



User Manual

Thermublast MQL

www.thermublastmql.com

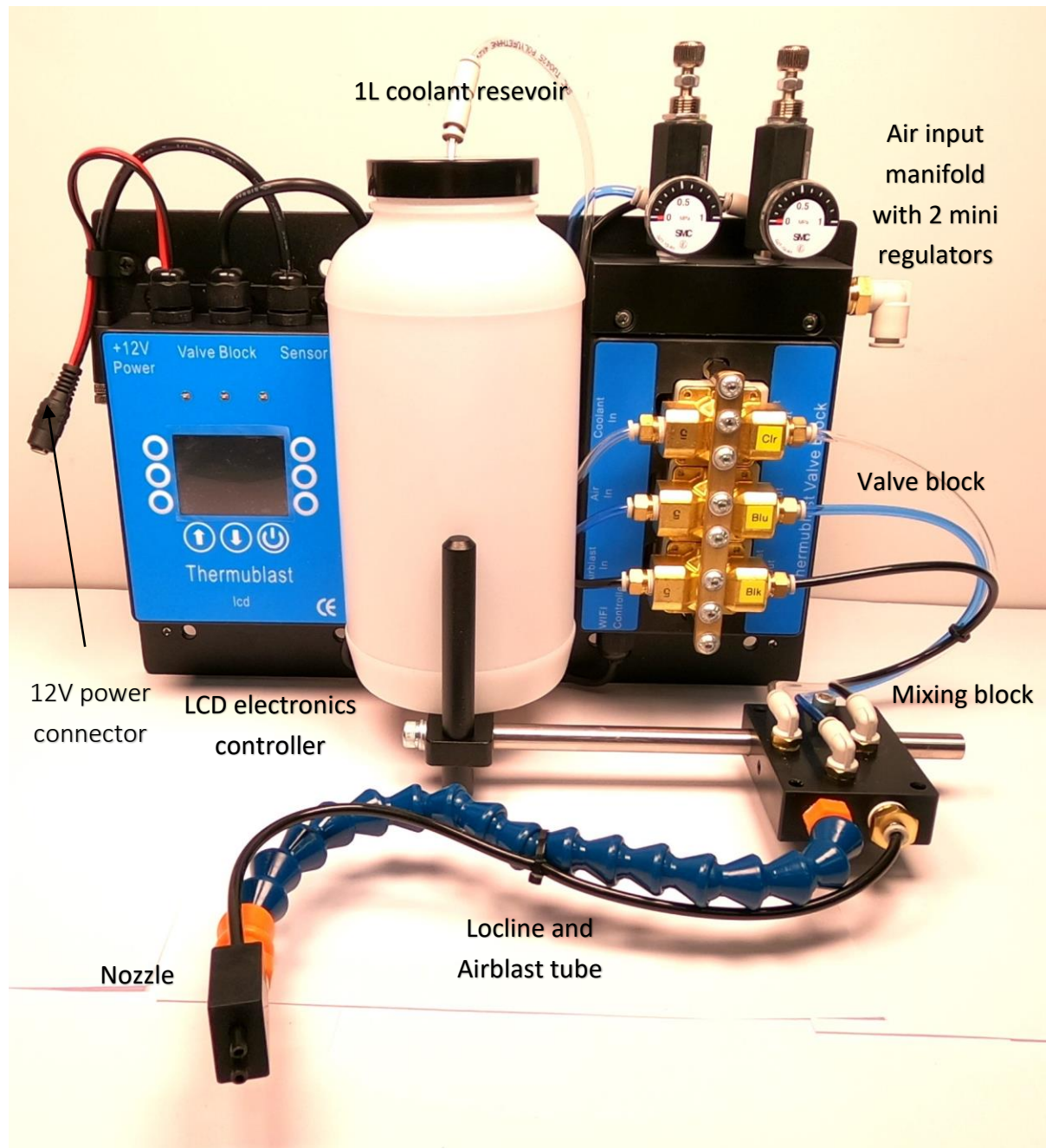


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1.0 System Overview:



Thermublast MQL is a precision(microprocessor controlled), pulsed spray cooling and lubrication plus airblast chip clearing system. All without misting or fogging. Thermublast MQL provides a low cost, low mess alternative to flood coolant on machine tools such as mills, lathes, grinders, saws and so on.

To accompany this manual, there are a number of videos on the website thermublastmql.com and on the ThermublastMQL youtube channel.



2.0 Operating Instructions

Thermublast is supplied, fully connected in the box. Once removed from the box, mount the unit on or adjacent to your machine, connect the 12V dc power supply included in the box and connect clean, dry compressed air(max pressure 8bar(110psi)). The air input fitting is for 8mm tube. Reducers are supplied in the box for 6mm and 4mm air tube input.

