TECHNICAL MANUAL
SEWING MACHINE HEAD

Electronic Pattern Sewing Machine
Model PLK-G6030 2-N (PLK-X107)
FOR SAFE USE

Before the installation, operation, and inspection for this product, read the “FOR SAFE USE” and the technical manuals carefully. Also read the other technical manuals, “Control Unit” and “Operation Panel” describing some instructions, which are not in this manual, and use the sewing machine properly.

SAFETY INDICATIONS

DANGER Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.

CAUTION Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage. Note that CAUTION level may lead to a serious consequence according to the circumstances. Always follow the instructions of both levels because they are important to personal safety.

CAUTION INDICATIONS

<table>
<thead>
<tr>
<th>No.</th>
<th>Caution indication</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1   | ![Caution symbol](image1.png) | Precaution for sewing machine operation: Indicates that removing the safety and operating the sewing machine for some other purposes with power-on are prohibited.  
- Please do not operate the sewing machine without protective equipment such as a needle guard, an eye guard, a belt cover or the others.  
- Please turn off the power switch when threading, changing a needle and a bobbin, cleaning, and lubricating. |
| 2   | ![Caution symbol](image2.png) | Caution for fingers injury: Indicates a possibility of fingers (hands) injury in a certain condition. |
| 3   | ![Caution symbol](image3.png) | Caution for squeezing fingers: Indicates a possibility of squeezing fingers in a certain condition. |
## SAFETY PRECAUTIONS

### DANGER

To prevent from receiving an electric shock, always turn off a power switch and unplug power supply when opening a control box, and then open after ten minutes passes.

### CAUTION

#### USAGE ENVIRONMENT

Please do not operate the sewing machine under the following conditions.

1. In the ambient temperature of 35 degrees (95°F) or more than 35 degrees, or the ambient temperature of 5 degrees or less than 5 degrees (41°F).
2. In the ambient temperature of 55 degrees (131°F) or more than 55 degrees, or the ambient temperature of -10 degrees or less than -10 degrees (18°F) during transportation.
3. In the relative humidity exceeding 85% or less than 45%.
4. In the open-air place or the location that receives direct sunlight.
5. In the place near heat sources such as heating devices.
6. In the atmosphere filled with dust, explosive gas, or corrosive gas.
7. In the place where the fluctuation in the power voltage of 10% or more than 10%, or the power voltage of -10% or less than -10% of the fixed power voltage.
8. In the place where the power source cannot supply enough voltage to keep the motor running.
9. In the place filled with strong electric noises such as high-frequency welders.

#### INSTALLATION

1. Please have some specialists, who have enough experience for the sewing machine installations, install the sewing machine.
2. Please have a qualified electrician perform necessary electric wiring.
3. Please do not operate until the sewing machine is repaired when any damage or fault is found on the sewing machine at the installation.
4. Please do not refurbish the sewing machine.
5. The sewing machine is heavy. For the safety, please make sure to install the sewing machine head by more than one person.
6. Please make sure to fit the safety protective equipment (the motor cover or the others) and the accessory protective equipment (the eye guard) that removed temporarily for installation.
<table>
<thead>
<tr>
<th>SEWING</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Please make sure to turn the power switch off before installing or replacing needles.</td>
</tr>
<tr>
<td>(2) Please pay attention for the fingers not to be injured by the needle point.</td>
</tr>
<tr>
<td>(3) Please make sure to turn power switch off before lubricating.</td>
</tr>
<tr>
<td>(4) Please pay attention that oil does not get on your skin or in your eyes as it may cause an inflammation.</td>
</tr>
<tr>
<td>(5) Please make sure to keep oil out of the reach of children who may drink oil by mistake.</td>
</tr>
<tr>
<td>(6) Please make sure to turn the power switch off before threading a needle.</td>
</tr>
<tr>
<td>(7) Before starting the sewing, please make sure the position and the function of the halt switch.</td>
</tr>
<tr>
<td>(8) Please do not touch the operating parts during sewing operation.</td>
</tr>
<tr>
<td>(9) It is very dangerous to operate the sewing machine without safety guards (eye guards, belt covers, link covers, finger guards or the others). Please make sure to operate the sewing machine with safety guards.</td>
</tr>
<tr>
<td>(10) Please make sure to turn the power switch off when stopping the sewing machine temporarily.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADJUSTMENT</th>
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<tbody>
<tr>
<td>(1) Please make sure to turn the power switch off before adjusting the sewing machine.</td>
</tr>
<tr>
<td>(2) If the adjustment is required while the power switch on, do not step on the foot switch by mistake.</td>
</tr>
<tr>
<td>(3) Please be careful not to be injured by a sharp part such as the needle and the shuttle hook point.</td>
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<tr>
<td>(4) Please make sure to put the safety guards (eye guards, belt guards, link covers, and finger guards or the others) back on the initial position after the sewing machine adjustment.</td>
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</table>
1. STRUCTURE OF THE SEWING MACHINE

PLK-X107 electronic pattern sewing machine consists of the following main parts.

