alfa
COLORPAINT DISPENSER

Operator Manual

Thor

ORIGINAL INSTRUCTION

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IMPORTANT:

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0. FOREWORD

0.1. HOW TO USE THE MANUAL

0.1.1. IMPORTANCE OF THE MANUAL

The manual contains instructions and advice for the commissioning and use of the Thor product.
Before installing and commissioning the system, carefully read this manual in all its parts and in particular the chapters “GENERAL INFORMATION”, “INSTALLATION” and “HOW TO PRODUCE A COLOUR”, paying more attention to the paragraphs related to precautions and safety alerts.
In case problems or difficulties should arise, the TECHNICAL SERVICE SUPPORT of Alfa Srl is always available to provide the right support, advice, explanation and assistance.
Alfa Srl reserves the right to make modifications for improving its own products without prior notification.
The incorrect use of the system can lead to loss of warranty in all its forms and terms.

0.1.2. HOW TO KEEP THE MANUAL

Do not remove, modify, rewrite contents of this manual for any reason.
Keep the manual in a safe place, protected from heat and humidity.

0.1.3. HOW TO CONSULT THE MANUAL

This manual comprises:

- COVER PAGE IDENTIFYING THE TYPE OF PRODUCT
- TABLE OF CONTENTS
- INSTRUCTIONS AND/OR NOTES ON THE PRODUCT

The COVER PAGE identifies the product described in this manual.
Use the CONTENTS to find the list of CHAPTERS and PARAGRAPHS contained in the manual and their subjects.
The INSTRUCTIONS AND/OR NOTES ON THE PRODUCT define the safe working practices and advice on the correct procedures and the skills required to correctly operate and maintain the system.
Some images of this manual having been enclosed for easier identification of the described parts may not be exactly the same as the ones in your System.

0.1.4. SYMBOLS USED IN THE MANUAL

The safety and advice symbols used in this manual are used to draw the reader's attention to warnings concerning safety or indicating good working practices.
The same symbols are also placed on the machine to indicate dangerous areas and refer to the relevant safety notes in the manual.

MEANING OF THE SYMBOLS

	**WARNING! GENERAL DANGER**
	**WARNING! HIGH VOLTAGE**
	**WARNING! RISK OF CRUSHING.**
	**WARNING! LASER RADIATION DANGER**
	**GROUND CABLES** **THIS SYMBOL INDICATES GROUND REFERENCE POINT.**

0.1.5. PROCEDURE FOR UPDATING THE MANUAL IN CASE OF MODIFICATIONS TO MACHINE

If the MACHINE or MANUAL is MODIFIED in any way, an UPDATE could be sent for insertion into the printed Manual.

0.2. INSTRUCTIONS FOR ORIGINAL SPARE PART AND CONSUMABLE ORDER

To provide a fast and efficient service, always specify the following information when ordering replacement and consumable parts:

- **Machine type**: as indicated on nameplate.
- **Serial number**: as indicated on nameplate.
- **Quantity** of each item required.
- **Code** of required part.
- **Description** of required part.

0.3. SAFETY INFORMATION
0.3.1. PRECAUTIONS AND USAGE REGULATIONS

The machine must be positioned in an enclosed area that complies with the environmental requirements set out in the relevant paragraph.

	Do not install the machine in a dusty environment. Do not expose the machine to sources of heat, excessive cold, water, electromagnetic energy, or sources of smoke. The machine must be positioned on perfectly level flooring.
	Always make sure that the power cable is intact and free of any cuts or cracks. In case of cable damage, renew the cable using genuine spare parts.
	The noise level generated by the machine is less than 70 DB (measured at a distance of 1 m and at a height of 1.60 m from the floor). This value can be exceeded in certain work environments. If the noise to which the operator is exposed on a daily basis is presumably greater than 85 DB, effective hearing protections must be used, as required by the 86/188/EEC regulations.

0.3.2. GENERAL SAFETY WARNINGS

	Thor is compliant with all the safety requirements of the main European and extra-European Standards and Institutions. Despite that, it is suggested to read carefully the information contained in this chapter and in the next pages since they show the possible dangerous situations and the necessary precautions to take.
	The machine is provided with doors and guards that prevent the operator from getting in contact with mechanical and electrical hazardous parts. A periodical check on the safety devices must be performed according to the instructions provided by this manual. If the safety protection systems are damaged, turn off the machine and call the technical service.
	**High voltage parts - Risk of electric shock** No high voltage part is accessible from the User area. All the high voltage circuits are contained into enclosed areas and protected by fixed guards. The high-voltage internal parts are accessible to the maintenance operator and are protected against direct contact with dangerous parts by means of IP 2X or higher class protection. Dangerous parts are marked by the symbol indicated on the side.
	**Dangerous mechanical parts - Risk of crushing or trapping**. Internal moving parts are accessible only to technical personnel. Do not put your hands into the machine working areas. Tie hair to avoid the risk that it can be trapped in the machine. For the same reason, keep away of the machine or avoid wearing any hanging objects such as ties, necklaces, pendants or other similar items.
	**High-temperature parts - Risk of scalds** The machine includes no components or areas that may reach so high temperature as to become dangerous for the user, the maintenance operator or the technician. The areas where this risk can occur, under faulty conditions, are marked by the symbol indicated on the side.
	**Flammable parts - Risk of fire** The machine is made from materials which do not propagate fire in order to minimise fire risk. Nevertheless, the machine must be installed in a duly ventilated room, complying with the manufacturer's installation requirements. Never leave materials, fluid or foreign objects that might increase the risk and spread of a fire inside the machine.
	It is forbidden to modify the machine's internal an external protections. Contact Alfa's Technical Support Service if necessary. Alfa Srl shall bear no responsibility for any damage that may arise due to the failure to comply with the above instructions. In the event of a malfunction, contact the manufacturer's technical support service.

	**GROUND CONNECTION** Ground wire connection point. Always ensure that yellow-green ground leads are duly fastened to the ground point indicated by the symbol on the side. DO NOT REMOVE GROUND CONNECTIONS. In case of lead damage, switch machine off and immediately contact the technical service support.

IF THE EQUIPMENT HAS BEEN USED IN A MANNER NOT SPECIFIED BY THE MANUFACTURER, THE PROTECTION PROVIDED BY THE EQUIPMENT MAY BE IMPAIRED

0.3.3. USERS AND ACCESS LEVELS

The machine has three different user interfaces:

- USER: an operator who uses the machine for the purpose of producing a colour sample;
- MAINTENANCE OPERATOR: user in charge of performing ordinary maintenance operations, such as canister and tank filling, nozzle cleaning and autocap moisturising. Access to the dedicated software area is protected by a first level password;
- TECHNICIAN: an expert operator authorised to access the machine's special diagnostic, calibration, configuration, troubleshooting, and extraordinary maintenance functions. Access on the part of these operators is protected by a second level password.
- ADMINISTRATOR: a superuser who's authorised to access the machine's software in order to add or delete users, change user rights, reset passwords, etc.

In order to identify the various areas of intervention, the following definitions must be taken into account:

- USER AREA: the area outside the machine that the user accesses in order to produce a colour sample and to perform ordinary maintenance operations;
- MAINTENANCE AREA: the area inside the machine, which can be accesses with a key, where ordinary maintenance operations are usually performed (on Thor such operations are performed by the MAINTENANCE OPERATOR); extraordinary maintenance operations require the access to the SERVICE AREA and are performed by the TECHNICIAN (replacement of dispensing units, circuits, electric parts);
  SERVICE AREA (FOR USE BY TECHNICIANS): the internal areas of the machine that can not be accessed using a single key, but with other tools (circuits electrical cabinets);

1. GENERAL INFORMATION

1.1. INTRODUCTION

Thor is a dispenser to be used by an operator that can be used in medium-low productivity points of sale to produce paint cans with a volume between 100 ml and 20 litres.
Depending on the configurations, this dispenser can be provided with a variable number of circuits for dispensing of colorants, bases and semi-finished products.

Thor can be composed of the following modules:

- Colorant module (up to 16 circuits)
- Master Module (up to 5 circuits)

Circuits can be configured with pumps having different flow rate and tanks having different capacity, as described in more detail below.

The pre-filled can is loaded manually by the operator by placing the can on the suitable can lifter with adjustable height (manually).

Thanks to the accuracy and high resolution of the cutting-edge dispensing systems designed and patented by Alfa, the machine can reproduce any colour chart with exceptional precision and absolute repeatability.

1.1.1. MODELS AND VERSIONS

Thor dispenser can be configured in “Tinting” or “Master” version.
Tinting version is equipped with colorant circuits only, while Master version is also equipped with circuits to dispense semi-finished products. Both versions can be equipped with “CT” option, which allow producing 100 cc samples, thus replicating Alfa Color tester function.

A third configuration, named “Muletto” consists of a cabinet including the circuits to dispense semi-finished products.

1.1.2. THOR TINTING

THOR TINTING 12
- No.8 1.5 l tanks + no.8 0.25 l/min pumps
- No.4 3 l tanks + no.4 0.25 l/min pumps

THOR TINTING 16
- No. 12 1.5 l tanks + no. 12 0.25 l/min pumps
- No.4 3 l tanks + no.4 0.25 l/min pumps

THOR TINTING 20
- No. 12 1.5 l tanks + no. 12 0.25 l/min pumps
- No.4 3 l tanks + no.4 0.25 l/min pumps
- No.4 6 l tanks + no.4 0.25 l/min pumps (included in the lower cabinet)

1.1.3. THOR TINTING + CT

Tinting base machine can be equipped with elements which allow producing 100 cc samples (max 60 pieces), thus replicating Alfa Color tester function.
In this case, configurations are as follows:

	THOR TINTING 12 + CT	**THOR TINTING 16 + CT**
2 bases	• No.8 1.5 l tanks + no.8 0.25 l/min pumps • No.4 3 l tanks + no.4 0.25 l/min pumps • No. 2 6 l tanks + no. 2 0.25 l/min pumps • Sample kit	• No. 12 1.5 l tanks + no. 12 0.25 l/min pumps • No.4 3 l tanks + no.4 0.25 l/min pumps • No. 2 6 l tanks + no. 2 0.25 l/min pumps • Sample kit
3 bases	• No.8 1.5 l tanks + no.8 0.25 l/min pumps • No.4 3 l tanks + no.4 0.25 l/min pumps • No. 3 6 l tanks + no. 3 0.25 l/min pumps • Sample kit	• No. 12 1.5 l tanks + no. 12 0.25 l/min pumps • No.4 3 l tanks + no.4 0.25 l/min pumps • No. 3 6 l tanks + no. 3 0.25 l/min pumps • Sample kit
4 bases	• No.8 1.5 l tanks + no.8 0.25 l/min pumps • No.4 3 l tanks + no.4 0.25 l/min pumps • No.4 6 l tanks + no.4 0.25 l/min pumps • Sample kit	• No. 12 1.5 l tanks + no. 12 0.25 l/min pumps • No.4 3 l tanks + no.4 0.25 l/min pumps • No.4 6 l tanks + no.4 0.25 l/min pumps • Sample kit

Tinting version + CT is therefore equipped with two 6 l canisters with 0.25 l/min pump for white and transparent base of chosen product to prepare the samples. In the configuration with 4 canisters two different types of products can be prepared. Finally “CT” version is equipped with a “sample kit” which allows accommodating 100cc cans, relevant covers and a manual capping system.

1.1.4. THOR MASTER

THOR MASTER 12
- No.8 1.5 l tanks + no.8 0.25 l/min pumps
- No.4 3 l tanks + no.4 0.25 l/min pumps
- No.2 12 l tanks + no.1 3 l/min pump
- No. 2 6 l tanks + no. 2 0.5 l/min pumps

THOR MASTER 16
- No. 12 1.5 l tanks + no. 12 0.25 l/min pumps
- No.4 3 l tanks + no.4 0.25 l/min pumps
- No.2 12 l tanks + no.1 3 l/min pump
- No. 2 6 l tanks + no. 2 0.5 l/min pumps

MULETTO
- No.2 12 l tanks + no.1 3 l/min pump
- No. 2 6 l tanks + no. 2 0.5 l/min pumps

1.1.5. THOR MASTER + CT

CT function can be included into Thor Master by adding:

- No.1 6 l tank + no.1 0.25 l/min pump
- Sample kit

1.1.6. SPECIAL VERSIONS

Upon customer's request the machine can be customised with the requested number of circuits having different flow rates.

1.2. INTENDED AND UNINTENDED USE

The machine is designed to dispense water-based liquid paint into a vessel having a known capacity.
Any uses other than those expressly described in this manual are strictly prohibited.

DO NOT USE PAINTS OR COLORANTS NOT APPROVED BY THE MANUFACTURER

DO NOT USE FLAMMABLE LIQUIDS

DO NOT USE VESSELS WITH CAPACITIES LESS THAN 500 ML OR GREATER THAN 20 LITRES

MAKE SURE THAT THE ELECTRICAL SPECIFICATIONS AND USAGE CONDITIONS FORESEEN BY THE MANUFACTURER ARE MET PRIOR TO INSTALLATION (Para. 1.5).

1.3. DESCRIPTION OF THE MACHINE

The paragraph describes the main external and internal components of the machine and their function.

1.3.1. MAIN COMPONENTS (THOR MASTER)

1. Colorant group cabinet
2. Semi-finished product cabinet (extractable type)
3. Adjustable can base worktop
4. Autocap
5. CT kit (option)
6. Electric panel (on the back side)

1.3.2. COLORANT TURNING TABLE

The machine can house up to 16 colorant groups.
Circuits are placed on a “turning table” (1), which allows dispensing from the various circuits sequentially.

