KUZMA XL AIR Turntable **S/N:…….....**

INSTRUCTION MANUAL **Air pressure:.....**

2022-07

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1.0.0.0. GENERAL:

1.1.0.0. PRODUCT REGISTRATION AND WARRANTY:

Kuzma products have a non transferable 2 year limited warranty on parts and labour. This 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. It does not apply to the air supply(compressor, filters or other air parts).

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.

1.2.0.0. TECHNICAL DATA:

Mass (total w/o PS and compressor) :	120 kg
Platter aluminium- top	22 kg
Bronze platter- lower	22 kg
Base:	27 kg
Motor tower:	7,5 kg
Tonearm tower:	14 kg (No. 1)
Air pressure	4 bars
Speeds:	33, 45, 78 rpm
Dimension:	turntable: 450x 400 x 300 mm, compressor: 180x410x430 mm
Compressor mass:	20 kg
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

1.3.0.0. SAFTEY 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. Electrical connection to the compressor from the mains comes via supplied cable. Please keep compressor away from moisture and be careful not to damage the mains cable. Keep it dry in a ventilated place above freezing temperatures. See page 6.

1.4.0.0. PACKING:

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.
Total 4 boxes:

Box 1:

Platter

Box 2:

Tonearm tower, base with airbearing, 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.

Box 4:

50 kg (2 pcs internal boxes A+B)
1 set Double PVC bottles
1 set Silver filters with stands

Box A: Bronze platter, 1 pc brass tonearm tower plate, allen key 6 mm
2 sets of 4 mm black PVC tubes (21m + 4 m), 1 pvc bottle of isopropyl alcohol.

Box B: compressor, oil, compressor manual

2.0.0.0. DESCRIPTION:

XL Air turntable uses an air bearing instead of a conventional bearing, which allows for improvement in two important parameters of turntable design.
An air bearing has almost zero friction and thus no vibration in the bearing itself, so no noise reaches the cartridge.
The second advantage of a properly designed air bearing (not simply floating on an air cushion) is a higher load.

Fig. 1.

2.1.1.0. Base with air bearing

The base holding the air bearing is made from two pieces of solid brass which are clamped together and have good damping properties.
An air bearing requires compressed air to function and this is supplied from the air supply. The air supply consists of a compressor and air filters.
Air bearing surfaces are made from porous carbon thus having millions of small holes to let air pressure out. This creates more uniform pressure inside the bearing's gap of 5 microns with 4bar pressure, thus making the air bearing stiffer with zero movement.

2.1.2.0. Platter with mat

The total mass of the rotating platter is 44 kg, making it more immune to cartridge drag which slows down any platter regardless of mass and drive. The top platter is the same as in XL DC turntable (22 kg) and is a sandwich construction of aluminium and acrylic plates screwed together in a pre-stressed form to damp all unwanted vibration. The lower bronze platter (22kg) is cast and gives good damping properties.
The mat is made from a semi-hard combination of rubber and textile which is glued on the platter.
(Removable)

2.1.3.0. Tonearm tower
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 and zero play while allowing VTA to be changed. Adjustments can be made over a range of 60mm, 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.

2.1.4.0. Motor tower with belt
The three phase DC motor is mounted via various decoupling elastomers in its own heavy brass tower, minimising motor noise while maintaining maximum motor torque.
Torque is transfered from a pulley to the subplatter via the precision machined, plastic stiff blue belt.

2.1.5.0. Power supply and control pad
The PS 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.
The control pad is connected to PS via a cable and can be positioned within the turntable. It controls start/stop and speed selection.

2.1.6.0. Clamp
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 a mat cover.

2.2.0.0. AIR PRESSURE SUPPLY:

2.2.1.0. Air pressure line
NOTE: The air supply line is under high pressure 4-8 bar so do not disassemble any parts under pressure. Turn off the compressor and release pressure from the air supply line.

Pressurised air flow comes from the compressor via the black PVC tube to the silver filters. From the silver filters the air flow goes via a black PVC tube to the base with the air bearing (turntable). The air bearing requires clean air to function properly. Air contains dust particles, water and oil moisture and these are removed by using filters along the air supply line.

2.2.2.0. Compressor
This creates pressurised air flow (up to 8 bars). Position the compressor in a suitable place with its own mains outlet. It generates heat and requires natural ventilation to cool down.
The compressor has 3 filters built in. The first filter is an air inlet to filter dust, the second filter is below the pressure regulator and the third filter collects condensation from the compressor's reservoir. The compressor's automatic system removes all this debris via three tubes into double PVC bottles. Fig. 3.

2.2.3.0. Silver filters
These filters remove the final fine dust and moisture from the air flow just prior to the air bearing. Position them vertically on the floor near the turntable. Fig. 2.

