



**HERO**  
INNOVATIVE **COLOR** TECHNOLOGY

- **ARCHIMEDE**
  - **A100/A150**
- Automatic Colourant Dispenser**

## **USER MANUAL**



# Declaration of Compliance with CE Regulations

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HERO EUROPE S.r.l.  
Fraz. Burette, 12/A  
12041 – Bene Vagienna (CN)  
ITALY

Declares that:

The Automatic Dispenser model: **ARCHIMEDE A100-A150**  
**Serial number:** \_\_\_\_\_

Is in compliance with the EC Machinery Directives:

**Machinery Directive 98/37/EEC**  
**Low tension 73/23/EEC**  
**Electromagnetic Compatibility 89/336/EEC**

Is in compliance with the standardized European Regulations:

**EN 292-1, EN 292-2, EN 418 & EN 1050**  
**EN 60204-1**  
**EN 61000-6-2, EN 61000-6-3, EN 61000-3-2 & EN 61000-3-3**

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Alessandro Sacchet  
  
Chairman  
HERO EUROPE S.r.l.

# A100-A150 Automatic Dispenser Key



Can loading

Nylon shelf for positioning the paint can



Colourant dispensing nozzles

Electronic control board (open the front panel)



Canisters and covers

## General Conditions

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By choosing the ARCHIMEDE A100-A150 automatic colourant dispenser manufactured by HERO EUROPE, you have selected a product which represents the result of intensive research in the field of high-tech fluid dispensing equipment. Top quality materials, modern designing tools such as the use of CAD three-dimensional parametrical systems, together with the attention given to ergonomics, guarantee an easy to use, long lasting machine.

The dispenser is in compliance with the 89/392/EEC directive regarding machinery, the 89/336/EEC directive regarding electromagnetic compatibility, as well as the 73/32/EEC directive regarding electrical equipment to be used within a specific voltage range compiled by the European Community Council of Ministers, and is provided with the EC trademark.

The handbook explains how to install a HERO EUROPE automatic dispenser and provides all the necessary information in order to insure easy use and proper maintenance.

**It is very important to read the manual carefully and completely before completing any task on the dispenser.**

The dispenser uses progressive cavity volumetric pumps to dispense colourants for the purpose of tinting paint either sequentially (A100) or simultaneously, up to 4 colourants (A150). **Do NOT run the pumps, either manually or automatically, if there is no colourant in the canisters. Should this occur, the pumps will be irreparably damaged.**

**The maximum allowable time between agitation cycles is 36 hours.**

Always follow the recommended maintenance procedures and schedule to ensure the best possible operation of the dispenser. Where and when appropriate, these procedures should be completed by duly authorized and trained personnel. For optimum performance the dispenser needs to be installed and operated within the following guidelines:

- Room temperature: **15-40°C**
- Relative humidity: **30-90%**

The dispenser must be connected to a dedicated electrical outlet with an appropriate ground.

**Failure to comply with the above listed requirements will invalidate the dispenser's warranty.**

For technical assistance, please contact the vendor's Customer Service department.

This handbook should be kept in a safe place

# Warranty Terms

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The ARCHIMEDE A100-A150 automatic dispenser terms of warranty are summarized as follows:

1. HERO EUROPE provides a one year warranty on the correct functioning of the products supplied, except for break downs due to normal usage. If a breakdown is not covered by the warranty, the customer will be charged for the inspection, implemented by HERO EUROPE, to determine whether the breakdown is covered by the warranty or not. Should the breakdown be covered by the warranty, HERO EUROPE will deliver an identical or equivalent product. The terms of warranty, herein described, apply only if the products supplied by HERO EUROPE are used in compliance with what is stated in the manual. The labour necessary to complete the work related to the warranty, together with transfer time, travel, meals and accommodation expenses will be calculated according to current rates.
2. HERO EUROPE is not obligated to honour the terms of the warranty if:
  - a. The product was repaired or attempted to be repaired by the customer or by a third party without the proper authorization from HERO EUROPE, unless HERO EUROPE previously refused to repair the product at a reasonable price;
  - b. HERO EUROPE demonstrates that no defect was detected after testing;
  - c. The customer did not immediately and correctly communicate the breakdown to HERO EUROPE, when possible, in writing and/or via fax, and/or did not carefully follow HERO EUROPE's instructions;
  - d. The customer used or treated the product incorrectly or differently to what was established by HERO EUROPE;
  - e. The damage was originated by circumstances that occurred during transport or installation and cannot be verified by HERO EUROPE.
3. Henceforth, the word "program" will refer to the standard computer program that HERO EUROPE has put at the customer's disposal, based on computer software and relevant documents (Software handbook), including any improved or updated versions. The word "PC" refers to the machine to which the program is associated and should solely be used in relation to such program.
4. The customer has the right to copy the program partially or completely (up to a maximum of two copies) for internal security reasons; the copies must bear the same trademarks, indications pertinent to copy right and any other identification marks present on the original version of the program.
5. The customer does not have the right to modify, translate, decode or adapt the program to its original code unless specific written consent is granted by HERO EUROPE. Furthermore, if requested by the customer, HERO EUROPE must provide information on how to obtain effective program interfacing with other software.

