

CENTRIFUGAL CONCENTRATOR WITH SELF-DISCHARGE CONCENTRATE  
Flexicone CCFB170

MANUAL



**Attention:** Cone must be bolted before switch on power . Concentrator supplied with cone in unbolted condition. To avoid Poliurethane cone to take nonround form , do not keep cone in squeezed condition for period more then 1 week. Unsrew central FlexiCone bolt.

This manual, combined with the technical description and operating instructions, is a document guaranteed by the manufacturer main parameters and specifications.

Manual is designed to study the concentrator and the principle of its work and sets the operating rules, compliance with which maintains a hub in constant readiness to work.

Taking into account customer feedback the developer is constantly improving product design, so some structural changes in individual units and parts may not be reflected in this data.

Concentrator can be fitted with top screen vibrating classifier



## PURPOSE

Centrifugal concentrator with floating bed CCFB170 (hereinafter -concentrator ) is designed for high-quality gravity concentration of fine material (sand and alluvial deposits of crushed ore) containing free gold, silver and platinum, in the industrial extraction of small and fine fractions of precious metals and other heavy valuable minerals.

The concentrator can be used:

- 1) In technological research large area samples of mineral raw materials containing precious metals.
- 2) the processing of ore and placer deposits and tailings developments, containing small and micron gold
- 3) in the industrial processing of technogenic raw materials containing precious metals (sand and gravel, aggregates dumps and CHP, metallurgical slag, electronic scrap).

concentrator operates indoors or under cover at a positive air temperature. Operating conditions correspond to the performance of IP44

## 2. SPECIFICATIONS

- 2.1. A fineness of the processed material, mm – less than 3.
- 2.2. Performance on hard, kg / h: - 1000 \*).
- 2.3. Gold recovery of size,%
  - +50 microns 96-99
  - + 10-50 microns 92-96
  - + 3-10 microns, 50-92
- 2.4. Sand to liquid (ratio S: L) from 1: 4 to 1:12.  
(When enrichment placer sands and fine ores S:L – 1:4 ... 1:10, and when finishing roughing concentrates S:L - 1: 8.....1: 12).
- 2.5. The volume of the resulting concentrate to 100 ml
- 2.6. RPM of Bowl 1400r/min
- 2.7. The frequency of the bowl vibrations /per min 0- 70 Hz
- 2.8. Power supply 220-240VAC, frequency (50 + -1) Hz, (12VDC-optional)
- 2.9. Power of motor 280W ( on shaft)
- 2.10. Overall dimensions, mm:
  - length of not more than 500.
  - width not more than 450.
  - height is not more than 540.
- 2.11 Weight, kg 12

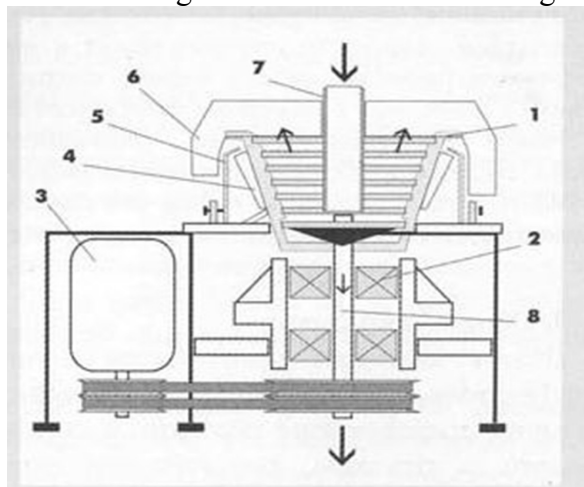
\*) The maximum output corresponds to the ideal operating conditions (achieved in tests artificial mixtures of quartz sand and granulated ferrosilicon, simulating the density of precious metals), allowing to provide high recovery of small and thin heavy particles. The equipment can not achieve the best results at maximum performance depending on the material composition of the material forms particles of heavy minerals and power characteristics (pulp density).

## 3. PACKAGE

1. Concentrator centrifugal CCFB170
2. Feed funnel
3. Washing flexible hose
4. Packing

## 4. STRUCTURE AND OPERATION

Fig.1. Schematic diagram of the centrifugal concentrator with floating bed



1. Elastic trapping cone. 2. The bearing assembly. 3. The electric motor with a belt drive. 4. The crimping rollers. 5. Bracket crimping rollers. 6. snail for discharging tailings slurry. 7. The power supply spigot 8. The hollow shaft for discharging the concentrate.