3.0.0.0. TURNTABLE INTIAL SET UP:

3.1.0.0. TURNTABLE BASE:

NOTE: Some parts are very heavy, so be careful when handling!
NOTE: Choose a suitable supporting table which can hold over 120 kg 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.

Locate the main brass base with the airbearing. 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 with the air indicator should face forward. Fig. 2.

Fig. 2. Base with air bearing-for now ignore silver filters

NOTE: Before you proceed further with motor tower or platters you need to set up the air supply!

4.0.0.0. AIR SUPPLY SET UP:

4.1.0.0. COMPRESSOR:

NOTE: Do not switch on compressor without first inserting oil!
NOTE: Do not tilt compressor with oil inside!
NOTE: **E**nsure that all air supply tubes are connected.
NOTE: The compressor has a safety valve and overheating protection!
NOTE: Do not position it in a small non ventilated space!
NOTE: The compressor is factory set up to a max pressure of 8 bar (120 psi) higher than quoted in the Compressor Instruction Manual. (See label at the side of the cover!)

Everything is set and checked by Kuzma Ltd. The only item to be added is **compressor's oil.** If the compressor is in an upright position, it can be moved safely.

Open the box and lift up the compressor by the handle. It is a heavy item. Remove the plastic bag. Inside the box is the instruction manual for the compressor(no need to check it), a bottle with oil, and a plastic PVC drain bottles. In small bag inside the compressor housing are the air intake filter (or factory fitted on the rear of the compressor see Fig. 4.b-depends on compressor version) and PVC nozzle with tube for pouring oil into the compressor. Remove the two pieces of cardboard wedged between compressor head and housing. Fig. 3.
The compressor should not be transported with oil inside unless you can guarantee that it will be in a vertical position at all times.
Position the compressor on a hard surface with plenty of air for ventilation! Do not position it in a closed space, in direct sun or in temperatures below freezing. The compressor must be connected to the mains voltage.

4.1.1.0. Oil

Remove the small plastic cap from the metal input tube. Fig. 4.a. Fix the nozzle with clear tube onto the oil bottle.
Remove the plastic cup from metal tube. Fig. 5. Put the clear tube from oil bottle into the metal tube at the side. Gently squeeze all the oil into the compressor. Wipe any spillage of oil. Cover the tube with plastic cap.

Fig. 3. Compressor with "Double PVC drain bottles"

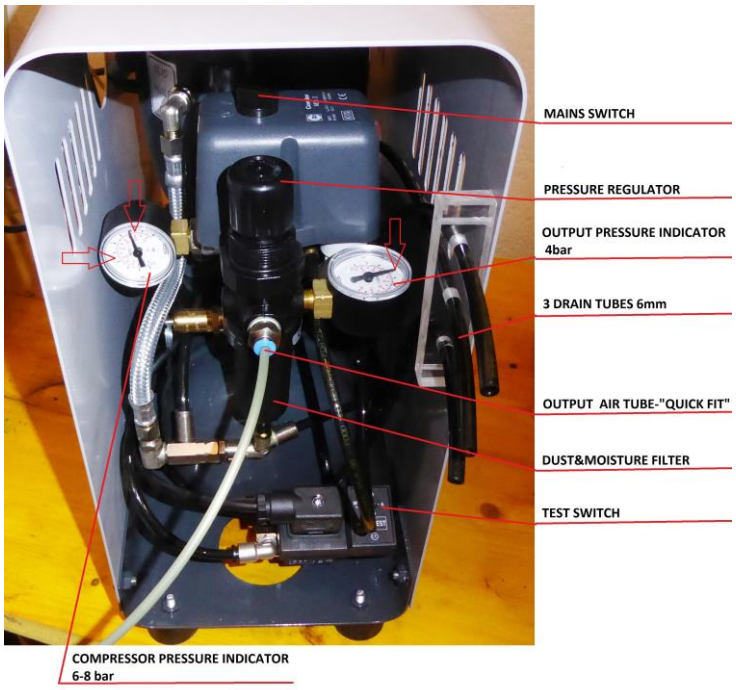

Fig. 4. Compressor parts- front

Fig. 4.a. Compressor-rear-manually fitted

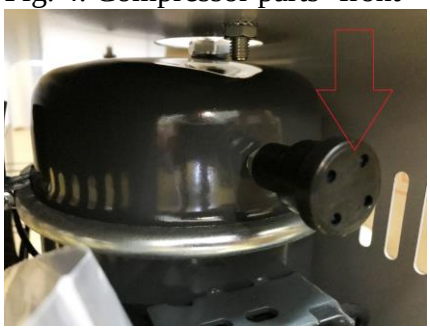

Fig. 4.b. Air intake filter factory fitted

Fig.5. Oil filling from side of the compressor

Fig.6. Double PVC bottles

At the rear of the compressor (or at the side) is a glass bubble which will show the correct level of oil, this is half the bubble (Correct level is shown only if compressor has not been working for at least an hour).