6. In case of a PC breakdown, the customer has the option to install the program on another PC until the original PC is repaired, however, HERO EUROPE must be notified within 5 days.
7. In case of a PC break down, the PC manufacturer's terms of warranty will be considered valid, even if the PC was supplied by HERO EUROPE.
8. Should there be a need to install the program on another PC, the customer must ask HERO EUROPE to provide written consent, which cannot be refused on unreasonable grounds.

## Safety Instructions

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Please read the instructions carefully before installing and operating the dispenser, as a personal safety measure as well as to avoid needless damage to the equipment.

HERO EUROPE declines any responsibility should the following instructions not be followed:

- Do not turn on a damaged machine (for example, if the machine is damaged during transportation). If in doubt, first contact the service department or the reseller.
- Position and connect the machine by carefully following the installation instructions and by respecting the conditions stated in this manual.
- All the instructions and local safety regulations must be observed.
- The machine must only be connected to a wall electrical socket installed according to regulations, with the grounding circuit and the voltage value in compliance with what is written on the machine's information plate.
- The user must maintain the machine in good working condition and replace any broken components.
- Any service on the machine, other than routine, can only be carried out by a qualified technician. **Make sure that the power cable is not plugged into the socket while the machine is being repaired.**
- A standard machine is solely suited to dispensing water-based colourants into standard paint cans.
- The elastomeric parts inside the dispensing circuits could be damaged if other thinners, i.e., solvent-based colourants are used.
- Never run the pumps without colourant in the respective canister, otherwise the friction within the pumps will lead to an increase in temperature capable of damaging the pumps.



# Machine Positioning and Installation

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## Instructions for correct positioning

Be certain to respect the following details while positioning the machine:

- Place the machine on a steady, horizontal surface by using a level.
- The area must be well ventilated. To avoid drying of colourants, make sure the machine is not exposed to the sun or near heaters or any other source of heat.
- The surrounding temperature should be kept as constant as possible, around 18°C (and always between 15 and 40°C) so as to prevent variations in the specific weight and viscosity of the colorants.
- Make sure the machine is connected only to a wall socket installed according to regulations, with its grounding circuit and voltage value in compliance with what is written on the machine's information plate.

## Machine unpacking

- Remove the external nylon film from the package
- Remove the fastening straps placed around the outside of the packaging box
- Remove the packaging box by lifting it above the unit

## Pallet removal and machine positioning

Due to its weight, between 62Kg and 72Kg, this must be done by a minimum of two persons. Place the machine where it is intended to be put to use.



