



OPERATING MANUAL

VMS-700

Minimum Quantity Lubrication



VELRON VMS - Features and Function

	VMS 500 Venturi-Principle		VMS-700 Pressurized vessel	
	Manual operation	With solenoid valve	Manual operation	With solenoid valve
Functional check prior to delivery	●	●	●	●
Compressed air can be switched off	●	●	●	●
Pressure regulator with gauge	●	●	●	●
Spray head air shut-off	●	●	●	●
Spray head liquid shut-off	●	●	●	●
Fill level indicator	●	●	●	●
MQL-300 spray head available	●	●	●	●
Fogbuster spray head available	○	○	●	●
HPM HTR 135 spray head available	○	○	●	●
Pressure vessel with safety valve	○	○	●	●
Solenoid valve 24 VDC available	○	●	○	●
Solenoid valve 230 VAC available	○	●	○	●
Sol. valve also operable via switch	○	●	○	●

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.

Contents

1. Symbols	Page 3
2. Intended use	Page 4
3. Operating principle.....	Page 4
4. Assembly	Page 4
5. Overview	Page 5
5.1 VMS-700 manual	Page 5
5.2 VMS-700 with solenoid valve	Page 5
6. Technical data	Page 6
7. Attachment.....	Page 6
8. Connection.....	Page 6
9. Operation	Page 7
10. Cooling lubrication mixing nozzle Velron MQL-300	Page 8
11. Cooling lubrication mixing nozzle Fogbuster	Page 8
12. Cooling lubrication mixing nozzle HPM	Page 9
13. Maintenance	Page 9

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-700 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!

The manufacturer is not liable for damages caused by improper use.

3. Operating principle

The VMS-700 minimum quantity lubrication system operates using pressure-based delivery: pressurized cooling lubricant is fed into a high-speed airflow within a mixing nozzle. A subsequent nozzle atomizes the fluid and directs the fine mist onto the tool cutting edge. The cooling effect is generated by the compressed air and the evaporation of the cooling lubricant.



The coolant reservoir is pressurized during operation. Before removing it, be sure to switch off the solenoid valve or close the manual shut-off valve!



Note:

The VMS-700 works with any mixing nozzle designed for this purpose. However, we recommend connecting one of the nozzles listed at the back of this manual, for which the system was designed and optimized.



Fig. 1: In the VMS-700 system, the reservoir is pressurized..

4. Assembly

The VMS-700 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.



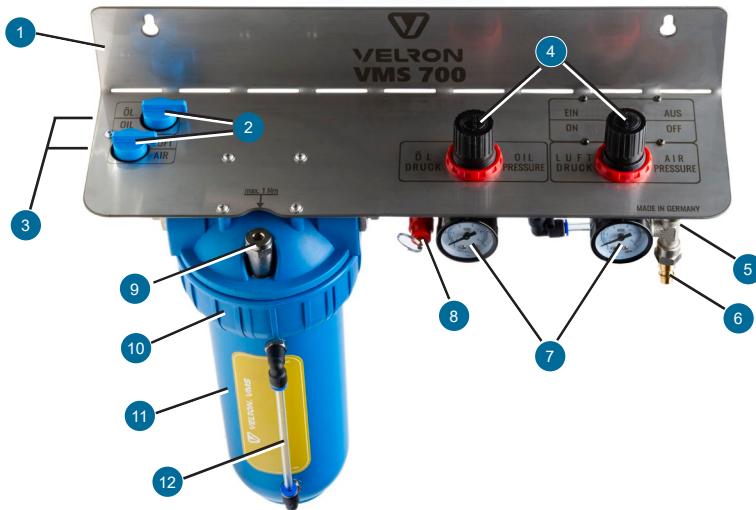
Fig. 2: The storage container (left) is included separately.



Fig. 3: Tighten the profile ring by hand.

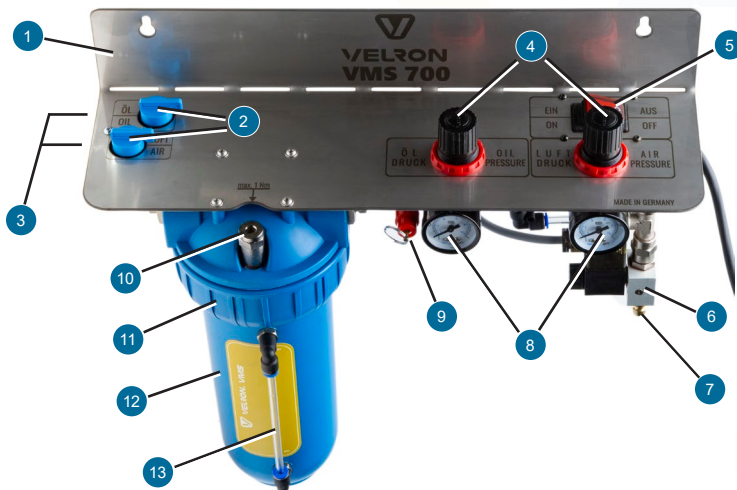
5. Overview

5.1 VMS-700 manual



- 1 Mounting plate
- 2 Shut-off valves for air and cooling lubricant
- 3 Hose connections for mixing nozzle
- 4 Press. regulators for air and cooling lubricant
- 5 Compressed air shut-off valve
- 6 Connection for compressed air
- 7 Manometers for air and cooling lubricant
- 8 Safety valve
- 9 Coolant filler opening
- 10 Profile ring for maintenance key
- 11 Storage container
- 12 Level indicator

