

## MANUAL SPS/S-CV1

Automatic Cap Visor Sewing Machine





- 1. Thank you for purchasing our product. Based on the rich expertise and experience accumulated in industrial sewing machine production, SUNSTAR will manufacture industrial sewing machines, which deliver more diverse functions, high performance, powerful operation, enhanced durability, and more sophisticated design to meet a number of user's needs.
- 2. Please read this user's manual thoroughly before using the machine. Make sure to properly use the machine to enjoy its full performance.
- 3. The specifications of the machine are subject to change, aimed to enhance product performance, without prior notice.
- 4. This product is designed, manufactured, and sold as an industrial sewing machine. It should not be used for other than industrial purpose.





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# Machine classification and specification

### 1.1) Classification



### 1.2) Specification

Category	SPS/S-CV1	
Needlework scope (X,Y)	300mm X 180mm	
Sewing speed	Maximum of 1,500spm	
Stitch length	0.1~12.7mm	
Needle	MR5 DP17, MR4 DP17	
Hook	Large rotary hook	
Presser foot lift amount	Maximum of 20mm	
Presser foot stroke	4mm(0~7mm)	
Trimming device	Basic supply	
Emergency switch	Basic supply	
Memory device	3.5 FDD(2HD)	
Possible input pattern number	Maximum of 691 pattern	
Possible input needle number	Maximum of 360,000 needle	
Reduction/expansion ratio	1~400%(0.1% STEP)	
Main driva motor	SPS/B Series : 500W direct drive AC servo motor	
Main unve motor	SPS/B Series : 500W AC Servo Motor	
Transfer system	Transfer by stepping pulse motor	
Power	Simple-phase 110V ~ 240V, triple-phase 200V ~ 440V, 50/60Hz	
Air pressure	0.49Mpa	



# **2** Safety rules

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### 2.1) Safety indication

Safety Rules define caution, danger, warning in this manual and indicate that failure to obey the rules may bring damages, personal and physical, or machine breakdown.

No.	Name	Contents	
CAUTION	Caution	Danger of personal or physical damages from mishandling	
WARNING	Warning	Danger of death or serious injury from mishandling	
DANGER	Danger	Danger of death or serious injury and other high level of serious condition from mishandling	

### 2.2) Delivery





2.3) Machine installation	<ul> <li>Wrong machine Installation may cause malfunction &amp; breakdown and other physical damages so comply with what follows.</li> <li>1) Workbench or table should be strong enough to hold machine weight (see face plate)</li> <li>2) Implement regular check-up with Air Conditioner as dust and humidity cause contamination and corrosion.</li> <li>3) Keep machine out of direct sunlight. (Long exposure to direct sunlight is a source of color change and deformation.)</li> <li>4) Leave at least over 50cm space to left and right sides of machine to allow enough repair space.</li> <li>5) Explosion accident : To avoid explosion, stop operation when there is combustive material in the air.</li> <li>6) Work light: Lighting doesn't come with machine so that lighting should be separately installed for machine operation.</li> <li>7) Subversion danger : Don't place machine at an unstable stand or table which will give serious shock to people and machine if it falls down. Sudden stop while moving machine or exterior shock may cause subversion.</li> </ul>
2.4) Machine Operation	<ul> <li>SPS/S-CV1 is manufactured to sew textile and its similar texture. Machine body has caution and warning stickers at each danger part to call attention to safety indication, which should be kept in mind and obey what follows in operating machine.</li> <li>1) Read this manual and fully understand how to operate it before use.</li> <li>2) Have safety outfit on. A long hair, a necklace, a bracelet or a wide sleeve may get jammed into machine. Slip-proof shoes are also necessary.</li> <li>3) Check operation scope in order for machine not to encounter obstacles in operation</li> <li>4) Keep a hand or a head away from accident-vulnerable parts (needle, hook, thread lever, pulley).</li> <li>5) Don't remove safety cover protecting pulley or shaft for a user's safety while operating.</li> <li>6) When dismantle electric box including control box, make sure electricity is blocked and power switch is "off".</li> <li>7) When rotate upper shaft with hands, make sure power switch is "off".</li> <li>8) Ensure that machine stops when thread a needle or until after-work check.</li> <li>9) Failure to obey what follows will bring physical damages including malfunction &amp; breakdown. Comply with the following instruction.</li> <li>Don't use bent or end-damaged needle.</li> <li>Use palette suitable for work condition.</li> </ul>