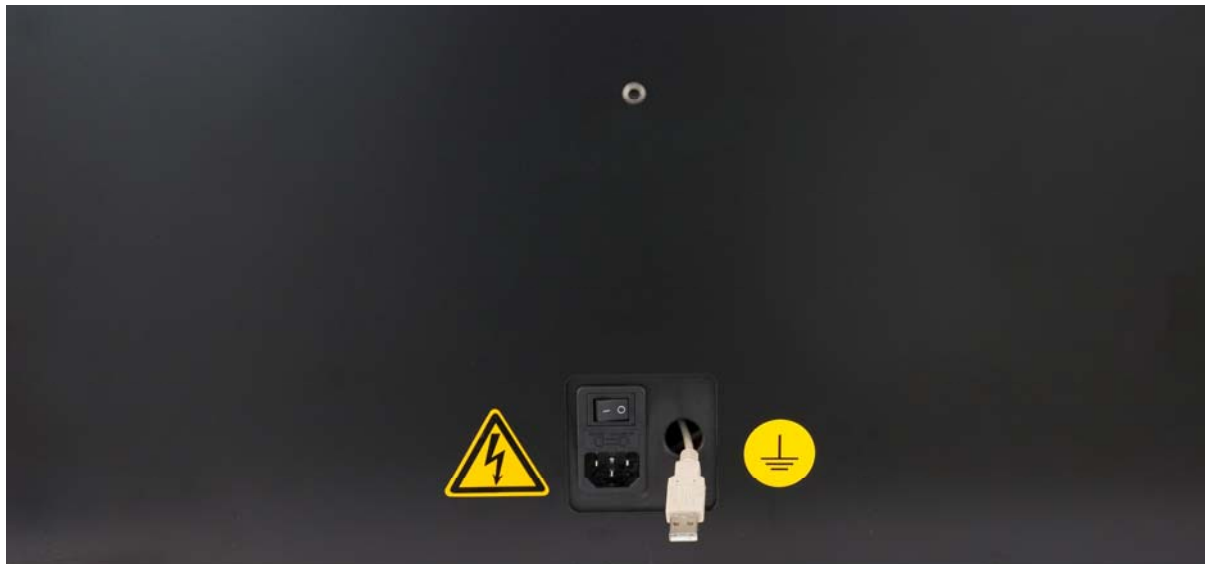
## Computer and Monitor Assembly

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After having positioned the PC, you must connect it to the electronic card that commands and controls the dispenser. In order to do so, you will find a USB connecting cable included inside the package.

On one side, connect the USB cable to the appropriate socket positioned on the electronic card in the dispenser and on the other side, connect it to one of the USB sockets on the PC. The USB port on the PC will be configured correctly by installing the software provided with the dispenser.



## Starting the Dispenser

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Connect the AC power cords of the dispenser and the PC to a wall socket (refer to “General conditions” and “Safety instructions” sections) then turn on the PC.

By following the instructions in the software handbook, install the software on the PC. Load the colourants into the canisters but be careful not to overfill.

Complete the following procedure to load the colourants:

- Disconnect the power plug to the agitation motor on the lid of the canister that you intend to fill.
- Remove the lid.
- Fill the canister, but be very careful not to spill any colourant on the central part of the agitation paddles.
- Replace the lid once the canister has been filled. Make sure the lid is closed properly.
- Reconnect the power plug to the lid.

After having loaded all the canisters, the calibration procedure must be completed before being able to use the machine.

A precision scale is necessary to accomplish the calibration procedure.

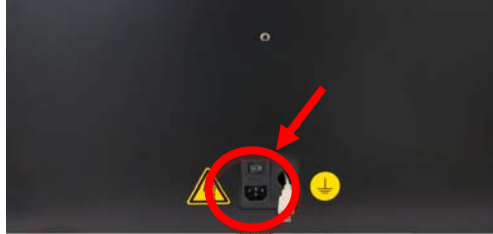
Please refer to the software handbook for instructions regarding calibration.

# Canister Replacement

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**WARNING: Ensure that the machine is turned off**

- To disconnect the machine's power supply, pull the power plug out of the socket



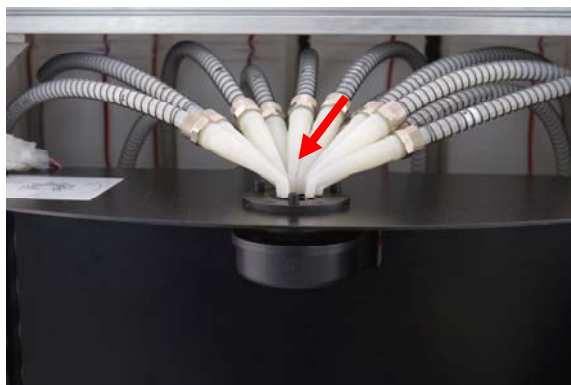
- Disconnect all the cables from the covers and remove all the covers



- Remove the upper front cover of the nozzle assembly, the canister plate that surrounds all of the canisters and open the front panel



- Pull the appropriate nozzle away from the dispense head



- Remove the wing nut that holds the canister, located under the lower canister support plate



- Disconnect the canister power cable from the electronic board and pull the canister away from its seating



- Disconnect the cable connector from the electric stepper motor located in the lower part of canister and pull the thin agitation cable out of its hooks on the side of the canister



- Connect the cable to the electric stepper motor of the new canister and insert the cable into its hooks on the canister



- Cut the tubing at the proper length and attach it on the canister by screwing the metal ring nut on the nipple