Fix the air intake filter onto the metal tube at the rear of compressor. Fig. 4.a or see Fig.4.b. your compressor version can be already factory fitted air intake filter.
Locate the double PVC bottles which has three black 'quick fit' fittings at the. There are three black tubes (6 mm in diameter), which drain moisture from various parts of the compressor (pressure regulator filter, cylinder, reservoir,). Pull them out of the compressor and insert into the top of the Quick fitting on the bottle. Fig. 6. Position them near the compressor.

When you first turn the compressor ON it will take a little longer time to fill the compressor's reservoir from zero to 8 bars (4-5 minutes). But the compressor must be connected to the air supply tube with the valve closed otherwise air will freely flow out and compressor can not build up pressure.

NOTE: Oil should last for at least 5 years of normal use and should be replaced when it is very dark - almost black in colour. Check oil level when the compressor is in the cool-rest position for 2 hours.
NOTE: Check water condensation occasionally, 1-3 months approx in double PVC bottles.
NOTE: For extra details consult original instructions supplied with the compressor.

4.2.0.0. SILVER FILTERS:

NOTE: Keep the silver filters in an upright position. They might leak otherwise.
NOTE: Keep valve closed between compressor and silver filters until pressure is raised in the compressor.
NOTE: Keep valve closed between silver filters and turntable.
NOTE: Open the same valve to put pressure into the silver filters. This will seal the drain system.

The silver filters which are positioned near the turntable in their own stands have an automatic drainage system (it will collect very little moisture).

Fig. 7. Silver filters- see arrow for airflow

4.2.1.0. Sealing silver filters

The silver filters must be connected with PVC tubes between the compressor and turntable.
The filters are sealed only when air pressure is inside them.

4.3.0.0. AIR TUBE CONNECTIONS:

4.3.1.0. Compressor to silver filters

The silver filters should be positioned near the turntable in their own stands.
Choose the longer piece of black tube (21m) with the valve nearer to the compressor and connect the compressor output to the silver filters input. Fig. 4&7.

4.3.2.0. Silver filters to air bearing base

Choose the shorter piece of tube (4m- with valve) and connect the silver filters output to the turntable's input. Fig. 8.

Fig. 8. Tube from filters to airbearing

Fig. 9. Valve in closed position

4.4.0.0. AIR PRESSURE SET UP:
NOTE: All tubes must be connected. Keep both valves on air tubes in the closed position. Fig. 9.

4.4.1.0. Compressor
Plug the compressor into the mains. The main switch is under the cover on the top. It has two positions. When the main switch is turned ON, pressure will start to build up (working time) and this will be shown on the pressure gauge on the left side of the compressor. This will show the air pressure in the reservoir. It should rise and reach 8-8.5 bars (110-120 psi) in about 4-5 minutes then the compressor will stop (cooling time). The right hand pressure gauge shows output pressure. It should rise and then show constant pressure at around 4 bars (60-65 psi). Leave it permanently turned ON. When the air supply is closed at the turntable's end valve, the compressor will go on stand by.
The knob on top of the pressure regulator is for readjusting the output pressure. To readjust, it must first be pulled up. Fig. 4. Output pressure is set up in factory to 4 bar.

4.4.1.1. Compressor working cycle when air flow is open:
The working time (heating time) of the compressor is around 90-120 seconds while building up pressure from 6 to 8 bars. When pressure reaches 8 bars, the compressor switches off (cooling time). When the air flow is in use, pressure will slowly drop. When the pressure in the compressor drops to 6 bars it will switch on again and pressure will build up to 8 bars. The cooling time should be at least the same time as the heating time. This allows the compressor's head to cool down. It is good to monitor the working cycle occasionally!

4.4.1.2. If the working time is longer then 3-4 minutes and cooling time shorter than 1 minute, then stop using the compressor and check maintenance, "troubleshooting" pages or FAQ (web)!
First check for leaks. A longer working time will cause the compressor to overheat and can damage it.

NOTE: When you close the air flow on the valve at the turntable end then the compressor will go on stand- by. It might switch on every few hours to build up lost pressure. Also you will hear a 2-3 second long burst of air leak caused by the timer on "test swich" releasing moisture from the compressor every few hours.
NOTE: If you switch off the compressor completely, the air pressure will drop in 12-24 hours. Then start set up air supply as for first time.

