



**KUZMA STABI REF PS 2 TURNTABLE (without arm ) S/N.....**

**Instruction manual**

**2010-10**

# KUZMA LTD

## INSTRUCTION MANUAL FOR STABI Ref 2 turntable

The **Stabi Reference 2** turntable is a very precisely engineered piece of equipment. However the construction is robust and requires minimal maintenance for optimal performance. It differs from Stabi Ref only in the use of different power supply called PS REF 2.



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## General description

Stabi Reference turntable is a suspended subchassis turntable. The main chassis, subchassis and platter are of an acrylic and aluminium sandwich construction which dampens all resonance of the turntable. The subchassis is isolated from the environment by four springs which are damped with silicon oil in sealed reservoirs. The suspension is easily adjusted via four knobs on the turntable top. The whole turntable stands on three large spikes.

The bearing assembly is of an inverted type. The platter lies on a ruby ball and is centred by a sliding ring. These both have their own oil bath.

Two motors drive the platter via a flat belt. The turntable has its own external motor controller which enables motors to rotate with minimum vibration and constant torque. On the PS REF 2 (MCU- motor control unit) front panel is a speed display and start, store and speed selector. It is computer controlled, split phase with fine speed adjustment. The signal is amplified by two 20W amplifiers.

Each turntable is individually built and tested and made of the best available materials to ensure the highest possible standard of musical performance. The turntable is supplied with one predrilled armboard.

### **Kuzma Stabi Reference turntable:**

Mass	40 kg
External dimensions	500x400x200 mm
Weight of platter	8 kg
Resonance of subchassis	2 Hz (damped)
Speeds	33, 45 RPM
Fine speed adjustment	yes
Mat	textile & rubber
Motor	2 pcs 24 poles
Mains supply (non-selectable)	110-130 V 50-60 Hz, 200-240 V 50- 60 Hz
Max tonearm weight:	2,5 kg

### **PS REF 2:Motor Controller Unit Ref 2 (MCU):**

Mass:	2 kg
Size:	120x140x400 mm
Power consumption:	50w
Output:	33, 45 rpm (40-100Hz, 110V)

**Optional:** various predrilled armboards (SME, Graham, Triplanar, Ikeda, Ortofon,...)

### **Safety Precautions:**

Electrical connection to the motor controller (MCU) from the mains comes via the cable. Please keep MCU away from moisture and be careful not to damage the mains cable. The same precaution applies to cables feeding the turntable motors.

## Unpackaging

### Contents:

Stabi Ref is packed in a single main box.

### Inner box:

platter, subplatter, PVC bottle with bearing oil, belt, armboard, motor controller, power cord and motor cable, Allen key 4 mm with 4 pcs screws for armboard, instruction manual, clamp with 2 washers.

### At the bottom of main box:

Subchassis with bearing shaft and base chassis with motors.

### Removing parts:

Prepare the surface where you will set up the turntable. Open the box at the top (see vertical arrows). On top is an inner box containing platter, subplatter, motor controller, clamp & accessories: - remove this.

Below are the two main chassis of the turntable. Remove top foam inserts and lift up the subchassis and set it aside. Remove remaining foam inserts and lift up the lower main chassis. Be careful not to damage motor pulleys. Position the base chassis on top of the shelf or stand.

## Basic Setup

**Note:** Some parts are heavy, so be careful when handling!

**Note:** Choose a suitable supporting table which can hold over 45 kg without warping.

**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.

**Note:** The base chassis must be in a horizontal position for at least two hours before the top subchassis is placed on top. This will give enough time for the silicone oil to settle at the bottom of the reservoirs.

**Note:** The top subchassis will reach its correct position only when the weight of the platter is added.

**Note:** Allow ventilation space above motor controller unit.

### Base chassis:

The base lower chassis has suspension towers on the four corners and two motor pulleys in the middle positioned diagonally. This is heavy. Lift it, being careful not to scratch against metal parts of clothing, and position it in the middle of the supporting board. If you are planning to use some extra supporting discs below the turntable's own spikes, now is the easiest time to do it. Clean surfaces with a soft brush or cloth. Now is the moment to level the stand horizontally.



Base chassis

**Top subchassis:**

There are suspension adjustment knobs on four corners of the subchassis and in the middle is the shaft with a fixed ruby ball. Check the **Note** on page 4 regarding settling time for damping oil in the base chassis.

Carefully position the subchassis above the base chassis and gently lower it onto the base chassis, ensuring that the motor pulleys fit into the holes in the subchassis. The gap between both chassis should be between 10 to 15 mm. When gently pushed down with both hands it should move down and when released should come up again.