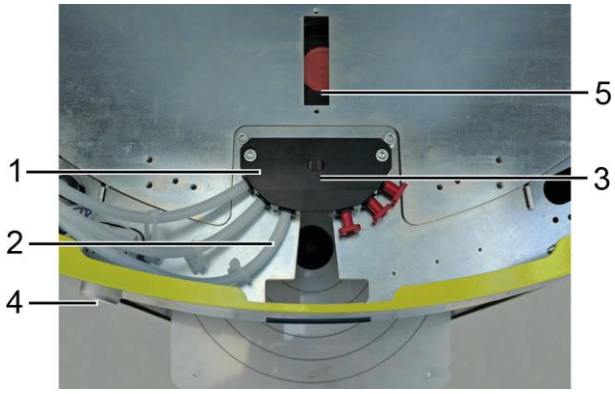
Each colorant group can be equipped with one 1.5 l or 3 l tank and is provided with its own dispensing unit.

There is only one actuator allowing dispensing (2) and is exclusively coupled with the group opposite to dispensing (in front of the operator). Therefore there is only one dispensing station, which is the same where circuit recirculation can be executed.

1.3.3. DISPENSING STATION WITH MOISTURISED AUTOCAP

The dispensing unit is on the upper part of the master module, where the sequentially dispensing units as well as the instantaneous dispensing units converge.

The figure on the side shows the front upper part of a master module with the nozzle station (1) where semi-finished products dispensing pipes (2) converge. In the central part of the nozzle station there is the hole (3) where colorants, which are placed in the upper part of the machine, are dispensed.



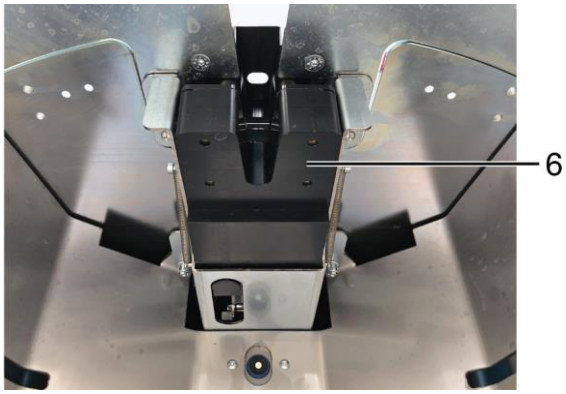
On the front panel of the machine there is a button/ignition light/status (4) which also serves as a stop control, while the autocap (6) moisturising cap (5) is partially hidden by the upper base.

The warning light can take three different statuses:

Steady light = machine ON (STANDBY/DISPENSING)
Flashing light 1s ON / 1s OFF = RESET in progress
Flashing light 0.5s ON / 0.5s OFF = ALARM

When the stop button is pressed, the machine switches to error status (ERR.10), and a RESET is required.

During the refill operations the machine is in the so-called POSITIONING status, which is characterized by a fixed light.



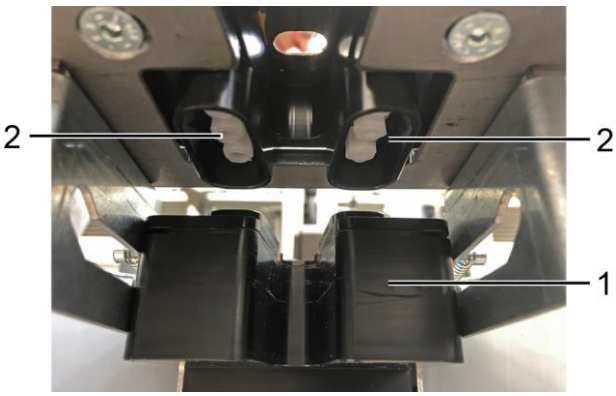
1.3.4. AUTOCAP

Autocap (1) is included in the master circuit cabinet. It is placed under the semi-finished product dispensing nozzles (2) and its function is to keep the volume around the nozzles normally closed and moisturised to prevent any product drying issues.

The unit is electronically controlled: it is opened a few seconds before dispensing, and immediately closed after dispensing is completed.

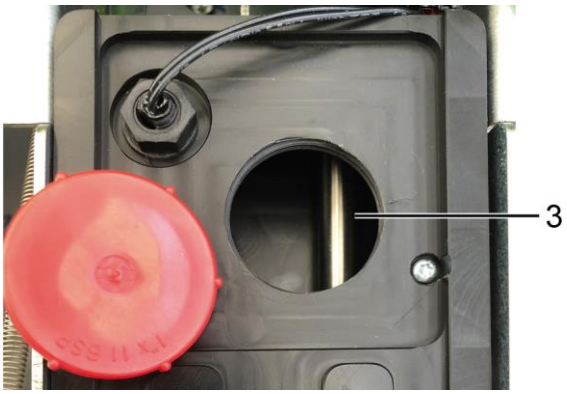
The Autocap can take two different statuses, corresponding to two different positions: CLOSED (moisturising) and OPEN (dispensing/maintenance).

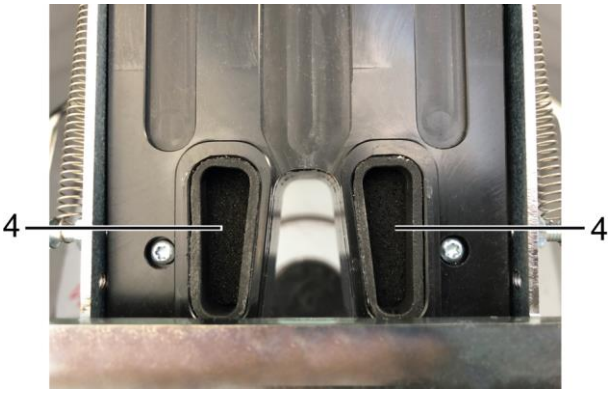
Inside the autocap there is a moisturising water tank, which is heated at suitable temperature by means of an immersed resistance.



Extract the master cabinet to access the parts to be upkept:

- Tank for distilled water (3) top-up;
- Nozzle moisturising sponges (4).



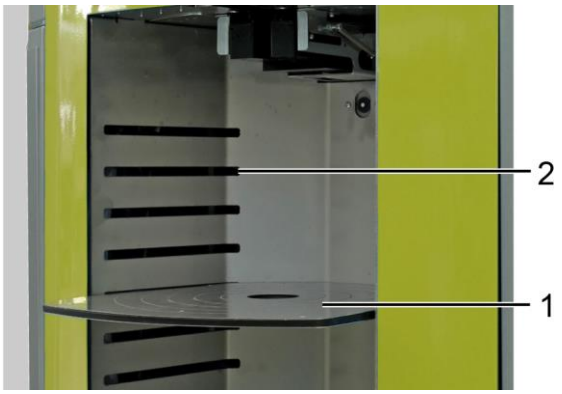


1.3.5. STOOL

The machine produces colour samples in volumes ranging from 100cc to 20 litres.

The can lifter is the adjustable base (1) on which to position the can to be filled. It can be positioned at different heights in order to accommodate cans of appropriate volumes, based on the quantity to be dispensed.
The bearing surface features concentric circles that indicate the exact position of the can according to its diameter.

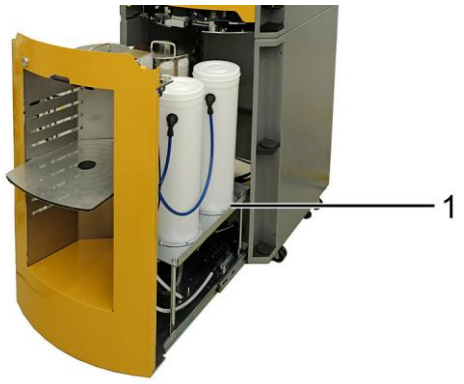
The can lifter is manually moved: the operator raises and lowers the can lifter by manually removing it from the guide (2) and repositioning it at the desired height.



1.3.6. SEMI-FINISHED PRODUCT CIRCUIT CABINET

The lower part of the cabinet is designed to accommodate the semi-finished product dispensing circuits.
The structure containing the circuits (1) is provided on a mobile carriage; for easy circuit maintenance operations extract it.

Appropriate presence sensors detect when the cabinet is not in the working position.



1.3.7. ELECTRICAL CONTROL PANEL

It is located on the rear side of the machine and provides the main electrical connections of the system.

1. On/off Switch
2. Fuse holder 5x20mm T4A 250Vac
3. Standard CT-120 Power Socket 100-240Vac
4. 4 x standard C14 connector (200W MAX*)
5. “0.100”: RJ45 socket for direct communication with the machine
6. “DHCP”: RJ45 socket for local Ethernet network connection
7. “SCALE”: Port RS-232 (for scale)
8. “USB”: port for Spectrophotometer or other USB device connection, if needed
9. “BOOT”: USB-B service port that can be used for firmware updates via BOOT

* total power available at the 4 external sockets.

NOTE:
- Port “0.100” is used for the connection of an LTE router modem;
- The port set in DHCP will take the IP address which the network to which it is connected will attribute. This will allow users connected to the same network/subnetwork to communicate with the machine.

1.3.8. LTE ROUTER MODEM

The product can be provided with a LTE connection device for an easy remote monitoring and piloting, even if no wired Ethernet connection is present.

1.3.9. “CT” OPTION

The “CT” option configured machines can dispense 100 cc paint samples, just like the samples dispensed by an Alfa ColorTester.
The CT option provides for the use of circuits for base dispensing and a “sample kit” that allows accommodating a small 100 cc can storage inside the cabinet, with relevant lids and a manual capping system.

1.4. WORK CYCLE

Following are the possible machine statuses:

STANDBY: machine ready, waiting for controls
DISPENSING: dispensing in progress
RESET: reset in progress
ALARM: machine error
DIAGNOSTIC: machine waiting for direct controls
POSITIONING: colorant circuit positioning (only for refill operations)

For further details, refer to the next part of this paragraph and to chapter 4.

1.4.1. SWITCH-ON - RESET

Upon switch-on, system runs a reset routine and sets to stand-by, thereby allowing the operator to use the Software control interface and set production of one or several colour samples.

1.4.2. OPERATOR INTERFACE AND MAINTENANCE INTERFACE

The machine use and maintenance are managed by means of web interfaces. Refer to chapter 3 – INSTALLATION – for the machine initialisation operations and to chapter 4 – HOW TO PRODUCE A COLOUR - for a description of the basic functions. For a description of the low level functions, refer to the "software manual".

1.4.3. ALARMS

The interface installed on the machine, which can be viewed using a Web Browser (e.g. Google Chrome), shows in real time any critical machine alarms requiring immediate operator intervention and preventing the use of the machine, as well as non-critical alarms, reminding the operator of (even not immediately) required service operation(s).

Critical alarms include:
- Failed autocap opening or closing
- Communication errors
- Motor movement errors (e.g. loss of steps)
- Error on can detection

Non-critical alarms include:
- Colorant quantity below the warning level
- Colorant quantity below the minimum level*

*: this alarm does not prevent the use of the machine unless a formula is set that requires a colorant volume higher than the available one (see paragraph 5 for further details).

1.4.4. STAND-BY

When the machine is not in use, it performs some activities required for a trouble-free operation. These activities include:

- Colorant stirring;
- Semi-finished product stirring;
- Semi-finished product recirculation;
- Colorant recirculation;

1.4.5. PRODUCT STIRRING AND RECIRCULATION

The product stirring and recirculation functions are carried out cyclically on all circuits, at regular intervals that can be programmed via software.
Each semi-finished product circuit is equipped with its own pump and therefore with independent timing parameters. On the contrary, colorant circuits are all simultaneously stirred at any rotation of the turning table on which the colorant groups are installed.
The default values of the duration and pause variables of each function are indicated in the following table:

	Stirring	Recirculation
Colorants	At any turning table rotation and before any colorant recirculation	1’ every 30’
Bases or Semi-finished products	30” every 30’	1’ every 30’

The parameters can be set independently for each circuit of the machine by accessing the ADMIN interface (see chap. 4 - ACCESS TO THE CONFIGURATION ADVANCED FUNCTIONS and the “software manual”).
Upon commissioning, the installing TECHNICIAN must adjust stirring and recirculation parameters depending on the recommended settings for every installed product. Access to programmable functions is described in the “Software manual”.
Every single product is stirred after dispensing. This further stirring cycle resets the relevant timer for “stirring pause”.
Stirring speed is approx. 15 rpm and can not be modified.

1.4.6. WORKING CYCLE

When the colour production input is sent, the machine performs the following work phases:

1. **CHECKING THE PRESENCE OF THE CAN UNDER THE DISPENSING NOZZLE**
2. **AUTOCAP OPENING**
3. **PAINT DISPENSING (WITH COLORANT CIRCUIT POSITIONING)**
4. **AUTOCAP CLOSING**
5. **RETURN TO STANDBY.**

The can lifter must be positioned by the operator (see chapter 4 – CAN LIFTER HEIGHT ADJUSTMENT).
NOTE: the machine does not check whether the can capacity is suitable for the amount to be dispensed!

1.5. TECHNICAL SPECIFICATIONS

1.5.1. ELECTRICAL SPECIFICATIONS

Power supply	100-240Vac ±10% 50/60Hz
Max current	5.0÷2.5A
Absorbed power	400W max (+200W AUX)
Fuses 5X20 mm	T6.0A-250V Q.ty 2pcs
Working noise (*)	Lower than 70 dB (A)

(*) A-weighted sound pressure level determined during normal use to 1 m distance far from the surface of the machinery and to 1.60 m height from the floor.