- <1>: Sewing machine head
- <2>: Main shaft motor
- <3>: Halt switch
- <4>: Control box
- <5>: Operation panel
- <6>: Work holder switch
- <7>: Start switch
- <8>: Thread stand
- <9>: Sewing machine table
## 2. SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model</th>
<th>PLK-X107</th>
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</table>
| Sewing area | X-direction (left/right) 600 mm  
 Y-direction (front / back) 300 mm |
| Maximum sewing speed | 1,800rpm (Continuous feeding)  
 1,800rpm (Intermittent feeding) |
| Setting speed \(^3\) | 10 speed levels in 200 rpm to 2,000 rpm |
| Stitch length | 0.1 to 20.0 mm |
| Stitch type | Double needle lock stitch |
| Maximum number of needles | 20,000 per pattern |
| Storable sewing data item | 900 patterns (internal memory) |
| Data memory | Internal memory, USB memory |
| Needle bar stroke | 41.2 mm |
| Thread take up lever stroke | 70mm |
| Class of needle | DPX17#18 |
| Needle thread holder | Needle thread holder and thread catcher system |
| Presser foot lift \(^1\) | 12 mm (as factory default setting) (Maximum 15 mm) |
| Presser foot stroke \(^2\) | In 4 mm to 10 mm (4 mm as factory default setting) |
| Hook | Large size horizontal rotating hook |
| Bobbin case | With non racing spring |
| Bobbin | Large size aluminum bobbin |
| Thread trimmer system | Horizontal engagement with fixed knife and movable knife |
| Lubrication system | Manual oiling and replenishment with the oil braids from the oil tanks |
| Lubrication oil | Pulley SF oil |
| X-Y drive system | Stepping motor feedback control  
 Timing belt drive system. Intermittent or continuous feeding |
| Machine dimensions (W)x(L)x(H) | 1,350mm x 1,572mm x 1,234mm |
| Weight | Total 445 Kg |
| Type of motor | XL-K756-20 |
| Type of controller | PLK-G-CU-20 |
| Type of operation panel | PLK-G-PAL-2 |
| Power | In 200V to 240V single-phase or three-phase  
 The power in 110V to 120V or in 380V to 415V is compatible with power unit (option) |

\(^1\) Presser foot lift is the height of the presser foot after the sewing has stopped.

\(^2\) Presser foot stroke is the up and down movement of the presser foot while sewing.

\(^3\) Sewing speed may be limited by the operation or sewing condition.
3. INSTALLATION

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3-1. Installation of the foot switch
Refer to the instructions to p.3 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.

3-2. Connection of the air tube
Refer to the instructions to p.3 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.

3-3. Installation of the thread stand
Refer to the instructions to p.4 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.
3-4. Installation of the spindle motor

(1) If the spindle motor (No.1) has been removed from the machine for the adjustment or the like, fix the spindle motor as the procedure described below.

(2) Set the pin (No.3) position of the bushing to the motor mark (No.2).

(3) Adjust the clearance between the motor and the coupling (No.4). Use the part measuring 7mm on the gauge (No.5). Position Bolt “A” (No.6) in the UP position when reinstalling the coupling to the machine top shaft. Make sure the clearance of the coupling is from 2.0 to 3.2mm.

(4) Turn the pulley (No.8) in the direction of the arrow then, make the thread take up lever (No.9) most upper position.

(5) Be careful not to make the motor turn and fit the coupling to the upper shaft, and then tighten the bolt A (No.6) first and the bolt B (No.7) second.
4. LUBRICATION

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<tr>
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[Notice] Please make sure to lubricate when operating for the first time after the installation. Also, please make sure to check the amount of oil when the machine has not been used for a long time.

4-1. Filling the oil tank

Pour the oil through the oil hole (No.1) to the oil tank (No.2) on the machine arm.

4-2. Oiling

Put some oil to the red marked oil holes (No.3 & No.4).
4-3. Oil lubrication mechanism for hook

Component of oil lubrication mechanism is showing in below drawing.