Remove protection cup over the bearing shaft. Be sure that it is clean. Locate the PVC bottle with bearing oil and cut the top off the nozzle to allow drops to be poured onto the shaft.

Altogether pour 35 drops of oil. This is not critical as any surplus will be caught in the lower reservoir. By squeezing the PVC bottle pour 8-10 drops of oil in the well, which contains the ruby ball. Then, by nearly touching the edge of the well with the dropper, allow the rest of the oil to slowly run along the shaft into the lower well. Have a tissue handy in case of oil spillage.

Clean your hands in case of oil contamination.

Gently position the subplatter over the shaft and slowly lower it down. A small amount of oil & air might escape from the hole on the slope- wipe it. Gently rotate the subplatter a few times, lift it up half ways and lower it again. It should rotate smoothly.



Base chassis and subchassis on top

**Platter:**

Position the platter on the subplatter, holding the platter with both hands at the sides. Due to the small gap between the lower edge of the platter and the top of the subchassis, do not hold the platter underneath. Hold it firmly, so it will not slip.

**Setting up the turntable****Suspension adjustment:**

Adding or subtracting mass from the subchassis will affect its height above the base chassis. Height adjustment is by rotation of the black knobs on the top.

Turning the adjustment knobs anticlockwise causes the subchassis to rise. If you look from the side between the base chassis and subchassis you can see a line marked on each suspension tower 7 mm above the base chassis. Adjust the height of the subchassis by turning all 4 knobs so that the lower edge of the subchassis is level with the markings on all towers.

The best way to do this is to adjust two opposing knobs a little, then another two knobs a little and the first pair again, etc. At this stage do not be too precise as the armboard and tonearm have yet to be added and they will lower the subchassis height.



Position of the lower edge of the subchassis



Belt position

Test suspension: The subchassis should move a few mm in all directions if gently pushed and then return to its original position.

**Belt:**

Lift up the platter and position the belt onto the motor pulley in a diamond shape. Due to the lack of mass, the subchassis will be higher and belt position is a little slanted. If you can push the subplatter down near the spindle you will be able to rotate the subplatter for a few turns with the other hand and the belt will slip into its correct position.

Now add the platter and rotate it by hand.

## PS REF 2:



Front panel

### General description:

The AC motor controller unit generates a dual sine wave output to control rotation and speed of two AC synchronous motors. The signal is generated by a sophisticated computer based program. This allows for smooth generation of the sine wave with very fine choice of speed. Each speed can be selected, finely adjusted independently and then stored in the memory. The PS is factory preset. Connect the motor cable to the motor output.

It may take few hours for a new turntable to settle at the correct speed. When the PS is unplugged, the preset speeds will be stored.

### PS (Motor controller unit-MCU) connection:

Position the MCU in such a way, that it will be convenient for operation of the turntable. You should, however, allow space above for ventilation, of at least 10-20 mm.

The cable which connects the motor controller unit and turntable has a five pin DIN plug, which should be inserted and locked into the connectors at the rear of the MCU and turntable.

Connect the mains cable into the mains and then switch on the MCU at the rear panel, which is left permanently on. A red light and green display will light up on the front panel.

### Operation:

1. Press the power button at the rear of the MCU firmly. After 10 sec the MCU is ready. The display will show 33 and above the start button a red LED will be shown. You can keep the MCU switched on all the time.
2. By pressing the start button the red LED will turn green and the platter should start rotating. To stop platter simply press the start button again. The red LED will show and the platter will 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 the start button before the mains switch is on.

### **Mounting armboard and tonearm:**

Be sure that you have an armboard with the correct pre-cut. Mount armbase on the armboard and then mount armboard on the turntable with four Allen keys. Fix firmly. The armboard can be fixed in both directions, so be sure you mount it correctly orientated. If necessary a second cut can be made on the armboard, but this is made of aluminium.

Mount the arm as instructed in the tonearm instruction manual. Readjust the suspension due to the added weight, as described before, but now be more precise regarding level so that the lower edge of the subchassis is aligned with the markings on the suspension towers. Again retest movement of the suspension. Route tonearm cable underneath the turntable, below the armboard.

## **Use and adjustments**

### **Platter rotation:**

Ensure that the red LED lights up and the green display shows selected speed, when the MCU is switch on. Press the start button. It is normal to hear some crackling sounds made by the belt and this will disappear in a few days. If constant noise is heard, then check the height of the subchassis or the position of the belt on motor pulleys.

