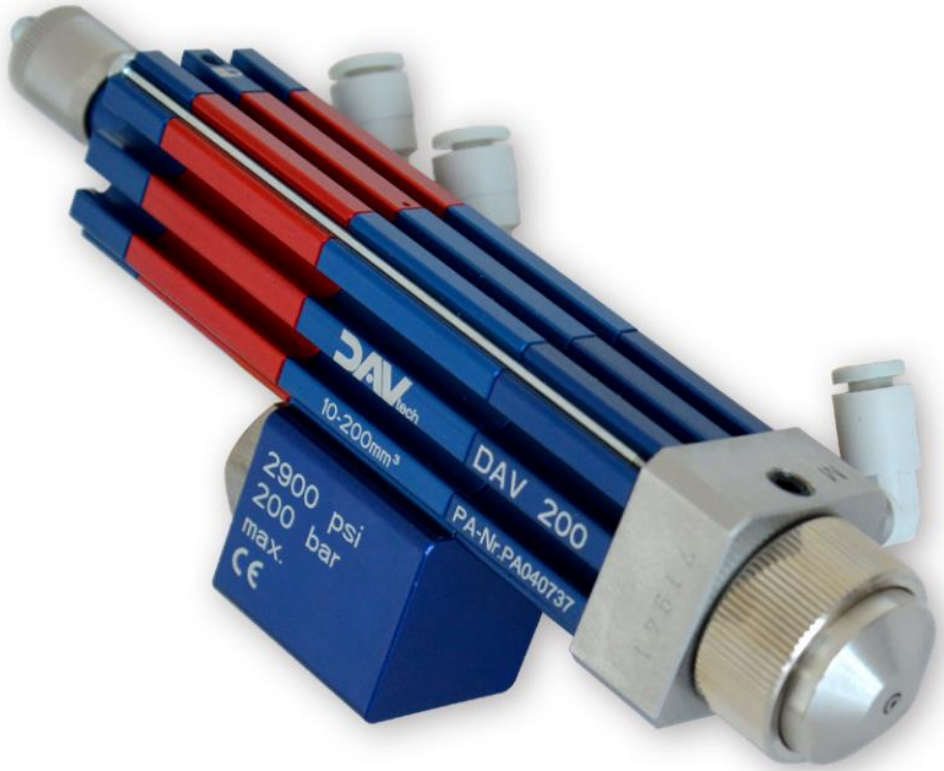
PARTS, SYSTEMS AND AUTOMATIONS FOR FLUID DISPENSING

USE AND MAINTENANCE MANUAL

SPRAY DOSING VALVE DAVS 200



COD.: **DTVI_DAVS200_2424**
REV.: **01**
DATE: **23/05/2025**

TRANSLATED FROM ORIGINAL
Read carefully before use!

EN

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1 GENERAL INFORMATION

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

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

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

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

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

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.

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1.1 Symbology

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

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

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

NOTE. Indicate relevant information or insight.

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

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

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

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

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

Electrical maintenance technician
Qualified technician able to carry out electrical, adjustment, maintenance and routine repair work described in this manual. It 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.

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1.2 Reference standards

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

Directives

- 2006/42/EC – Machinery Directive;
- 2014/30/EU – EMC Directive (Electromagnetic Compatibility)

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

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

DECLARES THAT THE ALMOST MACHINE

Component: DAVS 200 Valve
Model: Volumetric spray dosing valve
Year: 2024
Intended use: Volumetric dispensing of medium and low viscosity fluid

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, 21 May 2024

The legal representative

Andrea Grazioli

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1.4 Glossary

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

TERM	DEFINITION
Enable	Term that defines the act of preparing (enabling) an action. The action will be triggered as soon as the criteria are met, which consequently leads to the activation of the enabled action.
Active	The action that is performed instantaneously when the control is activated.
Human controls	This defines those commands that, used for manual operations, must be kept activated for the action to be performed. When the command is released, the action stops.
Two-hand controls	Human-controlled controls 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.
HP	High Pressure. An acronym that indicates high pressure.
Icon	A small image that represents a command, a function or even a document or an operating program, which appears on a computer screen. When selected by the user, it initiates the function or program it symbolizes.
Joystick	Lever manipulator used in control panels.
N.A.	Not Applicable, i.e. it indicates that it is a field that does not apply to this manual and that it cannot be integrated into the component.
Operator panel	A control station where the machine control instruments are located
P.I.	Possible Implementation, i.e. it is currently absent from the component described in this manual, but it is possible to make an addition and implement it.
Screen	Interface system between man and component. Screenshots are the images displayed on the operator panel that allow the user to receive and provide information to the management software.
Push-button panel	Composition of buttons and selectors that allow you to act directly on the behavior of the component.
Keyboard	Keyboard only (stand-alone element) or in addition to a display (keys only, no selectors or other)
Touch screen	Touch screen that allows the user to interact with a graphic interface using their fingers or objects.

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1.5 Service and manufacturer contact details

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

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

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

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2 PRESENTATION AND OPERATION

In this manual we want to learn more about the operation of the DAVS 200 valve, an automatic spray valve suitable for dosages of low quantities of fluid with an NLGI value of less than 2. To work, it needs to be connected to the pneumatic and fluidic system, on the electronic side there are only the sensors for objectifying the dosage.

In other words, the function of this component is:

VOLUMETRIC SPRAY DISPENSING OF LFUIDS WITH VISCOSITY LESS THAN NLGI 2

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.

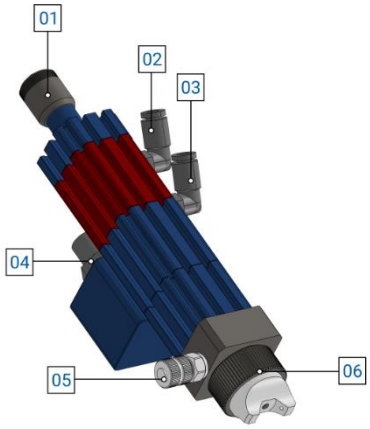

Figure 01 – DAVS 200 detail

No.	DESCRIPTION
01	Micrometric adjustment
02	Dosing air inlet
03	Air inlet loading
04	Fluidic inlet
05	Atomization air inlet
06	Fluid outlet nozzle

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.