Pour the oil hole (No.1) to the oil tank for hook on the machine bed. Please fill with the oil over level mark (No.2) of the oil tank for hook.
5. PROPER OPERATION

5-1. Initial setting of the control box
When using the sewing machine for the first time, the model and the language of the sewing machine in use have to be set.
Refer to the instructions in the paragraph “[6] Initial Setting of System (Model/language Setting)” in the CONTROL UNIT technical manual. Please choose Model button for 6030-2.

5-2. Installation of the needle
Refer to the instructions to p.6 in the SEWING MACHINE LT2-2250 technical manual.

5-3. Threading the upper thread
Refer to the instructions to p.7 in the SEWING MACHINE LT2-2250 technical manual.

5-4. Winding the bobbin thread
Refer to the instructions to p.9 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.

5-5. Setting the bobbin
Refer to the instructions to p.8 in the SEWING MACHINE LT2-2250 technical manual.
5-6. Opening the cylinder cover
(1) Press the end of cylinder cover (No.1).
(2) The cylinder cover can be inserted in the slide plate (No.2). (Fig. A)
(3) The cylinder cover also can be detached from slide plate.
(4) When back the cylinder cover to the slide plate insert the end of cylinder cover in the groove (a).

<1>: Cylinder cover  <2>: Slide plate
6. SEWING

6-1. The sewing operation
Refer to the instructions to p.11 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.

6-2. Operation of the halt switch
Refer to the instructions to p.12 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.

6-3. Operation of the needle select switch
When push this switch each time the sewing needle can be changed.

![Image: Needle select switch]

6-4 Adjustment of the thread tension
(1) Setting of bobbin
Refer to the instructions to p.8 in the SEWING MACHINE LT2-2250 technical manual.

(2) Threading of bobbin threads
Refer to the instructions to p.9 in the SEWING MACHINE LT2-2250 technical manual.

(3) Tension adjustment of bobbin threads
Refer to the instructions to p.9 in the SEWING MACHINE LT2-2250 technical manual.

(4) Adjustment of upper thread tension
Refer to the instructions to p.9 in the SEWING MACHINE LT2-2250 technical manual.
7. STANDARD ADJUSTMENT

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7-1. Timing between rotating hook motion and needle motion
Refer to the instructions to p.10 in the SEWING MACHINE LT2-2250 technical manual.

7-2. Needle vertical position adjustment
Refer to the instructions to p.11 in the SEWING MACHINE LT2-2250 technical manual.

7-3. Relationship between hook motion and opener motion
Refer to the instructions to p.13 in the SEWING MACHINE LT2-2250 technical manual.

7-4. Gap between movable knife and bobbin case holder stopper
Refer to the instructions to p.16 in the SEWING MACHINE LT2-2250 technical manual.

7-5. Adjustment of holding pressure of bobbin thread
Refer to the instructions to p.18 in the SEWING MACHINE LT2-2250 technical manual.

7-6. Sharpening of fixed knife
Refer to the instructions to p.20 in the SEWING MACHINE LT2-2250 technical manual.

7-7. Adjustment on oiling to rotating hook
Refer to the instructions to p.5 in the SEWING MACHINE LT2-2250 technical manual.
7-8. Adjustment of the presser foot timing
Refer to the instructions to p.17 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.

7-9. Adjustment of the presser foot lift
Refer to the instructions to p.18 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.

7-10. Adjustment of the presser foot height position
Refer to the instructions to p.19 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.

7-11. Adjustment of the presser foot position
Refer to the instructions to p.19 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.

7-12. Adjustment of the presser foot walk during the sewing
Refer to the instructions to p.20 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.

7-13. Adjustment of the presser foot spring pressure
Refer to the instructions to p.20 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.
7-14. Adjustment of the bobbin winder
Refer to the instructions to p.22 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.

7-15. Changing the work holder
Refer to the instructions to p.23 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.

7-16. Adjustment of the opening time of the upper thread tension release disks
Refer to the instructions to p.27 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.

7-17. Adjustment of the mechanical home position
The mechanical home position (No.1) is fixed at the center of the sewing area when the sewing machine is shipped from the factory. However, it can be moved within the area covered with diagonal lines (No.2).

Note: The mechanical home position adjusted based on the rear side needle.
7-18. Adjustment of the X direction
Refer to the instructions to p.29 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.

7-19. Adjustment of the Y direction
Refer to the instructions to p.30 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.

7-20. Adjustment of the X-Y timing belt tension
Refer to the instructions to p.31 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.