2.5) Repair	When repair is needed, it should be made by a designated A/S technician only who is trained in our company.	
	<ol> <li>In order to maintain machine such as cleaning and repair, make sure to block main power and wait for four minutes during which electricity is completely discharged.</li> <li>Wait for ten minutes for main shaft motor and X/Y drive box to be completely discharged after main power is blocked.</li> <li>Don't change specification or parts without consultation with our company otherwise safety is threatened during operation.</li> <li>Use SWF pure authentic parts for repair and parts replacement.</li> <li>After repair, reinstall all the safety covers that were detached during repair.</li> </ol>	
DANGER		

### 2.6) Safety Label Type

Image: Caution 경고Image: Caution guardDo not operate without finger safety devices. Before threading, changing bobbin and needle, cleaning etc. switch off main switch. 손가락 보호대와 안전장치 없이 작동하지 미십시오. 실, 보빈, 바늘교환시나 청소전에는 반드시 주전원의 스위치를 꺼 주십시오.	Do not operate without finger guard and safety devices. Before threading, changing bobbin and needle, cleaning etc. switch off main switch.
Marking           Injury may be caused by winding.           Be sure to turn off the power           before cleaning, lubricating, adjusting or repairing.	Injury may be caused by winding. Be sure to turn off the power before cleaning, lubricating, adjusting or repairing.



2.6) Label Attachment Location



# **3** Basic Assembly

### 3.1) Name of each part

3.1.1) Each part



1	Power ON/OFF	7	Clamp pedal
2	Arm	8	Clamp button
3	Table	9	Sewing start button
4	Control box	10	Emergency stop switch
5	Operation box	11	Thread stand
6	Sewing start pedal	12	Clamp



### 3.1.2) Inside of control box



### 3.2) Sewing machine installation

### 3.2.1) Installation condition

- 1) Don't use if it accounts for more than 10% of rating voltage to prevent wrong operation-induced accident.
- Check designated pressure for devices using air pressure including A-cylinder to prevent wrong operation-induced accident.



Comply with installation condition of this manual for the best operation. Otherwise there will be unexpected breakdown.

- 3) For operation :  $0^{\circ} \sim 40^{\circ}$ C ( $32^{\circ} \sim 104^{\circ}$ F)
- 4) For maintenance :  $-25^{\circ} \sim 55^{\circ}$ C ( $-13^{\circ} \sim 131^{\circ}$ F)
- 5) Humidity
  - relative humidity : within 45  $\sim$  85%

### 3.2.2) Electricity Installation Condition



Power voltage should be within 10% fluctuation of rating voltage

- 1) Power voltage
  - Voltage should be within 10% fluctuation of rating voltage
  - Frequency should be within 1% of rating frequency(50/60Hz).
- 2) Electromagnetic waves noise
  - Separate electric power with strong magnetic and high wave products and never keep both of them close.
- 3) Don't make water and coffee enter into control box and motor.
- 4) Don't drop control box and motor.

### 3.2.3) Table stand installation

- 1) Table fixing
  - Insert shock-absolving rubber into level adjuster and raise it until caster moves freely.
  - After installation, fix level adjuster by tightening nut.
- 2) Table height adjustment
  - Adjust height by loosening bolt slightly attached to table and tight it again completely.





### 3.3) Peripheral Device Installation

### 3.3.1) Operation box stand assembly

- Combine operation box stand with a table and then fix it with bolt.



#### 3.3.2) Motor cover

- Attach motor cover with a turnbuckle.



### 3.3.3) Standing pedal installation

- Connect standing pedal plug to control box.



### 3.3.4) Thread stand installation

- Install thread stand on a table.





While attaching using tools, be careful not to drop one of the parts and get injured.

### 3.3.5) Installation of pneumatic controlling parts

- 1) Filter regulator
  - Install a filter regulator at the bottom of a table support with a bolt.
  - When connecting an air hose, use a quick joint socket to link it to the quick joint plug attached on a regulator.
- 2) Solenoid valve
  - Fix a solenoid valve to a table support with a set bolt.



