PARTS, SYSTEMS AND AUTOMATIONS FOR FLUID DISPENSING

USE AND MAINTENANCE MANUAL

EVO CONTROL UNITS

CONTROLLER EVO E2K

CONTROLLER EVO GP

CONTROLLER EVO GP2K

CONTROLLER EVO PCP

CONTROLLER EVO PDP

CONTROLLER EVO RISCALDATORI

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TRANSLATED FROM ORIGINAL
Read carefully before use!

EN

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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 suitable behavior for correct operation. This manual has been designed to be simple and as straightforward as possible, with a subdivision into chapters and sub-chapters that allows you to find any information you need quickly. In addition, the manual begins by giving a general description of the contents, then an overview of the component, to arrive at aspects of safety, transport, installation and use and finally to the end of life. If you have any doubts about the interpretation or reading of this document, please contact the manufacturer.

DAV Tech declines any responsibility relating to improper use of the component. Observe the specifications in this manual.

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

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

It is the task of the end user to optimize the functionality of the component, always considering the purpose for which it was built.

It is asked to keep this manual, together with the attached documentation, in good condition, legible and complete. In addition, it must be stored in the vicinity of the component or, in any case, in a place accessible and known to all personnel who use the component itself or who must perform maintenance or inspection interventions. If the manual deteriorates or is no longer complete, a copy must be requested from the manufacturer, indicating the code of the manual and the revision.

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

If you have any doubts about the correct interpretation of the information contained in this manual, please contact the manufacturer.

GUARANTEE

During the design phase, a careful choice of materials and components to be used in the project was made and they were subjected to regular testing before delivery. All elements have been designed and manufactured with an adequate degree of safety, such as to be able to withstand stress greater than those of normal use.

The warranty is valid for a period of 12 months from the date of commissioning and in any case no longer than 15 months from the date of delivery. Work carried out during the warranty period does not extend the warranty period in any way.

The manufacturer is not liable for defects due to normal wear and tear of parts which, by their nature, decay.

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1.1 Symbology

Below are the symbols that are used to give a greater impact to the importance of the concept you want to give.

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

DANGER!
It refers to a major event that could cause major damage (death, permanent injury, irreversible breakage of the component).

NOTE. Indicate relevant information or insight.

OBLIGATION. It indicates a task that must be performed, related to both the component and the manual.

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

In addition, the list of symbols is integrated with that of the personnel responsible for using the component and its function, together with other symbols used within the manual.

Operator
A (qualified) person capable of operating the component, adjusting, cleaning, starting or resetting the component. The operator is not authorized to perform maintenance.

Mechanical maintenance technician
Qualified technician able to carry out mechanical, adjustment, maintenance and routine repair work described in this manual. He is not authorized to carry out interventions on electrical systems in the presence of voltage.

Electrical maintenance technician
Qualified technician able to carry out electrical, adjustment, maintenance and routine repair work described in this manual. It is able to work in the presence of voltage on electrical cabinets and junction boxes. He is not authorized to carry out interventions on the mechanical side.

Manufacturer's technician
Qualified technician made available by the manufacturer to carry out operations of a complex nature in particular situations, or in any case as agreed with the customer.

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1.2 Reference standards

The reference standards and directives of this manual are the following:

Directives

- 2006/42/EC – Machinery Directive;

Applicable essential health and safety requirements (EHSR) of Directive 2006/42/EC, set out in Annex I, paragraph:

- 1.1.2: Principles of safety integration;
- 1.1.3: Materials and products;
- 1.1.5: Design of machinery to facilitate its handling;
- 1.1.6: Ergonomics;
- 1.3.4: Risks due to surfaces, edges or angles;
- 1.5.1: Electricity supply;
- 1.5.2: Static electricity;
- 1.5.4: Errors of fitting;
- 1.5.8: Noise;
- 1.5.9: Vibrations;
- 1.6.3: Isolation of energy sources;
- 1.6.4: Operator intervention;
- 1.7.1.2: Warning devices;
- 1.7.4: Instructions

Each component that makes up a system has its own CE declaration as a quasi-machine, but it must be considered that the serial number of the system is given by the serial number of the control unit to which they are connected.

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1.3 Declaration of incorporation (Annex II B DIR. 2006/42/EC)

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

DECLARES THAT THE ALMOST MACHINE

Component: PCP/PDP/GP/GP2K/E2K CONTROLLERS/EVO HEATERS
Model: Control system for pumps, extruders, heaters and stirrer
ID:
Year: 2024
Intended use: Standalone controller for various pumps, extruder, heater and stirrer models

COMPLIES WITH THE INCORPORATION PROVISIONS OF DIRECTIVE 2006/42/EC

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

- Machinery Directive 2006/42/EC of the European Parliament and Council of 17 May 2006

IT ALSO DECLARES THAT:

- The product has been designed and manufactured in compliance with the essential health and safety requirements of Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and meets all applicable safety regulations set out in chapter 1.2 of this manual;
- Undertakings are undertaken to provide, in response to a properly substantiated request from the national authorities, relevant information on this partly completed machine;
- The technical file was prepared by Andrea Grazioli, via Ravizza, 30, Montecchio Maggiore (VI), IT.

This quasi-machine cannot be used until the machinery on which it will be used is declared compliant with regulation 2006/42/EC.

Montecchio Maggiore, 23 October 2024

The legal representative

Andrea Grazioli

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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 triggered as soon as the criteria are met, which consequently leads to the activation of the enabled action.
Active	The action that is performed instantaneously when the control is activated.
Human controls	This defines those commands that, used for manual operations, must be kept activated for the action to be performed. When the command is released, the action stops.
Two-hand controls	Human-controlled controls require two manual controls to be operated simultaneously to perform an action.
P.P.E.	Personal protective equipment. They include all the items necessary to ensure the protection of personnel from possible accidental damage (safety shoes, gloves, helmet, and more).
Display	It is used to display information. It can be in any shape and size, even touch screen.
Manufacturer	Natural or legal person who designed and manufactured the component covered by this manual.
HP	High Pressure. An acronym that indicates high pressure.
Icon	A small image that represents a command, a function or even a document or an operating program, which appears on a computer screen. When selected by the user, it initiates the function or program it symbolizes.
Joystick	Lever manipulator used in control panels.
N.A.	Not Applicable, i.e. it indicates that it is a field that does not apply to this manual and that it cannot be integrated into the component.
Operator panel	A control station where the machine control instruments are located
P.I.	Possible Implementation, i.e. it is currently absent from the component described in this manual, but it is possible to make an addition and implement it.
Screen	Interface system between man and component. Screenshots are the images displayed on the operator panel that allow the user to receive and provide information to the management software.
Push-button panel	Composition of buttons and selectors that allow you to act directly on the behavior of the component.
Keyboard	Keyboard only (stand-alone 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 graphic interface using their fingers or particular objects.

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1.5 Service and manufacturer contact details

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

The customer can make use of the technical and commercial support of local agents or importers, who are in direct contact with the company 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

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2 PRESENTATION AND OPERATION

In this manual we want to talk about the various controller models for PCP, PDP, GP, GP2K pumps and E2K extruders and heaters. The basic operation is the same for all models, some aspects change, since the characteristics are different. In those aspects where there are differences, there are chapters dedicated to specific controllers. If there are equalities, the GP model is taken as a reference, otherwise its particularity is specified for each model.

The EVO models also include the DA-1000V controller, i.e. the nanopen; however, that controller is exposed within the appropriate manual.

In this manual we want to deepen the operation of the control systems of PCP, PDP, GP, GP2K pumps, E2K extruders and heaters, whose basis is the same for all, only some aspects change. The heater controller differs from the others in that it does not have a real control unit but has a control system for a maximum of one pair of heaters, which can be heated tubes or tire warmers, and two agitators; the other controllers, on the other hand, can control the behavior of the associated pumps or the associated extrusion system.

In other words, the function of this component is:

CONTROL OF PARAMETERS AND DISPENSING OF PUMPS, EXTRUDERS AND HEATERS (AND AGITATORS)

Intended use is the use described in the chapter below, while improper use is considered any other use that is not described in this manual, with products of different material and format from those for which it was built.

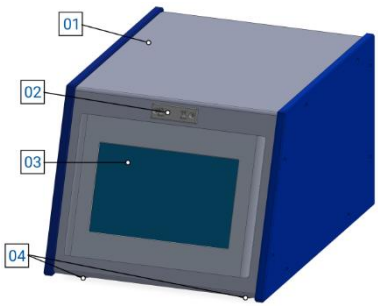

Figure 01 – Front PCP/PDP/GP/E2K EVO

No.	DESCRIPTION
01	Cover
02	Pen holder attachment
03	Display HMI
04	Support feet

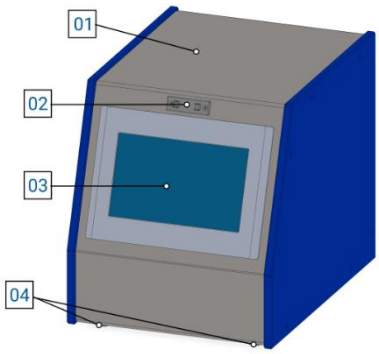

Figure 02 – GP2K EVO front end

No.	DESCRIPTION
01	Cover
02	Pen holder attachment
03	Display HMI
04	Support feet

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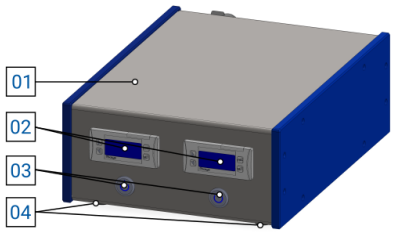

Figure 03 – Front EVO HEATERS

No.	DESCRIPTION
01	Cover
02	Pixsys
03	Stirrer power button
04	Support feet

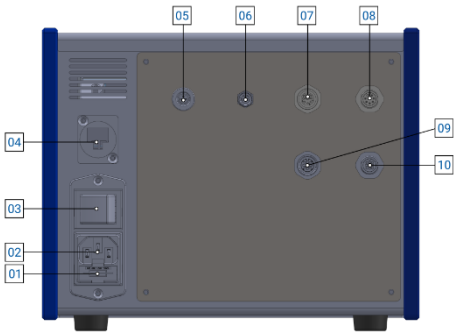

Figure 04 – E2K EVO Retro Controller

No.	DESCRIPTION
01	Input fuse
02	Power socket connection
03	Power switch
04	Ethernet connection
05	ON/OFF VALVE connection (M9 3-pin F)
06	CONTROL connection (M8 4-pin F)
07	OUT connection (M12 8-pin F)
08	IN connection (M12 8-pin M)
09	MOTOR connection (M12 5-pin F)
10	ENCODER connection (M12 5-pin M)

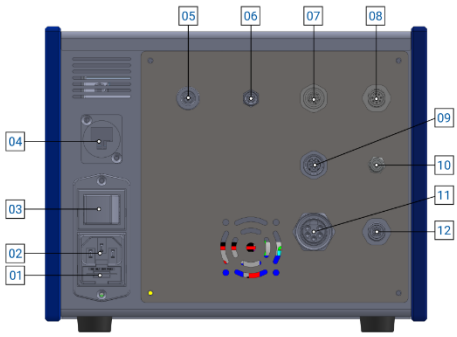

Figure 05 – GP EVO Retro Controller

No.	DESCRIPTION
01	Input fuse
02	Power socket connection
03	Power switch
04	Ethernet connection
05	Valve ON/OFF connection (M9 3-pin F)
06	CONTROL connection (M8 4-pin F)
07	OUT connection (M12 8-pin F)
08	IN connection (M12 8-pin F)
09	LEVEL connection (M12 4-pin F)
10	PRESSURE connection (M8 3-pole F)
11	MOTOR connection (7/8 5-pin F)
12	ENCODER connection (M12 5-pin M)

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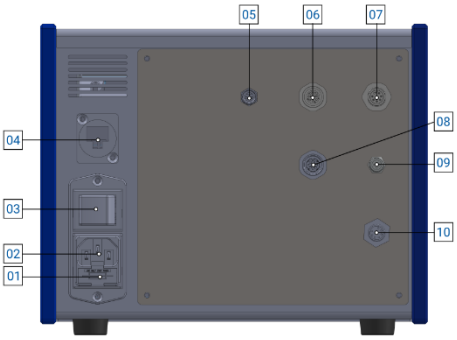

Figure 06 – Retro PCP EVO controller

No.	DESCRIPTION
01	Input fuse
02	Power socket connection
03	Power switch
04	Ethernet connection
05	CONTROL connection (M8 4-pin F)
06	OUT connection (M12 8-pin F)
07	IN connection (M12 8-pin M)
08	LEVEL connection (M12 4-pin F)
09	PRESSURE connection (M8 3-pin F)
10	DISPENSER connection (Chogori M)

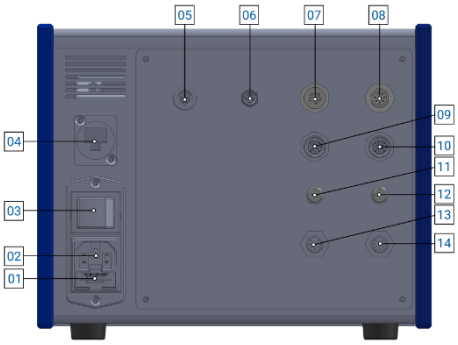

Figure 07 – PDP EVO Retro Controller

No.	DESCRIPTION
01	Input fuse
02	Power socket connection
03	Power switch
04	Ethernet connection
05	ON/OFF VALVE connection (M9 3-pin F)
06	CONTROL connection (M8 4-pin F)
07	OUT connection (M12 8-pin F)
08	IN connection (M12 8-pin M)
09	LEVEL A connection (M12 4-pin F)
10	LEVEL B connection (M12 4-pin F)
11	PRESSURE A connection (M8 3-pin F)
12	PRESSURE B connection (M8 3-pin F)
13	DISPENSER A connection (Chogori M)
14	DISPENSER B connection (Chogori M)

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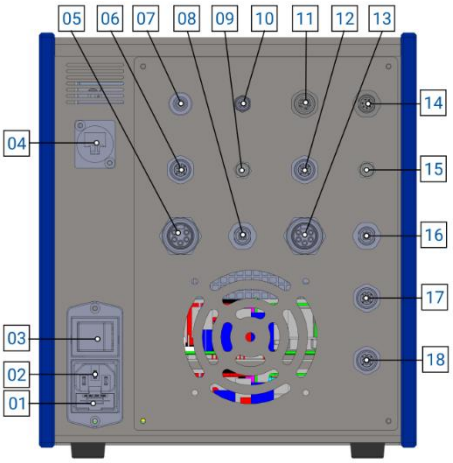

Figure 08 – Retro controller GP2K EVO

No.	DESCRIPTION
01	Input fuse
02	Power socket connection
03	Power switch
04	Ethernet connection
05	MOTOR A connection (7/8 5-pin F)
06	LEVEL A connection (M12 4-pin F)
07	ON/OFF VALVE connection (M9 3-pin F)
08	ENC connection. A (M12 5-pin M)
09	PRE OUT A connection (M8 3-pin F)
10	CONTROL connection (M8 4-pin F)
11	OUT connection (M12 8-pin F)
12	LEVEL B connection (M12 4-pin F)
13	MOTOR B connection (7/8 5-pin F)
14	IN connection (M12 8-pin M)
15	PRE OUT B connection (M8 3-pin F)
16	ENC B connection (M12 5-pin M)
17	PRE IN A connection (M12 4-pin F)
18	PRE IN B connection (M12 4-pin F)

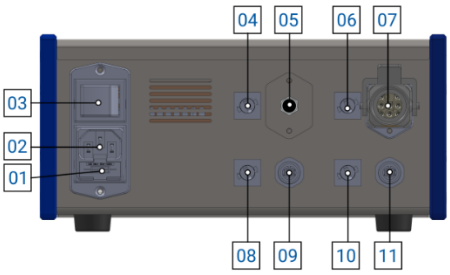

Figure 09 – Retro controller EVO HEATERS

No.	DESCRIPTION
01	Input fuse
02	Power socket connection
03	Power switch
04	Heated zone A fuse input
05	M8 5-pin zone A connection
06	Heated zone B fuse input
07	HARTING 8-pin zone B connection
08	Zone A agitator fuse
09	Stirrer connection A (M12 4-pin)
10	Zone B agitator fuse
11	Stirrer connection B (M12 4-pin)

For the EVO heater you can have combinations of two HARTING, two M8 5-pin connectors, or one HARTING connector and one M8 5-pin connector in points 05 and 07, depending on the customer's requirements.

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Before you can choose the correct template for your application, you must verify that it matches the component template you want to use. In particular:

- PCP pumps must be matched with the PCP EVO controller;
- PDP pumps must be combined with the PDP EVO controller;
- The GP pump must be combined with the GP EVO controller;
- Two GP pumps must be combined with the GP2K EVO controller (if used at the same time);
- The E2K family of extruders must be combined with the E2K EVO controller;
- The family of heaters (tire warmers, heated tubes and valve heaters) and agitators must be combined with the EVO HEATERS controller.

You can also buy "combined" systems, i.e., for example, PCP EVO controllers + EVO HEATERS controllers. Although they come together and can be mounted one on top of the other (generally the heater is placed underneath), the two systems are independent.

SPECIAL VERSIONS

The HEATERS EVO controller has a special version in case you need to connect a valve heater, which mounts an M8 connector instead of the standard connector, inserted as an example in figure 09. This type of heater can accommodate one pair of HARTING connectors, one pair of M8 5-pin connectors, or one per type, depending on your needs.

OPERATION

These devices work in a totally electric way and must be connected to devices that have an electrical and not pneumatic operation; Then, once the necessary connections have been made for the specific case (based on the customer's needs), the controller allows you to check and modify the parameters that are written on the screen, changing the behavior of the component to which they are connected. In particular:

- The HEATERS EVO controller allows you to adjust the temperatures of the devices to which they are associated and activate or deactivate the agitators;
- The GP EVO controller allows you to control the quantity delivered, the flow rate and the maximum pressure of the GP pump to which it is associated;
- The GP2K EVO controller is like the GP, only it allows you to control two GP pumps in parallel;
- The PCP EVO controller allows you to control the flow rate, the amount of material to be dosed (and sucked in), the pressure generated at the exit of the pump and any delays of the PCP pump to which it is connected;
- The PDP EVO controller is like the PCP EVO controller, only that it allows you to control a two-component pump, so both resin side (A) and hardening side (B);
- The E2K EVO controller allows you to control the quantity and flow rate of dosing (and suction), the residual volume of the cartridge and any delays of the extrusion system to which it is connected.

This chapter is for presentation only. To see all the features of the controller, you must go inside the associated chapter (chapter 6)

ATTENTION!
In this manual we refer, in some cases, to a double connection, indicated by "A" and "B" (PDP and GP2K pumps). In both cases, "A" is the resin circuit, while "B" is used to indicate the hardener circuit. You should NEVER swap these circuits.

