PARTS, SYSTEMS AND AUTOMATIONS FOR FLUID DISPENSING

USE AND MAINTENANCE MANUAL

METERING SYSTEM DA – 1000V

COD.: **DTVI_DA1000V_2434**
REV.: **04**
DATE: **08/01/2026**

TRANSLATED FROM ORIGINAL
Read carefully before use!

EN

Summary

1 GENERAL INFORMATION

This manual contains information regarding the installation, use, maintenance and end of life of the component and provides indications for the most appropriate behavior for correct operation. This manual has been designed to be simple and as immediate as possible, with a subdivision between chapters and sub-chapters that allows any desired information to be found quickly. Furthermore, the manual begins by giving a general description of the content, then an overview of the component, to arrive at aspects of safety, transport, installation and use and finally the end of life. In case of doubts about the interpretation or reading of this document, please contact the manufacturer.

DAV Tech disclaims all responsibility relating to improper use of the component. Comply with what is specified in this manual.

Read this manual before handling the component or performing any action on it

The manual constitutes an essential safety requirement and must accompany the component throughout its entire life cycle.

It is the responsibility of the end user to optimize the functionality of the component, always keeping in consideration the purpose for which it was built.

This manual must be kept, together with the attached documentation, in good condition, readable and complete. Furthermore, it must be stored near the component or, in any case, in a place accessible and known to all personnel who use the component itself or who must carry out maintenance or inspection interventions. In the event that the manual deteriorates or is no longer complete, a copy must be requested from the manufacturer, indicating the manual code and revision.

The manual is intended for personnel who use the component (operators), who perform maintenance on it (maintenance technicians), and personnel who must carry out checks or inspections. The manufacturer is not liable for damage to the component caused by personnel who have not followed the indications contained within the manual itself.

In case of doubts about the correct interpretation of the information contained in this manual, please contact the manufacturer.

WARRANTY

During the design phase, materials and components were carefully selected for implementation in the project and subjected to routine inspection prior to delivery. All elements, from fastening assemblies to control mechanisms, have been engineered and manufactured with an appropriate safety factor to withstand loads exceeding those encountered during normal operating conditions.

For additional notes regarding equipment warranty provisions, please refer to Section 7 of the "GENERAL CONDITIONS OF SALE AND WARRANTY" form issued during either the quotation or order confirmation phase.

1.1 Symbology

The following symbols are used to give greater impact to the importance of the concept to be conveyed.

ATTENTION!
Refers to a warning that could lead to minor damage (minor injuries, damage to the component requiring maintenance technician intervention).

DANGER!
Refers to a major event that could cause significant damage (death, permanent injury, irreversible component failure).

NOTE. Indicates relevant information or elaboration.

OBLIGATION. Indicates an activity that must be performed, related to both the component and the manual.

REFERENCE. Refers to an external document that is important to view.

Furthermore, the symbol list is integrated with that of personnel authorized to use the component and their function, together with other symbols used within the manual.

Operator
Qualified person capable of operating on the component, performing adjustment, cleaning, start-up or restart operations. The operator is not authorized to perform maintenance.

Mechanical maintenance technician
Qualified technician capable of performing mechanical interventions, adjustment, maintenance and ordinary repair described in this manual. Not qualified to perform interventions on electrical systems in the presence of voltage.

Electrical maintenance technician
Qualified technician capable of performing electrical interventions, adjustment, maintenance and ordinary repair described in this manual. Capable of working in the presence of voltage on electrical cabinets and junction boxes. Not qualified to perform interventions on the mechanical side.

Manufacturer's technician
Qualified technician made available by the manufacturer to perform complex operations in particular situations, or in any case according to what has been agreed with the customer.

1.2 Reference standards

The normative and directive references for this manual are as follows:

Directives

- 2006/42/CE -- Machinery Directive;
- 2014/30/UE -- EMC Directive (Electromagnetic Compatibility)
- 2014/35/UE -- Low Voltage Directive

1.3 EC Declaration of Conformity (Annex II A Dir. 2006/42/EC)

Manufacturer's name: **DAV Tech Srl**
Address: Via G. Ravizza, 30, .36075, Montecchio Maggiore (VI)

DECLARES THAT THE MACHINE

Component: DA-1000V
Model: Electric actuator controlled by dedicated controller
Serial number 51/24C
Year: 2024
Intended use: Manual fluid dosing managed by external controller

COMPLIES WITH THE FOLLOWING DIRECTIVES

The technical documentation has been drawn up in compliance with Annex VII B, as required by the following:

- **Machinery Directive 2006/42/CE** of the European Parliament and Council of 17 May 2006
- **Directive 2014/35/UE** concerning the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed to be used within certain voltage limits
- **Directive 2014/30/UE** concerning the harmonization of the laws of the Member States relating to electromagnetic compatibility (recast)

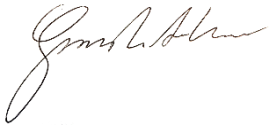
FURTHER DECLARES THAT:

- In response to an adequately motivated request from national authorities, we undertake to transmit relevant information concerning this machine;
- The technical file has been prepared in accordance with Annex VII A of Directive 2006/42/CE and compiled by Grazioli Andrea at Via Ravizza, 30, Montecchio Maggiore -- (VI) IT;
- Should the machine undergo constructive modifications or integrations of other components not falling within ordinary or extraordinary maintenance, it cannot be put into service without being declared compliant again with the requirements of the Directives mentioned above.

Montecchio Maggiore, 22 August 2024

The legal representative

Andrea Grazioli



1.4 Glossary

The following are the most used terms within this manual with their meanings.

TERM	DEFINITION
Enable	Term that defines the act of preparing (enabling) an action. The action will be activated as soon as criteria are satisfied which, as a consequence, lead to the activation of the enabled action.
Activate	The action that is performed instantaneously upon command actuation.
Hold-to-run Commands	Commands that, used for manual operations, must be kept activated for the action to be completed. When the command is released, the action stops.
Two-hand Commands	Hold-to-run commands that require simultaneous actuation of two manual commands to perform an action.
PPE	Personal Protective Equipment. Includes all objects necessary to ensure personnel protection from possible accidental damage (safety shoes, gloves, helmet, and others).
Display	Used to display information. Can be in any form and size, including touch screen.
Manufacturer	Natural or legal person who designed and manufactured the component subject to this manual.
HP	High Pressure. Abbreviation indicating high pressure.
Icon	Small image that symbolically represents a command, function or even a document or operating program, which appears on a computer screen. When selected by the user, it starts the function or program it symbolizes.
Joystick	Lever controller used in command panels.
N/A	Not Applicable, indicating a field that does not apply to this particular manual and cannot be integrated into the component.
Operator Panel	Command station where machine control instruments are located.
P.I.	Possible Implementation, currently absent from the component described in this manual, but possible to add and implement.
Screen	Interface system between man and component. Screen images displayed on the operator panel that allow the user to receive and provide information to the management software.
Control Panel	Composition of buttons and selectors that allow direct action on component behavior.
Keyboard	Keyboard only (standalone element) or in addition to a display (keys only, no selectors or other).
Touch Screen	Touch screen that allows the user to interact with a graphical interface using fingers or special objects.

1.5 Service and manufacturer contact details

For any reason relating to use, maintenance or request for spare parts, the customer must contact the manufacturer directly (or the service center if present), specifying the component identification data.

The customer can avail themselves of commercial technical support from area agents or importers, who are in direct contact with DAV Tech Srl.

Company name	**DAV Tech Srl**
Postal address	Via Ravizza, 30, 37065, Montecchio Maggiore (VI) – (IT)
Telephone	+39 0444 574510
Fax	+39 0444 574324
email	davtech@davtech.it
Website	www.davtech.it

2 PRESENTATION AND OPERATION

This manual aims to examine in detail the operation of the "DA 1000 V" component and its controller. It was decided to create a single manual in this case since the DA 1000V alone has too simplified operation for a separate manual. In this case, it is a manual electric actuator for volumetric dosing, which performs dosing when a command arrives from a control unit or other manual methods (such as foot pedal or button).