1) Adjust proper pneumatic pressure to 5~5.5kgf/cm (0.49~0.54MPa).



message. (Error message: Err 24 (Low Pressure!)3) When you turn off the finger valve after use, residual air is automatically emitted and remaining pressure indicates 0Mpa (0kgf.cm).

2) When the pressure drops less than 4kdf/cm, machine stops operating with an error



## **4** Machine Operation

### 4.1) Voltage set-up

- Detach a cover of electric controlling pattern sewing machine to check whether components are the same with those in the picture below.
- 2) Check whether location of power voltage switching connector in electric board and transformer use are chosen properly to match with input voltage shown in table1 and table 2 shows.
  - Ex) If power voltage is 220V, the transformer model should be "SPS-  $\Box \Box \Box$  -220" and the location of power voltage switching connector, "JP5".
  - \*The transformer model can be found in a sticker attached on the upper part.

Input voltage	Location of power voltage switching connector
95V ~ 105V	JP4
106V ~ 115V	JP3
116V ~ 125V	JP2
200V ~ 230V	JP5
231V ~ 245V	JP4
345V ~ 415V	JP3
416V ~ 480V	JP2

[Table1. Location of voltage switching connector]

Power voltage Machine model	SPS /S -CV1
100V ~ 120V	SPS-1306-110(for common use)
220V ~ 440V	SPS-1306-110(for common use)

- 3) Check whether power switch is for a single-phase or for a triple-phase.
- 4) If 2) and 3) are not available, it may be in danger of breakdown. Thus, take the following measures to avoid machine damage.

Ex) In case the location of power voltage switching connector is not appropriate,

- Separate transformer connector CN7, CN8, and CN9 from power board.
- Switch power voltage switching connector to the proper location of table1.
- Reconnect transformer connector CN7, CN8, and CN9 to power board.



If transformer and power switch do not conform to specification, exchange or repair in the store you purchase them.

### 4.2) How to supply oil

### 4.2.1) oil supply location

- In the first driving of a sewing machine, check the amount of remaining oil through the window of each oil supply place, and complement the insufficient part.



### 4.3) Needle

### 4.3.1) Needle attachment

– Loosen a needle turnbuckle of a needle bar and push the needle until its upper tip reaches the end of needle insertion mouth of the bar with the needle long hole facing forward. And then, fix the needle by using a needle fixing screw.



### 4.3.2) Adjusting needle bar height

 Loosen turnbuckle holding a needle bar holder at the lowest point of the bar to make the upper line matching with specification conform to the lower face of a needle bar bushing. Then, screw the bar turnbuckle.





### 4.3.3) Adjusting needle and hook

- When a needle bar rises at the lowest point of a needle bar, align the lower line which fits the applied needle to the lower face of a needle bar bushing.



#### 4.3.4) Threading a needle

 Thread a needle after moving a thread take up lever to the highest point, when holding a thread like ① for thick materials, and like ② for knitwear, general and thin materials.



### 4.4) Thread

### 4.4.1) Holding Upper and lower thread

1) Hooking upper thread

Place the thread take up lever on the highest position, and hold the thread by making it pass through major and minor thread tension control ass'y as the same with the picture.



#### 2) Hooking lower thread

 Put bobbin into bobbin case. Then, pass a thread through a thread hole, and hook the thread under a tension adjusting plate spring.



### 4.4.2) How to separate bobbin case

 Grab the handle of bobbin case, and push it into a hook until a sound is heard.





Operating machine while the bobbin case does not enter fully can lead to tangled thread or make bobbin case spring out.

### 4.4.3) How to adjust tension

1) Adjusting upper thread tension

Turn the tension nut of major and minor thread tension control ass'y clockwise to strengthen the tension of an upper thread; turn them counterclockwise to weaken the tension. To control thread tension, adjust the tension depending on the sewing conditions such as sewing materials, threads, and stitch numbers.





 Adjusting thread take up lever spring tension Adjust major thread tension control ass'y shaft by turning a bolt with a driver. Turn the bolt clockwise to strengthen the tension of a thread take up lever spring; turn it counterclockwise to weaken the tension. (Standard moving length: 6~8mm, tension: 30~50g)



3) Adjusting lower thread tension

Turn tension adjusting screw of bobbin case clockwise to strengthen the tension of lower thread; turn it counterclockwise to weaken the tension.



