

USE AND MAINTENANCE MANUAL

DAVR-1000 CENTRIFUGAL SYSTEM



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1 GENERAL INFORMATION

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



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



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



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

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



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 stresses greater than those of normal use.

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

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

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;
- 2014/30/EU – EMC Directive (Electromagnetic Compatibility)

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: DAVR 1000
Model: Low viscosity centrifugal fluid dosing system
Year: 2024
Intended use: Non-contact dispensing of cylindrical beads of low-viscosity fluids

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
- **2014/30/EU:** of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility (recast).

IT ALSO DECLARES THAT:

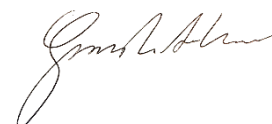
- Undertakings are undertaken to provide, in response to a properly substantiated request from the national authorities, relevant information on this partly completed machine;
- The technical file was prepared by Andrea Grazioli, via Ravizza, 30, Montecchio Maggiore (VI), IT.

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, 06 August 2024

The legal representative

Andrea Grazioli



1.4 Glossary

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

TERM	DEFINITION
Enable	Term that defines the act of preparing (enabling) an action. The action will be 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 that require two manual controls to be operated simultaneously to perform an action.
P.P.E.	Personal protective equipment. They include all the items necessary to ensure the protection of personnel from possible accidental damage (safety shoes, gloves, helmet, and more).
Display	It is used to display information. It can be in any shape and size, even touch screen.
Manufacturer	Natural or legal person who designed and manufactured the component covered by this manual.
Icon	A small image that represents a command, a function or even a document or an operating program, which appears on a computer screen. When selected by the user, it initiates the function or program it symbolizes.
Joystick	Lever manipulator used in control panels.
N.A.	Not Applicable, i.e. it indicates that it is a field that does not apply to this manual and that it cannot be integrated into the component.
Operator panel	A control station where the machine control instruments are located
P.I.	Possible Implementation, i.e. it is currently absent from the component described in this manual, but it is possible to make an addition and implement it.
Screen	Interface system between man and component. Screenshots are the images displayed on the operator panel that allow the user to receive and provide information to the management software.
Push-button panel	Composition of buttons and selectors that allow you to act directly on the behavior of the component.
Keyboard	Keyboard only (stand-alone element) or in addition to a display (keys only, no selectors or other)
Touch screen	Touch screen that allows the user to interact with a graphic interface using their fingers or 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

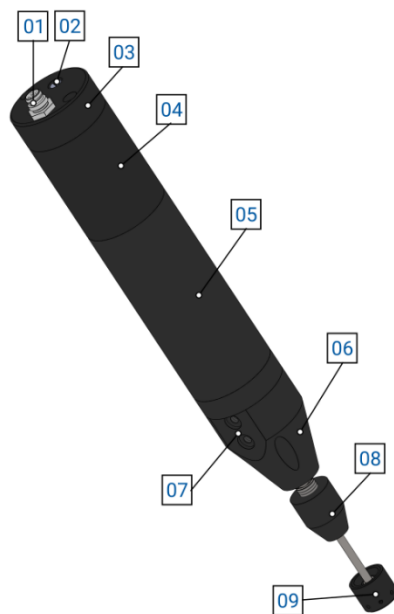
2 PRESENTATION AND OPERATION

This component is based on an electrical power system. The electrical connection is used to power the electric motor which then rotates the nozzle at a speed adjustable by means of a special lever. The fluid, on the other hand, is brought directly to the dosing nozzle by an external component, which can be a pump or a valve. The difference of this radial dosing system compared to the others is that it can perform dosages of anaerobic fluids, i.e. fluids that react in contact with particular elements, such as metal.

In other words, the function of this component is:

RADIAL DISPENSING OF LOW-VISCOSITY FLUID

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.



No.	DESCRIPTION
01	Power supply connection
02	Speed adjustment
03	PWM Security
04	Cover PCB PWM
05	Engine cover
06	Transmission case
07	Bracket mounting
08	Mandrel
09	Dosing nozzle

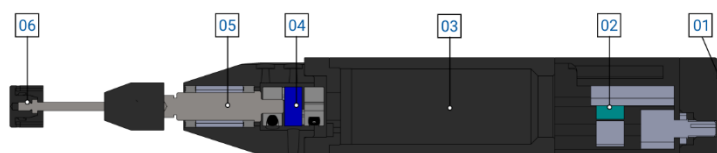
Figure 01 – DAVR 1000 detail

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 valve;
- 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.

