

**KUZMA**

**XL DC Turntable .....  
Instruction manual**

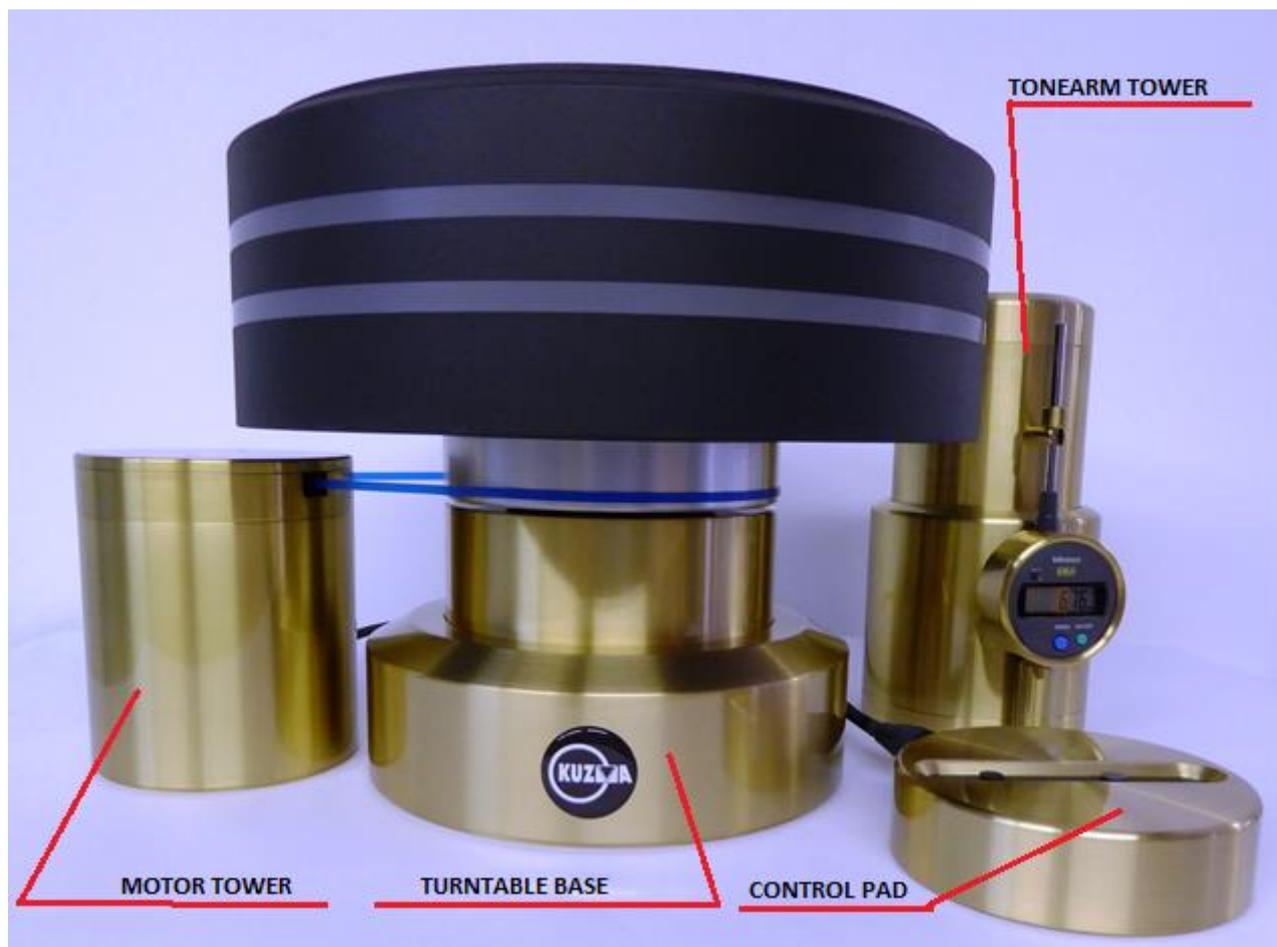
**2020-11**

# KUZMA LTD

## INSTRUCTION MANUAL FOR XL DC turntable

The XL DC turntable is a very precisely engineered piece of equipment. However the construction is robust and requires minimal maintenance for optimal performance.