### 4.4.4) How to wind lower thread

- 1) Insert bobbin to bobbin winder drive shaft of bobbin winder base attached to a top cover.
- 2) Attach bobbin winder lever on bobbin, and press pedal to operate machine.
- 3) After bobbin winder lever falls from bobbin, use a bobbin winder knife to cut the thread.



#### 4.4.5) Adjusting bobbin winder amount

Use the initial position of a bobbin winder adjusting plate. If bobbin winder amount is large, loosen a turnbuckle of adjusting plate to turn it into A direction and if the amount is small, turn it into B direction.



### 4.4.6) Adjusting location of bobbin winder drive wheel

Adjust the location of bobbin winder drive wheel to have a 1mm distance from presser foot drive cam. Then, screw a turnbuckle.



### 4.5) Transfer device

### 4.5.1) Adjusting height of presser foot

- 1) Loosen the turnbuckle of presser foot at the lowest point of a needle bar.
- 2) Adjust presser foot height depending on thickness of sewing materials, and tighten the turnbuckle.





### 4.5.2) Adjusting presser foot device

1) Align the end of presser foot cam with the center of upper shaft carved mark, and the carved line of the cam with the carved mark. And then tighten a turnbuckle.





When presser foot drive cam is not properly placed, its vertical movement timing of the foot is not right, which may cause friction between the needle plate and the foot.

2) Adjusting presser bar height

Adjust presser bar end to 17mm in the bar holder. And then tighten a turnbuckle after checking a needle passes through the center of the presser foot.





Tighten presser bar turnbuckle with 40~45kgf/cm pressure. Excessive pressure may cause deformation of the bar and problem in operation.

- 3) Adjusting presser foot adjusting arm
  - Make a space between location link stopper and fixing link hinge screw of presser foot movement by loosening location link stopper screw.
  - Loosen fork link screw and place the foot link hinge screw to the right side of the foot adjusting arm. And then tighten the link hinge screw.
  - Place needle bar at the lowest point by turning a hand pulley.
  - Raise presser bar and tighten the fork link turnbuckle to set the distance to allow 4mm between the bar holder and the bar bushing
  - Adhere the location link stopper closely to the foot moving link hinge screw by tuning the stopper turnbuckle.
  - Tighten fork link screw and check to make sure that there is no extra space in vertical movement of the foot adjusting
    arm. Adjust the foot stroke after checking the tightening condition of screws.

### 1) Insufficient space between presser bar holder and presser bar bushing may interrupt operation and make a noise.



2) Failure to tighten screw completely after adjusting can bring damage to the machine during operation.

3) If the foot moving link hinge screw does not adhere to the end of location link stopper closely, a noise can become louder because the machine trembles during operation.



4) Adjusting presser foot stroke (upper, lower movement adjustment)

After loosening the foot hinge screw, move presser foot adjusting arm to A direction to make the foot stroke bigger, and to the B direction to make the presser foot stroke smaller. (Stroke is set at 4mm in a released machine to a market.)



### 4.5.3) Adjusting thread release components

1) Setting thread release notch location

Place the right side of long hole of thread release notch to reach the circumference of the thread release notch turnbuckle. And then fix it with a turnbuckle.





If location is not properly set, remaining thread amount may be smaller or irregular. And also thread may fall out of needle at the beginning of sewing.



### 2) Setting thread release stopper

- Remove thread release return spring.
- Adjust the space between thread trimmer drive link and thread release lever pin to 0.3mm after loosening the turnbuckle of thread release stopper.

To make narrow the space between thread trimmer drive rink and thread release lever pin, push thread release stopper to the right, and to make the space wide, push the stopper to the left.

- Hook thread release return spring.





For your safety, use tools when you attach or detach thread release return spring.

- 3) Adjusting opening of the thread guide disk
  - Loosen the turnbuckle of thread release adjusting plate.
  - Perform a trimmer function to open the thread guide disk.
  - Adjust the opening of thread guide disk to 0.6~0.8mm for general materials and to 0.8~1mm for heavy materials.
     Wider angle of thread release adjusting plate makes the disk opening wide and narrower angle makes it narrow.
  - Tighten a turnbuckle after adjustment.