SPECIAL VERSIONS

This valve exists in various versions:

1. Version with extension for radial spraying (100, 150, 200 or 300 mm long and, on request, also custom lengths) and allow low and medium viscosity products such as oils and greases to be dispensed inside holes and cylinders;
2. Version with sensor for objectification of valve opening;

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OPERATION

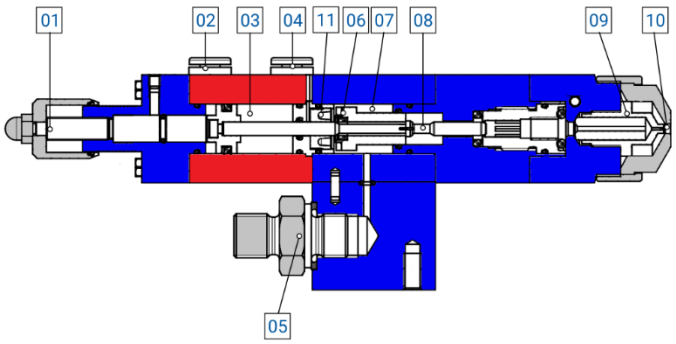

Figure 02 – DAVS 200 internal section

No.	DESCRIPTION
01	Micrometric adjustment
02	Dosing air inlet
03	Pneumatic chamber
04	Charging air inlet
05	Fluid inlet
06	Piston
07	Fluidic chamber
08	Needle
09	Mist chamber
10	Fluid output
11	Compass

This valve needs 3 pneumatic connections, i.e. two that manage the pneumatic chamber (managed by a 5/2 valve) and the other that manages the nebulization (managed by a 3/2 valve). Furthermore, being a volumetric valve, the fluid does not come out of the valve continuously, but a well-determined quantity comes out, i.e. the one contained inside the fluidic chamber. Therefore, this valve performs spot spray dosing, and not continuous.

For minimum working pressures, please refer to Chapter 2.2.

The valves cannot operate autonomously. To ensure that it dispenses product, they must be connected to a power source, which can be a tank, a pump or other, depending on the system and the customer's needs.

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

The valves are also equipped with an adjustment screw, which is used to determine how much product to dose. In practice, the adjustment of the pin determines, together with the pressure of the material and the opening time, the quantity of product dispensed. To use the screw, you can turn clockwise to decrease the stroke of the needle and, therefore, the amount of fluid dispensed (until it is completely closed); Turning in the other direction increases the amount of fluid delivered.

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The following is intended to explain how the DAVS 200 valves work.

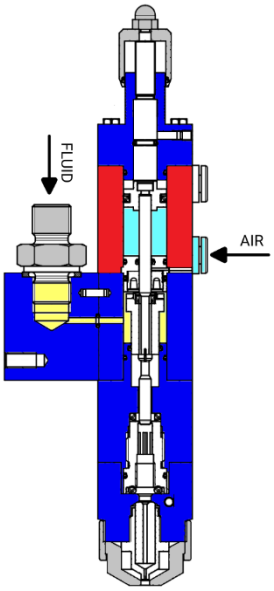

Figure 03 – Resting phase

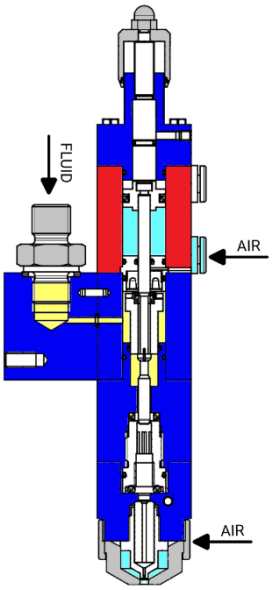

Figure 04 – Nebulization phase

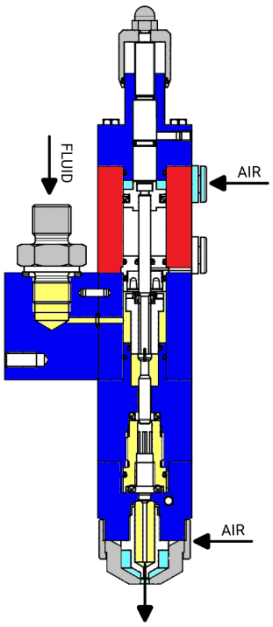

Figure 05 – Dosing phase

The fluid is pushed inside the valve by the appropriate inlet and remains constantly under pressure. To prevent it from coming out, the valve is equipped with a piston that blocks communication between the fluidic chamber and the valve outlet. When the metering command arrives, the spray air is activated, then the main air inlet is exchanged, and the pneumatic piston is pushed forward. This pushes the needle forward which opens the way for the fluid, causing it to go forward and passing it through the spray airstream. By doing so, the fluid comes out nebulized. Once the needle reaches the end of the stroke, the fluid is blocked inside the fluidic chamber and no more dosing is performed, to perform precise dosages of fluid quantities. When the reload command is given, first the main input is swapped, making the needle and the piston go back; In the meantime, the spray air continues to be active, to prevent fluid residues from remaining on the head. Once the pneumatic piston comes back completely, the spray air also stops. So, in general, the toggle sequence is as follows:

- The fluid is ready to exit into its special chamber (Figure 03);
- The needle is closed for the air that pushes on the pneumatic piston;
- The nebulization command is given, then air is sent inside the special inlet by means of a 3/2 solenoid valve (Figure 04);
- The opening command is given, then air is sent inside the dosing inlet by exchanging the solenoid valve 5/2;
- The movement of the needle allows the passage of the fluid and begins to come out being nebulized by the spray air (Figure 05);
- The dosing of everything that contains the fluidic chamber is carried out;
- Once the needle finishes its stroke (and therefore the piston), the dosage is objectified (if the appropriate sensor is present);
- The system swaps the airflow in the solenoid valve 5/2, letting air in from the charging inlet (Figure 04)
- As soon as the needle has gone back completely (and therefore also the piston), the arrival of the piston is objectified, and the nebulization air flow is interrupted (Figure 03).

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The last two points are performed in this way to give time to the fluid to come out of the chamber, atomize it all and then clean the exit nozzle, like the cap. Below is a diagram of the switching on and off of the two solenoid valves and, therefore, of opening and closing the pneumatic circuits.