### **Fine speed adjustment:**

Observe on a strobe disc if the bars are stationary. If not (bars move in the same direction as platter rotation then the speed is too high) then press the plus or minus buttons few times until the bars are stationary (there are very small steps- so keep pressing). On the display you will see a green dot in the right bottom corner indicating that change is in process. Using a sharp pen, press the “store” button and the green dot will disappear. Check speed independently for both speeds. When using the strobe disc, be sure that you use it properly. Check that you are looking at the correct speed and are using the correct strobe light.

### **Factory preset speed:**

If you find out that your speed selection is out of range for some reason you should reset PS 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.

### **Clamp:**

The function of the clamp is to press the record close to the platter mat, thus minimizing vibration between record and platter and decreasing warps of the record itself.

See section “suspension adjustment on page 6 regarding height of the subchassis, when adding extra weight like clamp.

The clamp can be used without washers. Gently screw down the clamp on top of the record.

It is advisable to put a washer under the LP (thin for thick records and thick for thin records) before 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 too touch the mat. Hold the LP so that it does not rotate. If the clamp is screwed to much, the outer edge will begin to 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 very bent records pay particular attention to the highest point of the rim.

With practice there is no need to stop spinning the platter while changing LPs or using the clamp.

## **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, when the subplatter is lowered onto the shaft, the bearing surface increases the level of oil above the ruby ball. When the subplatter is removed you can see the level of oil inside its sliding ring (brown 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 the belt and running surfaces of the motor pulleys and the subplatter with a soft cloth soaked in alcohol (every 8-12 months). For best performance replace belts every three years.

## Problems

### Platter not rotating:

Motor controller unit- check if the red LED is on

- green displays shows 33 or 45, if not re-plug MCU
- check connection cables from MCU to motor

Consult dealer or qualified electrician.

### Very slow start:

Only one motor receives output from PS: MCU. Remove the platter and belt and check that the motor pulleys are rotating. If only one motor pulley rotates, disconnect the mains and connecting cables and check if there is a failure of the MCU. If both pulleys are rotating, try to slow them down by braking with fingers and observe how much force is needed to slow them down. If this is not much and if you can manage to rotate it in the opposite direction, re-check MCU.

### Wrong speed:

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

First check position of the belt and height subchassis.

Factory preset:

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

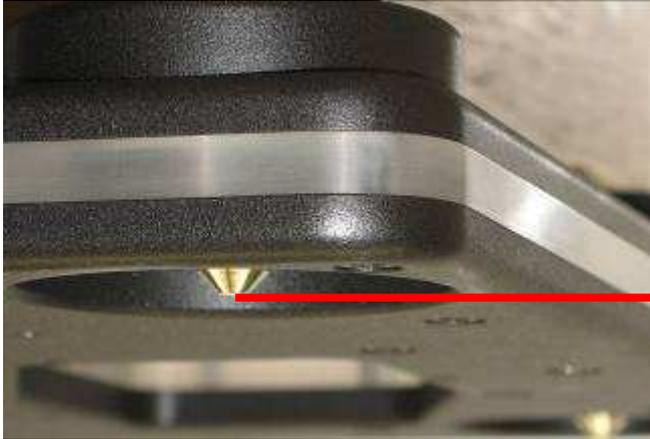
A.Speed:To reach correct speed, adjusted it on the PS. Also check that the distance of motors to the platter are correct.

B.If the speed is totally incorrect: Reset to factory preset.

### Suspension:

If you can not properly adjust the height of the top subchassis or if one corner is not moving, it is possible that one or more of the adjustment knobs is out of adjustment range. The solution is simple.

Remove the platter and belts and lift up the subchassis. Under each corner knob are silver finished spikes, which fit into the top of the suspension reservoirs on the corners of the base chassis. With another person holding the subchassis, or by positioning it on a soft surface, check the height of the silver spikes. Holding a knob in one hand, rotate the spike along the screw until the spike point is approximately level with the lower edge of the subchassis. Adjust all four knobs and return subchassis, belt and platter and readjust the height.



Silver spike

## Transportation

For short distances dismantle the platter, remove belt and disconnect all cables. Block the tonearm's tube and then the turntable with the subplatter can be transported as it is, providing that it will not be tilted more than 15 degrees, which could cause oil leakage.

If the subchassis might possibly be tilted more than this angle you should remove the bearing oil and it is advisable to protect the ruby ball.

Removal of the subchassis automatically seals the oil wells. Should the base chassis be held vertically or upside down for more than a moment, it should be left for 3-4 hours in a horizontal position before use.

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

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