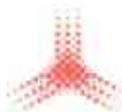




falma machines

am: aluminizing machine

for the aluminizing of bulb or PAR reflector lamps



montena
falma machines



Turning darkness into light

Montena machinery develops, builds and commissions machines and production lines for the manufacture of all kinds of light sources: incandescent or economical, traditional or the latest generation.

Working in close co-operation with montena lighting, montena machinery has acquired complete mastery over all the phases of lamp production. This synergy effect brings high benefits: for example, it enables montena machinery to make an objective and well-informed assessment of production tool quality.

Montena's foremost aim is to give you comprehensive service, dedicated to your satisfaction and success. Our customer advice focuses on research, development and engineering; we also provide on-site after-sales service, maintenance and monitoring of installations.

Montena summarises its objectives in a single declaration of intent: we can do it!

We will be happy to give you further information. Just contact us!



am aluminizing machine for the aluminizing of bulb or PAR reflector lamps

Fully automatic aluminizing plant for the coating of bulbs or PAR reflectors

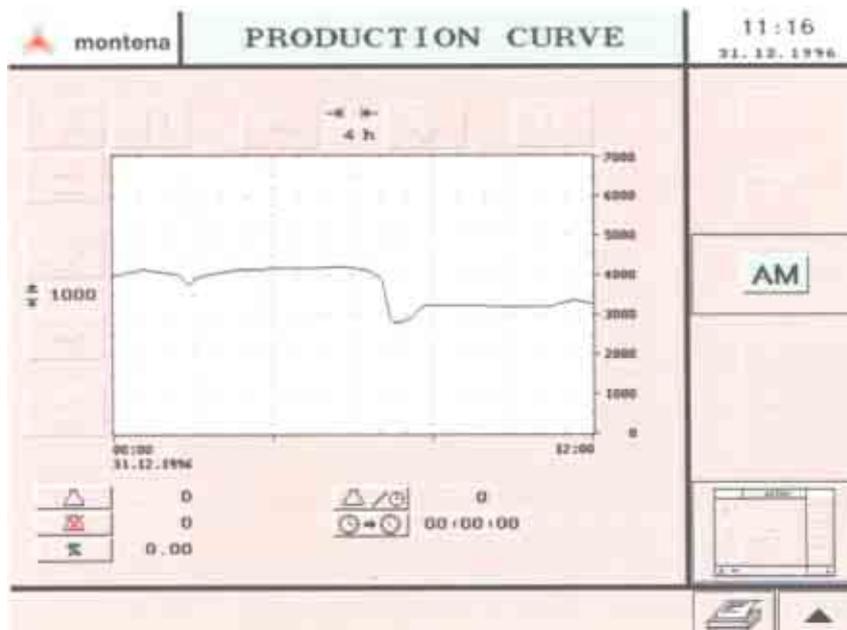
- The AM is a fully automatic machine
- Can be integrated in a production line
- Integrated vision control system available
- The evaporation of the aluminum wire is microprocessor controlled
- Flexible system (very short change over time from one lamp type to the other)
- High efficiency and high quality
- For the handling of the PAR reflectors a robotic system can be added if necessary
- Automatic replacement of burned out coils
- Automatic loading of aluminium wires
- High technology vacuum system
- 3 shift operation possible
- Minimal floor space
- Easy control system of the line

Know how

The machine has been designed for the internal coating of bulbs for reflector lamps, crown mirrored lamps and PAR reflector lamps by evaporation of an aluminium wire. High vacuum is ensured by 24 turbo molecular vacuum pumps. The machine is fully automatic, including loading of bulbs and aluminium wire, replacing used tungsten coils, final control and unloading. It can be used stand alone or integrated in a production line. Index speed is up to 6000/h for bulb diameter 35-95 mm and 3000/h for bulb diameter 125 mm.