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

OPERATION



No.	DESCRIPTION
01	Power supply connection
02	PWM Module
03	Engine
04	Elastic coupling
05	Transmission
06	Nozzle

Figure 02 – DAVR 1000 internal section

The power supply connection carries the signal of 24VDC and 0VDC, i.e. the simple power supply of the motor. Once the engine speed is adjusted and the ignition command is sent via PLC, the engine starts rotating, rotating the transmission that rotates the nozzle.

Figure 02 shows the most complete case. For minimum working pressures, please refer to [Chapter 2.2](#).

The component cannot operate autonomously. To ensure that it dispenses product, it must be connected to a dosing system (depending on the use, several types of valves or pumps are available) and the latter to a power source, which can be a tank, a pump or other, depending on the system and the customer's needs.

The following is intended to explain how the component works in detail.

The centrifugal system, in order to work, needs a dosing system connected and that doses on the nozzle of the centrifugal system itself.

When the signal from the control system arrives, power is given to the DAVR-1000, which turns the motor that spins the nozzle. Only when the nozzle reaches full capacity, the dosing system is given the command to put the fluid inside the nozzle of the centrifugal system, which, thanks to centrifugal force, performs the dosing radially.

When, on the other hand, the dosing stop signal arrives, the dosing system stops first, to perform the dosing of all the desired fluid and also clean the nozzle of the centrifugal system; Once there is no more fluid, then the block command is also sent to the centrifugal system, which stops.

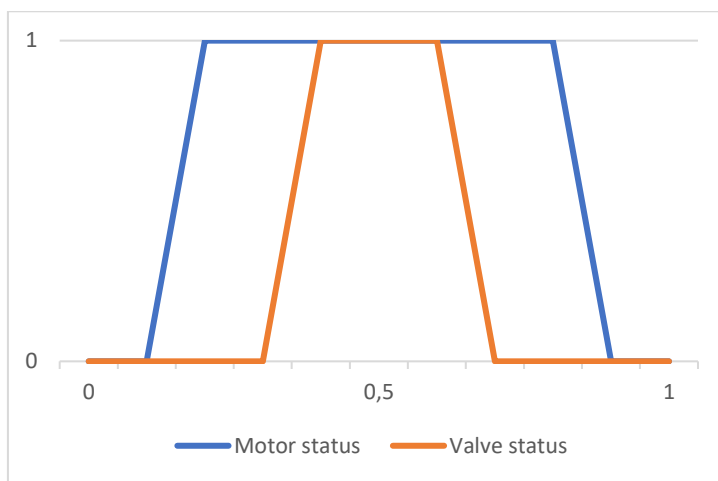


Figure 03 – DAVR 1000 motor activation and dosing system

Another method of using the component is to dose the fluid inside the nozzle, wait about 1 second and then rotate the nozzle. This is used for particular fluids with relatively low viscosity, or in any case with fluids that, with the first method, risk being dosed in the same place.

