PARTS, SYSTEMS AND AUTOMATIONS FOR FLUID DISPENSING

# USE AND MAINTENANCE MANUAL

# TWO-COMPONENT ELECTRONIC PRESSURE PLATE PUMP PPE2K SERVER


COD.: **DTVI_PPE2KSR_2428**
REV.: **00**
DATE: **12/07/2024**

**TRANSLATED FROM ORIGINAL**
Read carefully before use!

EN

# Summary

# 1 GENERAL INFORMATION

This manual contains information regarding the installation, use, maintenance and end of life of the component and provides indications for the most 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.

You are 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 commission 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.

## 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 can 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.

## 1.2 Reference standards

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

### Directives

- 2006/42/EC – Machinery Directive;

## 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:** PPE2KSR
**Model:** Two-component electronic pressure plate pump in server mode
**ID:**
**Year:** 2024
**Intended use:** Two-component fluid supply to the dosing system

**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:**

- 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, 12 July 2024

**The legal representative**

**Andrea Grazioli**

## 1.4 Glossary

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

| TERM | DEFINITION |
|---|---|
| **Enable** | Term that defines the act of preparing (enabling) an action. The action will be 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. |
| **D.P.I.** | 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 component control tools 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 defined as 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 objects. |

## 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 |

# 2 PRESENTATION AND OPERATION

In this manual we want to explain the operation of the two-component electric pressure plate pump PPE2KSR. This type of pump has the main feature of working with electric motors, which push the fluid inside the pump itself to maintain a constant (settable) outlet pressure, i.e. the motors rotate the rotors at a higher or lower speed based on the feedback received from the pressure sensor placed on the outlet so that the set pressure remains constant

In other words, the function of this component is:

**FLUID SUPPLY FROM TWO DRUMS TO THE DOSING SYSTEM IN SUCH A WAY THAT THE PUMP OUTLET PRESSURE IS CONSTANT.**

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.

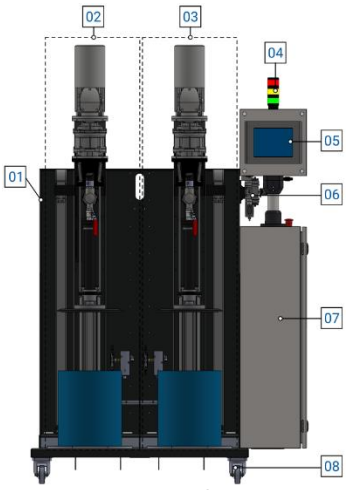


Figure 01 – Detail PPE2KSR

| No. | DESCRIPTION |
|---|---|
| 01 | Protection box |
| 02 | Pumping unit A |
| 03 | Pumping unit B |
| 04 | Signal tower |
| 05 | Display HMI |
| 06 | Pneumatic system |
| 07 | Electrical panel |
| 08 | Handling wheels |

**ATTENTION!**
Throughout the manual we talk about "Part A" and "Part B", which are the two fluids that characterize the pump. Note that fluid A indicates resin, while fluid B indicates hardener.

Before using a certain type of fluid, it is necessary to check that:

- The viscosity of the fluid is compatible with the characteristics of the pump;
- The characteristics of the fluid meet the desired requirements;
- The technical data sheet of the fluid provided by the manufacturer contains all the information regarding the product such as viscosity, applications, drying times and storage;
- The fluid storage time has not been exceeded;
- The fluid packages are tightly sealed.
- Verify the chemical compatibility of the fluid with the materials in contact

If it is necessary to use several fluids with the same pump, the system must be thoroughly cleaned to prevent residues from the previous processing from affecting the work to be performed.

## SPECIAL VERSIONS

This pump can be used either with a two-component pump or with two, i.e. either in series with a PDP or with two PDPs. In this manual, when necessary, the differences and what to do are explained.

## OPERATION

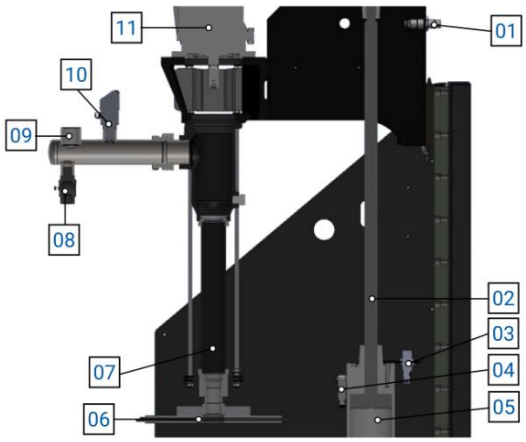



Figure 02 – Internal section PPE2KSR

| No. | DESCRIPTION |
|---|---|
| 01 | Retention sensor |
| 02 | Pneumatic cylinder piston |
| 03 | Product Level Sensor |
| 04 | Upper Air Interceptor |
| 05 | Pneumatic cylinder |
| 06 | Pressing plate |
| 07 | Fluidic piston |
| 08 | Purge valve |
| 09 | Product Output |
| 10 | Outlet pressure sensor |
| 11 | Gear motor |

The pump has a sealing sensor, which is used to prevent the pump from starting to work before it reaches a certain level. This is to force the operator to keep the two-hand control active while the pump descends, to prevent anyone from putting their hands under the plate itself. Once the holding sensor reaches the set level, the deck is inside the tank in a safe zone and, therefore, the pump moves to the level autonomously and the operator can release the two-hand control. For the start of processing, however, it can be either manual or automatic, depending on the software settings.

For the working parameters, please refer to chapter 2.2.

The pumps cannot operate autonomously. To ensure that it can dose correctly, it must be connected to a dosing system, in this case two-component (PDP pumps), and which sets the recipes inside the pump itself, since the pump does not manage work recipes independently.

**ATTENTION!**
It is recommended to connect the pumps to the systems indicated in this manual in chapter 2.2. Connecting them to other systems or products with features not listed in this manual may break them.

The following is intended to explain how the pumps work PPE2KSR.

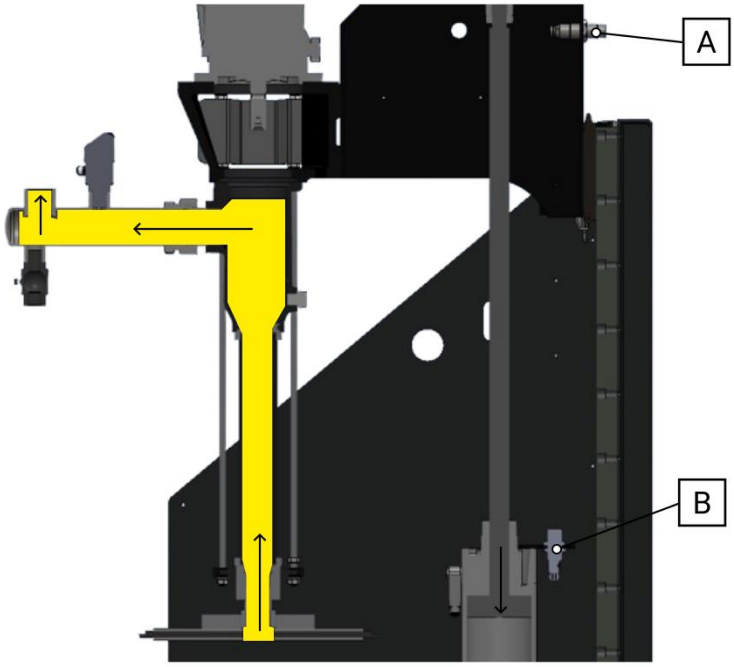



Figure 03 – Feeding phase

Once the keg is inserted into position, the keg presence sensor sends the signal to the system that the keg is present, giving the first green light to the dosing plant. At this point, the operator must secure the drum to the system using the appropriate hooks and then go to the push-button panel and, using a two-hand control, lower the pneumatic piston. If the restraint sensor (A) does not reach the minimum safety level and the operator releases the two-hand control, the system cannot start, and the pneumatic piston stops in position. Once the restraint sensor exceeds the minimum threshold, the operator can release the two-hand controls and the pump automatically brings itself to level, without starting dispensing (if in manual mode, No.01 chapter 6.3.3). Once the operator starts the pump, it begins to dispense fluid, which passes inside the pneumatic piston through a progressive cavity system, which pushes the fluid until it reaches the product exit point and passing through a pressure sensor, which sends the pressure currently read in analog mode to the system. As the product is used, the platter lowers, together with the piston of the pneumatic cylinder, which lowers inside the cylinder itself, and the cover is also lowered by means of a special linear guide. The sensor constantly sends the height reading signal to the system and when this value reaches the set threshold value, a level alarm is sent, and the drum must be changed to proceed. From here, the operator raises the pump by means of a two-hand control and changes the drum

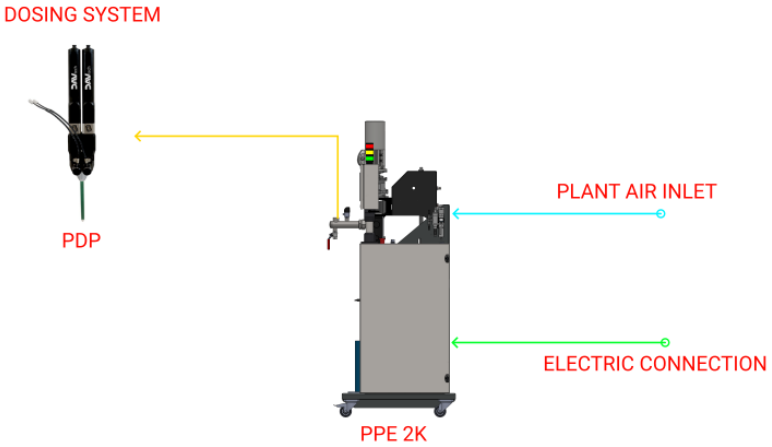
**ATTENTION!**
This guide is for operation only. For the drum change procedure, see chapter 7.9

The pneumatic pressure of the system is automatically managed by an electro-pneumatic valve and a 5/3 solenoid valve with external control, the first of which is used to set the pressure values that are desired during the up and down phase of the system, which can be different for the two phases; the second is used to allow the operator to be able to jerk up the system, preventing it from falling between one pulse and another (also useful as a safety, even if the main safety on the cylinder is made by the interceptors).

