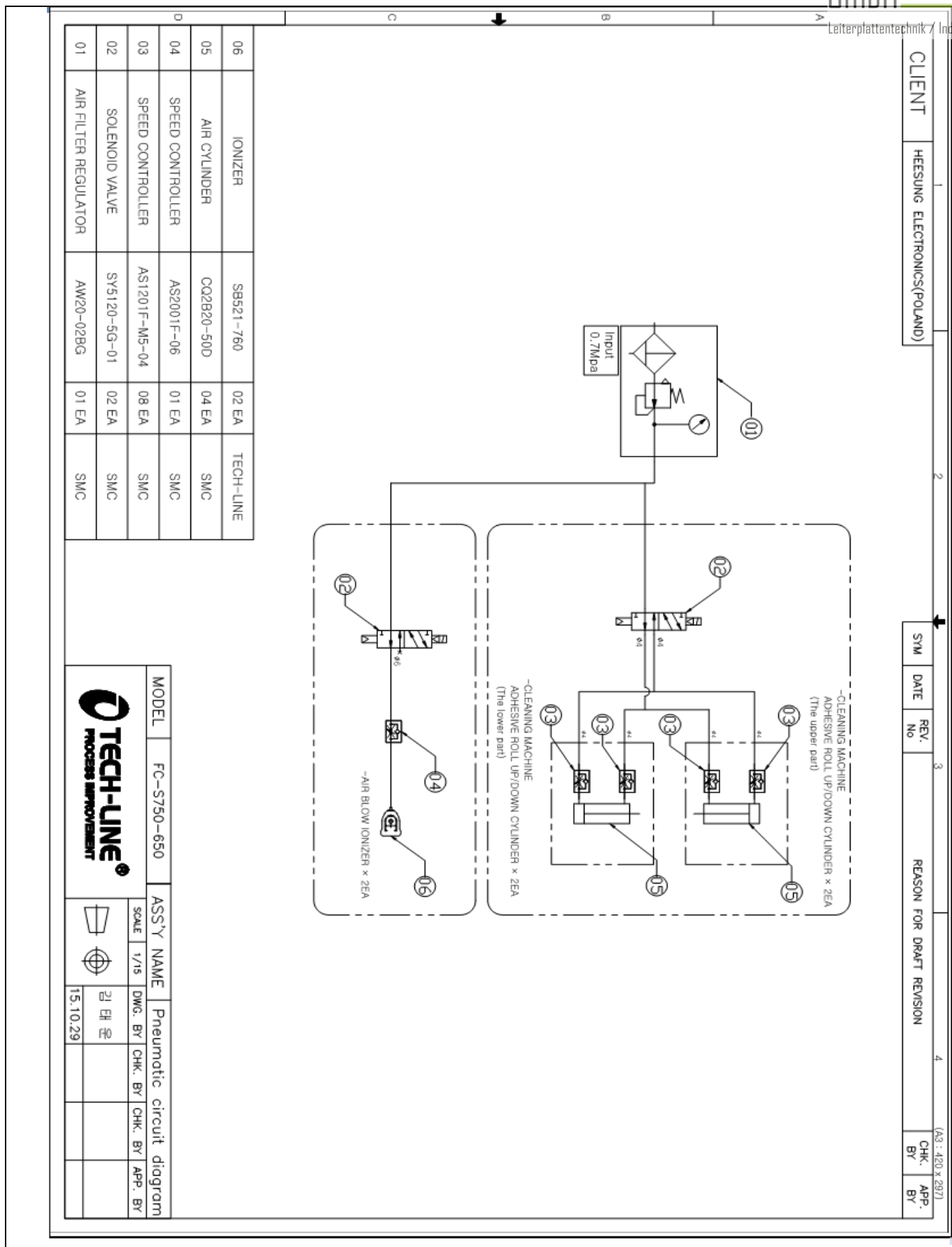
<RELAY BOARD>

PART VI. MACHINE LAYOUT

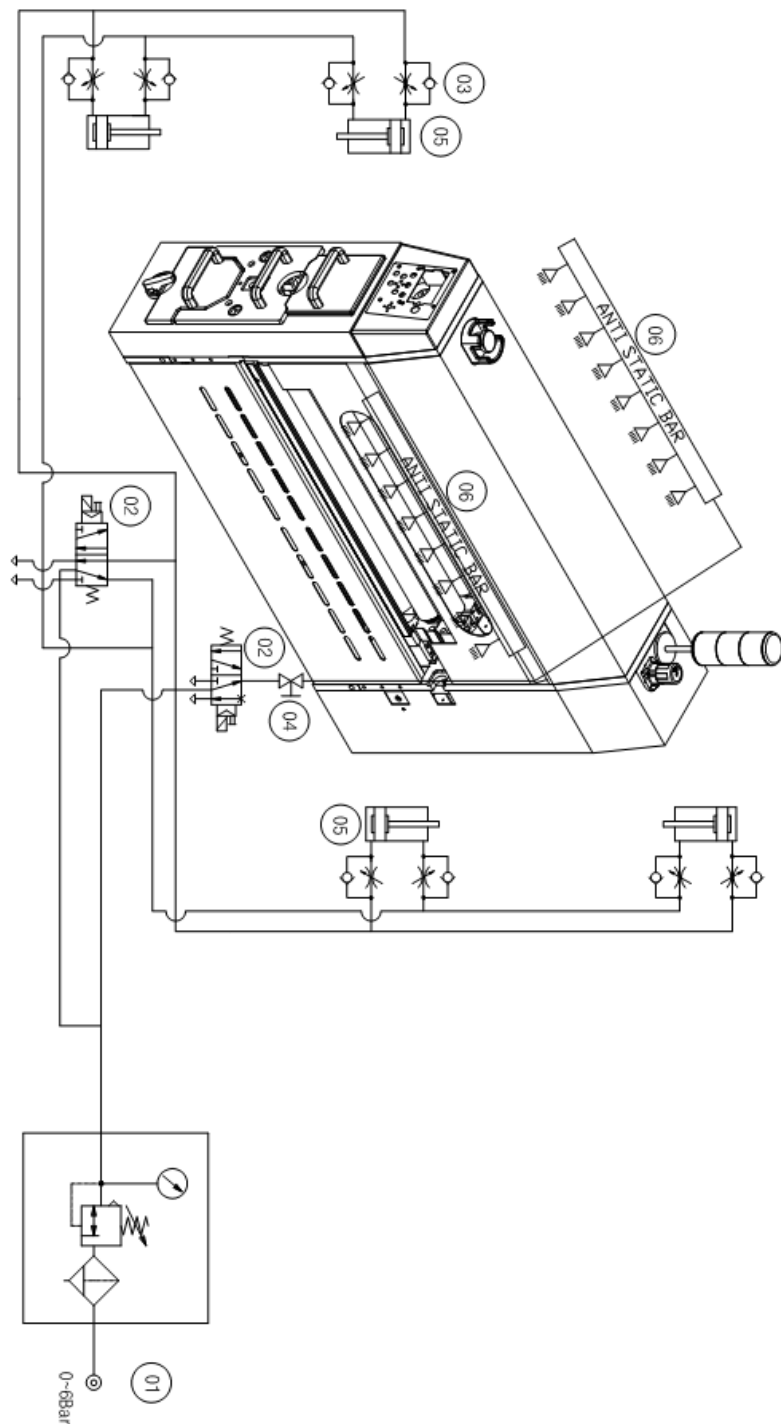
VI-1. ELECTRIC CIRCUIT OF THE CLEANING MACHINE



VI-2. PNEUMATIC WIRING DIAGRAM OF THE CLEANING MACHINE



CLIENT	HEESUNG ELECTRONICS(POLAND)	SYM	DATE	REV. NO	REASON FOR DRAFT REVISION	CHK. BY	APP. BY



06	IONIZER	SB521-760	02 EA	TECH-LINE
05	AIR CYLINDER	CQ2B20-50D	04 EA	SMC
04	SPEED CONTROLLER	AS2001F-06	01 EA	SMC
03	SPEED CONTROLLER	AS1201F-M5-04	08 EA	SMC
02	SOLENOID VALVE	SY5120-5G-01	02 EA	SMC
01	AIR FILTER REGULATOR	AW20-02BG	01 EA	SMC

MODEL	FC-S750-650	ASS'Y NAME	Pneumatic circuit diagram					
		SCALE	1/15	DWG. BY	CHK. BY	CHK. BY	APP. BY	
				김 태 운				
		15.10.29						





TL 20081210-1

LETTER OF DESIGNATION AS QUALITY-ASSURED COMPANY

We deeply thank you for purchasing a cleaning machine of TECH-LINE CO., LTD.

Please check the machine whether it has defects or not and contact us if the defects are found.

1. The period of guarantee

TECH-LINE CO., LTD. warrants the cleaning machine for a period of 12 months from the date of shipment. However, the period of guarantee for cleaning roller covers 6 months. (On the basis of the working time with 8 hours per day)

2. The range of guarantee

The repair will be provided without any charge when the breakdown of cleaning machine occurs during the period of guarantee because of TECH-LINE's own defects. The following situations are excluded from the range of the guarantee.

- ① The breakdown caused by unsuitable conditions, environment, treatment, and method of use but user manual and separately issued specifications.
- ② The breakdown caused by the factors like software design of customer etc. which are not from defects of the product.
- ③ The breakdown caused by remodeling or repair from not members of staff of TECH-LINE but others.
- ④ The breakdown caused by usage spare parts which are not supplied by TECH-LINE.
- ⑤ The breakdown caused by factors which cannot be expected scientifically and technically at the time of shipment.
- ⑥ The breakdown which can be prevented if spare parts written in manual are repaired and replaced properly.
- ⑦ The breakdown caused by external factors without faults of TECH-LINE such as conflagration, earthquake, flood damage, calamity, abnormal voltage, and so on.

The range of guarantee is provided for above conditions and TECH-LINE will not be responsible for the second damages including the breakdown of other machines, opportunity loss, disbenefit that may result from the malfunction of the cleaning machine.

3. The range of application as the cleaning machine.

The cleaning machine of TECH-LINE is produced and designed as a general industrial machine. Therefore, the machine cannot be utilized for the purposes which are related to effect on human life or property such as nuclear power generation, aviation, railroad, medical appliance, and so on. However, when customer consults about specifications of the cleaning machine with TECH-LINE and both of them understand sufficiently, the machine can apply to the product.

Tech-Line Co. Ltd.
President Sung Ho Jun