If the thread guide disk is not open enough, remaining thread amount may be smaller or irregular. And thread guide disk may not be completely closed.

### 4.5.4) Adjusting hand pulley device

- 1) Put hand pulley gear in line with the end of hand pulley axis, and tighten them with a turnbuckle.
- 2) Align the extra space of gears connected to upper shaft and hand pulley axis, and then tighten them with a turnbuckle.
- Adjust bushing by moving it to the right and to the left in order to minimize entangle generated between gears when a roller rides the end of hand pulley bushing.



### 4.5.5) Adjusting drive belt tension



#### 1) Adjusting X-axis tension

- (1) Timing belt of motor drive part
  - ①Check tension of X-motor drive part timing belt with a sound wave belt tensiometer after separating X-axis rail cover from the main body.
  - ②Adjust X-motor drive timing belt tension to 13~14kgf when you flip the belt center with a finger or a similar tool.
  - ③Data input of sound wave belt tensiometer of a Xmotor drive part timing belt Weight : 40 gf/m

Wide : 20mm/#R

Span : 67



- (4) To adjust tension of X-motor drive timing belt, loosen the nut tightened to tension adjustment bolt and turn adjustment bolt clockwise for tension increase while motor-fixing bracket is pushed to the moving direction of the bolt, and turn it counterclockwise for tension decrease.
- (2) X-axis transfer timing belt
  - $\bigcirc$  Check tension of X axis transfer timing belt with a sound wave belt tensiometer after moving frame attachment plate to the right completely.
  - (2) Adjust tension of X axis transfer timing belt to 11~12kgf when you flip the belt of its center with a finger or a similar tool.
  - ③Data input of a sound wave belt tensiometer of a X-axis transfer timing belt
    - Weight: 3.8 gf/m
    - Wide : 18mm/#R
    - Span : 513mm
  - (4) To adjust tension of X-axis transfer timing belt, loosen the screw of tension adjustment axis and adjustment nut, and adjust the bolt to a optimum tention level. Turn adjustment bolt clockwise for tension increase and counterclockwise for tension decrease.





### 2) Adjusting Y-axis tension

- (1) Y-motor drive part timing belt
  - ①Check tension of Y-motor drive part timing belt with a sound wave belt tensiometer after separating X-axis rail cover from the main body.
  - ② Adjust tension of Y-motor drive timing belt tension to 12~13kgf when you flip the belt center with a finger or a similar tool.
  - ③ Data input of sound wave belt tensiometer of a Ymotor drive part timing belt.

Weight: 4.0 gf/m

Wide : 20mm/#R

Span : 112mm

- (4) To adjust tention of Y-motor drive timing belt, loosen fixing screws (4 places), turn tension adjustment screw to the right for tension increase and to the left for tension decrease.
- (2) Y-transfer timing belt
  - ① Check a Y-transfer timing belt tension with a sound wave belt tensiometer after placing X-drive part to drive pulley part.
  - ② Adjust tension of Y-axis timing belt tension to 30~32kgf when you flip the belt center with a finger or a similar tool.
  - ③Data input of sound wave belt tensiometer of a Y-axis drive part timing belt.

Weight: 3.8 gf/m

- Wide : 18mm/#R
- Span : 230mm
- (4) To adjust tension of Y-axis timing belt, turn tension adjustment screw to the right for tension increase and to the left for tension decrease.





### 4.5.6) Setting X-Y axis starting points

1) Setting up Y-axis starting point

 Move the center of feed plate to be in the middle toward X-axis.

- Loosen X-censor bracket nut to be the center of

censor, and then tighten fixing screw.



Sensor X sensor plate



Move the center of feed plate to be in the middle toward Y-axis



 Loosen Y-censor bracket nut to be the center of censor, and then tighten fixing screw.





### 4.6) Trimming device

### 4.6.1) Setting thread trimming cam

Adjust the distance between upper shaft collar and thread trimming cam to 2.5mm. Locate the cam carved line in the same line with the shaft carved mark, and then tighten the turnbuckle.





If the cam is in a wrong position, the trimmer may not work properly, or the machine may be stuck.

### 4.6.2) Adjusting link stopper screw

- 1) Check whether there is enough space between the cam roller and the both sides of the cam when push the thread trimming drive link toward the cam direction at the lowest level of needle bar within the cam operating area.
- 2) With the roller inserted into the cam operating area, adjust the end part of the link stopper screw to reach the tightening part of the trimming connecting rod and then tighten nut.