In other words, the function of this component is:

DOSING OF VARIOUS TYPES OF FLUIDS

The intended use is considered to be that described in the chapter below, while improper use is considered to be any other use not described within this manual, with products of different material and format from those for which it was constructed.

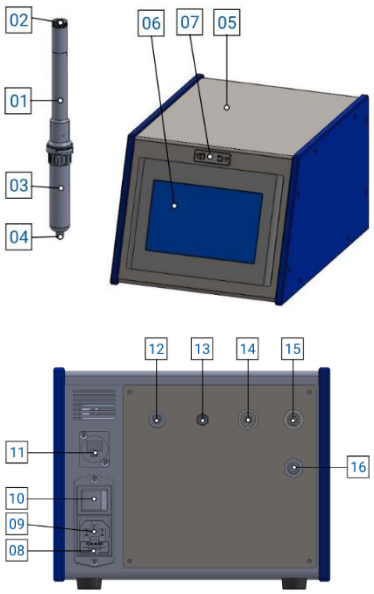


Figure 01 – Detail DA-1000V

No.	DESCRIPTION
01	DA-1000V
02	DA 1000V electrical connection
03	Actuator
04	Fluid outlet
05	DA-1000V Controller
06	Controller command screen
07	Screen pen holder
08	Power supply fuse housing
09	Power connector
10	Power switch
11	Ethernet connector
12	Actuator ON/OFF connector (M5 3-pole F)
13	Control connector (M8 4-pole F)
14	OUT connector (M12 8-pole F)
15	IN connector (M12 8-pole M)
16	DA 1000V connector

Before using a specific type of fluid, verify that:

- The fluid viscosity is compatible with the actuator characteristics;
- The fluid characteristics satisfy the desired requirements;
- The fluid technical data sheet provided by the manufacturer contains all information regarding the product such as viscosity, applications, drying and storage times;
- The fluid storage time has not been exceeded;
- The fluid packages are hermetically sealed.

SPECIAL VERSIONS

No special versions of this component exist at the time of writing this manual. However, it should be noted that this component can have actuators of sizes 3cc, 5cc, 10cc, and 30cc.

OPERATION

This system has two operating modes:

- Stand alone, where only the DA-1000V is used without connecting it to other external elements;
- Connected to other external control elements.

In both cases, the operation of this system is similar, where the controller presents specific screens for controlling the electric actuator, from which you can command the working mode, start and stop of work, recipe type, and all related settings. From here, it connects via appropriate cable to the DA 1000V, which has an electric motor for controlling the piston that enters inside the actuator and pushes the product toward the nozzle.

In case of connection to external control elements, the system can send notifications regarding dosing cycles and any alarms to the system, putting it in parallel with another already functioning system.

For minimum working pressures, refer to chapter 2.2.

The following explains the operation of the DA 1000V.

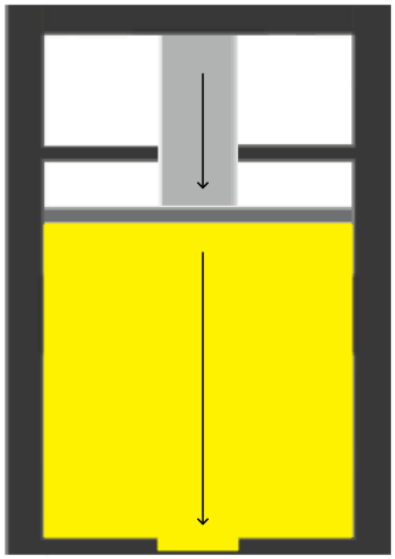


Figure 02 – Dosing phase

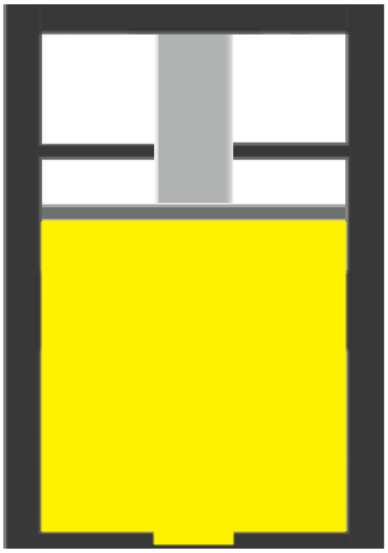


Figure 03 – Rest phase

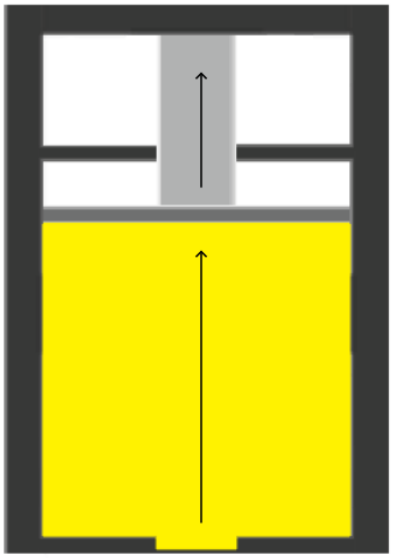
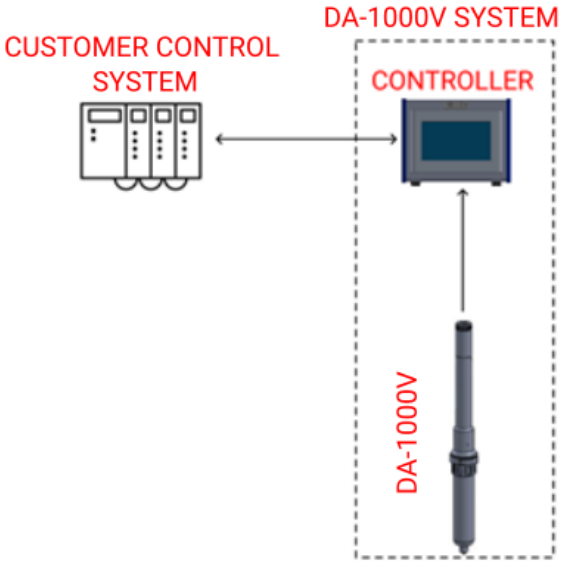


Figure 04 – Recall phase

The fluid, which is inside the appropriate actuator, is pushed by the piston present on the DA 1000V when the dosing command arrives from the controller. Once the dosing command stops, the piston stops and no longer performs dosing until the next command. In case it is set by recipe, or by operator in case of manual command, suck back is also performed, that is, at the end of dosing the system recalls the piston to ensure that there are no excessive fluid drops that can influence the dosing itself.

DANGER!
The actuator must absolutely not be forced manually, otherwise the actuator will be irreparably damaged.



COLOR	MEANING
BLACK	Data
RED	Notes

Figure 05 – Connection example

2.1 Exploded view

N.A.

2.2 Technical data

The following indicates all technical characteristics regarding the component of this manual.