## USEFUL TIPS

**ATTENTION!**
The parameters shown are indicative, as the pump also has special applications. Always ask for advice from technicians during the design phase to have an application suitable for your use

- The purge outlet (No. 08 Figure 02) must not be connected to any pipe. This is to avoid problems with the backpressure of residual fluid from previous purges, which contaminate the product inside the system



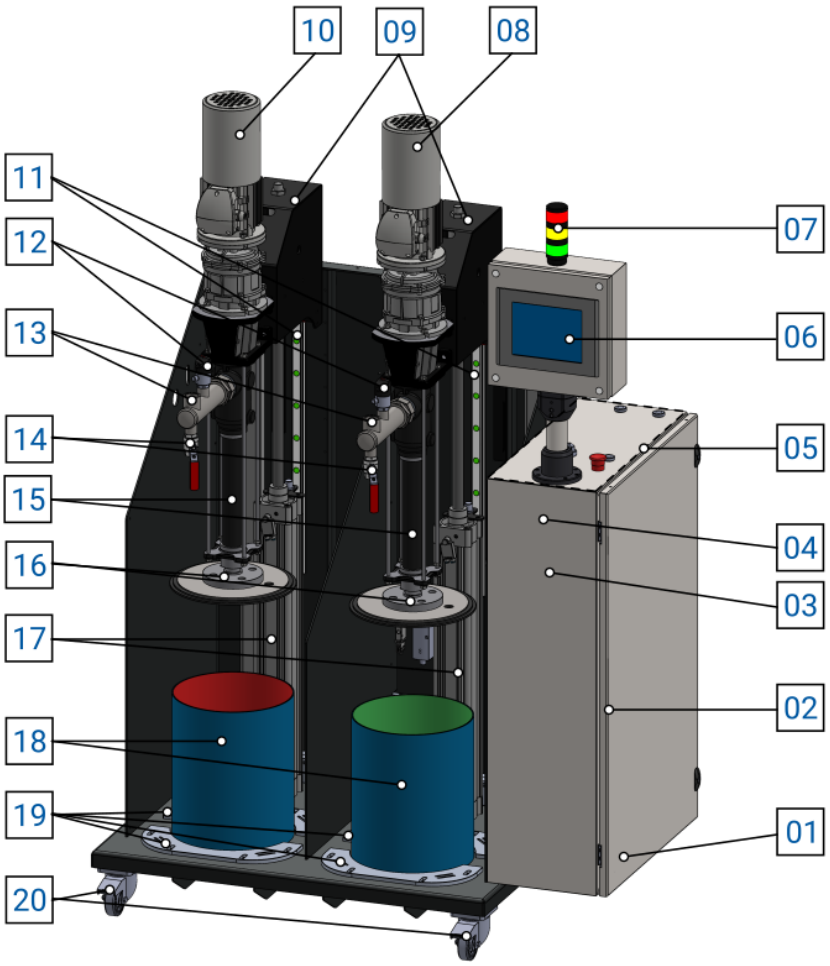

| COLOR | MEANING |
|---|---|
| CYAN | Main Air |
| YELLOW | Product |
| GREEN | Electric |
| RED | Notes |

Figure 04 – Connection example

**ATTENTION!**
Pipes must not be connected to the vent outlet (No.08 Figure 02), otherwise there is a risk of generating back pressure when it is time to vent which risks generating air bubbles inside the circuit.

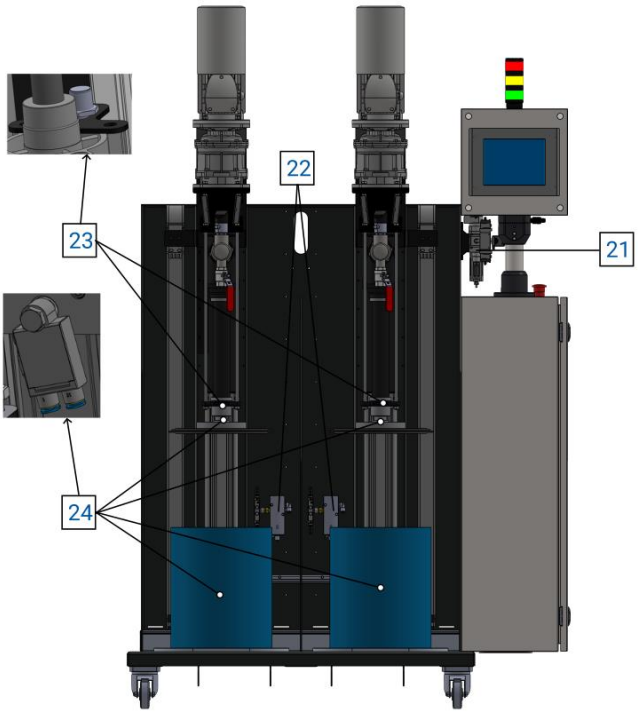
## 2.1 Exploded

The following is a list of the main valve components with spare part numbers.

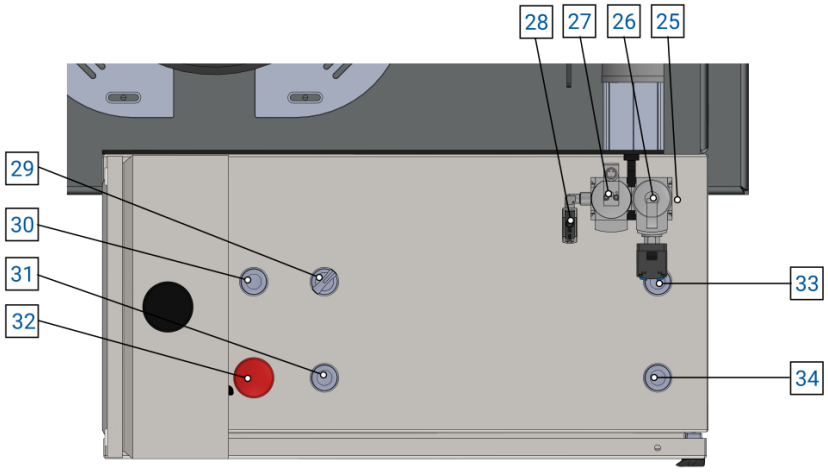



**Front Dimetric View**

| No | Description |
|---|---|
| 01 | Position of the CE marking plate. The plate contains the following information:<br>- Name;<br>- Logo;<br>- CE marking;<br>- Component model;<br>- Serial number;<br>- Rated voltage;<br>- Nominal frequency;<br>- Year of construction.<br>⚠ It is recommended that if the license plate becomes illegible, a new one must be requested. |
| 02 | Electrical panel |
| 03 | Main switch |
| 04 | Security stickers |
| 05 | Push-button position |
| 06 | Display HMI |
| 07 | Signal tower |
| 08 | Pump B Motor |
| 09 | Protective hoods |
| 10 | Pump motor A |
| 11 | Linear guides |
| 12 | Product outlet pressure sensors |
| 13 | Product outlet fittings |
| 14 | Purge valves |
| 15 | Stator |
| 16 | Pressing dishes |
| 17 | Pneumatic cylinders |
| 18 | Position of drums |
| 19 | Lock drums |
| 20 | Handling wheels |

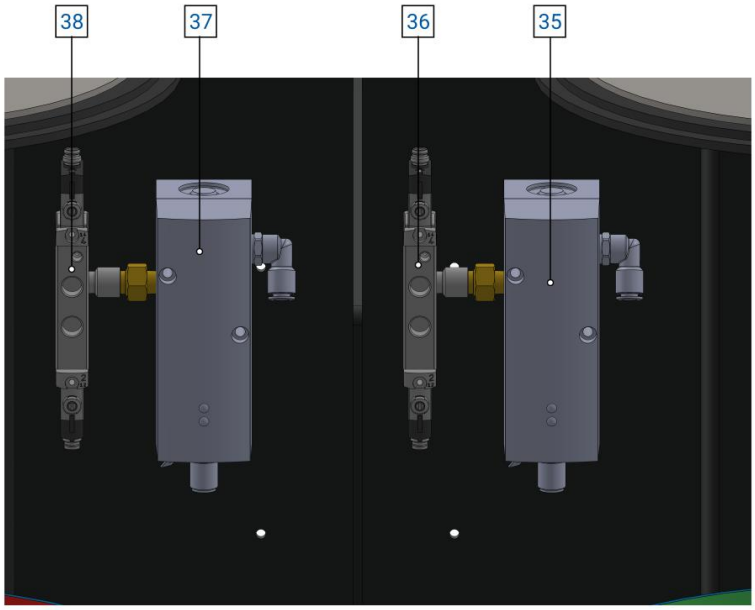



**Front view**



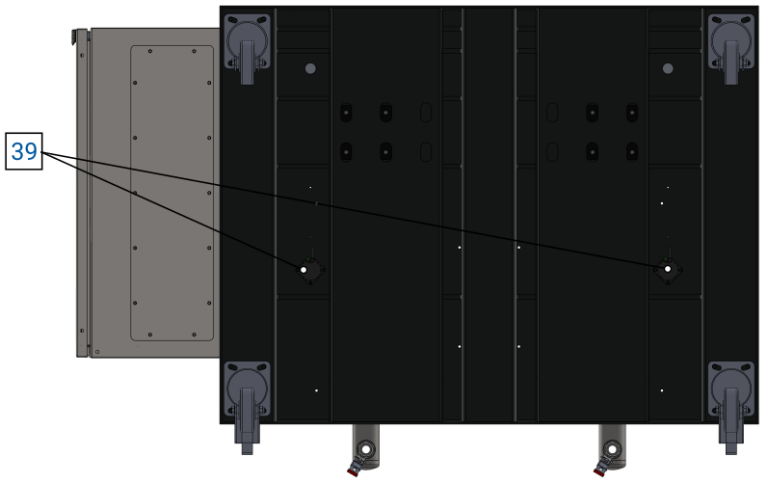

**Detail of push-button panel and pneumatic unit**

| No | Description |
|---|---|
| 21 | Pneumatic cab |
| 22 | Automatic plate up and down pressure regulator |
| 23 | Ultrasonic Product Level Sensor |
| 24 | Pneumatic interceptor positions on cylinders |
| 25 | Line air inlet |
| 26 | Filter regulator with digital pneumatic supply pressure switch |
| 27 | Safety Drain Valve |
| 28 | Manifold for lifting and lowering cylinder pressure plate |
| 29 | Pump selector (A/B) |
| 30 | Auxiliary rearmament |
| 31 | Two-hand control button |
| 32 | Emergency button |
| 33 | Flat Rise Button |
| 34 | Flat Down Button |




**Detail of the automatic pressure regulator**

| No | Description |
|---|---|
| 35 | Automatic plate B lift and bottom controller |
| 36 | 5/3 closed circuit solenoid valve |
| 37 | Automatic plate A elevation and down controller |
| 38 | 5/3 closed circuit solenoid valve |
| 39 | Drum presence sensors |




**Bottom view**

IMPIANTI DI MICRODOSAGGIO
Via Ravizza 30 36075 Montecchio Maggiore (VI) Italy
+39 0444 574510 www.davtech.it davtech@davtech.it

**PPE 2K SYSTEM**

Serial number 14/24 Year 2024
Voltage 380-400VAC 2500W
Frequency 50-60Hz

CE

**Example of CE plate on the component in position 01 with the relevant data**

## 2.2 Technical data

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

| SPECIFICATIONS | | |
|---|---|---|
| **Description** | **UdM** | **Values** |
| General features | | |
| Model | \ | PPE2KSR |
| Materials used in contact with the fluid | \ | Aluminum<br>Stainless steel<br>NBR (other materials on request) |
| Fluid outlet nozzle thread | Inch | 1 |
| Electrical Characteristics | | |
| Input | W | 2500 |
| Type of power supply | V | 380 (three-phase) |
| Type of engine | \ | Electric |
| Type of fluid thrust system | \ | Progressive cavity auger |
| Pneumatic characteristics | | |
| Pneumatic tube section | mm | 8x6 |
| Pneumatic inlet pressure | bar | 5 ÷ 8 |
| Pneumatic pressure cylinder rising | bar | 4 ÷ 6 |
| Pneumatic cylinder pressure downhill | bar | 2 ÷ 4 |

**ATTENTION!**
During the design phase of the component, the manufacturer's technical department must be contacted for any customizable details, such as the size of the drums to be used.