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USEFUL TIPS

- If you have a recipe open and you edit it, you must call a different recipe and then go back to the working one to update the working parameters;
- If you press the "EXIT" button from the settings screen, you will get to the Windows screen, from which you risk losing data or damaging the control unit. If necessary, restart the controller via switch;
- When changing the main parameters (not from recipes), it is recommended to restart the control unit;
- When changing the "MODBUS mode" (i.e. whether you switch from MODBUS = ON to OFF mode or vice versa) it is recommended to restart the control unit;
- When changing the "WEIGHT mode" (i.e. whether you switch from WEIGHT = ON to OFF mode or vice versa) it is recommended to restart the control unit;
- When working in WEIGHT mode and changing the specific gravity, it is recommended to restart the control unit;
- Connect and disconnect the cables when the control unit is off;

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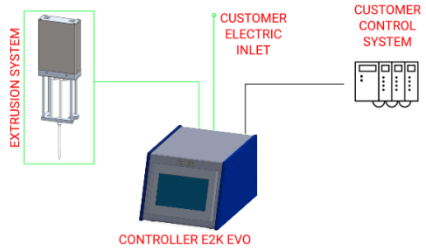
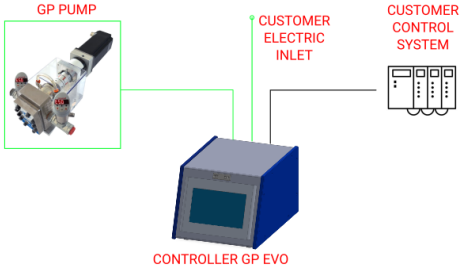


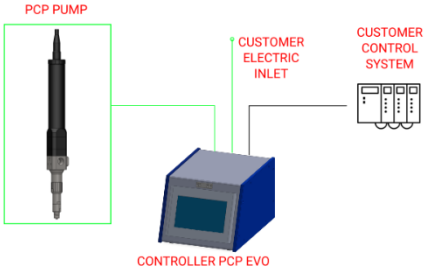
COLOR	MEANING
BLACK	Data
GREEN	Electrical connection
RED	Notes

Figure 10 – Example of E2K EVO controller connection



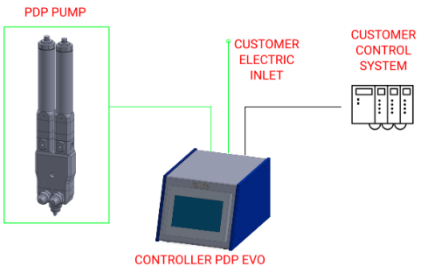
COLOR	MEANING
BLACK	Data
GREEN	Electrical connection
RED	Notes

Figure 11 – GP EVO controller connection example



COLOR	MEANING
BLACK	Data
GREEN	Electrical connection
RED	Notes

Figure 12 – Example of PCP EVO controller connection



COLOR	MEANING
BLACK	Data
GREEN	Electrical connection
RED	Notes

Figure 13 – PDP EVO Controller Connection Example

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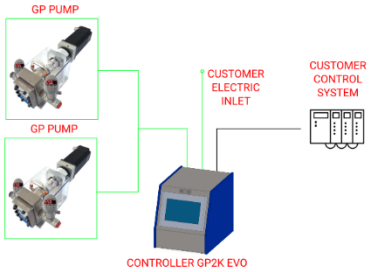
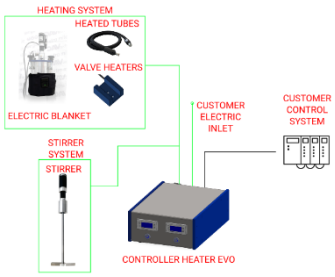


COLOR	MEANING
BLACK	Data
GREEN	Electrical connection
RED	Notes

Figure 14 – GP2K EVO controller connection example



COLOR	MEANING
BLACK	Data
GREEN	Electrical connection
RED	Notes

Figure 15 – Example of EVO HEATERS controller connection

ATTENTION!
For electrical connections, check the specific section of the component manual.

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2.1 Exploded view

N.A.

2.2 Technical data

All the technical characteristics concerning the components of this manual are indicated below.

SPECIFICATIONS		
Description	**UdM**	**Values**
GENERAL		
Controller type	\	EVO
Activation	\	Electric
ELECTRIC		
Single-phase power supply	V	110/230
Power supply fuse voltage	V	250
Power consumption GP/PCP/PDP/E2K EVO controller	W	250
Power consumption GP2K EVO controller	W	1200
Power consumption Controller EVO HEATERS	W	2500
Ionizing radiation	Sv	Not allowed
Frequency	Hz	50 ÷ 60

ENVIRONMENTAL CHARACTERISTICS		
Description	**UdM**	**Values**
Working Ambient Temperature	°C	10 ÷ 45
Storage Ambient Temperature	°C	-20 ÷ 55
Permissible non-condensing humidity	%	5 ÷ 90

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DIMENSIONAL AND WEIGHT CHARACTERISTICS GP/PCP/PDP/E2K EVO CONTROLLER		
Description	**UdM**	**Value**
Component length (min ÷ max)	mm	245
Component height (min ÷ max)	mm	195
Component depth (min ÷ max)	mm	260 ÷ 325
Component weight	kg	6.1 ÷ 6.7

DIMENSIONAL AND WEIGHT CHARACTERISTICS OF THE GP2K EVO CONTROLLER		
Description	**UdM**	**Value**
Component length (min ÷ max)	mm	245
Component height (min ÷ max)	mm	275
Component depth (min ÷ max)	mm	260 ÷ 325
Component weight	kg	9.5

DIMENSIONAL AND WEIGHT CHARACTERISTICS EVO HEATER CONTROLLER		
Description	**UdM**	**Value**
Component length (min ÷ max)	mm	245
Component height (min ÷ max)	mm	115
Component depth (min ÷ max)	mm	325
Component weight	kg	5.4

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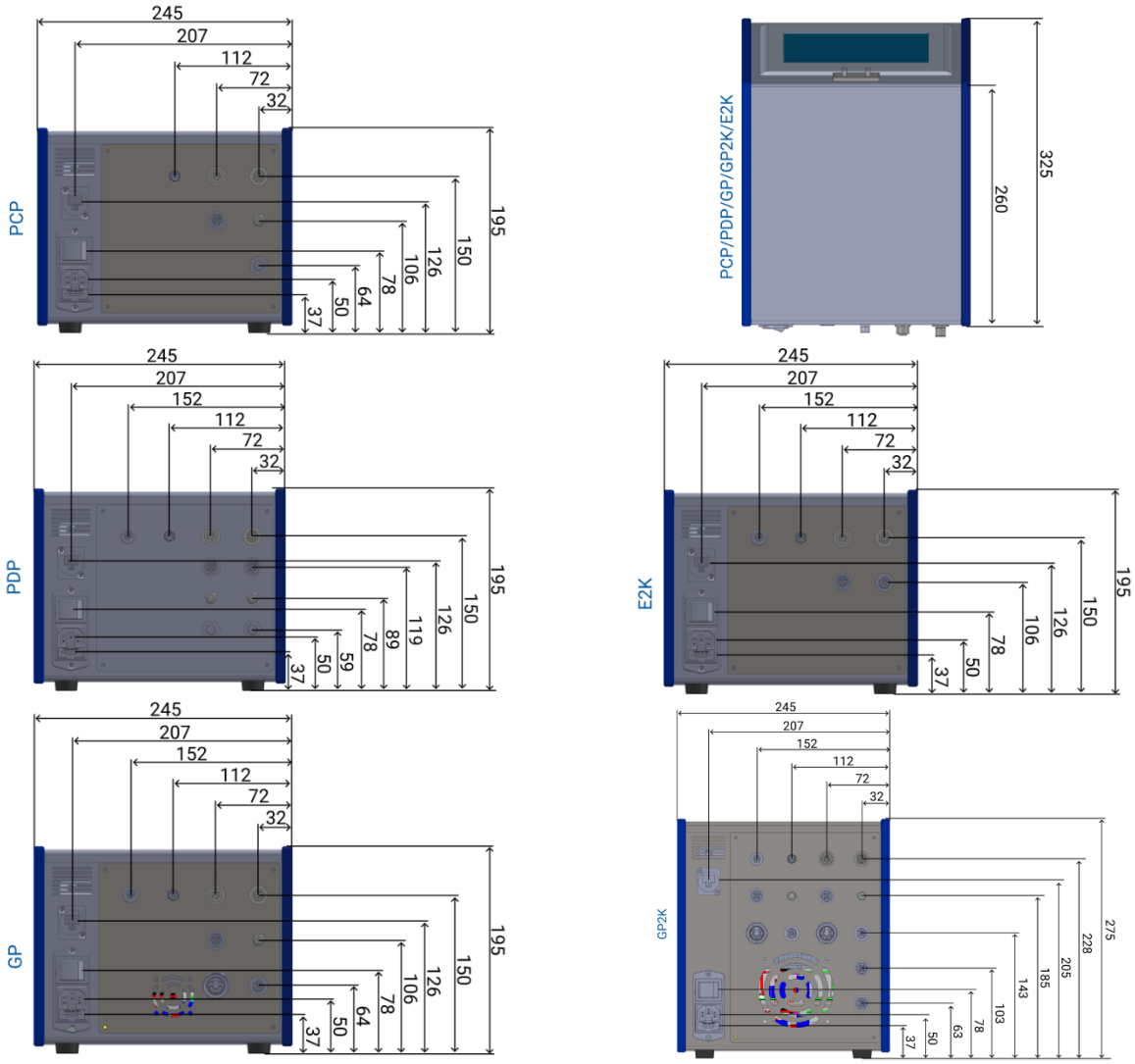
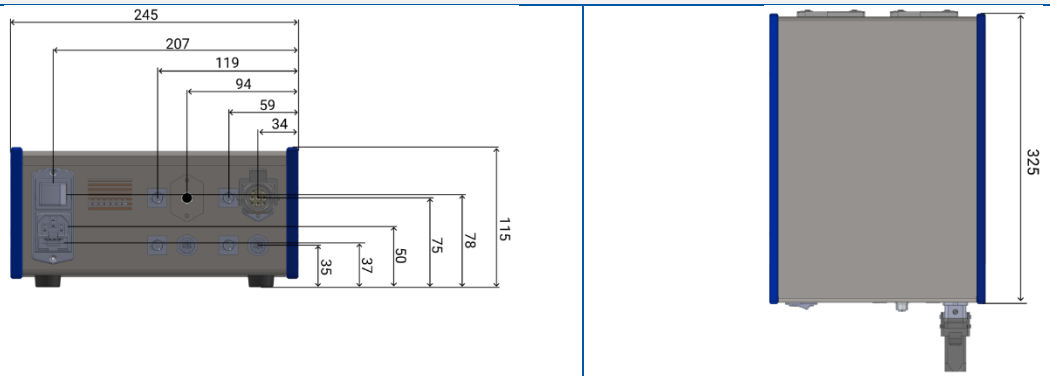
GP/GP2K/PCP/PDP/E2K EVO CONTROLLER TECHNICAL DRAWING



TECHNICAL DRAWING EVO HEATER CONTROLLERS



You can request the 3D of the component in the desired version from the manufacturer without any obligation.

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3 SAFETY

The following is a list of warnings regarding the component covered by this manual. Please read carefully before proceeding to the next chapters.

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

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

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

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

ATTENTION!
Modifications to the component must not be made to achieve performance other than 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 for the sole purpose for which it was designed and manufactured.

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

3.1 Machine safety devices

N.A.

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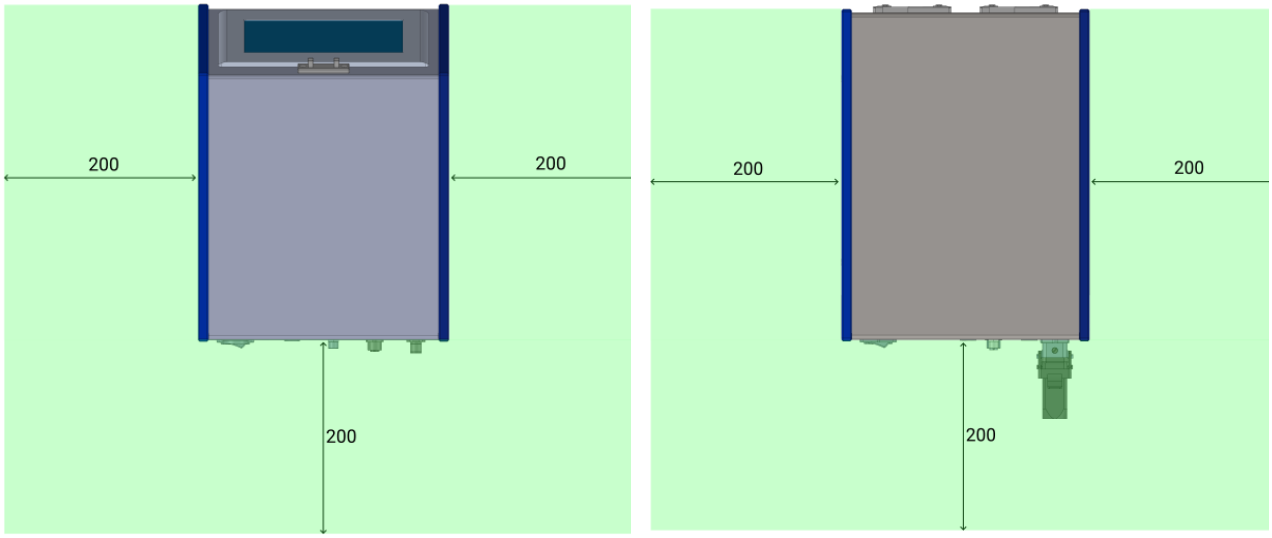
3.2 Free useful spaces

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

For the electrical panel, a free space equal to the size of the open door increased by 60cm is required.



In this image, the areas that are clear of any obstacles have been marked in green.

3.3 Risk areas and residual risk

N.A.

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4 TRANSPORT AND HANDLING

Once you have received the goods, you must check that the packaging is intact and that there is an exact correspondence with the material ordered. The components weigh below the limit imposed by the ISO 11228:1 standard, shown below:

MEN		WOMEN	
Age (years)	Weight (kg)	Age (years)	Weight (kg)
18 ÷ 45	25	18 ÷ 45	20
Less than 18 or above 45	20	Less than 18 or above 45	15

Therefore, the components can be moved without external aid.

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

ATTENTION!
If the packaging is not intact, contact the manufacturer immediately, also sending photos of the condition of the packaging. Do not open it until you have notified the manufacturer.

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5 INSTALLATION

The installation of the component is carried out by the customer. If necessary, you can contact the manufacturer to have a specialist technician to help you.

To be able to place the controller, just place it on a table, as it is equipped with support feet. If you have purchased a controller together with an EVO heater controller, you can place the controller on top of the heater, with the heater on a plane parallel to the ground. It is not possible, however, to place it in other positions: it must remain resting on a surface parallel to the ground.

It is recommended that you perform a component check before beginning the installation. If it is evidently damaged, please contact the manufacturer.

ATTENTION!
Please remove the packaging with the utmost care. If damage is caused to the component, the manufacturer is not liable.

Dispose of the 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

In this chapter, we want to explain the connection method that must be used for the component. The following types of connection are provided:

- Electrical connection;

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5.2.1 Electric

Authorized personnel		**PPE to wear**						
Component status	Component placed in the workplace							
Power Values	See chapter 2.2							
Necessary preparations	N.A.							
Materials needed	N.A.							
Equipment needed	N.A.							

The electricity connection is at the expense of the customer.

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

The connection diagrams of the components are shown below. The only component to be connected to the power supply is the controller, which has the connection set up for the 220V power supply with a specially supplied power supply.

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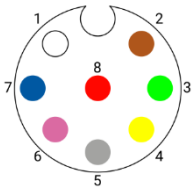
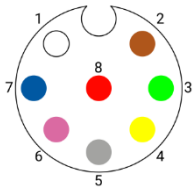
M12 8 PIN CONNECTOR – INPUT (IN)



PIN	COLOR	PCP	PDP	GP	GP2K	E2K
REFERENCE CAP.2		Fig. 06 No. 07	Fig.07 No. 08	Fig.05 No. 08	Fig.08 No. 14	Fig. 04 No. 08
1	WHITE	Bit 0 recipe				
2	BROWN	Bit 1 recipe				
3	GREEN	Bit 2 recipe				
4	YELLOW	Bit 3 recipe				
5	GREY	Bit 4 recipe				
6	PINK	Start dispensing				
7	BLUE	Park				
8	RED	+24 VDC (power)				

Through this connector it is possible to command certain actions to the controller, such as executing particular recipes (if the "recipes from digital I/O mode" is selected) or executing the start of dosing. It is possible to interface it with an external system by following the link below.

M12 8 PIN CONNECTOR – OUTPUT (OUT)



PIN	COLOR	PCP	GP	E2K	GP2K	PDP
REFERENCE CAP.2		Fig. 06 No. 06	Fig.05 No. 07	Fig.04 No. 07	Fig. 08 No. 11	Fig. 07 No. 07
1	WHITE	Alarm				
2	BROWN	Ready				
3	GREEN	End dispensing				
4	YELLOW	EV control				
5	GREY	End of fluid			Resin end	
6	PINK	Not connected			Hardener end	
7	BLUE	Drive alarm			Not connected	
8	RED	0 VDC				

Via this connector, the controller communicates various dosage states with digital signals, such as that the system is ready to work or the presence of alarms.

For the EV control (PIN 4, YELLOW color) there must be a maximum of 10W of absorption.

It is possible to interface it with an external system by following the link below.

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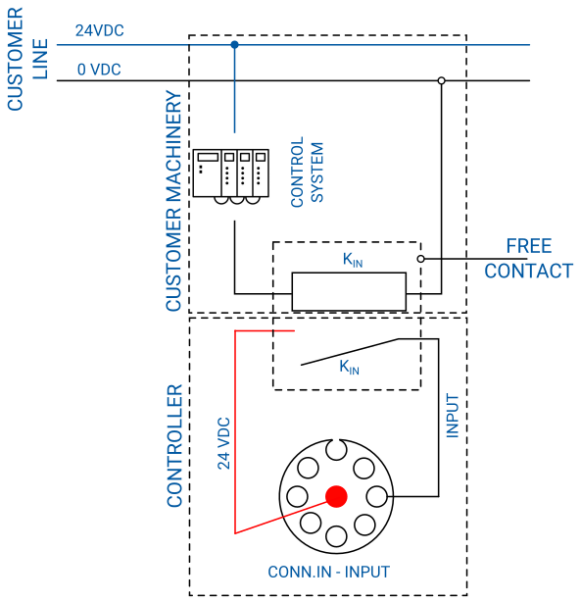
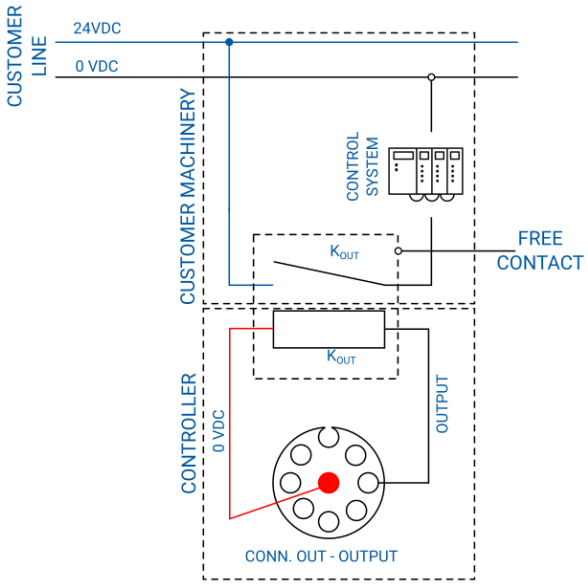
CONNECTION WITH EXTERNAL SYSTEMS



Connection of inputs with external system



Connection of outputs with external system

ATTENTION!
The figures above show how to connect an input or output signal to an external control system. Particular attention should be paid to when the 24 VDC (input) and when the 0 VDC (output) should be connected. In addition, free contacts are required for making connections, as shown in the illustrations. The connection diagram is generic for each type of input or output, i.e. it can be connected to the PIN of the desired connector. In addition, a control system is a generic system, which can be a PLC, another controller, a switch, or something else.

ATTENTION!
If you want to connect several inputs (or outputs), you must set up several free contacts; that is, for each input (or output) that you want to connect, you need to have a single free contact.

