

# **AUTODOT**

The marking system to use in production and quality controls.

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## MAIN USES

“**AUTODOT**”, is a marking system for the quality control. In outline, these are some of its most common uses:

- 1. For the control of piece manipulation.** It allows us to mark a dot in screw connections to control if those pieces have been manipulated. Example : Shock absorbers, carburetors, airbag,....
- 2. For the elimination of manual marking.** We eliminate, this way, the manipulation, oversights and we win in mark quality and in time.
- 3. For the placing of a piece.** It always indicates to us its right position.
- 4. For process controls.** Example: When it shoots a green colour dot, it shows us it has passed the process of quality control correctly. If, on the other hand, it prints a red dot, or it leaves the colour dot out, that indicates to us that piece is not valid.

## MAIN ADVANTAGES OF THE “AUTODOT” SYSTEM

- Immediate reuse for its use in another production line (immediate assembly and disassembly).
- Elimination of manipulation.
- Quality and image in the mark.
- Immediate drying.
- Hardly measurable maintenance.
- According to mark size, it marks between 45,000 to 50,000 pieces per liter of ink.
- Capacity according to the model, between 3 and 7 liters.
- System cleaning.

This is a small summary of some of the advantages and uses of our system, “**AUTODOT**”. A marking system broadly used and approved in the automotive sector.

## **AUTODOT – COLOUR MARKING SYSTEM**

**AUTODOT** is a system developed to solve the existent problems, up to now, of coding control, using a colour dot in an efficient way and protecting the environment at the same time.

**AUTODOT** is the best way of avoiding a lot of problems in planing, production and maintenance. Time factors and costs are reduced to a minimum. The capacity of the system allows an automatic and continuous working for a long period of time without the need of refilling or cleaning it.

**AUTODOT** can be easily integrated in any tool or screwing system existing in the production line.

### **Arguments for professionals:**

- ✓ It is not necessary the constant cleaning of the nozzles. The system of needle locking allows its cleaning in every impulse.
- ✓ The special elimination of colour remains and cleaners will not be necessary, every refill can be totally used.

The special colours developed for **AUTODOT** are:

- ✓ Favorable to the environment.
- ✓ Of a quick drying.
- ✓ Non water-soluble.

The colour marking size with “**AUTODOT**” depends on the following factors:

1. Distance of the nozzle to the object.
2. Assembly position - **AUTODOT**.
3. Length of impulse of the marking.
4. Used valve.
5. Air pressure.
6. Used nozzle.
7. Used colour.

### **1.- Distance of the nozzle to the object.**

The distance between the **AUTODOT** nozzle and the object to mark should be 30 mm. maximum. This distance guarantees ideal results as for colour intensity and a homogeneous diameter of the marking.

### **2.- Assembly position - AUTODOT.**

The best results are obtained when the sign colour pointer **AUTODOT** is flat. It can be used in any other position thanks to the pressurization of the ink that allows it to be projected without any problems, in short impulses as well as in long ones.

It is necessary to avoid the vertical assembly with the nozzle leaned upwards, although it can be used. The remains of the projection fall constantly over the head of the system producing some advisable dirt.

### **3.- Length of impulse of the marking.**

The length of impulse of air for the marking establishes, in an essential way the diameter of the colour dot the same as the quantity of cycles/hour of marking.

Our experiences with manufacturers have clearly proved that considerable oscillations appear, though minimum, with the lengths of impulse and, therefore, in the marking results.

The programming display, that is, of adjustment in the existing controls for a length of sign to use for the marking system **AUTODOT** is fixed, although depending on each case, it can be programmed by means of an optional terminal.

To reduce the costs for the adjustment of the marking system **AUTODOT** to a minimum, we recommend the use of our timer device **BELCONTROL**.

The timer has a lineality of +/- 1%. The control of the timer can be carried out by a voltage sign of 24V/AC or by a sign without potential energy. For the control of the timer with a sign without potential energy, there has to be a supply of constant voltage of 220V/AC in the timer.

The advantage of the external timer **BELCONTROL** is in its simple adjustment (programmable) and, as a consequence, in the adjustment of the colour dot size.

The maintenance staff won't have any problems with the help of a console or a small terminal for the programming.

The advantages of the timer **BELCONTROL** are in its easy handling and high flexibility, besides avoiding high programming costs in the controls.