4.4.2.0. Silver filters
When full air pressure is reached in the compressor for the first time (the compressor stops working in about 4-5 minutes) open the valve on the tube before the silver filters and the air pressure will flow into the silver filters which will seal the automatic drain systems in these filters. Fig.7.
Check if it is sealed properly by listening- there should be no hissing noises.

4.4.3.0. Air bearing
IMPORTANT:
Do not assemble or operate air bearing without air pressure flow!
NOTE: Do not insert subplatter into airbearing without air pressure in the air bearing

Open the valve behind turntable (Fig.10& 13.). The front pressure indicator on the base will show a similar level of air pressure (3,5 - 4 bar) as on the right hand pressure indicator on the compressor. Fig .11. If not, check for leaks (hiss noise) at silver filters or at compressor. Check if the valve at the longer PVC tube is in the open position.

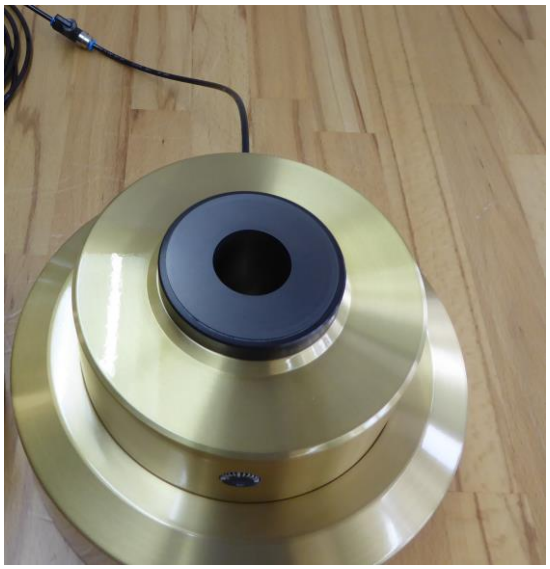
Fig. 10. Base with airbearing


Fig.11. Air pressure indicator

5.0.0.0. PLATTERS SET UP:

5.1.0.0. AIR BEARING SET UP:

5.1.1.0. Inserting the subplatter into the air bearing

IMPORTANT:
Do not assemble or operate air bearing without air pressure flow!

NOTE: Before inserting the subplatter with shaft into the air bearing be sure that it is clean and that the indicator shows pressure at 3,5- 4 bar. If lower, readjust pressure regulator on compressor!

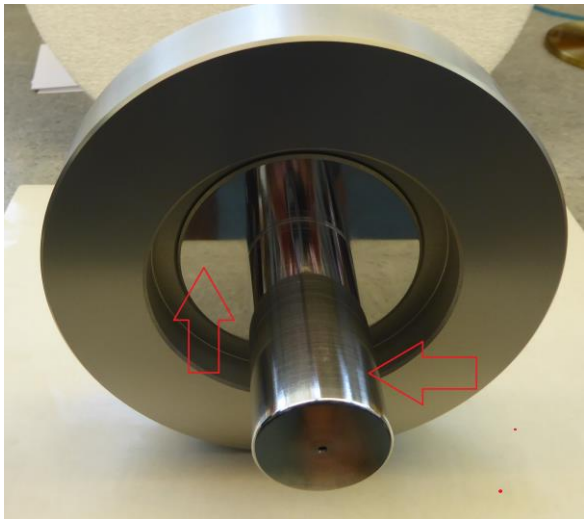

Fig. 12. Subplatter-arrows indicating bearing surfaces

Fig. 12.a. Airbearing base with subplatter

Fig. 13. Air flow- open

Remove the black cap from the top of the air bearing. Fig.2. Carefully lower subplatter into air bearing. Gently rotate subplatter - try it back and forth a few times. It should move freely and smoothly. If not, then lift up the subplatter, check for particles and clean shaft and air bearing with isoproply alcohol while the air flow is on. Just squirt some from the bottle supplied and wait to dry.

5.2.0.0. MOTOR AND BELT:

5.2.1.0. Motor tower

Fig.14. DC motor tower

Fig. 15. Motor tower and belt fitted

The three phase frequency controlled DC motor is encapsulated inside the heavy brass tower. Fig. 14. Position the motor tower to the left of the subplatter (it does not matter where around the platter circumference). The gap betwen motor tower and round base should be 23 mm. Fig.22. (the actual distance from the centre of the platter to the centre of the motor tower is 191 mm).

Remove the top cover by unscrewing the two screws on the top of the motor tower using 2.5 mm Allen key and carefully lift it up and put aside.

5.2.2.0. Belt

Fit the belt around the motor pulley and then, stretching the belt, fit it over the subplatter. Rotate subplatter by hand to position belt at the correct height. Fig. 15. Rotate the motor tower to ensure that the belt is not touching the grooves in the motor tower. Fig. 16.