A distinctive feature of centrifugal machine is the FlexiBowl (truncated cone), which is pressed from several directions by rollers mounted on fixed supports. As a result of compression the cone in cross section takes the form of a rounded triangle, square, etc. (depending on the number of crimping rollers). Upon rotation of the cone, material in grooves periodically move to the axis of rotation and are removed from it, and stay in loosened condition in a centrifugal field of up to hundreds "g". The radius of curvature of the inner surface of the cone with a frequency of tens of hertz varies in a range from minimum to maximum. The frequency may be infinitely large. Consequently, the centrifugal field is variable in the angular coordinate. Maximum centrifugal force exceeds the force in the unstrained cone about 1.5 times. The mineral bed formed in the deep grooves between the riffles, while the flexural deformation of the wall of the cone is experiencing frequent compression and tension in the direction of circular motion. When compressed, mineral bed squeezed out of the grooves and when tensile lowered, minerals fill grooves again and thus performs motion like jig action.

Thus, in the described apparatus mineral bed undergoes complex movements similar to the movements in both jig and a vibration table. All this takes place in an alternating intensity of the centrifugal field. The centrifugal acceleration varies with the frequency of the process equal to the product of speed by the number of rolls. Swipe centrifugal acceleration value from a hundreds "g" to a value close to zero or even to a small negative (under strong crimping rollers cone).

Consequently, the mineral bed resides loosened (fluidized) state in which the grains of different densities, irrespective of their shape and size quickly differentiated groove depth. Grains with a high density sink to the bottom, and the light density minerals move to groove surface where up flow and remove from the cone.

In contrast to the previous models concentrators with floating bed, Flex Bowl cone is made by special technology and composite materials, thus reducing engine power and increase the service life several times

4.3. The principle of operation of electrical circuit.

The circuit is powered by a single-phase 220-240volts

Concentrator have switch ON/OFF.

## 5. SECURITY MEASURES

5.1 Service the concentrator allowed by person familiar with device and past safety training.

5.2. Do not put hands or objects in the area of rotation of the cone when cone rotates, switch ON rotation if the inner cone was not inserted or properly fitted

## 6. MAINTENANCE

6.1. During maintenance the safety requirements are according to section 5 "Safety Precautions" section of this passport.

6.2. At least one time per week, test the state of the cone at fixing points of internal PU cone.

6.3. Every 500 hours of operation concentrator, check the outside cone on wearing of (it is noticeable ring trace from rollers). If any signs of significant wear, replace the outside bowl.

## 7. PREPARATION OF THE PRODUCT AND ORDER OF OPERATIONS

Switch ON motor.

Start to supply water at maximum volume as possible but avoid coming water from drainage pipe at bottom. Low tilting concentrator to discharge site are recommended.

Start to feed material with water through the hopper or feed tube to the bottom of the bowl. Try to avoid significant vibration of concentrator. The rotating blades of the impeller is pushing and throw pulp to the sides of the bowl. Under the influence of centrifugal acceleration, grained fraction of the pulp falls into the grooves of bowl, where as a result of fluctuations the loosening material and the segregation of heavy minerals and gold particles formed inside the mineral bed with their concentration mainly in the depth of the grooves.

Light mineral particles with the slurry, entrained up flow sludge, rolling through the riffles, are removed from the bowl to the discharging housing and then on the tail pipe outside. In addition to

the main pipe, small discharge pipe is located at the bottom of the tube to drain the pulp, accidentally fell into the bottom section.

At the end of cycle (enrichment), stop the motor drive and take out the bowl in the bucket to extract concentrate.

In order to ensure effective concentration, selection of the optimal values of bowl squeeze by rollers must be set according feeding rate and material. For adjustment, unscrew central bolt at bottom of cone. Put or remove extra washers under cone. To avoid excessive wearing of the cone and rollers, avoid squeeze of cone more than 4mm (distance measured between squeezed and non squeezed cone on each roller point). To achieve maximum recovery, especially when working with heavy concentrate or clay put volume of water feed as much as possible (1m<sup>3</sup>/hour)

**ATTENTION! Control the the drainage bottom pipe during work. If water/pulp comes from pipe, reduce feed rate on hard material and increase ratio water to hard material.**

## 8. TROUBLESHOOTING AND REMEDIES

1. The motor drive do not turn on or bowl rotation drive motor vibrates or rotating slowly. Rotate bowl by hand. If rotates free, check electrical contacts or cable break. Fix cable and electrical contacts.

If rotates hard – must be sand in crimping rollers. Wash rollers properly with plenty water.

If one of the rollers do not rotate at all, it must be rusted after long storage, make it rotate and replace bearings as soon as convenient for you. **ATTENTION! When finish work and wash concentrator, switch on and let cone to rotate for 1 minute to make it dry and remove all water before storage.**

2. The knock or intermittent noise in the bowl rotation unit. Wearing of main motor bearings and/or cone radial bearings. Wearing of rollers or cone outside

Damaged or overtightened radial bearings. Loose nut of the bearings.

Disassemble and replace worn bearings with new, replace wear of rollers, replace outside cone.