

Technical leaflet

KOC-VE – Coiling machine



Introduction

GRANLUND manufactures a series of automatic coiling machines, type KOC, which have proven to meet the highest demands from the manufacturers of resistance coils for heating elements. The machines enable the manufacturing of uniform and reproducible coils, whereby a uniform temperature can be obtained along the entire element.

The principle for all GRANLUND coiling machines is that the wire is coiled around a rotating mandrel. In order to get sufficient friction on the mandrel and improve the coiling, one or two external winding rolls are applied. This technique is well developed and has proven to be the most cost effective when coiling resistance alloys. One of the unique features of GRANLUND KOC-VE is the design of the gearbox. It has two sliding controllable clutches for the winding rolls to ensure the uniform coils and the ability to control the amount of friction and pressure on the coil when winding.

Technical description

The KOC-VE coiling machines can produce coils with resistance wire from 0.1 mm to 1.0 mm in diameter. A suitable mandrel diameter is 4-15 times the wire diameter but also mandrel diameters outside these principle values can be applied in certain cases. Maximum coil diameter is 9 mm for KOC-VE.

It all depends on the ratio of coil to wire diameter. A suitable ratio is:

$$5 \leq D/d \leq 12$$

Where D is outer coil diameter and d is wire diameter. The ratio should be between 5 and 12

Or

$$3 \leq D_m/d \leq 10$$

Where D_m is mandrel diameter and d is wire diameter

Example: if the wire diameter is 0,5mm, the coil diameter should be between 2,5 and 6,0mm.

In many cases it is of advantage to use two wires wound in parallel instead of one single heavy wire. This can be achieved by fitting a second tower containing spool holder, roll labyrinth and wire brake as well as micro switch to the coiling machine.

Construction

The machine is aimed for placing on a table, suitable 700 mm high. It comprises the following:

- machine stand in welded sheath design
- gear box
- AC motor, frequency controlled, with variable mandrel speed
- control tower
- cutting device (solenoid)
- coil tray

Optional equipment

- tandem winding device (option, second "tower")
- arm with safety switch for taking wire from big spool. (option)

Function

The AC motor rotates the mandrel, and the mandrel speed can be regulated stepless between 0 and 6000 rpm. The same motor through friction clutches, allowing their speed to be adjusted according to actual coil, runs the outer winding rolls. To get the correct resistance of the coil, the wire length is set on the counter. A measuring wheel measures the length and decides when cutting takes place. The cutting device is operated by an electric magnet (solenoid). The number of coils to be made is also programmed.

Technical data

total height	1000 mm (excl. table)
height of machine stand	350 mm
length	750 mm
width	550 mm
weight appr.	100 kg
maximum spool weight type KOA)	4 kg (for bigger spools or pails, use a separate dereeler,
mandrel speed	0-6000 rpm
wire diameter	max 1,0 mm
min	0,20 (0,10, it could work, but we can't guarantee it) mm
mandrel diameters	Ø 0,7 - 8,5 mm, in steps of 0,1 mm
cut-off bushings	Ø 1,0 - 11,5 mm in steps of 0,25 mm
coil diameter	max Ø 7 mm with knife 332A Ø 9 mm with knife 332B Ø 12 mm with knife 332C
electrical connection	single-phase 230 V, 50/60 Hz, 500 W as standard

Required information for ordering

1. mandrel size
2. coil diameter
3. electrical connection
4. Diameter of wire
5. Wire quality

• Standard equipment

Following equipment is calculated in this quotation:

1. 1 pce of mandrel, dimension up to your decision
2. 5 pieces hard plastic rolls
3. 1 piece cut-off bushing based on one of your coil dimensions
4. 1 piece cut-off knife