5.2 VMS-700 with solenoid valve



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

6. Technical data

Dimensions (WxHxD): appr. 430 x 390 x 125 mm

Spacing of mounting holes: 350 mm

Weight: approx. 3 kg (man.) / 3.5 kg (switched)

Tank size: 1 l

Electrical connection:

Depending on the version, 24 VDC or 230 VAC

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-700 manual



Fig. 6: Control panel manual version

VMS-700 with solenoid valve



Fig. 7: Control panel manual version

- 1 Fill the reservoir with coolant. The easiest way to do this is to remove the reservoir. (Fig. 12).



The coolant reservoir is pressurized during operation. Before removing it, be sure to switch off the solenoid Valve or shut off the compressed air supply!

- 2 Open the manual shut-off valve or switch on the solenoid valve.
- 3 Set the working pressure using the right-hand pressure regulator. 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 Set the delivery pressure for the cooling lubricant to approx. 1.5 bar using the left-hand pressure regulator..
- 5 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 8).

i Note:

When working with wood, you can keep the "OIL" valve closed while still using the air to blow away chips. However, depending on the spray head installed, any residual cooling lubricant remaining in the hose will be sprayed out first.



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-700 as described on page 7.
- 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. Cooling lubrication mixing nozzle Fogbuster

The Fogbuster mixing nozzle has proven itself in thousands of cooling-lubrication systems. To use it with the VMS 700, proceed as follows:

- Ensure that the needle valve is **1** closed.
- Start the VMS-700 as described on page 7.
- Position the spray head so that the nozzle is approximately 5 to 7 cm away from the workpiece and points downwards.
- Now carefully open the needle valve until a light spray pattern appears. With the normal setting, a light stream of coolant is visible within the airflow at the nozzle outlet.

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

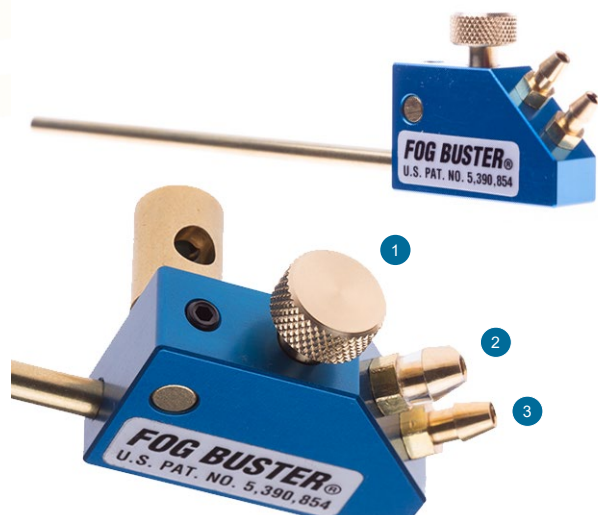


Fig. 10: Coolant mixing nozzle Fogbuster

12. Cooling lubrication mixing nozzle HPM

The HPM mixing nozzle impresses with its heavy-duty industrial quality and precise adjustment. To use it with the VMS 700, proceed as follows:

- Ensure that the control nozzle **1** is closed.
- Start the VMS-700 as described on page 7.
- Position the spray head so that the nozzle is approximately 5 cm away from the workpiece.
- Hold a piece of paper in front of the workpiece and carefully open the control nozzle. With the normal setting, the paper will begin to discolor after about two seconds.

i Note:

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

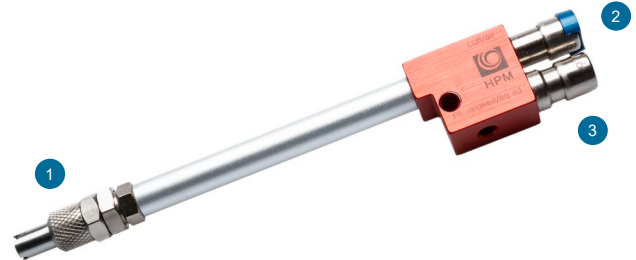


Fig. 11: Coolant mixing nozzle HPM

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

13. Maintenance

The VMS-700 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. Fig. 12 shows how to use it. If necessary, check the threads for sticky residue before reassembling.



Fig. 12: Opening the storage container with the ring spanner