2.1 Identifying the Main Components

1. The air input manifold with pressure regulators, LCD electronics controller, 1Litre reservoir and Valve block are all mounted on a black, powder coated, aluminium base plate:
 - Air input manifold - this is a black aluminium block, above the valve block. It has an 8mm tube elbow fitting for air input and two, miniature, pressure regulators with gauges to set the liquid(cooling and lubrication) dispense pressure and the air blast(chip clearing) pressure independently. The liquid dispense pressure should be set to 1 to 2 bar(blue tube) and the air blast pressure should be set between 1 and 5 bar(black tube). Exceeding these pressure settings may result in fogging(atomising of the coolant) or slowing down of the valve response.
 - LCD controller – allows the operator to set the liquid flow and volume for cooling and the air flow and volume for chip clearing by altering the timing of the switching on and off of the valves in the valve block.
 - 1 Litre resevoir –a polyethylene bottle with a screw cap for the coolant, with a tube through the cap to deliver the coolant to the valve block. The tube has a brass frit(filter) on one end to stop the ingress of solids/contaminants in the coolant being drawn through the valves to the dispense nozzle and a 4mm, quick change(push in) inline connector at the exit of the reservoir cap to allow the reservoir to be removed quickly and easily for refilling.
 - Valve block – 3 valves for coolant(clear tube), liquid dispense air(blue tube) and air blast(chip clearing)(black tube) mounted in a line above one another, with the coolant valve at the top.
2. The Mixing block is mounted on a 10mm stainless steel shaft connected to the bottle holder. The outputs of the valves drive through the mixing block to propel the coolant and air blast(chip clearing) to the nozzle and onto the machine tool to be cooled/lubricated.
3. 12V dc Power supply(supplied with the system) – connects via a 3.5mm jack socket on the power supply cable to a red/black flying lead exiting the top left hand corner of the LCD controller.



2.2 Assembling the Thermublast System:

The system interconnections are shown in section 1.0 'System Overview' and must be adhered to for correct system operation. Air input is via an 8mm elbow fitting on the rhs of the input manifold. This connects to a clean, dry air supply with a maximum pressure of 8bar(110psi). 6mm and 4mm reducers are provided with the system .

The valve block comes with 3, 4mm diameter, colour coded tubes attached to the inputs(LHS) of the 3 valves:

- (1). The top left connection is labelled 'Coolant In' and is connected via a 'clear tube' to the 1L coolant bottle through a hole in the lid of the bottle. This tube carries the coolant from the bottle to the coolant valve and has a filter(a brass frit) on the end in the bottle to stop solid particles entering the coolant tube.
- (2). The middle left connection is labelled 'Air In' and is connected via a 'blue tube' to the lhs mini regulator on the input manifold via a 4mm push fitting on the back of the regulator.
- (3). The bottom left connection is labelled 'Airblast In' and is connected via a 'black tube' to the rhs min regulator on the input manifold via a 4mm push fitting on the back of the regulator.
- (4). There are 3, 4mm diameter tubes approximately 300mm long, provided with the system. These are colour coded and are used to connect the outputs(RHS) of the valve block to the mixing block to dispense air and coolant to the nozzle. These can be replaced with longer tubes(3 x 2m tubes are provided in the packing box, with Thermublast) and cut to length as required depending on where the valve block is mounted relative to the mixing block. The order and colour coding of the tubes should be maintained as shown in the photograph of section 1.0.

2.3 Installation of the ThermuBlast System

1. Ensure the system is mounted in a secure location.
2. Fill the 1L bottle with coolant.
3. Connect clean, dry, compressed air at 8bar or less to the 8mm elbow on the input manifold.
4. Set the lhs regulator(coolant pressure) to 1 to 2 bar. Adjust later if necessary.
5. Set the rhs regulator(air blast pressure) to 2 to 5 bar. Adjust later if necessary.
6. Ensure the 12V power supply is plugged into a 13A, mains power outlet.
7. Secure the mixing block to the guide rail on Thermublast(this is how the unit comes supplied) or some part of the machine via a suitable bracket(not supplied) or magnetic base(not supplied) and direct the nozzle to the machine tool.



2.4 Priming the Liquid Lines

Priming is required on initial switch on to ensure that the liquid lines from the bottle to the valve block and from the valve block to the nozzle are full of liquid and all air has been expelled. Air in the lines will cause inconsistent dispensing of coolant. To prime the system, press the Power ON/OFF button on the LCD controller continuously and maintain in the pressed condition. During this time a line of 3, flashing blue LED's will indicate the Thermublast unit is ON. When a constant liquid flow from the end of the nozzle has been achieved, all air has been expelled from the system and priming is complete. This should take less than 30seconds. The Power ON/OFF button can then be released, switching off the unit and the LED's.