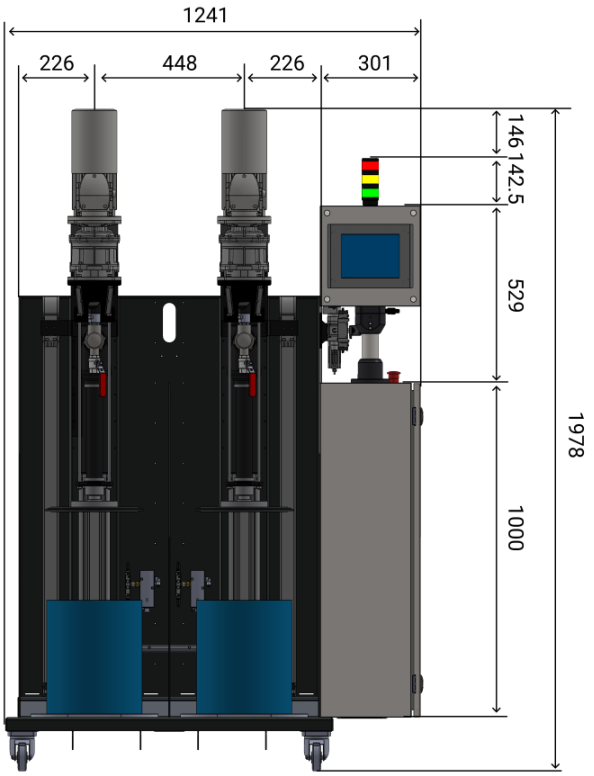
| ENVIRONMENTAL CHARACTERISTICS | | |
|---|---|---|
| **Description** | **UdM** | **Values** |
| Working Ambient Temperature | °C | 5 ÷ 45 |
| Storage Ambient Temperature | °C | -20 ÷ 55 |
| Permissible non-condensing humidity | % | 5 ÷ 90 |

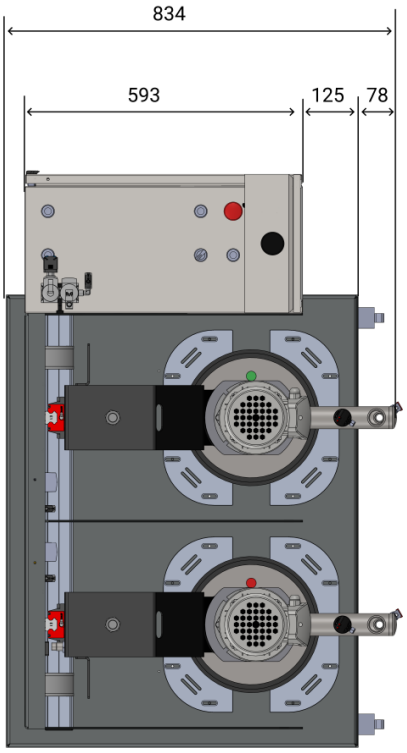
| USABLE FLUIDS |
|---|
| Paste products |
| Silicones |
| NLGI Greases 1 - 3 |
| Two-component resins |
| Various medium-high viscosity products compatible with NBR, aluminum and stainless steel (contact the manufacturer for more information) |

**ATTENTION!**
As specified above, fluid "A" is used to indicate resin and fluid "B" is used as hardener. These two fluids are not to be reversed for any reason, otherwise the system will be ruined.

| DIMENSIONAL AND WEIGHT CHARACTERISTICS | | |
|---|---|---|
| **Description** | **UdM** | **Value** |
| Component length (min ÷ max) | mm | 1241 |
| Component depth (min ÷ max) | mm | 1978 |
| Component height (min ÷ max) | mm | 834 |
| Component weight | kg | 400 |

**Component**




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

# 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.

**DANGER OF CRUSHING!**
Do not introduce hands, arms or any part of the body into areas where there are moving parts, both during the handling of the component and during the phase in which the component is operational. It is also forbidden to park under suspended loads.

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

**DANGER!**
Some products can create irritation or be harmful to health. Always carefully read the classification sheets and the safety and use information for the product you are using and follow all recommendations.

**RISK OF ELECTROCUTION!**
Always disconnect the component from a power source before performing maintenance and/or replacement. Any maintenance, cleaning or repair carried out with the electrical system live can result in serious accidents, including fatalities.

**DANGER!**
During the maintenance phases, the area concerned must be cordoned off and a sign must be affixed to the control panel indicating the state of downtime for maintenance of the component, as well as being carried out by a single operator to avoid random or involuntary activations

**DANGER!**
Be very careful when servicing the component, especially when working with very heavy components. If necessary, get help.

**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.

**ATTENTION! WEARING PPE**
The personnel responsible for operating the component (depending on the operations to be carried out) must always wear the PPE indicated. The manufacturer declines all responsibility for any damage to people caused by failure to use PPE or by modification of the same.

**ATTENTION! RISK OF DRAGGING**
Personnel are prohibited from wearing clothing and accessories that could become entangled in the component such as: loose clothing, ties, belts, necklaces, bracelets, watches, earrings, rings, etc.

**ATTENTION! DO NOT REMOVE PROTECTIVE EQUIPMENT**
The safety, protection and/or control devices of the component must not be neutralized, removed, modified or rendered inefficient.

**ATTENTION!**
Check the packaging or the documentation attached to it for the weight to be lifted and the pre-established attachment points. In addition, suitable lifting equipment must be used.

**ATTENTION!**
Avoid introducing foreign bodies, even small ones, into the pneumatic system, which could cause a malfunction of the system and compromise the safety of the component.

**ATTENTION!**
For load handling, ISO 11228:1 recommends the following limits:

| 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 |

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

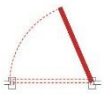
The component is manufactured in compliance with the technical safety standards in force at the time of its construction.

## 3.1 Component Safety Devices

**ATTENTION!**
The replacement of component safety components is reserved exclusively for the manufacturer's technicians. This must be done in accordance with the manufacturing specifications of the component.

The safety devices must be kept in working order. Use only original spare parts when replacing safety components.

The safety devices of the component are all those components (both mechanical and electrical) installed to ensure that personnel can work safely and in compliance with the regulations in force at the time of construction. Despite this, staff are required to maintain an appropriate level of attention while in the vicinity of the component. The symbols used for some of the safety devices are listed below.

| Symbol | Meaning | Presence |
|---|---|---|
|  | **Emergency button:** It is a button that, when pressed, removes power from the motors, securing the work area | YES |
|  | **Fixed guards:** These are devices that are designed to be static, for example doors that need a key to be opened. They typically do not need to be connected to alarms or lock component functions as they can only be accessed via key or another unlocking device. | YES |
|  | **Interlocked movable guards:** These are devices that are used to protect the operator while they are closed. If they are opened while the component is running, an alarm is triggered, and the torque is removed from the motors. | NO |
|  | **Safety labels:** These are labels placed in places where there is a danger and caution is recommended. | YES |
|  | **Valve air interceptor:** it is a device capable of maintaining air in a certain place even if there is no line air | YES |
|  | **Pneumatic disconnector:** This is a device used to regulate the pressure of the incoming air and, if necessary, remove it (in case of interventions or problems) | YES |
|  | **Electrical disconnector:** It is positioned just outside the electrical panel and is used to remove the torque from the motors and the voltage from the entire component | YES |
|  | **Beacons:** This is a device that indicates the status of the component. It is indicated in this chapter because it is also used to indicate alarm states. | YES |
|  | **Acoustic signals:** These are devices that are used to alert personnel of a particular event (it can be an error or even the end of the cycle, depending on the settings) | NO |

### 3.1.1 Static signaling devices

These are all those devices that are used to signal the presence of a danger to the operator or maintenance technician. In general, static signaling devices can be labels or signs.

The positions of the static signaling devices are given in chapter 2.1 number 04. The reports are shown below.



**ATTENTION!**
Labels should be replaced if they are worn or illegible in any way.

### 3.1.2 Guards (fixed and mobile interlocked)

These are all those devices that are used to secure personnel by closing/blocking certain areas of the component, to prevent there from being problems with involuntary crushing. If they are opened or are not working, the system sends an error to the operator's HMI panel with the corresponding message.

The following devices are present in this component:

- Fixed guard: 1 device given by the electrical substation ( chapter 2.1 number 02);

**DANGER!**
Opening the electrical cabinet doors is not bound to the main electrical switch; therefore, before opening them, the main switch must be turned to "OFF". In addition, their opening is allowed only to personnel in charge of operating inside the cabinet.

### 3.1.3 Electrical and pneumatic disconnecting devices

These are all those devices that are used to interrupt the electrical or pneumatic flow in emergencies or if maintenance needs to be performed on the component. Pneumatic disconnecting devices are used to remove air from the system, but the power supply is maintained; while the electrical disconnecting devices are used to de-energize the system.

In this component there is one device per type, of which:

- The pneumatic disconnecting system is in position 26 in chapter 2.1;
- The electrical disconnecting system (main switch) is in position 03 in chapter 2.1.

**ATTENTION!**
The handling of the disconnecting devices may only be carried out by qualified personnel.

The electrical disconnecting system has two working modes, namely

- Position 0 – "OFF": The operator panel and the component are not powered;
- Position 1 – "ON": The operator panel and component are powered.

In addition, there is the possibility of applying a padlock when the switch is in position 0 to secure the component.

### 3.1.4 Emergency stop devices

These are all those devices that are used to interrupt the operation of the component instantaneously, removing torque from the motors and deactivating the auxiliary circuits.

In this component there is a single emergency stop device, located in position 32 in chapter 2.1.

**DANGER!**
The emergency device does not remove the voltage from the component. Pay attention to the parts you are going to touch.

In order to resume normal work once the emergency stop button has been pressed, the button must be reset according to the instructions written on it, the active errors must be eliminated on the HMI display (reset the alarms, chapter 9) and press the auxiliary reset button (located in position 30 in chapter 2.1).

Use the emergency button only when you need it.

## 3.1.5 Signaling devices (light and sound)

These are those devices that signal certain states of the component to the staff. These reports can be made in two ways:

- Luminous: through indications of lights of various colors positioned in such a way as to be visible even from a distance;
- Acoustic: by means of sound indications.

In this component there is a type of luminous device and no acoustic device, namely:

- A light signal tower, located in position 07 in chapter 2.1;

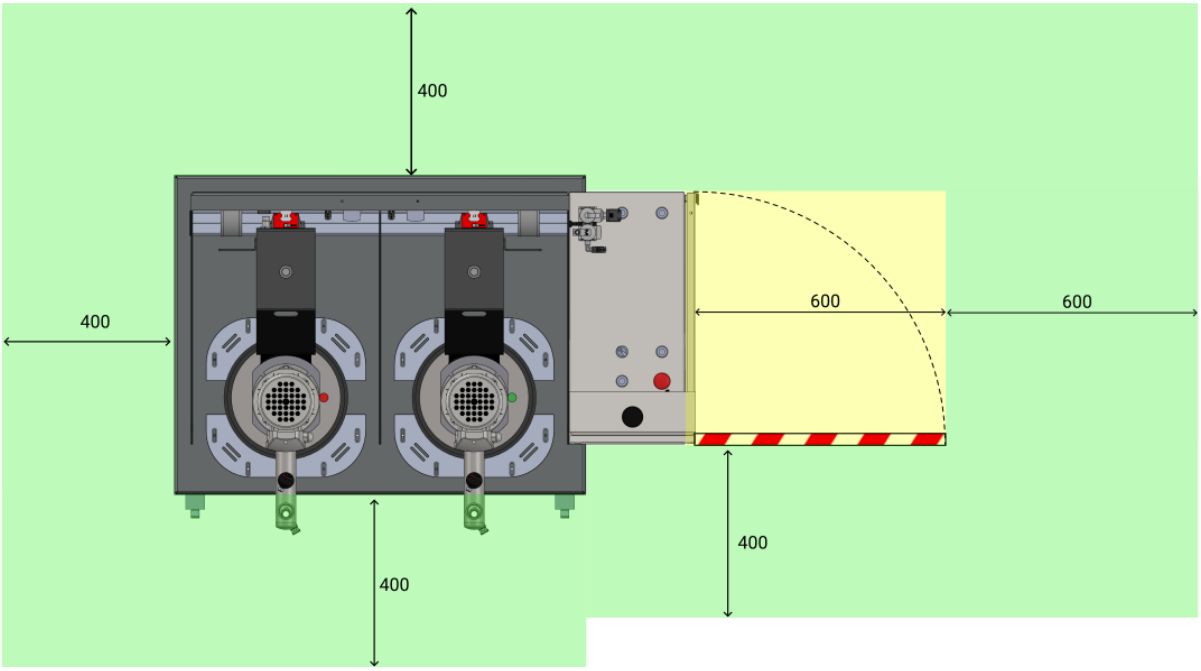
The indications given by the luminous devices are shown below.

| SIGNAL TOWER | |
|---|---|
| **Color** | **Meaning** |
| Flashing green | The component is working |
| Continuous green | Station in automatic and ready for processing |
| Flashing Yellow | P.I. |
| Continuous yellow | Product Level Alarm (A or B) |
| Flashing red | P.I. |
| Continuous red | There is an active alarm |

## 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 and the areas that may contain obstacles in yellow; The red-white lines are used to indicate the maximum extension of the ports.