1.5.2. EQUIPMENT CLASSIFICATION AND REFERENCE STANDARDS

Overvoltage category	II See note (1)
Protection classification	IP 20
Class of equipment	I
Reference standards	IEC 61010-1 IEC EN 61326-1
Airborne noise (*)	Lower than 70 dB (A)

Note (1):
The equipment is protected for overvoltage up to 1500V. For power lines subjected to transients with peaks of voltage greater than 1500V, the use of external suitable protection devices is recommended.

1.5.3. OPERATING CONDITIONS

Operating temperature (*)	+5 ÷ +35°C
Relative humidity	30% ÷ 90% without condensate
Storage temperature	-25 ÷ +55°C
Altitude	2000 m

(*) The products (colorants and semi-finished products) lose their rheological characteristics outside the temperature range of 15÷ +35°C.

1.5.4. DIMENSIONS AND WEIGHT

COLORANT MODULES	Thor Tinting (Master)	Thor Muletto
Height (mm)	1420	1050
Width (mm)	770	770
Depth (mm)	850	850
Unladen weight (kg)	190 (240)	162

1.5.5. PRODUCTION CAPABILITY AND TECHNICAL SPECIFICATIONS

Net colour sample capacity	From 500 ml (1/4 gallon) to 20 l (5 gallons) 100 ml for “CT” versions
Colorant canister capacity	1.5, 3 litres
Semi-finished product tank capacity	6, 12 litres
Max. number of colorant circuits	12, 16 (according to configuration)
Max number of semi-finished circuits	5
Types of colorants that can be used	Universal and water-based types
Colours that can be dispensed	Infinite
Master circuit Capacity/Flow rate (for simultaneous dispensing semi-finished products)	No. 2 6 l tanks + no. 2 0.25 l/min pumps No.2 12 l tanks + no.1 1.5 l/min pump (*)
Colorant circuit Capacity/Flow rate (sequential dispensing)	0.25 litres/min
Minimum quantity that can be dispensed	1/1920 fl oz (0.0154 cc)
Semi-finished product strainer	1.2 mm
Colorant strainer	0.9 mm
Dispensing mode	Simultaneous (sequential for colorants)
Output (**)	100cc in 35 seconds

(*) Customised configurations available
(**) Output depends on type of formula and software setup

1.5.6. CONSUMABLE STORAGE

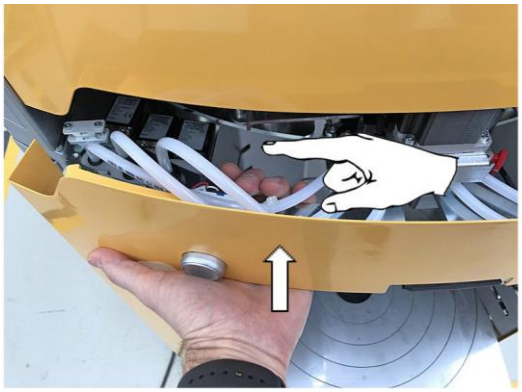
Colorants and semi-finished products	Refer to manufacturer's instructions

1.6. RESIDUAL RISKS AND DANGEROUS AREAS

USER AND MAINTENANCE OPERATOR

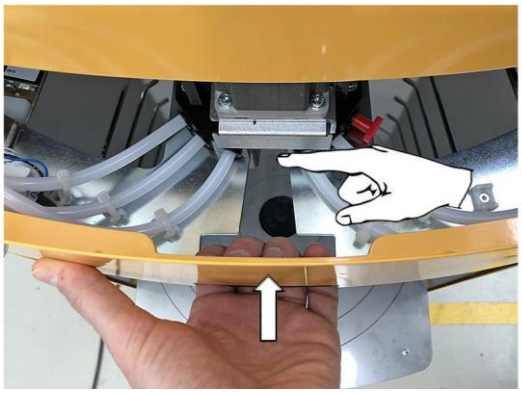
The potentially dangerous areas associated with mechanical moving parts:

- Colorant turning table movement; the colorant support base rotation during dispensing or refill operations does not present any risk that is not obvious; however, it is advisable to be careful and not to approach the parts with hands, arms, hair or clothes during operation.



- Paint tanks: risk of squeezing arms, hands or fingers due to the movement of stirring blade. The stirring cycle activation is timed by the software and may occur unexpectedly. Do not insert your hands into the tanks. Always shut off the machine prior to performing any necessary interventions.

- Master module extraction: be careful when refitting the master carriage. Possible risk of squeezing hands and fingers between the fixed and the mobile parts (figure on the side).



- Autocap movement; pay attention to possible risks of crushing. Never insert your hands or fingers between fixed protection (1) and mobile autocap (2).

TECHNICIAN: The authorised technician can remove the machine fixed protections and access the internal parts containing live electrical components.

- Electrical panel area: risk of electric shock.

Any intervention that requires the operator to access zones where risks of electric shock are present must be performed with the machine off.

	**REMOTE ASSISTANCE**: **The machine may also be remotely activated via Personal Computer or Smart device. Pay maximum attention during access to dangerous areas.**

1.6.1. CONTACT WITH COLORANTS OR BASES

Always beware of any product leaks from the machine or circuits during production, as well as during cleaning and maintenance operations.
Contact with the products (colorants or bases) can cause irritations or injuries if not properly treated.
In case of need always refer to the safety sheet of the concerned liquid, available at the colorant manufacturer.

1.6.2. GENERAL FIRST AID MEASURES

In the event of eye contact: remove contact lenses, if present. Immediately rinse the eyes with running water for at least 15 minutes, holding the eyelids open. Consult a physician immediately.
In the case of skin contact: remove the contaminated garments. Wash the skin thoroughly with soap and water.
Ingestion: immediately consult a physician and show them the can, label or material safety data sheet. Keep the person warm and relaxed. Do not induce vomiting.

1.7. CERTIFICATIONS

1.7.1. END OF LIFE TREATMENT - WEEE DIRECTIVE

This product complies with the Standard 2012/19/EU on the waste of electric and electronic equipment which abrogate Standard 2002/96/EC.

	The symbol on the equipment or on the package indicates that the equipment must not be disposed of as general waste at the end of its operating life but must be disposed of in a collection point specific for electric and electronic equipment organised by the Public Administration. The user desiring to dispose of this equipment may also contact the manufacturer and receive further information for a correct separate collection of the equipment at the end of its operating life. A correct separate collection for subsequent recycling of decommissioned equipment, treatment and environmentally compatible disposal, helps avoiding possible negative effects on the environment and on human health and promotes recycling of the materials making up the product. Therefore, the commitment to do so is a moral and civil duty for every citizen. Illegal disposal of the product by the owner causes the imposition of administrative sanctions as indicated by the law in force. For safe machine packaging and handling it is recommended to use a pallet for Thor, equipped with the necessary fixing points (see para. 2). All handling procedures must be carried out using an industrial truck or a transpallet of right capacity.

1.7.2. FCC

The manufacturer Alfa Srl - Via Santa Chiara 2 - 40137 - Bologna – Italy, declares under its own responsibility that the Thor system is compliant with the main international standards and regulations and in particular that:
For the equipment supplied with power at 100-120V, 60 Hz, Alfa declare that:

	**Thor complies with part 15 of the FCC regulations, Sub-chapters A and B - sections 15.107 (b) (e) and 15.109 (b) (g) - for Class A digital devices**

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

1.7.3. ROHS CHINA DECLARATION

	**Thor is compliant with the Chinese RoHS standard concerning pollution caused by Electronic Information Products (SJ/T11363-2006, SJ/T11364-2006, SJ/T11365-2006).**

Part Name	Toxic or Harmful Substances or Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent chromium (Cr VI)	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
Thor	O	O	O	O	O	O
O: Indicates that this toxic or harmful substance contained in all the homogeneous materials for this part is below the limit required by the SJ/T11363-2006 regulation. X: Indicates that this toxic or harmful substance contained in at least one of the homogeneous materials used for this part is above the limit required by the SJ/T11363-2006 regulation.						

1.7.4. EC DECLARATIONS

CE	The equipment complies with the following European Directives: 2006/42/EC, 2014/35/EU, 2014/30/EU, 2011/65/EU.

alfa
COLORPAINT DISPENSER

DECLARATION OF 'CE' CONFORMITY

The manufacturer **Alfa Srl** - Via Caduti di Ustica, 28 - 40012 Calderara di Reno - Bologna - Italy,
DECLARES UNDER SOLE RESPONSABILITY THAT THE DESK PRODUCTS

SERIES

THOR TINTING

THOR MASTER

FORKLIFT

TO WHICH THIS DECLARATION REFERS, ARE IN CONFORMITY WITH
THE FOLLOWING EUROPEAN UNION DIRECTIVES:

N° 2006/42/EC	of 17 May 2006 on machinery, replacing Directive 98/37/EC
N° 2014/35/UE	of 26 February 2014 on the harmonisation of the laws of the Member States relating relating to electrical equipment designed for use within certain voltage limits
N° 2014/30/UE	of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility, replacing Directive 2004/108/EC
N° 2011/65/EU	of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (recast), replacing Dir. 2002/95/EC

AND WITH PARTICULAR REFERENCE TO THE FOLLOWING IEC STANDARDS:

EN ISO12100	Safety of machinery - General principles for design - Risk assessment
EN 60204-1	Electrical equipment of machines – safety of machinery
IEC 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use
EN 61326-1	EMC requirements - Electrical equipment for measurement, control and laboratory use
EN 61000-3-2	Harmonic current emissions
EN 61000-3-3	Voltage fluctuations and flicker
EN 61000-4-2	Electrostatic discharge immunity
EN 61000-4-3	Immunity to Radio frequency electromagnetic fields
EN 61000-4-4	Immunity to Fast voltage transients on Power AC line and serial data line
EN 61000-4-5	Immunity to surge
EN 61000-4-6	Immunity to conducted disturbances, induced by radio-frequency fields
EN 61000-4-8	Immunity to power frequency magnetic fields
EN 61000-4-11	Immunity to voltage dips, short interruptions and voltage variations

PLACE AND DATE	Calderara di Reno, March 20, 2018	
NAME	Marco ROSSETTI	SIGNATURE
POSITION	President	

Person authorised to compile the technical file:
Mr Marco ROSSETTI
Via Caduti di Ustica 28 - Calderara di Reno (BO) - Italy

Last two digits of the year in which the CE marking was affixed: 16

Alfa S.r.l.
Headquarters: Via Caduti di Ustica, 28 I-40012 – Calderara di Reno (BO), Italy
Tel. +39 (0) 51 0828494 **Fax** +39 (0) 51 0823283
Registered Office: Via Santa Chiara, 2 I- 40137 – Bologna, Italy
VAT: IT-03364471205 – REA BO: 513367 – Shared Capital € 500.000,00 f.p.

2. UNPACKING

2.1. GENERAL RECOMMENDATIONS

The machine is delivered on a wooden pallet covered with corner protectors and triple wall cardboard in order to avoid any risk of damage during transport.
All the accessories supplied are contained in the same wooden case.

2.1.1. DIMENSIONS OF THE PACKAGE

The dimensions of the package depend on the machine configuration.

	ThorTinting (Master)	Thor Muletto
Pallet width (mm)	75	75
Pallet depth (mm)	80	80
Height on pallet (mm)	183	183
Weight of packed Thor (kg)	242 (271)	191

	**WARNING:** **DO NOT PERFORM ANY OPERATION BEFORE CAREFULLY READING THE WHOLE OPERATOR'S MANUAL.**
	**WARNING:** **HANDLE WITH A DOUBLE FORK-LIFT TRUCK, TRANSPALLET OR SIMILAR DEVICE WITH A CAPACITY OF AT LEAST 500KG.**
	**NOTE:** **NEVER DISPOSE OF THE MACHINE PACKAGING IN THE ENVIRONMENT AFTER UNPACKING. TAKE IT TO THE SPECIFIC COLLECTION POINT.**

2.2. UNPACKING

The unpacking procedure described in this paragraph is conceptually valid for all the individual packages, regardless of the configuration.

- Using a cutter, carefully remove the straps.
- Lift the wooden cover (1), remove it and place it on the ground close to the machine.
- Slide the cardboard box upwards and remove the internal Pluriball protections of the machine.
- Cover (1) has to be stored undamaged. It can be used as a ramp to unload the machine from the pallet.

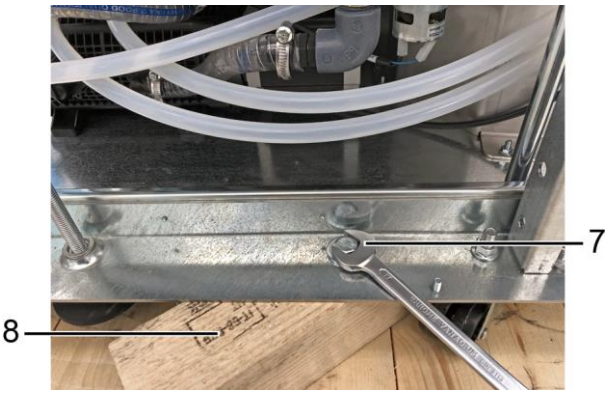
To free the machine from the pallet, remove the cover outer panels and the fixing screws securing the machine to the pallet. In order to do so, proceed as follows:

- Remove the low rear panel by loosening no.4 button head M6x12 retaining screws (2) with a 4 mm Allen key.

- Remove the two side panels by loosening the M6x12 TCEI screw present under each panel (3) using a 5mm Allen key; then slide the panel towards the back of the machine so that the slots present in the lower part of the panel (4) are released from the anchor pins present on the base.