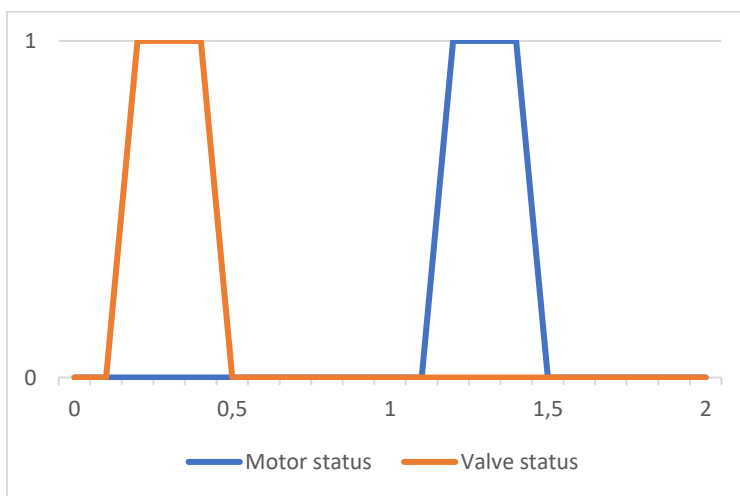


Figure 04 – DAVR 1000 motor activation and dosing system

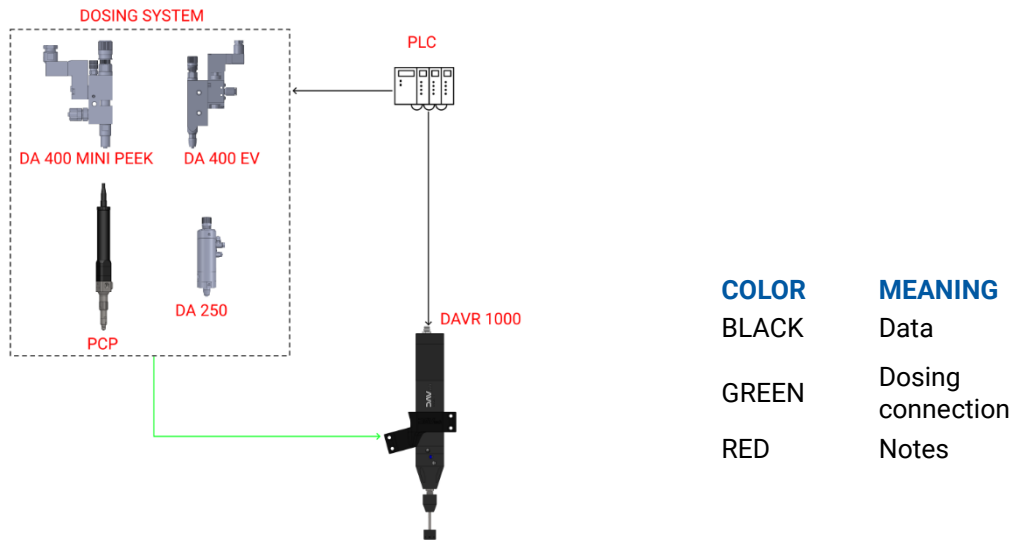
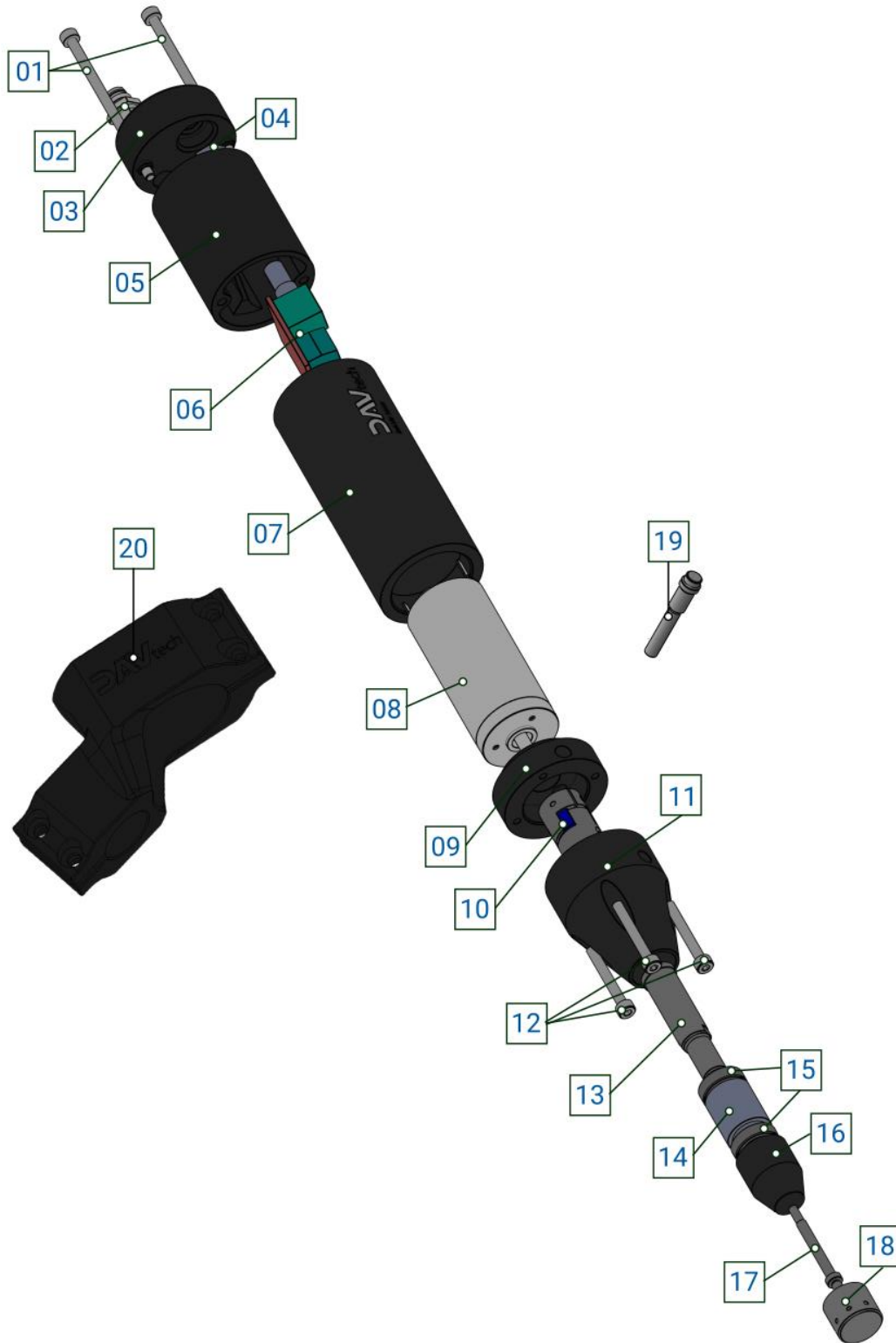