- Insert the spring and screw the other stainless steel nut onto the nozzles

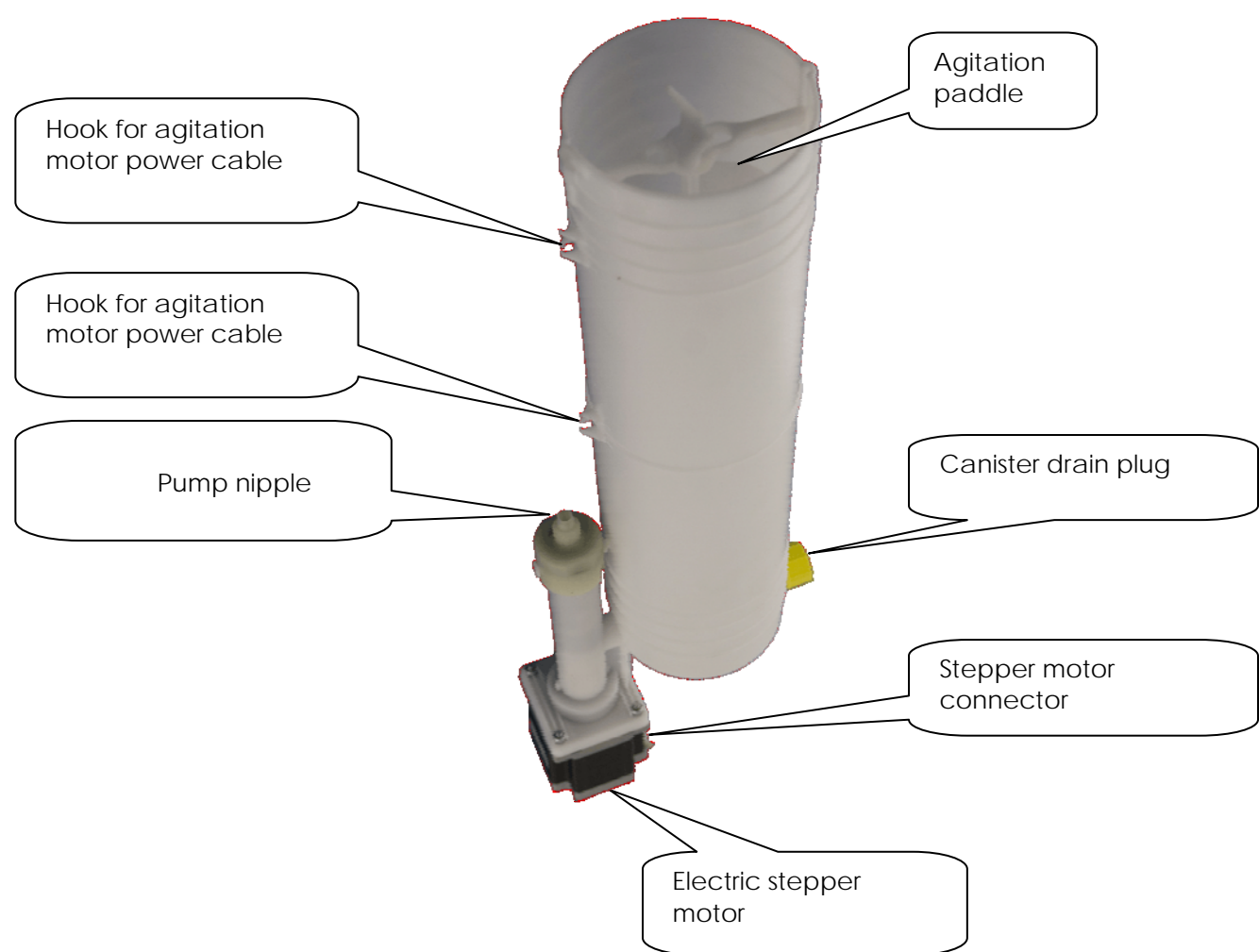


- Put the new canister in its appropriate place and lock it in place by tightening the wing nut



- Insert the nozzle into the dispense head
- Reconnect the cable to the electronic board
- Replace the upper canisters plate
- Replace the upper front cover of the nozzle assembly
- Place the lids on the canisters and reconnect the cables
- Close the front panel
- Add colourant to the new canister
- Start the canister's pump through the Manual Commands screen in order to release the air which is present within the new tubing and pump. Continue the process until a solid flow of colourant comes out of the nozzle

# Canister/Pump/Stepper Motor Assembly





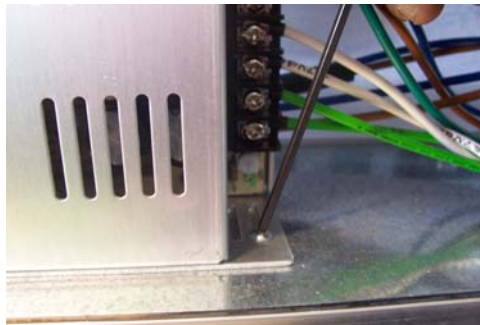
# Power Supply Replacement

**WARNING: Ensure that the machine is turned off**

- To disconnect the machine's power supply, pull the power plug out of the socket