2.5 Using ThermuBlast

1. Press the Power ON/OFF button momentarily.
2. The ThermuBlast unit will start dispensing with the default settings.
3. Adjust the coolant pressure using the lhs regulator on the input manifold so that each pulse produces a spray of liquid which travels the 25mm to 50mm to the tool and no more. This is achieved via an indicated pressure on the gage of between 1 and 2 bar, depending on the viscosity of the coolant. If the pressure is too low then little or no coolant will be dispensed; if the pressure is too high then the volume and speed at which the liquid is dispensed will increase dramatically, causing the coolant to atomise and produce a mist or fog, which is highly undesirable and over long periods could pose a health hazard. Once adjusted to your own personal requirements, then lock off the regulator with the checknut.
4. Adjust the air blast(chip clearing) pressure using the rhs regulator on the input manifold. Normally this is best set between 2 and 5 bar and should be set as per your requirements and then fixed using the checknut. Setting air blast pressure above 5 bar is not recommended as this will slow down the response of the valves.
5. Once the initial settings of coolant pressure and air blast pressure have been optimised, they should remain constant and any additional adjustments can be made by changing coolant and airblast profiles in the software, from the membrane keypad on the lcd controller as outlined in the next section.



3.0 Using the ThermuBlast LCD controller

Select Button: highlights a new field to be edited each time it is pressed. On the screen shown, the current field selected (highlighted) is 'Blast Enable'. Use the Up and Dn Arrow Buttons to change this field to Off or On. The other editable fields in this menu are:
 BlastOnly(On/Off)Pulse OnTime(0.1to0.9s)
 OnPulses(1to9)
 OffTime(1to9s)

Save Button: displays save menu to allow any changes made to parameters to be stored in the unit.

Blast Button: Toggles between Coolant and Blast parameters menus

Up and Dn Arrow Buttons to change values which can be Boolean(on/off) or numerical.

Power On/Off Button: A single press Starts unit; another single press stops the unit. Running condition indicated by 3 blue leds flashing.

This photograph shows the membrane keypad and colour LCD display of the ThermuBlast LCD controller. This unit shows us the various parameters which set the functions of the unit and also allows us to edit these parameters to change the amount of liquid dispensed for cooling or the amount of air blown onto the machine tool for chip clearing.

The LCD display shows the current parameters used by the unit and also the functions of the 3 buttons on the left of the display and the 3 buttons on the right of the display. The function of these buttons changes between the 3 main menus in the system: 'coolant parameters', 'blast parameters' and the 'save changes' menu. The 3 buttons directly in line from left to right below the lcd display have labels on them to indicate their functions which never change. They are: 'Up Arrow' to increase a value, 'Down Arrow' to decrease a value and 'Power On/Off' to start and stop the unit.



4.0 Settings

4.1 Coolant Parameters:

There are 5 coolant parameters to set the amount of coolant dispensed by the coolant nozzle:

- (1). **Pulse on Time:** the on duration of the liquid dispense valve .Range 0.1-0.9 seconds.
- (2). **On Pulses:** the number of times the liquid dispense valve is switched on and then off. Range 1-9
- (3). **Off Time-**the delay after dispensing the 'On Pulses'. Range 1-9 seconds. After the off time delay the next cycle of pulses will occur.
- (4). **Enable/Disable air blast:** Air blast is the chip clearing function which has its own parameters set using the 'blast' menu button. If set to 'On' then the air blast settings will be as per the Blast Parameters menu; If set to 'OFF' the the air blast chip clearing function is disabled.
- (5).**Blast only:** This disables all liquid dispensing functions.



Use the 'Select' button to highlight the field to be edited/changed.

Use the 'Up Arrow' and 'Dn Arrow' to increase or decrease or toggle values.

Use the 'Save' key to switch to the 'Save changes Menu' to confirm and save the changes made.

Use the 'Blast' key to switch to the 'Blast Parameters Menu'



4.2 Air Blast Parameters

There are 5 blast parameters to set the amount of Air blown onto the machine tool after the liquid coolant cycle has been completed:

- (1). **Pulse on Time:** the on duration of the air blast valve. Range 0.1-0.9 seconds.
- (2). **On Pulses:** the number of times the air blast valve is switched on and then off. Range 1-9
- (3). **Off Time-**the delay after dispensing the air blast 'On Pulses'. Range 1-9 seconds. After the off time delay the next cycle of liquid coolant pulses will occur(followed by the air blast pulses).
- (4). **Thermublast unit timeout in Hours(0-9)**
- (5). **Thermublast unit timeout in minutes(1-59)**

The thermublast unit will automatically switch off completely once the Timeout Settings have been exceeded. This function minimises use of coolant if the operator forgets to switch the unit off.