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

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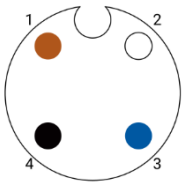
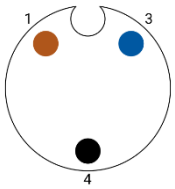
M8 4 PIN CONNECTOR – START + END DISPENSING (CONTROL)



PIN	COLOR	PCP	PDP	GP	E2K	GP2K
REFERENCE CAP.2		Fig. 06 No. 05	Fig.07 No. 06	Fig.05 No. 06	Fig. 04 No. 06	Fig. 08 No. 10
1	BROWN	+24 VDC (power)				
2	WHITE	End dispensing				
3	BLUE	0 VDC				
4	BLACK	Start dispensing				

Through this connector it is possible to control the dispensing and receive an end-of-dosing signal. The same signals are received and given by the "IN" and "OUT" connectors; the "CONTROL" connector can be used as an alternative.

M9 3 PIN CONNECTOR – EV CONTROL (ON/OFF VALVE)

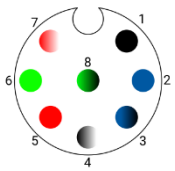


PIN	COLOR	GP	PDP	GP2K	E2K
REFERENCE CAP.2		Fig. 05 No. 05	Fig.07 No. 05	Fig.08 No. 07	Fig. 04 No. 05
1	BROWN	Not connected			
3	BLUE	0 VDC			
4	BLACK	EV control			

Through this connector it is possible to control the opening and closing of an external solenoid valve, or to control the start and stop of the dynamic mixer. The same signal is provided by the "OUT" connector, so you can use it as an alternative.

There must be a maximum of 10W of absorption.

CHOGORI CONNECTOR – PUMP CONTROL (DISPENSER)



PIN	COLOR	PCP	PDP
REFERENCE CAP.2		Fig. 06 No. 10	Fig.07 No. 13 & 14
1	BLACK	Motor +	
2	BLUE	5 VDC	
3	BLUE/BLACK	Ground (GND)	
4	BLACK/WHITE	Motor -	
5	RED	Encoder A	
6	GREEN	Encoder A -	
7	RED/WHITE	Encoder B	
8	GREEN/BLACK	Encoder B -	

Through this connector, the motor of the component must be connected to the controller, so that its movement can be controlled.

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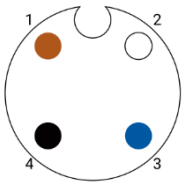
M12 4-PIN CONNECTOR – LEVEL

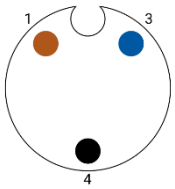


PIN	COLOR	PCP	PDP	GP	GP2K
REFERENCE CAP.2		Fig. 06 No. 08	Fig.07 No. 09 & 10	Fig.05 No. 09	Fig. 08 No. 06 & 12
1	BROWN	+24 VDC (power)			
2	WHITE	Not connected			
3	BLUE	0 VDC			
4	BLACK	Product level			

Through this connector it is possible to send the digital signal of the product level; or, based on the controller settings (if NO or NC), the system sends the end-of-product signal, with relative alarm and possible impossibility of starting new dosages.

This connector is also valid for double level control in the case of the PDP pump and GP2K pumps, indicated by "A" and "B".

M8 3-PIN CONNECTOR – OUTLET PRESSURE (PRESSURE or PRE. OUT)

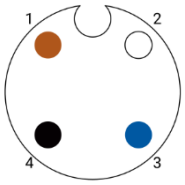


PIN	COLOR	PCP	PDP	GP	GP2K
REFERENCE CAP.2		Fig. 06 No. 09	Fig.07 No. 11 & 12	Fig.05 No. 10	Fig. 08 No. 09 & 15
1	BROWN	+5 VDC (power)		+24 VDC (power)	
3	BLUE	0 VDC			
4	BLACK	Sensor signal			

Through this connector it is possible to receive the analog pressure signals at the output of the components, activating any alarms if they are set via software.

This connector is also valid for double level control in the case of the PDP pump and GP2K pumps, indicated by "A" and "B".

M8 4-PIN CONNECTOR – INLET PRESSURE (PRE. IN)



PIN	COLOR	GP2K
REFERENCE CAP.2		Fig. 08 No. 17 & 18
1	BROWN	+24 VDC (power)
2	WHITE	Not connected
3	BLUE	0 VDC
4	BLACK	Sensor signal

Through this connector it is possible to receive the input analog pressure signals of the components, activating any alarms if they are set via software. This signal is obtained for both pumps, i.e. both pump "A" and pump "B".

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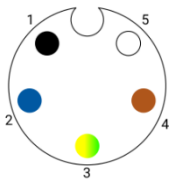
7/8 5-PIN CONNECTOR – MOTOR CONTROL

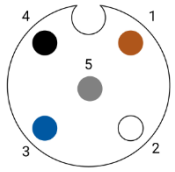


PIN	COLOR	GP	GP2K
REFERENCE CAP.2		Fig. 05 No. 11	Fig.08 No. 05 & 13
1	BLACK	Phase A	
2	BLUE	Phase A-	
3	GREEN/YELLOW	Ground (GND)	
4	BROWN	Phase B	
5	WHITE	Phase B-	

Through this connector, the motor of the component must be connected to the controller, so that its movement can be controlled.

This diagram is valid only for motors mounted on GP pumps

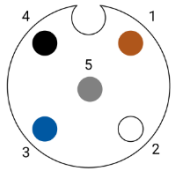
M12 5-PIN CONNECTOR – ENCODER CONTROL (ENCODER)



PIN	COLOR	E2K	GP	GP2K
REFERENCE CAP.2		Fig. 04 No. 10	Fig. 05 No. 12	Fig. 08 No. 08 & 16
1	BROWN	+24 VDC		
2	WHITE	Channel A		
3	BLUE	Common		
4	BLACK	Channel B		
5	GREY	Channel Z		

The encoder of the component must be connected to the controller via this connector so that the movement of the motor can be controlled correctly.

M12 5-PIN CONNECTOR – MOTOR CONTROL



PIN	COLOR	E2K
REFERENCE CAP.2		Fig. 04 No. 09
1	BROWN	Phase A -
2	WHITE	Phase A
3	BLUE	Phase B -
4	BLACK	Phase B
5	GREY	Shield

Through this connector, the motor of the component must be connected to the controller, so that its movement can be controlled.

This diagram is valid only for motors mounted on extrusion plants (E2K)

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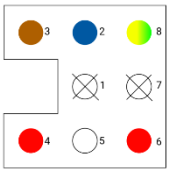
HARTING CONNECTOR – HEATER CONTROL 230V (HARTING)

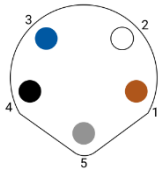


PIN	COLOR	HEATER
REFERENCE CAP.2		Fig. 09 No. 05 e 07 (based on component configuration)
1	N.A.	Not connected
2	BLUE	Resistence neutral
3	BROWN	Resistence phase
4	RED	PT100 probe
5	WHITE	PT100 probe
6	RED	PT100 probe
7	N.A.	Not connected
8	GREEN/YELLOW	Ground (GND)

The heating system (heated blanket or heated pipe) must be connected through this connector so that it can be controlled and adjusted.

ATTENTION!
This type of heater controls only PT100 probes. For other types of probes, please request the manufacturer's technical office.

M8 5-PIN CONNECTOR – HEATER CONTROL 24V

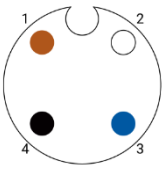


PIN	COLOR	HEATER
REFERENCE CAP.2		Fig. 09 No. 05 e 07 (based on component configuration)
1	BROWN	PT100 probe
2	WHITE	PT100 probe
3	BLUE	Resistence neutral
4	BLACK	Resistence phase
5	GREY	PT100 probe

The heating system (valve heater) must be connected via this connector so that it can be controlled and adjusted.

ATTENTION!
This type of heater controls only PT100 probes. For other types of probes, please request the manufacturer's technical office.

M12 4-PIN CONNECTOR – AGITATOR CONTROL (AGITATORS)



PIN	COLOR	HEATER
REFERENCE CAP.2		Fig. 09 No. 09 & 11
1	BROWN	Start mixer
2	WHITE	0 VDC
3	BLUE	0 VDC (Joint with pin 2)
4	BLACK	Start mixer (Button fuse A or B)

A mixer must be connected via this connector so that it can be controlled.

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5.3 Commissioning

The commissioning of the component is carried out once the positioning and connection of the connections has been completed. Before commissioning the component, the following checks must be carried out:

- Check that the connections have been connected correctly;
- Check that the component is free of dirt or residues of various kinds;
- Check that the connectors have been connected correctly;
- Make sure that the components are resting on a surface as indicated in the previous chapters.

ATTENTION!
If even one of the above points does not comply, commissioning must not be carried out. Commissioning should only be carried out when all points have been successfully completed.

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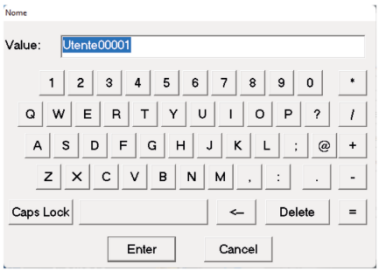
6 SOFTWARE

In this chapter we want to deepen the software part of the component, we want to see both the operator terminal and the screens that are displayed and how to change screens.

The operator terminal is a touch screen and is used to display the current screen, change screens, check the status of values within the component. The software starts automatically as soon as the component is powered.

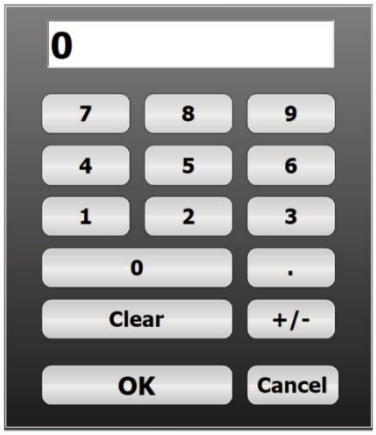
This symbol appears on any screen when an alarm arises. By pressing on this symbol, you can access the ALARMS and SIGNALS screen, and you can view the alarm and, if necessary, reset it.

By pressing on any interactive field on a screen, the numeric keypad appears to help the operator fill in the field itself. Keypads can be of two types:



Alphanumeric keypad: appears in case you need to enter texts as well as numbers. It is typically used to enter username, password, recipe name, or similar fields. Some keys are:

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



Numeric keypad: appears if you only need to enter numbers. It is typically used to enter passwords or similar fields. Some keys are:

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

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

In the event of alarms in progress, the ALARMS AND SIGNALS screen appears immediately when the program is switched on, accompanied by an intermittent sound.

TO ACCESS THE SETTINGS MENU, YOU MUST USE THE FOLLOWING CREDENTIALS:

USERNAME: dav **PASSWORD:** dav

Access and modification of some parameters in the menu is allowed only with the authorization of the manufacturer's technicians as they are protected by different credentials

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The controllers described below can be controlled via Digital I/O. This means that the following controllers, through the "IN" input connector, can manage a certain number of recipes, a total of 32 (5 bits are dedicated, from bit 0 to bit 4).

ATTENTION!
To perform the recipe change, the necessary bits must be set at the same time (**any delays between one signal and another could lead to incorrect readings**); after this, there must be a wait of about 200ms before the status of the bit ready is checked by the external system. After receiving the signal, wait another 200ms before dispensing.

Below we want to give the list of how the reading of the inputs is managed based on the selected recipes, i.e. which bits are activated to read a given recipe. Pay attention to the reading of the bits, as in this table we start from "BIT 4" and arrive at "BIT 0".

Recipe	Bit				
	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
1	0	0	0	0	0
2	0	0	0	0	1
3	0	0	0	1	0
4	0	0	0	1	1
5	0	0	1	0	0
6	0	0	1	0	1
7	0	0	1	1	0
8	0	0	1	1	1
9	0	1	0	0	0
10	0	1	0	0	1
11	0	1	0	1	0
12	0	1	0	1	1
13	0	1	1	0	0
14	0	1	1	0	1
15	0	1	1	1	0
16	0	1	1	1	1
17	1	0	0	0	0
18	1	0	0	0	1
19	1	0	0	1	0
20	1	0	0	1	1
21	1	0	1	0	0
22	1	0	1	0	1
23	1	0	1	1	0
24	1	0	1	1	1
25	1	1	0	0	0
26	1	1	0	0	1
27	1	1	0	1	0
28	1	1	0	1	1
29	1	1	1	0	0
30	1	1	1	0	1
31	1	1	1	1	0
32	1	1	1	1	1

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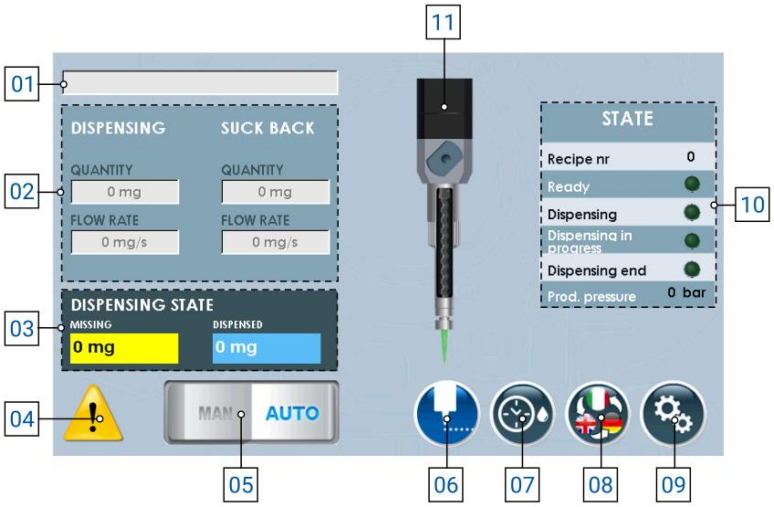
6.1 CONTROLLER PCP EVO

The following are the screens inside the PCP EVO controller

6.1.1 Main screen



1) **Drop-down menu** for choosing the recipe, in the case of automatic dosing;
2) **List of parameters** set per recipe (in case of manual mode, they can be modified), of which you have:
   a) **Dosing quantity:** Indicates the quantity of product to be dosed;
   b) **Dosing rate:** Indicates the amount of product to be dosed per second;
   c) **Suck back quantity:** Indicates the amount of product to be returned to the pump once the dosage has been carried out;
   d) **Suck back flow rate:** Indicates the amount of product per second to be returned to the pump once the dosage has been carried out;
3) **Dosage status:** Indicates how much product has been dosed and when there is enough left to reach the total quantity;
4) Location where you have notification of **active alarms**, visible if present;
5) Selector to change the working mode (**manual** or **automatic**);
6) Button to **enable dosing** (i.e. it dispenses the fluid with the quantities and flow rates indicated in point 02);
7) Button to enable **automatic purge mode,** visible if set;
8) Button to change the **language** of page display;
9) Button to enter the **settings menu** (chapter 6.1.2);
10) A list that indicates the status of the component, that is:
   a) **Recipe nr.:** Indicates the number of the recipe currently selected to work;
   b) **Ready:** indicates whether the component is ready to perform machining;
   c) **Dosage:** Indicates that I am commanding the component to dispense the product;
   d) **Dispensing in progress:** Indicates that the component is performing a dosage;
   e) **Dispensing end:** Indicates that the component has finished processing, i.e. according to the system parameter (08 chapter 6.1.2 subchapter "SYSTEM") the following behaviors occur:
      i) **If you work in "None", "HI pause" and/or control from the display (point 06),** you have an impulse that signals the end of dosing;
      ii) **If you work in "LO pause" or "Interrupt",** the end of dosage signal remains high as long as the dosage signal remains high.
   f) **Prod. pressure:** Indicates the pressure of the fluid container;
11) Indicative image of the pump status (animated).

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6.1.2 Settings screen

1) **Parameters:** button that allows you to access the parameter menu, to modify them according to the customer's needs;
2) **Recipes:** button that allows you to access the recipe menu, so that you can modify, add or delete them, according to the customer's needs;
3) **Interfacing:** button that allows you to access the interfacing menu between the controller and the customer's external system, to be able to see if there are communication problems between the two systems;
4) **Back:** button that allows you to return to the main screen (chapter 6.1.1);
5) **Exit:** button that allows you to close the dosing program to go to the main windows screen.

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

ATTENTION!
If you change a parameter within the "Parameters" item, it is recommended that you restart the controller for the change to take effect.

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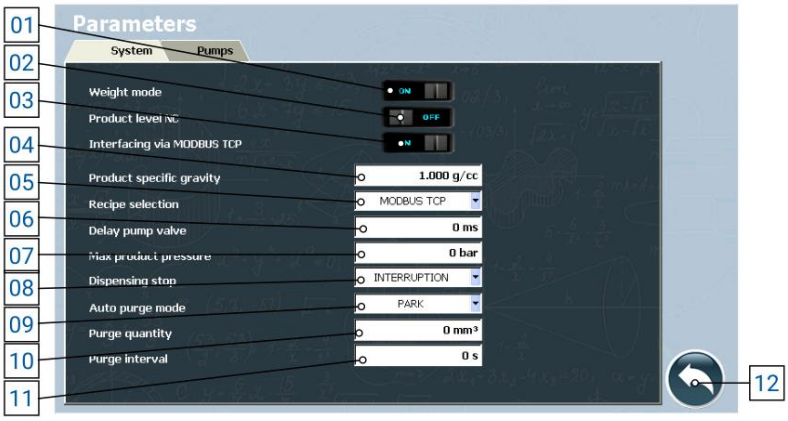
PARAMETERS → SYSTEM



1) **Weight mode:** Selector that, if active, allows you to work by displaying the value in weight instead of volume;

ATTENTION!
Working by weight there is a possible loss of stability in the dosage since the conversion is carried out using the specific gravity entered in the appropriate parameter (No. 04). The fluid may undergo variations in specific gravity due to external causes, causing a deviation between the set value and the actual value, resulting in incorrect delivery.

2) **Product Level NC:** If you are using a product level sensor NO you must set the selector switch to "OFF"; if you want to use an NC sensor you must set the selector switch to "ON";
3) **Interfacing via MODBUS TCP:** if enabled, it allows communication with an external customer system via modbus TCP/IP (ethernet);
4) **Product specific gravity:** This field appears only if the "Weight mode" selector (point 01) is "ON". It allows you to enter the specific gravity of the product you are using to perform the necessary conversions from mm^3 to mg;
5) **Recipe selection:** drop-down menu that allows you to choose the working mode, in particular:
   a) **Manual:** the recipe is selected by the operator via the HMI panel (reference Point 01 chapter 6.1.1);
   b) **Digital I/O:** the recipe is automatically passed to the controller via the wiring of the "IN" connector;
   c) **Modbus TCP/IP:** the recipe is automatically passed to the controller via ethernet connection, only if the modbus interface selector is enabled (point 03);
6) **Valve pump delay:** Parameter to indicate a possible delay between the opening of a possible solenoid valve and the start of the dosing cycle (first it sends the command to the solenoid valve and then, after the indicated time, the dosing cycle starts). If no solenoid valve is present, leave at 0;
7) **Maximum product pressure:** Maximum acceptable pressure generated at the outlet of the PCP pump. Each pump has its maximum pressures, so please consult the manual of the pump you bought;

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8) **Dispensing stop:** Indicates the mode in which you want to perform the dosing lock. In particular, the modalities can be:
   a) **None:** In this mode it is not possible to stop the dosage once it has started, except by turning off the control unit using the power switch on the back;
   b) **Interruption:** In the case of external use (control button or PLC), the dosage signal must be activated to start dispensing. As soon as it is deactivated (i.e. the dosage signal is missing), dosing stops. When activated again, dosing starts again from the beginning (it does not save the dosed amount). In the case of use via HMI display, press once to start (without holding down) and press again to stop;
   c) **HI Pause:** In this mode, there is no need to press and hold the dosing button. The dosing cycle is paused when it receives a new dosing signal. When it is sent again after the pause, the cycle is resumed from the previously dosed quantity (saves the amount of fluid dosed), completing the recipe. You can take several breaks during dosing. In the case of use via HMI display, press once to start dispensing (without holding down) and press again to stop it and, subsequently, press a third time to resume it, ending the set quantity;
   d) **LOW pause:** In this mode you need to press and hold the dosing button (or signal from PLC). The dosing cycle is paused when the dosing signal is no longer available (release the dosing button, for example). When the dosing signal is activated again, the cycle resumes from the previous point (thus keeping the dosing history saved) and continues dosing until the dosing signal is deactivated (for example, as long as the dosing button is pressed). To end the cycle in this mode, the dosage signal must be kept high until the recipe is completed. You can take several breaks during dosing. In the case of use via HMI display, press once to start dispensing (without holding down) and press again to stop it and, subsequently, press a third time to resume it, ending the set quantity;
9) **Automatic purge mode:** This drop-down menu allows you to select how you want to perform the automatic purge (if you want to perform it). In particular, you can set:
   a) **Always OFF:** Automatic purge is not performed in this mode;
   b) **Always ON:** In this mode, purge is always performed with the modes set in the following points if enabled from the main screen (No. 07 chapter 6.1.1);
   c) **Parking:** Automatic purge can only be performed if the system receives the park signal (e.g. via sensor) and if it is enabled from the main screen (No. 07 chapter 6.1.1).
10) **Purge quantity:** The amount of fluid that is expelled during the automatic purge mode. It is recommended to set it in such a way that it expels all the fluid present in the nozzle. The purge flow rate and suck back parameters are equivalent to those set in the recipe in use;
11) **Purge Interval:** Indicates the minimum amount of time that must elapse from the last dispense to the start of automatic purging.