SPECIFICATIONS		
Description	**UdM**	**Values**
GENERAL		
Model	\	DA-1000V
Actuation	\	Electric
CONTROLLER		
Single-phase supply	V	110/230
Supply fuse voltage	V	250
Power consumption	W	250
Screen type	\	Capacitive
DA 1000V		
Cartridge types	cc	3
		5
		10
		30
Dosing flow rate	mm^3/sec	3cc -> 3.6
		5cc -> 12.7
		10cc -> 25
		30cc -> 138

ENVIRONMENTAL CHARACTERISTICS		
Description	**UdM**	**Values**
Working Ambient Temperature	°C	5 ÷ 45
Storage Ambient Temperature	°C	-20 ÷ 55
Permissible non-condensing humidity	%	5 ÷ 90

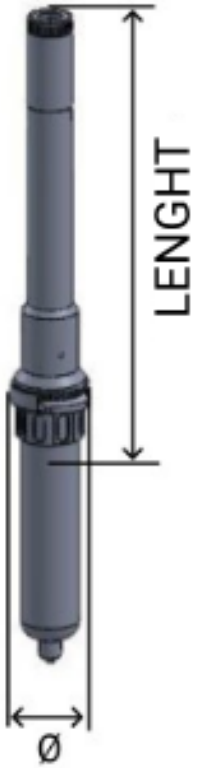
USABLE FLUIDS
Silicones
Oils
Adhesives
Liquid gaskets
Greases
Resins
Various medium-high viscosity products (contact manufacturer for more information)

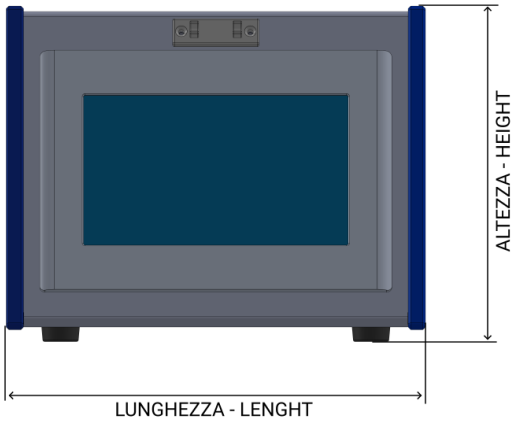
NANOOPEN DIMENSIONAL AND WEIGHT CHARACTERISTICS		
Description	**UdM**	**Value**
Component length (min ÷ max) [1]	mm	180 ÷ 230
Component diameter (min ÷ max)	mm	20 ÷ 30
Component weight	kg	0.13 ÷ 0.23

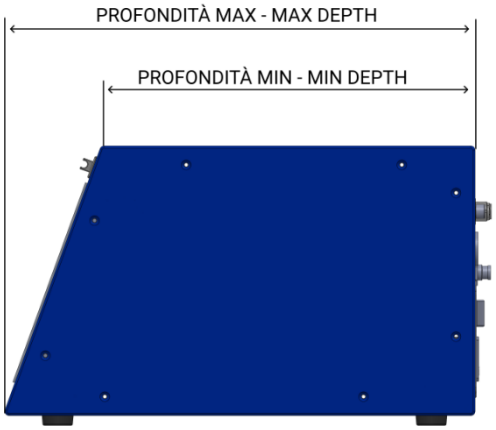
DIMENSIONAL AND WEIGHT CHARACTERISTICS CONTROLLER		
Description	**UdM**	**Value**
Component length (min ÷ max)	mm	243
Component height (min ÷ max)	mm	195
Component depth (min ÷ max)	mm	261 ÷ 324
Component weight	kg	6.6

[1] This dimension was taken without considering the inserted actuator

Components







It is possible to request the 3D model of the component in the desired version from the manufacturer without any commitment.

3 SAFETY

The following presents the list of warnings regarding the component subject of this manual. Please read carefully before proceeding with the next chapters.

DANGER!
Before commissioning the component or performing any action on it, carefully read this manual.

DANGER!
Do not use the component under the influence of drugs or other substances that may impair attention and reaction capacity.

DANGER!
Operators must perform only operations or interventions that are within the competence of their assigned role and qualifications.

FIRE/EXPLOSION HAZARD!
This component is not designed to work in ATEX environments.

ATTENTION!
No modifications should be made to the component to obtain performance different from that for which it was designed and built, unless authorized by the manufacturer.

The component may only be used by trained and authorized operators and only for the purpose for which it was designed and built.

The component is built in compliance with the safety technical standards in force at the time of its construction.

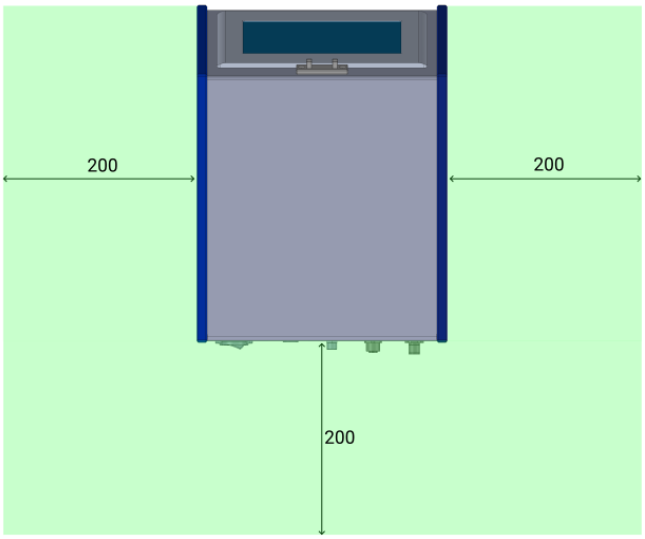
3.1 Component safety devices

N.A.

3.2 Required free spaces

These are the spaces that must be respected during component installation and serve to allow personnel passage safely, as well as to perform maintenance and cleaning operations safely.

For the electrical cabinet, a free space equal to the dimension of the open door plus 60cm is required.



In this image, the areas that are clear of any obstacles are highlighted in green.

3.3 Risk areas and residual risk

N.A.

4 TRANSPORT AND HANDLING

Once the goods are received, verify that the packaging is intact and that there is exact correspondence with the ordered material.

ATTENTION!
The original configuration of the component must not be modified. The manufacturer is not responsible for damage caused by inappropriate use of the component.

ATTENTION!
If the packaging is not intact, immediately contact the manufacturer, also sending photos of the packaging condition. Do not open it before notifying the manufacturer.

5 INSTALLATION

Component installation is performed by the customer. If necessary, they may contact the manufacturer to have a specialized technician assist them.

To position the controller, simply place it on a table, as it is equipped with support feet. It cannot be placed in other positions: it must remain resting on a surface parallel to the ground.

The actuator, instead, is equipped with support, which must also be placed on a plane parallel to the ground.

It is recommended to perform a component inspection before beginning installation. If it shows evident damage, please contact the manufacturer.

ATTENTION!
Please remove packaging with maximum care. Should damage be caused to the component, the manufacturer is not responsible.

Dispose of packaging correctly, considering the different nature of the components and following the regulations in force in the country.

5.1 Positioning

N.A.

5.2 Connections

This chapter explains the connection method to be used for the component. The following types of connections are provided:

- Electrical connection;

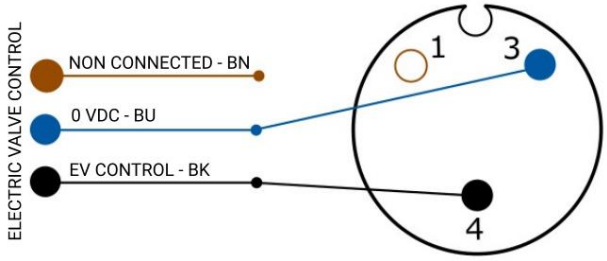
5.2.1 Electric

Authorized personnel		**PPE to wear**	    
Component Status	Component installed		
Supply Values	See chapter 2.2		
Necessary Preparations	N.A.		
Required Material	N.A.		
Required Equipment	N.A.		

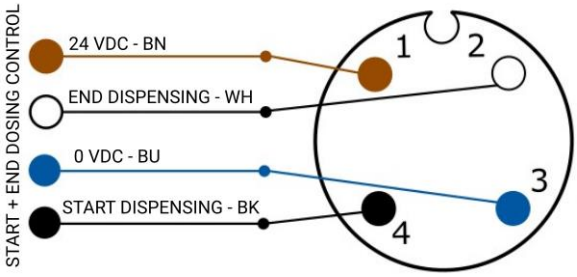
Electrical connection is the customer's responsibility.