- Remove the rear cover
- Remove the screws on the sides of the power supply with a wrench



- Remove the power supply, take note of which colored wire is connected to which terminal and disconnect the wires
- Install the new power supply ensuring that each wire is connected to the correct terminal



67VDC



24VDC

- Secure the new power supply to the machine with the original screws
- Replace the rear cover



# Simultaneous Control Board Replacement (USA market)

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**WARNING: Ensure that the machine is turned off**

- To disconnect the machine's power supply, pull the power plug out of the socket



- Remove the rear cover
- Remove the power supplies without disconnecting the cables
- Remove the upper front cover of the nozzle assembly and open the front panel



- Disconnect the cables to the canister lids and remove the lids
- Remove the upper canister plate that surrounds all of the canisters
- Remove all of the canisters in the last row on the rear of the machine and in the first row on the front  
(see "Canister Replacement" page 11)
- Pull out all of the connectors from the electronic board
- Remove the four screws holding the control board to the bottom of the unit
- Take the electronic board out from the rear of the machine



- Place the new electronic board and secure it with the screws

- Connect the cables following the number markings on the board and on the cables
- Replace the rear cover

## Sequential Control Board Replacement

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**WARNING: Ensure that the machine is turned off**

- To disconnect the machine's power supply, pull the power plug out of the socket



- Open the front panel by removing the screws



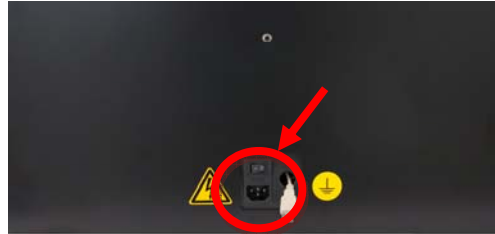
- Disconnect all the cables and remove the electronic board
- Install the new electronic board and connect the cables following the number markings on the board and on the cables

# Automatic Cap Replacement

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**WARNING: Ensure that the machine is turned off**

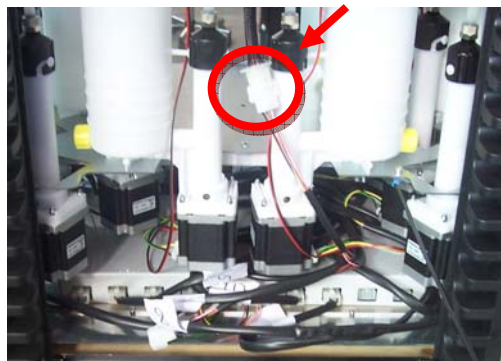
- To disconnect the machine's power supply, pull the power plug out of the socket



- Remove the upper front cover of the nozzle assembly and open the front panel



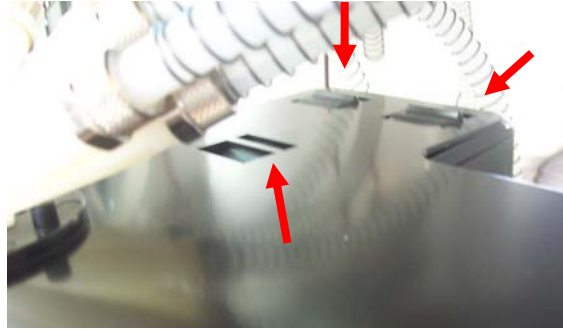
- Unplug the connector on the harness that leads to the cap



- Pull forward (towards you) on the complete cap assembly or housing to release it from the chassis



