



OPERATING MANUAL

VMS-500

Minimum Quantity Lubrication



ZMMS.VMS.500.02.MAN
ZMMS.VMS.500.02.24VDC
ZMMS.VMS.500.02.230VAC

VMS-500 - The variants

	Manual control	Solenoid valve control 24 VAC	Solenoid valve control 230 VAC
Switchable air pressure	○	●	●
Controllable	○	●	●
Order No.	ZMMS.VMS.500.02.MAN	ZMMS.VMS.500.02.24VDC	ZMMS.VMS.500.02.230VAC

Introduction

Flood cooling, which is well-suited and effective in heavy-duty industrial machining, especially of steel, appears oversized and unsuitable for more easily cut materials and smaller machines. The solution is minimum quantity lubrication cooling.

The idea behind it: to deliver precisely the amount of coolant needed to the cutting edge of the tool. This is surprisingly little. The required quantity can be achieved with a tightly controlled mist or a focused stream of tiny droplets. The air pressure from a simple compressor is sufficient; no additional pump is needed. Since volatile coolants are typically used instead of heavy oils, evaporation eliminates the need for recirculation to a tank in a system.

Velron's versatile minimum quantity lubrication systems make the principle of precise dosing available at a reasonable price for small and medium-sized machining tools, not at least for hobby applications.

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1. Symbols

	Warning! Danger from electric current!		Warning! Danger of imminent explosion!
	Attention! General hazard warning.		Note. Useful information of particular value.

2. Intended use

The VMS-500 minimum quantity lubrication system, in combination with a designated spray nozzle, is used for the metered application of cooling lubricants intended for this purpose in machining processes of metal or plastics. When machining wood, the cooling air can be used without lubricant to blow away chips. Any use other than that described in these instructions is considered improper. In particular, the use of cooling lubricants other than those expressly approved for this purpose is not in accordance with the intended use.



The warning regarding highly flammable liquids and the risk of explosion in the „Operation“ section must be strictly observed!

VELRON is not liable for damages caused by improper use..

3. Operating principle

The VMS-500 minimum quantity lubrication system operates on the Venturi principle: A high-speed airflow passes through a mixing nozzle and over a perpendicular delivery line containing coolant. The fluid is drawn in by the locally generated negative pressure, carried along by the airflow, and directed by the subsequent nozzle onto the cutting edge of the tool. The cooling effect is achieved through the compressed air and the evaporation of the coolant.

The coolant reservoir remains unpressurized. The fluid is driven solely by the vacuum created in the mixing nozzle.



Note:

The VMS-500 works with any mixing nozzle designed for this purpose. However, we recommend using the MQL-300 (see page 7) or another VELRON nozzle for which the system was designed and optimized.



Fig. 1: In the VMS-500 system, the storage is unpressurized.

4. Assembly

The VMS-500 is delivered with the reservoir detached. To assemble, thread the riser pipe into the reservoir. Align the reservoir so that the fill level indicator faces forward. Then screw the profile ring onto the top part – hand-tightening is sufficient.



Fig. 2: The storage container (left) is included separately.



Fig. 3: Tighten the profile ring by hand.

5. Overview

5.1 VMS-500 manual



- 1 Mounting plate
- 2 Shut-off valves for air and cooling lubricant
- 3 Hose connections for mixing nozzle
- 4 Pressure regulator
- 5 Connection for compressed air
- 6 Manometer
- 7 Coolant filler opening
- 8 Profile ring for maintenance key
- 9 Storage container
- 10 Level indicator