ATTENTION!
The power supplies present on the connectors serve to power transducers and sensors connected to the controller inputs. If the controller must be interfaced with an external system that has its own power supply, please connect only the negative pole (GND). The positive pole must not be connected, otherwise the power supplies of the two systems are in parallel.

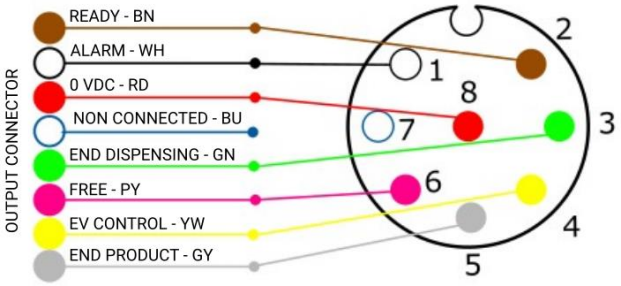
To perform the electrical connection, connect the electrical cable (which must comply with the specifications in chapter 2.2) to the appropriate connectors, which must be connected to the controller respecting the connection polarity. The following provides a diagram of what the connector pins do:



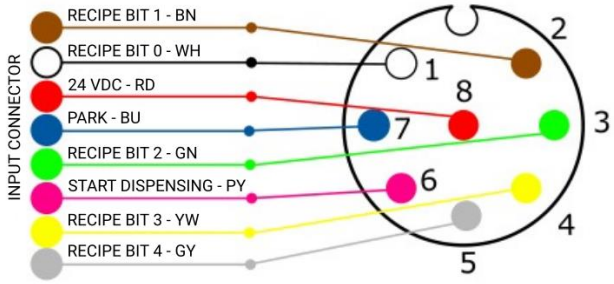
Connector No. 12 Chapter 2 Figure 01 (1)



Connector No. 13 chapter 2 Figure 01 (2)

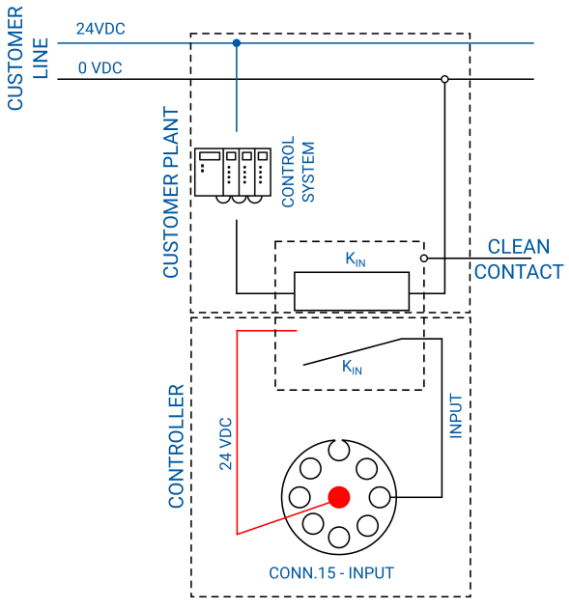


Connector No. 14 chapter 2 Figure 01 (3)

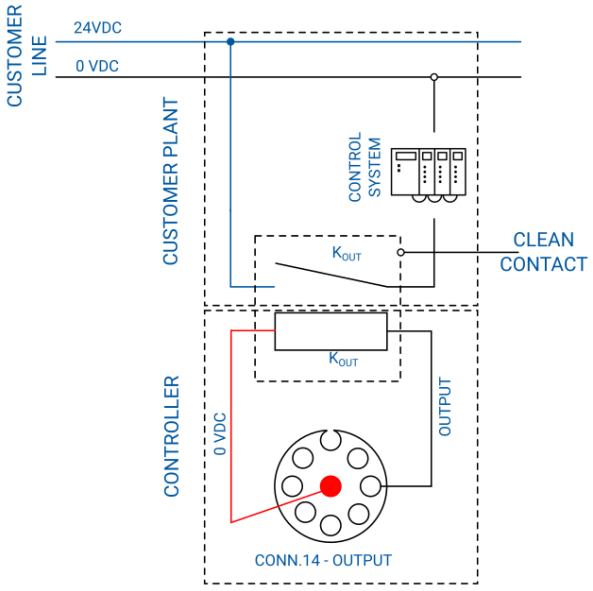


Connector No. 15 chapter 2 Figure 01 (4)

(1) Used as an alternative, since the same signal is available with the "OUT" connector, No. 14. If used, the solenoid valve must not absorb more than 10W;
(2) Same signals are provided by the "IN" and "OUT" connectors No. 15 and No. 14, can be used as an alternative;
(3) From here the controller communicates with digital signals the various dosing states. For "EV COMMAND" (YELLOW) there must be a maximum absorption of 10W;
(4) From this connector it is possible to recall recipes (if "recipes from digital I/O" is selected), execute a dosing command, or inform the controller that the dispenser is parked.



Input Connection with External System



Output Connection with External System

ATTENTION!

The figures above indicate how to make the connection of an input or output signal to an external control system. Pay particular attention to when to connect 24 VDC (input) and when 0 VDC (output). Furthermore, clean contacts are required to make connections, as indicated in the figures. The connection diagram is generic for each type of input or output, meaning it can be connected to the desired connector PIN. Furthermore, by control system we mean a generic system, which can be a PLC, another controller, a switch, or other.

ATTENTION!

If you want to connect multiple inputs (or outputs), you must provide multiple clean contacts; that is, for each input (or output) you want to connect, you need to have a unique clean contact.

The clean contact indicated in the images is that of the customer's electrical panel, it is not the manufacturer's responsibility.

5.2.2 Pneumatic

N.A.

5.3 Commissioning

Component commissioning is performed once positioning and connection operations are completed. Before performing component commissioning, the following checks must be performed:

- Verify that connections have been made correctly;
- Verify that the component is free of dirt or various residues;
- Verify that connectors have been connected correctly;
- Verify that components are resting on a plane as indicated in previous chapters.

ATTENTION!
If even one of the points listed above is not compliant, do not proceed with commissioning. Proceed with commissioning only when all points have been successfully completed.

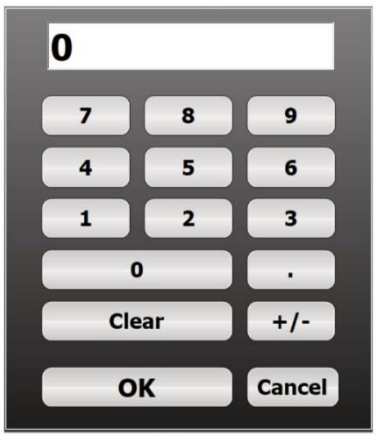
6 SOFTWARE

This chapter aims to examine in detail the software part of the component, specifically looking at both the operator terminal and the screens that are displayed and how to change screens.

The operator terminal is touch type (touch screen) and is used to display the current screen, change screens, control the status of values within the component. The software is started automatically as soon as the component is powered.

This symbol appears on any screen when an alarm occurs. Pressing this symbol accesses the ALARMS and SIGNALS screen where you can view the alarm and, if necessary, reset it.

Pressing any interactive field on a screen brings up the numeric keypad that helps the operator fill in the field. The keypads can be of two types:



Alphanumeric keypad: appears when text needs to be entered in addition to numbers. Generally used to enter username, password, recipe name, or similar fields. Some special keys are:

- CAPS LOCK: select lowercase/uppercase character;
- BACK: delete the last entered character;
- CLEAR: delete all values in the field;
- OK (ENTER): confirm entered characters and close keypad
- CANCEL: close keypad without making changes.