## 3.3 Risk areas and residual risk

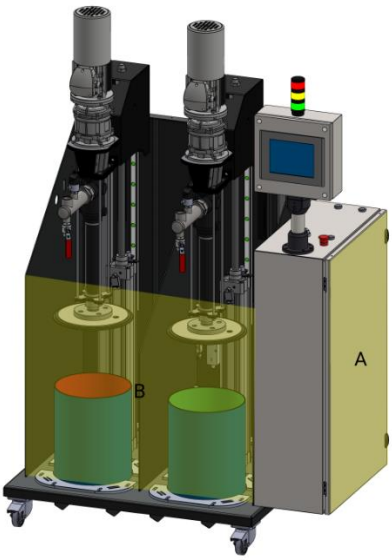
These are areas whose danger has not been completely removed and it is recommended that the staff pay particular attention when they are near those areas. Some methods that remove the risk can be the presence of two-hand controls or guards on the doors of the moving areas and on the doors of the electrical cabinet.

### AREAS AT RISK

There are no risk zones in this component, as all zones are covered by special security, as can be seen in the next chapter "Residual risk zones".

## RESIDUAL RISK AREAS

These are areas where risks remain even if appropriate safety measures have been taken to reduce them.




In this case there are two areas of residual risk, given by the electrical panel (A) and the drum change area (B)

**DANGER!**
Risk of electrocution and electrocution due to the presence of residual electric current. Once the switch has been set to the "0 – OFF" position, wait at least two minutes before working on the inside of the cabinet.

The opening of the electrical cabinet doors is not constrained to the position of the main electrical switch.

**DANGER!**
The drum change operation involves the use of two-hand controls, in which the operator is bound to keep his hands on the buttons to prevent damage. This operation must be followed by a single operator, to avoid accidental damage during the handling of the plates.

**DANGER!**
Risk of crushing when changing the drum. Operate with caution when loading/unloading the product drums.

**ATTENTION!**
Risk of dangerous fumes due to the product inside the drums. Allow the area to air and wear the appropriate PPE when changing the drums.

The component is also free of burrs, corners and cutting edges; however, it is required to pay the utmost attention during loading and unloading not to hit body parts against the pallet.

# 4 TRANSPORT AND HANDLING

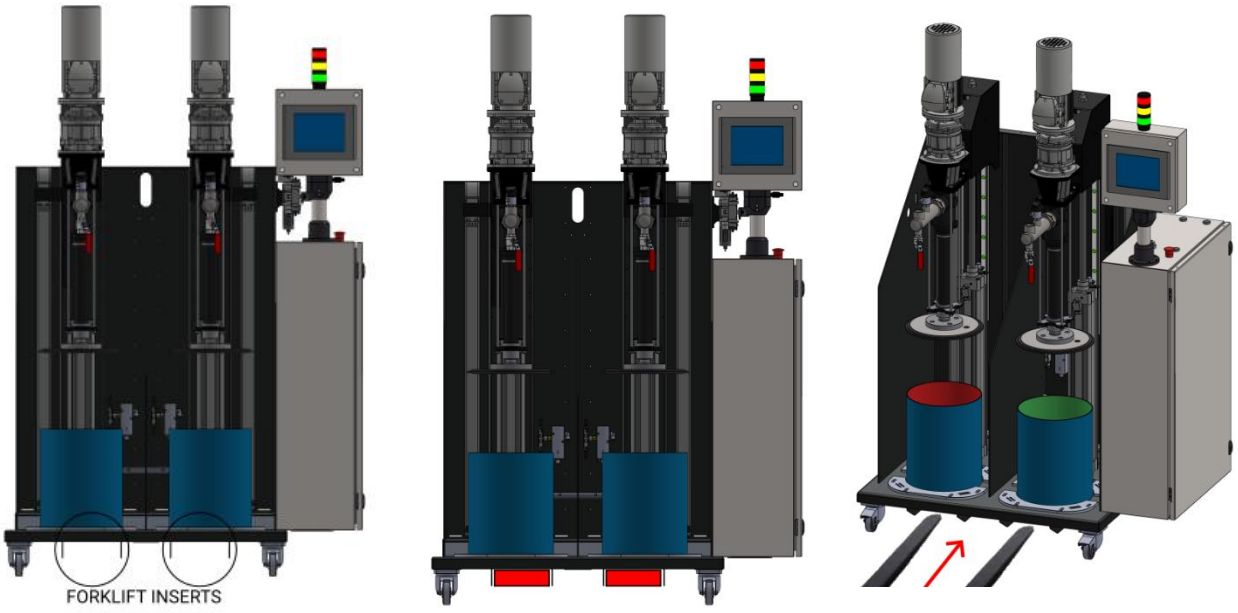
Once you have received the goods, you must check that the packaging is intact and that there is an exact correspondence with the material ordered. Once the integrity of the goods has been checked, two methods can be used to carry out the handling of the component:

1. Manually, i.e. if the component has been removed from the various packages and unloaded from the pallet and is located near the work area, it can be moved using the wheels below the component itself. This method is recommended for short stretches of the route;
2. By lift, i.e. a lift (a forklift or similar) must be used to remove it from the pallet or to move it along medium-long distances. In this case, it is advisable to respect the method indicated in the figure below as a method to lift the component, otherwise there is a risk of doing damage (even permanent) to the component, damaging its integrity.

**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.

**ATTENTION!**
If damage is done to the component during handling due to an incorrect method of loading the component, the manufacturer is not liable.




| Description | Units of Measurement | Value |
|---|---|---|
| Component Mass | kg | 400 |

# 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 install the component, it must be ensured that there is a solid support base and the correct environmental characteristics (lighting, ventilation), so that the operator can work in optimal conditions and safely. In addition, a check must be carried out that all the arrangements agreed between the manufacturer and the customer have been complied with.

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

Once positioned at the workplace, this component is equipped with 4 wheels (No. 20 chapter 2.1), 2 of which can be locked, so that the component does not move on its own.

**DANGER!**
It is important to lock the wheels once they are brought into position, otherwise the vibrations could cause the component to move and damage objects around it or even people.

**ATTENTION!**
The component must be installed in a location that is free of slopes. If there are slopes that make the component move even with the brakes activated, the manufacturer does not assume responsibility for any damage to objects and/or property.

During the testing phase of the component, checks are carried out to be sure that the brakes are working correctly and are not defective.

## 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;
- Pneumatic connection;
- Fluid connection

### 5.2.1 Electric

| **Authorized personnel** |  | **PPE to wear** |      |
|---|---|---|---|
| Component status | Component and electrical panel installed, with cable with outgoing industrial socket | | |
| Power Values | See chapter 2.2 | | |
| Necessary preparations | Electrical system with industrial socket and correct power supply | | |
| Materials needed | N.A. | | |
| Equipment needed | N.A. | | |

The electricity connection is at the expense of the customer.

The electrical connection must only be made after the positioning and possible fixing and at the end of the assembly of all the parts that make up the component.

To make the electrical connection, you must take the cable with the industrial electrical socket supplied. Since the socket is red, it must be connected to a 380 VAC power supply.

### 5.2.2 Pneumatic

| **Authorized personnel** |  | **PPE to wear** |      |
|---|---|---|---|
| Component status | Component installed and shut down | | |
| Power Values | See chapter 2.2 | | |
| Necessary preparations | Working with a pneumatic air system | | |
| Materials needed | N.A. | | |
| Equipment needed | N.A. | | |

Pneumatic connection is the responsibility of the customer.

To connect the air system, the hose of the size specified in section 2.2 must be extended to the pneumatic inlet of the component (No. 25 chapter 2.1).

### 5.2.3 Fluidic

| **Authorized personnel** |  | **PPE to wear** |      |
|---|---|---|---|
| Component status | Component installed and shut down | | |
| Necessary preparations | Dosing system present (no need for it to be working) | | |
| Materials needed | Connection hose with nut for locking on the system | | |
| Equipment needed | Dedicated fixing key | | |

Pneumatic connection is the responsibility of the customer.

To connect the component to the dosing system, a special hose must be taken (depending on the application) and connected to fluidic outlet No. 13 chapter 2.1.

**ATTENTION!**
Make sure the hose is securely connected, otherwise you may have fluid leaks from the fitting.

## 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:

- Verify that the component placement has been done correctly;
- Check that the connections have been connected correctly;
- Check that the component is free of dirt or residues of various kinds;

**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.

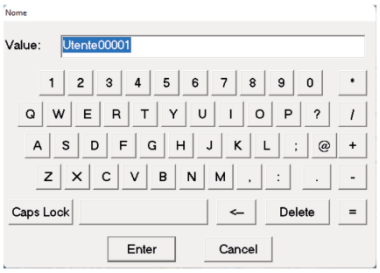
# 6 SOFTWARE

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.

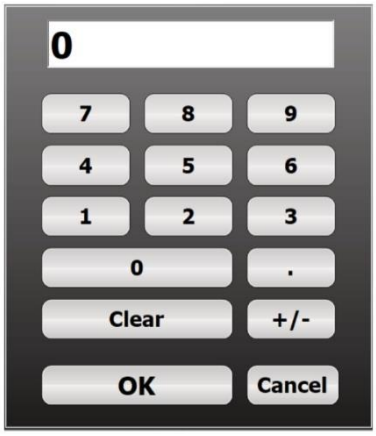
This symbol appears on any screen when an alarm arises. By pressing on this symbol, you can access the ALARMS and SIGNALS screen, and you can view the alarm and, if necessary, reset it.

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:**

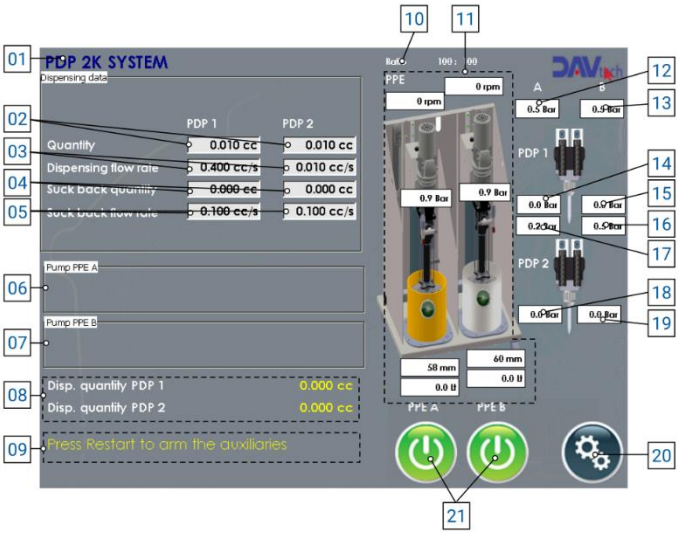
**USERNAME:** adm **PASSWORD:** 574510

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

In this case, the most generic case is described in which there are two PDP pumps connected to the same system. In case there is only one PDP pump connected, just ignore the notes put with "PDP 2" or "with two PDP pumps"; moreover, the screens only have images of PDP 1. However, the indications given here are also valid for a single PDP.