Figure 05 – Connection example

2.1 Exploded

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



No.	Description	Var.	Code	Variant details
01	SCREW TCEI M3X60	-	UNI 5931	-
02	M8 3-PIN CONNECTOR	-	7000-08552-9700050	-
03	PWM SECURITY	-	130121530000	-
04	PWM	-	DAVPWM90W_D	-
05	PCB PWM COVER	-	130121540000	-
06	PWM 90W	-	DAVPWM90W	-
07	ENGINE COVER	-	130121550000	-
08	DC 24V MOTOR	-	B7CF56B9F054	-
09	MOTOR FLANGE	-	130121580000	-
10	ELASTIC COUPLING	-	CPJC14-BL-3-5	-
11	TRANSMISSION CASE	-	130121560000	-
12	SCREW TCEI M3X20	-	UNI 5931	-
13	SPINDLE SHAFT	-	130121510000	-
14	BEARING SPACER	-	130121570000	-
15	BALL BEARING	-	B6700ZZ	-
16	MANDREL	-	28941	-
17	ROTATING STEM	-	130317070817	-
18	CENTRIFUGAL NOZZLE ⁽¹⁾	-	130121620000	-
19	ENGINE RPM COUNT SENSOR	-	IS-05-A1-S1	-
20	DOSING SYSTEM SUPPORT BRACKET	-	-	-
-	-	20.a	250222500000	DA400 MINI PEEK VALVE BRACKET ⁽²⁾
-	-	20.b	130121600000	DA250 VALVE BRACKET ⁽²⁾
-	-	20.c	130121610000	PCP-005, PCP-015 & PCP-050 PUMP BRACKET ⁽³⁾
-	-	20.d	310322500000	DA400 EV VALVE BRACKET ⁽²⁾

⁽¹⁾ The sizing of the nozzle must be carried out according to the type of product to be dispensed and the component to be processed

⁽²⁾ Pairs with DA 2000 smart controller

⁽³⁾ Pairs with PCP EVO controller

2.2 Technical data

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

SPECIFICATIONS		
Description	UdM	Values
Model	\	DAVR-1000
Activation	\	Electronic
Electric motor power supply	VDC	24
Power consumption electric motor	W	~ 70
Current consumption	A	~ 2.64
Type of connection cables	\	M8 3-pole
Maximum engine rpm	rpm	9800
Modulation	\	YES
Materials used in contact with the fluid	\	PA-12