Numeric keypad: appears when only numbers need to be entered. Generally used to enter passwords or similar fields. Some special keys are:

- +/-: converts values from positive to negative;
- CLEAR: deletes all typed values;
- OK: Confirms entered values and closes keypad;
- CANCEL: Closes keypad without making changes

The list of messages (if present) and alarms that may appear for this system are reported in chapter 9

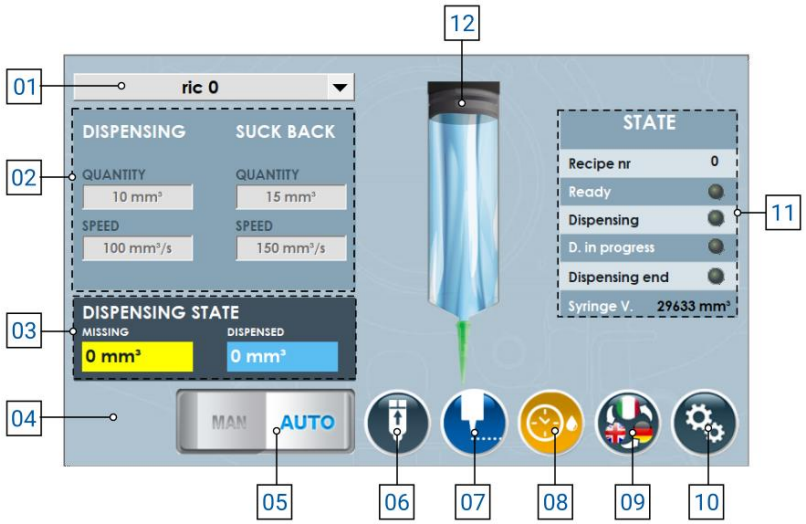
In case of ongoing alarms, when the program starts up, the ALARMS AND SIGNALS screen immediately appears accompanied by an intermittent sound.

TO ACCESS THE SETTINGS MENU USE THE FOLLOWING CREDENTIALS:

USERNAME: dav **PASSWORD:** dav

Access and modification of parameters in the menu is allowed only with prior authorization from the manufacturer's technicians

6.1 HOME Screen



1) Recipe selection via dropdown menu (available only with automatic mode enabled);
2) Menu to enter parameters in manual mode (modifiable only with manual mode enabled). Specifically, it has:
   a) **Dosing quantity:** In this field you can set the quantity (in mm³) to be dosed when dosing is started;

   If the quantity is left at 0, the system interprets it as "**unlimited dosing**", meaning the system continues to dose as long as the dosing command remains active. This dosing mode is defined as "**jog mode**".

   b) **Dosing speed:** Indicates the fluid flow rate (in mm³/s) with which the system must perform dosing when dosing is started (see notes chapter 6.3);
   c) **Suck back quantity:** In this field you can set the quantity (in mm³) to be recalled inside the actuator when the system has finished dosing;
   d) **Suck back speed:** Indicates the fluid flow rate (in mm³/s) with which the system must perform recall inside the actuator when the system has finished dosing (see notes chapter 6.3);
3) Parameters indicating the status of ongoing dosing, i.e., how much product still needs to be dosed (in "remaining" box) and how much product has been dosed (in "dosed" box);
4) Alarm message if present. If pressed, leads to the alarms page (chapter 9);
5) Selector to set automatic or manual mode;
6) Button used to make the extruder return to the initial position;
7) Button that allows starting dosing (**predetermined** if in automatic or manual with setting different from "0" on dosing quantity, **jog** if in manual/automatic with setting "0");
8) Button that allows automatic purging (visible only if enabled in settings);
9) Button that allows language change;
10) Button that allows access to the **settings** menu;
11) Table indicating component states, namely:
    a) **Recipe nr:** Indicates the recipe number currently set in automatic mode;
    b) **Ready:** Indicates if the component is ready to work;
    c) **Dosing:** Indicates receipt of a dosing command;
    d) **D. in progress:** Indicates if the component is performing dosing;
    e) **End dosing:** Indicates if the component has finished dosing;
    f) **V. syringe:** Indicates the volume of the actuator currently set and in use.
12) Indicative image of the electric actuator state.

6.2 SETTINGS MENU screen

1) **Parameters:** Allows access to the parameters menu, modifying them. See chapter 6.3;
2) **Recipes:** Allows access to the recipes menu, see chapter 6.4;
3) **Interfacing:** Allows verification of the communication status between controller and external system, see chapter 6.5;
4) **Back:** Returns to previous menu, see chapter 6.1
5) **Shutdown Runtime:** Exits the system application

ATTENTION!
When exiting the application, to re-enter you must turn the controller off and on again.

6.3 PARAMETERS screen

This screen contains all values needed for the machinery to operate correctly. It is subdivided into:

- **SYSTEM:** Contains general plant parameters;
- **ACTUATOR:** This page represents all data related to the type of actuator used, to optimize the use of the DA 1000V.

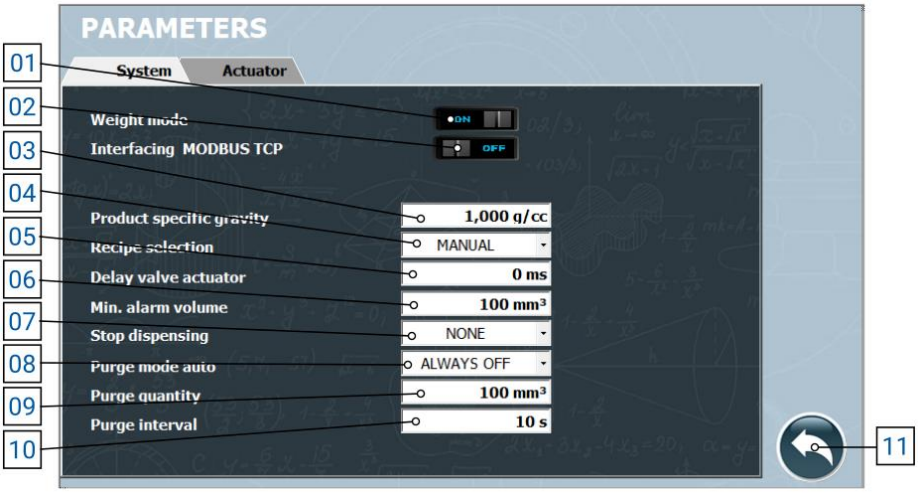
ATTENTION!

The parameters shown have already been set by the manufacturer's technicians so that the machinery can operate under optimal working conditions. It is recommended to make changes to these only after consultation with the manufacturer. Any damage due to parameter changes without consultation with the manufacturer is not covered by warranty.

ATTENTION!

Speed parameters, both suck back and dosing, also depend greatly on fluid viscosity. If the fluid viscosity is high (approximately 10,000 mPas or higher) it is recommended to set a low speed to avoid accumulating too much pressure inside the actuator, which could suffer structurally and have failures. If there are strong component vibrations, or it does not dispense as expected, reduce the dosing speed.

6.3.1 SYSTEM → PARAMETERS screen



1) **Weight mode:** If enabled, allows the system to work in weight mode (mg) and not in volume (mm³). In this mode, the specific weight of the product must be set
2) **MODBUS TCP interfacing:** Selector used to communicate to the controller that you want instructions to come directly from the customer server.

> **ATTENTION!**
> Must be connected via appropriate MODBUS TCP cable, i.e., Ethernet cable.