Kuzma XL DC differs from previous Stabi XL, XL2 & XL4 turntables by using a very special DC motor, a machined plastic belt and a new power supply (PS DC), which gives a new, unique and uniformly precise drive to the platter.



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## General Description:

The turntable is packed in three boxes. Some parts are very heavy so handle boxes with care.

The motor tower, platter base and tonearm tower are stand alone items not connected to each other. **The turntable's support must handle mass of a 100 kg.**

The base is of solid brass which is clamped together from two pieces and has good damping properties. The main shaft, which is 28 mm in diameter, is fixed into this base. The platter is a sandwich construction of aluminium and acrylic plates screwed together in a pre-stressed form to damp all unwanted vibration. Hard non-metallic material is used for the bearing which, together with a ruby ball, is lubricated in an oil pool to provide one point contact, ensuring minimal vibration and noise. The position of the platter is further stabilised by a sliding non – metal ring, precisely matched to the shaft diameter and immersed in a second large oil pool.

One single DC motor is mounted via various decoupling elastomers in its own heavy brass tower, minimising motor noise while maintaining maximum motor torque. Torque is transferred from pulley to subplatter via the precision machined, plastic blue belt. The electronic power supply PS DC generates frequency controlled feed from a computer to the DC motor.

A heavy threaded brass and acrylic clamp provides additional damping of vibration caused by playback, as well as flattening curved records. The record is pressed securely to the platter-mat, which is a semi-hard combination of rubber and textile. The strobe disc also acts as mat cover.

The tonearm tower is a massive brass unit and the armboards can be exchanged to accommodate various tonearms. The mass of the tower gives structural and damping rigidity to the tonearm. The unit allows for VTA adjustment during playback without loss of rigidity or azimuth. The movable part is supported via a linear ball bearing 30 mm in diameter and 100 mm in length. This gives firm support while allowing VTA to be changed. Adjustments can be made over a range of 60 mm, each turn of the knob representing 1 mm precisely. In order to simplify adjustment, a micrometer gives a digital readout over a fine range of 12 mm at an exactitude of 0.01mm. These adjustments are repeatable.

## Product registration and warranty extension

Kuzma products have a non transferable 2 year limited warranty on parts and labour, which may vary in each country.

To obtain the 5 years\* limited warranty from us, you need to register the product on our web site within 30 days of purchase. We suggest registration of products in any case because this will also help you to receive our technical support more easily and with resale of products.

Simply register on our web site, complete the forms and you will receive an extended five year warranty card on your email within a few days. \* not valid for ex demo products.

## Technical data:

|                       |                                      |
|-----------------------|--------------------------------------|
| Mass (total w/o PS) : | 80 kg                                |
| Platter:              | 22 kg                                |
| Base:                 | 27 kg                                |
| Motor tower:          | 7,5 kg                               |
| Tonearm tower:        | 14 kg ( No. 1)                       |
| Speeds:               | 33, 45, 78 rpm                       |
| Dimension:            | 450x 400 x 300 mm                    |
| Power supply:         | 110V or 240 V, 50/60Hz (factory set) |

**Optional:** extra tonearm towers (No.1 or No.3 without VTA), various armboards, outer clamp

**Safety Precautions:**

Electrical connection to the power supply from the mains comes via the cable. Please keep PS away from moisture and be careful not to damage the mains cable. The same precaution applies to cables feeding the motor towers.

**Unpacking:**

XL DC comes packed in three boxes. Be aware that the boxes are very heavy and that the centre of gravity might not be in the middle of the box. Inside are cutouts in the packaging blocks of firm foam for various parts of the turntable. Some parts are very heavy, so handle with care while lifting from the boxes and placing them on the assembly surface.

**Contents:**

Box 1:

Platter

Box 2:

Tonearm tower, base, subplatter, clamp, VTA gauge.

Box 3:

Motor tower, Power supply, belt, motor cables 2x, motor positioner, bearing oil bottle 2x, clamp washers 2x, power cord, Allen keys: 1.5 , 2 , 2.5, 3mm, Instruction manual.