ATTENTION!
The three parameters above depend on the type of fluid and how quickly it tends to cross-link in contact with air. It is advisable to keep the settings set by the manufacturer, or at least contact the manufacturer if you want to change them.

12) **Back:** Button to return to the settings menu;

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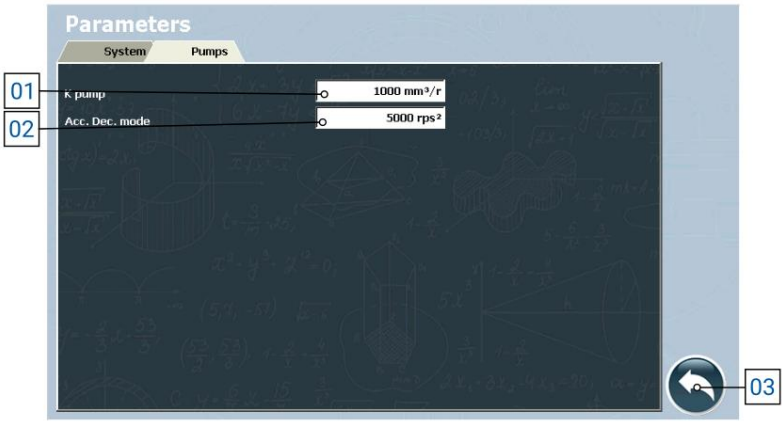
PARAMETERS → PUMP



1) **K pump:** Parameter that indicates the amount of product dispensed by the pump at each rotation.

The value indicated in this parameter must be a value relatively close to the size of the PCP used.

ATTENTION!
This parameter is set by the manufacturer's technicians and is not to be changed, unless requested by the technicians themselves. If you must set it up yourself, call the manufacturer's technicians for assistance.

2) **Acc. Dec. mode:** Parameter that indicates the acceleration (and deceleration) of the pump during the delivery and stop phase;
3) **Back:** Button to return to the settings menu;

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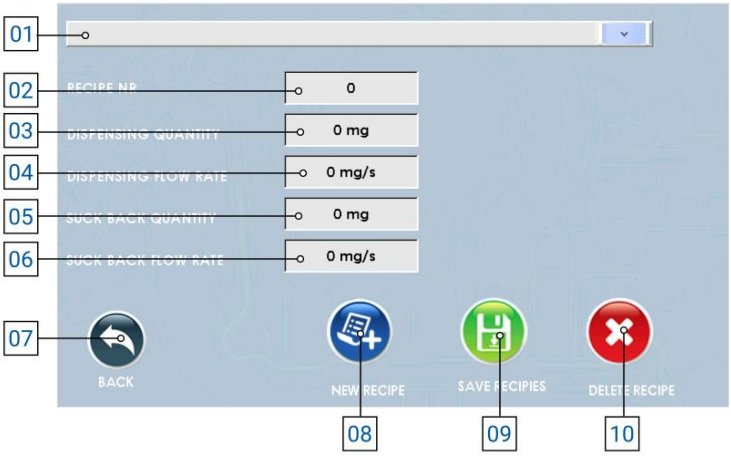
6.1.3 Recipes screen



1) Drop-down menu for **recipe selection**;
2) **Recipe number:** Indicates the number of the recipe saved in the software, useful for interfacing the controller with the customer's external systems and recalling the recipe with this number;
3) **Dosing quantity:** Indicates the quantity of product to be dosed;
4) **Dosing rate:** Indicates the amount of product to be dosed per second;
5) **Suck back quantity:** Indicates the amount of product to be sucked up once the dosage has been carried out;
6) **Suck back flow rate:** Indicates the amount of product per second to be sucked up once the dosage has been carried out;
7) **Back:** button to return to the settings menu (chapter 6.1.2);
8) **New recipe:** button that allows you to create a new recipe;
9) **Save recipe:** button that allows you to save the changes made to the recipe;

ATTENTION!
If you do not press this button, the changes you have set are lost.

10) **Delete recipe:** button that allows you to delete the selected recipe.

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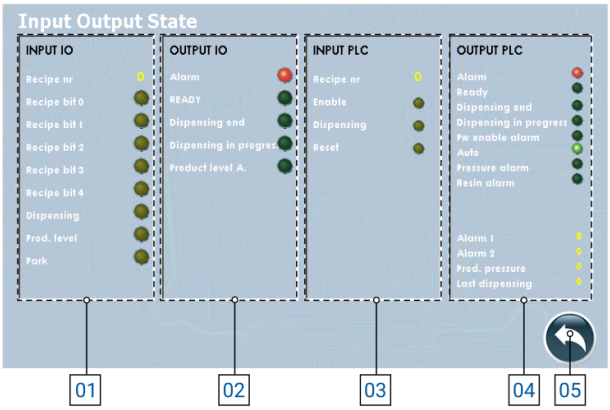
6.1.4 Interfacing Screen



1) **I/O INPUTS:** These are all the inputs that arrive from the system to the controller to manage the process:
   a) **Recipe No.:** Indicates the recipe number set by the client server to the controller (or manually set in the controller);
   b) **Bit Recipe (0/1/2/3/4):** Indicates whether the relative bit is active or not. Based on the combination, the recipe used can be traced (refer to chapter 6 for coding);
   c) **Dispensing:** Indicates whether the dispensing command is present;
   d) **Product Level:** Indicates whether the level sensor is detecting the end of the product in the fuel system (behavior may vary depending on parameter settings);
   e) **Park:** Indicates whether the dosing system is in the park position.
2) **I/O OUTPUTS:** These are all the outputs that the controller sends to the system to be able to manage the process if connected via Digital I/O:
   a) **Alarm:** Indicates if there are active alarms;
   b) **Ready:** Indicates whether the system is ready to dispense;
   c) **End of dosing:** Indicates whether the system has finished dosing;
   d) **Dispensing in progress:** Indicates whether the system is performing a dosage;
   e) **Product level A:** Indicates if a product level alarm is present.
3) **PLC INPUT:** These are all the inputs that come from the external system to the controller if connected via MODBUS TCP/IP (visible only with the "MODBUS TCP" selector enabled):
   a) **Recipe nr:** Indicates the recipe number set by the system;
   b) **Enable:** Indicates whether the controller is enabled to work or not;
   c) **Dispensing:** Indicates whether the dispensing signal arrives at the input;
   d) **Reset:** Indicates if the alarm restart command comes from the system;
4) **PLC OUTPUT:** These are all the outputs that the controller sends to the external system to manage the process if connected via MODBUS TCP/IP (visible only with the "MODBUS TCP" selector enabled):
   a) **Alarm:** Indicates if there are active alarms;
   b) **Ready:** Indicates whether the system is ready to dispense;
   c) **End of dosing:** Indicates whether the system has finished dosing;
   d) **Dispense in progress:** Indicates whether the system is performing a dosage;
   e) **Alarm for enable:** The system is in alarm due to the system enable;
   f) **Auto:** Indicates whether the system is in automatic mode;
   g) **Pressure Alarm:** Indicates that there is an alarm related to the outlet pressure;
   h) **Resin alarm:** Indicates that there is an alarm related to the product to be dosed;
   i) **Alarms (1/2):** Indicates the indicative number of the active alarm, to send it to an external system;
   j) **Product Pres.:** Indicates the pressure generated in real time at the outlet of the PCP;
   k) **Last dosage:** Indicates the quantity of product that was dosed in the last process;
5) **Back:** Button to return to the settings menu (chapter 6.1.2);

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6.1.5 Interfacing Screen

The various logs and how they were configured are described below.

You can request the sample project developed by the manufacturer in TIA Portal 16 and the MODBUS TCP/IP configuration wizard by contacting the manufacturer.

If there are indications such as "B0" under a register, the bit occupied within the register and its function is indicated, otherwise the register and the function it has, in which the whole register is occupied to indicate a certain value.

HOLDING REGISTER 0	
Status of outputs	
B0	Alarm
B1	Ready
B2	End of dosage
B3	Ongoing dosing
B4	Power enable alarm
B5	Auto Mode
B6	Pressure alarm
B7	Product Level Alarm

HOLDING REGISTER 1	
Alarms 1	
B0	Timeout modbus drive 1
B1	Free
B2	IO modbus module timeout
B3	Timeout modbus PLC
B4	Fault drive 1
B5	Free
B6	Drive Power Alarm 1
B7	Max Pressure
B8	Level 1 alarm

HOLDING REGISTER 2
Alarms 2
Empty

HOLDING REGISTER 3
Pressure 1

HOLDING REGISTER 4
Not used

HOLDING REGISTER 5
Last quantity dosed LSB

HOLDING REGISTER 6
Last quantity dosed MSB

HOLDING REGISTER 10	
Commands	
B0	Enable
B1	Dosage
B2	Alarm Reset

HOLDING REGISTER 11
Recipe

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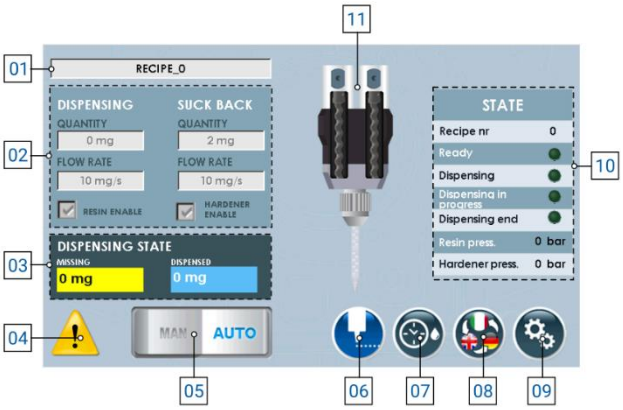
6.2 CONTROLLER PDP EVO

The following are the screens inside the PDP EVO controller

6.2.1 Main screen



1) **Drop-down menu** for choosing the recipe, in the case of automatic dosing;
2) **List of parameters** set per recipe (in case of manual mode, they can be modified), of which you have:
   a) **Dosing quantity:** Indicates the quantity of product to be dosed;
   b) **Dosing rate:** Indicates the amount of product to be dosed per second;
   c) **Suck back quantity:** Indicates the amount of product to be returned to the pump once the dosage has been carried out;
   d) **Suck back flow rate:** Indicates the amount of product per second to be returned to the pump once the dosage has been carried out;
3) **Dosage status:** Indicates how much product has been dosed and when there is enough left to reach the total quantity;
4) Location where you have notification of **active alarms**, visible if present;
5) Selector to change the working mode (**manual** or **automatic**);
6) Button to **enable dosing** (i.e. it dispenses the fluid with the quantities and flow rates indicated in point 02);
7) Button to enable **automatic purge mode,** visible if set;
8) Button to change the **language** of page display;
9) Button to enter the **settings menu** (chapter 6.2.2);
10) A list that indicates the status of the component, that is:
   a) **Recipe nr.:** Indicates the number of the recipe currently selected to work;
   b) **Ready:** indicates whether the component is ready to perform machining;
   c) **Dosage:** Indicates that I am commanding the component to dispense the product;
   d) **Dosage in progress:** Indicates that the component is performing a dosage;
   e) **End of dosing:** Indicates that the component has finished processing, i.e. according to the system parameter (08 chapter 6.2.2 subchapter "SYSTEM") the following behaviors occur:
      i) **If you work in "None", "HI pause" and/or control from the display (point 06),** you have an impulse that signals the end of dosing;
      ii) **If you work in "LO pause" or "Interrupt",** the end of dosage signal remains high as long as the dosage signal remains high.
   f) **Resin Pres.:** Indicates the pressure of the resin fluid container;
   g) **Hardener Pres.:** Indicates the pressure of the hardener fluid container;
11) Indicative image of the pump status (animated).

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6.2.2 Settings screen

1) **Parameters:** button that allows you to access the parameter menu, to modify them according to the customer's needs;
2) **Recipes:** button that allows you to access the recipe menu, so that you can modify, add or delete them, according to the customer's needs;
3) **Interfacing:** button that allows you to access the interfacing menu between the controller and the customer's external system, to be able to see if there are communication problems between the two systems;
4) **Back:** button that allows you to return to the main screen (chapter 6.2.1);
5) **Exit:** button that allows you to close the dosing program to go to the main windows screen.

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

ATTENTION!
If you change a parameter within the "Parameters" item, it is recommended that you restart the controller for the change to take effect.

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SYSTEM → PARAMETERS

1) **Weight mode:** Selector that, if active, allows you to work by displaying the value in weight instead of volume;

ATTENTION!
Working by weight there is a possible loss of stability in the dosage since the conversion is carried out using the specific gravity entered in the appropriate parameter (No. 04). The fluid may undergo variations in specific gravity due to external causes, causing a deviation between the set value and the actual value, resulting in incorrect delivery.

ATTENTION!
If you use the weight mode, you must set the "Resin:hardener ratio" parameter to VOLUME and not by weight, otherwise the internal calculations of the system are incorrect, leading to incorrect dosages.

2) **Product Level NC:** If you are using a product level sensor NO you must set the selector switch to "OFF"; if you want to use an NC sensor you must set the selector switch to "ON";
3) **Interfacing via MODBUS TCP:** if enabled, it allows communication with an external customer system via modbus TCP/IP (ethernet);
4) **Product specific gravity:** This field appears only if the "Weight mode" selector (point 01) is "ON". It allows you to enter the specific weight of the product (both resin and hardener) that you are using to perform the necessary conversions from mm^3 to mg;
5) **Recipe selection:** drop-down menu that allows you to choose the working mode, in particular:
   a) **Manual:** the recipe is selected by the operator via the HMI panel (reference Point 01 chapter 6.2.1);
   b) **Digital I/O:** the recipe is automatically passed to the controller via the wiring of the "IN" connector;
   c) **Modbus TCP/IP:** the recipe is automatically passed to the controller via ethernet connection, if the modbus interface selector is enabled (point 03);
6) **Valve pump delay:** Parameter to indicate a possible delay between the opening of a possible solenoid valve and the start of the dosing cycle. If no solenoid valve is present, leave at 0;
7) **Maximum Resin/Harder Pressure:** Maximum acceptable pressure generated at the outlet of the PDP pump. Each pump has its maximum pressures, so please consult the manual of the pump you bought;

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8) **Dispensing stop:** Indicates the mode in which you want to perform the dosing lock. In particular, the modalities can be:
   a) **None:** In this mode it is not possible to stop the dosage once it has started, except by turning off the control unit using the power switch on the back;
   b) **Interruption:** In the case of external use (control button or PLC), the dosage signal must be activated to start dispensing. As soon as it is deactivated (i.e. the dosage signal is missing), dosing stops. When activated again, dosing starts again from the beginning (it does not save the dosed amount). In the case of use via HMI display, press once to start (without holding down) and press again to stop;
   c) **HI Pause:** In this mode, there is no need to press and hold the dosing button. The dosing cycle is paused when it receives a new dosing signal. When it is sent again after the pause, the cycle is resumed from the previously dosed quantity (saves the amount of fluid dosed), completing the recipe. You can take several breaks during dosing. In the case of use via HMI display, press once to start dispensing (without holding down) and press again to stop it and, subsequently, press a third time to resume it, ending the set quantity;
   d) **LOW pause:** In this mode you need to press and hold the dosing button (or signal from PLC). The dosing cycle is paused when the dosing signal is no longer available (release the dosing button, for example). When the dosing signal is activated again, the cycle resumes from the previous point (thus keeping the dosing history saved) and continues dosing until the dosing signal is deactivated (for example, as long as the dosing button is pressed). To end the cycle in this mode, the dosage signal must be kept high until the recipe is completed. You can take several breaks during dosing. In the case of use via HMI display, press once to start dispensing (without holding down) and press again to stop it and, subsequently, press a third time to resume it, ending the set quantity;
9) **Automatic purge mode:** This drop-down menu allows you to select how you want to perform the automatic purge (if you want to perform it). In particular, you can set:
   a) **Always OFF:** Automatic purge is not performed in this mode;
   b) **Always ON:** In this mode, purge is always performed with the modes set in the following points if enabled from the main screen (No. 07 chapter 6.2.1);
   c) **Parking:** Automatic purge can only be performed if the system receives the park signal (e.g. via sensor) and if it is enabled from the main screen (No. 07 chapter 6.2.1).
10) **Purge Amount:** The amount of fluid that is expelled during the automatic purge mode. It is recommended to set it in such a way that it expels all the fluid present in the nozzle. The purge flow rate and suck back parameters are equivalent to those set in the recipe in use;
11) **Purge Interval:** Indicates the minimum amount of time that must elapse from the last dispense to the start of automatic purging.

ATTENTION!
The three parameters above depend on the type of fluid and how quickly it tends to cross-link in contact with air. It is advisable to keep the settings set by the manufacturer, or at least contact the manufacturer if you want to change them.

12) **Back:** Button to return to the settings menu;

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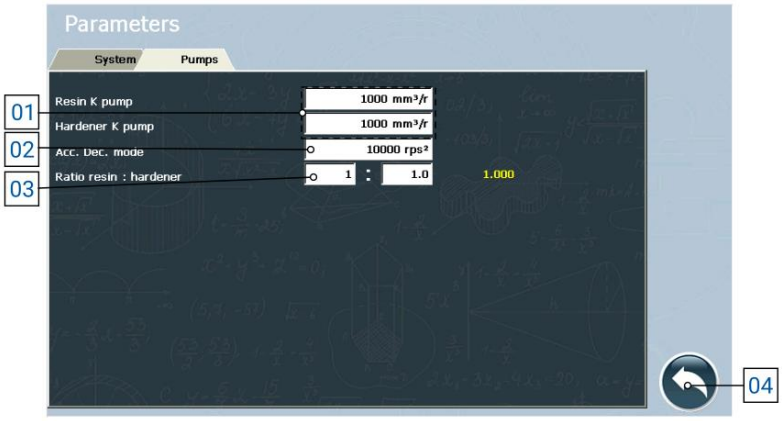
PARAMETERS → PUMP



1) **K pump (resin/hardener):** Parameter indicating the amount of product dispensed by the pump at each rotation.

The value indicated in this parameter must be a value relatively close to the size of the PCP used.