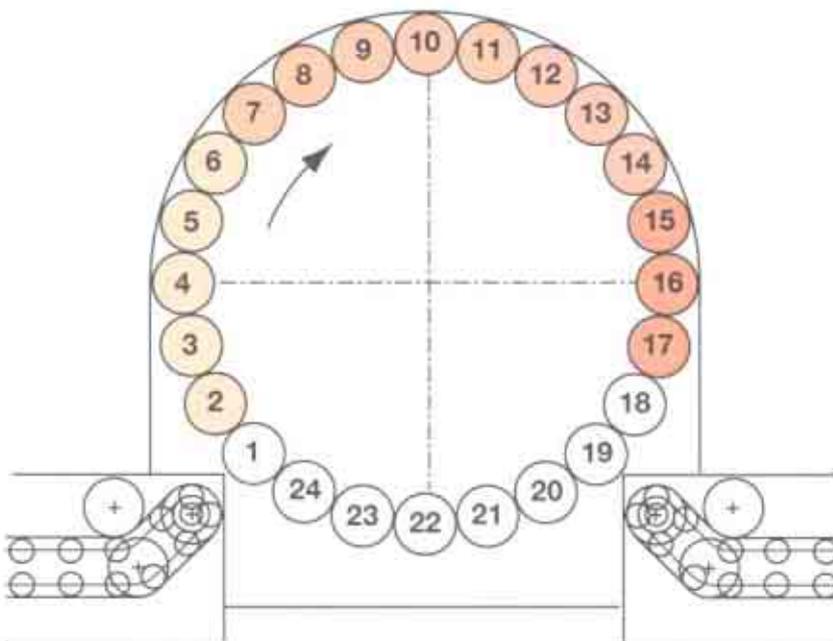
With the aluminizing machine AM montena machinery can deliver as well the know-how and the technology

how to coat bulbs with a high efficiency, assuring a high product quality. Every single step from the beginning to the end is important and that's how we teach your personnel to solve daily problems and how to reduce raw material costs to a minimum and how to increase the overall efficiency. To ensure the quality and the high efficiency of the installation, the operators of the machine follow a specific training program. Along with our detailed documentation they will soon be able to handle the machine by their own. If later on, during operation of our installation you have questions and problems to be solved and answered, we will help you as well with our support at any time.



process steps

- | | | | |
|----|--------------------------------------|----|---------------------------|
| 01 | bulb loading | 13 | turbomolecular pump, heat |
| 02 | primary vacuum pump | 14 | turbomolecular pump |
| 03 | primary vacuum pump | 15 | cooling position |
| 04 | primary vacuum pump | 16 | cooling position |
| 05 | primary vacuum pump | 17 | cooling position |
| 06 | primary vacuum pump | 18 | air inlet |
| 07 | turbomolecular pump | 19 | bulb unloding |
| 08 | turbomolecular pump | 20 | empty position |
| 09 | turbomolecular pump | 21 | taking off burned coils |
| 10 | turbomolecular pump | 22 | setting new coils |
| 11 | turbomolecular pump | 23 | empty position |
| 12 | turbomolecular pump,
pre-pre-heat | 24 | aluminium wire loading |



The turret system of the AM has 24 positions. Every position is controlled and checked electronically. The results can be seen on the LSI (One Supervision and Information system, see electronic and controls page 6-7). The percentage of failure of each position is indicated and so the operator can check and replace any necessary item on the machine. Global efficiency is high and under control.

The aluminizing of bulbs or PAR reflectors bases on a turret system which is proven falma quality. A turret driven by an indexing cam, connected with a lead-in chain and an exit chain where the coating quality is automatically controlled.

The machine can be used as a stand-alone unit or inline with an incandescent lamp production line.

Accessories

- ❑ Evaporation coils.
Holders for evaporation coils.

Options

- ❑ Change parts for different bulb types.
- ❑ Quality control system with bulb selection for
 - incoming bulbs
 - coated bulbs.
- ❑ Bulb loading and unloading conveyors according to customers specification.
- ❑ Coil reconditioning unit.
Coil support cleaning unit.



presentation of the machine

AM aluminizing machine

The AM-turret contains 24 (12) heads each with 4 holders for bulbs. The loading and unloading is performed through a vacuum pick up system. The aluminium wire is automatically placed in the coil for evaporation. Each head has four of them. They are automatically replaced when they are burned out. Evaporation only takes place when the vacuum is reached. The whole process is fully automatic and commands are given by a touch screen monitor (only inline with a production line) or an alphanumeric panel. All production figures and efficiencies are monitored.