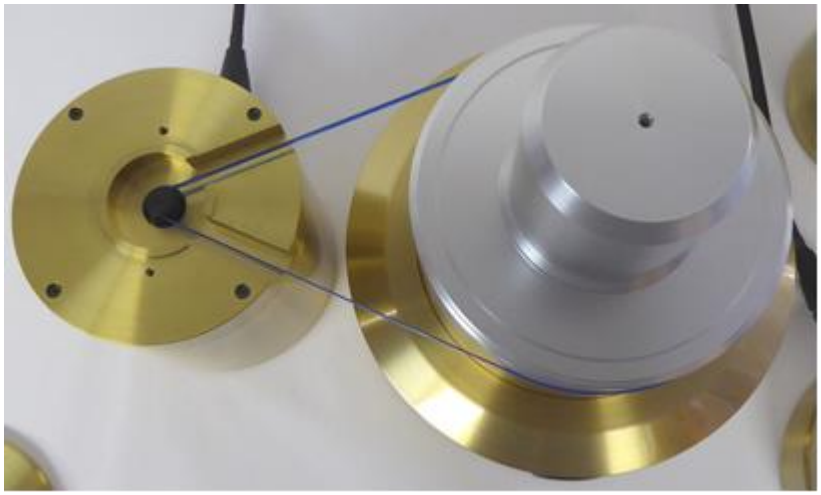

Fig. 16. Belt position in grooves

5.3.0.0. MOTOR POWER SUPPLY:
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. 17. PS DC front panel

Fig. 18. PS DC rear panel

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. 17-18.

5.3.1.0. Connecting PS
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 easily accessible.
At the rear of the PS are two female XLR outputs:
7pin XLR from PS to motor tower
5pin XLR for PS to control pad (you can add this later)
Connect the mains cable and then switch on POWER on the front panel, which is then left permanently on.
5.3.2.0. Operation:
IMPORTANT:
Do not assemble or operate air bearing without air pressure flow!
NOTE: Do not close air flow till subplatter is at full rest.

5.3.2.1. 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.
5.3.2.2. On pressing the START button the red LED will turn green and the subplatter should start rotating. To stop the sub platter, simply press the START button again. The red LED will show and the subplatter will slowly stop rotating.
5.3.2.3. Press the SPEED button and the selected speed will change from 33 to 45. Press again and it will return to 33.
5.3.2.4. Do not press and hold the start button before the mains switch is on (see Reset function).

5.3.3.0. 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.19. This you connect after you set up the turntable.


Fig. 19. Control pad

5.4.0.0. TESTING:

5.4.1.0. Subplatter and air bearing testing:
IMPORTANT:
Do not assemble or operate air bearing without air pressure flow!
NOTE: Do not close air flow till subplatter is at full rest.

5.4.1.1. 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.

5.4.1.2. On pressing the START button the red LED will turn green and the subplatter should start rotating. To stop the sub platter, simply press the START button again. The red LED will show and the subplatter will slowly stop rotating. Check that the belt is correctly positioned.

5.4.1.3. Test subplatter rotation by turning power supply on and leave it running for 5-10 minutes. Fig. 15. Remove belt and check if the subplatter rotates smoothly again without the belt. If it does not run smoothly then lift up the subplatter check for particles and clean shaft and air bearing with isoproply alcohol while the air flow is on. Again test subplatter rotation with the belt fitted by turning power supply on and leave it running for 5 minutes. Again remove belt and check if subplatter rotates smoothly without belt. If a problem persists contact dealer or us.

5.4.2.0. Platters testing – prior to fitting platters on subplatter
NOTE: Both platters are very heavy. Handle with care.It is a job for **4 hands and 4 eyes.**
NOTE: First test how the top platter fits on the bronze platter without subplatter. Fig 18&19.

This will get you acustomed to fitting platters before you place them on the subplatter for the first time. The platters are very heavy and a bit of a practise will avoid putting unnecessary forces on the air bearing.


Fig. 18. Bronze platter


Fig. 19. Top platter fitted on top of the bronze platter

Place the bronze platter on a clean table (load will be 50 kg) with foam from box.Fig 18. This is best done by 4 hands and 4 eyes. Position the top platter above the bronze platter, center it above the lip while keeping it parallel. Then gently lower the top platter . There is a tight fit. If you have a problem fitting it be sure that it is parallel and check if there are any particles obstructing fitting. If sucessful, lift it up and remove platter. If you have any problems contact us or dealer.

5.5.0.0. PLATTERS FITTING ON SUBPLATTER:
NOTE: Have you tested the platter's fit as 5.4.2.0.

IMPORTANT:
Do not assemble or operate air bearing without air pressure flow!

