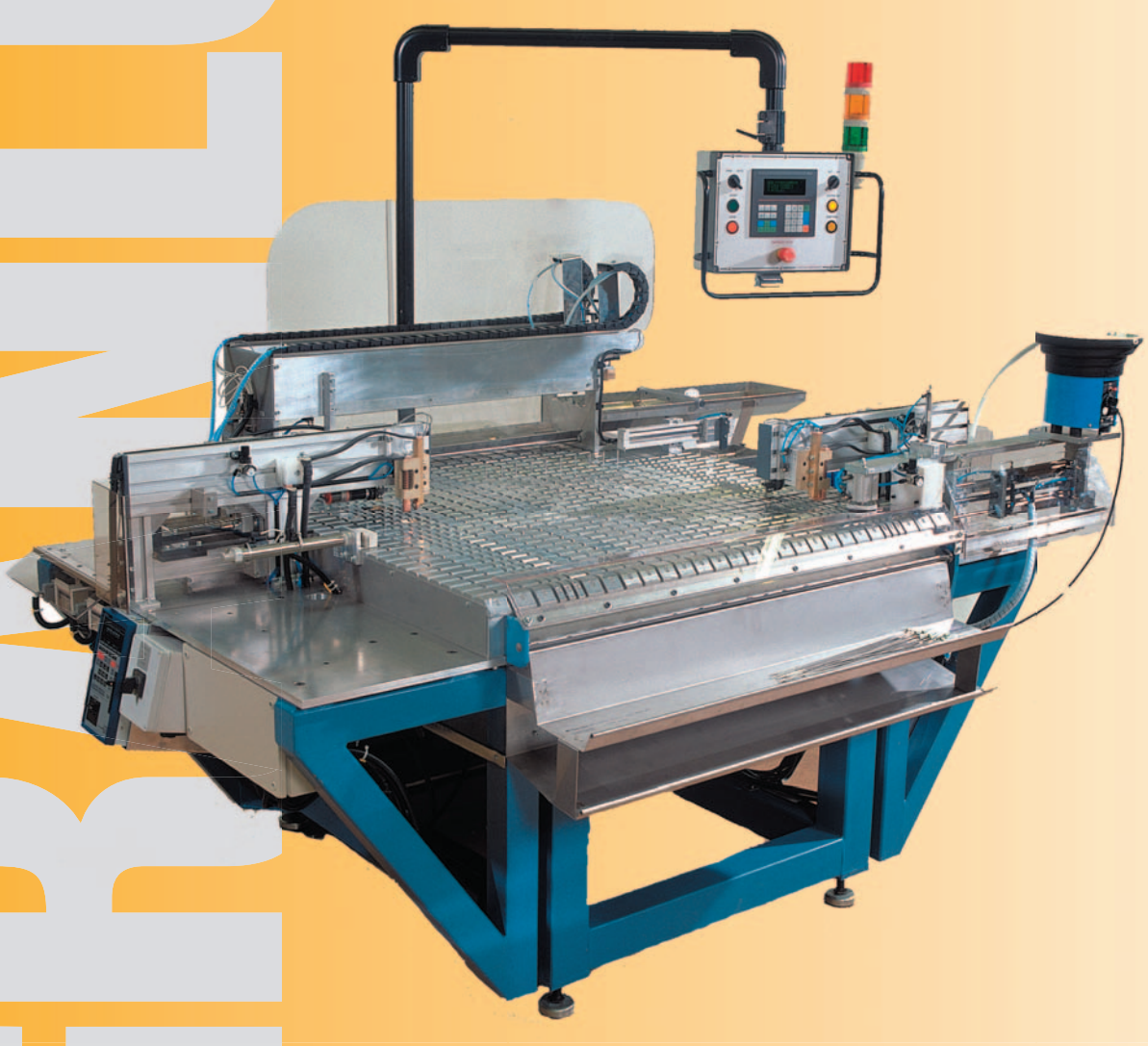
GRANLUND

GRANLUND
Machinery

Automatic coil-pin-plug assembly unit - KBMA



GRANLUND KBMA automatic assembly unit assembles and welds two terminals pins to a resistance coil as well as locating the bottom sealing plug onto the terminal pin. High capacity. Flexible and reliable. Easy to operate and to service

Assembles and welds two terminal pins to a resistance coil

The machine consist of:

A walking beam

To move the coils step by step through the process

Coil container

The coils should be held against the end of the container by the moveable holding plate. This ensures the correct position of the coil on the walking beam.

Robotic arms

These automatically pick and place the coils.

Automatic feeders

These magazines feed the upper and lower terminal pins.

Vibrator feeder

This component automatically feeds the sealing plug.

Spot welders

The welding amperage is checked to be constant at ± 3%, independent of changes in the inlet voltage of + 10%/-20%.

The process

1. The robotic arms automatically pick up the coils from the container and place them on a trap door for dropping onto the walking beam, in sequence. The trap door is necessary because the robotic arm may not pick-up the coil at the first attempt.
   The walking beam moves the coil to the next station.
2. The terminal pin is turned and pushed into the coil.
3. The sub-assembly of the coil/terminal pin is then moved to the next station, where they are welded together.
   The sub-assembly is transferred automatically to the other side of the walking beam where...
4. ...the lower pin is then inserted into the coil, again by turning and pushing the automatic feeders and the vibrator feeder.
5. ...the bottom terminal pin is welded onto the end of the coil.
6. ...the sealing plug is automatically added.
7. The sorting position will eject those items not correctly assembled.