**Basic Setup:**

**Note:** Some parts are very heavy, so be careful when handling! Open all three boxes and remove top covers.

**Note:** Choose a suitable supporting table which can hold over 90-100 kg without warping. If you are using more than one tonearm tower be sure that the support can handle the extra mass.

**Note:** While the parts are packed in plastic bags for protection, these are not intended to be strong enough to lift or carry the contents.

**Base:**

Locate the main brass base with the shaft. Fig. 1. This is very heavy. Lift, being careful not to scratch against metal parts of clothing, and position it in the middle of the supporting board. The Kuzma logo should face forward. Use a ruler to position the centre of the base.



Fig. 1. Bearing base

**Subplatter:**

Remove the protection cover from the shaft and see if there are any dirt particles in the area of the shaft and ruby ball. Remove these using a soft cloth and further clean the area if necessary with a cloth soaked in alcohol.

Oil should be poured into the reservoir on top of the shaft (where the ruby ball is located) until it is full and oil starts to run into the lower reservoir. Then empty the rest of the oil into this lower reservoir. The level of oil is not critical due to the construction of the bearings.

**Note:** There is a spare bottle of oil!

Carefully put the aluminium subplatter over the shaft as vertically as possible and gently lower by rotating it back and forth. When lowered, ensure that rotation of the subplatter feels free and firm. If your hands are sweaty or sticky from the oil, clean the outer surfaces of the subplatter with a cloth soaked in alcohol.

**Belt:**

Put the belt over the subplatter before fitting the platter on it. Try to avoid oil contamination.

**Platter:**

Carefully put the platter on the subplatter. The best way to do this is for one person to hold the platter while another person positions it over the subplatter, helping to lower it down. Be sure that you do not touch the motor tower- if not sure move it away from base.

Be careful not to scratch the platter with jewellery, buckle, etc. Check that the platter is resting on the subplatter.

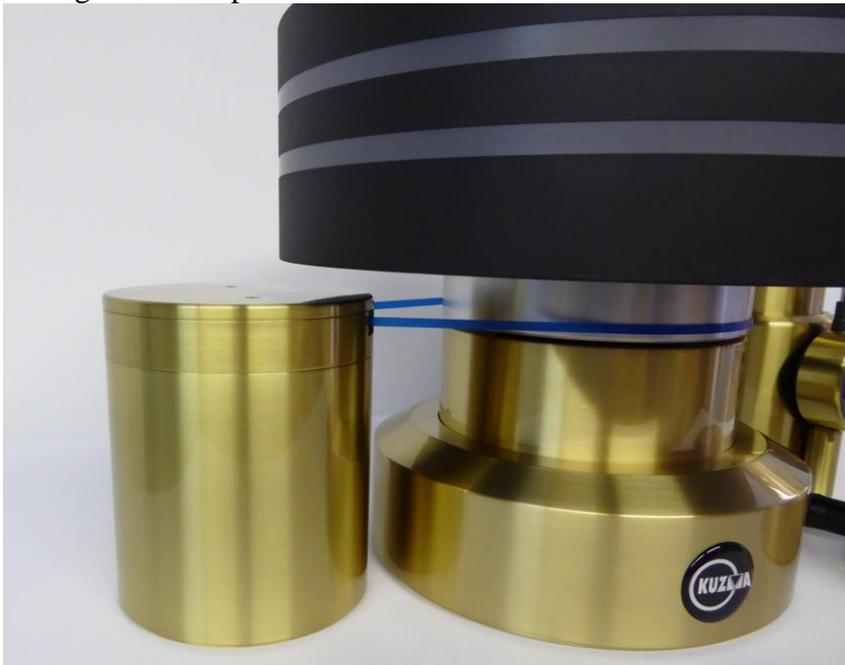


Fig. 2. XL DC platter drive

**DC motor tower:**

The three phase frequency controlled DC motor is encapsulated inside the heavy brass tower Fig. 2-6.

Position the motor tower to the left of the subplatter (it does not matter where around the platter circumference). The gap between the round bearing base and the motor tower should be at least 30-40 mm (the actual distance from the centre of the subplatter to the centre of the motor tower is 191 mm). Remove the top cover by unscrewing two screws on the top of the motor tower using 2.5 mm Allen key and carefully lift it up and put aside.