- Using two 17 mm wrenches, block the nut under the pallet (5) and loosen the no.3 M10x150 screws (6) securing the base to the pallet.

- Similarly, loosen the two screws on both sides of the machine (7).
- Adjust the wheels so that they slightly touch the pallet, then remove the wood spacers that are between the machine and the pallet (8).



- Slowly push the machine on the pallet by letting it slide on the wheels.

This operation must be performed by at least two operators, keeping the machine from both sides to avoid unbalances, overturning or loss of control during the descent. Check that the footboard does not move when the machine passes from the pallet to it.

- Place the machine in its installation place, on a surface suitable for sustaining its weight or on perfectly smooth and level flooring.

Refer to chapter 3 – INSTALLATION to lower the supporting feet and complete the installation.

2.3. OPENING PACKAGE AND CHECKING THE CONTENT

After unpacking, make sure all parts are in place and that the machine does not show any internal or external damage or evident fault.

The supplied accessories are housed in a well-visible position.

Make sure all these accessories are provided:

- Power cable;
- Connecting cable;
- Ethernet cable;
- User's manual;
- Spare fuse kit;
- Autocap sponge kit.

2.4. MOVING THE MACHINE

Thor must only be moved under conditions of maximum safety.

In order to move the machine with the cabinet, it is possible to raise the support feet and use the dedicated wheels.

IN ORDER TO AVOID THE RISK OF PAINTING SPILLS INSIDE THE MACHINE, NEVER MOVE THE MACHINE WITH THE COLORANT CIRCUITS FULL.

BEWARE OF ANY STEPS OR IRREGULARITIES IN THE FLOORING/TERRAIN THAT COULD RESULT IN SUDDEN STOPPAGES, AS THESE COULD CAUSE MACHINE TO BECOME UNBALANCED. ALWAYS PROCEED AT A LOW SPEED WITH TWO PEOPLE HANDLING THE MACHINE AT ALL TIMES.

For bigger movements, it is necessary to use a suitable lifting mean. In this case, proceed as follows:

- Switch the machine off and disconnect all electric connections (power supply, ethernet, etc.);
- remove PC, keyboard, monitor and any other device from the machine bearing surfaces;
- Push the machine on the forks of a forklift truck or a manual lift truck having a suitable capacity, after checking the weight of the configuration in section 1.5.4 of the operator's manual;

EMPTY ALL TANKS OR BRING THEM TO MINIMUM LEVEL BEFORE LIFTING AND/OR MOVING THE MACHINE.

LIFT THE MACHINE CAREFULLY, TAKING CARE TO MAKE SURE THAT IT IS GRIPPED PROPERLY AND IS NOT AT RISK OF TIPPING OVER

- Handle the machine using the forklift truck and position it in the required space.

Always place the machine on a surface suitable for sustaining its weight or on perfectly smooth and level flooring.

Once the movement has been completed, lower the support feet to stabilise the machine and reconnect the electrical circuits. Use a spirit-level to level the machine.

3. INSTALLATION

3.1. CHOOSING THE ROOM

The machine must be installed in a manned room, complying with the requirements in chapter 1.

DO NOT INSTALL THE MACHINE OUTDOORS OR ANYWHERE EXPOSED TO WEATHER.

THE EQUIPMENT IS NOT SUITABLE FOR INSTALLATION IN AREAS WHERE WATER SPRAY COULD BE USED.

ONLY INSTALL ON SMOOTH, FLAT AND STEADY FLOOR, ABLE TO SUSTAIN THE MACHINE FULL-LOAD WEIGHT.
THE MACHINE MUST BE POSITIONED ON A HORIZONTAL SURFACE (FLOORING WITH A GRADE BELOW 2%)

INSTALLATION ON INTERMEDIATE FLOOR IS ALLOWED ONLY IF THE REQUIRED LOAD BEARING CAPACITY IS VERIFIED (>1000KG/SQ.M).

INSTALL THE MACHINE AT 5-10 CM FROM THE WALLS, AND ENSURE THAT THE ROOM EASILY ALLOWS YOU TO EASILY OPEN THE SERVICE COMPARTMENTS AND THAT THE CIRCUIT BREAKER CAN BE EASILY ACCESSED.

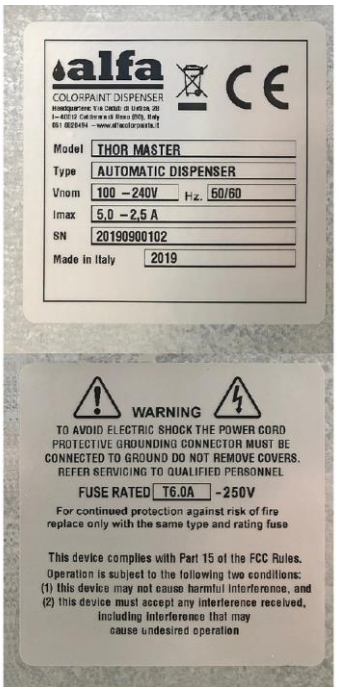
3.2. PRODUCT LABEL AND ELECTRICAL CONNECTION

Make sure that the system meets the electrical requirements specified on the machine nameplate, then connect the power cable to the socket.

- Model: machine model
- Type: machine type
- Vnom: power supply voltage
- Hz: mains frequency
- Imax: absorbed current*
- SN: serial number
- Made in Italy: year of manufacture
- Fuse Rate: fuse value

The machine is equipped with a detachable power cable for connection to the mains.
Connect the machine to the mains using exclusively the cable supplied.
Always make sure that the voltage output from the mains is compatible with the nameplate specifications.

* maximum absorbed current in case of use of Thor at full load and of AUX sockets (see chap. 1 – ELECTRICAL CONTROL PANEL) with load of 200W.



	USE ONLY LISTED DETACHABLE POWER SUPPLY CABLES NOT EXCEEDING 4.6 M. LENGTH, TYPE SVT OR SJT, 3X18 AWG 10 A, WITH GROUND CABLE.

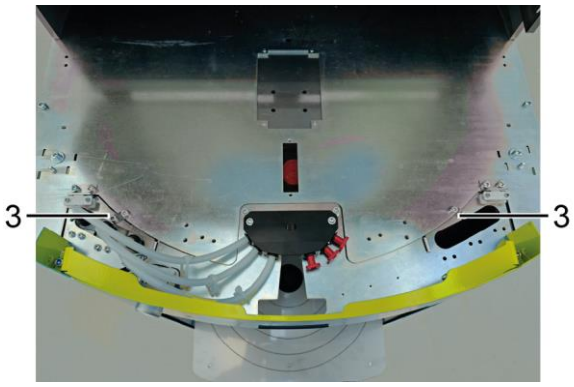
To ensure the correct machine operation and the highest safety level, it is essential that the machine is connected to ground. Make sure that the system is connected to a power supply with an efficient ground.

	WARNING: ONLY CONNECT THE MACHINE TO ELECTRIC SYSTEMS PROVIDED WITH GROUND CIRCUIT CONNECTION COMPLIANT WITH THE NATIONAL STANDARDS.

3.3. COMMISSIONING - INSTALLATION

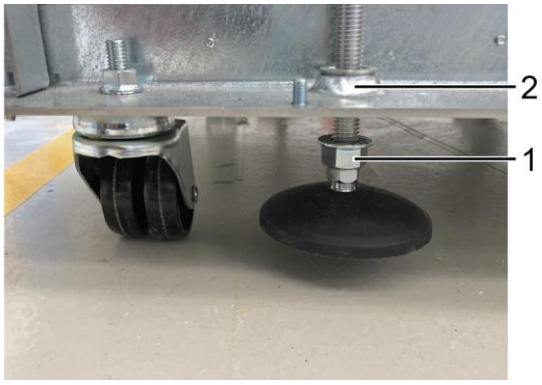
3.3.1. REMOVING THE MECHANICAL AND PARKING RETAINERS

- The semi-finished product carriage is secured to the machine by means of two small brackets. Loosen the screws and the brackets (1) with a 4 mm Allen key.



Once the machine is in the correct position, it must be stabilized on the adjustable supporting feet, acting as follows for each one of the 2 feet:

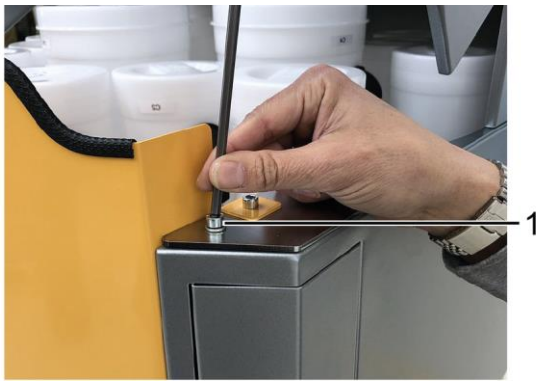
- Work on the nut/recess located at the base of the screw (1) with a 10mm wrench to lower the foot until the nearby wheel is completely lifted. As an alternative, tighten an M12 nut fully home on the insert (2) and work on it to lift or lower the foot using a 19mm wrench.
- Use a spirit level to correct the height of the 2 feet until obtaining a good alignment.
- Use an M12 nut to lock the foot;

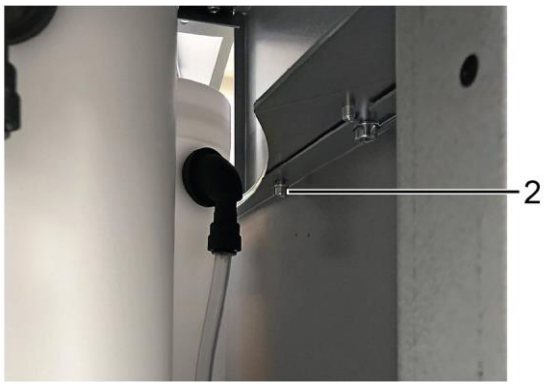


3.3.2. UNLOCKING TURNING TABLE

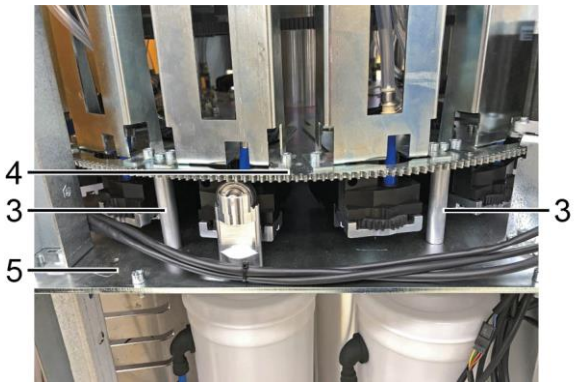
The turning table is fixed to the cabinet by 4 columns that prevent rotation during transport. Unlock the turning table as follows:

- Remove the upper side panels by loosening the M6 TCEI screw (1) with a 5 mm Allen key and the M5 TCEI screw (2) inside the machine with a 4 mm Allen key. To reach the internal screw access from the rear panel. The side panel can then be removed by sliding it towards the back of the machine.





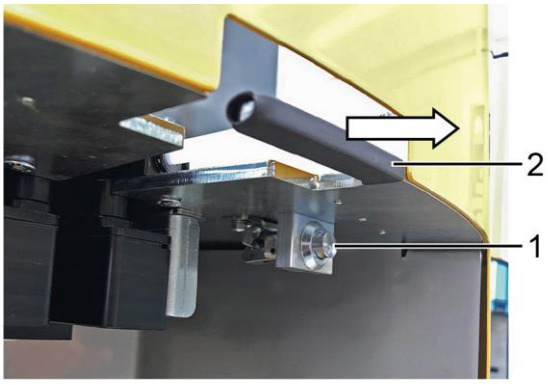
- Remove the 4 columns (3), two on each side of the turning table securing the turning table (4) to the fixed base (5) by loosening the corresponding M5 TCEI screws on top of each column and the M6 TCEI screws under each column.



3.3.3. SEMI-FINISHED PRODUCT CARRIAGE EXTRACTION

To extract the base carriage from the cabinet the safety lock has to be released:

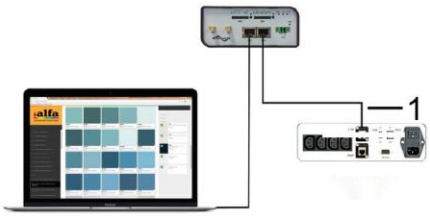
- Press button (1) and extract the cabinet by acting on handle (2).



3.3.4. CONTROL PC INSTALLATION

Connect the PC to a suitable power socket. If AUX sockets available on the Alfa tinting machine are used, check the electrical characteristics on the data plate.

Then connect the PC Ethernet plug to the machine Ethernet socket (or to LTE modem, if any) using the cable supplied with the machine. For the first setup of the machine or to retrieve the DHCP IP address assigned by the network to a machine connected to the LAN, it is necessary to connect to the “0.100” (1) port of the machine.



If an LTE modem router is used, refer to the next paragraph.

Connect the accessories required, such as monitor, mouse, keyboard, and printer if necessary.

DISCLAIMER

Alfa machines are set for local network communication with third party devices and for access to services via internet (alfa-cloud, alfa-service in VPN, etc.) using Ethernet or wireless interfaces.

These systems are NOT designed to be directly used online, as they do not ensure the necessary cyber security protection.

Direct exposure of network interfaces to the internet network without a firewall or similar protection system poses a cyber security risk, that must be avoided with a suitable configuration at the time of installation and for which Alfa srl is not responsible.