6. Technical data

Dimensions (WxHxD): appr. 291 x 390 x 140* mm
 *150 mm with solenoid valve

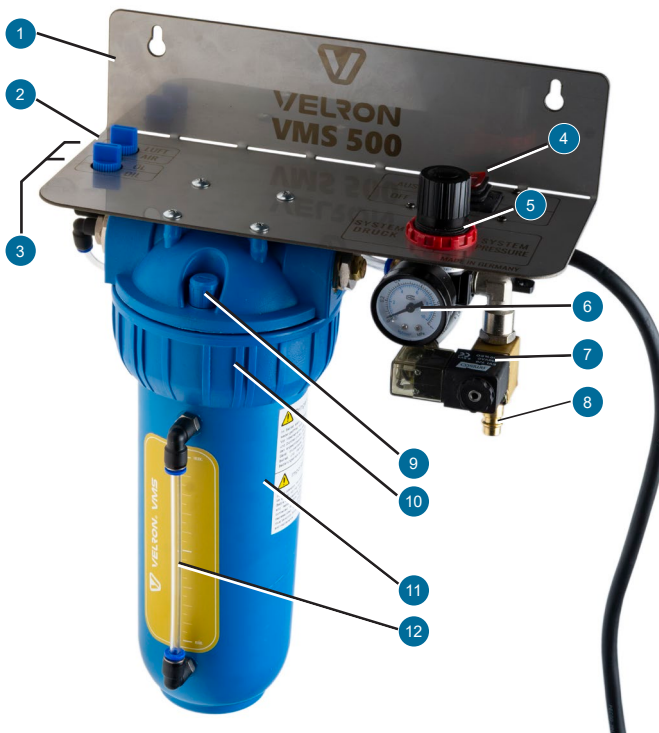
Spacing of mounting holes: 233 mm

Weight: approx. 2,3 kg (man.) / 2,7 kg (switched)

Tank size: 1 l

Electrical connection:

Depending on the version, 24 or 230 VAC



- 1 Mounting plate
- 2 Shut-off valves for air and cooling lubricant
- 3 Hose connections for mixing nozzle
- 4 On/Off switch
- 5 Pressure regulator
- 6 Manometer
- 7 Solenoid valve
- 8 Connection for compressed air
- 9 Coolant filler opening
- 10 Profile ring for maintenance key
- 11 Storage container
- 12 Level indicator

7. Attachment

Mount the minimum quantity lubrication system in an easily accessible location on the machine. Ensure sufficient clearance below to allow for easy removal of the reservoir when needed.

The nozzle should be mounted slightly below the working height of the spray head to prevent accidental emptying.

8. Connection

- Insert the air hose (Ø 6 mm) leading to the mixing nozzle into the connector labeled "AIR".
- Insert the coolant hose (Ø 4 mm) into the connector labeled "OIL".
- Connect the compressed air supply to the compressed air port.

Only versions with solenoid valve:

- Connect the power supply, either 230 V or 24 V depending on the model. Refer to the relevant instructions in your control unit's documentation if necessary.



The 24V version must be connected to a suitable power supply!
Connecting the 24 V version directly to 230 V will destroy the solenoid valve!
Connection must be carried out by a qualified electrician!

9. Operation

VMS-500 manual



Fig. 6: Control panel manual version

VMS-500 with solenoid valve



Fig. 7: Operation with solenoid valve switch

- 1 Fill the reservoir with coolant. The easiest way to do this is to remove the reservoir. (Fig. 10).
- 2 (only versions with solenoid valve) Turn on the solenoid valve.
- 3 Set the working pressure. For fine work such as engraving, approximately 1.5 bar is sufficient. To blow chips out of the groove, approximately 3 bar is required.
- 4 Open the shut-off valves for air and coolant. These valves are not for regulating the spray pattern; this is done exclusively at the mixing nozzle (see page 7).

Note:

When working with wood, you can leave the „OIL“ valve closed, but use the air to blow out shavings. However, the remaining coolant in the hose at first will be sprayed out completely.



Do not use highly flammable liquids (alcohol, gasoline, etc.) as cooling lubricants! Risk of deflagration!

10. Cooling lubrication mixing nozzle Velron MQL-300

The VMS-500 minimum quantity lubrication system includes the universally applicable MQL-300 cooling lubrication nozzle as standard. To commission the system, proceed as follows:

- Start the VMS-500 as described on page 6.
- Open the air control valve **1** fully
- Open the coolant control valve **2** just enough to allow fluid to flow. Hold a piece of paper about five centimeters in front of the nozzle. The flow rate is correctly adjusted when the paper begins to change color after approximately two seconds.

Note:

If you can see the liquid coming out of the nozzle with the naked eye, the flow rate is definitely too high.

- Point the nozzle at the point between the tool cutting edge and the workpiece.



Fig. 8: Coolant mixing nozzle Velron MQL-300



- 1** Control valve for air
- 2** Control valve for coolant lubricant
- 3** Hose connection Ø 6 mm for air
- 4** Hose connection Ø 4 mm for coolant lubricant

Fig. 9: Operation MQL-300

11. Maintenance

The VMS-500 system is largely maintenance-free. Occasionally remove any external dust and dirt with a soft cloth.

In case the profile ring on the reservoir is difficult to remove, a suitable plastic ring wrench is included. Figure 10 shows how to use it. If necessary, check the threads for sticky residue before reassembling.



Fig. 10: Opening the storage container with the ring spanner