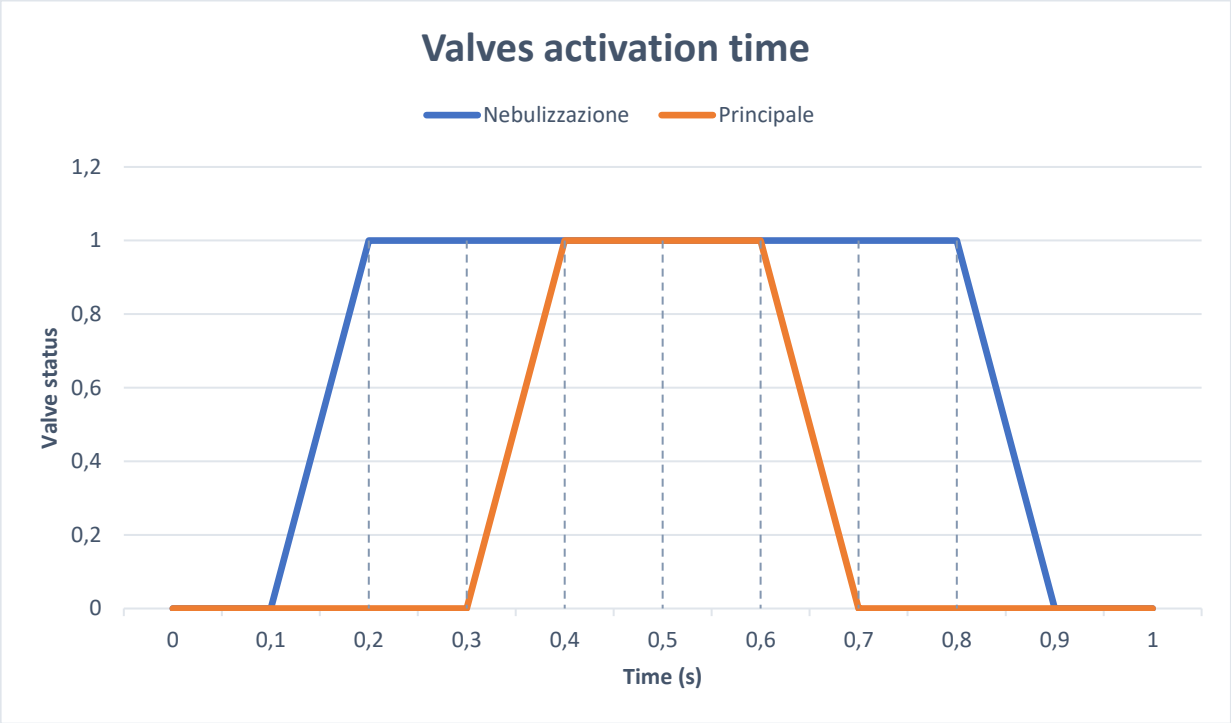

Figure 06 – Valve activation graph in one second of work

Figure 06 shows an example graph of the activation and deactivation times of the respective valves, i.e. typically there is a difference of about 0.1-0.2 seconds between the activation and deactivation of the valves. This figure is indicative as it depends on the viscosity of the fluid and the use of the valve itself.

Below we want to give advice for optimal use, to increase the life of the valve itself and reduce the need for any maintenance.

- The operating air pressure must be 6 bar;
- The spray air must be adjusted so that it is turned on before the needle retracts and is only turned off after the nozzle is closed;
- Only clean and filtered fluid should be used;

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USEFUL TIPS

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

- With low viscosity fluids (less than 100 mPa*s) it is recommended to use a nozzle with a small hole (0.5mm or less) to better control the spray flow;
- To extend the spray radius of a round cap, a spin nozzle must be used. In general, a round cap has a 15° spray arc (angle of the cone opening from the nozzle);
- If you increase the distance between the surface to be sprayed and the nozzle, you will have a change in the size of the spray template. In general, the minimum recommended distance is 5mm, while the maximum distance is 200mm, depending on the application;
- Care should be taken that the air arriving at the spray inlet is properly reduced, including the initial instantaneous air peak of the solenoid valve. Consider the use of quality gearboxes, which can perform correct damping even of the initial peak;
- To obtain a "spot" dispensing (i.e. a very small circle), consider using a front extension;
- The 60° oval cap has a single nebulization exit hole, which allows for an oval with more pronounced ends; while, the 90° one has two nebulization holes, and allows you to have an oval with the most delicate ends;
- The resulting shape of the fluid coming out of any oval cap is perpendicular to the nebulization holes of the head itself;
- The oval cap covers more area (horizontal) than a round cap.

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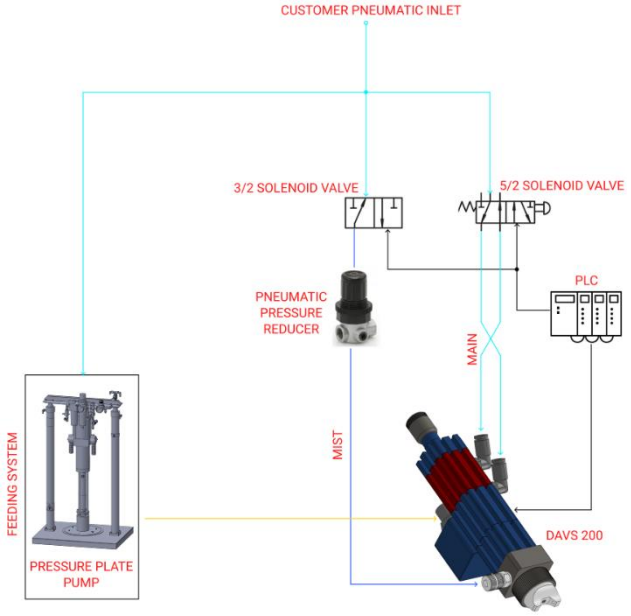

CYAN	Main Air
BLUE	Air Mist
YELLOW	Product
BLACK	Data
RED	Notes

Figure 07 – Connection example

ATTENTION!
The air entering the valve must be filtered and without water (dried), otherwise it risks forming oxide inside the component and wearing it out more quickly.