3.3.5. CONTROL SOFTWARE

To control the dispenser, Alfa makes the web-based interface called AlfaTint available to all its customers.
In case you wish to apply your own software, Alfa provides a series of calls (API Rest) allowing interfacing the machine with any third-party software.
For more details on the API Rest, please refer to the technical manual or contact Alfa Service Department.

In the following, we will refer to AlfaTint interface commands.

3.3.6. LTE ROUTER MODEM INSTALLATION (OPTIONAL)

LTE modems supplied by Alfa are always configured to provide router-machine communication at the address 192.168.0.100.

In case the router is used, it will be necessary to start VPN connection by using the specially provided certificate and to connect to the router IP by setting the last digits of the IP address to 100 (see technical manual for more detailed information).

Different LTE Routers may be supplied, depending of the destination market of the machine.
With reference to the figure on the side, the upper model (1) is suitable for North American markets (Mexico, USA, Canada), whereas the lower model (2) can be used elsewhere in the world. Further models can be used in specific areas where special type-approval requirements are necessary (e.g. Australia).

- Connect the machine Ethernet 0.100 plug to one of the two Router Ethernet sockets and the PC Ethernet plug to the other Router Ethernet socket;
- Connect the power cable present inside the router box between modem PWR connector and 24Vdc socket available in the internal power supply unit. As an alternative, it is possible to use the power supply unit included in the package, to be directly connected to an external mains socket.
- Screw the antenna supplied (3) to ANT threaded connector;
- Insert a data SIM into SIM1 slot, taking care to previously check that no PIN is enabled (before inserting the SIM into the router, insert the SIM into a telephone and disable the PIN if necessary).
  NOTE: In some types of modem, SIM1 slot can be located in the rear part of the modem.

Check that the accessory kit includes:

- Modem
- Network cable
- No. 2 antennae

If necessary the antenna equipped with cable and magnet can be used.

3.4. SWITCH-ON AND INITIALISATION

Connect a PC to the machine Ethernet “0.100” socket using the supplied Ethernet cable, then proceed as described.

- Update the PC network configuration so that the IP address is within the same subnet as that of the machine (see the adjacent example).
- The machine default IP address is 192.168.0.100.
- For more information on how to modify your PC's IP address, contact your IT administrator.
- Turn on the machine by turning the on switch to its “I” position.

MACHINE:

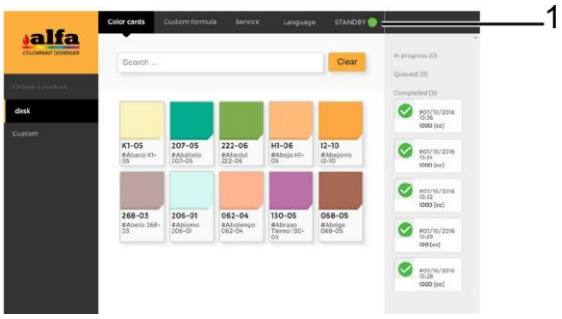
IP: 192.168.0.100
NETMASK: 255.255.255.0

PC:

IP: 192.168.0.XXX
NETMASK: 255.255.255.0

xxx = free subnet address

- Open the Alfa TINT control interface on the Internet browser (preferably Chrome or Mozilla Firefox) and enter the address indicated in the figure.
- When the interface displays the window shown in the figure, the machine is ready to be commissioned and used.
- If the window is not displayed, check the Ethernet connection.



On top right you can always see the machine (1) status.
Upon switch-on, the machine is in ALERT status (red status indicator).
To use the machine it is necessary to perform a RESET. When the operation is completed, check that the STAND-BY status is displayed.

If the machine shows alarm or error warnings, check type of alarm and take the required steps to restore proper operation (see Chapter 8 - Trouble Shooting).

If machine does not switch on, check that power voltage is correct and fuse is not blown.
For further details on malfunction issues, please refer to Chapter 8 "Trouble Shooting".

WARNING: if you are unable to communicate with the machine via the web browser, turn off the machine and contact the manufacturer's technical support service.

3.5. SWITCH-OFF

In order to switch off the machine, turn the main switch to its “O” position and disconnect the power cable from the socket.

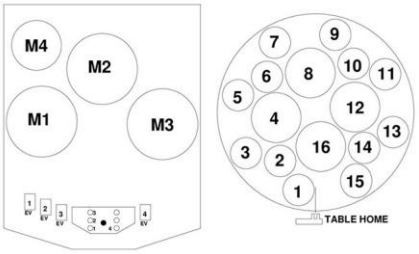
WARNING: in order to disconnect the machine, the operator must not rely exclusively upon the power switch, but must also unplug the machine power cable.

NOTE: The Thor is provided with an integrated board whose aim, among other things, is to maintain the internal 12V power supply for the time required to safely shut down the Linux board (approx. 60 seconds). Any voltage interruptions or dips with a shorter duration do not cause machine switching off by the PC.

3.6. COMMISSIONING - PREPARATION

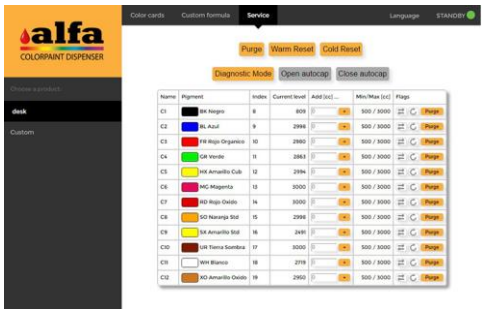
3.6.1. DYE CANISTER LOADING

Each colorant group is matched to a hardware address.
By convention, colorant order is as shown in figure below.
The canisters are always marked with labels from C1 to Cn, according to the actual number of present circuits.



The position-colorant association can be viewed by accessing the special software section.

Such associations can be modified by qualified TECHNICAL personnel. For further information, refer to the Software manual.



Upon first installation, the technician must set the proper tinting system and fill the tanks according to the proper sequence.
To load the products refer to chapter 5.
WARNING: Do not overfill the tanks.
Then, trigger the circuits and leave them in recirculation mode for the time needed (see chapter 3 - RECIRCULATION).
The tinting system loaded on the machine can be changed, as well as the colorant software indexing. These operations are reserved to authorised technical staff.
To see or change the positions associated with each colorant, please refer to machine configuration (ref. "Software manual").

3.6.2. SEMI-FINISHED PRODUCT LOADING (THOR MASTER VERSION)

The semi-finished products must be loaded in the semi-finished product carriage tanks. Fill as follows:

- Extract the semi-finished product (1) carriage.
- Remove the covers (2) and fill the tanks with the product indicated by the software.

The semi-finished product carriage can have different configurations; the circuit numbers are indicated on the circuits.

WARNING: Do not overfill the tanks.
Refer to paragraph 5 for the correct filling methods.

3.6.3. MOISTURISING FUNCTION

The autocap, if present, includes the components necessary to keep the nozzles humidified in order to prevent or reduce the drying of the products at the nozzle ends.

The system is composed of a distilled water tank built inside the autocap, of a resistance and of a level sensor.

Safety function
A level sensor allows detecting when the level of the liquid inside the tank is low and allows the machine to disable moisturising function until the liquid level is restored. If the level is too low the alarm “TOO LOW WATER LEVEL” will be displayed by the machine.

Operation parameters
The machine periodically activates the resistance according to factory preset power levels and intervals, as shown in the table below.

	Closed autocap	Open autocap
Power	20W x 0.3 (PWM 30%)	20W x 0.3 (PWM 30%)
Repetition interval	200”	60”
Duration	55”	20”

Parameters can be changed by authorised operators (see technical manual and/or software manual).

When switching on the machine, perform the autocap moisturising as described in chapter 6 – AUTOCAP CLEANING AND MOISTURISING.

3.6.4. SEMI-FINISHED PRODUCT CIRCUIT OPENING

Under the tanks there are the relevant pumping units provided with shut-off valves (1). Upon commissioning and before testing the circuits, check that the valves are open.

3.6.5. CIRCUIT TRIGGERING AND RECIRCULATION

Before using the machine, trigger circuits and leave them in recirculation mode.

Once the circuits are full, it is recommended to perform some purge cycles and leave the machine in stand by mode for at least 12 hours, a period of time usually sufficient to remove the residual air from the circuits.

3.6.6. SETUP OF CIRCUITS

The machine is now ready to be initialised or for producing the first sample.

Typically, the machines leave the factory with all circuits already characterised and ready to be used with the colorants of the tinting system specified in the order.
When using dyes that are not yet characterised on a software level, the circuits need to be set up first.

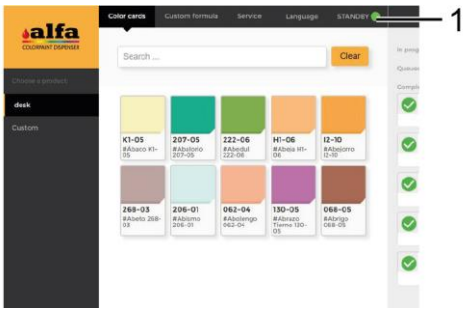
An incorrectly characterized machine can cause significant color production errors. Circuit setup is a procedure reserved for expert technicians so, if necessary, contact Alfa-authorised Technical Service. Circuit setup execution modes are described in the Software Manual.
Once the recirculation and setup stages are completed, the machine is ready for dispensing a test sample and commissioning.

Refer to "How to produce a sample” to perform a test production run.

4. HOW TO PRODUCE A COLOUR

4.1. MACHINE STATUSES

On top right of the Alfa TINT software interface you can always see the machine (1) status. Following are the possible machine statuses:



STANDBY: machine ready, waiting for controls
DISPENSING: dispensing in progress
RESET: reset in progress
ALARM: machine error
DIAGNOSTIC: machine waiting for direct controls

The direct controls are described in the following paragraphs.

4.2. PRODUCTION OF A COLOUR

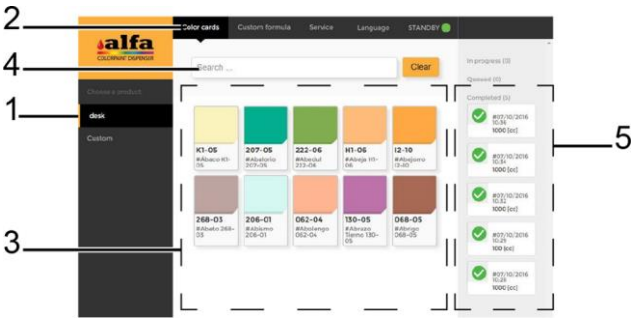
Once the system is installed, it is possible to start the production. To produce a colour, follow the instructions provided in this paragraph.

4.2.1. ADJUSTMENT OF THE STOOL HEIGHT

Adjust the can lifter height so that the distance between the upper edge of the can to be used and the nozzle is of 2-3cm.

- To modify the height, manually remove the table top (1) and place it in the appropriate height rail (2).

4.2.2. FORMULA SELECTION AND DISPENSING



Formulas concerning different types of product (e.g.: washable paints for outdoor use / washable paints for indoor use / quartz /...) can be loaded onto the machine, each one of them characterised by its own set of original formulas. The types of products are listed in the column on the left (1).

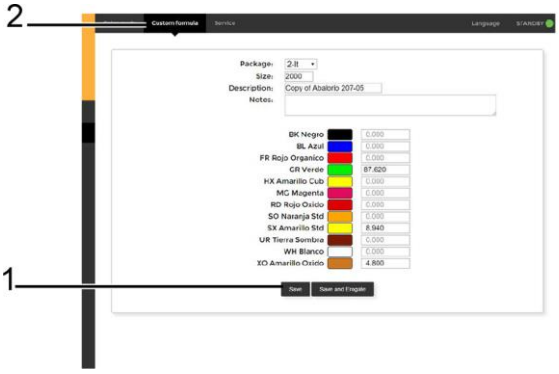
Start the control interface Alfa TINT on the browser web

- Select the desired product type (1).
- The Color cards tab (2) shows a preview of the available colours (3) and a search bar (4) where to enter the name or code of the desired colour.

The right column (5) shows the chronology of the last dispensing cycles.

- By selecting a colour, the display will show the dispensing window (see figure on the side).
- In the “Select package size” drop-down menu, select the desired volume ensuring that it is consistent with the volume of the can being used.
- Then press “Dispense” to start dispensing or “Edit” to change the formula.
- Before starting the dispensing, the machine will check, by means of a sensor, the actual presence of the can under the nozzle; if this is not the case, the display will show the message "Please Insert Can".
- To add a package with different volume, not present in the drop-down menu, refer to the software manual (Recipes >> Packages).
- During the dispensing, the machine is in DISPENSING status. When the dispensing is completed, if there are no errors, the machine will return in STANDBY mode.

4.2.3. CREATION OF A NEW FORMULA AND CHANGE OF AN EXISTING ONE



If a formula is modified starting from a laboratory one or if a new formula is created from scratch, this formula is not saved among the laboratory ones but in dedicated and different space (e.g. Custom Formulas).

Once an existing formula has been selected, the Edit control allows accessing the “Custom formula” tab that contains the formula editing functions.
To edit the recipe starting from the selected formula, enter the values in cc of the relevant components.
The software offers the possibility to save the formula without activating it, by means of the “Save” control (1) or to save the formula and activate it (“Save and Erogate” control).
The name assigned by default to the modified formula is “Copy of oldformulaname”. The name can be edited together with a field for notes that will be saved with the new formula.

The display mentioned above can be accessed directly even from the initial page by selecting the “Custom formula” tab (2) and can be used to create a new formula. In this case, the default values of the components will be all to zero.