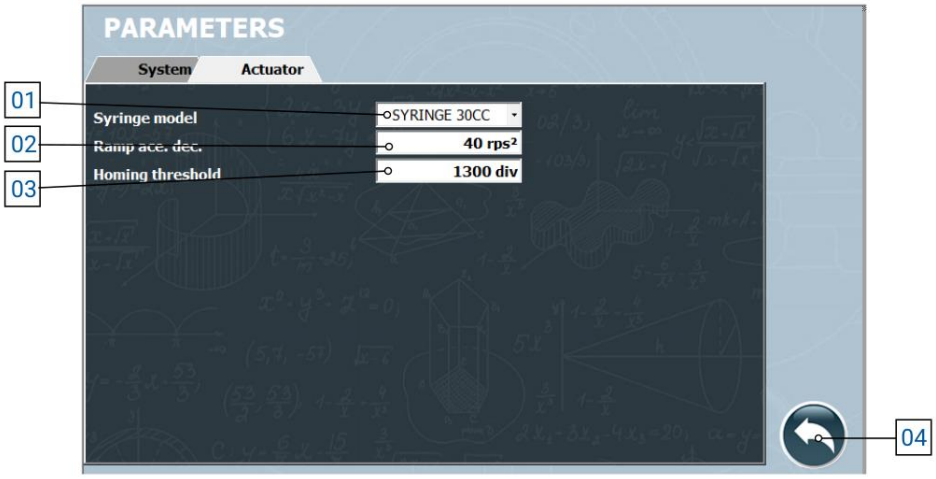
3) **Product specific weight:** Enabled only if weight mode is "ON", used to indicate the specific weight of the product, to calculate exactly the quantity of product to be dosed.
4) **Recipe selection:** Dropdown menu that allows selecting the method for recipe selection. Possible methods are:
   a) **Manual:** Allows selecting via controller the recipe (if in automatic mode), or setting parameters for dosing the product (if in manual mode);
   b) **Digital IO:** Allows receiving recipes from an external system connected via "IN" cable, No. 15 chapter 2 Figure 01;
   c) **MODBUS TCP:** Allows connecting the system via customer server, to receive recipes via Ethernet connection
5) **Actuator valve delay:** Indicates the time between opening of any solenoid valve and the start of the dosing cycle. If no solenoid valve is used, leave at zero.
6) **Minimum alarm volume:** Indicates at what fluid level the product level alarm should activate;

7) **Dosing stop:** Indicates the method for blocking dosing. Specifically, the methods can be:
   a) **None:** In this mode it is not possible to block dosing once started, except by turning off the control unit via the power switch on the rear;
   b) **Interruption:** In case of external use (command button or PLC), the dosing signal must be activated to start dispensing. As soon as it is deactivated (dosing signal is lost), dosing stops. When activated again, dosing restarts from the beginning (does not save dosed quantity). In case of use via HMI display, press once to start (without holding) and press again to stop;
   c) **Pause HI:** In this mode there is no need to hold the dosing button. The dosing cycle is paused when it receives a new dosing signal. When sent again after pause, the cycle resumes from the previously dosed quantity (saves dosed fluid quantity), completing the recipe. Multiple pauses can be made during dosing. In case of use via HMI display, press once to start dispensing (without holding) and press again to stop it and, subsequently, press a third time to resume it, finishing the set quantity;
   d) **Pause LOW:** In this mode you need to hold the dosing button (or signal from PLC). The dosing cycle is paused when the dosing signal is lost (dosing button is released, for example). When the dosing signal is activated again, the cycle resumes from the previous point (maintains saved dosing history) and continues dosing until the dosing signal is deactivated (for example, until the dosing button is held). To complete the cycle in this mode, the dosing signal must be kept high until recipe completion. Multiple pauses can be made during dosing. In case of use via HMI display, press once to start dispensing (without holding) and press again to stop it and, subsequently, press a third time to resume it, finishing the set quantity;
8) **Automatic purge mode:** This dropdown menu allows selecting how to perform automatic purging (if desired). Specifically, you can set:
   a) **Always OFF:** In this mode automatic purging is not performed;
   b) **Always ON:** In this mode purging is always performed with the methods set in subsequent points if enabled from main screen (No. 07 chapter 6.1);
   c) **Parking:** Automatic purging can be performed only if the system receives the parking signal (for example, via sensor) and if enabled from main screen (No. 07 chapter 6.1).
9) **Purge quantity:** Quantity of fluid expelled during automatic purge mode. It is recommended to set it to expel all fluid present in the nozzle. Purge flow rate and suck back parameters are equivalent to those set in the recipe in use;
10) **Purge interval:** Indicates the minimum time that must elapse from the last dispensing to the start of automatic purging.

ATTENTION!
The three parameters above depend on the type of fluid and how quickly it tends to crosslink in contact with air. It is recommended to maintain the settings made by the manufacturer, or at least contact the manufacturer if you want to modify them.

11) **Back:** Button to return to the SETTINGS menu (chap. 6.2)

6.3.2 ACTUATOR → PARAMETERS screen



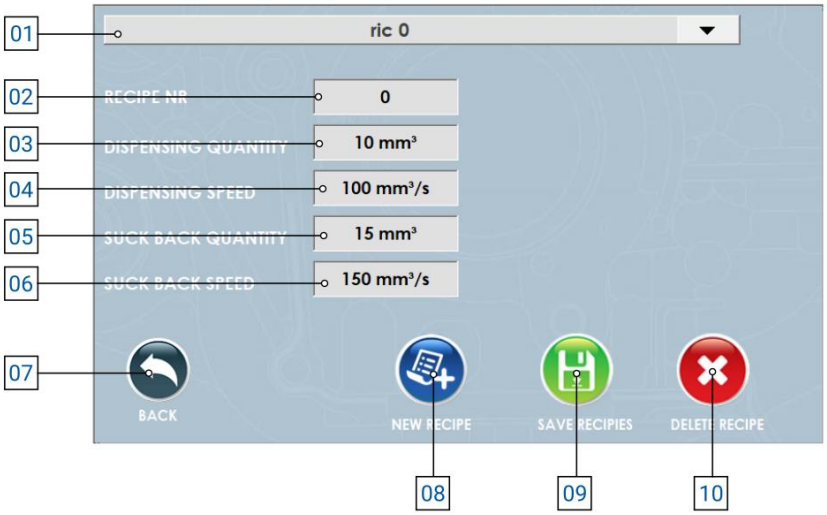
1) **Syringe model:** This dropdown menu is used to indicate the actuator model being used, to define more precise settings for the system. There are the following choices:

   a) **3cc syringe;**
   b) **5cc syringe;**
   c) **10cc syringe;**
   d) **30cc syringe.**

ATTENTION!
If you modify the item just described, it is recommended to restart the controller to make the modification effective.

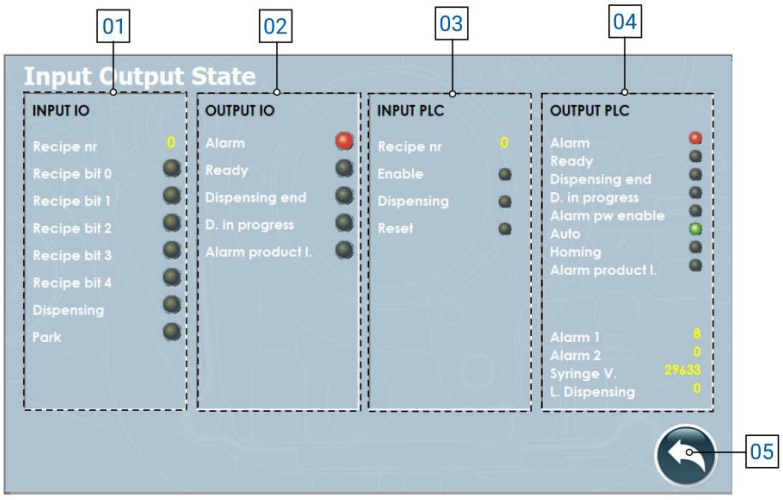
2) **Acc. dec. ramp:** Parameter that allows setting the acceleration and deceleration ramp of the actuator to reach the set dosing flow rate;
3) **Homing threshold:** Analog value indicating when the actuator is at zero position.
4) **Back:** Button to return to the SETTINGS menu (chap. 6.2)