### **4.- Used valve.**

We recommend for **AUTODOT** the specially developed box of valves. This one guarantees the highest effectiveness possible.

If another valve is used, the valve should be a quick ventilation one with a flow of 8501/min. to 6 bar of service pressure.

If a quick ventilation valve is not used, there is risk of "additional marking" , or faults in the coding sign and there could be oscillations in the dot sizes.

### **5.- Length of the flexible tube of the valve – SICOPOINT 9000.**

The length of the tube should be no more than 6 m. If a too long tube is used, air could be accumulated in the flexilbe tube, running the risk of additional marking.

The impulse time will be adapted to the length of the flexible tube and to the air pressure.

### **6.- Air pressure.**

The ideal air pressure for the colour marking **AUTODOT** is 4 – 5 bar.

If the pressure is too low, the desirable colour intensity is not obtained. If, on the other hand, the pressure is too high, an excess in the projection or an electrovalve blocking is produced.

## 7.- Used nozzle (extension).

The original nozzles (standard nozzles) should not be modified in any case, this would decrease the working of the colour marking system.

When using extensions, the effectiveness is related to the length. The shorter the extension is, the more effectiveness you obtain.

## 8.- Used colour.

The **AUTODOT** colours are standard colours specially developed for the system.

White	Yellow	Orange
Red	Blue	Green

- ❖ Although special colours are available (by order).

# ELECTRONIC CONTROL

## 1. Technical characteristics

The equipment of the electronic control of the system is controlled by microprocessor and allows it to adapt to many applications, thanks to all the available configuration options.

The equipment has an electropneumatic valve to make the shooting of a dot during a programmable time.

It has a red pilot light and a green one that indicate the state of the equipment. If the green pilot light is on, it indicates the equipment is under pressure; if it blinks, it indicates the equipment is timing. The red pilot light is on when the valve is activated.

The inlet amplifier admits sensors of the type "INDUCTIVE SENSOR PNP" and coaxial cable should be used for long distances.

## 2. Instructions of handling and configuration

To change the equipment configuration, the programming console should be connected to the card; if this one doesn't light up, it indicates the connector has been placed in a wrong way. The console can be taken off or put with the equipment on. The number of printing pulses given to the cylinder must appear in the display, as well as the waiting and activation times that the equipment carries out.

To put the pulses meter to zero, just press the two keys on the right at the same time.

To enter in configuration, the key "**Fun**" must be pressed, that will make the equipment ask for the access code; to introduce it, you can use the two keys on the right. The key "**Up**" increases the value of the selected digit and the key "**Displace**"

selects the following digit. If, finally, the key "Fun" is pressed and the code is right, the word [Config] will appear in the equipment display for a few seconds.

To modify the configuration parameters, the parameter to be modified will be selected with the keys "Up" and "Displace". When this one is in the display, the key "Fun" will be pressed to modify the value of the parameter. The digits are selected with the key "Displace" and modified with the key "Up". Finally, to end up, the key "Fun" will be pressed again, this allows you to return to the configuration menu. If you press "Esc" the parameter will not be modified.

To leave the configuration menu, just press the key "Esc", it will record the present configuration indicating it with the word [record] and returning to the initial visualization.

Now you can read about the configuration parameters of the equipment in upward order as they appear in the configuration menu.

**[Waiting]** It fixes the waiting time in hundredths (1-65535). It determines the waiting time in hundredths from the moment the equipment receives a pulse to the moment it shoots a dot, its value can be between 1 and 65535.

**[Active]** It fixes the activating time in hundredths (1-65535). It determines the activating time of the printing pulse in hundredths from the moment the equipment activates the projection of ink to the moment it cuts it, its value can be between 1 and 65535.

**[-Mode-]** It fixes the different options of the work of the equipment. These options are represented in the shape of short and long bars, so that a short bar indicates the option is deactivated and a long one, activated. These options are represented in the figure as they appear in the display.

(III – III)

1. Base of times in tenths or hundredths.
2. Yes/No restartable timer.
3. Shot to activation or deactivation.
4. Reshot mode.
5. Visualization of the timers.
6. Direct mode.
7. Reverses the inlet of level sensor.

Extension.