1) If there is no enough space between the roller and the both sides of the cam, the trimmer may not work properly, or the machine may be stuck at the beginning of sewing or during trimming.

2) If the link stopper screw is in a wrong position, the cam roller may return to its original position slowly after trimming and the screw may not be tight enough during sewing.



### 4.6.3) Setting thread trimming shaft position

- 1) Loosen the turnbuckle of thread trimming drive link and the turnbuckle of thread trimming shaft collar.
- 2) Align thread trimming shaft with A part of the arm.
- 3) Tighten turnbuckle



### 4.6.4) Setting link stopper position

1) When thread trimmer is not working, loosen the turnbuckle of thread trimming drive link. Adjust the distance between the link and the link stopper notch to 0.3mm.





If position is not correct, trimmer may not work properly, or the machine may be stuck.

### 4.6.5) Setting thread trimming solenoid position

- 1) Loosen the turnbuckle of thread trimming solenoid bracket. Adjust the distance between thread trimming shaft and the rotary link of thread trimming solenoid to 0.5mm, and tighten the turnbuckle.
- 2) Loosen the rotary link turnbuckle of trimming solenoid and manually drive the link to adjust thread trimming shaft to 6.8mm and tighten the turnbuckle.
- 3) Check to make sure that the collar is returned to its original position when the rotary link returns to its first position.





If the position is not correct, the trimmer return may become slow, or the machine doesn't give the best sewing due to slow thread release.



### 4.6.6) Adjusting moving and fixing mes

1) Adjust the distance A between thread dividing point of moving mes and needle plate hole to the same figure as given with lever adjustment screw when needle bar stops moving.



CAUTION

If the position is not correct, thread can't be trimmed properly or remaining thread amount may get smaller.

### 4.7) Installing and adjusting direct motor

### 4.7.1) Attaching coupling

1) Attaching servo motor coupling

With coupling turnbuckle locating exactly at the cutting part of servo motor, adjust the distance between the coupling and the motor to 0.7mm, and tighten the coupling turnbuckle.

2) Attaching coupling to upper shaft

With coupling turnbuckle locating exactly at the cutting part of upper shaft, adjust the distance closely between Bearing O-ring and the coupling to be 2mm, and tighten the turnbuckle.



### 4.7.2) Combining motor

1) Motor combination

Combine motors carefully while making sure to align the location of motor coupling turnbuckle to that of upper shaft coupling turnbuckle.



If the location of coupling turnbuckle is not correct, a needle does not stop in the right place.

### 4.8) Clamp adjustment

### 4.8.1) Pressure control of side clamp

1) Solenoid valve adjustment

To adjust the pressure of side clamp use the pressure reducing valve of a solenoid valve attached to a table's base.

After adjusting the pressure of side clamp properly, fasten fixing nut to maintain the set pressure.

2) Pressure control

Turn the reducing valve clockwise to increase side clamp pressure and counterclockwise to decrease it.



### 4.8.2) Adjusting forward and backward speed of middle clamp

1) Adjustment of speed controller

To adjust forward and backward speed of middle clamp: turn the valve of speed controller clockwise to increase speed and counterclockwise to decrease it.

After completion of adjusting speed properly to operation, fasten fixing nut to maintain the set pressure.



### 4.9) How to operate clamp

### 4.9.1) Operation of clamp/start switch

First, press clamp switch. The clamp moves to fix a visor to a feed plate so as not to move while sewing. And then, press start switch. The machine begins to sew on the visor fixed to clamp.





### 4.9.2) Operation of standing pedal

Press the right side of standing pedal to operate as does clamp switch.

Press the left side of the pedal to begin sewing as does start switch.



### 4.10) How to insert pattern images

 To insert a variety of patterns into the sewing machine by using a floppy disk.





A floppy dist available in a market can be used after formatting. Authorized disk only.

5

### Maintenance & repair



1) Abide by safety rules on machine and electric safety when checking, maintaining and repairing the machine.

2) These works should be one when the machine power is "OFF."