6.4 RECIPES screen



1. **Dropdown menu:** From here you can choose the recipe to use, as well as create a new one;
2. **Recipe nr.:** Indicates the number that can be used to recall the recipe from other collaborative software (industry 4.0);
3. **Dosing quantity:** Indicates the quantity of fluid to be dosed in the selected recipe;
4. **Dosing speed:** Indicates the flow rate with which to dose the quantity indicated above;
5. **Suck back quantity:** Indicates the quantity of fluid to be recalled inside the actuator once the fluid is dosed;
6. **Suck back speed:** Indicates the flow rate with which to recall the quantity of fluid indicated above inside the actuator;
7. **Back:** Button to return to SETTINGS menu (ch. 6.2);
8. **New:** Button to create a new recipe;
9. **Save:** Button used to save the selected recipe;
10. **Delete:** Button used to delete the selected recipe;

6.5 INTERFACE screen



1) **INPUT I/O:** All inputs that arrive from the system to the controller to manage the process:
   a) **Recipe nr.:** Indicates the recipe number set by the customer server to the controller;
   b) **Recipe bit (0/1/2/3/4):** Indicates whether the related bit is active or not. Based on the combination, you can trace back to the recipe used;
   c) **Dosing:** Indicates whether there is a request to perform dosing or not;
   d) **Parking:** Indicates whether it is requested to park the actuator.
2) **OUTPUT I/O:** All outputs that the controller sends to the system to manage the process if connected via Digital I/O:
   a) **Alarm:** Indicates if there are active alarms;
   b) **Ready:** Indicates if the system is ready to perform dosing;
   c) **End dosing:** Indicates if the system has finished performing dosing;
   d) **D. in progress:** Indicates if the system is performing dosing;
   e) **P. level alarm:** Indicates if there is a product level alarm.
3) **INPUT PLC:** All inputs that arrive from the system to the controller if connected via MODBUS TCP/IP:
   a) **Recipe nr:** Indicates the recipe number that the system passes to it;
   b) **Enable:** Indicates if the controller is enabled to work or not;
   c) **Dosing:** Indicates if the dosing signal arrives at the input;
   d) **Reset:** Indicates if the alarm restart command arrives from the system;
4) **OUTPUT PLC:** All outputs that the controller sends to the system to manage the process if connected via MODBUS TCP/IP:
   a) **Alarm:** Indicates if there are active alarms;
   b) **Ready:** Indicates if the system is ready to perform dosing;
   c) **End dosing:** Indicates if the system has finished performing dosing;
   d) **D. in progress:** Indicates if the system is performing dosing;
   e) **Enable alarm:** The system is in alarm due to system enable;
   f) **Auto:** The system is in automatic mode;
   g) **Homing:** The system is performing actuator homing;
   h) **P. level alarm:** Indicates if there is a product level alarm.
   i) **Alarms (1/2):** Indicates the indicative number of the active alarm, to communicate it to an external system;
   j) **V. syringe:** Indicates the volume of the actuator in use;
   k) **V. dosing:** Indicates the volume of product dosed in the last cycle.
5) **Back:** Button to return to the SETTINGS menu (chapter 6.2);

6.6 MODBUS TCP/IP registers

The following describes the various registers and how they have been configured.

You can request the example project developed by the manufacturer in TIA Portal 16 and the guided procedure for MODBUS TCP/IP configuration by contacting the manufacturer.

If indications like "B0" are present under a register, it indicates the bit occupied within the register and its function, otherwise it indicates the register and the function it has, where the entire register is occupied to indicate a specific value.

HOLDING REGISTER 0	
Status of outputs	
B0	Alarm
B1	Ready
B2	End dosing
B3	Dosing in progress
B4	Power enable alarm
B5	Auto Mode
B6	Home status
B7	Syringe level alarm

HOLDING REGISTER 1	
Alarms 1	
B0	Modbus drive 1 timeout
B1	Free
B2	Modbus IO module timeout
B3	Modbus PLC timeout
B4	Drive 1 fault
B5	Pen disconnected
B6	Drive 1 power alarm
B7	Free
B8	Level 1 alarm
B9	Free

HOLDING REGISTER 2
Alarms 2
Empty

HOLDING REGISTER 3
Syringe Level

HOLDING REGISTER 4
Last dosed quantity LSB

HOLDING REGISTER 5
Last dosed quantity MSB

HOLDING REGISTER 10	
Commands	
B0	Enable
B1	Dosing
B2	Reset alarms

HOLDING REGISTER 11
Recipe

7 PROCEDURE

This chapter explains the main configurations that can be used on the component subject of this manual. Specifically, it explains in detail:

- How to perform actuator replacement;

7.1 Actuator replacement

Actuator replacement is the most delicate phase of using this system, as it is important to avoid air bubbles inside the actuator, which could modify the quality of dosing. To perform actuator replacement, you can follow three methodologies:

- Standard method with fluids having viscosity below 30,000 mPas;
- Standard method with fluids having high viscosity;
- Double actuator method.

The choice of method is left to the customer, based on available instrumentation.

ATTENTION!
Using the first method with fluids having viscosity above 30,000 mPas can give unsatisfactory results and leave bubbles inside the actuator.

7.1.1 Standard method with viscosity below 30,000 mPas

- Insert the metal plug inside the plunger. The smooth part of the metal plug must serve as a base for the plunger

ATTENTION!
There are different plugs and plungers on the market, based on models. Please adhere to standard models recommended by the manufacturer

- Take a new actuator (with cap on the nozzle side) and, holding it with the nozzle side down, fill it about 3/4 with fluid;

ATTENTION!
In case of glue-like fluids it is recommended not to dirty the side walls, as they then solidify and block the plunger, making the actuator ineffective

- Insert the plunger and plug assembly inside, taking care to put the plunger on the fluid side;
- Once the plunger is inserted as close as possible, turn the actuator 180°, bringing the nozzle side up;
- By physical separation, air moves toward the nozzle, while fluid approaches the plunger;
- Once all air is toward the nozzle, remove the cap and push the plunger until a tip of fluid comes out;
- Clean the nozzle, insert the nozzle and coupling for the DA 1000V;
- Bring the DA 1000V piston to rest mode via appropriate button (No. 06 chapter 6.1) and insert the actuator in the appropriate housing.

7.1.2 Standard method with high viscosities

- Insert the metal plug inside the plunger. The smooth part of the metal plug must serve as a base for the plunger

ATTENTION!
There are different plugs and plungers on the market, based on models. Please adhere to standard models recommended by the manufacturer

- Take a new actuator (with cap on the nozzle side) and, holding it with the nozzle side down, fill it about 3/4 with fluid;

ATTENTION!
In case of glue-like fluids it is recommended not to dirty the side walls, as they then solidify and block the plunger, making the actuator ineffective

- Insert the plunger and plug assembly inside, taking care to put the plunger on the fluid side;
- Put the actuator on a device for fluid separation (centrifuge, vibrating plate, or other) and wait for air and fluid to separate, with fluid toward the plunger and air toward the nozzle;
- Open the nozzle cap and let out all air present inside the actuator by pushing from the plunger until a tip of fluid comes out;
- Clean the nozzle, insert the nozzle and coupling for the DA 1000V;
- Bring the DA 1000V piston to rest mode via appropriate button (No. 06 chapter 6.1) and insert the actuator in the appropriate housing.

7.1.3 Double actuator method

- Insert the metal plug inside the plunger. The smooth part of the metal plug must serve as a base for the plunger

ATTENTION!
There are different plugs and plungers on the market, based on models. Please adhere to standard models recommended by the manufacturer

- Take a new actuator and one with fluid and, via appropriate coupling, join the two cartridges;
- Insert the plunger inside the new actuator (the one with fluid should already have the plunger)
- By pushing via the plunger of the full actuator and keeping the empty one under pressure, push the fluid inside the new actuator;
- Remove the now empty actuator and coupling and put the appropriate nozzle;
- Insert the coupling for the DA 1000V;
- Bring the DA 1000V piston to rest mode via appropriate button (No. 06 chapter 6.1) and insert the actuator in the appropriate housing.