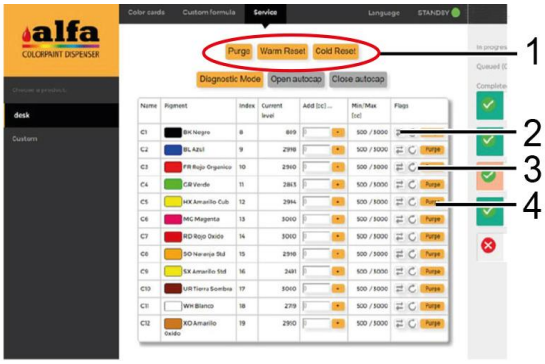
All formulas customized by the operator can be viewed even if they do not have a coloured label, in the “Custom formulas” product menu (3).

At the end of the dispensing, remove the can and close it carefully, then place it in a mixer unit to mix the paint.

4.3. SERVICE ADVANCED FUNCTIONS

The “Service” tab allows accessing useful functions for the diagnosis and maintenance operations. Inside this interface it is possible to send the following direct controls to the machine:

- Purge
- Warm Reset (without movements)
- Cold Reset
- Open Autocap
- Close Autocap
- Start/Stop Recirculate Circuit (2)
- Start/Stop Stirring Circuit (3)
- Purge Circuit (4)
- Refill



The first three controls (1) are available also with machine in stand-by mode. The other controls are available only after switching the machine to “Diagnostic” (5) by pressing “Diagnostic Mode”.

NOTE: when the stirring command is given for a colorant, all the colorants are stirred, since the stirring function of the colorants on Thor is associated with the rotation of the table.

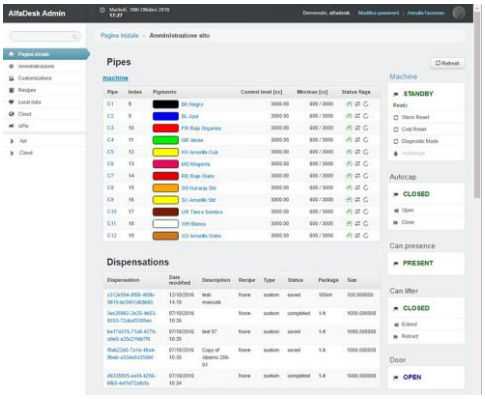
In diagnostic mode it is also possible to enter the product quantities added during the circuit refill (see chapter 5 – MAINTENANCE).

At the end of the service operations, quit the DIAGNOSTIC mode by starting a Reset.

- Cold Reset: performs a complete reset of the machine by starting all movements to search the photocells.
- Warm Reset: quits the Diagnostic mode by performing only the strictly necessary movements.

4.4. ACCESS TO THE CONFIGURATION ADVANCED FUNCTIONS

The access to the configuration and diagnostic functions is allowed only to authorised and qualified TECHNICIANS.



After the authentication, the specialised TECHNICIAN can access the “Admin” interface (figure on the side), from which it is possible to manage the configuration advanced functions, the alarms and the diagnosis.

System administrator can create new users with different credentials and assign customised passwords. It is recommended to carefully store the password since it is not saved anywhere so it cannot be recovered if lost.

If you lose the password, contact system administrator and request a new temporary password.

For further details consult the Software manual.

5. ORDINARY MAINTENANCE AND ADJUSTMENTS

5.1. INTRODUCTION

The following paragraphs describe the circuit top-up operations as well as the instructions for simple adjustments that can be performed by the operator.
Namely:

- Colorant and master tanks top-up

Please refer to Chapter 6 for lubrication and cleaning of the machine.

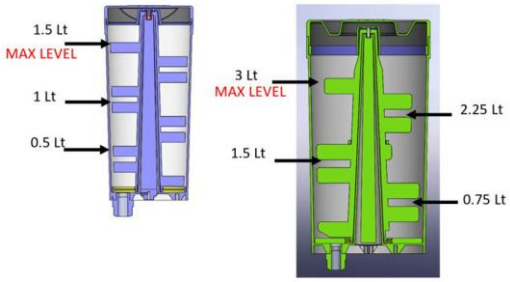
THE OPERATIONS DESCRIBED IN THIS CHAPTER MAY REQUIRE ACCESS TO DANGEROUS SERVICE AREAS.
ACCESS TO SERVICE AREA IS RESERVED TO TRAINED AND AUTHORISED STAFF (MAINTENANCE OPERATOR, SEE PARA. 0. – USERS AND ACCESS LEVELS).

5.2. TANK AND CANISTER TOP-UP

When the machine indicates that the product reserve level has been reached, it is necessary to top up the relevant canister or tank and then record the top-up operation. In order to perform this operation, proceed as follows:

Colorant group canisters:
Top-up using only the canister in the front part of the machine.
To top-up colorant proceed as follows:

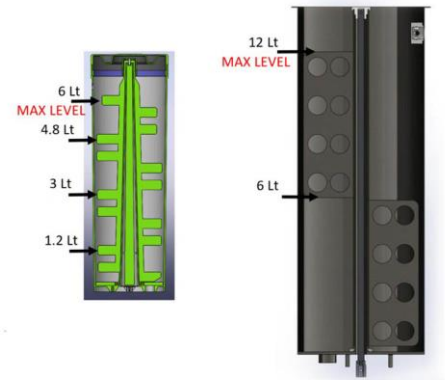
- Open AlfaTint “Service” tab and press REFILL button of the circuit to be topped-up.
- Once the table has completed rotation (if necessary) the circuit will be in the front position and will be ready for top-up.
- Remove the canister lid.
- Fill the canister with the appropriate pigment up to the indicated maximum level (MAX LEVEL).



NOTE: The cross element can be used to support a container when you leave it to drain. Do not overfill beyond the recommended level.

Base and semi-finished product tanks:
To top-up semi-finished product circuits, if any, proceed as follows:

- Extract the base/semi-finished product carriage from the Thor cabinet.
- Remove the cover of the tank/tanks to be topped up.
- Top up the circuits using the suitable product. Do not overfill beyond the level indicated by the end of the stirring blade (MAX LEVEL).

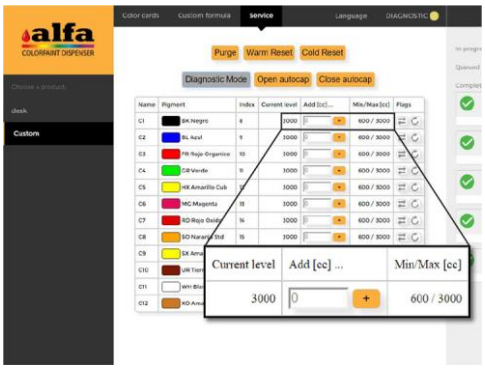


At the end of the top-up operations, close the lids of the filled circuits and refit the carriage inside the cabinet, then record the just carried out operation in the software (see next paragraph).

5.3. RECORDING THE OPERATION

After each top-up operation it is necessary to record in the software the product added quantity:

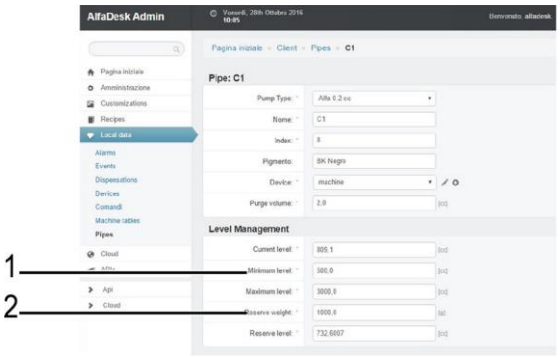
- Access the “Service” section and then “Diagnostic Mode”;
- In the “Add [cc]” field enter the volume in cc of the product supplied in the circuit, then press “+”.
- Repeat this operation for each topped-up circuit.
- Perform a reset to quit the DIAGNOSTIC mode.



5.4. MINIMUM AND RESERVE LEVEL

For each circuit it is possible to define a reserve level (that can be checked by means of the hardware sensor) and a minimum level (that can be checked via software).
If the product volume is lower than the reserve level (1) detected by the sensor, the system shows an alarm.
If the volume is lower than the minimum level (2) calculated by the software, the system disables the circuit and does not supply that product until the circuit is topped-up.

Every time a dispensing control is sent, the software calculates if the volume of each product in the machine is sufficient to perform the formula so that the residual volume is not lower than the minimum set one. In case even only one of the components of the formula is not sufficient, the system requires the operator to select another formula.



5.5. ADJUSTING MINIMUM LEVELS

Thor is not provided with minimum level sensors. Levels are only software controlled.

5.6. PRODUCT DISPOSAL

During the maintenance or repair interventions it may be necessary to empty canisters and tanks from the paints contained in the circuits.

Colorants and base must be disposed of in suitable collector tanks to be treated and disposed of in a suitable way.

It is forbidden to release the products in the environment or in the public sewers.

6. ORDINARY MAINTENANCE AND CLEANING

6.1. SCHEDULED MAINTENANCE

The following table indicates the scheduled maintenance recommended by Alfa.

SERVICE OPERATION	INTERVAL
Lubrication	none
Autocap cleaning and moisturising	weekly
Nozzle cleaning + Purge	daily
Machine external cleaning	monthly
Machine internal cleaning	monthly
Strainer cleaning	every 12 months
Changing fuses	If needed
Functional check of door and trolley sensors	weekly

This chapter describes the service operations required at regular intervals to ensure machine trouble-free operation.

OPERATIONS DESCRIBED IN THIS CHAPTER REQUIRE ACCESS TO DANGEROUS SERVICE AREAS. ACCESS TO SERVICE AREA IS RESERVED TO TRAINED AND AUTHORISED STAFF (MAINTENANCE OPERATOR, SEE PARA. 0. – USERS AND ACCESS LEVELS).

	**TO ENSURE CORRECT AND TROUBLE-FREE MACHINE OPERATION, IT IS NECESSARY TO PERIODICALLY CARRY OUT THE MAINTENANCE OPERATIONS BELOW AS PER THE MANUFACTURER'S INSTRUCTIONS.**
	**IF THE MAINTENANCE OPERATIONS ARE NOT CARRIED OUT IN ACCORDANCE WITH THE INSTRUCTIONS PROVIDED, ALFA SHALL NOT BE HELD LIABLE IN ANY WAY FOR ANY MACHINE PROBLEMS AND MALFUNCTIONS.**
	**ALWAYS TURN OFF THE MACHINE BEFORE PROCEEDING TO MAINTENANCE AND CLEANING.**
	**IT IS STRICTLY FORBIDDEN TO REMOVE COVERS AND SYSTEM PROTECTIONS.**

6.2. SERVICE EQUIPMENT

Below is a list of the required equipment for the service operations.

Blotting paper, clean cloth/sponge

Plastic spatula

Thin metal wire or clip (to clean colorant nozzles)

Thin tip tool or 2.5 mm flat screwdriver (for cleaning master nozzles)

22 mm open wrench

Funnel (for humidifier top-up)

6.3. LUBRICATION

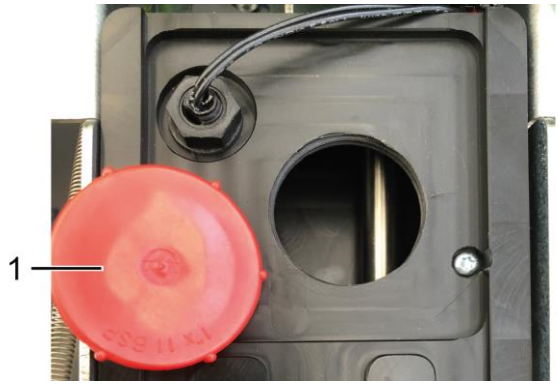
In terms of ordinary maintenance, the machine requires no scheduled lubrication by the MAINTENANCE OPERATOR.

6.4. AUTOCAP CLEANING AND MOISTURISING (IF ANY)

Humidifier level refilling

In case of low level:

- Extract the base/semi-finished product carriage from the cabinet.
- Refill by loosening the red cap (1) and adding distilled water.
- Screw the cap again to prevent evaporation phenomena.
- Refit the carriage inside the Thor cabinet.



REFILL WITH DISTILLED WATER ONLY

During refilling, it is recommended to use a funnel to prevent the risk of water spilling outside the tank. In case of accidental water spillage during refilling, thoroughly dry the wet parts with blotting paper.

Autocap sponge cleaning

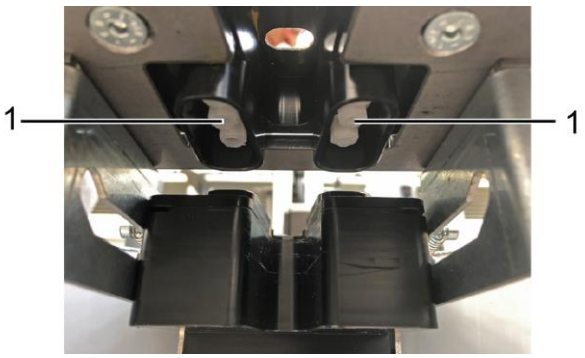
It is recommended to periodically clean the sponges present inside the autocap cover, as described below:

- Open AlfaTint Service tab in DIAGNOSTIC mode (refer to chap. 4 - SERVICE ADVANCED FUNCTIONS), then press button “Open Autocap”.
- Remove the sponges (1), if necessary use a metal wire. Wash them with running water.
- Refit the sponges to their original positions.
- Press Alfatint “Close Autocap” button to close autocap, then reset to exit DIAGNOSTIC mode.