7-20-1. Adjustment of the X timing belt tension
Refer to the instructions to p.31 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.

7-20-2. Adjustment of the Y timing belt tension
Refer to the instructions to p.32 in the SEWING MACHINE HEAD PLK-G4030/G6030 technical manual.
ADJUSTMENT OF THE TRIMMING THREAD CHANGING MECHANISM

1. Outline
1. Driving source are trimmer cam and connecting rod unit (No.1) which are same as LT2 sawing machine. These unit and two sets of drive plate (No.2) are mechanically-interlocked.
2. When the rear side thread trimming, the drive arm unit (No.3) which connected with thread trimmer (No.4) moving into the drive plate groove (No.2). Therefore thread trimmer (No.4) and drive source mechanically-interlocked.
3. When the front side thread trimming, it is same way of the rear side needle trimming method.
4. Each drive arm (No.3) are connected with connecting bar (No.6). This enables the drive arm (No.3) to moving into the drive plate groove (No.2) alternately by air cylinder (No.5).

2. How to remove the trimming thread changing mechanism.
If remove the trimming thread changing mechanism for maintenance etc.
Please done by following procedures. Usually this operation is not necessary.
1. Loosen the 4 points of hand screws (No.2) and remove the oil cover (No.1). Please move the oil cover to the direction of arrow which showing below figure.
2. Remove the 4 points of screws (No.3) and remove the oil pan (No.4).

3. Loosen the 2 points (left and right side) of hand screws (No.2) and drawing the oil receiver (No.1) to the end stop of the guide rail (No.3).
4. Remove the 3 points of screws (No.1) and 2 points of screws (No.2). Loosen the 2 points of nuts (No.3).
   **Notice**: One of the nut (No.3) is left-handed screw.
5. Remove the connecting rod (No.5) and spring (No.4) from the spring post (No.6).

6. Remove the air tube from the air cylinder (No.1) and remove the 2 points of screws (No.2).

7. It can be remove the thread changing mechanism. When back the this mechanism it has be done by reverse method. And then make some adjustment according to the attached document.
3. Adjustment of thread trimmer cam
1. Remove the 6 points of screws and remove the slide plate (No.1).
2. Remove the main shaft motor cover and turn the pulley (No.2) in the following direction until the needles reach the lowest position.
3. Remove the oil cover and draw the oil receiver. Remove the oil pan if needed.
4. Maintaining the needle position, depress the cam follower crank (No.3) by hand and put the cam roller (No.4) into the groove of thread trimmer cam.
5. Turn the pulley (No.2), adjust the thread trimmer cam (No.5) so that the movable knife starts moving when the red mark point (No.6) on the pulley (No.2) come in line with red marked line on the main shaft motor (No.7).
   To adjust, loosen two thread trimmer cam clamp screws (No.8)

<table>
<thead>
<tr>
<th>Reference</th>
<th>Main shaft motor pulley angle</th>
<th>Main shaft detector indicate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needle upper position</td>
<td>0°  (No marking)</td>
<td>220°</td>
</tr>
<tr>
<td>Take up lever upper position</td>
<td>63°  (marked)</td>
<td>283°</td>
</tr>
<tr>
<td>Needle lower position</td>
<td>180°  (No marking)</td>
<td>40°</td>
</tr>
<tr>
<td>Movable knife starts moving</td>
<td>220°  (marked)</td>
<td>80°</td>
</tr>
</tbody>
</table>

The detector angle is visible on control panel [Input/output setting mode].
4. Adjustment of cam roller position
1. Turn the hand pulley until the needles reach the lowest position.
2. Remove the oil cover and oil pan and draw the oil receiver.
3. Depress the cam follower crank (No. 1) by hand and put the cam roller (No. 2) into the groove of thread trimmer cam.
4. When it does not, loosen the 2 points of nuts (No. 3) and turn the connecting rod (No. 4) so that cam roller into the groove of thread trimmer cam smoothly.

Notice: One of the nut (No. 3) is left-handed screw.
5. Adjustment of driving arm unit position.
1. Remove the air tube from the air cylinder.
2. Remove the oil cover and oil pan and draw the oil receiver.
3. Confirm the each thread trimmer rocking crank (No.2 and No.3) and stopper pin (No.1) has contact.
   If it does not, press the thread trimmer rocking crank (No.2 and No.3) to contact the stopper pin (No.1)
4. Move the clevis rod (No.4) back and forth, and confirm the driving arm roller (No.5) alternately move into
   the drive plate groove (No.6) smoothly.
5. If it does not, loosen the screw (No.7) and adjust the driving plate position.