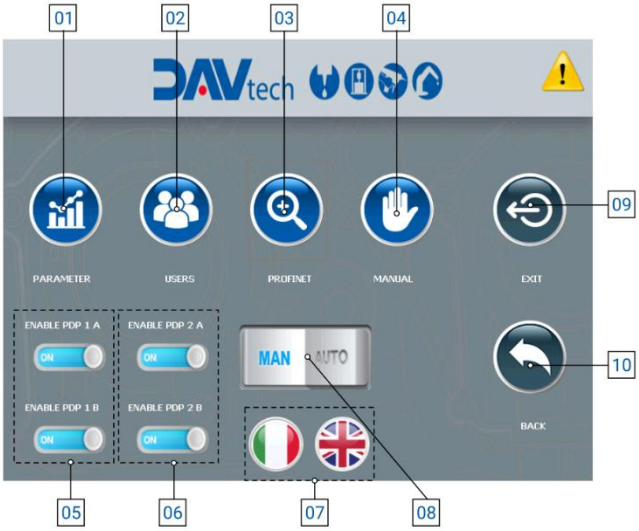
The screenshots, with the corresponding parameters, shown below are generic and we have taken a case in which, even if you set the component with these parameters, no damage is done to the system. However, each component has its own settings, and you are asked to avoid changing them, unless a technician of the manufacturer asks you to change them, giving instructions on the value to be inserted.

## 6.1 HOME screen




1) **Name** of the component;
2) **Quantity:** Indicates the amount of fluid you want to dose. If there are two PDPs connected, indicate the quantities you want to dose for each of the pumps;
3) **Dosing Flow:** Indicates the amount of fluid you want to dispense per second. If there are two PDPs connected, the parameters for both pumps are indicated;
4) **Suction Quantity:** Indicates the amount of fluid you want to withdraw inside the pumps after dosing. If there are two PDPs connected, the parameters for both pumps are indicated;
5) **Suction flow:** Indicates the amount of fluid you want to draw into the pump per second. If there are two PDPs connected, the parameters for both pumps are indicated;
6) **PPE Pump A:** Indicates the status of the fluid pump "A" and whether there are any tasks to be performed;
7) **PPE Pump B:** Indicates the status of the fluid pump "B" and whether there are any tasks to be performed;
8) It indicates the **total dosed amount** of the associated PDP pump. If there are two PDPs connected, the parameters for both pumps are indicated;
9) Zone where system **messages appear**;
10) **Rate of dosage** used in this plant;
11) **Parameters** related to the **PPE2KSR component.** Indicate:
    a. **Relative motor** revolutions per minute;
    b. **Relative fluid** outlet pressure;
    c. **Height** inside the relative stem;
    d. **Volume of fluid** within the relative drum;
12) Value detected by the **inlet pressure switch** of the PDP pump 1 fluid "A";
13) Value detected by the **inlet pressure switch of** the PDP 1 fluid "B" pump;
14) Value detected by the **outlet pressure switch** of the PDP 1 fluid "A" pump;
15) Value detected by the **outlet pressure switch** of the PDP 1 fluid "B" pump;
16) Value detected by the **inlet pressure switch of** the PDP 2 fluid pump "B";
17) Value detected by the **inlet pressure switch** of the PDP 2 fluid pump "A";
18) Value detected by the **outlet pressure switch of** the PDP 2 fluid pump "A";
19) Value detected by the **outlet pressure switch** of the PDP 2 fluid pump "B";
20) Button to access the **settings menu** (chapter 6.2);
21) Manual **activation button** for the "A" or "B" fluid pumps.

## 6.2 SETTINGS MENU screen




1) **Parameters:** Allows you to access the parameter menu, modifying them. See chapter 6.3;
2) **Users:** Allows you to change user settings, see chapter 6.4;
3) **Profinet:** Allows you to view the connections to the Customer's network, see chapter 6.5;
4) **Manual controls:** Allows you to set the values of the component in manual mode, see chapter 6.6;
5) Selector that allows you **to enable or disable** the dosing of the PDP 1 pump, fluid "A" or "B" (useful in the case of maintenance);
6) Selector that allows you **to enable or disable** the dosing of the PDP 2 pump, fluid "A" or "B" (useful in the case of maintenance);
7) Buttons that allow you to select the **display language** of the screens (ITA or ENG);
8) **Work mode:** Allows you to select the desired working mode (auto when working, man when it is necessary to act on the "manual controls");
9) **Shut Down Runtime:** Exits the system application

**ATTENTION!**
When you exit the application, you must turn the component off and on again to re-enter. In case it is running, and you exit the application, call the service center.

10) **Previous:** Go back to the previous menu, see chapter 6.1

## 6.3 PARAMETERS screen

This screen contains all the values that the component needs to be able to operate correctly. It is divided into:

- **SYSTEM:** Inside there are the general parameters of the system;
- **PDP Pumps:** On this page you will find all the necessary calibrations for the PDP pumps associated with the system;
- **PPE pumps:** On this page there are the general settings of the PPE2KSR component, valid for both pumps;
- **PPE Pump A - B:** On this page there are the settings relating to the PPE2KSR component, valid only for the fluid pump "A" or "B";
- **Levels:** On this page you will find the settings related to the sensor levels of the PPE2KSR component;
- **Compensation:** Parameters related to PID compensation to have a correct reading by the PID itself and to be able to set correct feedback.

**ATTENTION!**

This last page contains parameters that are very delicate and that it is strongly recommended not to touch, or to modify with the assistance of the manufacturer's technicians. Changing these parameters without the manufacturer's authorization could cause malfunctions of the system and breakage, for which the manufacturer is not responsible.

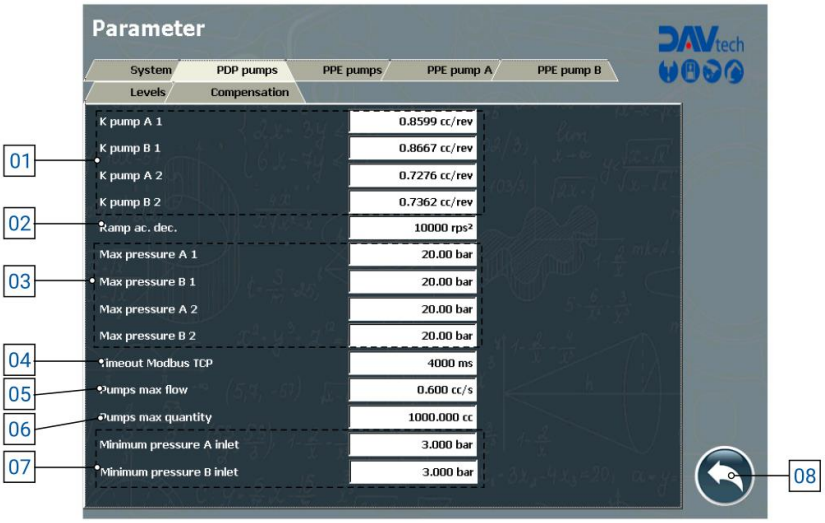
**ATTENTION!**

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

## 6.3.1 SYSTEM → PARAMETERS screen

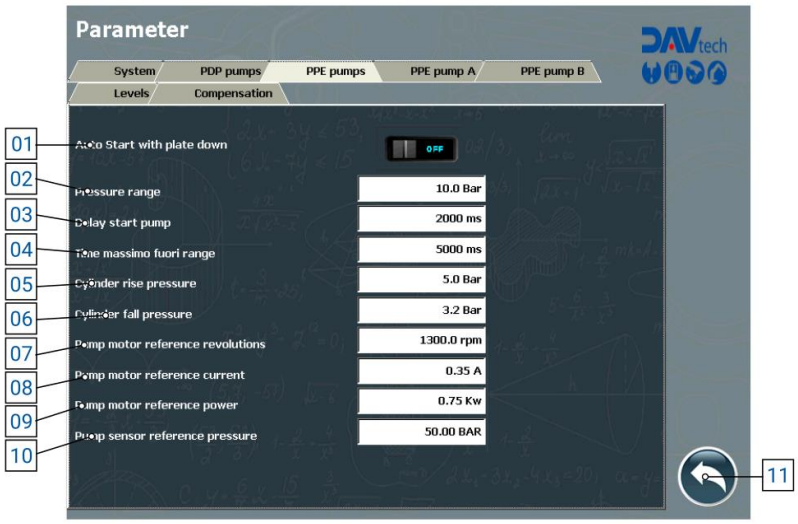

1) **Enable scale:** Allows you to enable or disable the use of the scale (if present);
2) **Specific density A:** Allows you to set the value of the specific density of fluid A, so that the scale can adjust the weight with the values entered (if the scale is present);
3) **Specific density B:** Allows you to set the value of the specific density of fluid B, so that the scale can adjust the weight with the values entered (if the scale is present);
4) **Scale weight limit:** Allows you to set a weight limit to the value read by the scale (if in use);
5) **Ratio A:B:** Indicates the ratio in volume of the two products with which they are then dosed by the PDP pump (if with two pumps, the rate is the same for both, so with this parameter the rate of both is set);
6) **Component Name:** Indicates the name you want to give to the component;
7) **Back:** Allows you to return to the main menu (chapter 6.2).

## 6.3.2 PDP PUMP → PARAMETERS screen



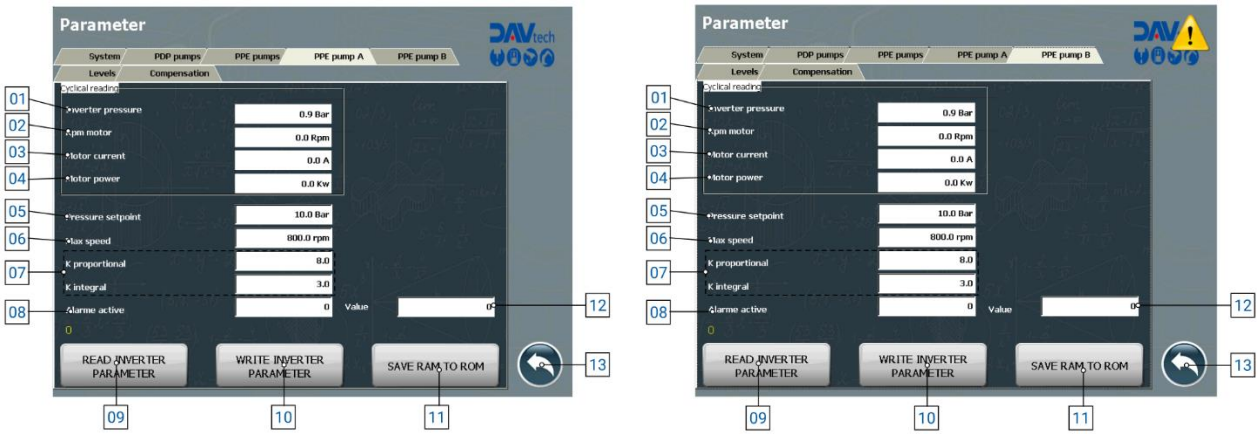

1) **K Pump (A-B)(1-2):** Parameter for correcting the dosing constant of the relevant pump, so that the nominal dosing of the pump itself is respected;
2) **Acc./dec. ramp:** acceleration and deceleration ramp of the pumps to reach the set dosing flow (valid for all pumps connected to the system);
3) **Maximum pressure (A-B)(1-2):** Maximum outlet pressure that can reach the relevant pump;
4) **TCP modbus timeout:** Maximum time the component waits before sending an alarm that fails to communicate with the client server;
5) **Maximum flow of pumps:** Maximum amount per second that the pumps can reach;
6) **Maximum quantity of pumps:** Maximum quantity that the pumps can dose;
7) **Minimum inlet pressure (A-B):** Minimum inlet pressure that must read the sensor under which it sends an alarm to the system;
8) **Back:** Button to return to the SETTINGS menu (chapter 6.2).