6.5. NOZZLE CLEANING

It is recommended to periodically make sure nozzles are free of scale, deposits or colorants settled and dried up.
WARNING: The problem might be made worse by insufficient moisturising of the autocap unit.
Visually inspect nozzles every day, before starting up the machine.
To inspect and clean the nozzles proceed as described below:

- Open AlfaTint Service tab in DIAGNOSTIC mode (refer to chap. 4 - SERVICE ADVANCED FUNCTIONS), then press button “Open Autocap”.
- Clean the dispensing nozzles using a tool with a thin metal tip to remove any dry residues from the outlet channel.
- Press Alfatint “Close Autocap” button to close autocap, then reset to exit DIAGNOSTIC mode.



After this procedure, always perform a purge cycle (see the following paragraph).
NOTE: The maintenance operator does not have to clean colorant group nozzles.

6.6. PURGE

This function consists in dispensing a small quantity of product from one or several circuits, so as to ensure proper cleaning of the dispensing circuits and prevent settling or drying out issues that could compromise machine operation. During purge, products are unloaded into a can, which must be properly placed under the dispensing nozzle.

From the diagnostics interface, the MAINTENANCE OPERATOR can execute the command to purge the individual circuit, as well as an automatic purging operation, which dispenses a small amount of colorant from all the circuits present on the machine.

To force a machine purge command, proceed as follows:

- Access the Service interface (see Chapter 5 and access “Diagnostic Mode”);
- Place a can under the dispensing nozzle;
- Start the purge cycle by pressing the relevant control (“Purge”);
- Wait for the machine to complete the cycle, and check to make sure that no alarms have been generated;
- When the cycle is completed, remove the previously-positioned can.
- Reset the machine.

6.7. EXTERNAL CLEANING

The machine requires no special precautions for cleaning.
Clean external surfaces using a cloth wetted with water, degreaser, or denatured alcohol at 90%.
Do not use solvents or abrasive products.
Do not use water jets to clean the machine.

6.8. INTERNAL CLEANING

- Use a spatula to remove any dry residues from the surfaces.
- Clean machine inside by vacuuming dust and dirt. If needed, use a brush.
- Clean any surfaces that could not be cleaned with the above-described methods using a cloth (or blotting paper) wetted with water.

Be careful not to damage the electric parts and in particular the optic forks of the machine.

6.8.1. SPILLING OF COLORANTS OR PAINTS

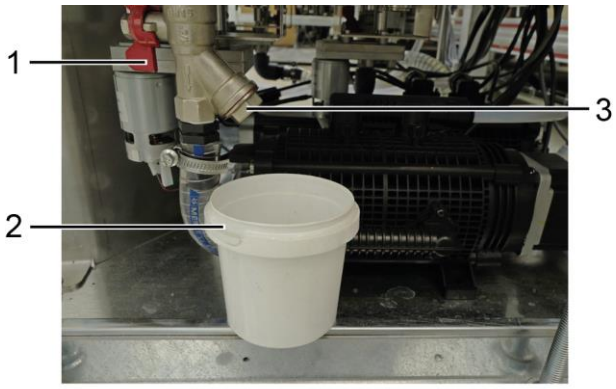
Colorant or paint may be spilled during normal use or topping-up.
The best way to clean residues is to remove the dry product with a spatula.
Should you need to clean parts from liquid colorant spilling, use blotting paper, sponges or dry cloths, trying to remove as much product as possible without using water.
It is recommended not to use water or other liquids to rinse.

DO NOT USE SOLVENTS OR ABRASIVE PRODUCTS
Drain and wash the vessels in a suitable washing circuit for collecting colorant waste (DO NOT RELEASE IN THE ENVIRONMENT NOR IN THE CIVIL SEWER SYSTEM).

6.8.2. SEMI-FINISHED PRODUCT CIRCUIT FILTER

Upstream of the dispensing pumps, at the outlet of the tanks, there can be a combined valve including a tap and a filter.
It is recommended to periodically clean the filter, since during use it tends to hold all impurities of the products.
Have this operation performed by qualified TECHNICIANS. For filter cleaning, contact technical service every 12 months.
Clean filter as follows:

- Close tap upstream of filter (1);
- Set a vessel under the filter bottom end (2);
- Loosen the filter holder cap using a 22 mm wrench (3);
- Remove filter and flush with fresh water to clean it;
- Refit filter and its screw cap, then work tap to open the circuit;



NOTE: A properly positioned can will prevent the product in the filtering compartment from falling and contaminating the surfaces below.

6.9. REPLACING THE FUSES

In case of mains malfunction or problems, the safety fuses could blow and cut power.
Fuses are located in the fuse holder built in the plug with switch on the back panel (see chapter 1 - ELECTRICAL CONTROL PANEL)
To change it, remove power plug and open fuse holder using a flat screwdriver to prise it open.
Lift the fuse holder until it can be manually removed.

	**USE ONLY FUSES OF THE SAME TYPE AND THE NOMINAL RATING SHOWN IN THE PRODUCT LABEL (SEE PARA. 3.2).** **Fuse requirements:** **EU - IEC 60127 Approval** **US - UL248-1 and UL248-14 Approval**

	**WARNING** **THE FUSE MUST BE REPLACED WHEN THE MACHINE IS SWITCHED OFF AND THE POWER CABLE IS UNPLUGGED FROM THE MAINS.**

6.10. CHECK OF THE CORRECT OPERATION OF THE DOOR CONTROL SENSORS

Periodically, at least once a week, check the correct operation of the door opening and trolley extraction sensors. To carry out the check:

- open the upper door;
- check that the AlfaTint software detects the ALARM status, thus preventing the dispensing of a formula;
- close the door and reset the error;
- extract the trolley, checking again that the machine sets to ALARM status.

If an ALARM status is not detected, interrupt the production activities and contact the Service.

7. EXTRAORDINARY MAINTENANCE

The extraordinary maintenance operations require access to the service areas and area reserved for specialised technicians.

ALWAYS ENTRUST THE SPECIAL MAINTENANCE INTERVENTIONS TO AN AUTHORISED SUPPORT CENTRE.

THE MACHINE POWER CABLE MUST BE UNPLUGGED FROM THE MAINS BEFORE ACCESSING THE SERVICE AREA AND BEFORE PERFORMING ANY REPLACEMENT/REPAIR OPERATIONS. IT IS ALSO RECOMMENDED TO POSITION THE CABLE SO THAT THE PLUG IS ALWAYS VISIBLE TO THE OPERATOR DURING THE COURSE OF THE MAINTENANCE INTERVENTION.

ALFA SHALL BEAR NO RESPONSIBILITY FOR ANY MACHINE MALFUNCTIONS OR PROBLEMS THAT MAY ARISE DUE TO THE OMISSION OR INCORRECT EXECUTION OF THE MAINTENANCE OPERATIONS.

ONCE THE REPAIR INTERVENTION HAS BEEN COMPLETED:

- **RESTORE ALL THE ELECTRICAL CONNECTIONS**
- **RESTORE ALL THE GROUNDING CONNECTIONS**
- **REINSTALL ALL THE REMOVED PROTECTION DEVICES**
- **PLUG THE MACHINE TO THE MAINS**
- **PERFORM A FUNCTIONAL CHECK BY FOLLOWING THE PROCEDURE DESCRIBED IN PARAGRAPH 3.4 AND CHAPTER 4**

8. TROUBLE SHOOTING

Error code	Error detected	Error description	Resolution of the problem
1	TIMERMG_TEST_FAILED	Timer operation test failure	Test failure means that the program on the MAB board has stopped working. Restart the program
2	EEPROM_COLOR_CIRC_PARAM_CRC_FAULT	Circuit parameter CRC fault	Check for the absence of parameters in the case of MAB replacement. Load the master/colorant circuit parameters onto the new MAB board
3	EEPROM_CALIB_CURVES_PARAM_CRC_FAULT	Calibration curve parameter CRC fault	Check for the absence of parameters in the case of MAB replacement. Load the calibration parameters onto the new MAB board
5	EEPROM_SLAVES_EN_PARAM_CRC_FAULT	Slave configuration CRC fault	Check for the absence of parameters in the case of MAB replacement. Load the SLAVE configurations onto the new MAB board
8	EEPROM_HUM_20_PARAM_CRC_FAULT	Humidifier 2.0 parameter CRC fault	Check for the absence of parameters in the case of MAB replacement. Load Humidifier 2.0 parameters onto the new MAB board
9	EEPROM_CIRCUIT_PUMP_TYPES_CRC_FAULT	For each circuit type pump CRC fault	Check for the absence of parameters in the case of MAB replacement. Load the types of pumps onto the new MAB board
10	USER_INTERRUPT	Machine operation Software interruption	HALT has been pressed
11-18	TIMEOUT_COM_MAB_ACT B“X”, where “X” = 1..8	"X" BASE slave communication time-out (detected on the MAB side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the ”X” BASE slave board
19-34	TIMEOUT_COM_MAB_ACT C“Y”, where “Y” = 1..16	Slave “Y” COLORANT communication time-out (detected on the MAB side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the ”Y” COLORANT slave board
51	AUTOCAP_IDX	Slave AUTOCAP communication time-out (detected on the MAB side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the AUTOCAP slave board

Error code	Error detected	Error description	Resolution of the problem
53	HUMIDIFIER_IDX	Slave HUMIDIFIER communication time-out (detected on the MAB side)	Check the HUTBRD power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the HUMIDIFIER slave board
54	TIMEOUT_COM_MAB_ACT_TINTING	TINTING slave communication time-out (detected on the MAB side)	Verify the MMT power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the TINTING Slave board
59	TIMEOUT_COM_MAB_MGB	MAB-MGB Communication time-out	Check MAB and MGB power supply wiring and replace it if damaged. Check the SERIAL communication connectors, and visually check the hardware of the 2 boards
61-68	B"X"_BASE_TOUT_ERROR, where "X" = 1..8	"X" BASE slave communication time-out (detected on the SLAVE side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the "X" BASE slave board
69-82	C"Y"_COLOR_TOUT_ERROR, where "Y" = 1..16	Slave "Y" COLORANT communication time-out (detected on the SLAVE side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the "Y" COLORANT slave board
101	AUTOCAP_TOUT_ERROR	AUTOCAP slave communication time-out (detected on the SLAVE side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the AUTOCAP slave board
102	HUMIDIFIER_20_TOUT_ERROR	HUMIDIFIER slave communication time-out (detected on the SLAVE side)	Check the HUTBRD power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the HUMIDIFIER slave board

Error code	Error detected	Error description	Resolution of the problem
103	TINTING_TOUT_ERROR	TINTING slave communication time-out (detected on the SLAVE side)	Verify the MMT power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the TINTING Slave board
201	RESET_TIMEOUT	RESET process time-out	The RESET process was NOT completed within the maximum set time. Check for a mechanical jam in the dispenser and eliminate it if possible
202	TIMEOUT_SUPPLY_START	Time-out at Dispensing start	Dispensing did NOT start within the maximum set time. Check for a mechanical jam in the dispenser and eliminate it if possible
203	TIMEOUT_SUPPLY_FAILED	Dispensing duration time-out	Dispensing did not end within the maximum set time. The formula is too long, or check for a mechanical jam in the dispenser and eliminate it if possible
230	AUTOCAP_HOME_POS_ERROR	Loss of steps: deviation upon the detection of slave AUTOCAP HOME position	Verify the cleanliness of the mechanical parts and sensors, and remove any residues if necessary. Verify the integrity of the motor and replace it if deterioration is encountered. If any mechanical parts are damaged or jammed, remove or change the mechanical parts in question. Verify the electrical connections and change them if damaged. Check the photocell sensors and reposition them or change them if damaged.
301-308	B”X”_BASE_RESET_ERROR, where “X” = 1..8	"X" BASE slave reset procedure duration time-out	Verify the cleanliness and positioning of the photocell mounted on the ”X” BASE, then clean or reattach the sensor. Verify the integrity of the “flag”, the pusher, the motor, and the connectors, and replace the parts or the entire unit if any mechanical wear or damage is found. If the communication is present but an electronic type problem remains, replace the SCCB board.

Error code	Error detected	Error description	Resolution of the problem
342	AUTOCAP_HOMING_ERROR	Loss of steps: deviation upon the detection of slave AUTOCAP HOME position	Verify the cleanliness of the mechanical parts and sensors, and remove any residues if necessary. Verify the integrity of the motor and replace it if deterioration is encountered. If any mechanical parts are damaged or jammed, remove or change the mechanical parts in question. Verify the electrical connections and change them if damaged. Check the photocell sensors and reposition them or change them if damaged.
346	TINTING_PUMP_RESET_ERROR	Tinting Pump reset procedure duration time-out	Verify the integrity of the Pump motor, of connectors, the connection on the MMT board
347	TINTING_VALVE_RESET_ERROR	Tinting Valve reset procedure duration time-out	Verify the integrity of the Valve motor, of connectors, the connection on the MMT board
348	TINTING_TABLE_RESET_ERROR	Tinting Table reset procedure duration time-out	Verify the integrity of the Table motor, of connectors, the connection on the MMT board
351-358	B"X"_DATA_SUPPLY_FAILED, where "X" = 1..8	Invalid table parameters	Check for consistency errors between the tables and the circuit installed on the machine. Verify the proper installation of the calibration tables in the Machine menu.
359-374	C"X"_DATA_SUPPLY_FAILED, where "X" = 1..16	Invalid table parameters	Check for consistency errors between the tables and the circuit installed on the machine. Verify the proper installation of the calibration tables in the Machine menu.
401-408	B"X"_SUPPLY_CALC_ERROR, where "X" = 1..8	In CONTINUOUS dispensing the Number of steps of the "X" BASE to carry out is NOT a multiple of a whole stroke	Check for consistency errors between the tables and the circuit installed on the machine. Verify the proper installation of the calibration tables in the Machine menu.