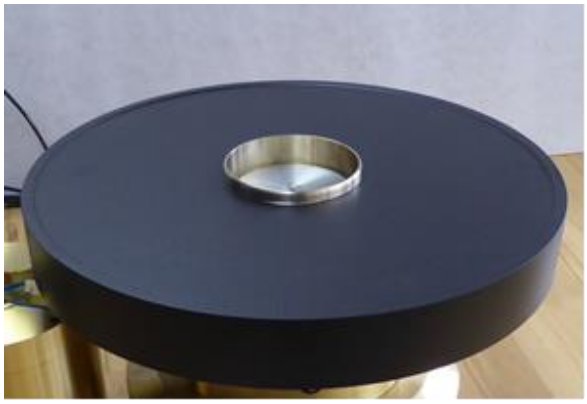
Fig. 20. Bronze platter on the subplatter


Fig. 21. Fully assembled platters

5.5.1.0. Bronze platter on subplatter
Hold the bronze platter above the subplatter. This is best done by 4 hands and 4 eyes. Center the bronze platter above the subplatter while keeping it parallel, then gently lower it on the subplatter. Fig. 20. Check below for fit on subplatter. If a problem occurs stop and if you can, lift it up and check platter fitting- see page 14 (3.9.)
If you suddently hear or feel noise or vibration do not be alarmed. This is resonance's noise in the air bearing prior to full loading. Ignore it.

5.5.2.0. Top platter on bronze platter
Hold the top platter above the bronze platter. Center it above the lip on the bronze platter while keeping it parallel. Then gently lower it, center it on the lip of the bronze platter. Fig. 20. If a problem occurs stop and try again. Ignore the resonance noise- it should stop now with the increased platter mass.
If not check that the pressure is not too high or too low- see front page.

NOTE: Only close the valve at the turntable, only if the platter is not rotating at all! The compressor will go on standby. Every few hours or so air release noises can be heard and the compressor will switch on a few times per day when the compressor is resting in the standby position.

5.6.0.0. MOTOR TOWER TO TOP PLATTER DISTANCE:
Check the position and distance of the motor tower . The gap betwen the motor tower and the base should be 23 mm.

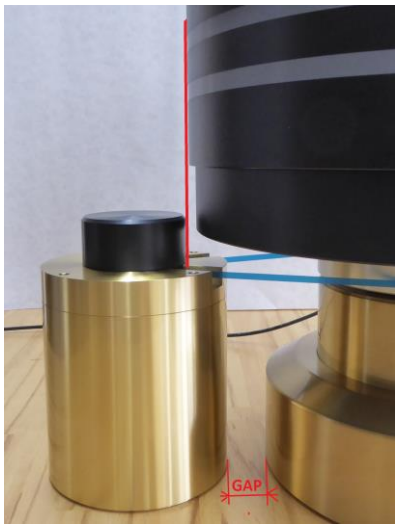

Fig. 22. PVC Motor positioner

Fit the black PVC motor positioner on the top of the motor tower - see Fig. 22. Slowly move the motor tower until the motor positioner is in the line of the outer edge of the top platter and then take off the positioner. Rotate the motor tower to ensure that the belt is not touching the grooves in the motor tower. Fig. 16.

5.7.0.0. PLATTER ROTATION:
IMPORTANT:
Do not assemble or operate air bearing without air pressure flow!
NOTE: Always open the air valve and then start platter rotation!
NOTE: Check if the air indicator shows 3,5 - 4 bar.
NOTE: Always wait till platter comes to a complete stop before closing the air valve!

On PS chose 33 SPEED button and start platter's rotation by pressing START button. Red LED will turn green and the platter should reach 33rpm in about 15 - 20 seconds. Run the platter for 5 min before stopping it. Do not stop platter rotation with the hands. Repeat the process 2 - 3 times.
If it takes longer, e.g. over 30 - 40 seconds- see 'Trouble shooting'- slow start.
If everything works OK you can replace the motor cover onto the motor tower and secure it with two screws.

6.0.0.0. TURNTABLE'S BASIC SET UP:

6.1.0.0. TONEARM TOWER:

6.1.1.0. Position

Position the tonearm tower in a normal tonearm position. Locate the tonearm support and place it under the tonearm tower. 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 guage are facing towards the front. For Kuzma tonearms with 212mm mounting distance (9 inch) the gap between the top of the platter and tower is 5mm.

6.1.2.0. Tower height and VTA

By rotating the VTA knob counterclockwise, raise the height of the tonearm tower to just 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. 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. Fig. 24. 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. 23. Tonearm tower raised with support pad

6.1.3.0. 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.23.