Fig. 3. DC motor tower



Fig. 4. Black PVC Motor positioner

Fit the motor positioner on the top of the motor tower-see Fig. 4, then slowly move the motor tower closer to the platter until the motor positioner touches the outer edge of the platter and then take off the positioner. Fit the belt around the subplatter and then, stretching the belt, fit it over the motor pulley. Rotate the motor tower to ensure that the belt is not touching the grooves in the motor tower.

Rotate the platter carefully by hand to ensure that the belt is in the correct position. Fig. 5-6.

The motor brass cover can be fitted after the platter is on top of the subplatter. Slide the cover onto the motor tower under the platter, fit in the two screws, rotate the cover and the screws will lock in the correct holes. Then gently tighten them with the Allen key.

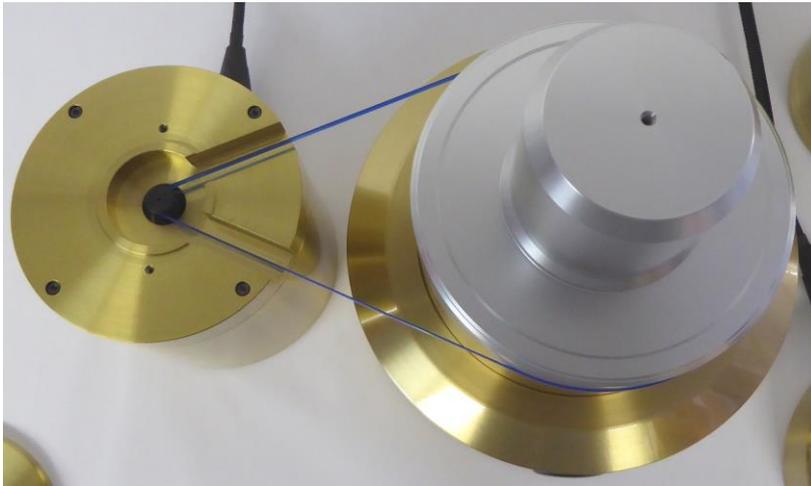


Fig. 5. Belt position in grooves

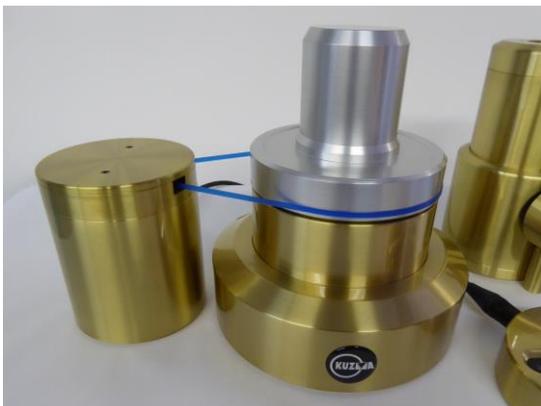


Fig. 6. DC belt drive



Fig. 7. Control pad

### **Tonearm tower:**

Position the tonearm tower in the approximately normal tonearm position. Ensure that the tonearm tower does not touch the platter, base, or motor tower. Position the tower so that the VTA toothed knob is facing away from the platter and that the parts holding the measuring gauge are facing towards the front. For Kuzma tonearms the gap between platter and tower is 5mm.

By rotating the VTA knob counterclockwise, raise the height of tonearm tower to slightly below the top surface of the platter (10-20mm). Underneath the toothed VTA knob is a screw for securing the VTA, to prevent this being accidentally changed ( using Allen key 1.5mm). If your tonearm tower comes with an appropriate cutout for your tonearm, measure the distance from the spindle to the centre of the tonearm tower. When used with most of Kuzma tonearms this should be 212 mm. The top brass armboard is removable. Armboards with different cutouts are available. Removal or rotation of the armboard against the tonearm tower is easily done. Just release the two side screws with Allen key 3mm. The position of the tonearm tower in relation to the perimeter of the platter does not affect the tonearm geometry, so the tower should be placed for convenience of use. The only critical parameter is the distance to the platter centre.