## 6.3.3 PPE PUMP → PARAMETERS screen




1) **Auto start with lowered platter:** selector that allows you to set the automatic start of the component when the platter reaches the fluid, i.e. immediately after performing the drum change. It is generally recommended to keep it off and start the system manually;
2) **Pressure range:** Indicates the maximum outlet pressure that the PPE pump can reach;
3) **Pump start delay:** If selector 1) is active, it indicates the delay that the pump must respect before starting work once the fluid has been reached;
4) **Maximum Out-of-Range Time:** Indicates the maximum time that the pressure value can remain outside the entered limits beyond which the component sends an alarm to the system;
5) **Cylinder rise pressure:** Pressure with which the system makes the plates rise inside the drums;
6) **Cylinder Descent Pressure:** Pressure with which the system lowers the platters into the drums;
7) **Reference revolutions of the pump motor:** Parameter used to perform internal calculations to calculate the speed of the pump motor;
8) **Pump motor reference current:** Parameter used to perform internal calculations to calculate the speed of the pump motor;
9) **Reference power of the pump motor:** Parameter used to perform internal calculations to calculate the speed of the pump motor;
10) **Pump sensor reference pressure:** Parameter used to perform internal calculations to calculate pump pressure;
11) **Back:** Button to return to the SETTINGS menu (chapter 6.2).

## 6.3.4 Screen PARAMETERS → PPE PUMP A - B



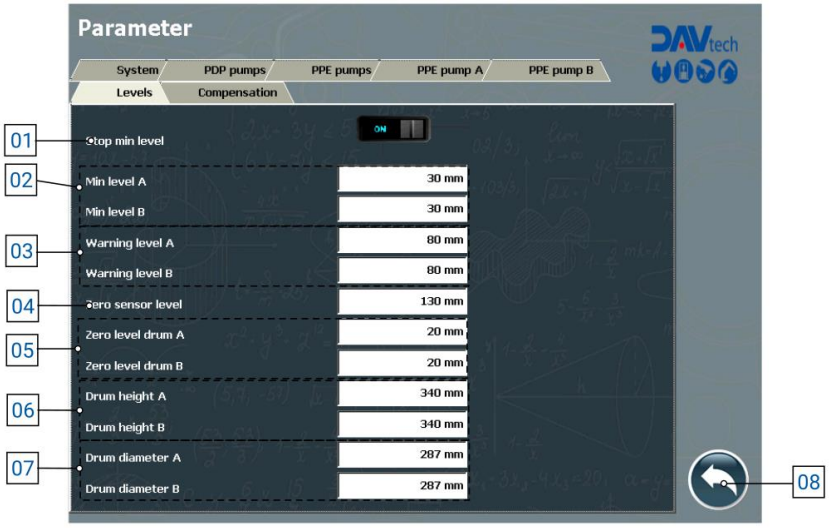

1) **Inverter pressure:** Pressure read by the inverter in real time linked to the revolutions of the auger;
2) **Engine rpm:** Revolutions per minute that the engine is exerting on the system;
3) **Motor Current:** Current that the motor is consuming;
4) **Motor power:** Power that the engine is consuming;
5) **Pressure setpoint:** Maximum pressure that can be had at the exit of the PPE pump before sending an alarm;
6) **Maximum speed:** Maximum speed that the motor can reach before sending an alarm to the system;
7) PID parameter setting, i.e. **proportional and integral constant**;
8) **Active alarms** on the current pump;
9) **Inverter parameter reading:** Button used to read the current parameters of the inverter;
10) **Write inverter parameters:** Button that is used to change the inverter parameters;
11) **Save RAM to ROM:** Button used to save the newly modified parameters on the ROM, making them permanent;

**ATTENTION!**

If you do not press button 11), the data is not saved and the newly modified data is deleted the first time the component is restarted.

12) **Value:** Value relative to the alarm that went out;
13) **Back:** Button to return to the SETTINGS menu (chapter 6.2).

## 6.3.5 PARAMETERS → LAYERS screen



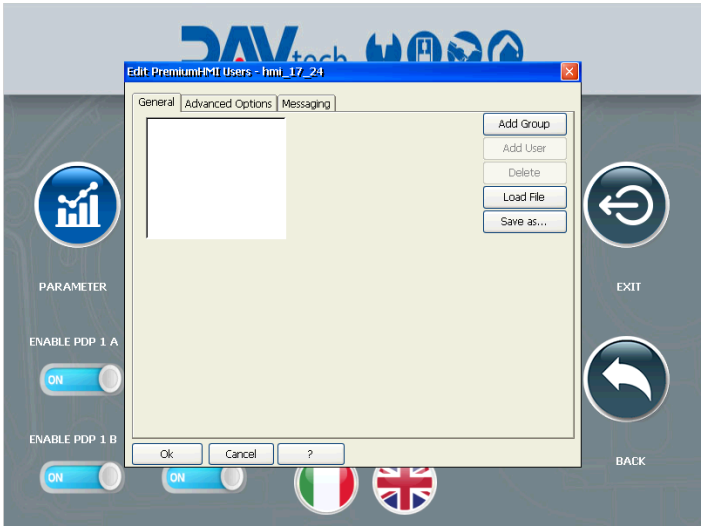

1) **Minimum level stop:** Selector that allows you to choose whether you want the PPE pump to stop dispensing once the minimum level alarm goes off (it ends the current dosage and does not do any more until the drum is changed). It is recommended to always keep IT ON;
2) **Minimum Level (A-B):** Indicates the minimum level that you want the system level alarm to trigger. At this level, if the selector of point 1) is set to "ON", the system ends the dosage in progress and then stops until the keg is changed;
3) **Level Warning (A-B):** Indicates the level at which you want the system to alert the operator to the fact that the product is running low. At this level, the system only sends a warning, so it does not block the processing;
4) **Sensor Zero Level:** Indicates the level at which the sensor reads the beginning of the keg. This parameter is used to calibrate the sensor at the beginning and, generally, you don't need to touch it;
5) **Drum Zero Level (A-B):** Indicates the starting height of the product drum. At this height, the barrel is completely empty. Once calculated, there is generally no need to change it again;
6) **Drum height (A-B):** Indicates the total height of the drum you are using, useful for performing calculations of the volume of product remaining inside the drum;
7) **Drum diameter (A-B):** Indicates the diameter of the drum that is being used, useful for performing calculations of the volume of product remaining inside the drum;
8) **Back:** Button to return to the SETTINGS menu (chapter 6.2).

## 6.3.6 PARAMETERS → COMPENSATION screen


This page is for adjusting the compensation PID and should not be modified under any circumstances. It is important that the selector always remains on "OFF", so as not to activate the self-compensating PID.

**ATTENTION!**
Changing the selector can lead to the breakdown of the system itself or to completely incorrect dosages. If this page is changed and damage is caused as a result, the manufacturer is not liable.

## 6.4 USERS screen




From this screen, you can create new user groups, new users, delete groups, or import or export user groups.

## 6.5 PROFINET screen

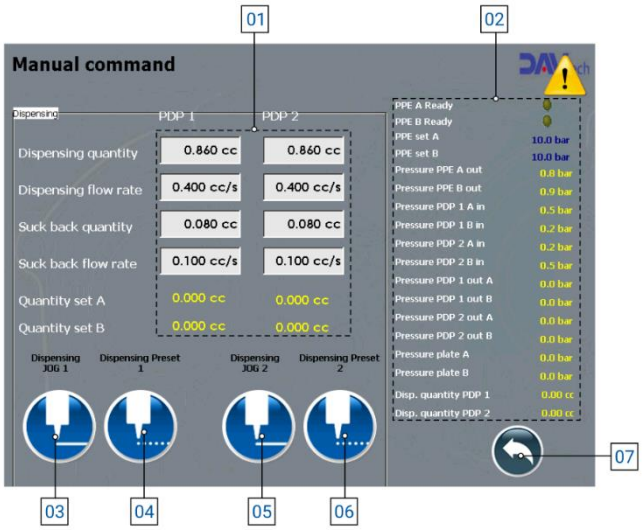
On this page it is possible to see the communication status of the component with the customer's entire plant, recognizing the input, output and sensor readings parameters immediately, to see if there are any problems with the component itself.


1) **INPUT:** These are all parameters that describe the input signals to the component; therefore, signals that the component waits for before starting to perform an action and are:
   a) **Enable Auxiliaries:** Indicates whether auxiliaries are active on the component, i.e. whether it is ready to start machining. It must be turned on in order to start dosing;
   b) **Predetermined dosage (1 – 2):** Indicates that the component is performing a predetermined type of dosage, i.e. a dosage in which a quantity of fluid to be dosed with a certain flow (set by the Customer system) is set;
   c) **Jog dosing (1 – 2):** Indicates that the component is dosing in continuous mode, i.e. the system continues to dispense product until the stop dispensing command arrives;
   d) **Alarm reset:** Indicator that is used to indicate that the alarms have been reset;
   e) **Dosing quantity (1 – 2):** Indicates the quantity set by the recipe (which is sent by the customer server) to perform the dosing of product 1 or 2 in a predetermined mode;
   f) **Dosing flow rate (1 – 2):** Indicates the quantity to be dosed per second set by the recipe (which is sent by the customer server) to perform the dosing of product 1 or 2 in predetermined mode;
   g) **Suction quantity (1 – 2):** Indicates the amount of material to be returned to the PDP pump once dosing is finished. This parameter is passed by the client server;
   h) **Suction flow rate (1 – 2):** Indicates the quantity to be dosed per second set by the recipe (which is sent by the customer server) to bring the material back inside the PDP pump once the dosing has been completed in predetermined mode;
2) **OUTPUT:** These are all the parameters that describe the signals coming out of the component; therefore, signals that the component sends to the client server and are:
   a) **System power:** Indicates whether the component is active or not, i.e. that it has power;
   b) **Auxiliary OK:** Indicates whether the auxiliary (pneumatic) systems are powered;
   c) **PPE pump ready:** Indicates whether the PPE pump is ready to perform dosing;
   d) **PDP Pump (1 – 2) Ready:** Indicates whether the relevant pump is ready to dispense;
   e) **PDP Pump (1 – 2) Busy:** Indicates whether the relevant pump is busy and working;
   f) **Alarm:** Indicates if there are active alarms on the component (PPE Pump);
   g) **Drum level OK:** Indicates whether the drum level is suitable for continuing with processing;

h) **Drum Caution (A – B):** Indicates that the fluid level in the drum is below the pre-alarm threshold;
i) **Dosage OK (1 – 2):** Indicates that the dosage of the relevant line has been successfully completed;
j) **KO dosage (1 – 2):** Indicates that the dosage of the relevant line has ended with a failure (non-compliant component);
k) **End of Dosing (1 – 2):** Indicates that the PDP pump is finishing dosing;
l) **Manual:** Indicates that the PPE pump is in manual mode;
m) **Scale Plate Caution:** Indicates that the scale plate has an active alarm for overweight;

3) **SENSORS:** These are all the parameters read by the sensors placed inside the circuit, which report the reading in real time on this page and are:
   a) **PPE Outlet Pressure (A – B):** Indicates the outlet pressure from the PPE pump;
   b) **PDP Outlet Pressure (1 – 2)(A – B):** Indicates the outlet pressure from the respective PDP pump and the respective outlet of circuit 1 or 2;
   c) **Level (A – B):** Indicates the level of product still present within the respective barrel;
   d) **Quantity dosed (1 – 2):** Indicates the quantity of product dosed in the last dosage of the respective line;
   e) **Word alarm (1 – 2 – 3):** Indicates if there are active alarms;
4) **Back:** Button to return to the SETTINGS menu (chapter 6.2).