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

Low viscosity fluids

USABLE VALVES

DA 400 Mini PEEK

DA 400 EV

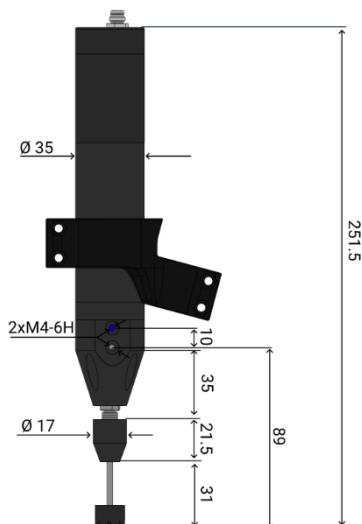
DA 250

PCP

DIMENSIONAL AND WEIGHT CHARACTERISTICS

Description	UdM	Value
Component diameter (min ÷ max)	mm	35
Component height (min ÷ max)	mm	251.5
Component weight	kg	0.45

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.



FIRE/EXPLOSION HAZARD!

This component is not designed to work in an ATEX environment.



DANGER!

Be very careful when servicing the component, especially when disassembling components that have pressure springs inside.



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!

Avoid introducing foreign bodies, even small ones, into the pneumatic system, which could cause the system to malfunction and compromise the safety of the machine.



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



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

3.1 Machine safety devices

N.A.

3.2 Free useful spaces

N.A.

3.3 Risk areas and residual risk

There are the following residual risks on the component:

- **Hazards due to inhalation of hazardous vapors:** The component is not designed to have insulation from any toxic and/or hazardous vapors; personnel working with this device should be aware of this during its use;
- **Fire hazard due to vapors:** Personnel working near this component must absolutely not have any heat sources that could start a fire;
- **Risk due to fluid projection under pressure:** If incorrectly adjusted, the component can expel fluid in areas where it should not go. Pay attention to the instructions of the manufacturer's technicians.

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.



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.

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 help you.

This component has been designed as a support for the operation of other components, i.e. it cannot work alone (given the absence of valves and / or dosing systems) but must be connected to an external power supply, to allow the power supply itself to perform a function that, on its own, it could not perform, namely radial dosing.

Since it has been designed as a support system, it provides a bracket fixing system of two M4 threaded holes (No. 07 [chap. 2](#) Figure 01)

An engine rev count sensor can also be installed in the engine count housing. Refer to chapter 7 for sensor installation



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



ATTENTION!

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



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

5.1 Positioning







N.A.

5.2 Connections

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

- Electrical connection;

5.2.1 Electric

Authorized personnel	 PPE to wear     
Machine status	PLC installed, with outgoing communication cable
Power Values	See chapter 2.2
Necessary preparations	M8 x 3-pole power cable
Materials needed	N.A.
Equipment needed	N.A.



The electricity connection is at the expense of the customer.

To make the electrical connection, the electrical cable (which must comply with the specifications given in [chapter 2.2](#)) must be connected to the appropriate connector, which must comply with the following diagram:

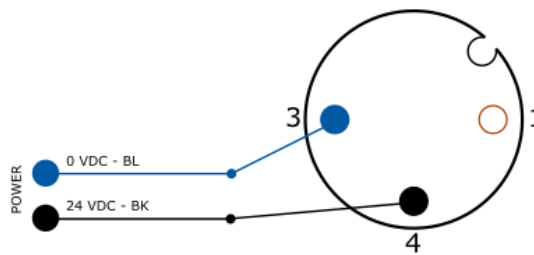


Figure 05 – Motor power connection

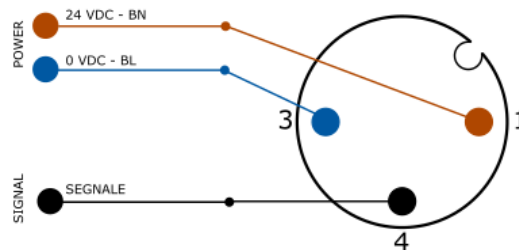


Figure 06 – Round-counter probe connection



ATTENTION!

The motor and sensor must be connected with a 24VDC power supply. Deviating from this value can affect the performance of the components or break them.



ATTENTION!

Make the connections as per the diagram. Reversing the connections leads to component breakage.

5.3 Commissioning

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

- Check that the connections have been connected correctly;
- Check that the component is free of dirt or residues of various kinds;
- Check that the dispensing system is securely connected to the component;



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

N.A.