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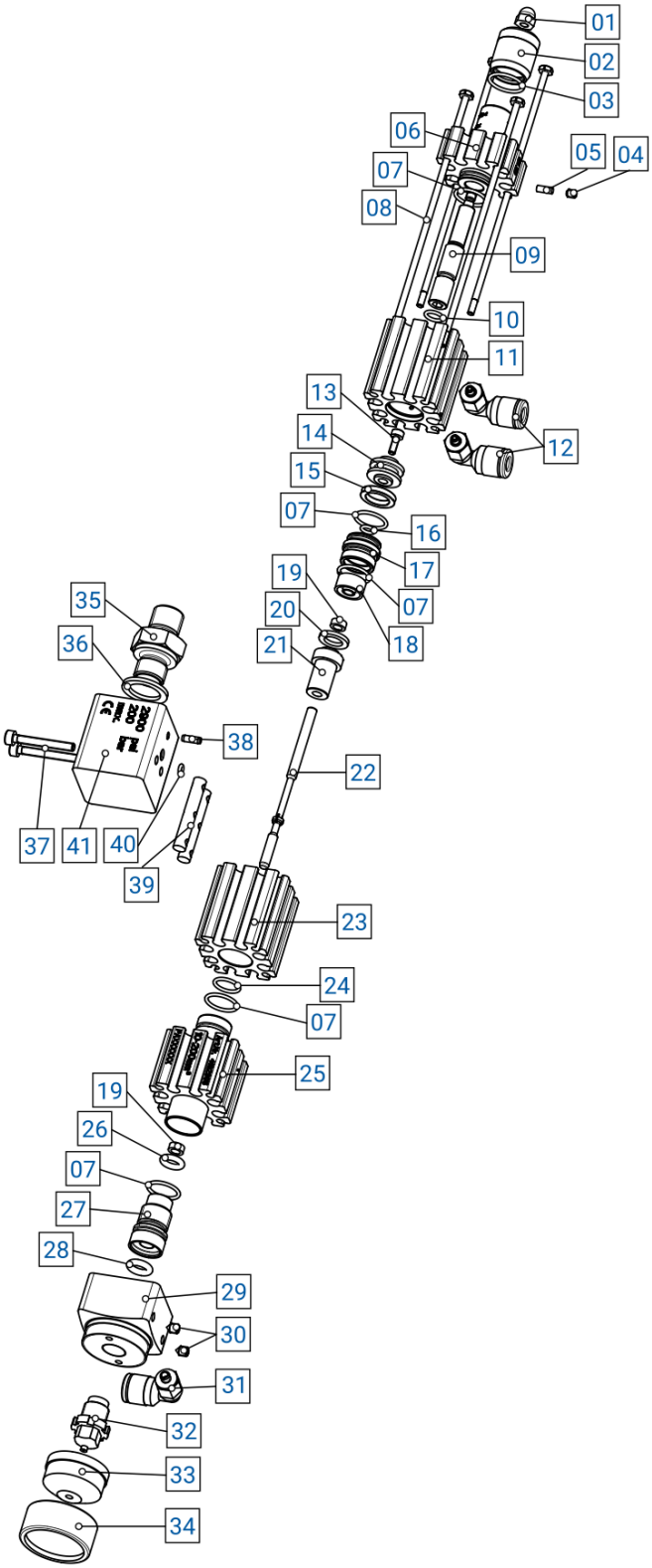
2.1 Exploded

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



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No.	Description	Var.	Code	Variant details
01	NUT	-	8411400	Maximum torque = 1.2 Nm
02	MICROMETRIC ADJUSTMENT	-	0001042	-
03	O-RING	-	8225600	-
04	GRUB SCREW	-	8510101	-
05	DOWEL PIN	-	0001227	-
06	BODY ADJUSTMENT	-	0004890	-
07	O-RING	-	8223401	-
08	FIXING SCREWS	-	0001228	Maximum torque = 0.3 Nm
09	STOPPER	-	0001045	-
10	O-RING	-	8221600	-
11	PNEUMATIC BODY	-	0004891	-
12	AIR CONNECTION	-	0002633	-
13	SCREW PIN	-	0001226	Maximum torque = 0.4 Nm
14	PNEUMATIC PISTON	-	0001043	-
15	X-RING	-	0001106	-
16	O-RING	-	8220400	-
17	COMPASS	-	0001041	-
18	LIP SEAL	-	8353502	-
19	SCRAPER	-	8221401	-
20	MAGNETIC RING	-	0001044	-
21	VOLUMETRIC CHAMBER	-	0001629	-
22	NEEDLE	-	0001039	-
23	INTERMEDIATE BODY	-	0004892	-
24	O-RING	-	0001628	-
25	FRONT BODY	-	0004893	-
26	O-RING	-	8221400	-
27	LUER LOCK SOCKET	-	0001037	-
28	O-RING	-	DAVSBLOCK-ORING	-
29	SPRAY BLOCK	-	DAVS-BLOCK	-
30	DOWEL PIN [1]	-	-	-
31	PNEUMATIC FITTING	-	220089	-
32	NOZZLE	-	-	-
-	-	32.a	210110	STANDARD NOZZLE 0.2 MM
-	-	32.b	210111	STANDARD NOZZLE 0.3 MM
-	-	32.c	210112	STANDARD NOZZLE 0.5 MM
-	-	32.d	210113	STANDARD NOZZLE 0.8 MM
-	-	32.e	210114	STANDARD NOZZLE 1.0 MM
-	-	32.f	210115	STANDARD NOZZLE 1.2 MM
-	-	32.g	210116	STANDARD NOZZLE 1.5 MM
-	-	32.h	210117	STANDARD NOZZLE 2.0 MM
-	-	32.i	210118	STANDARD NOZZLE 2.5 MM
-	-	32.j	210776	SPIN NOZZLE 0.2 MM
-	-	32.k	210777	SPIN NOZZLE 0.3 MM
-	-	32.l	210778	SPIN NOZZLE 0.5 MM
-	-	32.m	210779	SPIN NOZZLE 0.8 MM
-	-	32.n	210780	SPIN NOZZLE 1.0 MM
-	-	32nd	210781	SPIN NOZZLE 1.2 MM
-	-	32.p	210782	SPIN NOZZLE 1.5 MM
-	-	32.q	210783	SPIN NOZZLE 2.0 MM
-	-	32.r	210784	SPIN NOZZLE 2.5 MM
33	CAP	-	-	-
-	-	33.a	310032	STANDARD 60° OVAL AIR CAP FOR NOZZLE 0.2-1.0 MM
-	-	33.b	310033	STANDARD 60° OVAL AIR CAP FOR 1.2-1.5 MM NOZZLE
-	-	33.c	310079	STANDARD 60° OVAL AIR CAP FOR 1.8-2.0 MM NOZZLE
-	-	33.d	310090	STANDARD 60° OVAL AIR CAP FOR 2.5 MM NOZZLE
-	-	33.e	310036	90° OVAL AIR CAP FOR NOZZLE 0.2-1.0 MM
-	-	33.f	310037	90° OVAL AIR CAP FOR 1.2-1.5 MM NOZZLE
-	-	33.g	310166	90° OVAL AIR CAP FOR 1.8-2.0 MM NOZZLE
-	-	33.h	310167	90° OVAL AIR CAP FOR 2.5 MM NOZZLE
-	-	33.i	310038	45° OVAL AIR CAP FOR 0.2-1.0 MM NOZZLE
-	-	33.j	310039	45° OVAL AIR CAP FOR 1.2-1.5 MM NOZZLE
-	-	33.k	310034	STANDARD 15° ROUND AIR CAP FOR 0.2-1.0 MM NOZZLE
-	-	33.l	310035	STANDARD 15° ROUND AIR CAP FOR 1.2-1.5 MM NOZZLE
-	-	33.m	310080	STANDARD 15° ROUND AIR CAP FOR 1.8-2.0 MM NOZZLE
-	-	33.n	310091	STANDARD 15° ROUND AIR CAP FOR 2.5 MM NOZZLE
34	RING	-	410028	-
35	NIPPLO INLET	-	8573307	Maximum torque = 20 Nm
36	MOULDED GASKET	-	8259300	-
37	SCREWS	-	8423904	Maximum torque = 0.5 Nm
38	DOWEL PIN	-	8460002	-
39	FIXING NUTS	-	0002213	-
40	O-RING	-	0001224	-
41	FLUIDIC BODY	-	0004895	-
-	GASKET KIT	-	GASKETKIT-DAV100200	-