ATTENTION!
This parameter is set by the manufacturer's technicians and is not to be changed, unless requested by the technicians themselves. If you must set it up yourself, call the manufacturer's technicians for assistance.

2) **Acc. Dec. mode:** Parameter that indicates the acceleration (and deceleration) of the pump during the delivery and stop phase;
3) **Resin/hardener ratio:** Indicates how much resin you want to get out of the hardener, based on the specifications of the product you are using;

ATTENTION!
This parameter is set by the manufacturer's technicians and is not to be changed, unless requested by the technicians themselves. If you must set it up yourself, call the manufacturer's technicians for assistance.

ATTENTION!
If you use the weight mode, you must set the "Resin:hardener ratio" parameter to VOLUME and not by weight, otherwise the internal calculations of the system are incorrect, leading to incorrect dosages.

4) **Back:** Button to return to the settings menu;

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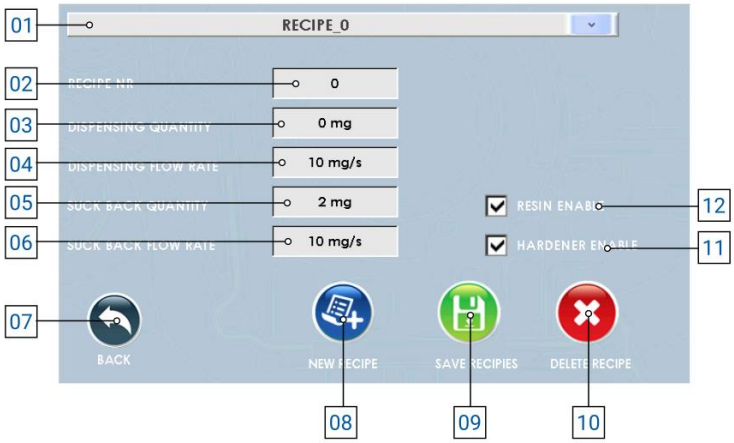
6.2.3 Recipes screen



1) Drop-down menu for **recipe selection**;
2) **Recipe number:** Indicates the number of the recipe saved in the software, useful for interfacing the controller with the customer's external systems and recalling the recipe with this number;
3) **Dosing quantity:** Indicates the quantity of product to be dosed;
4) **Dosing rate:** Indicates the amount of product to be dosed per second;
5) **Suck back quantity:** Indicates the amount of product to be sucked up once the dosage has been carried out;
6) **Suck back flow rate:** Indicates the amount of product per second to be sucked up once the dosage has been carried out;
7) **Back:** button to return to the settings menu (chapter 6.2.2);
8) **New recipe:** button that allows you to create a new recipe;
9) **Save recipe:** button that allows you to save the changes made to the recipe;

ATTENTION!
If you do not press this button, the changes you have set are lost.

10) **Delete recipe:** button that allows you to delete the selected recipe.
11) **Enable hardener:** selector to enable or disable the dispensing of hardener using this recipe, useful in the case of maintenance recipes;
12) **Enable resin:** selector to enable or disable resin dispensing using this recipe, useful in the case of maintenance recipes;

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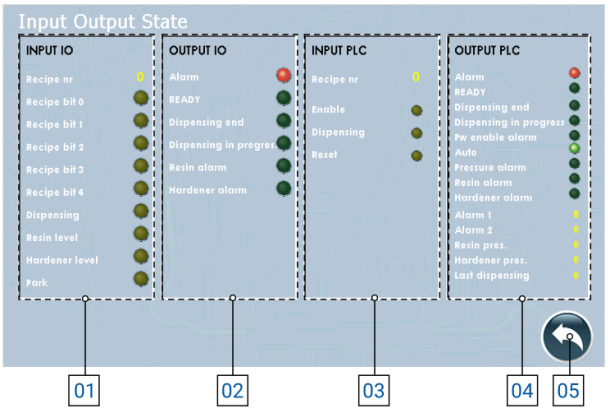
6.2.4 Interfacing Screen



1) **I/O INPUTS:** These are all the inputs that arrive from the system to the controller to manage the process:
   a) **Recipe No.:** Indicates the recipe number set by the client server to the controller (or manually set in the controller);
   b) **Bit Recipe (0/1/2/3/4):** Indicates whether the relative bit is active or not. Based on the combination, the recipe used can be traced (refer to chapter 6 for coding);
   c) **Dispensing:** Indicates whether the dispensing command is present;
   d) **Resin/hardener level:** Indicates whether the level sensor is detecting the end of the product in the feeding system (behavior may vary depending on parameter settings);
   e) **Park:** Indicates whether the dosing system is in the park position.
2) **I/O OUTPUTS:** These are all the outputs that the controller sends to the system to be able to manage the process if connected via Digital I/O:
   a) **Alarm:** Indicates if there are active alarms;
   b) **Ready:** Indicates whether the system is ready to dispense;
   c) **End of dosing:** Indicates whether the system has finished dosing;
   d) **Dispensing in progress:** Indicates whether the system is performing a dosage;
   e) **Resin/Hardener Alarm:** Indicates if a product level alarm is present.
3) **PLC INPUT:** These are all the inputs that come from the external system to the controller if connected via MODBUS TCP/IP (visible only with the "MODBUS TCP" selector enabled):
   a) **Recipe nr:** Indicates the recipe number set by the system;
   b) **Enable:** Indicates whether the controller is enabled to work or not;
   c) **Dispensing:** Indicates whether the dispensing signal arrives at the input;
   d) **Reset:** Indicates if the alarm restart command comes from the system;
4) **PLC OUTPUT:** These are all the outputs that the controller sends to the external system to manage the process if connected via MODBUS TCP/IP (visible only with the "MODBUS TCP" selector enabled):
   a) **Alarm:** Indicates if there are active alarms;
   b) **Ready:** Indicates whether the system is ready to dispense;
   c) **End of dosing:** Indicates whether the system has finished dosing;
   d) **Dispensing in progress:** Indicates whether the system is performing a dosage;
   e) **Alarm for enable:** The system is in alarm due to the system enable;
   f) **Auto:** Indicates whether the system is in automatic mode;
   g) **Pressure Alarm:** Indicates that there is an alarm related to the outlet pressure;
   h) **Resin/hardener alarm:** Indicates that there is an alarm related to the product to be dosed;
   i) **Alarms (1/2):** Indicates the indicative number of the active alarm, to send it to an external system;
   j) **Resin/hardener pres.:** Indicates the pressure generated in real time at the output of the PDP;
   k) **Last dosage:** Indicates the quantity of product that was dosed in the last process;
5) **Back:** Button to return to the settings menu (chapter 6.2.2);

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6.2.5 Interfacing Screen

The various logs and how they were configured are described below.

You can request the sample project developed by the manufacturer in TIA Portal 16 and the MODBUS TCP/IP configuration wizard by contacting the manufacturer.

If there are indications such as "B0" under a register, the bit occupied within the register and its function is indicated, otherwise the register and the function it has, in which the whole register is occupied to indicate a certain value.

HOLDING REGISTER 0	
Status of outputs	
B0	Alarm
B1	Ready
B2	End of dosage
B3	Ongoing dosing
B4	Power enable alarm
B5	Auto Mode
B6	Pressure alarm
B7	Resin level alarm
B8	Hardening level alarm

HOLDING REGISTER 1	
Alarms 1	
B0	Timeout modbus drive 1
B1	Timeout modbus drive 2
B2	IO modbus module timeout
B3	Timeout modbus PLC
B4	Fault drive 1
B5	Fault drive 2
B6	Drive Power Alarm 1
B7	Drive Power Alarm 2
B8	Level 1 alarm
B9	Level 2 Alarm

HOLDING REGISTER 2
Alarms 2
Empty

HOLDING REGISTER 3
Pressure 1

HOLDING REGISTER 4
Pressure 2

HOLDING REGISTER 5
Last dosed quantity LSB

HOLDING REGISTER 6
Last dosed quantity MSB

HOLDING REGISTER 10	
Commands	
B0	Enable
B1	Dosage
B2	Alarm Reset

HOLDING REGISTER 11
Recipe

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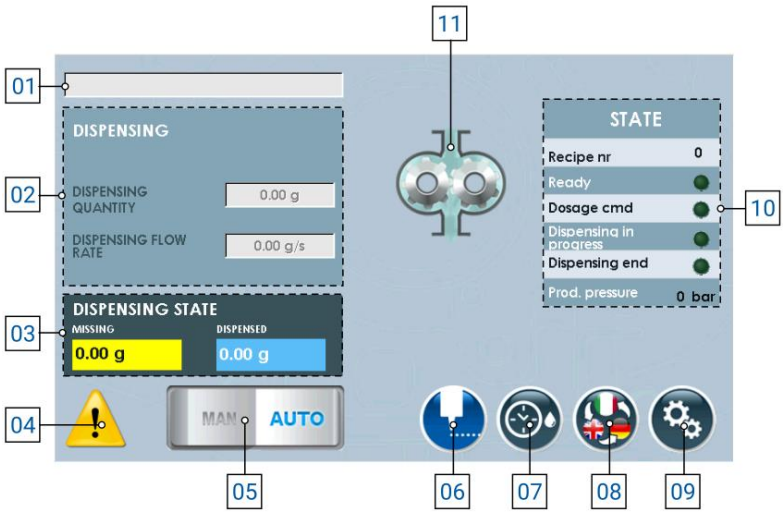
6.3 CONTROLLER GP EVO

The following are the screens inside the GP EVO controller

6.3.1 Main screen



1) **Drop-down menu** for choosing the recipe, in the case of automatic dosing;
2) **List of parameters** set per recipe (in case of manual mode, they can be modified), of which you have:
   a) **Dosing quantity:** Indicates the quantity of product to be dosed;
   b) **Dosing rate:** Indicates the amount of product to be dosed per second;
3) **Dosage status:** Indicates how much product has been dosed and when there is enough left to reach the total quantity;
4) Location where you have notification of **active alarms**, visible if present;
5) Selector to change the working mode (**manual** or **automatic**);
6) Button to **enable dosing** (i.e. it dispenses the fluid with the quantities and flow rates indicated in point 02);
7) Button to enable **automatic purge mode,** visible if set;
8) Button to change the **language** of page display;
9) Button to enter the **settings menu** (chapter 6.3.2);
10) A list that indicates the status of the component, that is:
   a) **Recipe nr.:** Indicates the number of the recipe currently selected to work;
   b) **Ready:** indicates whether the component is ready to perform machining;
   c) **Dosage:** Indicates that there is a command to the component to dispense the product;
   d) **Dispensing in progress:** Indicates that the component is performing a dosage;
   e) **End of dosing:** Indicates that the component has finished processing, i.e. according to the system parameter (08 chapter 6.3.2 subchapter "SYSTEM") the following behaviors occur:
      i) **If you work in "None", "HI pause" and/or control from the display (point 06),** you have an impulse that signals the end of dosing;
      ii) **If you work in "LO pause" or "Interrupt",** the end of dosage signal remains high as long as the dosage signal remains high.
   f) **Product Pres.:** Indicates the pressure of the fluid container;
11) Indicative image of the pump status (animated).

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6.3.2 Settings screen

1) **Parameters:** button that allows you to access the parameter menu, to modify them according to the customer's needs;
2) **Recipes:** button that allows you to access the recipe menu, so that you can modify, add or delete them, according to the customer's needs;
3) **Interfacing:** button that allows you to access the interfacing menu between the controller and the customer's external system, to be able to see if there are communication problems between the two systems;
4) **Back:** button that allows you to return to the main screen (chapter 6.3.1);
5) **Exit:** button that allows you to close the dosing program to go to the main windows screen.

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

ATTENTION!
If you change a parameter within the "Parameters" item, it is recommended that you restart the controller for the change to take effect.

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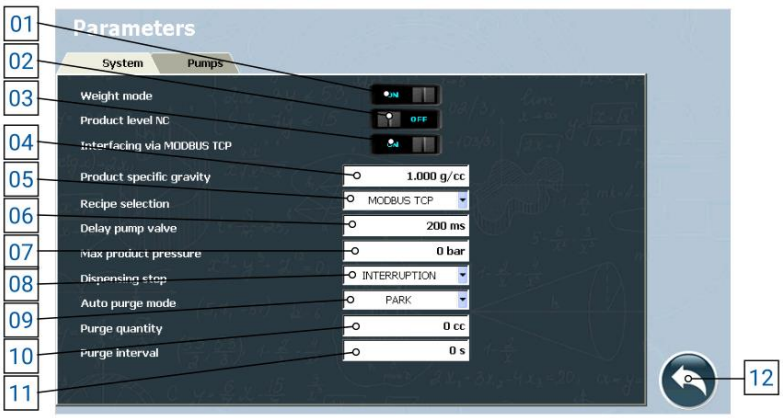
PARAMETERS → SYSTEM



1) **Weight mode:** Selector that, if active, allows you to work by displaying the value in weight instead of volume;

ATTENTION!
Working by weight there is a possible loss of stability in the dosage since the conversion is carried out using the specific gravity entered in the appropriate parameter (No. 04). The fluid may undergo variations in specific gravity due to external causes, causing a deviation between the set value and the actual value, resulting in incorrect delivery.

2) **Product Level NC:** If you are using a product level sensor NO you must set the selector switch to "OFF"; if you want to use an NC sensor you must set the selector switch to "ON";
3) **Interfacing via MODBUS TCP:** if enabled, it allows communication with an external customer system via modbus TCP/IP (ethernet);
4) **Product specific gravity:** This field appears only if the "Weight mode" selector (point 01) is "ON". It allows you to enter the specific gravity of the product you are using to perform the necessary conversions from mm^3 to mg;
5) **Recipe selection:** drop-down menu that allows you to choose the working mode, in particular:
   a) **Manual:** the recipe is selected by the operator via the HMI panel (reference Point 01 chapter 6.3.1);
   b) **Digital I/O:** the recipe is automatically passed to the controller via the wiring of the "IN" connector;
   c) **Modbus TCP/IP:** the recipe is automatically passed to the controller via ethernet connection, if the modbus interface selector is enabled (point 03);
6) **Valve pump delay:** Parameter to indicate a possible delay between the opening of a possible solenoid valve and the start of the dosing cycle (first it sends the command to the solenoid valve and then, after the indicated time, the dosing cycle starts). If no solenoid valve is present, leave at 0;
7) **Maximum product pressure:** Maximum acceptable product pressure at the outlet of the GP pump. Each pump has its maximum pressures, so please consult the manual of the pump you bought;

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8) **Dispensing stop:** Indicates the mode in which you want to perform the dosing lock. In particular, the modalities can be:
   a) **None:** In this mode it is not possible to stop the dosage once it has started, except by turning off the control unit using the power switch on the back;
   b) **Interruption:** In the case of external use (control button or PLC), the dosage signal must be activated to start dispensing. As soon as it is deactivated (i.e. the dosage signal is missing), dosing stops. When activated again, dosing starts again from the beginning (it does not save the dosed amount). In the case of use via HMI display, press once to start (without holding down) and press again to stop;
   c) **HI Pause:** In this mode, there is no need to press and hold the dosing button. The dosing cycle is paused when it receives a new dosing signal. When it is sent again after the pause, the cycle is resumed from the previously dosed quantity (saves the amount of fluid dosed), completing the recipe. You can take several breaks during dosing. In the case of use via HMI display, press once to start dispensing (without holding down) and press again to stop it and, subsequently, press a third time to resume it, ending the set quantity;
   d) **LOW pause:** In this mode you need to press and hold the dosing button (or signal from PLC). The dosing cycle is paused when the dosing signal is no longer available (release the dosing button, for example). When the dosing signal is activated again, the cycle resumes from the previous point (thus keeping the dosing history saved) and continues dosing until the dosing signal is deactivated (for example, as long as the dosing button is pressed). To end the cycle in this mode, the dosage signal must be kept high until the recipe is completed. You can take several breaks during dosing. In the case of use via HMI display, press once to start dispensing (without holding down) and press again to stop it and, subsequently, press a third time to resume it, ending the set quantity;
9) **Automatic purge mode:** This drop-down menu allows you to select how you want to purge (if you want to perform it). In particular, you can set:
   a) **Always OFF:** Automatic purge is not performed in this mode;
   b) **Always ON:** In this mode, purge is always performed with the modes set in the following points if enabled from the main screen (No. 07 chapter 6.3.1);
   c) **Parking:** Automatic purge can only be performed if the system receives the park signal (e.g. via sensor) and if it is enabled from the main screen (No. 07 chapter 6.3.1).
10) **Purge Amount:** The amount of fluid that is expelled during the automatic purge mode. It is recommended to set it in such a way that it expels all the fluid present in the nozzle. The purge flow rate and suck back parameters are equivalent to those set in the recipe in use;
11) **Purge Interval:** Indicates the minimum amount of time that must elapse from the last dispense to the start of automatic purging.

ATTENTION!
The three parameters above depend on the type of fluid and how quickly it tends to cross-link in contact with air. It is advisable to keep the settings set by the manufacturer, or at least contact the manufacturer if you want to change them.

12) **Back:** Button to return to the settings menu;

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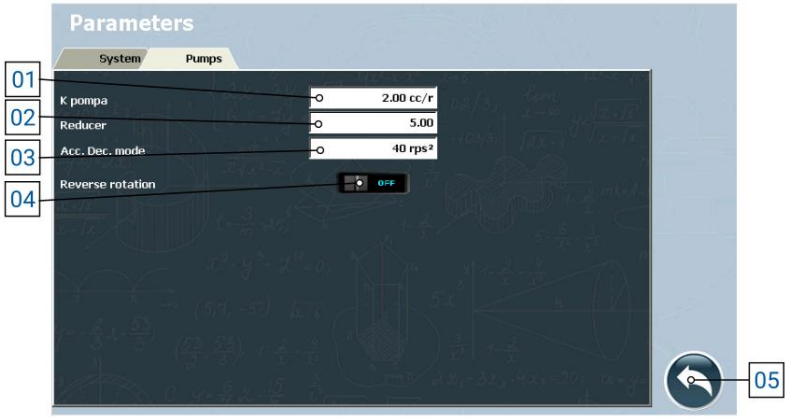
PARAMETERS → PUMP



1) **Pump K:** Parameter that indicates the amount of product dispensed by the pump at each rotation.

The value indicated in this parameter must be a value relatively close to the size of the GP used.

ATTENTION!
This parameter is set by the manufacturer's technicians and is not to be changed, unless requested by the technicians themselves. If you must set it up yourself, call the manufacturer's technicians for assistance.

2) **Reducer:** size of the reducer installed inside the gear pump;
3) **Acc. Dec. mode:** Parameter that indicates the acceleration (and deceleration) of the pump during the delivery and stop phase;
4) **Reverse rotation:** selector to turn the gear pump clockwise or counterclockwise, useful if the motor cables have been wired in reverse direction (the two phases are reversed), or if the input with the output has to be reversed and vice versa;
5) **Back:** Button to return to the settings menu;

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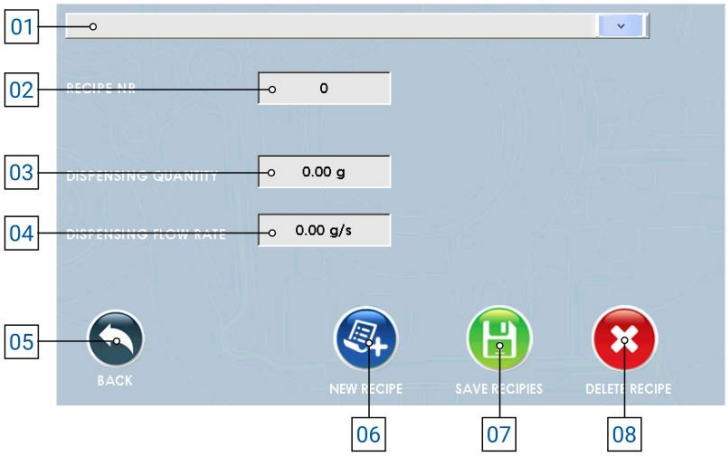
6.3.3 Recipes screen



1) Drop-down menu for **recipe selection**;
2) **Recipe number:** Indicates the number of the recipe saved in the software, useful for interfacing the controller with the customer's external systems and recalling the recipe with this number;
3) **Dosing quantity:** Indicates the quantity of product to be dosed;
4) **Dosing flow rate:** Indicates the amount of product to be dosed per second;
5) **Back:** button to return to the settings menu (chapter 6.3.2);
6) **New recipe:** button that allows you to create a new recipe;
7) **Save recipe:** button that allows you to save the changes made to the recipe;

ATTENTION!
If you do not press this button, the changes you have set are lost.