- 1) Short Bar :The values of the times (**Waiting and Active**) will be in hundredths. Long Bar: The values of the times (**Waiting and Active**) will be in tenths.
- 2) Short Bar: The "**Waiting**" timer will be started again if a new shot appears. Long Bar: The "**Waiting**" timer will not be restarted until the cycle is finished.
- 3) Short Bar: The shot takes place when the sensor is activated. Long Bar: The shot takes place when the sensor is deactivated.
- 4) Short Bar: The shot takes place when the sensor is activated and, although this remains activated, the cycle does not recur.

Long Bar: The shot takes place when the sensor is activated and if this one remains activated when the cycle finishes, a new cycle will recur.

- 5) Short Bar: Every time a shot takes place, it can be visualized in the console; first, The “Waiting” timer and, when it reaches “0”, the “Active” timer is visualized. When the cycle is finished, the meter is visualized. shots  
 Long Bar: Only the shots meter is visualized.
- 6) Short Bar: Normal working.  
 Long Bar: The outlet remains activated while the shot sign remains activated. When this sign disappears, the outlet is also deactivated.
- 7) Short Bar: The sensor contact is closed with ink.  
 Long Bar: The sensor contact is open with ink.

The value, if it is not changed, is (All the options deactivated).

## AUTODOT PRINTING HEAD

1. **Characteristics:** The ink  
 projector head consists of two different parts that allow a very precise control of the ink quantity and its projection. It consists of a projection device (ref:46090-16), used with pressurized ink or a mixture of pressurized ink and air, and a high resolution electropneumatic valve.
  
2. **Head and tying measures:** The head  
 external measures are: 65x180 mm. The tying base  
 consists of 4 holes of 7mm. Diameter situated in 70x80 mm.  
For more details, see description outline.
  
3. **Head adjustments:** The  
 projector head consists of three inlets: Air, Sign, Ink. Depending  
 on the marking needs and the intensity of the dot, we can make the following adjustments in a different way:  
  - a) Quantity of ink: By the adjusting screw. A left turning, less quantity. A right turning, more quantity. By the adjustment of the pressure in the pressurized tank.
  - b) Quantity of air: By the adjustment of the air pressure in the inlet. Optional, pitch strangler in the head.
  - c) Sign: It is regulated according to the programming of the control box. The electropneumatic valve of the head adjusts the sing time ( in parallel to the projection of air ), that is the time of the flow of ink to the projection.

# INSTALLATION OF THE AUTODOT EQUIPMENT

## 1.- Checking the equipment when it is received:

**AUTODOT** equipments usually go with a small quantity of ink in the tank and in the connection tube of the ink to the head, used for quality tests of our installations, so it is advisable to be careful when it is used once you have received it.

**AUTODOT** equipments come with the air inlet and the ink outlet of the pressurized tank closed, so it is advisable to open it after the air after the air connection for the checking test.

**AUTODOT** equipments are prepared with all its connections made, except the air inlet and the air connections between the inlet and the pressurized tank, the connection tubes are 6mm. diameter.

Steps to carry out when it is received:

1. Check there have not been ink leaks during the transport and no tube or cable have been undone.
2. Check in the pressurized tank that the mains tap of the tank (5), the inlet (3) and outlet (7) valves are closed.
3. Connect pressurized air, maximum 5/6 bar, to the air inlet (3) of the pressurized tank, open the inlet valve (4) and regulate the pressure regulator (8) to 2 bar maximum.
4. Connect pressurized air to the air inlet in the control panel.
5. Connect the electric current (220V) to the inlet plug.
6. Place the printing head flat to carry out the first printing test on a material.
7. Give sign by the magnetic closeness sensor.
8. An impulse of ink will have taken place and the marking will have been carried out.

The control unit is ready to make a mark in 0,3 seconds and using a minimum quantity of ink regulated mechanically in the head device.

If the characteristics of the dot to be marked do not adjust to the needs, you have to regulate the projection time and the quantity of ink according to the instructions detailed in the control panel devices and in the head.

A terminal and a magnetic closeness sensor are sent with the equipment. The terminal can be used for the change of the standard programming of the equipment, if it does not fit your needs. The magnetic sensor is used for marking the first working test in a simple way. The terminal and the sensor are both optional and we send them to make the first starting, so, once the installation is made, please send them back to us or we will proceed to confirm their invoice.