- Install the new cap by inserting it into the proper slots on the chassis

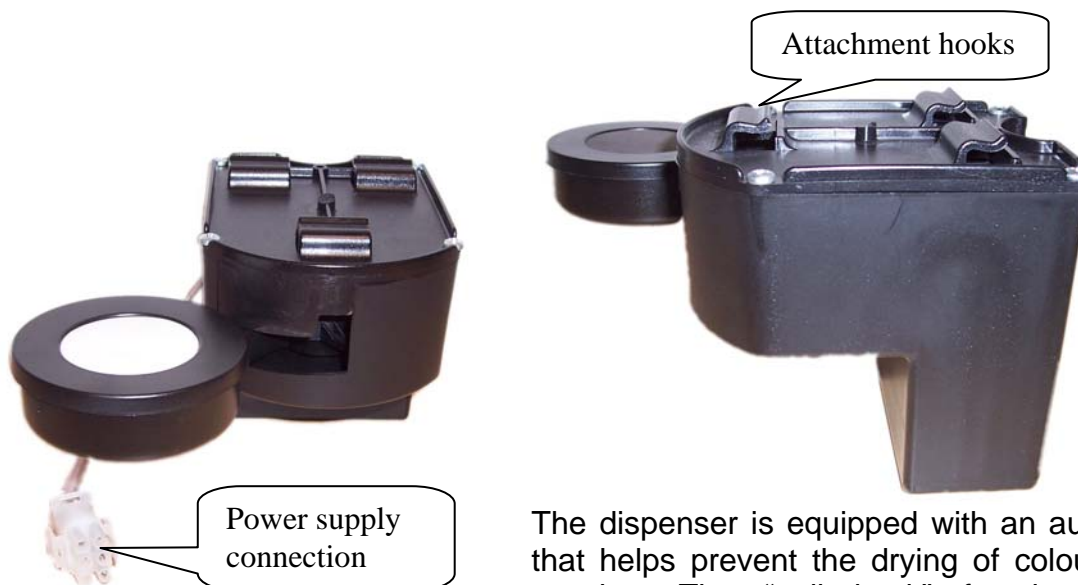


- Connect the cable from the cap to the appropriate wiring harness



- Replace the upper front cover of the nozzle assembly and close the front panel

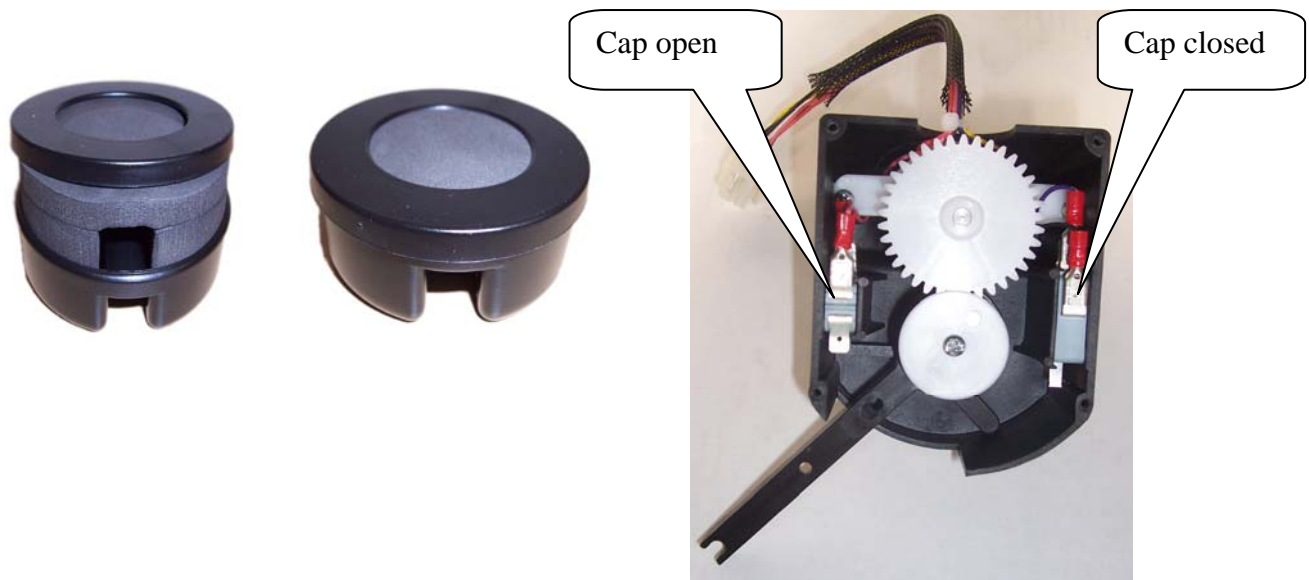
## Automatic Cap



The dispenser is equipped with an automatic cap, that helps prevent the drying of colourants in the nozzles. The “pull back” function within the software parameters must be set correctly, to avoid problems of contamination or dripping of colourants. The cap opens automatically before each dispense and also closes automatically after dispensing; with this device the possibility of colourants drying in the nozzles is greatly reduced. The part of the cap containing the sponge is easily removed to facilitate cleaning, as shown in the pictures below.