8) **Delete recipe:** button that allows you to delete the selected recipe.

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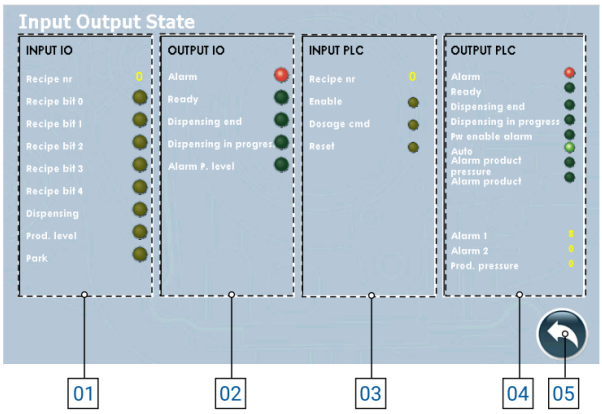
6.3.4 Interfacing Screen



1) **I/O INPUTS:** These are all the inputs that arrive from the system to the controller to manage the process:
   a) **Recipe No.:** Indicates the recipe number set by the client server to the controller (or manually set in the controller);
   b) **Bit Recipe (0/1/2/3/4):** Indicates whether the relative bit is active or not. Based on the combination, the recipe used can be traced (refer to chapter 6 for coding);
   c) **Dispensing:** Indicates whether the dispensing command is present;
   d) **Product Level:** Indicates whether the level sensor is detecting the end of the product in the fuel system (behavior may vary depending on parameter settings);
   e) **Park:** Indicates whether the dosing system is in the park position.
2) **I/O OUTPUTS:** These are all the outputs that the controller sends to the system to be able to manage the process if connected via Digital I/O:
   a) **Alarm:** Indicates if there are active alarms;
   b) **Ready:** Indicates whether the system is ready to dispense;
   c) **End of dosing:** Indicates whether the system has finished dosing;
   d) **Dispensing in progress:** Indicates whether the system is performing a dosage;
   e) **Level P Alarm:** Indicates if a product level alarm is present.
3) **PLC INPUT:** These are all the inputs that come from the external system to the controller if connected via MODBUS TCP/IP (visible only with the "MODBUS TCP" selector enabled):
   a) **Recipe nr:** Indicates the recipe number set by the system;
   b) **Enable:** Indicates whether the controller is enabled to work or not;
   c) **Dosing command:** Indicates if the dosing signal arrives at the input;
   d) **Reset:** Indicates if the alarm restart command comes from the system;
4) **PLC OUTPUT:** These are all the outputs that the controller sends to the external system in order to manage the process if connected via MODBUS TCP/IP (visible only with the "MODBUS TCP" selector enabled):
   a) **Alarm:** Indicates if there are active alarms;
   b) **Ready:** Indicates whether the system is ready to dispense;
   c) **End of dosing:** Indicates whether the system has finished dosing;
   d) **Dispensing in progress:** Indicates whether the system is performing a dosage;
   e) **Alarm for enable:** The system is in alarm due to the system enable;
   f) **Auto:** Indicates whether the system is in automatic mode;
   g) **Product Pressure Alarm:** Indicates that there is an alarm related to the outlet pressure;
   h) **Product alarm:** Indicates that there is an alarm related to the product to be dosed;
   i) **Alarms (1/2):** Indicates the indicative number of the active alarm, to send it to an external system;
   j) **Product Pres.:** Indicates the pressure generated in real time at the outlet of the GP;
5) **Back:** Button to return to the settings menu (chapter 6.3.2);

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6.3.5 Interfacing Screen

The various logs and how they were configured are described below.

You can request the sample project developed by the manufacturer in TIA Portal 16 and the MODBUS TCP/IP configuration wizard by contacting the manufacturer.

If there are indications such as "B0" under a register, the bit occupied within the register and its function is indicated, otherwise the register and the function it has, in which the whole register is occupied to indicate a certain value.

HOLDING REGISTER 0	
Status of outputs	
B0	Alarm
B1	Ready
B2	End of dosage
B3	Ongoing dosing
B4	Power enable alarm
B5	Auto Mode
B6	Pressure alarm
B7	Level Alarm

HOLDING REGISTER 1	
Alarms 1	
B0	Timeout modbus drive 1
B1	Free
B2	IO modbus module timeout
B3	Timeout modbus PLC
B4	Fault drive 1
B5	Free
B6	Drive Power Alarm 1
B7	Free
B8	Level 1 alarm
B9	Free

HOLDING REGISTER 2
Alarms 2
Empty

HOLDING REGISTER 3
Pressure 1

HOLDING REGISTER 5
Last dosed quantity LSB

HOLDING REGISTER 6
Last dosed quantity MSB

HOLDING REGISTER 10	
Commands	
B0	Enable
B1	Dosage
B2	Alarm Reset

HOLDING REGISTER 11
Recipe

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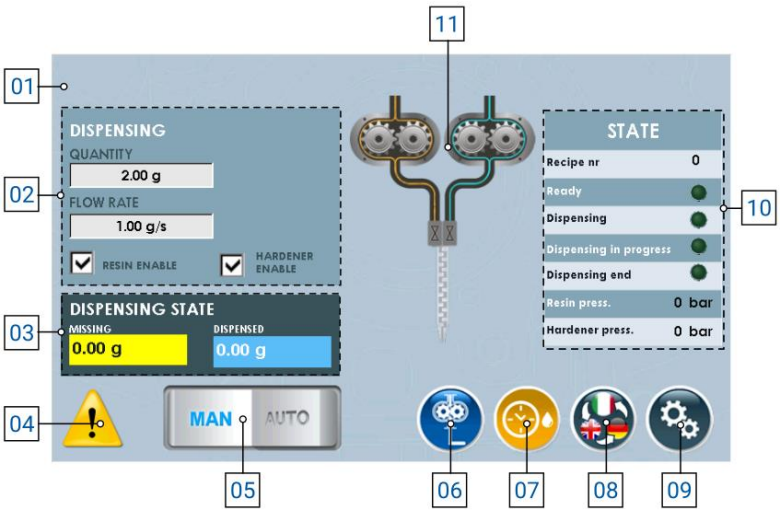
6.4 CONTROLLER GP2K EVO

The following are the screens inside the GP2K EVO controller

6.4.1 Main screen



1) **Drop-down menu** for choosing the recipe, in the case of automatic dosing;
2) **List of parameters** set per recipe (in case of manual mode, they can be modified), of which you have:
   a) **Dosing quantity:** Indicates the quantity of product to be dosed;
   b) **Dosing rate:** Indicates the amount of product to be dosed per second;
   c) **Resin/hardener enablement:** Allows you to enable or disable the dosage of resin and/or hardener, useful for carrying out any maintenance;
3) **Dosage status:** Indicates how much product has been dosed and when there is enough left to reach the total quantity;
4) Location where you are notified of **active alarms**, if any;
5) Selector to change the working mode (**manual** or **automatic**);
6) Button to **enable dosing** (i.e. it dispenses the fluid with the quantities and flow rates indicated in point 02);
7) Button to enable **automatic purge mode,** visible if set;
8) Button to change the display **language** of the component pages;
9) Button to enter the **settings menu** (chapter 6.4.2);
10) A list that indicates the status of the component, that is:
   a) **Recipe nr.:** Indicates the number of the recipe currently selected to work;
   b) **Ready: indicates** whether the component is ready to perform machining;
   c) **Dosage:** Indicates that I am commanding the component to dispense the product;
   d) **Dispensing in progress:** Indicates that the component is performing a dosage;
   e) **End of dosing:** Indicates that the component has finished processing, i.e. according to the system parameter (08 chapter 6.4.2 subchapter "SYSTEM") the following behaviors occur:
      i) **If you work in "None", "HI pause" and/or control from the display (point 06),** you have an impulse that signals the end of dosing;
      ii) **If you work in "LO pause" or "Interrupt",** the end of dosage signal remains high as long as the dosage signal remains high.
   f) **Resin Pres.:** Indicates the pressure of the resin fluid container;
   g) **Hardener Pres.:** Indicates the pressure of the hardener fluid container;
11) Indicative image of the pump status (animated).

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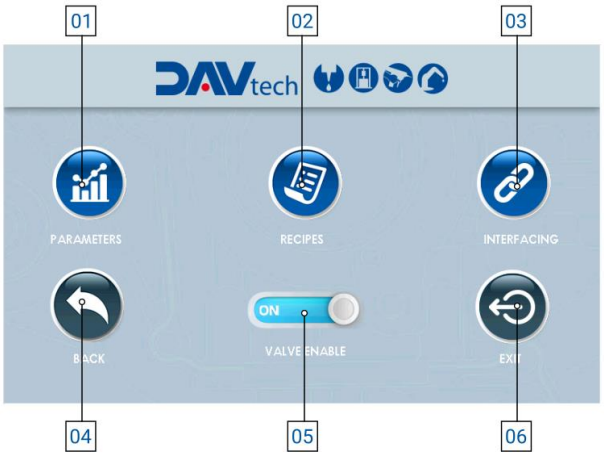
6.4.2 Settings screen



1) **Parameters:** button that allows you to access the parameter menu, to modify them according to the customer's needs;
2) **Recipes:** button that allows you to access the recipe menu, so that you can modify, add or delete them, according to the customer's needs;
3) **Interfacing:** button that allows you to access the interfacing menu between the controller and the customer's external system, so as to be able to see if there are communication problems between the two systems;
4) **Back:** button that allows you to return to the main screen (chapter 6.4.1);
5) **Valve enable:** Selector to enable or disable the operation of the valve to which the system is connected, useful in case maintenance needs to be carried out;
6) **Exit:** button that allows you to close the dosing program to go to the main windows screen.

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

ATTENTION!
If you change a parameter within the "Parameters" item, it is recommended that you restart the controller for the change to take effect.

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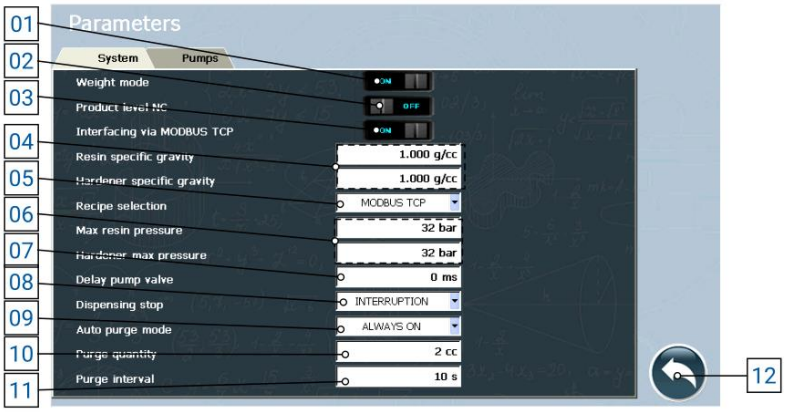
PARAMETERS → SYSTEM



1) **Weight mode:** Selector that, if active, allows you to work by displaying the value in weight instead of volume;

ATTENTION!
Working by weight there is a possible loss of stability in the dosage since the conversion is carried out using the specific gravity entered in the appropriate parameter (No. 04). The fluid may undergo variations in specific gravity due to external causes, causing a deviation between the set value and the actual value, resulting in incorrect delivery.

ATTENTION!
If you use the weight mode, you must set the "Resin:hardener ratio" parameter to VOLUME and not by weight, otherwise the internal calculations of the system are incorrect, leading to incorrect dosages.

2) **Product Level NC:** If you are using a product level sensor NO you must set the selector switch to "OFF"; if you want to use an NC sensor you must set the selector switch to "ON";
3) **Interfacing via MODBUS TCP:** if enabled, it allows communication with an external customer system via modbus TCP/IP (ethernet);
4) **Resin/hardener specific gravity:** This field appears only if the "Weight mode" selector (point 01) is "ON". It allows you to enter the specific weight of the product (both resin and hardener) that you are using to perform the necessary conversions from mm^3 to mg;
5) **Recipe selection:** drop-down menu that allows you to choose the working mode, in particular:
   a) **Manual:** the recipe is selected by the operator via the HMI panel (reference point 01 chapter 6.4.1);
   b) **Digital I/O:** the recipe is automatically passed to the controller via the wiring of the "IN" connector;
   c) **Modbus TCP/IP:** the recipe is automatically passed to the controller via ethernet connection, if the modbus interface selector is enabled (point 03);
6) **Maximum Resin/Hardener Pressure:** Maximum acceptable pressure of the product (resin or hardener) generated at the GP pump outlet. Each pump has its maximum pressures, so please consult the manual of the pump you bought;
7) **Valve pump delay:** Parameter to indicate a possible delay between the opening of a possible solenoid valve and the start of the dosing cycle. If no solenoid valve is present, leave at 0;

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8) **Dispensing stop:** Indicates the mode in which you want to perform the dosing lock. In particular, the modalities can be:
   a) **None:** In this mode it is not possible to stop the dosage once it has started, except by turning off the control unit using the power switch on the back;
   b) **Interruption:** In the case of external use (control button or PLC), the dosage signal must be activated to start dispensing. As soon as it is deactivated (i.e. the dosage signal is missing), dosing stops. When activated again, dosing starts again from the beginning (it does not save the dosed amount). In the case of use via HMI display, press once to start (without holding down) and press again to stop;
   c) **HI Pause:** In this mode, there is no need to press and hold the dosing button. The dosing cycle is paused when it receives a new dosing signal. When it is sent again after the pause, the cycle is resumed from the previously dosed quantity (saves the amount of fluid dosed), completing the recipe. You can take several breaks during dosing. In the case of use via HMI display, press once to start dispensing (without holding down) and press again to stop it and, subsequently, press a third time to resume it, ending the set quantity;
   d) **LOW pause:** In this mode you need to press and hold the dosing button (or signal from PLC). The dosing cycle is paused when the dosing signal is no longer available (release the dosing button, for example). When the dosing signal is activated again, the cycle resumes from the previous point (thus keeping the dosing history saved) and continues dosing until the dosing signal is deactivated (for example, as long as the dosing button is pressed). To end the cycle in this mode, the dosage signal must be kept high until the recipe is completed. You can take several breaks during dosing. In the case of use via HMI display, press once to start dispensing (without holding down) and press again to stop it and, subsequently, press a third time to resume it, ending the set quantity.
9) **Automatic purge mode:** This drop-down menu allows you to select how you want to purge (if you want to perform it). In particular, you can set:
   a) **Always OFF:** Automatic purge is not performed in this mode;
   b) **Always ON:** In this mode, purge is always performed with the modes set in the following points if enabled from the main screen (No. 07 chapter 6.4.1);
   c) **Parking:** Automatic purge can only be performed if the system receives the parking signal (e.g. via sensor) and if it is enabled from the main screen (No. 07 chapter 6.4.1).
10) **Purge Amount:** The amount of fluid that is expelled during the automatic purge mode. It is recommended to set it in such a way that it expels all the fluid present in the nozzle. The purge flow rate and suck back parameters are equivalent to those set in the recipe in use;
11) **Purge Interval:** Indicates the minimum amount of time that must elapse from the last dispense to the start of automatic purging.

ATTENTION!
The three parameters above depend on the type of fluid and how quickly it tends to cross-link in contact with air. It is advisable to keep the settings set by the manufacturer, or at least contact the manufacturer if you want to change them.

12) **Back:** Button to return to the settings menu;

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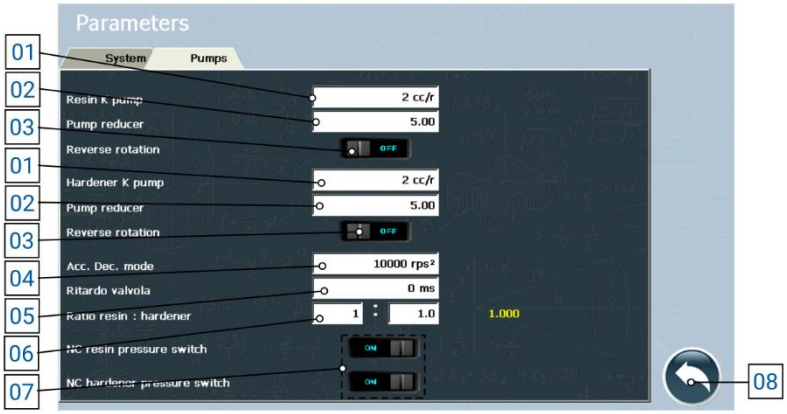
PARAMETERS → PUMP



1) **K resin/hardener pump:** Parameter that indicates the amount of product dispensed by the pump at each rotation.

The value indicated in this parameter must be a value relatively close to the size of the GP used.

ATTENTION!
This parameter is set by the manufacturer's technicians and is not to be changed, unless requested by the technicians themselves. If you must set it up yourself, call the manufacturer's technicians for assistance.

2) **Pump reducer:** size of the reducer installed inside the gear pump;
3) **Inverted rotation:** selector to turn the gear pump clockwise or counterclockwise, useful if the motor cables have been wired in reverse direction (the two phases are reversed), or if the input with the output must be reversed and vice versa;
4) **Acc. Dec. mode:** Parameter that indicates the acceleration (and deceleration) of the pump during the delivery and stop phase;
5) **Valve delay:** This is used to delay the dosing action to allow any solenoid valve to open. If a solenoid valve is not used, this parameter must be left at 0;
6) **Resin : Hardener ratio:** Amount of resin to be dosed relative to the hardener. This is a parameter that changes according to the product used;

ATTENTION!
If you use the weight mode, you must set the "Resin:hardener ratio" parameter to VOLUME and not by weight, otherwise the internal calculations of the system are incorrect, leading to incorrect dosages.

7) **NC resin/hardener pressure switch:** selector switch that allows you to set the type of pressure switch you are using. If the signal behaves in the opposite way to the desired one, this selector must be inverted;
8) **Back:** Button to return to the settings menu;

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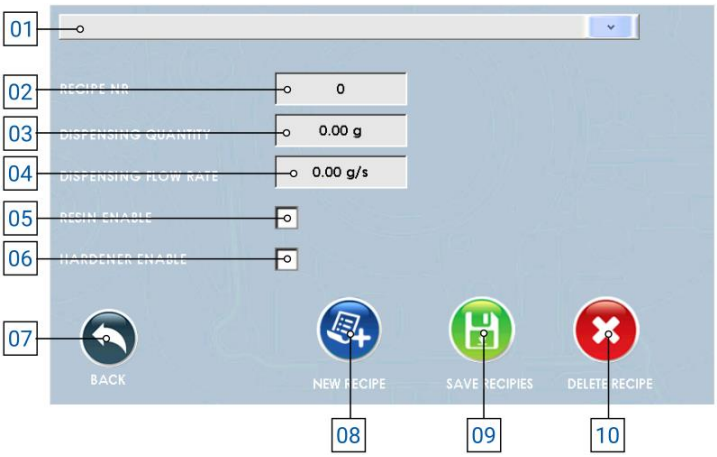
6.4.3 Recipes screen



1) Drop-down menu for **recipe selection**;
2) **Recipe number:** Indicates the number of the recipe saved in the software, useful for interfacing the controller with the customer's external systems and recalling the recipe with this number;
3) **Dosing quantity:** Indicates the quantity of product to be dosed;
4) **Dosing rate:** Indicates the amount of product to be dosed per second;
5) **Enable resin:** check to enable or disable resin dosing with this recipe, useful in the case of maintenance;
6) **Enable hardener:** check to enable or disable the hardener dosage with this recipe, useful in the case of maintenance;
7) **Back:** button to return to the settings menu (chapter 6.4.2);
8) **New recipe:** button that allows you to create a new recipe;
9) **Save recipe:** button that allows you to save the changes made to the recipe;

ATTENTION!
If you do not press this button, the changes you have set are lost.