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.

6.1.4.0. Setting 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.

7.0.0.0. TONEARM SET UP:

7.1.0.0. 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. 24.

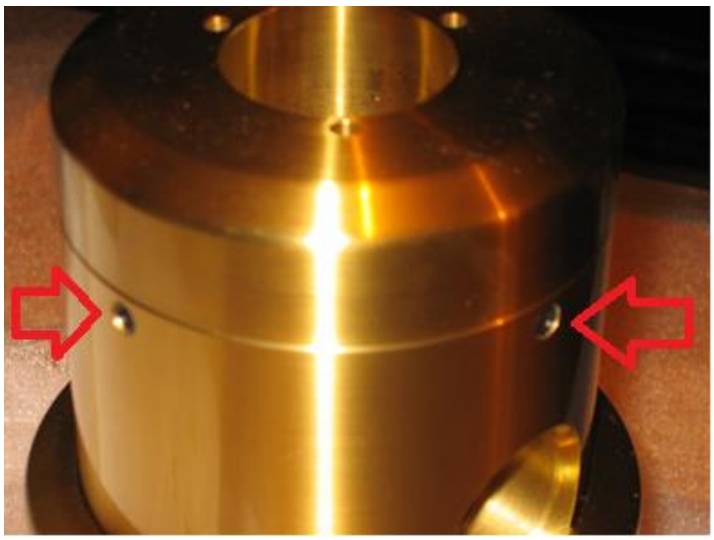
Fig. 24. Fixing screws on top of the tonearm tower.

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.

7.1.1.0. Tonearm height
Refer to **6.1.0.0. Tonearm tower**

7.1.2.0. Cartridge and tonearm adjustment
Follow tonearm's instruction and set up tangential geometry, VTF, VTA, bias, azimuth, etc. More info is on our web site.

8.0.0.0. USE AND ADJUSTMENT:

IMPORTANT:
Do not assemble or operate air bearing without air pressure flow!

8.1.0.0. OPERATION AND SPEED SELECTION:
NOTE: Always open the air valve and then start platter rotation!
NOTE: Check that the air indicator shows 3,5 - 4 bar.
NOTE: Always wait unitil platter comes to a complete stop before closing the air valve!

8.1.1.0. Press the power button on 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.
8.1.2.0. 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.
8.1.3.0. Press the speed button and the selected speed will change from 33 to 45. Press again and it will return to 33.
8.1.4.0. Do not press and hold the start button before the mains switch is on(see Reset function).
8.1.5.0. 78rpm- see 8.3.1.0.

8.2.0.0. 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 on front PS panel 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.

8.3.0.0. POWER SUPPLY TEMPORARY OPTIONS:

8.3.1.0. 78 rpm
While platter is not rotating press and hold + button for 7- 10 seconds, finally press speed button to show 78. Then press start for platter rotation. Pressing the speed button will show all three speeds.

8.3.2.0. Display off
While platter is not rotating, 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.

8.3.3.0. Power supply reset
See 10.4.1.0.

8.4.0.0. 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.

9.0.0.0. MAINTENANCE:

9.1.0.0. AIR SUPPLY:

NOTE: If you go away for a long period of time, switch off the mains switch at compressor.
NOTE: Check our web site at FAQ, regarding air supply issues at Air Line tonearm.

9.1.1.0. Compressor

When air is consumed, the compressor works automatically i.e. ON-OFF, approximately every 2 minutes and then rests for about 2 minutes (working- cooling cycle). When it stops you will hear the noise of air being released from the reservoir a 1-2 seconds burst into PVC bottles (see TEST switch).
The automatic drainage system works every few hours (you can also test this by pressing TEST switch: Fig.4. when a 1 - 2 seconds long burst of air will rush into PVC bottles). This is normal.

9.1.2.0. Double PVC drain bottles

The amount of water & brown oil released depends on the working hours of the compressor and the humidity of the air. Water will be collected in the double PVC bottles. Air pressure will push liquid from the first into the second bottle. When the second bottle is half full, unscrew it and empty it.
With normal use check this every few months. If the air supply is used every day and humidity is high, (over 70%) then monthly checking is recommended. In the compressor manual, working conditions are described for compressors used all day, every day, and all the time in industry, where conditions are much more demanding.

9.1.3.0. Silver filters

From the silver filters, small amounts of water might drain into the supporting stands. Lift up the filters and empty the liquid.

9.1.4.0. Air bearing and subplatter shaft

Clean all surfaces in airbearing with a soft clean cloth and a few drops of isoproply alochol while air is flowing. It will bubble and evaporate. Wait till it dries before starting assembly. Perform every 3-4 years.