Inside the cap housing there are two micro-switches that control the two positions of the automatic cap; closed and opened. The automatic cap was designed to be replaced easily and quickly. To replace, unplug the power supply connection and pull the cap towards the front of the dispenser; the attachment hooks will release and the cap will slide out. Now the new automatic cap can be installed and connected without using any tools.

***It is very important to keep the sponge clean and wet to allow for proper and trouble-free dispensing, so it is advised that the sponge be cleaned and kept wet on a regular basis.***



## Equipment Specifications

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Description:	ARCHIMEDE A100-A150 Automatic Colourant Dispenser		
Capacity:	Up to sixteen (16) 2.5lt canisters		
Pumps:	Each canister is fitted out with a progressive cavity pump. The pump rotors are made of metal treated with a hardening chroming so as minimize wear. The stators are made of Viton elastomer. The materials used for the pumps are compatible with water-based colourants.		
Pump speed:	Variable and to be established depending on the colourants and ambient conditions. Maximum speed is 0,2 litres/min.		
Nozzle cleaning:	Colourant pull-back system after dispensing, to minimize drying of colourants in the nozzles. Automatic humidifying cap.		
Canister agitation:	Each canister is provided with a lid that includes a motor, which rotates agitation paddles inside the canister.		
Can sensor:	Reflection-photocell detects the can on the shelf.		
Power supply:	Variable from 110 to 240 Volts AC with a 50 or 60 Hz frequency.		
Dimension:	Height	600 mm	
	Width	700 mm	
	Depth	540-610 mm	
	Weight	141-161 Kg	
Package size:	ARCHIMEDE A100-12	780 x 600 x 870 (h)	
	ARCHIMEDE A150-12	780 x 670 x 870 (h)	
	ARCHIMEDE A100-16	780 x 670 x 870 (h)	
	ARCHIMEDE A150-16	780 x 670 x 870 (h)	

## Suggested Spare Parts

- Complete canister/stepper motor assembly
- Canister lid with agitation motor
- 3 m of flexible tubing for outlet lines from pumps to nozzles
- Set of nozzles (8 pieces)
- Canister power cable
- Electronic board
- Power supplies (24VDC and 67VDC)



## Troubleshooting Guide

The following chart listing “Problem”, “Cause” and “Solution” should be consulted before requesting service.

When in doubt, please contact HERO EUROPE S.r.l.’s service department before any attempts are made to repair the equipment.

PROBLEM	CAUSE	SOLUTION
Colourant leaks from the flange connecting the pump motor to the canister	Broken pump	Canister replacement
Colourant dripping from the nozzle	<ul style="list-style-type: none"> <li>Air in the circuit</li> <li>The pull-back function parameters are not set correctly</li> </ul>	<ul style="list-style-type: none"> <li>Purge the circuit until you see a regular colorant flow, free from air bubbles</li> <li>Program the pull-back function parameters correctly</li> </ul>
When dispensing ends the colorant goes back towards the canister through the nozzle thus emptying the tubing	Worn pump	Canister replacement
During operation, the circuit dispenses in a noisy, irregular way	<ul style="list-style-type: none"> <li>The cable connecting the electronic card and the pump motor is not plugged in correctly</li> <li>The cable connecting the electronic card and the pump motor is damaged</li> <li>Motor has broken down</li> <li>Electronic card is not working</li> <li>Stalled pump</li> </ul>	<ul style="list-style-type: none"> <li>Check that the cable between the electronic card and the motor is properly connected on both ends</li> <li>Replace the cable connecting the electronic card and the motor</li> <li>Replace the canister</li> <li>Replace the electronic card</li> <li>Start the pump by hand slowly until it unblocks. Increase the purging frequency and if necessary, thin the colourant</li> </ul>
<p>The sensors don't work and/or</p> <p>The pump motors don't work and/or</p> <p>The mixing motors don't work</p> <p>The connection between the PC and the machine is no longer functioning</p>	<ul style="list-style-type: none"> <li>No power</li> <li>The machine's power cable is disconnected</li> <li>The power cable for the electronic card is not plugged in</li> <li>A fuse has blown</li> </ul>	<ul style="list-style-type: none"> <li>Verify that the unit has power</li> <li>Connect the machine's power cable to the power outlet</li> <li>Make sure the power cable to the electronic card is plugged in</li> <li>Replace the fuse</li> </ul>