6. Initial position of movable knife
1. Adjust the movable knife standby position as bellow figure.
   To adjust the movable knife position loosen the thread trimmer rocking crank bolt. (Same as LT machine)
2. When finish the adjustment please check the previous paragraph [5. Adjustment of driving arm unit position].
7. Adjustment of meshing pressure of fixed knife for front trimming device.
1. Loosen the fixed knife bracket clamp screw (No.1) by hexagon wrench.
2. Turn the vertical position adjusting screw (No.2) to adjust meshing pressure and then tighten the screw (No.1).

8. Adjustment of meshing pressure of fixed knife for rear trimming device.
1. Remove the slide plate and loosen the fixed knife bracket clamp screw (No.1) by hexagon wrench.
2. Adjust meshing pressure and tighten the screw.

Note: There is no vertical position adjusting screw because it is small area to operate the screw.
ADJUSTMENT OF HOOK POINT (Supplementary note)

1. Adjustment of hook point (supplementary note)
   1. When adjusting the clearance between needle and the hook, loosen the clamper bolt (No.1 and No.2). There are 2 access holes on the trimming thread changing devices plate (arrow indicated) when loosen the set screw (No.2).
   2. After adjusted the hook point tighten the screws (No.1 and No.2).
ASSEMBLING METHOD OF NEEDLE BAR

1. Assembling method of needle bar
1. Below figure is state of pre-install the needle.
   It does not have presser hoot component parts and needle changing device.
   Upper needle bar guide is removable, loosen the 2 point of screw (No.1) if needed.
   In this case please attention to oil pipe etc.
   Lower needle bar guide can not remove because it is firmly bonded to machine arm with anaerobic adhesive.

2. Install below parts temporary.
   At first, assemble the rear side needle bar component parts.

3. Loosen the 2 points of screws (No.2) and remove the presser foot unit.
   Put the any brock height about 60mm on the needle plate. Brock is not included in accessory box.
   Put the 3 pieces of steel ball on lower hole of needle bar. Please attention not to lost it.
   Put the any brock height about 17mm on the needle plate. Brock is not included in accessory box.
   Put the 3 pieces of steel ball on upper hole of needle bar. Please attention not to lost it.
4. Support the bottom of needle bar and needle bar holder by hand in the direction of arrow indicated. In this way, keep holding the steel ball not to drop from the needle bar. Then move up the needle bar up to push pin (No.3) visible position. Please not to drop the steel ball. Press the push pin firmly and put a steel ball into the needle bar holder.

5. Put the 2 pieces of spacer on needle bar. Please attention not to lost it.

6. Keep holding the needle bar, move up the needle bar holder slowly up to spacer position. Steel ball has appear from the needle bar holder then needle bar and needle bar holder being fixed.

7. Assemble the front side needle bar in the same way as previous described method.

8. Tighten the screw (No.5) and fix the needle holder by the correct position. Tighten the screw (No.4) temporary and test the needle bar changing has correctly. 
   **Note:** While push pin has pushed, the needle bar does not work. When release the push pin by needle bar upper position needle bar being the working status. After check the needle bar movement tighten the screw (No.4) firmly. Finally confirm the each parts attached correctly especially steel ball and spacer etc.
NEEDLE CHANGING DEVICE

1. Needle changing function
The needle changing device function described below figure.
When to adjust this device loosen the screw (No.1 or No.2) that to be below described condition.

Air cylinder back state

No contact

Clearance (About 0.5mm)

Rear side needle active state

Air cylinder forward state

No contact

Clearance (About 0.5mm)

Front side needle active state
PLK-X107 AIR PIPING DWG
8. MAINTENANCE

CAUTION

(1) Please make sure to turn the power switch off before cleaning the sewing machine.
(2) Please pay attention to that staining your skin or eyes with oil may cause an inflammation.

8-1. Cleaning
(1) Remove the dust and the thread waste sticking the threading parts or the hooks area regularly.

(2) The dust or the like sticking the X-Y slide guide absorbs lubrication oil on the rails and significantly lowers the slide guide running life.

Clean the slide guide regularly and also pour some grease.
Recommended grease: Multemp PS2 (Produced by Kyodo Yushi Co. Ltd)
(Lithium grease 2)

8-2. Disposing of oil waste
If the waste oil pan is full filled in the oil bottle (No.1), remove the oil bottle then dispose of the waste oil.