10) **Delete recipe:** button that allows you to delete the selected recipe.

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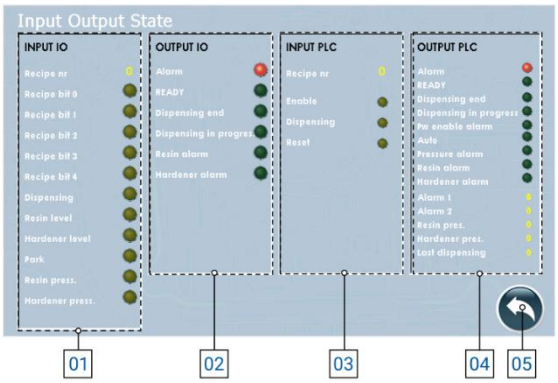
6.4.4 Interfacing Screen



1) **I/O INPUTS:** These are all the inputs that arrive from the system to the controller to manage the process:
   a) **Recipe No.:** Indicates the recipe number set by the client server to the controller (or manually set in the controller);
   b) **Bit Recipe (0/1/2/3/4):** Indicates whether the relative bit is active or not. Based on the combination, the recipe used can be traced (refer to chapter 6 for coding);
   c) **Dispensing:** Indicates whether the dispensing command is present;
   d) **Resin/hardener level:** Indicates whether the level sensor is detecting the end of the product in the feeding system (behavior may vary depending on parameter settings);
   e) **Park:** Indicates whether the dosing system is in the park position.
   f) **Resin/Hardener press.:** Indicates whether the pressure sensor is connected or not;
2) **I/O OUTPUTS:** these are all the 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 whether the system is ready to dispense;
   c) **End of dosing:** Indicates whether the system has finished dosing;
   d) **Dispensing in progress:** Indicates whether the system is performing a dosage;
   e) **Resin/Hardener Alarm:** Indicates if a product level alarm is present.
3) **PLC INPUT:** These are all the inputs that come from the external system to the controller if connected via MODBUS TCP/IP (visible only with the "MODBUS TCP" selector enabled):
   a) **Recipe nr:** Indicates the recipe number set by the system;
   b) **Enable:** Indicates whether the controller is enabled to work or not;
   c) **Dispensing:** Indicates whether the dispensing signal arrives at the input;
   d) **Reset:** Indicates if the alarm restart command comes from the system;
4) **PLC OUTPUT:** These are all the outputs that the controller sends to the external system to manage the process if connected via MODBUS TCP/IP (visible only with the "MODBUS TCP" selector enabled):
   a) **Alarm:** Indicates if there are active alarms;
   b) **Ready:** Indicates whether the system is ready to dispense;
   c) **End of dosing:** Indicates whether the system has finished dosing;
   d) **Dispensing in progress:** Indicates whether the system is performing a dosage;
   e) **Alarm for enable:** The system is in alarm due to the system enable;
   f) **Auto:** Indicates whether the system is in automatic mode;
   g) **Pressure Alarm:** Indicates that there is an alarm related to the outlet pressure;
   h) **Resin/hardener alarm:** Indicates that there is an alarm related to the product to be dosed;
   i) **Alarms (1/2):** Indicates the indicative number of the active alarm, to send it to an external system;
   j) **Resin/hardener pres.:** Indicates the pressure generated in real time at the outlet of the GP;
   k) **Last dosage:** Indicates the quantity of product that was dosed in the last process;
5) **Back:** Button to return to the settings menu (chapter 6.4.2);

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6.4.5 Interfacing Screen

The various logs and how they were configured are described below.

You can request the sample project developed by the manufacturer in TIA Portal 16 and the MODBUS TCP/IP configuration wizard by contacting the manufacturer.

If there are indications such as "B0" under a register, the bit occupied within the register and its function is indicated, otherwise the register and the function it has, in which the whole register is occupied to indicate a certain value.

HOLDING REGISTER 0	
Status of outputs	
B0	Alarm
B1	Ready
B2	End of dosage
B3	Ongoing dosing
B4	Power enable alarm
B5	Auto Mode
B6	Pressure alarm
B7	Resin level alarm
B8	Hardening level alarm

HOLDING REGISTER 1	
Alarms 1	
B0	Timeout modbus drive 1
B1	Timeout modbus drive 2
B2	IO modbus module timeout
B3	Timeout modbus PLC
B4	Fault drive 1
B5	Fault drive 2
B6	Drive Power Alarm 1
B7	Drive Power Alarm 2
B8	Level 1 alarm
B9	Level 2 Alarm

HOLDING REGISTER 2
Alarms 2
Empty

HOLDING REGISTER 3
Pressure 1

HOLDING REGISTER 4
Pressure 2

HOLDING REGISTER 5
Last dosed quantity LSB

HOLDING REGISTER 6
Last dosed quantity MSB

HOLDING REGISTER 10	
Commands	
B0	Enable
B1	Dosage
B2	Alarm Reset

HOLDING REGISTER 11
Recipe

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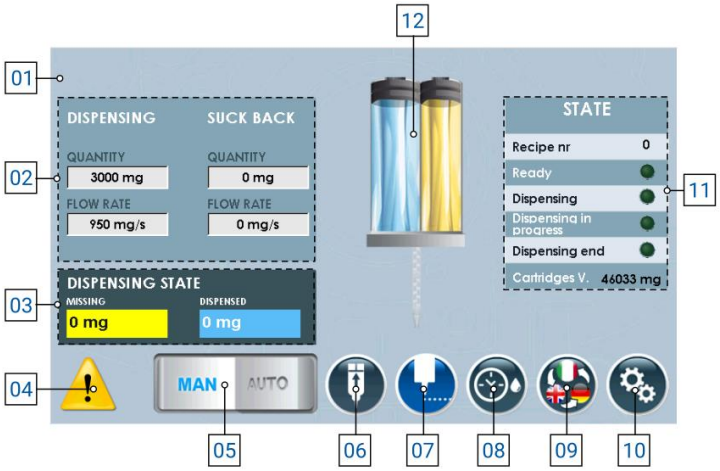
6.5 CONTROLLER E2K EVO

The following are the screens inside the E2K EVO controller

6.5.1 Main screen



1) **Drop-down menu** for choosing the recipe, in the case of automatic dosing;
2) **List of parameters** set per recipe (in case of manual mode, they can be modified), of which you have:
   a) **Dosing quantity:** Indicates the quantity of product to be dosed;
   b) **Dosing rate:** Indicates the amount of product to be dosed per second;
   c) **Suck back quantity:** Indicates the amount of product to be returned to the pump once the dosage has been carried out;
   d) **Suck back flow rate:** Indicates the amount of product per second to be returned to the pump once the dosage has been carried out;
3) **Dosage status:** Indicates how much product has been dosed and when there is enough left to reach the total quantity;
4) Location where you are notified of **active alarms**, if any;
5) Selector to change the working mode (**manual** or **automatic**);
6) Button that allows the product thrust pads to be returned to their initial state;
7) Button to **enable dosing** (i.e. it dispenses the fluid with the quantities and flow rates indicated in point 02);
8) Button to enable **automatic purge mode,** visible if set;
9) Button to change the display **language** of the component pages;
10) Button to enter the **settings menu** (chapter 6.5.2);
11) A list that indicates the status of the component, that is:
   a) **Recipe nr.:** Indicates the number of the recipe currently selected to work;
   b) **Ready:** indicates whether the component is ready to perform machining;
   c) **Dosage:** Indicates that I am commanding the component to dispense the product;
   d) **Dispensing in progress:** Indicates that the component is performing a dosage;
   a) **End of dosing:** Indicates that the component has finished processing, i.e. according to the system parameter (08 chapter 6.5.2 subchapter "SYSTEM") the following behaviors occur:
      i) **If you work in "None", "HI pause" and/or control from the display (point 06),** you have an impulse that signals the end of dosing;
      ii) **If you work in "LO pause" or "Interrupt",** the end of dosage signal remains high as long as the dosage signal remains high.
   e) **V. cartridges:** Indicates the volume of product still present inside the cartridges;
12) Indicative image of the pump status (animated).

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6.5.2 Settings screen

1) **Parameters:** button that allows you to access the parameter menu, to modify them according to the customer's needs;
2) **Recipes:** button that allows you to access the recipe menu, so that you can modify, add or delete them, according to the customer's needs;
3) **Interfacing:** button that allows you to access the interfacing menu between the controller and the customer's external system, to be able to see if there are communication problems between the two systems;
4) **Back:** button that allows you to return to the main screen (chapter 6.1.1);
5) **Exit:** button that allows you to close the dosing program to go to the main windows screen.

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

ATTENTION!
If you change a parameter within the "Parameters" item, it is recommended that you restart the controller for the change to take effect.

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PARAMETERS → SYSTEM

1) **Weight mode:** Selector that, if active, allows you to work by displaying the value in weight instead of volume;

ATTENTION!
Working by weight there is a possible loss of stability in the dosage since the conversion is carried out using the specific gravity entered in the appropriate parameter (No. 04). The fluid may undergo variations in specific gravity due to external causes, causing a deviation between the set value and the actual value, resulting in incorrect delivery.

2) **Interfacing via MODBUS TCP:** if enabled, it allows communication with an external customer system via modbus TCP/IP (ethernet);
3) **Product specific gravity:** This field appears only if the "Weight mode" selector (point 01) is "ON". It allows you to enter the specific gravity of the product you are using to perform the necessary conversions from mm^3 to mg;
4) **Recipe selection:** drop-down menu that allows you to choose the working mode, in particular:
   a) **Manual:** the recipe is selected by the operator via the HMI panel (reference Point 01 chapter 6.5.1);
   b) **Digital I/O:** the recipe is automatically passed to the controller via the wiring of the "IN" connector;
   c) **Modbus TCP/IP:** the recipe is automatically passed to the controller via ethernet connection, if the modbus interface selector is enabled (point 03);
5) **Actuator valve delay:** Parameter to indicate a possible delay between the opening of a possible solenoid valve and the start of the dosing cycle. If no solenoid valve is present, leave at 0;
6) **Minimum Alarm Volume:** Minimum volume of fluid that can be reached inside the cartridges before the system sends an alarm to the end-of-product operator;

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7) **Dispensing stop:** Indicates the mode in which you want to perform the dosing lock. In particular, the modalities can be:
   a) **None:** In this mode it is not possible to stop the dosage once it has started, except by turning off the control unit using the power switch on the back;
   b) **Interruption:** In the case of external use (control button or PLC), the dosage signal must be activated to start dispensing. As soon as it is deactivated (i.e. the dosage signal is missing), dosing stops. When activated again, dosing starts again from the beginning (it does not save the dosed amount). In the case of use via HMI display, press once to start (without holding down) and press again to stop;
   c) **HI Pause:** In this mode, there is no need to press and hold the dosing button. The dosing cycle is paused when it receives a new dosing signal. When it is sent again after the pause, the cycle is resumed from the previously dosed quantity (saves the amount of fluid dosed), completing the recipe. You can take several breaks during dosing. In the case of use via HMI display, press once to start dispensing (without holding down) and press again to stop it and, subsequently, press a third time to resume it, ending the set quantity;
   d) **LOW pause:** In this mode you need to press and hold the dosing button (or signal from PLC). The dosing cycle is paused when the dosing signal is no longer available (release the dosing button, for example). When the dosing signal is activated again, the cycle resumes from the previous point (thus keeping the dosing history saved) and continues dosing until the dosing signal is deactivated (for example, as long as the dosing button is pressed). To end the cycle in this mode, the dosage signal must be kept high until the recipe is completed. You can take several breaks during dosing. In the case of use via HMI display, press once to start dispensing (without holding down) and press again to stop it and, subsequently, press a third time to resume it, ending the set quantity.
8) **Automatic purge mode:** This drop-down menu allows you to select how you want to purge (if you want to perform it). In particular, you can set:
   a) **Always OFF:** Automatic purge is not performed in this mode;
   b) **Always ON:** In this mode, purge is always performed with the modes set in the following points if enabled from the main screen (No. 08 chapter 6.5.1);
   c) **Parking:** Automatic purge can only be performed if the system receives the park signal (e.g. via sensor) and if it is enabled from the main screen (No. 08 chapter 6.5.1).
9) **Purge Amount:** The amount of fluid that is expelled during the automatic purge mode. It is recommended to set it in such a way that it expels all the fluid present in the nozzle. The purge flow rate and suck back parameters are equivalent to those set in the recipe in use;
10) **Purge Interval:** Indicates the minimum amount of time that must elapse from the last dispense to the start of automatic purging.

ATTENTION!
The three parameters above depend on the type of fluid and how quickly it tends to cross-link in contact with air. It is advisable to keep the settings set by the manufacturer, or at least contact the manufacturer if you want to change them.

11) **Back:** Button to return to the settings menu;

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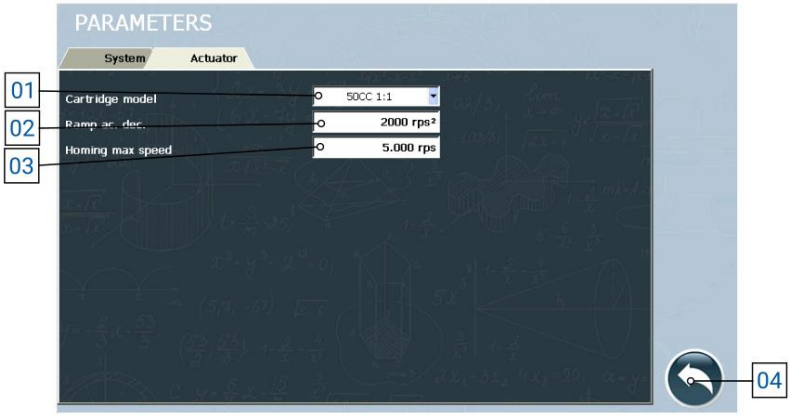
PARAMETERS → PUMP



1) **Cartridge model:** In this field you must enter the exact model of cartridge you are using, as it is used by the system to perform internal calculations regarding the parameters of use of the component itself;
2) **Acc. Dec. mode:** Parameter that indicates the acceleration (and deceleration) of the pump during the delivery and stop phase;
3) **Max homing speed:** Maximum speed of the motor with which it returns the dosing pistons to their initial position;
4) **Back:** Button to return to the settings menu;

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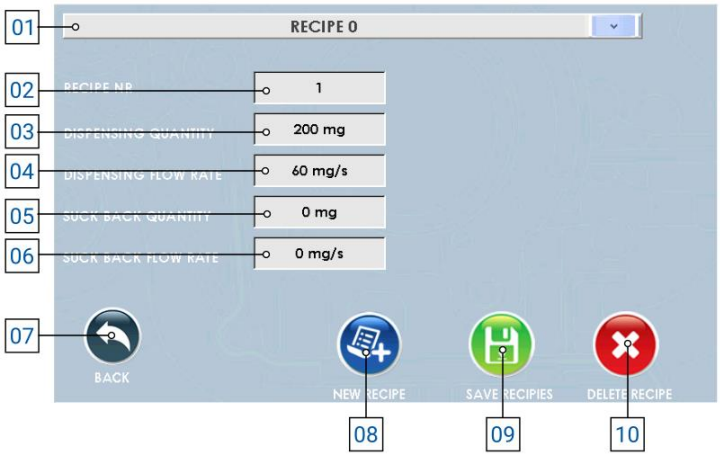
6.5.3 Recipes screen



1) Drop-down menu for **recipe selection**;
2) **Recipe number:** Indicates the number of the recipe saved in the software, useful for interfacing the controller with the customer's external systems and recalling the recipe with this number;
3) **Dosing quantity:** Indicates the quantity of product to be dosed;
4) **Dosing rate:** Indicates the amount of product to be dosed per second;
5) **Suck back quantity:** Indicates the amount of product to be sucked up once the dosage has been carried out;
6) **Suck back flow rate:** Indicates the amount of product per second to be sucked up once the dosage has been carried out;
7) **Back:** button to return to the settings menu (chapter 6.5.2);
8) **New recipe:** button that allows you to create a new recipe;
9) **Save recipe:** button that allows you to save the changes made to the recipe;

ATTENTION!
If you do not press this button, the changes you have set are lost.

10) **Delete recipe:** button that allows you to delete the selected recipe.

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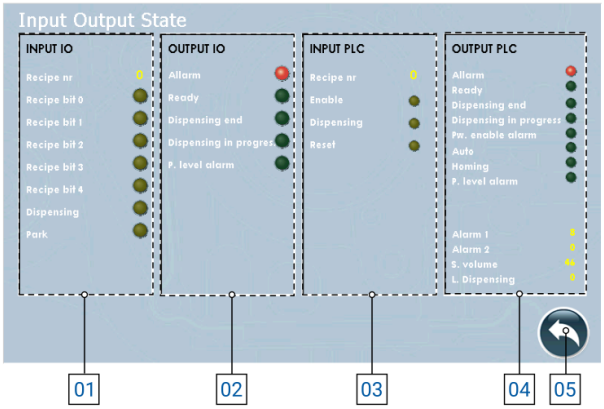
6.5.4 Interfacing Screen



1) **I/O INPUTS:** These are all the inputs that arrive from the system to the controller to manage the process:
   a) **Recipe No.:** Indicates the recipe number set by the client server to the controller (or manually set in the controller);
   b) **Bit Recipe (0/1/2/3/4):** Indicates whether the relative bit is active or not. Based on the combination, the recipe used can be traced (refer to chapter 6 for coding);
   c) **Dispensing:** Indicates whether the dispensing command is present;
   d) **Park:** Indicates whether the dosing system is in the park position.
2) **I/O OUTPUTS:** These are all the outputs that the controller sends to the system to be able to manage the process if connected via Digital I/O:
   a) **Alarm:** Indicates if there are active alarms;
   b) **Ready:** Indicates whether the system is ready to dispense;
   c) **End of dosing:** Indicates whether the system has finished dosing;
   d) **Dispensing in progress:** Indicates whether the system is performing a dosage;
   e) **Level P Alarm:** Indicates if a product level alarm is present.
3) **PLC INPUT:** These are all the inputs that come from the external system to the controller if connected via MODBUS TCP/IP (visible only with the "MODBUS TCP" selector enabled):
   a) **Recipe nr:** Indicates the recipe number set by the system;
   b) **Enable:** Indicates whether the controller is enabled to work or not;
   c) **Dispensing:** Indicates whether the dispensing signal arrives at the input;
   d) **Reset:** Indicates if the alarm restart command comes from the system;
4) **PLC OUTPUT:** These are all the outputs that the controller sends to the external system to manage the process if connected via MODBUS TCP/IP (visible only with the "MODBUS TCP" selector enabled):
   a) **Alarm:** Indicates if there are active alarms;
   b) **Ready:** Indicates whether the system is ready to dispense;
   c) **End of dosing:** Indicates whether the system has finished dosing;
   d) **Dispensing in progress:** Indicates whether the system is performing a dosage;
   e) **Alarm for enable:** The system is in alarm due to the system enable;
   f) **Auto:** Indicates whether the system is in automatic mode;
   g) **Homing:** Identifies whether the component is returning to its initial position, i.e. with high pistons;
   h) **Level P alarm:** Indicates that there is an alarm related to the product to be dosed;
   i) **Alarms (1/2):** Indicates the indicative number of the active alarm, to send it to an external system;
   j) **S. volume:** Indicates the volume detected in real time inside the component;
   k) **L. dispensing:** Indicates the quantity of product that was dosed in the last process;
5) **Back:** Button to return to the settings menu (chapter 6.5.2);

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6.5.5 Interfacing Screen

The various logs and how they were configured are described below.