The pump motor functions normally, however no colourant comes out of the nozzle	<ul style="list-style-type: none"> <li>• No colourant in the canister</li> <li>• The canister nozzle is obstructed</li> <li>• The pump is damaged</li> </ul>	<ul style="list-style-type: none"> <li>• Add colourant to the canister and purge the circuit to remove any air</li> <li>• Replace the nozzle and verify that the colourant has not thickened.</li> <li>• Replace the canister and related tubing</li> </ul>
The colours are difficult to reproduce	<ul style="list-style-type: none"> <li>• The nozzles are dirty</li> <li>• Different quality of colourant</li> <li>• Thickened colourant</li> <li>• Colorant is leaking from the circuit</li> <li>• Temperature is too low</li> <li>• Circuit's calibration is incorrect</li> </ul>	<ul style="list-style-type: none"> <li>• Complete one or more purges and clean nozzles</li> <li>• Contact the colourant supplier</li> <li>• Replace the colourant</li> <li>• Substitute the canister and related tubing</li> <li>• Increase room temperature</li> <li>• Recalibrate the appropriate circuits</li> </ul>
No images on the monitor or the images are not clear	<ul style="list-style-type: none"> <li>• Monitor is turned off</li> <li>• Cables are not plugged in properly</li> <li>• Image adjustment is too dark</li> <li>• Monitor failure</li> </ul>	<ul style="list-style-type: none"> <li>• Turn on the monitor</li> <li>• Check all cable connections</li> <li>• Set the image up properly</li> <li>• Replace the monitor</li> </ul>
The keyboard and/or the mouse do not work	<ul style="list-style-type: none"> <li>• Cables are not plugged in properly</li> <li>• Cables are damaged</li> <li>• Damaged keyboard and/or mouse</li> <li>• Wrong set up</li> </ul>	<ul style="list-style-type: none"> <li>• Check all cable connections</li> <li>• Replace the cables</li> <li>• Replace the keyboard and/or the mouse</li> <li>• Verify the set up</li> </ul>
The agitation process of one or more canisters does not function	<ul style="list-style-type: none"> <li>• The cable to the motor is not well connected</li> <li>• The agitation motor is damaged</li> <li>• The cable is damaged</li> <li>• The electronic card is damaged</li> </ul>	<ul style="list-style-type: none"> <li>• Check the cable connection</li> <li>• Replace the lid/motor assembly</li> <li>• Replace the cable</li> <li>• Replace the electronic card</li> </ul>

If necessary, please contact HERO EUROPE 's service department. When doing so, be sure to have the machine's serial number, which can be found on the identification plate on the back panel of the machine

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## Standard Parameters

The following chart shows the parameters related to running a machine together with their respective default values.

PARAMETER	MEANING	DEFAULT VALUE
Mixing – Time ON Mixing – Time OFF	Mixing time ON Mixing time OFF	1 min – 0 sec 120 min – 0 sec
Pumps – acceleration	Pump motor acceleration speed	1000 When the value increases acceleration also increases
Pumps - deceleration	Pump motor deceleration speed	1500 When the value increases, deceleration also increases
Pumps – Boost time	Time in which the pump motor receives the maximum power	30 sec
Pumps – Start speed	Pump starting speed	15% (75 r.p.m.)

### Canister Page

Dispensing speed	Pump dispensing speed expressed as a percentage in regards to the maximum value	60% (300 r.p.m.)  It is possible to set 60% (300 r.p.m. – 0,2 l/min) as a max value when calibrating
Purging – ml	MI to deliver during purging	1 ml
Purging - Speed	Pump speed during the purging phase	25% (125 r.p.m.) The above value corresponds to the maximum speed of the step motor torque
Drip-free device - Steps	Number of pump motor steps during the phase in which the drop is "pulled back"	40 (0,1 r. – 0,07 cc)
Drip-free device – Waiting time	Waiting time, after each dispense has ended, before the drip-free device phase is implemented	3 sec
Capacity	Canister capacity	2 litres

Warning level	Below this level you are warned to fill the canister	0,4 litres
Alarm level	Below this level dispensing is no longer permitted	0,2 litres
Steps alarm	Number of motor steps possible before proceeding with a precautionary substitution	1.013.854.085 steps (1.760,00 litres)
Purging alarm	Maximum time lapse without purging, between one dispense and another of the same colourant	6 hours

### **Calibration Page**

Drop Calibration	Minimum quantity calibrated	
Threshold Calibration	Machine Calibration	

The theoretical value of the product moved (pumped) with one complete rotation of the pump is 0,6944 cc, measured with water at an approximate temperature of 25 °C.

576,05346 steps of the motor are necessary to dose 1cc. This value is programmed in the dispenser as being the standard calibration value.

# Parameters Images