Fig. 8-8a. Tonearm tower

### **Power supply PS DC:**

The DC motor controller unit generates a precise sine wave output to control speed and rotation of a three phase frequency controlled DC motor. The signal is generated by a sophisticated computer based program. This generates a smooth undistorted sine wave with very fine and stable speed adjustment . Each speed can be selected, finely adjusted independently and then stored in the memory.



Fig. 9. PS DC front panel



Fig. 10. PS DC rear panel

### Connecting:

Position the PS DC so that there is space above, of at least 10-20 mm, for ventilation. By using the control pad the PS does not need to be readily accessible.

At the rear of the PS are two female XLR outputs: 7pin XLR for motor connection and 5pin XLR for control pad.

Connect the XLR cables to the motor input in the motor tower and at the back of the control pad. Connect the other ends of the cables to the XLR outputs on the rear of PS DC panel. Connect the mains cable and then switch on POWER on the front panel, which is then left permanently on. A red LED above the START button and a green display will light up on the front panel. There is a row of 4 round buttons. With the round button marked SPEED you select the speed ( 33, 45, indirectly also 78 ), which is then displayed on the green screen. The START button has LED above (red). Pressing it will start platter rotation and the LED will turn to green. The middle two buttons are for fine speed adjustments. Above them is a small push “store” button. Fig. 9-10.

### Control pad:

This controls start/stop and speed selection. On the left side is a red/green LED and start/stop button. On the right hand side is a button for speed selection with two green LED ( left indicating 33rpm speed and right 45rpm). Fig.7.

### Operation:

1. Press the power button at the front of the PS DC firmly. After 10 sec the PS is ready. The display will show 33 (or 45) and above the start button a red LED will be shown. You can keep the PS DC switched on all the time.
2. On pressing the START button the red LED will turn green and the platter should start rotating. To stop the platter, simply press the START button again. The red LED will show and the platter will slowly stop rotating.
3. Press the SPEED button and the selected speed will change from 33 to 45. Press again and it will return to 33.
4. Do not press and hold the start button before the mains switch is on ( see Reset function).
5. 78rpm- see below

**Fine speed adjustment:**

Observe on a strobe disc if the bars are stationary- that is the correct speed. You need to have a light which flickers with mains frequency (50Hz or 60Hz): neon or some LED bulbs. If they are slowly moving (for example if the bars move in the same direction as platter rotation) then the speed is too high. Press the plus or minus buttons a few times until the bars are stationary (there are very small steps, press several times). On the display you will see a green dot in the right bottom corner indicating that a change is in process. Using a pointed pen or toothpick, press the “store” button and the green dot will disappear.

Resetting the PS causes the speed change\*\*. After the PS is reset there will be comparatively large steps towards plus or minus speed change. When the “store” button is pressed next the changes will be smaller until, finally the speed changes are barely visible.

Check the speed independently for both speeds. When using the strobe disc, be sure to use it properly. Check that you are looking at the correct speed and are using the correct strobe light.

**Temporary options:****78 rpm speed:**

While platter is not rotating (press START button), then press and hold +(plus) button for 7-10 seconds, then press SPEED button to show 78. Then press START for platter rotation. Pressing the SPEED button will show all three speeds.

**Display off:**

While platter is not rotating, then press and hold -(minus) button for 7-10 seconds and the display will switch off after 7-8 seconds. However when speed change or fine speed adjustment is used the display will turn back on for 7-8 seconds.

**Temporary options will be switched off, when the PS power button is turned off.**

**Factory preset speed:**

If you find that your speed selection is out of range for some reason, you should reset the PS DC to factory set outputs.

Turn the power off, wait 10 sec, press and hold the SPEED button and then press the POWER on. When the display shows CU, release the SPEED button. The display will now show FA and then 33. Your PS is now preset for factory preset speeds.

You need to repeat the very fine speed adjustments for all speeds.

\*\*If you set up the platter’s fine speed after a PS reset you will find that the first steps are bigger until you put the adjusted speed into the memory, then the next steps will be much finer.

## Setting up the turntable:

### Tonearm mounting:

Ensure that the supporting stand is completely horizontal.