You can request the sample project developed by the manufacturer in TIA Portal 16 and the MODBUS TCP/IP configuration wizard by contacting the manufacturer.

If there are indications such as "B0" under a register, the bit occupied within the register and its function is indicated, otherwise the register and the function it has, in which the whole register is occupied to indicate a certain value.

HOLDING REGISTER 0	
Status of outputs	
B0	Alarm
B1	Ready
B2	End of dosage
B3	Ongoing dosing
B4	Power enable alarm
B5	Standby
B6	Home status
B7	Syringe level alarm
B8	Free
B9	Buzzer

HOLDING REGISTER 1	
Alarms 1	
B0	Timeout modbus drive 1
B1	Free
B2	IO modbus module timeout
B3	Timeout modbus PLC
B4	Fault drive 1
B5	Pen disconnected
B6	Drive Power Alarm 1
B7	Free
B8	Level 1 alarm
B9	Free

HOLDING REGISTER 2
Alarms 2
Empty

HOLDING REGISTER 3
Cartridge Level

HOLDING REGISTER 4
Not used

HOLDING REGISTER 5
Last dosed quantity LSB

HOLDING REGISTER 6
Last dosed quantity MSB

HOLDING REGISTER 10	
Commands	
B0	Enable
B1	Dosage
B2	Alarm Reset

HOLDING REGISTER 11
Recipe

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7 PROCEDURE

In this chapter we want to list and describe the main procedures that can (and, in some cases, must) be used on the components covered by this manual for a correct use of the components themselves. In particular, we want to explain in detail:

- Switching on and off controllers (PCP/PDP/E2K/GP/GP2K/HEATERS)
- Controller configuration for pump priming (PCP/PDP/GP/GP2K);
- Controller configuration for extruder priming (E2K);
- Using the "Quick Command" mode (PCP/PDP/GP/GP2K/E2K);
- Using the suction function (PCP/PDP/E2K);
- Use of agitators and heaters (HEATERS);

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7.1 Controller on and off

On the back of the controller (any model listed in this manual) there is a switch to turn the controller on and off, once it is connected to the electrical outlet. See chapter 2 for your model and button location to turn the controller on and off

7.2 Pump prime (GP/GP2K/PCP/PDP)

Priming of the pump is performed whenever the pump itself is without the fluid inside; therefore, at the first start-up or when general maintenance is done to the pump itself.

DANGER!
Starting pumps without fluid inside risks ruining the internal components of the pumps.

During the priming phase, described in the specific manuals for each component, a very low dosage flow rate must be set, i.e. approximately 1/10 of the value. For example:

- For a GP10 you must set 1cc/sec;
- For a PCP 050, a maximum of 5mm^3/sec must be set;
- For PDP, consider the larger PCP pump and do as in the above point.

When the product begins to come out then it is possible to use higher flow rates

ATTENTION!
The increase in flow rates must be relative to the product to be dosed and the type of product (whether it is abrasive or not, for example). In general, it is advisable to set the parameters set at the beginning by the manufacturer's technicians and, if they have not been entered, ask the manufacturer's technicians for advice.

7.3 Extruder priming (E2K)

Extruder priming is performed every time the cartridge change is performed. Once the new cartridge has been inserted (before inserting the mixer and nozzle), a very low flow rate must be set, so that the pistons advance on the cartridges and arrive at the stop (it is advisable to use the jog mode for this phase).

At low flow rates, it is normal for the pistons to take a few seconds to hit the cartridges.

When the product begins to come out of the cartridges, it is advisable to stop dosing, insert the mixer with its nozzle (if present) and, once everything is assembled, dose at the real working range.

DANGER!
The flow rate should not be increased excessively as there is a risk of mechanical failure of the cartridge

ATTENTION!
The increase in flow rates must be related to the product to be dosed and the viscosity of the product. In general, it is advisable to set the parameters set at the beginning by the manufacturer's technicians and, if they have not been entered, ask the manufacturer's technicians for advice.

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7.4 "Quick Command" Mode (PCP/PDP/GP/GP2K/E2K)

This mode is recommended in the case of very fast cycle times, where even a few tenths of a second of latency can have an influence. To use the controller in this mode, you must set the "interruption" working mode in the "dispensing stop" parameter in the system settings menu.

ATTENTION!
Before you set this working mode, see exactly how the interrupt mode works, which is described within the specific paragraph for each controller.

7.5 Suction function (PCP/PDP/E2K)

The suck back function is very useful to prevent there from being any residue left on the end of the dosing system at the end of processing; it allows you to remove that drop that otherwise remains at the end of the dosage and that risks falling into unforeseen areas, also ruining the final result. This function allows you to dampen the pressure on the outlet nozzle by generating a negative back pressure that brings the product (or products) back inside.

To set it correctly, you must start with low quantity values and flow rate equal to or lower than the dosage value. From here, you perform some tests by increasing the quantity until the desired effect is achieved.

ATTENTION! (PCP)
If you increase the quantity, or the flow rate, you risk letting air inside the pump itself, ruining the stator (in case you work without fluid)

ATTENTION! (PDP)
If you increase the quantity, or the flow rate, you risk mixing the products inside the pump channels into which they are divided, risking that the product will mesh inside the pump itself

ATTENTION! (E2K)
If the quantity, or the flow rate, is increased too much, air is allowed to enter the mixer, taking longer to perform the dosage, as well as risking mixing the products inside the extruder cartridges in which they are divided, risking that the product cross-links inside the cartridge itself

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7.6 Use of stirrers and heated zones (HEATERS)

The EVO HEATERS controllers allow you to manage a maximum of one pair of agitators and a pair of heated zones, i.e. a pair of tire warmers, heating tubes or valve heaters (and combinations of these) managed by temperature probes.

To manage the agitators, simply press the 02 or 04 button, depending on the agitator you want to control. The rotation speed of the agitator is already set and cannot be adjusted.

To manage the temperature of the connected element, as soon as the control unit is switched on, the value on the display rises to a pre-assigned value (factory setting). To change the temperature value, you must:

a) Press the "SET" button. At this point, the green LED starts flashing corresponding to "OUT 1" (basically, this step may not be needed, as the indicated LED is already selected);
b) Using the arrows on the relative display, you can increase or decrease the set temperature;
c) Press the "SET" button to save the setting. Check that the green LED corresponding to "OUT 2" starts flashing
d) Using the arrows on the relative display, you can increase or decrease the set temperature;
e) Press the "SET" button to save the settings.

If you want to use only the stirrer and not the heater, you must set the temperature on the display so that it is lower than the room temperature, so that the heating circuit does not start (or disconnect the heated area).

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8 MAINTENANCE

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

- **Ordinary maintenance**, which are interventions on a regular basis or that can be carried out by the customer's staff, are the most important activities as they allow the component to be kept in good working condition;

ATTENTION!
Ordinary maintenance must be carried out in the manner and timing indicated in the following chapters.

- **Extraordinary maintenance**, i.e. all those interventions that are not regularly carried out or that have not been planned, or interventions that cannot be carried out by the Customer. They can also arise from the lack of routine maintenance.

ATTENTION!
Extraordinary maintenance work must be carried out together with the manufacturer's specialized technicians.

Regarding attendance, it must be considered that:

- **When necessary:** Operation to be carried out when the need to be carried out is seen;
- **Each component start or job end:** Indicates a daily period, in general. This can imply every 24 hours (i.e. at the beginning of the shift of every day, or the end of the shift of every day), or even more frequently, depending on the application;
- **Long pause:** Indicates a period approximately greater than an hour;
- **Weekly:** Indicates a period equal to seven calendar days;
- **Monthly:** Indicates a period equal to one calendar month;
- **Semi-annual:** Indicates a period equal to six calendar months;
- **Yearly:** Indicates a period equal to one calendar year.

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

Assigned	Description	Frequency	Chapter
	Perform a test operation of the controller (see if navigation works)	Each component start or job end	\
	Perform a surface cleaning of the controller	Each component start or job end	\

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

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9 SYSTEM MESSAGES

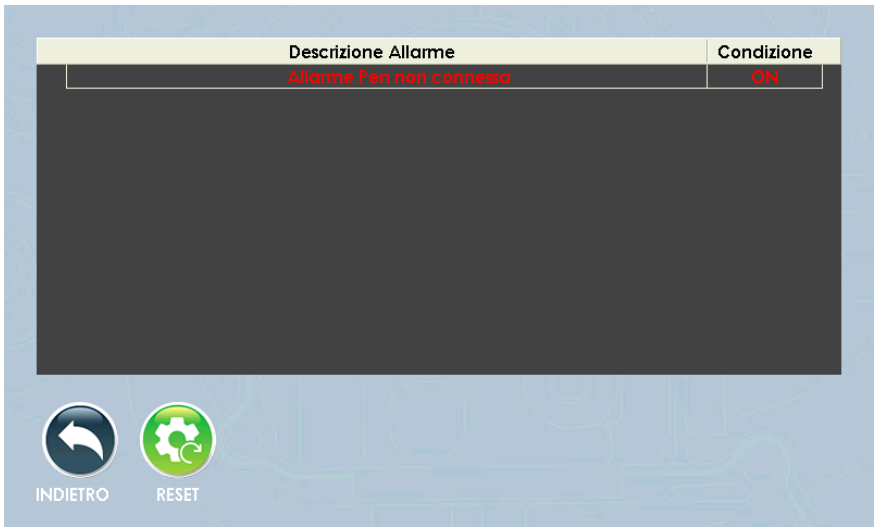
In this chapter, the types of messaging that are present within the component are explored and listed. In particular:

- **Mechanical defect:** This part deals with defects that there may be on a mechanical level with the controller.
- **Alarm:** warning from the component to the operator indicating a problem, which can be electrical, pneumatic or generic;

This chapter lists all the messages that the system produces, with their explanation, and all the alarms that the system emits, with their explanation and method of resolution of the specific alarm.

In general, to remove an alarm, you must:

- Identify the alarm (if there is more than one alarm, identify only one);
- Resolve the cause of the alarm, as indicated in the next chapter;
- From the operator terminal, access the alarm screen by pressing on the yellow triangle symbol. A screen like the figure below opens;
- Reset the specific alarm;



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9.1 Mechanical defect

Below are the various mechanical defects that can occur on all controllers. Defects are common for all controllers, so a single list is made

ALARM	CAUSE	SOLUTION
The controller does not turn on	No power	Check the supply line
		Check and, if necessary, replace the fuses
Drive power enable alarm	The drive is not receiving power	Verify that connections are made correctly
		Power cycle the controller
The drive does not respond correctly to commands	High temperatures inside the controller interfere with the drive's work	Contact the manufacturer
Drive connection alarm	The drive is not properly connected	Verify that connections are made correctly
		Power cycle the controller
Smoke comes out of the controller	Currents that are too high	Turn off the controller and unplug it
	Temperature elevate	
The controller does not communicate with the customer system via modbus TCP/IP	Ethernet cable not connected or ruined	Check the cable connection
		Check the integrity of the cable and, if necessary, replace it
		Check that your controller settings are correct
The controller does not communicate with the customer system via digital I/O	Incorrect wiring	Compare the wiring done with the diagram in chapter 5 (depending on the controller purchased, go to the relevant chapter)
		Make sure the cable is connected on both ends
	Damaged wiring harness cable	Change cables
	Wiring cable not connected	Make sure the cable is connected on both ends
Controller does not recall correct recipes via digital I/O	Input wiring performed incorrectly	Compare the wiring done with the diagram in chapter 5 (depending on the controller purchased, go to the relevant chapter)
	Incorrect recipe recall logic	Check the recipe change logic in chapter 6.
		Contact the manufacturer
The valve does not start the dosage even if it is commanded	Inverted "CONTROL" connector wiring	Compare the wiring done with the diagram in chapter 5 (depending on the controller purchased, go to the relevant chapter)

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9.2 Alarms

Below are the various alarms that are present within each individual controller, the reason why they are triggered and how to solve them.

ATTENTION!
The alarms managed by the manufacturer are listed below. The alarms of the EVO HEATER controller are managed by the Pixsys system. If you have any problems, ask the manufacturer for the dedicated manual.

9.2.1 PCP EVO Controller Alarms

ALARM	CAUSE	SOLUTION
Drive Alarm	The drive is on alert	Check that connections are made correctly
		Check PCP cable status
		Power cycle the controller
Drive power timeout alarm	The drive is not responding	Check that connections are made correctly
		Power cycle the controller
Modbus drive timeout alarm	The modbus inside the drive is not responding	Power cycle the controller. If the problem still comes up, contact the manufacturer
Timeout drive H alarm	The drive is not responding	Check that connections are made correctly
		Power cycle the controller
Modbus timeout alarm IO module H	The modbus inside the drive is not responding	Power cycle the controller. If the problem still comes up, contact the manufacturer
PLC modbus timeout alarm	Communication error via modbus TCP/IP	Check that connections are made correctly
		Check that the "MODBUS TCP/IP" selector within the system settings is enabled and that "MODBUS TCP/IP" is selected in the recipe selection drop-down menu
		Power cycle the controller. If the problem still comes up, contact the manufacturer
Level Alarm	The minimum quantity of product has been reached	Refueling/Replacing the fluid system
Pressure alarm	The outlet pressure at the pump has exceeded the maximum threshold	Check that there are no obstructions at the end of the pump
		Reduce the dosage flow rate

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9.2.2 PDP EVO Controller Alarms

ALARM	CAUSE	SOLUTION
Drive alarm (resin/hardener)	The drive is on alert	Check that connections are made correctly
		Check PCP cable status
		Power cycle the controller
Drive power timeout alarm (resin/hardener)	The drive is not responding	Check that connections are made correctly
		Power cycle the controller
Modbus drive timeout alarm (resin/hardener)	The modbus inside the drive is not responding	Power cycle the controller. If the problem still comes up, contact the manufacturer
Drive Timeout Alarm H (Resin/Hardener)	The drive is not responding	Check that connections are made correctly
		Power cycle the controller
Modbus timeout alarm IO module H	The modbus inside the drive is not responding	Power cycle the controller. If the problem still comes up, contact the manufacturer
PLC modbus timeout alarm	Communication error via modbus TCP/IP	Check that connections are made correctly
		Check that the "MODBUS TCP/IP" selector within the system settings is enabled and that "MODBUS TCP/IP" is selected in the recipe selection drop-down menu
		Power cycle the controller. If the problem still comes up, contact the manufacturer
Level alarm (resin/hardener)	The minimum quantity of product has been reached	Refueling/Replacing the fluid system
Pressure alarm (resin/hardener)	The outlet pressure at the pump has exceeded the maximum threshold	Check that there are no obstructions at the end of the pumps
		Reduce the dosage flow rate
		Check that the product has not cross-linked inside the mixer

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9.2.3 GP EVO Controller Alarms

ALARM	CAUSE	SOLUTION
Drive Alarm	The drive is on alert	Check that connections are made correctly
		Power cycle the controller
Drive power timeout alarm	The drive is not responding	Check that connections are made correctly
		Power cycle the controller
Modbus drive timeout alarm	The modbus inside the drive is not responding	Power cycle the controller. If the problem still comes up, contact the manufacturer
Timeout drive H alarm	The drive is not responding	Check that connections are made correctly
		Power cycle the controller
Modbus timeout alarm IO module H	The modbus inside the drive is not responding	Power cycle the controller. If the problem still comes up, contact the manufacturer
PLC modbus timeout alarm	Communication error via modbus TCP/IP	Check that connections are made correctly
		Check that the "MODBUS TCP/IP" selector within the system settings is enabled and that "MODBUS TCP/IP" is selected in the recipe selection drop-down menu
		Power cycle the controller. If the problem still comes up, contact the manufacturer
Product Level Alarm	The minimum quantity of product has been reached	Refueling/Replacing the fluid system
Product pressure alarm	The outlet pressure at the pump has exceeded the maximum threshold	Check that there are no obstructions at the end of the valve
		Check that if there are shut-off valves along the pipes, they are open
		Reduce the dosage flow rate

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9.2.4 GP2K EVO Controller Alarms

ALARM	CAUSE	SOLUTION
Drive alarm (resin/hardener)	The drive is on alert	Check that connections are made correctly
		Power cycle the controller
Drive power timeout alarm (resin/hardener)	The drive is not responding	Check that connections are made correctly
		Power cycle the controller
Modbus drive timeout alarm (resin/hardener)	The modbus inside the drive is not responding	Power cycle the controller. If the problem still comes up, contact the manufacturer
Drive Timeout Alarm H (Resin/Hardener)	The drive is not responding	Check that connections are made correctly
		Power cycle the controller
Modbus timeout alarm IO module H	The modbus inside the drive is not responding	Power cycle the controller. If the problem still comes up, contact the manufacturer
PLC modbus timeout alarm	Communication error via modbus TCP/IP	Check that connections are made correctly
		Check that the "MODBUS TCP/IP" selector within the system settings is enabled and that "MODBUS TCP/IP" is selected in the recipe selection drop-down menu
		Power cycle the controller. If the problem still comes up, contact the manufacturer
Level alarm (resin/hardener)	The minimum quantity of product has been reached	Refueling/Replacing the fluid system
Outlet pressure alarm (resin/hardener)	The outlet pressure at the pump has exceeded the maximum threshold	Check that the product has not cross-linked inside the mixer
		Check that there are no obstructions at the end of the valve
		Check that if there are shut-off valves along the pipes, they are open
		Reduce the dosage flow rate
Inlet pressure alarm (resin/hardener)	The pressure entering the pump does not reach the minimum set threshold	Check that there are no blockages in the circuit before the pumps
		Increase the inlet pressure to the pumps
		Check that if there are shut-off valves along the pipes, they are open

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9.2.5 E2K EVO Controller Alarms

ALARM	CAUSE	SOLUTION
Drive Alarm	The drive is on alert	Check that connections are made correctly
		Power cycle the controller
Drive power timeout alarm	The drive is not responding	Check that connections are made correctly
		Power cycle the controller
Modbus drive timeout alarm	The modbus inside the drive is not responding	Power cycle the controller. If the problem still comes up, contact the manufacturer
Timeout drive H alarm	The drive is not responding	Check that connections are made correctly
		Power cycle the controller
Modbus timeout alarm IO module H	The modbus inside the drive is not responding	Power cycle the controller. If the problem still comes up, contact the manufacturer
PLC modbus timeout alarm	Communication error via modbus TCP/IP	Check that connections are made correctly
		Check that the "MODBUS TCP/IP" selector within the system settings is enabled and that "MODBUS TCP/IP" is selected in the recipe selection drop-down menu
		Power cycle the controller. If the problem still comes up, contact the manufacturer
Product Level Alarm	The minimum quantity of product has been reached	Replace the cartridge

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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,** i.e. when the component is placed inside the warehouse for an unspecified period waiting for a third party to buy the component;
- **Dismantling,** i.e. when the component has reached the end of work period, whether it is due to age, obsolescence or faults that cannot be repaired, or that it is possible to repair but it is worth buying a new component.

If installation is not planned soon, the component can remain packaged and must be stored in a sheltered and preferably closed place. The ambient temperatures to be observed are given in chapter 2.2.

On the other hand, for the dismantling and consequent scraping of the component or its parts, the different nature of the various components must be considered, and a differentiated scrapping must be carried out. We recommend that you commission specialist companies for this purpose and must always observe the applicable laws on waste disposal.

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