[1] Use M4X5 grub screws (on the side, where there is only one hole) and M5X5 (to plug one of the two upper holes) with a flat head.

WARNING!

The complete gasket kit includes the gaskets for the DAV-100 and DAV-200 valve, as they are very similar. The only additional component that is present within the kit and that must be mounted on the DAV-100 valve is cod. 8227800

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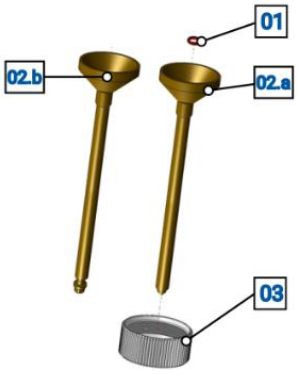
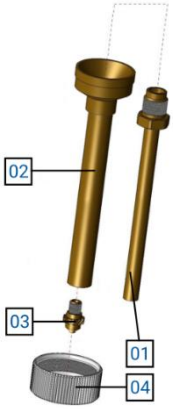


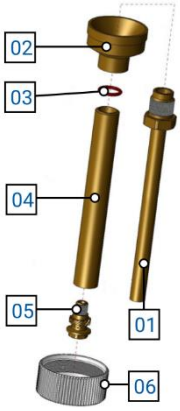
360° RADIAL DISPENSING EXTENSION OR FRONT DISPENSING L:100 mm Ø 4 mm

No.	Description	Code
01	O-RING	640203
02	COMPLETE EXTENSION	\
02.a	FULL FRONT EXTENSION	231515
02.b	COMPLETE RADIAL EXTENSION	230747
03	RING	410028



FRONT DISPENSING EXTENSION L:100 mm Ø 8 mm

No.	Description	Code
01	STANDARD INNER TUBE 100mm	850129
02	COMPLETE OUTER TUBE 100mm	850215
03	NOZZLE 0.5mm	210348
04	RING	410028



RADIAL DISPENSING EXTENSION 360° L:100/200 mm Ø 8 mm

No.	Description	Code
01	STANDARD INNER TUBE 100mm	850129
02	BELL	220197
03	O-RING	640366
04	COMPLETE OUTER TUBE 100mm	850130
05	NOZZLE	\
05.a	0.4mm NOZZLE	211206
05.b	0.6mm NOZZLE	211343
05.c	NOZZLE 0.8mm	211327
06	RING	410028

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2.2 Technical data

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

SPECIFICATIONS		
Description	**UdM**	**Values**
Model	\	DAVS 200
Activation	\	Double Acting
Maximum fluid pressure	bar	200
Air pressure for the drive	bar	5 ÷ 7
Air pressure nebulization	bar	0.1 ÷ 5
Dispensable quantity	cc	0.01 ÷ 0.2
Air inlet thread drive	\	M2.5, Ø4mm
Nebulization air inlet thread	\	M5
Fluid inlet thread	\	1/8 GAS
Fluid outlet thread	\	Nozzle with ring nut
Maximum fluid output speed	cycles/min	60
Passage adjustment	\	Micrometric
Materials used	\	Stainless steel
		Anodized aluminum

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
Fats
Lubricants up to NLGI 2 consistency
Ask the manufacturer for particular fluids

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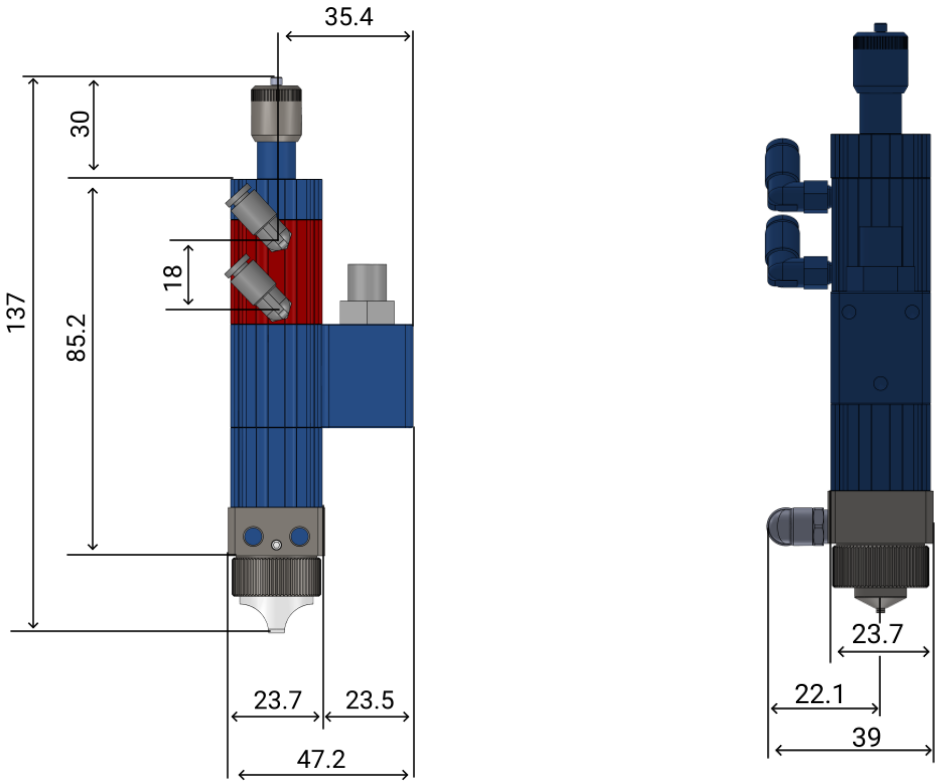
DIMENSIONAL AND WEIGHT CHARACTERISTICS		
Description	**UdM**	**Value**
Component length (min ÷ max)	mm	137
Component depth (min ÷ max)	mm	39
Component height (min ÷ max)	mm	47.2
Component weight	kg	0.28