7 PROCEDURE

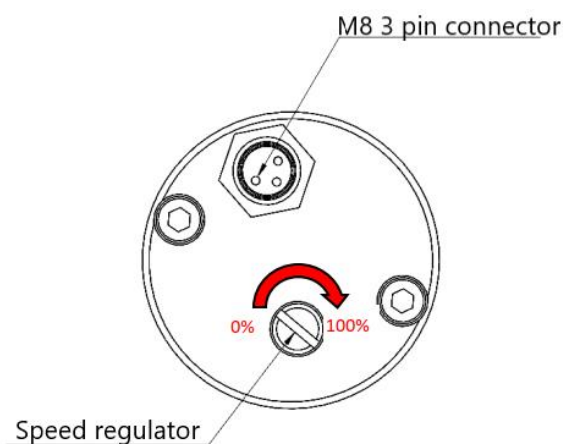
In this chapter we want to explain the main configurations that can be used on the component covered by this manual. In particular, we want to explain in detail:

- How to perform motor speed adjustment;
- How to install the engine rev count sensor;

7.1 Motor speed adjustment

In this chapter we want to explain how to perform the speed regulation of the electric motor of the DAVR-1000 centrifugal system.

The system is equipped with a flat screw (No.02 [chap. 2](#) Figure 01) which is used to adjust the speed. Looking at the device from above and holding the connector upwards, turning the screw clockwise increases the speed, while turning counterclockwise decreases the speed, as shown in the figure.



ATTENTION!

Change the engine speed only with the advice of the manufacturer's technicians. Changing the speed directly affects the quality of the dosage.

7.2 Rotation sensor installation

To install the sensor, or to change the position of the sensor, you need to:

- Check the position of the joint by looking through the sensor fixing holes;
- If the joint is full, i.e. the joint is close to the sensor hole, then screw the sensor and, when it reaches the stop, unscrew it for about 1/2 of a turn, to keep it at a certain distance from the joint. If it does not read values, screw it in very slowly;
- If the joint is empty, i.e. it is further away from the hole, then turn the nozzle until you see the solid joint and follow the point above.

ATTENTION!



If the sensor is screwed with the joint on the machined side, there is a risk that the sensor itself will be in the middle of the joint path during rotation, breaking the entire assembly and the sensor itself. Be very careful when installing the sensor.

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;
- **Every machine start or job end**: Indicates a daily period, in general. This can imply every 24 hours (i.e. at the beginning of the shift of every day, or the end of the shift of every day), or even more frequently, depending on the application;
- **Long pause**: Indicates a period approximately greater than an hour;
- **Each drum change**: Indicates each time the fuel system (tank, drum, cartridge or other) is changed;
- **Each mixer disassembly**: Indicates that each time the mixer is replaced, a certain operation must be performed;
- **Weekly**: Indicates a period equal to seven calendar days;
- **Monthly**: Indicates a period equal to one calendar month;
- **Semi-annual**: Indicates a period equal to six calendar months;
- **Yearly**: Indicates a period equal to one calendar year.



ATTENTION!

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

Assigned	Description	Frequency	Chapter
	Perform a surface cleaning of the dosing system	Every machine start-up or end of work	\
	Perform a nozzle change if it is clogged	When needed	\



ATTENTION!

Only use soft brushes or cotton cloths to clean the dosing system.

9 TROUBLESHOOTING

This chapter deals with the most common problems that may arise when using the component of this manual.



ATTENTION!

Once the operator has found a problem or assumes that there is a problem, they must call the technician in charge of maintenance. Maintenance should always be performed by a specialized and qualified technician.

DEFECT	CAUSE	SOLUTION
Engine won't start	Incorrect electrical connection	Check that the wiring complies with the instructions given in chapter 5.2.1 . Check that the motor has not been damaged in the event of a connection reversal
	Blocked nozzle, does not allow the motor to rotate	Unclog the nozzle and perform test rotations to check that the motor has not damaged
Ineffective motor speed adjustment screw	Damaged internal PWM	Contact the manufacturer
The component moves during dosing	Fixing screws not pulled correctly	Check that the screws have been correctly positioned and properly fastened
Valve moves during dosing	Fixing screws not pulled correctly	Check that the screws have been correctly positioned and properly fastened
Engine rpm not detected	Sensor malfunction	Adjust sensor
		Replace sensor

10 END OF LIFE

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

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

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

On the other hand, for the dismantling and consequent scrapping 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.