Mount the chosen tonearm according to instructions. Position the tonearm tower at the correct distance from the spindle. Firmly secure the armbase onto the tonearm top brass plate with two screws, using Allen key 3mm, at the side of the tower. See Fig.11

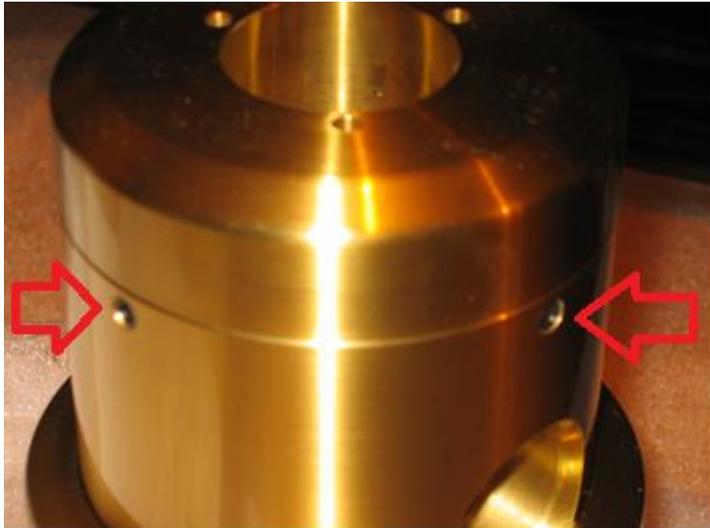


Fig. 11. Fixing screws on top of the tonearm tower.

Raise the tonearm to an appropriate height above the platter. Position the tonearm cable towards the back of the turntable towards the phono input. Check the length.

Check again the spindle to tonearm distance and rotate the tower to be in an optimal operating position.

**Note:** When the Air Line tangential tonearm is used, additional fine horizontal adjustment of the turntable or turntable support is mandatory.

### VTA Gauge:

Hang the digital display on the front of the tonearm tower using the lever and screw at the bottom of the tower.

Ensure that the display does not touch the platter or motor towers. Fig. 8.

The display can be left in the 'ON' position for up to three years (battery). Pressing 'origin' will cause 0.00 mm to show. Switching to + or – will cause this sign to appear in front of the numbers. Pressing (press and hold for about one sec) to 'origin' again, resets the display to zero. Due to the limits of height measurement (12mm), the display should show the middle of the measurement. An appropriate starting height for the tonearm is when the tube is parallel to the record after the cartridge is mounted.

### Setting the VTA gauge:

With Allen key 1.5mm release the small brass weight which holds the display in the upper position. The display will show minimum. Reset and the measurement will show zero. Lift the vertical rod for about 6-7mm (middle position) and with Allen key, secure this position with the screw on the brass weight. Then again reset and it will show that this new position is zero.

Raising the VTA by rotating the toothed knob, will show increased height above this reference point in mm and lowering it will show minus numbers. The precision achieved by this is 0.01mm. If the change in height of the tonearm comes outside this range of measurement, the brass weight can be repositioned. The measuring device will not be damaged by being outside its range. Each rotation of the knob corresponds to 1mm change in VTA and it can be moved while playing records.

## **Use and adjustments:**

### **Operation & speed selection:**

1. Press the power button at the front of the PS DC firmly. After 10 sec the PS is ready. The display will show 33( or 45) and above the start button a red LED will be shown. You can keep the PS DC switched on all the time.
2. On pressing the start button the red LED will turn green and the platter should start rotating. To stop the platter, simply press the start button again. The red LED will show and the platter will slowly stop rotating.
3. Press the speed button and the selected speed will change from 33 to 45. Press again and it will return to 33.
4. Do not press and hold the start button before the mains switch is on( see Reset function).
5. 78rpm- see below

### **Fine speed adjustment:**

Observe on a strobe disc if the bars are stationary- that is the correct speed. If they are not (for example if the bars move in the same direction as platter rotation) then the speed is too high. Press the plus or minus buttons a few times until the bars are stationary (there are very small steps, press several times). On the display you will see a green dot in the right bottom corner indicating that a change is in process. Using a pointed pen or toothpick, press the “store” button and the green dot will disappear.