8 MAINTENANCE

Maintenance interventions are all those activities to be performed on the component which, if performed correctly, allow it to have a longer life. In general, maintenance is divided into two groups:

- **Ordinary maintenance**, which are interventions at regular intervals or that can be performed by the customer's personnel, are the most important activities as they allow the component to be maintained in good working conditions;

ATTENTION!
Ordinary maintenance interventions must be performed with the methods and timing indicated in the following chapters.

- **Extraordinary maintenance**, i.e., all those interventions that are not at regular intervals or that have not been foreseen, or interventions that cannot be performed by the customer. They can also arise from the lack of ordinary maintenance interventions.

ATTENTION!
Extraordinary maintenance interventions must be performed together with the manufacturer's specialized technicians.

Regarding frequency, it must be considered that:

- **When necessary:** Operation to be performed when the need to perform it is seen;
- **Every machine start or end of work:** Indicates a daily time period, in general. This can imply every 24 hours (therefore at the beginning of shift every day, or end of shift every day), or even more frequently, based on applications;
- **Long pause:** Indicates a time period greater than approximately one hour;
- **Every drum change:** Indicates every time the supply system is changed (tank, drum, cartridge or other);
- **Every mixer disassembly:** Indicates that every time the mixer is replaced, a specific operation must be performed;
- **Weekly:** Indicates a time span equal to seven calendar days;
- **Monthly:** Indicates a time span equal to one calendar month;
- **Semi-annual:** Indicates a time span equal to six calendar months;
- **Annual:** Indicates a time span equal to one calendar year.

ATTENTION!
The times indicated below are indicative as they depend on how the component is used. Follow the variations suggested by technicians.

Assigned	Description	Frequency	Chapter
	Perform actuator functionality test	Every machine startup or end of work	\
	Perform surface cleaning of actuator	Every machine startup or end of work	\

ATTENTION!
Only use soft brushes or cotton cloths to clean the actuator.

9 SYSTEM MESSAGES

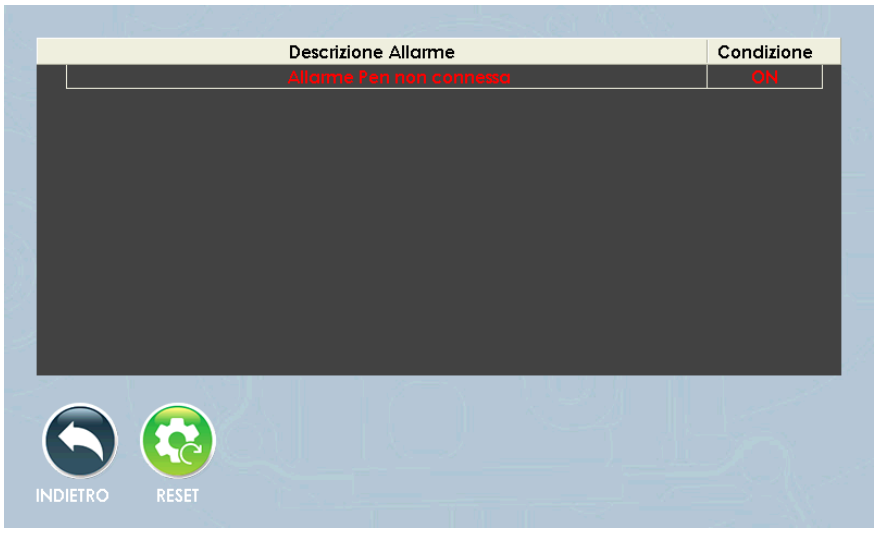
This chapter examines and lists the two types of messaging present within the machinery. Specifically, these two types are present:

- **Alarm:** warning signal from machinery to operator indicating a problem, which can be electrical, pneumatic, or generic in nature;
- **Mechanical defect:** This section deals with defects that could occur mechanically with the DA 1000V.

This chapter lists all messages that the system produces, with related explanation, and all alarms that the system emits, with related explanation and method for resolving the specific alarm.

In general, to remove an alarm, you must:

- Identify the alarm (if more than one alarm is present, identify only one);
- Resolve the cause of the alarm, as indicated in the next chapter;
- From the operator terminal access the alarms screen by pressing the yellow triangle symbol. A screen like the following figure opens;
- Reset the specific alarm;
- Once all alarms are reset, press the RIARMO AUX button from the control panel.



9.1 Alarms (controllers)

ALARM	CAUSE	SOLUTION
Drive power enable alarm	Drive does not receive power	Verify that all conditions for operation exist, turn controller off and on
Controller does not turn on	Lack of power supply	Replace fuses, check power supply line
Drive connection alarm	Drive is not connected correctly	Verify that all conditions for operation exist, turn controller off and on
Motor position alarm	Motor has not reached defined position	Check that there are no foreign bodies blocking movement. Turn controller off and on.
Drive alarm	Drive is in alarm	Verify that all conditions for operation exist, turn controller off and on
Following error alarm	Motor is not moving according to controller commands	Check that there are no foreign bodies blocking movement. Turn controller off and on.
Motor phase A/B disconnected alarm	Motor is not connected correctly	Verify that all conditions for operation exist, turn controller off and on. If necessary, replace connection cable between controller and DA 1000V
Product level alarm	Actuator has reached minimum product quantity	Change actuator following procedure
Pen not connected alarm	DA 1000V is not connected correctly to controller	Verify that all conditions for operation exist, turn controller off and on. If necessary, replace connection cable between controller and DA 1000V
Positioning timeout alarm	Motor has not reached defined position	Check that there are no foreign bodies blocking movement. Turn controller off and on.
Drive overtemperature alarm	Drive has reached maximum temperature	Position controller in a cooler location and verify correct drive operation
Drive power timeout alarm	Drive does not respond	Verify that all conditions for operation exist, turn controller off and on
Modbus PLC timeout alarm	Communication error via modbus TCP/IP	Verify wiring. Verify that Modbus TCP/IP selector in settings is "ON" (No. 02 chapter 6.3.1)

9.2 Mechanical defect (DA 1000V)

DEFECT	CAUSE	SOLUTION
Little or no fluid	Actuator does not receive command	Verify actuator command (solenoid valve). Perform manual test
	Nozzle is clogged	Unscrew and clean nozzle
	Filter is dirty (if present)	Wash or replace filter
	Fluid residues present in system	Disassemble and clean any solid particles
Excessive vibrations on instrument or does not dispense as expected	Set speed is too high (fluid too viscous or nozzle too small)	Decrease fluid dispensing speed
Nozzle drips even when actuator is not actuated	Dirt present in nozzle	Clean or replace nozzle
Plunger does not move	Fluid has glued plunger in position	Change actuator

10 END OF LIFE

End of life refers to all those activities that put the component out of service. End-of-life activities can be:

- **Storage**, meaning when the component is temporarily placed in the warehouse for future use;
- **Stocking**, meaning when the component is placed in the warehouse for an unspecified period while waiting for a third party to purchase the component;
- **Dismantling**, meaning when the component has reached the end of its working period, whether due to age, obsolescence, or failures that cannot be repaired, or that can be repaired but it is more convenient to purchase a new component.

If installation is not planned in the short term, the component can remain packaged and must be stored in a sheltered and preferably enclosed location. The ambient temperatures to be respected are indicated in chapter 2.2.

Instead, for dismantling and consequent scrapping of the component or its parts, the different nature of the various components must be considered and differentiated scrapping must be performed. It is recommended to hire specialized companies for this purpose and waste disposal laws in force must always be observed.