High Capacity

The capacity (700 - 800 units/hour) of the unit depends on the ratio between the wire and the coil diameters. The greater the ratio, the slower the production, as the coils will be very delicate to handle.

Flexibility

The unit is built up by different modules which are easily connected and disconnected. The coil hopper works independently of the coil lengths and different lengths can be mixed without disrupting the production. The terminal pin magazines are made for different diameters and to change from one diameter to another takes just a few seconds. All other stations are built the same way, reducing the changeover times to a minimum. To change from one terminal diameter to another takes around 15 minutes and from one coil diameter to another, 20 minutes maximum.

Reliability

The well-known walking beam system ensures good transportation through the unit.

The unit has been thoroughly tested before marketing, thereby ensuring immediate operation. The unit has various control systems integrated into it, for example:

- Welding control
- Coil location control
- Pin location control
- Plug location control

The unit memories if anything goes wrong during the cycle and automatically sorts out any faulty part or assembly at the last station of the machine. The automatic functions of the unit depend very much on the quality of the parts which are being assembled. It is therefore necessary to have a person observing and servicing the unit, the workload being very much dependent on how accurate the parts are.

Easy to operate

Any operator, with reasonable technical experience can, after a short training period with our instructors, easily operate the machine.

As well as the normal operating instructions, an instructional video tape is available to remind operators of the correct procedures. This tape can also be used in the training of a secondary operator.

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6. TERMINAL PIN
KMO, KBMA, spot welder

After coiling the wire, the coil must be connected to a terminal pin at each end. GRANLUND Machinery has machines for mounting the plugs on the pin and for welding the coil to the pin:

GRANLUND KMO	mounting plug on pin
GRANLUND KBMA	automatic coil-pin-plug assembly unit

GRANLUND can also supply a manual spot welding machine, suitable for welding the coil to the pin.

KMO
Plug on Pin Mounting Machine

The lower terminal pin must be fitted with plastic plug before filling. KMO is a device for mounting the bottom plug on the terminal pin, before welding the pin to the coil.

- saves labour

Construction and function

The KMO can be placed on a table.

The mounting process is automatic. The sealing plug is fed by a vibrator feeder and the terminal pins from a magazine. The pins must be correctly orientated.

To change the type of sealing plug, the cup in the feeder must be changed, as well as some minor mechanical adjustments.

Technical data

Terminal pin diameter	2-3 mm
Terminal pin length	40-175 mm
Average cycle time	0,75 s

KBMA
Automatic Coil-Pin-Plug Assembly Unit

The unit assembles and welds two terminal pins to a coil as well as locating the bottom sealing plug onto the pin. Faulty or non assembled parts are automatically sorted out.

As an option, the KBMA can be equipped with resistance measuring (stretching the coil, measuring resistance and on the same time making a simple check that the coil is welded) of the ready unit after welding.

Technical data

Pin length	min	55 mm
	max	150 mm
Pin diameter	min	2 mm
	max	4 mm
Coil length	min	60 mm
	max	800 mm
Coil diameter	min	2 mm
	max	5 mm
Wire diameter	min	0,2 mm
	max	0,8 mm

Welding power	10 + 10 kVA
Power supply	three-phase 400 V, 50/60 Hz
Pneumatic supply	6 bar

Production capacity

The normal cycle time is appr 3,5-4,0 s. Normal production during an eight-hour shift would be around 5000 - 6000 pcs.

This machine is only suitable for large batches, e g above 5 000 or 10 000 coils. Otherwise, the set-up time will become too important. However, if only the coil length varies, there is no need for a new set-up.

One week commissioning is a recommended option.

Sales Catalogue

Spot Welding Machine

The machine is a bench spot welding machine, suitable for manual spot welding of the wire coil end to the terminal pin.

This pneumatic bench spot welder with rectilinear descent is designed to satisfy varying requirements in terms of precision and production capacity.

Construction

• Table in sheet steel, edged with steel. Surface in wood, lined with a plastic laminate
• Aluminium structure for holding welding group
• Pneumatic cylinder in brass and slides in steel
• Electrode holders prepared for internal water cooling
• One pair of shaped electrodes (specially designed for this application)
• Control panel with the following functions
    - pressing time
    - welding time and current
    - annealing time and current (current adjustable in percent)
    - holding pressure
• Diode controlled (SCR), 200 A
• Transformer completely impregnated with epoxy resin and prepared for internal water cooling
• Pneumatic control with pressure regulator for weld pressure, pressure regulator for to reascend of electrode, manometers and filter group

Optional: water cooler with radiator, circulating fan and water tank

Function

The synchronous electronic control includes squeezing, welding current gauge (20-100% of nominal power), welding time selector (1-50 Hz) with possibility of welding in 0,5 Hz, and maintenance.

The double pressure adjustment (descent and rise of welding cylinder) enables a precise adjustment of welding pressure, not affected by the weight of the electrode or equipment, minimum pressure 0,5 bar.

Spot welder, cont.

Technical data

Total height	1150 mm
Width	1000 mm
Depth	700 mm
Weight	90 kg
Electrode pressure	40 kgf
Groove depth	95 mm
Max electrode stroke	35 mm
Water consumption	3 l/min (option)
Water pressure	1,5-3 bar
air consumption	0,9 l/cycle
Nominal power at 50%	15 kVA
Electrical supply	single phase 400 V, 50/60 Hz