Error code	Error detected	Error description	Resolution of the problem
409-424	C"X"_SUPPLY_CALC_ERROR, where "X" = 1..16	In CONTINUOUS dispensing the Number of steps of the "X" COLORANT to carry out is NOT a multiple of a whole stroke	Check for consistency errors between the tables and the circuit installed on the machine. Verify the proper installation of the calibration tables in the Machine menu.
451-475	DISABLED_REQUIRED_CIRCUIT_"X"_ERROR, where "X" = 0..24	"X" Slave must dispense but is erroneously Disabled	Load the Slave configurations onto the new MAB board.
501-508	B"X"_COLOR_HOME_POS_ERROR, where "X"=1..8	Error in the HOMING procedure of the "X" BASE	Check the correct operation of the photocell and the correct movement of the "X" BASE stepper
534	TINTING_VALVE_HOME_POS_ERROR	Error in the HOMING procedure of the Tinting Valve	Verify the correct operation of the 2 photocells and the correct movement of the stepper
535	TINTING_TABLE_HOME_POS_ERROR	Error in the HOMING procedure of the Tinting Turning Table	Verify the correct operation of the photocell, that there is at least one flag on the table and the correct movement of the stepper
551-558	B"X"_COLOR_HOME_BACK_ERROR, where "X" = 1..8	Loss of steps error in "X" BASE Dispensing	Decrease the dispensing speed
601-608	B"X"_COLOR_POS0_READ_LIGHT_ERROR, where "X" = 1..8	At the end of the movement from HOME position to POS0 the photocell is NOT engaged in the "X" BASE	Check photocell and stepper operation
609-624	C"X"_COLOR_POS0_READ_LIGHT_ERROR, where "X" = 1..16	At the end of the movement from HOME position to POS0 the photocell is NOT engaged in the "X" COLORANT	Check photocell and stepper operation
633	TINTING_PUMP_POS0_READ_LIGHT_ERROR	Tinting Pump Home photocell NOT engaged at the end of pump step movement, or never engaged within an undefined time or number of steps, or NOT engaged during Tinting Table movement	Check Home photocell and Stepper operation
634	TINTING_VALVE_POS0_READ_LIGHT_ERROR	No. 2 Valve photocells NOT engaged during Tinting Table movement or at the end of Homing procedure, or CLOSED valve during Dispensing	Verify operation of the 2 photocells and stepper
651-658	B"X"_COLOR_END_STROKE_READ_DARK_ERROR, where "X" = 1..8	At the end of the dosing stroke the photocell is engaged in "X" BASE	Check photocell and stepper operation

Error code	Error detected	Error description	Resolution of the problem
701-708	B_"X"_OVERCURRENT_ERROR, where "X" = 1..8	"X" BASE stepper motor overcurrent	Check wirings, stepper operation
733	TINTING_PUMP_OVERCURRENT_ERROR	Overcurrent on a Tinting Pump stepper motor driver jumper	Verify wirings and operation of Pump L6482H driver on MMT board
734	TINTING_VALVE_OVERCURRENT_ERROR	Overcurrent on a Tinting Valve stepper motor driver jumper	Verify wirings and operation of Valve L6482H driver on MMT board
735	TINTING_TABLE_OVERCURRENT_ERROR	Overcurrent on a Tinting Table stepper motor driver jumper	Verify wirings and operation of Table L6482H driver on MMT board
751-758	B"X"_SOFTWARE_ERROR, where "X" = 1..8	Logic error in the process statuses on "X" BASE	Replace electronic board, if the problem persists request a Firmware update
759-774	C"X"_SOFTWARE_ERROR, where "X" = 1..16	Logic error in the process statuses on "X" COLORANT	Replace electronic board, if the problem persists request a Firmware update
791	AUTOCAP_SOFTWARE_ERROR	Logic error in the process statuses on AUTOCAP	Replace electronic board, if the problem persists request a Firmware update
792	TINTING_PUMP_SOFTWARE_ERROR	Logic error in the Tinting Pump process statuses (including the Valve)	Replace the MMT electronic board, if the problem persists request a Tinting Firmware update
793	TINTING_TABLE_SOFTWARE_ERROR	Logic error in the Tinting Table process statuses	Replace the MMT electronic board, if the problem persists request a Tinting Firmware update
801-808	B"X_COLOR_DRV_OVER_CURR_TEMP_ERROR, where "X" = 1..8	"X" BASE Stepper motor overtemperature	Check wirings, stepper operation
841	AUTOCAP_DRV_OVER_CURR_TEMP_ERR	AUTOCAP Stepper motor overtemperature	Check wirings, stepper operation
851-858	B"X_COLOR_OPEN_LOAD_ERROR, where "X" = 1..8	Load missing in "X" BASE Stepper	Check wirings, stepper operation
891	AUTOCAP_OPEN_LOAD_ERR	Load missing in AUTOCAP Stepper	Check wirings, stepper operation
895	TOO_LOW_WATER_LEVEL	Insufficient Water level in Humidifier tank	Refill Water in the tank. If the problem persists, check connection of the level sensor to the board that manages it

Error code	Error detected	Error description	Resolution of the problem
896	HUMIDIFIER_20_PARAM_ERROR	Error in Humidifier 2.0 parameters reception	Check the correctness of parameters sent. The duration of Pump and Heater activation must NEVER be greater than Period
898	TEMPERATURE_ERROR	Error in Temperature measurement	Check connection of T/H Sensor housing board with HUTBRD board. Check that T/H sensor is not wet. If the problem persists, replace the board and/or the connection cable
899	TEMPERATURE_TOO_LOW	Temperature on board the machine too Low	Check Heater operation
907	TINTING_TIMEOUT_TABLE_MOVE_ERROR	Timeout expired during Tinting Table Homing, or in positioning to one circuit	Verify Tinting Table stepper motor wirings, the Table characteristic parameters sent to the Tinting and operation of Table photocell
908	TINTING_TABLE_SEARCH_POSITION_REFERENCE_ERROR	The reference mark found in the Tinting Table Homing differs from the theoretical value set by a quantity in steps greater than the tolerance set	Verify that there is a reference mark on the Tinting Table, that the Table characteristic parameters sent to the Tinting are correct and operation of Table photocell
909	TINTING_LACK_OF_CIRCUITS_POSITION_ERROR	Absence of the circuit positional table at the beginning of a Tinting Table positioning	The self-learning procedure has not been completed correctly, or has never been carried out
911	TINTING_SELF_LEARNING_PROCEDURE_ERROR	Error in the Self-learning procedure of the Tilting Table: at the start the Table is not on the Reference mark, or the Table photocell is not engaged, or the number of circuits found is > 16, or the number of circuits found in one rotation direction is different from the other	A Reset must be successfully completed before performing Self Learning. Check Tinting Table photocell operation

Error code	Error detected	Error description	Resolution of the problem
912	TINTING_BAD_PUMP_PARAM_ERROR	No response within the timeout set when the Pump parameter setting command is sent to Tinting, or when the Tinting Pump characteristic parameters are incorrect	Check 485 MAB- Tinting connections. Verify the set parameters and send the command to set the Pump parameters again
913	TINTING_BAD_TABLE_PARAM_ERROR	No response within the timeout set when the Table parameter setting command is sent to Tinting, or when the Tinting Table characteristic parameters are incorrect	Check 485 MAB- Tinting connections. Verify the set parameters and send the command to set the Table parameters again
914	EEPROM_PUMP_PARAM_CRC_FAULT	Tinting Pump parameter CRC fault	Check for the absence of parameters in the case of MAB replacement. Load the Tinting Pump parameters onto the new MAB board
915	EEPROM_TABLE_PARAM_CRC_FAULT	Tinting table parameter CRC fault	Check for the absence of parameters in the case of MAB replacement. Load Tinting Turning Table parameters onto the new MAB board
916	TINTING_BAD_PERIPH_PARAM_ERROR	No response within the timeout set when the Peripheral units setting command is sent to Tinting, or when the command parameters are incorrect	Check 485 MAB- Tinting connections. Verify the set parameters and send the command to set the Peripheral units again
918	TINTING_PUMP_PHOTO_HOME_READ_DARK_ERROR_ST	The Tinting Pump Home photocell is engaged while it should not be engaged	Verify pump home photocell and Tinting stepper operation
919	TINTING_PUMP_PHOTO_INGR_READ_LIGHT_ERROR	Wrong status of the Tinting Pump coupling photocell: it is engaged but it should not be engaged and vice versa	Verify Pump and Tinting Stepper coupling photocell operation. Verify the Pump characteristic parameters sent to the Tinting

Error code	Error detected	Error description	Resolution of the problem
920	TINTING_TABLE_TEST_ERROR	Tinting Table test failed: the starting position is NOT on the reference mark, or no circuit has been detected, or the number of detected circuits is > 16, or the position of at least one detected circuit in one direction differs from that in the opposite direction by a quantity in steps > of the set threshold, or the position of at least one detected circuit differs from that obtained in the Self Learning of a quantity > of the set threshold, or the map of detected circuits differs from that configured by software	Perform a Reset and try the Table Test again, verify the operation of the Tinting Table photocell, check the consistency between the circuits present on the Table and those configured in the software, try again to perform Self Learning, increase the tolerance on the positions of the Table by sending the Table Parameter configuration command again
922	TINTING_BASES_CARRIAGE_ERROR	Base carriage off-position when the machine is NOT in Diagnostic mode	Replace the carriage into its position. Verify carriage microswitch wiring on Tinting board
923	TINTING_PANEL_TABLE_ERROR	Open panel for Refill on the Tinting Table when the machine is NOT in Diagnostic mode, or it is in Diagnostic mode and you want to activate operations involving the movement of something that is NOT the Rotation of the Tinting Table	Close the panel. Verify the Tinting board panel microswitch wiring
923	TINTING_PANEL_TABLE_ERROR	Open panel for Refill on the Tinting Table when the machine is NOT in Diagnostic mode, or it is in Diagnostic mode and you want to activate operations involving the movement of something that is NOT the Rotation of the Tinting Table	Close the panel. Verify the Tinting board panel microswitch wiring
926	TINTING_HEATER_OPEN_LOAD_ERRO R	No load at CN4 output reserved to water heating Resistance on MMT board	Verify the connections and wiring of the Heating Resistance on the MMT board
927	TINTING_HEATER_OVERCURRENT_TH ERMAL_ERROR	Current circulating in the water heating resistance is higher than the threshold set in the MMT board driver, or overtemperature detected on the driver	Verify the connections and wiring of the Heating Resistance on the MMT board
934	TINTING_PUMP_MOTOR_THERMAL_SH UTDOWN_ERROR	Tinting Pump stepper motor controller internal overtemperature	Shut off the machine, wait some minutes and turn in on again. If the problem persists, verify the electric connections with the Pump stepper motor. If the problem persists, replace the MMT board

Error code	Error detected	Error description	Resolution of the problem
935	TINTING_VALVE_MOTOR_THERMAL_SHUTDOWN_ERROR	Tinting Valve stepper motor controller internal overtemperature	Shut off the machine, wait some minutes and turn in on again. If the problem persists, verify the electric connections with the Valve stepper motor. If the problem persists, replace the MMT board
936	TINTING_TABLE_MOTOR_THERMAL_SHUTDOWN_ERROR	Tinting Table stepper motor controller internal overtemperature	Shut off the machine, wait some minutes and turn in on again. If the problem persists, verify the electric connections with the Table stepper motor. If the problem persists, replace the MMT board
937	TINTING_PUMP_MOTOR_UNDER_VOLTAGE_ERROR	Tinting Pump stepper motor controller gate control voltage too low	Verify the electric connections with the Pump stepper motor. If the problem persists, replace the MMT board
938	TINTING_VALVE_MOTOR_UNDER_VOLTAGE_ERROR	Tinting Valve stepper motor controller gate control voltage too low	Verify the electric connections with the Valve stepper motor. If the problem persists, replace the MMT board
939	TINTING_TABLE_MOTOR_UNDER_VOLTAGE_ERROR	Tinting Table stepper motor controller gate control voltage too low	Verify the electric connections with the Table stepper motor. If the problem persists, replace the MMT board
940	EEPROM_TINTING_COLORANTS_STEPS_POSITION_CRC_FAULT	CRC fault of positional table of the circuits on the Tinting Table stored on the MMT board EEPROM	Perform Tinting Table Self-Learning. If the problem persists, replace the MMT board

Error code	Error detected	Error description	Resolution of the problem
984-1007	C"X"_TURN_TABLE_MISCMATCH_POSITION_ERROR, where "X" = 1..24	The circuits detected at the end of the Tinting Table Homing do not coincide with those found by the Self-Learning and stored in the MMT board EEPROM, or the positional tables of at least one circuit found in the two directions by the Self-Learning differ by a quantity in steps > of the tolerance set in the Table parameter configuration command, or the positional table of at least one circuit found by the Self-Learning differs from the theoretical value of a quantity in steps > of the tolerance set in the Table parameter configuration command, or incorrect matching between the positional table found in the Self-Learning and the colorant configuration set in the software	Verify Tinting Table photocell operation. Repeat Self-Learning, verify that the circuits physically present on the Table coincide with those set in the software configuration page, increase the Tolerance on the positions of the circuits and postpone the Tinting Table parameter setting command
1000	SCALE NOT RESPONDING	The scale is not connected to the machine	Connect a scale to calibrate it, or disable the scale Device within machine configuration in Admin mode

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