## 6.6 MANUAL CONTROLS screen




1) **PDP 1-2:** Manual settings regarding the PDP of the relevant line, where you can set:
   a) **Quantity to be dosed:** Amount of fluid that the pump must dose;
   b) **Flow rate to be dosed:** Quantity per second with which the pump must dose the quantity indicated above;
   c) **Suction quantity:** Quantity of material that the pump must bring back into it after dosing;
   d) **Suction flow rate:** Quantity per second with which the pump must return the material to the quantity specified above;
   e) **Quantity (A – B):** Quantity of material that the pump has dosed in the last process;
2) Panel showing the various readings of the sensors on the line and, specifically:
   a) **PPE ready (A – B):** Indicates that the respective section of the pump is ready to perform machining;
   b) **PPE set (A – B):** Pressure set to the system that the pump must maintain;
   c) **PPE outlet pressure (A – B):** Pressure detected at the outlet of the PPE pump of the relative fluid;
   d) **PDP pressure (1 – 2) (A – B) inlet:** Pressure detected at the inlet of the PDP pump of the respective channel and the respective fluid;
   e) **PDP pressure (1 – 2) (A – B) outlet:** Pressure detected at the outlet of the PDP pump of the respective channel and the respective fluid;
   f) **Plate pressure (A – B):** Pressure detected on the pressure plate of the respective fluid;
   g) **PDP Dispensed Quantity (1 – 2):** Indicates the amount of fluid dosed by the respective pump;
3) **JOG Dosing 1:** Pressing this button activates the continuous dosing mode of pump 1, i.e. the pump continues dosing until the dosing control is removed;
4) **Predetermined dosing 1:** Pressing this button activates pump 1's point dosing mode, in which the component dispenses for the amount and flow rate set by the server;
5) **JOG Dosing 2:** Pressing this button activates the continuous dosing mode of pump 2, i.e. the pump continues dosing until the dosing control is removed;
6) **Predetermined dosing 1:** Pressing this button activates pump 2's point dosing mode, in which the component dispenses for the amount and flow rate set by the server;
7) **Back:** Button to return to the SETTINGS menu (chapter 6.2).

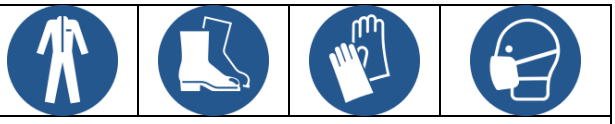
# 7 PROCEDURE

This chapter describes all the procedures that apply to the component.

**ATTENTION!**
Please follow the procedures that are listed here and in the manner they are described. If errors and/or deficiencies are found, please contact the manufacturer for a comparison and, if necessary, update the manual. Deviating from what is described in the next chapters can lead to component breakage or injury.

Below we refer to equipment that is used to secure the component (for example, padlock and related key). These tools are not included and are the responsibility of the customer, both for supply and maintenance. The manufacturer accepts no responsibility if they are lost during use.

## 7.1 First start

| | | | |
|---|---|---|---|
| **Authorized personnel** |  | **PPE to wear** |  |
| **Component status** | • Performed the installation procedure | | |

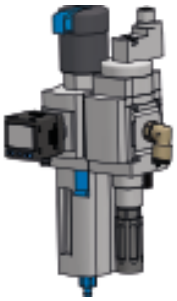
This procedure must be followed during the first phase of ignition of the component and gives advice and guidelines to both operators and maintenance technicians. During this phase you are also helped by the manufacturer's technicians.

### 01 ELECTRICAL


- Make sure the cable is connected to the mains (final part chapter 5);
- Turn the main switch to the "ON" position

**ATTENTION!**
Once the main switch is turned ON, there is voltage on the component. Please pay attention.

### 02 PNEUMATIC SYSTEM



- Make sure the air hose is connected (final part chapter 5);
- Make sure the main air valve is open;
- Generally, the pressure is already adjusted by technicians to perform tests in the factory; If it is necessary to adjust it, you must:
  - Unlock the adjustment knob by pulling upwards;
  - Turn counterclockwise to decrease the pressure or clockwise to increase it;
  - Lock the adjustment knob by pushing down.
- It is recommended to also insert the padlock to prevent tampering:
  - Push the blue slider located above the knob outwards;
  - Insert the padlock and close it;
  - Remove the key.

To start machining the component, see chapter 7.6

**ATTENTION!**
Always follow the instructions of the manufacturer's technicians in case there are problems or there are special procedures to follow.

## 7.2 Daily component start-up

| | | | | | | |
|---|---|---|---|---|---|---|
| **Authorized personnel** |  | **PPE to wear** |  |  |  | |
| **Component status** | • Off, No Voltage, with Air Connected and Open | | | | | |

This procedure is used for the daily start-up of the component, in case it must be switched off every evening.

**01**

**N.A.**

- Turn the main switch to the "ON" position;
- Reset the emergency and press the auxiliary reset button;

To start machining the component, see chapter 7.6

**ATTENTION!**
Once the main switch is turned ON, there is voltage on the component. Please pay attention.

## 7.3 Daily component shutdown

| | | | | | | |
|---|---|---|---|---|---|---|
| **Authorized personnel** |  | **PPE to wear** |  |  |  | |
| **Component status** | • In operation | | | | | |

This procedure is used for the daily shutdown of the component, in case it is to be done.

**01**

**N.A.**

- Press the buttons on the operator panel to turn off the pumps;
- Place a container under the purge valve (No.14 chapter 2.1) and open it;
- Keep it open until it reaches a value of less than 1 bar;
- Close the purge valve;
- Turn the main switch to "OFF"
- The panel turns off automatically after a few minutes, you don't need to turn it off manually.

**ATTENTION!**
If you use the emergency button to "turn off" the component, it is still on (it still has voltage) and you risk endangering any people who do not know that it is still active, as well as being a waste of electricity.

**ATTENTION!**
If the product is not removed from the pipe through the purge valve, the product tends to separate, generating problems for the fluidic system.

## 7.4 Extraordinary component shutdown

| | | | | | |
|---|---|---|---|---|---|
| **Authorized personnel** |  | **PPE to wear** |  |  |  |
| **Component status** | • In normal operation;<br>• With alarms in progress;<br>• Off | | | | |

This procedure should be used if it is necessary to perform an extraordinary shutdown of the component. This can be due to:

- Prolonged shutdowns of the component;
- Active alarms that, to be solved, require extraordinary maintenance;
- General maintenance (both ordinary and extraordinary).

**ATTENTION!**
Only the staff in charge can intervene in these cases and with the appropriate equipment.

### 01 FLUIDIC SYSTEM

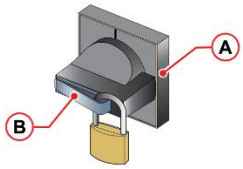
**N.A.**

- Press the emergency button (No. 32 chapter 2.1);
- Place a container under the purge valves (No. 14 chapter 2.1);
- Open the purge valve of both circuits;
- Allow the pressure on the sensor to drop to below 1 bar;
- Close the purge valves.

This operation must be carried out by the maintenance manager (mechanical side).

**ATTENTION!**
If the fluidic pressure is not discharged from the system, the product risks separating, leading to various problems for the system itself.

### 02 ELECTRICAL




- Turn the main switch (A) to the "OFF" position;
- Press on the front of the lever (B) of the switch to pull out the padlock insertion slot;
- Insert the padlock and close it;
- Remove the key from the lock.

This operation must be carried out by the maintenance manager (electrical side).

## 03 PNEUMATIC SYSTEM

- Unlock the knob by pulling it upwards;
- Turn the knob counterclockwise, to close the system and drain the residual air;
- Press the knob by pushing down;
- Pull the slider (blue) located at the top of the knob outwards;
- Insert the padlock and close it;
- Pull the key out of the lock

This operation must be carried out by the maintenance manager (mechanical side).

## 7.5 Extraordinary component start-up

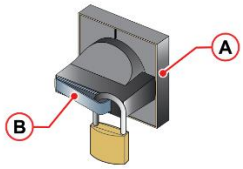
| | | | | | |
|---|---|---|---|---|---|
| **Authorized personnel** |  | **PPE to wear** |  |  |  |
| **Component status** | • Performed the extraordinary shutdown of the previous chapter | | | | |

This procedure should be used if you have blocked the component for an extraordinary shutdown. In this case, to reactivate the component, you must follow the steps below:

**ATTENTION!**
Only the staff in charge can intervene in these cases and with the appropriate equipment.

**ATTENTION!**
Check that there are no non-persons in charge of this operation near the component throughout the procedure.

### 01 ELECTRICAL




- Insert the key into the padlock and open it;
- Remove the padlock;
- Turn the main switch (A) to the "ON" position.

This operation must be carried out by the maintenance manager (electrical side).

### 02 PNEUMATIC SYSTEM

- Insert the key into the padlock and open it;
- Remove the padlock;
- Put the blue slider back in its seat;
- Unlock the knob by pulling it upwards;
- Turn the knob clockwise until the operating pressure is reached (chapter 2.2);
- Press the knob by pushing down;
- It is recommended to lock the knob; To do this, you must:
  - Pull the slider (blue) located at the top of the knob outwards;
  - Insert the padlock and close it;
  - Pull the key out of the lock
- Reset the emergency and press the auxiliary reset button.

This operation must be carried out by the maintenance manager (mechanical side).

To start machining the component, see chapter 7.6

## 7.6 Start of processing

| | | | | | | |
|---|---|---|---|---|---|---|
| **Authorized personnel** |  | **PPE to wear** |  |  |  | |
| **Component status** | • Component On Hold | | | | | |

This procedure is used to explain how a new start of a new processing takes place.

| | |
|---|---|
| **01** | **PROCESSING** |
| **N.A.** | • Check that the auxiliaries are rearmed and that the display shows the message waiting to start work in the appropriate section (No.06 and No.07 chapter 6.1);<br>• If there are any errors, fix them and reset them;<br>• Press the start button (No. 21 chapter 6.1). Pressing one activates both, since a two-component dosage is expected;<br>• When you want to stop dosing, press the start processing buttons again.<br>• In the case of extended breaks, follow these steps:<br>  ○ Place a container under the purge valves (No.14 chapter 2.1);<br>  ○ Open the valve and remove fluid until the pressure is 1 bar lower;<br>  ○ Close the valve. |

## 7.7 Changing the processing

| | | | | | | |
|---|---|---|---|---|---|---|
| **Authorized personnel** |  | **PPE to wear** |  |  |  | |
| **Component status** | • In operation | | | | | |

This procedure is intended to explain how to create a new recipe and switch from one recipe to another. In this case, the component accepts recipes only from the customer's server; Therefore, it is not possible to create or edit recipes from within the component

## 7.8 Machining Block

| | | | | | | |
|---|---|---|---|---|---|---|
| **Authorized personnel** |  | **PPE to wear** |  |  |  | |
| **Component status** | • In operation<br>• Danger to people or problems with the component | | | | | |

This procedure is used to block any operation of the component, which may be due to emergencies related to both the component and the person or line to which it is connected.

### 01 PNEUMATIC LOCKING AND UNLOCKING


- Press the emergency button to stop any component activity;
- Once the emergency has returned, turn the button in the direction indicated to reset the emergency;
- Press the auxiliary reset button;
- Resolve the alarms that appear on the screen;
- Now the component is ready to work. Follow chapter 7.6 to start machining.

### 02 FLUIDIC BLOCK

**N.A.**

- Press one of the on-screen buttons (No.06 and No.07 chapter 6.1) to stop the fluid supply;
- To relieve fluidic pressure on the circuit:
  - Go with a container on the purge valves (No.14 chapter 2.1);
  - Open the valve and remove the fluid until it reaches a pressure of less than 1 bar;
  - Close the valve.