Wire loading:

aluminum wire loading into the cathodes. The caps are lifted off each time and set again.



Cathode replacement:

when the cathodes are burned out, they are automatically replaced by new ones.



Loading:

the bulbs are loaded into the machine.

technical features of the AM

Technical specifications

- ❑ Reflector sizes: 39-125 mm
- ❑ PAR sizes: 50-95mm
- ❑ Capacity: 24 heads max. 6'000/h for bulb dia. up to 95 mm
max. 3'000/h for bulb dia. up to 125 mm
- ❑ Capacity: 12 heads max. 3'000/h for bulb dia. up to 95 mm
max. 1'500/h for bulb dia. up to 125 mm
- ❑ Control cabinets: 2 x (1000 x 800 x 2200) mm
1 x (600 x 800 x 1400) mm
- ❑ Weight machine: 6500 kg (without annexury equipment)
- ❑ Machine dimensions: 2700 x 2300 x 2300 mm
- ❑ Weight cabinets: 2 x 700 kg
1 x 500 kg

Energy requirements

- ❑ High pressure air: 6 bar, 10Nm³/h
- ❑ Operating voltage: 3 x 400 V; 50 or 60 Hz (others on request)
- ❑ Power: 30 KVA

electronic and controls

Technical data

The LSI is based on a personal computer and a normal VGA screen. Instead of the mouse, the LSI is equipped with a touch screen monitor which suits better to the environmental conditions of an aluminizing system. Under certain circumstances you may use the keyboard situated in the cabinet under the screen.

The LSI and the machine are connected together by means of a communication network. The LSI is defined as a MASTER while the machine controllers are SLAVES.

In our case, the LSI also manages the communication with peripheric systems like robots for loading/unloading, furnace, vision control etc. A printer is placed in the cabinet for protocols printing.

To guide the personnel for trouble shooting, a large alphanumeric panel can be installed on the line. It is connected to the LSI.

The touch screen control system is only available within a production line, or on request otherwise there is an alphanumeric command panel on the machine. Below some samples of menus.

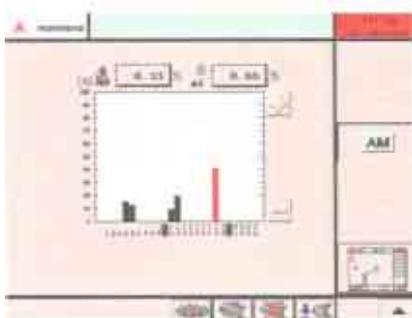
Selection of the product type



This touch key gives access to the auxiliary screen used to select the product type and to control the change-over from any type to another.

The first three buttons are used to select the product type. The following five touch keys are used to acknowledge, for each machine of the aluminizing system, the product change-over and therefore to send the new product parameters.

Menu line / jaws statistic



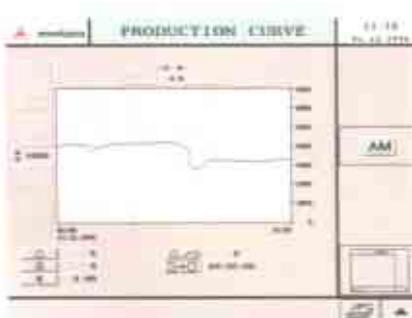
The following graphic is a typical representation of an auxiliary screen containing the jaws statistic of one particular turret.

The left hand side value (with the red icon) indicates the limit level from which one particular jaw is considered as being "in alarm".

The right hand side value (with the grey icon) indicates the limit level from which one particular jaw is considered as being "out of service automatically".

The above mentioned limit levels can be changed by the operator.

Menu line / production curve



By means of this touch key, the operator can access an auxiliary screen which contains a graphical representation of the machine production as a function of time.

The following graphic shows a typical example of a so-called "production curve" screen.

The value represented in the trend graph corresponds to the so-called "instantaneous average production" of the machine. To obtain this value, we extrapolate to one hour the production of the last 10 minutes.