9.2.0.0. MAT:

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

9.3.0.0. 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.

9.4.0.0. OUTER SURFACES:

Use a soft cloth soaked in diluted kitchen detergent or isoproply alochol

9.5.0.0. VTA GAUGE:

The sign 'B' in the top left corner of the clock indicates that the battery should be replaced.
Push clock out of the brass frame and reach the battery cover from the outer side. (battery SR 44)
Remove the battery cap and remove old battery replacing with a new battery. Secure the battery cover. 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.

10.0.0.0. TROUBLESHOOTING:

IMPORTANT:
Do not assemble or operate air bearing without air pressure flow!

10.1.0.0. PLATTER NOT ROTATING:
NOTE: check compressor and motor power supply.

10.1.1.0. Check pressure level at the base indicator or air flow. If no air pressure- check air supply.10.2.0.0. If yes, then try to rotate platter with hand. If platter rotates, check PS.

10.1.2.0. Motor power supply- 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.

10.2.0.0. VERY LOW OR NO AIR PRESSURE:
Compressor cannot generate enough pressure, or runs for longer than normal:

10.2.1.0. Check that the silver filters drainage system is sealed, as described at build up of the pressure.

10.2.2.0. Check tubes and connections, silver filters, and the compressor. Listen for air leaks- hissing.

10.2.3.0. Check the compresor working cycle when the platter is rotating. The compressor should take two minutes to build up pressure from 6 to 8- 8.5 bar. It should then cool down for 2 minutes. If the working cycle is longer or the cooling shorter, there is a leak in the system or a damaged compressor.

10.2.4.0. Checking working cycle when air is closed at turntable. See if the pressure builds in compressor into normal cycle from 6 to 8 bars in less then 2 minutes. Then open the valve on the turntable and the working cycle should be around 2 minutes. If it is longer than 3 minutes, then there is a leak in the system. The working pressure should be 3,5-4,0 bar. If it is higher readjust.

10.2.5.0. Checking compressor:

10.2.5.1. Close the pressure regulator valve to zero output (lift up black knob and rotate ACW showing 0 bar) and see if the pressure builds up to 8 bars in the left side of the pressure indicator and the compressor switches off after aprox. 2 minutes. If not, then the problem is in the compressor. If the pressure build up is normal, then readjust working pressure back .

10.2.5.2. When the turntable is not operating (valve on the arm closed and arm meter shows no pressure) the compressor will be on standby and it will switch on occasionally (2-4 times per day). This also means that there is no leak in the system. If it is switching on every hour or so, there is a leak in the system and the working cycle might be too long.

10.2.5.3. Compressor does not start:
Check the mains electricity. Compressor was overheated and overheating protection switches it off. Overheating protection needs replacing by service.

10.3.0.0. PLATTER SLOW START
NOTE: Check motor and belt position and air pressure.
If it takes a long time and air pressure is normal let platter rotate for 10-15 minutes and check again. If the problem persists you would need to take off the platter, bronze platter, belt and lift up the subplatter and clean all surfaces with a clean cloth and isoproply alochol while the air is flowing. When everything is dry assemble it back.

10.4.0.0. WRONG SPEED:
Perform fine speed adjustment and check position of the belt. Be aware that fine speed changes steps are very small. See 8.2.0.0.
If you find out that your speed selection is way out of range for some reason, you should perform factory preset on PS. See below. 10.4.1.0.

10.4.1.0. Power supply reset
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 shows 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 or us.

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

10.1.0.0. TURNTABLE PARTS:

NOTE: Remove both platters and subplatter with air pressure ON!
Return all parts into original boxes. Prior to turning off air supply remove both platters and subplatter.
Dismantle platters, remove belt from motor and disconnect all cables. From base remove subplatter and protect the top of the air bearing with cup. Remove the tonearm from the tonearm tower.

10.2.0.0. AIR SUPPLY:
10.2.1.0. Compressor
Turn off the compressor and release air pressure. Remove black tube (quick fit) and Double PVC bottles.
If you can ensure the compressor will be in an upright position at all times it is not necessary to remove the oil. If, however, there is a possibility that it may be tilted or turned upside down then the **oil must be removed**!

10.2.2.0. Oil removal from compressor
First ensure that there is no pressure in the compressor and that it is disconnected from the mains. Wait at least 2 hours for compressor to cool down. Remove the metal cover and then loosen the screw holding the rubber seal on top of the compressor head and lift off the cover. Pour away oil and return the head cover and fix the screw. Ensure that the sealing ring is correctly positioned.
More info is in the compressor instruction manual. Use original packing and fit parts in appropriate slots.

10.2.3.0. Silver filters
Air pressure must be OFF and then disconnect air tubes.

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