Resetting the PS causes the speed change. After the PS is reset there will be comparatively large steps towards plus or minus speed change\*\*. When the “store” button is pressed next the changes will be smaller until, finally the speed changes are barely visible.

Check the speed independently for both speeds. When using the strobe disc, be sure to use it properly. Check that you are looking at the correct speed and are using the correct strobe light.

### **Temporary options:**

#### **78 rpm speed:**

While platter is not rotating ( press start/stop button), then press and hold + button for 7- 10 seconds, then press speed button to show 78. Then press start for platter rotation. Pressing the speed button will show all three speeds.

#### **Clamp: (Gently screw down the clamp on top of the record)**

Put a washer under the LP (thin for thick records and thick for thin records) and start screwing the clamp down. Observe the outer edge of the LP. To start with, this edge will be above the mat but will slowly lower to touch the mat. With fingers hold the LP so that it does not rotate. If the clamp is further screwed, the outer edge will rise.

Pressure should then be released by slightly unscrewing the clamp until the outer edge is touching the mat again. This is the position in which the record is held in firmest contact with the mat.

With practise there is no need to stop spinning the platter while changing LPs or using the clamp. The clamp can also be used without washers.

### **VTA change:**

Rotation of the toothed knob at the base of tonearm tower raises and lowers the top part of the tonearm tower (seen from the top, counterclockwise rotation raises VTA). Adjustments are in repeatable increments below 0.01mm. The rigid construction allows for this to be done while records are playing, without changing the azimuth. For more details see the sections on tonearm tower and VTA clock.

## **Maintenance:**

### **Mat:**

The top surface of the mat can be cleaned using a roller textile cleaner.

### **Bearing:**

Oil in the bearing will last for 3-4 years or more. Running the bearing without oil will do no harm due to the choice of materials and type of construction.

Oil should be added if the top reservoir (with ruby ball) is totally dry. The oil level will be below the ruby ball as the bearing surface increases the level of oil above the ruby ball when the subplatter is lowered onto the shaft. When the subplatter is removed you can see the level of oil inside its sliding ring (golden colour). If it is above the sliding ring in the subplatter, there is plenty of oil. If excess oil is added it will run into the appropriate extra reservoir.

### **Belt:**

Periodically remove the platter and remove the belt. Clean belt and the running surfaces of the motor pulleys and the subplatter with a soft cloth soaked in alcohol (every 12 months). For best performance replace belts every 5-7 years.

### **VTA Gauge:**

The sign 'B' in the top left corner of the clock indicates that the battery should be replaced.

Push clock out of brass frame and reach battery cover from the outer side.

Remove the battery cap by turning it counterclockwise with a coin and remove old battery replacing with a new battery with the + side facing up. Secure the battery cap. Immediately after the battery has been set, a meaningless display or 'E' will appear. This is quite normal so merely continue to set up 'origin' again.

## **Troubleshooting:**

### **Platter not rotating:**

Motor controller unit- check if the red LED is on

-green display should show 33 or 45, if not re-plug PS DC

-unplug mains and check both connection cables from PS DC to motor

Consult dealer or qualified electrician.

### **Very slow start:**

Remove the platter and belt and check position of the belt and tension.

### **Wrong speed:**

Perform fine speed adjustment and check position of the belt. Be aware that fine speed changes steps are very small.

If you find out that your speed selection is way out of range for some reason, you should perform factory preset on PS.

### **Factory preset PS:**

If the speed is totally incorrect and fine speed adjustment does not help: Reset to factory preset and then adjust correct speed on the PS DC by using a strobe disc.

Turn the power off, wait 10 sec and then press and hold speed button, then press power on.

When display will show CU, release the speed button. The display will now show FA and then 33. Your PS is now reset for factory preset speeds.

\*\*Perform fine speed adjustment.

If this fails consult your dealer. The problem will be probably be solved by a microchip replacement.

## **Transportation:**

For short distances dismantle the platter, remove belt from motor and disconnect all cables. The base with the subplatter can be transported as one, providing that it will not be tilted, as this may cause oil leakage.

All parts are heavy, however, and can be easily damaged by sliding around a transport vehicle. Repacking in original cutouts and boxes is, therefore, recommended.

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