Component



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

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3 SAFETY

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

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

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

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

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

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.

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3.1 Machine safety devices

N.A.

3.2 Free useful spaces

N.A.

3.3 Risk areas and residual risk

N.A.

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.

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5 INSTALLATION

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

The valves covered by this manual have threaded holes near the lubricant inlet fitting. Through these holes, it is possible to fix the valve on any surface designed to house it (for the spacing of the holes, see chapter 2.2). It is recommended to make a good fixing of the valve itself, as vibrations could take it off-axis and give suboptimal dosing results.

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;
- Pneumatic connection;

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5.2.1 Electric

Authorized personnel		**PPE to wear**					
Machine status	Machine installed and turned off						
Power Values	See chapter 2.2						
Necessary preparations	Working electrical system						
Materials needed	\						
Equipment needed	Wrench or screwdriver						

The electricity connection is at the expense of the customer.

For this type of valve, there is an electrical installation that concerns only the sensor side, i.e. the limit switches on the valve. In this case, to be able to read the values and to be able to make the opening and closing of the valve automatic, the sensor cables must be connected to the appropriate PLC and in the place provided by the wiring diagram.

5.2.2 Pneumatic

Authorized personnel		**PPE to wear**					
Machine status	Machine installed and turned off						
Power Values	See chapter 2.2						
Necessary preparations	Working pneumatic air system						
Materials needed	Fixing screws (for centering holes)						
Equipment needed	Wrench or screwdriver						

The pneumatic connection is the responsibility of the customer.

Before assembling the valve, it is recommended to calibrate the valve, to carry it out precisely and once carried out, you can proceed with the assembly and possible fixing by screws on the appropriate seats. For connections, it is recommended to connect the pneumatic hoses first and then proceed with the connection of the product hose (using the data given in chapter 2.2).

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5.3 Commissioning

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

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

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 the first start of the valve;
- How to perform micrometric adjustment;
- How to perform the nebulization adjustment.

It should be noted that, being a volumetric valve, the output fluid depends only on the adjustment of the needle.

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7.1 First start

To perform the first start of the valve, follow these steps:

1. Fill the lubricant supply hose before connecting a metering valve, to remove the air from the hose;
2. Connect the fluid supply hose to the appropriate housing and the air to the respective pneumatic connections;
3. Set the maximum dosage, i.e. loosen the locking screw and turn the micrometer knob until it stops (you should see 100%);
4. If the pressure inside the valve is high and you have difficulty turning the knob, it is recommended that you perform a dosage while turning the knob. By doing so, the pressure inside the chamber decreases and it is possible to perform the adjustment;
5. To prevent tampering, it is recommended to tighten the locking grub screw.

Maintain the nozzle/application point distance, to increase dosing accuracy;

The cycle time depends on the viscosity of the fluid and the pneumatic pressure of the fluid.

7.2 Micrometric adjustment

In this case, the adjustment knob must be adjusted (see chapter 2, figure 01, number 01), to adjust the amount of fluid dispensed with extreme precision, namely:

- Turn counterclockwise to increase the needle stroke and therefore the amount of fluid dispensed;
- Turn clockwise to decrease the needle stroke and therefore the amount of fluid dispensed. If the valve reaches the end of its stroke, it is not completely closed but delivers the minimum value (chapter 2.2).

To facilitate the adjustment of the amount of fluid to be dispensed, it is recommended to keep the valve in dosing mode for the entire time of adjustment, so that the needle is towards the nozzle and not towards the adjustment.

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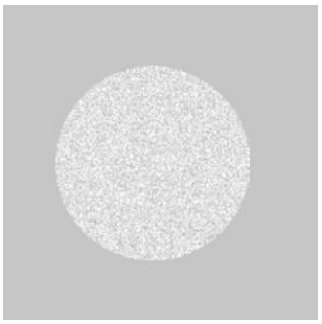
7.3 Mist adjustment

To make a correct adjustment of the nebulization, the following parameters must be taken into account:

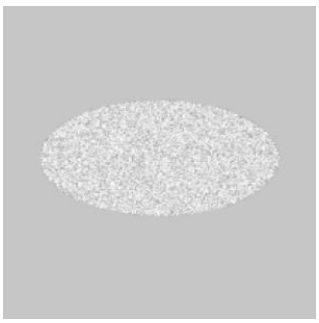
- Distance of the valve from the surface to be processed;
- Amount of fluid dispensed;
- Fluidic pressure;
- Spray air pressure.

Below are some examples to better understand when it is convenient to act on one (or more) of the parameters just listed.

ROUND CAP



OVAL CAP

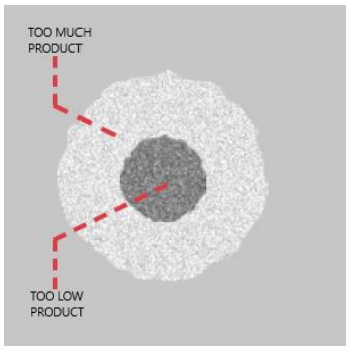


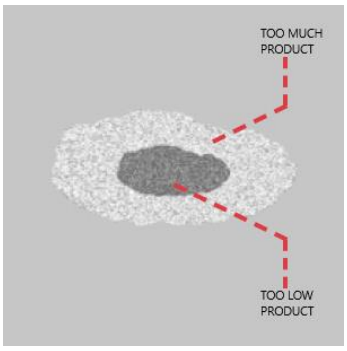
CORRECT AND OPTIMAL APPLICATION.