## 2.- Installation:

Once the first test has been carried out, we can make the installation of the system in the chosen point to do the codification and it is necessary to take into account the following recommendations:

- A. Prepare a circuit board for the screwing of the head ( it must be adjustable in movement to adjust the distance of the nozzle to the piece).
- B. Screw the head to the fixed board and adjust it to a distance of 30mm. from the piece (approximately).
- C. Cover the head with its protecting device and guide the connection sleeve to the pressurized tank and the control box through a protected area and without having the risk of getting hooked on materials in movement.
- D. Protect the area of projection of the ink properly, according to the instructions.
- E. Place the pressurized tank in a protected and dry place to avoid bumps and to have an easy access to facilitate refillings.
- F. Put the control unit in a protected and dry place to avoid problems in its working.
- G. Put the suitable sensor connected according to the instructions of the control box in the passage area or piece position.
- H. Program the delay time of projection of ink according to the sign of piece passing, if it were necessary, or in the suitable "mode" to the chosen marking system.
- I. Proceed to the starting in the same way we have done in the checking test.
- J. Check, systematically, each cycle of established time the level of ink in the tank.

**VERY IMPORTANT: Before proceeding to the opening of the mains tap of the tank (5), check there is no pressure in it; to do it, press the purgative valve (2) or pull the security valve (1).**

## LEVEL CONTROL BY INK SENSOR

For the installation of the equipment with the level control, we have to take into account some variables with regard to the conventional equipments.

The pressurized tank does not have any purgative valves (2), which are the places where the level sensor is installed.

To open the pressurized tank for refilling the ink, before opening the mains tap of the tank, you can eliminate the pressure by pulling the pressure security valve.

The level measure sensor has a connection by cable that has to be connected to the "ink sensor" indicated in the control box outline.

For the initial tests, the connection in the control equipment comes dotted; depending on the distance the pressurized tank is placed, the user will carry out the suitable connection.

# CLEANING INSTRUCTIONS

## HEAD:

- **Weekly cleaning:** It is advisable to do it with some solvent in the external part of the head, next to the projector. It is also advisable to clean the external part of the projection system, to do that we must close the outlet valve (7) and, once we have checked the lack of ink and the air pressure, we undo the external hexagonal screw N° 1, then we undo the air capsule N° 2 and the ink capsule N° 3 together with the joint N° 4 and finally we clean those element swith solvent to avoid the accumulation of ink.
- **Monthly cleaning:** Apart from the elements indicated in the weekly cleaning of the projector, it is advisable to disconnect the connection tube of the ink to the head and, with a syringe or connected to a solvent tank, clean the front part of the ink tube between the inlet and the ink capsule of the head.

## CONNECTION:

- **Semestral cleaning:** To avoid the obstruction of the ink tube, it is advisable its semestral cleaning or its annual replacement. We can supply you with the whole set which consists of: ink tube, air tube, electric connections and external protecting tube.

## TANK:

To clean or change the ink: first we will check the lack of pressure in the tank, then we will open the mains tap and, finally, we will spill its contents in a container.

- **Weekly recondition:** It is advisable to shake the ink and to change it weekly if its consumption is less than a weekly tank (the ink can still be used).
- **Monthly change:** To avoid the accumulation of pigment on the base and to have the inkready to be used, it is advisable to change it every month.

## HEAD:

- Stainless steel protection.
- Length: 180mm. – Width: 105mm. – Height: 65mm.
- Length of the connection of the head: 3 mts., with a protection in tube of 16mm. diameter.
- Weight: 2 kg.

## TANK:

- Stainless steel.
- Diameter: 229mm. – Heigth: 295mm.
- Weight: 4,6 kg.

## **CONTROL:**

- Control box integrated in a P.E. protection box.
- Length: 260mm. – Width: 170mm. – Height: 110mm.
- Weight: 2 kg.

**Head fixing:** 4 fixing points 70 x 80 mm.

**Current consumption:** 210 – 230 V CA, 50/50 Hz.

**Absorbed power:** Max: 100 VA.

**Compressed air:** 400 liters/hour, referred to atmospheric pressure.  
Maximum connection pressure 4 bar, compressed air  
without keystrokes, clean, dry and exempt from oil.

## **Environmental conditions:**

Temperature range: 0°C to +35°C (without quick temperature changes).

Relative humidity: 10% up to 90% maximum (without condensation).