### 5.1) Regular checkup

- 1) Regularly Clean, lubricate and pour grease into designated areas to maintain capabilities of the machine.
- 2) Check tension of each drive belt.
- 3) No regular checkup may cause the following problems:
  - Unusual abrasion of each frictional area led by insufficient lubrication and grease pouring.
  - Abnormal operation caused by dust and foreign substances in the drive.



 SUNSTAR takes no responsibility for mechanical breakdown or malfunction caused by no cleaning and lubrication of the machine through regular checkup.
 Cleaning period varies depending on using condition and surrounding environment.

### 5.2) Lubrication

### 5.2.1) Lubricant types

No. Lubricant types		using areas
1	Sewing machine oils	Arm, bed, hook areas
2	Grease	X-Y feed rail

### 5.2.2) How to lubricate

- 1) Arm
  - Feed oil after checking the amount of remained oil in an oil tank installed in the arm.
  - Feed oil in and upper side of an oil tank door.





 After removing a rubber cork of a table's oil tank mouth, feed oil and then, plug up the mouth again with the cork.





### 3) Hook

- Pull out a bobbin case and feed oil until it soaks in the hook and its surrounding areas.



### 5.2.3) Removal of residual oil

Remove oil when it is full in residual oil can.



### 5.2.4) Grease pouring

Pour grease regularly into X-Y transfer rail.



### 5.3) Cleaning

5.3.1) Frequency and method of major parts cleaning



Make sure to turn the machine power is "off" before cleaning.
 Reassemble all the parts removed for cleaning in the opposite order.

No.	Major parts cleaning	Cleaning frequency
1	Hook area	Everyday
2	Thread take-up lever / Thread tension control assembly	Once in a week
3	Moving and fixing mes area Remove dirt at moving and fixing mes by using air under needle plate.	Three times in a week
4	X-Y transfer timing pulley and timing belts Disassemble cover first and remove dirt in each part of X-Y transfer part by using air. (Rotate pulley when cleaning.)	Once in a month
5	Control box and cooling fan filter Remove cover and pull off filter. Wash the filter with running water and dry completely in the shade to use.	Once in a week





# **6** Pneumatic circuit diagram

[ SPS/S-CV1 Air System Circuit Diagram ]



7 Trouble shooting

### 1) Machine part

No.	Problems	Causes	Solutions
		excessively loose belt tension or belt damage	belt tension adjustment and belt change
1 Proble	Problems of machine and operation	power or circuit fuse disconnection	Check disconnection of major motor drive fuse in control box and change it
		disconnection from limited position of X or Y of feed bracket	Move feed bracket to the right position (within switch limitation)
2	Incorrect stop position	loose main drive belt	belt tension adjustment
2		incorrect position of synchro	synchro position adjustment
3	Needle break	needle damage (bent needle, damage on the eye of needle or hole, or worn-out or changed needle point)	new needle installation
	receile break	incorrect needle setting	correct needle installation
		needle and shuttle contact	needle and shuttle space adjustment
		wrong threading	correct threading
		wrongly inserted needle (needle height and direction etc.)	needle replacement
4	Thread breakage	damaged needle (bent needle, damage on the eye of needle or hole, or worn-out or changed needle point)	needle change
		too tight tension on lower and upper thread	tension adjustment
		excessive tension and workload at thread take-up lever spring	changing thread take-up lever spring tension and workload
		flaw on thread regulating hole area of spring on upper part spring of shuttle	replacement of new spring of shuttle upper part
		bent needle use	needle change
		wrong size needle for sewing thread	needle change
5	Skipped sewing	incorrect needle installationa	needle reinstallation
5		wrong needle and timing	readjustment of needle and shuttle timing
		improper hole and wide space between hole and shuttle point	readjustment of needle and shuttle timing
		excessive tension and workload at thread take-up lever spring	adjustment of thread take-up spring tension and workload
	T cal 1	weak upper thread tension	adjustment of upper thread tension
6	Incorrect thread tightening	weak lower thread tension	adjustment of lower thread tension
		improper needle and shuttle timing	readjustment of needle and shuttle timing
	Missing three -	loose crossed tension of moving mes and fixing mes	adjustment of fixing mes tension
7	trimming	worn-out knife edge hole of moving and fixing mes	changing moving and fixing mes
		incorrect position of thread trimmer cam	readjustment of thread trimmer cam position