No further modifications are recommended

JAGGED FAN OUTLINE

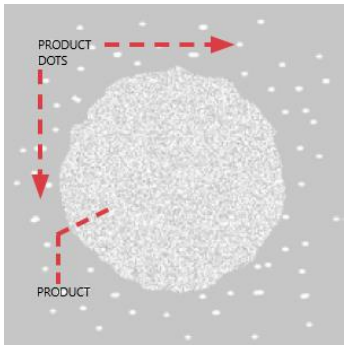
- The fluid bounces off the component, fouling the air cap and nozzle. It is recommended to decrease the pressure of the spray air;
- Excessive amount of fluid, it is recommended to decrease the fluid pressure

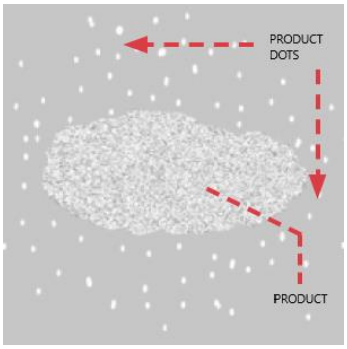




JAGGED FAN CONTOUR AND UNEVEN APPLICATION OF NEBULIZED FLUID

- Presence of fluid satellites, it is advisable to increase the pressure of the spray air;
- Low fluid quantity, it is recommended to increase the fluid pressure;
- Presence of impurities in the fluid, it is recommended to clean, or replace, the nozzle





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8 MAINTENANCE

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

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

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

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

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

Regarding attendance, it must be considered that:

- **When necessary:** Operation to be carried out when the need to be carried out is seen;
- **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.

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Assigned	Description	Frequency	Chapter
	Perform a test function of the valve	Every machine start-up or end of work	\
	Perform a surface cleaning of the valve	Every machine start-up or end of work	\
	Put a bit of grease on the outlet nozzle	Every end of work	\
	Cleaning and/or replacing the nozzle	Semiannual	See notes 8.1
	Disassembly and reassembly of the valve	Annual	8.1

ATTENTION!
Apply the grease tip at the end of the work and at every prolonged pause in the system, to preserve the fluid inside the system and the functionality of the valve itself

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

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8.1 Disassembly and reassembly of the valve

Assigned	Periodicity	Materials and equipment
	Annual	• Torque wrench 0.2 to 1.2Nm and 1 to 6 Nm; • 1.5mm, 2mm and 2.5mm hex wrench; • Allen key kit from 1.5 to 10mm; • Special Allen key SW 3.5mm; • Hook kit (for removing gaskets); • Vise with coated magnetic hooks

PPE to wear

DANGER!
Before performing this procedure, you must relieve the pressure from the system and disconnect the air connection.

To carry out the disassembly and consequent reassembly of the valve, please refer to the link below as it is a procedure that involves many steps. It is therefore recommended to watch the video:

ATTENTION!
The video talks about the disassembly and reassembly of the DAV 200, which the body has an equal disassembly and reassembly, it changes only for the head.

Link to video

Here's also how to do with the photos, in case you can't open the video online:

ATTENTION!
When installing the micrometer regulator or clamping screw, pay particular attention that the thread is inserted correctly, i.e. perpendicular to the body, and not that it is inclined.

ATTENTION!
Before screwing the nozzle into place, check that the adjusting screw, or knob, is completely loose to avoid damaging the nozzle and needle. To loosen them, turn counterclockwise until they no longer resist.

ATTENTION!
The passages that are present here are the same as those of the normal DAV 200. The concept is the same, except that in the DAV 200 there is a different head. To disassemble this part, follow the steps below and skip the dosing block steps shown in the pictures.

- To remove the head o-ring, disassemble the body lock screws (No.08 chap. 2.1) and perform maintenance on the o-ring;
- To change or clean the nozzle, simply unscrew the ring nut and, with a special key, remove the nozzle, without the need to remove the screws that lock the valve body.

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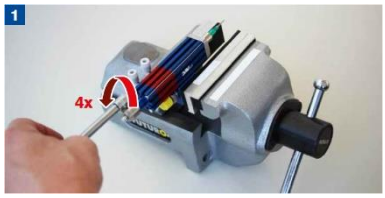

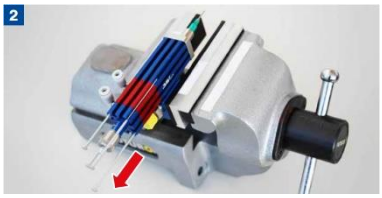

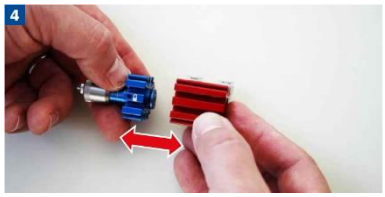

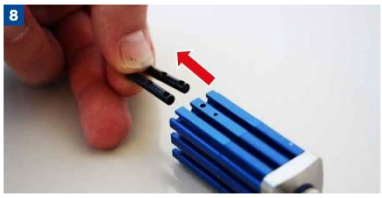

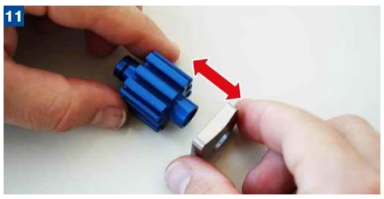

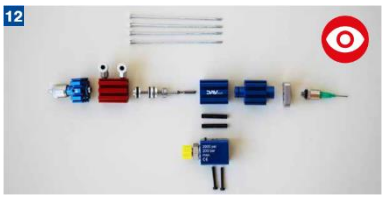

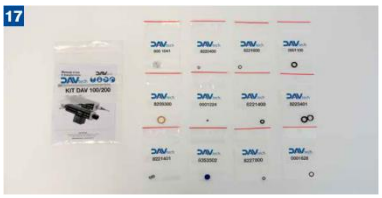

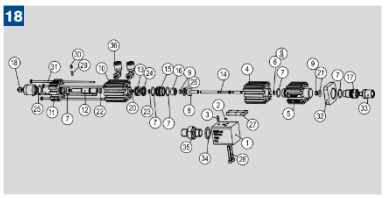

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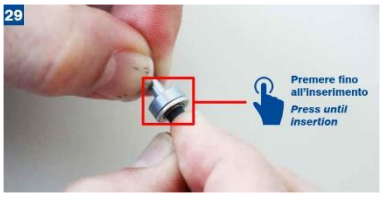