## 7.9 Fluid container change

| | | | | | | |
|---|---|---|---|---|---|---|
| **Authorized personnel** |  | **PPE to wear** |  |  |  | |
| **Component status** | • In operation<br>• Active tank level alarm | | | | | |

In this procedure we want to explain how to perform the change of the shells. This procedure is to be applied when the minimum level alarm appears and the dosing cycle is finished, to have the pump stopped. At this point, the pump does not perform any further dosing cycles until the drum is changed (if system-enabled, No. 01 chapter 6.3.5).

**01** **DRUM CHANGE**

- Switch off the pump by pressing the appropriate button on the HMI display (No. 06 and No.07 chapter 6.1);
- From the push-button panel, select the pump on which you want to change the drum using the appropriate selector (No. 29 chapter 2.1);
- Press the two-hand control button (No. 31 chapter 2.1) and the platter rise button (No. 33 chapter 2.1) at the same time for no more than 2 seconds.

**ATTENTION!**
This first ascent is to prevent the fluid from coming out of the platter at the next point. Trying to lift the platter without performing the next steps can lead to the collapse of the drum itself as a vacuum is generated inside

- Remove the pad from the pump plate by unscrewing it counterclockwise, to allow air to enter;

**N.A.**

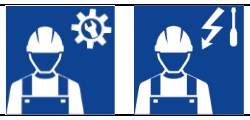
It is advisable to keep the pad close to the component as it must be used quickly afterwards

- Return to the push-button panel and press the same buttons as in the above point for enough time to make the platter rise out of the barrel;
- Remove the straps that hold the drum to the component and place a new one;
- Press the two-hand control button together with the platter descent button (No. 34 chapter 2.1). Keep it pressed until the platter enters the inside of the barrel. At this point you can remove your hands from the push-button panel and the plate continues to descend (it goes into self-restraint);
- When the platter meets the fluid, the fluid itself begins to come out of the place where the pad is to be inserted. When it starts to come out, close it with the pad by screwing it clockwise;
- Lock the barrel with the appropriate straps. Now the component is ready to continue machining.

During the drum change phase, before inserting the new drum, it is advisable to apply generic fat or petroleum jelly on the part of the plate that enters the inside of the drum. This is to facilitate the descent of the plate into the barrel and prevent it from wearing out too much.

**ATTENTION!**
If, once the product has been primed, there are leaks from the sides of the pressing plate, it may be that the centering of the drum is incorrect or that the plate is not resting correctly on the product. Check that the drum is correctly centered and that there is no air inside the drum, as well as that the plate does not have elevations on the points from which the product draws.

## 7.10 Service connection

| | | | | | |
|---|---|---|---|---|---|
| **Authorized personnel** |  | **PPE to wear** |  | | |
| **Component status** | • In operation | | | | |

This procedure is used by operators in case they need to connect remotely to perform assistance on the component through the HMI display.

**01** **LINK**

- Access the electrical panel

**DANGER!**
There is voltage inside the electrical panel. Risk of electrocution!

- Connect the ethernet cable to the appropriate slot located approximately in the center of the electrical panel. You can recognize it since it is the only isolated ethernet port, with no device nearby.
- Carry out the service work, following the instructions given by the manufacturer's technicians;
- When finished, remove the ethernet cable, close the electrical panel and resume normal use.

**N.A.**

To make the connection permanent, go through the appropriate passage on the underside of the electrical panel and connect it to the appropriate connector, so that you can open and close the electrical panel without problems and have an ethernet cable permanently connected to the appropriate port.

# 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 job start or 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;
- **Each drum change:** Indicates each time the fuel system is changed;
- **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 |
|---|---|---|---|
|  | Leak control from the pneumatic and fluidic circuit | Every start or end of work | \ |
| | Leak check (and level) glass of oil | Every start or end of work | \ |
|  | Component condensate emptying | weekly | 8.1 |
| | Changing the rubber on the pressing plate | Semiannual | \ |
| | Changing seals on pump [1] | Annual | \ |

[1] If the pump seals need to be changed, it is advisable to call the manufacturer.

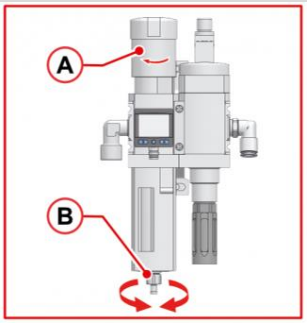
## 8.1 Component condensate emptying

| Assigned | Periodicity | Materials and equipment |
|---|---|---|
|  | Weekly | Normal cleaning equipment |

**PPE to wear**

**ATTENTION!**
Before proceeding, the component must be made safe by following the extraordinary shutdown procedure in section 7.4

**01** **REDUCER FILTER**




- Turn the pressure regulator (A) counterclockwise to drain the system;
- Turn the knob (B) to open the drain valve to drain the condensate;
- Close the drain valve;
- Set the working pressure.

# 9 SYSTEM MESSAGES

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

- **Alarm:** A warning from the component to the operator indicating a problem, which can be electrical, pneumatic or generic in nature;
- **Message:** A signaling alert from the component to the operator that alerts the operator to a certain activity or active feature.

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;
- Once all alarms have been reset, press the AUX RESET button from the hand control (No. 30 chapter 2.1).

## 9.1 Alarm list

| ERROR | CAUSE | SOLUTION |
|---|---|---|
| | **GENERAL ALARMS** | |
| **Safety circuit alarm not closed** | The customer-side safety circuit has alarms (barriers with obstacles, emergency pressed) | Check the system emergencies if they are all OK |
| **PN/PN coupler connection alarm** | The profinet connection component has been disconnected from the component | Contact the manufacturer. |
| **Profinet inverter connection alarm (A – B)** | The profinet connection of the motor inverter has dropped | Check the wiring of the wires and perform a component reboot. |
| **Emergency Alarm Pressed (Reset AUX)** | The emergency button has been pressed | Fix why you pressed and then reset the button |
| **PLC alarm in STOP** | PLC went down | Perform a restart of the component and contact the manufacturer. |
| **Alarm on the bus (IO-Link – Profinet)** | Communication system with customer server in alarm | Check the connections with the customer system and the customer network. |
| **PPE pump fan thermal protection alarm (A – B)** | The cooling ventilation of the relative PPE pump is not working properly | Contact the manufacturer |
| **Error during the Master cycle** | The Master cycle failed due to a generic error | Check that the master cycle has not been blocked due to the emergency button being pressed or an emergency system being activated |
| | **DRIVE ALARMS** | |
| **PDP Drive Communication Alarm (A – B) (1 – 2)** | No communication with the respective drive | Check the wiring of the drives and, if necessary, reset the system. |
| **PDP pump drive alarm (A – B)(1 – 2)** | The indicated drive is on alert due to a sudden block or timing problem between the motor and the encoder. | Check that there are no objects preventing handling. If the problem persists, restart the component. |
| **PDP Drive Power Missing Alarm (A - B) (1 – 2)** | The indicated drive is not receiving power properly. | Restart the component. Check fuses and power supply. |
| | **DOSING SYSTEM ALARMS** | |

| ERROR | CAUSE | SOLUTION |
|---|---|---|
| **End of product (A – B)** | Product level below the set limit | Perform drum replacement |
| **No compressed air alarm** | Compressed air absent or below the minimum threshold | Check that the shut-off valves at the inlet of the pressure regulators are open, and that the pressure indicated in chapter 2.2 is set on the reducing filter. |
| **PPE inverter alarm (A – B)** | The connection between the motor inverter and the component has fallen | Check the inverter wiring with the panel. |
| **Flow rate alarm (1 – 2) profinet out of range** | The remote set flow rate is outside the limits imposed by the system | Check that the parameter set is correct and that it is below the limit indicated in the parameters (chapter 6.3.2) |
| **Alarm flow rate suck back (1 – 2) profinet out of range** | The set suck back rate is outside the limits imposed by the system | Check that the parameter set is correct and that it is below the limit indicated in the parameters (chapter 6.3.2) |
| **Quantity alarm (1 – 2) profinet out of range** | The quantity set per recipe via remote is higher than the limits imposed on the component | Check that the parameter set is correct and that it is below the limit indicated in the parameters (chapter 6.3.2) |
| **Alarm quantity suck back (1 – 2) profinet out of range** | The amount of the set suck back is outside the limits imposed by the system | Check that the parameter set is correct and that it is below the limit indicated in the parameters (chapter 6.3.2) |
| **Pressure alarm outside the PPE range (A – B)** | The pressure coming out of the PPE is higher than the limits imposed by the system | Check the control parameters set in the system<br>Check that the hoses are clear of obstructions |
| **Maximum pressure alarm (A – B) (1 – 2)** | Pressure switch at pump outlet detects high pressure | Incorrect software settings<br>Fluid on dry end stretch, clean valve |
| **Minimum pressure alarm (A – B)(1 – 2)** | Pressure switch at pump outlet detects too low pressure | Incorrect software settings<br>Increase the inlet fluid pressure (see chap. 2.2) |
| **Level sensor alarm (A – B) not connected to IO-Link** | The connection between the sensor and the component has fallen | Check the connection of the sensor with the component and, if necessary, perform a restart of the component |
| **Pressure regulator alarm (A – B) not connected to IO-Link** | The pressure regulator that raises and lowers the pressure plate has lost connection with the component | Check the connection wiring and, if necessary, restart the component itself |
| | **TIMEOUT ALARMS** | |
| **Scale timeout alarm** | The connection to the scale has been lost | Check the connection cable with the scale |
| **Inverter parameter transmission alarm (A – B)** | The time for communicating inverter parameters has expired | Check the inverter wiring to the component and, if necessary, perform a restart of the component itself. |

## 9.2 Message list

| MESSAGE | MEANING |
|---|---|
| **PPE PUMP MESSAGES (A – B)** | |
| **Press the double button to lower the pump** | Press and hold the bi-manual button and the pump lowering button to proceed with the operation |
| **Press and hold the dual control** | Press and hold the two controls to proceed with the operation |
| **Pump Off Activate Pump** | The pump has switched off and must be switched on again |
| **Active pump** | The pump is active and ready for processing, or in processing |
| **Activate the pump** | Press the appropriate button on the screen to activate the pump |
| **Insert the product drum...** | Perform the product drum change |
| **SYSTEM MESSAGES** | |
| **A/B PUMP DISABLED** | Product dispensing has been disabled on one (or both) of the pumps |
| **ACTIVE MANUAL** | The component is in manual mode |
| **MESSAGES TO THE OPERATOR** | |
| **Press Restart to arm the auxiliaries** | Reset the auxiliaries using the appropriate button |
| **Dosage Jog in progress...** | The component is dosing in continuous mode |
| **Predetermined dosage in progress...** | The component is dosing in point mode |
| **Master Running Waiting Tara** | The weighing mode is active, the balance must be tamed; |
| **Master Running Gross Waiting** | The weighing mode is active, the gross of the component must be performed |
| **Weight acquisition** | Weight acquisition on the scale is in progress |
| **Master Cycle Error** | Error in the weighing cycle of the reference component |
| **Master OK** | OK Reference Component |
| **Master KO** | Reference component not OK |
| **Dosage Master in progress...** | Reference Component Assay in Progress |
| **Emptying the master cycle cup** | Remove the glass of product by reference weight |

# 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 it. Typically, you are stocking more than one component;
- **Relocation,** i.e. when, for reasons of moving, the component must be moved;
- **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.

In the case of long periods of storage, the parts of the component without paint should be sprinkled with lubricating grease.

The relocation of the component must be carried out by the manufacturer's specialized technicians or by technicians authorized by the manufacturer.

The component must be hooked on the points provided and indicated in this manual and suitable, tested and certified lifting equipment must be used.

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.