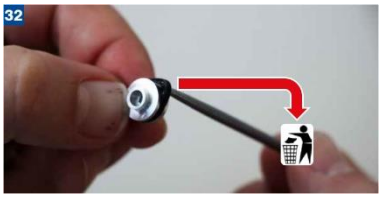

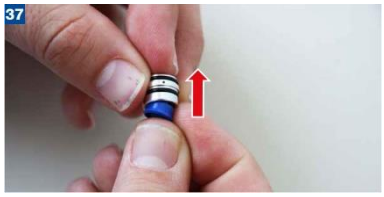

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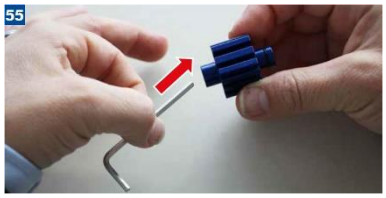

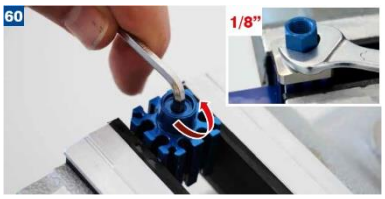

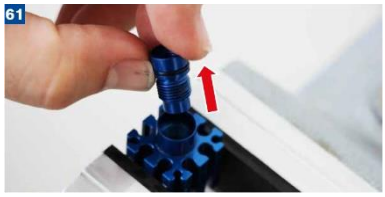

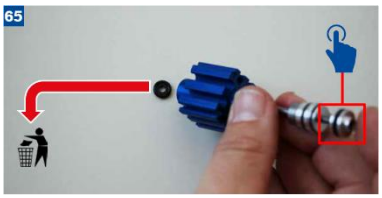

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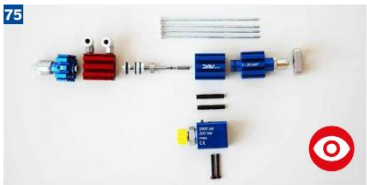

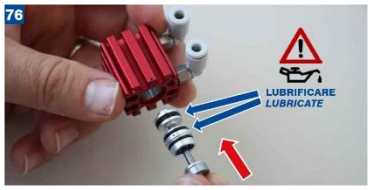

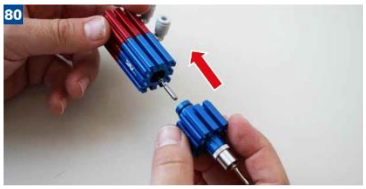

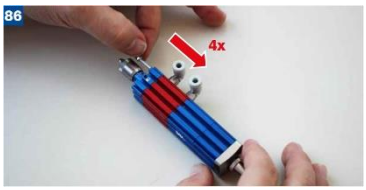

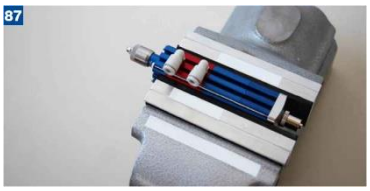

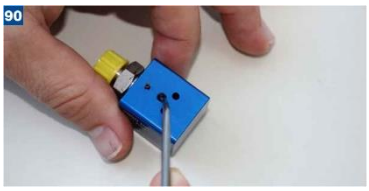

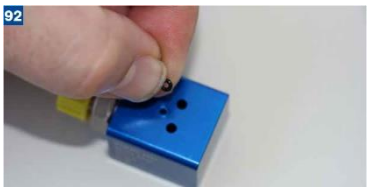

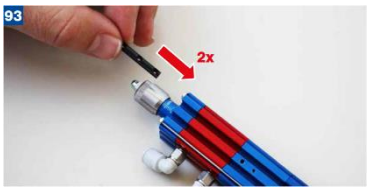

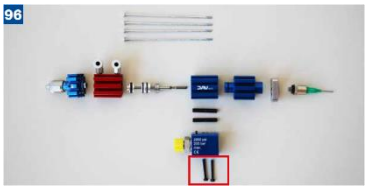

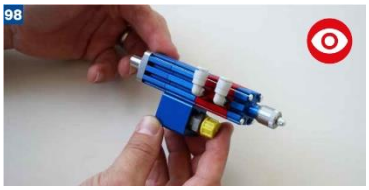

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9 TROUBLESHOOTING

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
No or little fluid	The valve does not receive the command	Check the valve control (solenoid valve). Perform a manual test
	Fluid pressure is too low or no	Check the pressure of the fluid supply unit and increase it if necessary
	The nozzle is clogged	Unscrew and clean the nozzle
	The filter is dirty (if any)	Wash or replace the filter
	A tube is kinked	Check the condition of the fluid supply hoses
	Insufficient operating pressure	Check the actuation pressure (chap. 2.2)
	Fluid agglomerates present in the system	Disassemble and clean any solid particles
Fluid leakage from the valve	Damaged seals	Overhaul the valve
Fluid leakage between valve body and fixing plate	O-ring on the fluidic body of the damaged fluid inlet	Replace the fluid inlet fluidic body o-ring.
	Possible collision between valve and foreign object	Check that the component is not damaged
Valve opens late	Insufficient operating pressure	Check the actuation pressure (chap. 2.2)
	O-Ring on Damaged Air Piston	Replace O-Ring on Pneumatic Piston
Uneven fluid atomization	Insufficient spray pressure	Check the spray air pressure (chap. 2.2)
	Dirt in the air cap	Clean the air cap

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In addition to these problems, there may also be situations in which the nebulized fluid does not settle correctly, thus creating incorrect dosages. The following are possible problems that can occur:

DRAWING	PROBLEM	CAUSE	SOLUTION
	Standard spray pattern when using the oval head		
	Standard spray pattern when using the round head		
	Higher concentration of fluid at the beginning or end of the model	Dirty hood	Clean nozzle and cap
		Dirty nozzle	
	Banana Shape Pattern	Dirty hood	Clean nozzle and cap
		Dirty nozzle	
	Concentrated center spray model	Too much material	Reduce material pressure
		High material density	Decrease material density
	8 model	Too little material	Increase material pressure
		High spray air pressure	Reduce air mist

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10 END OF LIFE

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

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

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

On the other hand, for the dismantling and consequent 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.

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