Use the 'Select' button to highlight the field to be edited/changed.

Use the 'Up Arrow' and 'Dn Arrow' to increase or decrease or toggle values.

Use the 'Save' key to switch to the 'Save changes Menu' to confirm and save the changes made.

Use the 'Coolant' key to switch to the 'Coolant Parameters Menu'



4.3 Save Changes Menu

This menu appears when the operator selects **'Save'** from the **'Coolant Parameters Menu'** or **'Blast Parameters Menu'** or if the operator changes between the Coolant and Blast parameters menus at any time.

Simply select **'Yes'** to save changes or **'No'** to discard any changes made.





5.0 Maintenance :

Caution Safety Warning

Make sure that you wear safety glasses at all times during maintenance and remember that the unit is connected to a compressed air supply and a 3pin, 240Vac power outlet(via a 12V dc power supply).

The buttons on the membrane keypad should be pressed with fingers only and definitely not with tools such as screwdrivers and so on as this may damage the membrane and allow water ingress which will eventually result in failure. Also, avoid pressing buttons with fingernails if possible.

To keep the Thermublast unit working at maximum efficiency you must do some basic checks every month. Make sure that the Thermublast unit is OFF using the start/Stop button on the LCD controller.

It is recommended you carry out the following checks every month and perform corrective measures where necessary:

- Top-up the 1L coolant bottle with clean coolant, by unscrewing the cap and using a funnel to avoid spillage. If the coolant in the bottle is dirty or contains any solid residues then these MUST be removed as they will clog the filter leading to the valve block and the liquid flow will be reduced or even stop. This may be a problem if you use certain water based coolants which react with air and oxidise over time to form a solid precipitate in the bottle. Using distilled or de-ionise water when making up the coolant will reduce this problem.
- Unscrew the cap on the bottle and remove the liquid tube to inspect the filter on the end. If the filter is clogged then clean it with a clean cloth and then replace the tube in the bottle and flush clean liquid through the system by pressing and keeping pressed the Start/Stop button. This will open all the valves and flush the system until you release the Start/Stop button.
- If you find that the liquid does not shutoff(stop) when the thermublast unit is stopped then this suggests that some solid material has passed through the filter and down into the valve. The valve is no longer fully closing and so liquid is leaking past the seal. This can be corrected by repeatedly flushing as in the last section or by assisting the flush using compressed air applied to the filter. The valves have a very large orifice of 5mm and so most contaminants should pass through without obstructing the lines.
- Check that the cable glands are all tight on the LCD controller and valve block to prevent the ingress of coolant and debris.
- Use a clean cloth to remove any debris from the LCD controller and the valve block.



6.0 Troubleshooting

Fault	Cause	Remedy
<p>Power-up failure</p>	<p>Electrical supply disconnected</p>	<p>Check the 12V power supply is plugged in to the mains outlet and connected to the 3.5mm connector (red/blk cable) on the controller.</p>
		<p>Press On/Off button on controller and the blue leds should illuminate.</p>
	<p>Faulty 12V power supply</p>	<p>Check voltage is 12V and replace if faulty.</p>
<p>No Air pressure</p>	<p>Air supply disconnected</p>	<p>Check the pneumatic supply to unit</p>
<p>Amount of liquid dispensed reducing over time.</p>	<p>Filter clogged in coolant bottle</p>	<p>Clean filter</p>
	<p>Check coolant clean and free from contamination. Try increasing the dispense pressure on the lhs mini regulator on the input manifold but do not increase so much as to cause misting or fogging.</p>	<p>If coolant dirty or contains solids, replace it with fresh.</p>



Fault	Cause	Remedy
<p>Dispensing nozzle drips after thermublast switched off</p>	<p>Debris in liquid valve preventing valve fully closing.</p>	<p>Flush clean coolant through valve block by pressing and holding the Start button. After 30 seconds release button and check again for drips. Repeat if necessary.</p>
		<p>If flushing doesn't cure the drip then unscrew the lid from the coolant bottle and lift the tube with the filter out of the bottle. Press the start button once to start thermublast and then blow compresses air through the filter with an air gun at about 0.5bar being carefull to observe the usual safety precautions when dealing with compressed air. Any debris should clear in a few seconds..</p>
	<p>Faulty Valve</p>	<p>Replace valve</p>
<p>No air blast function or No cooling function or neither</p>	<p>Pressure set on regulators on the input manifold is too high(greater than 5bar). This increases the time taken to open the valves to more than 0.1 secs and so if you are using a profile with 0. 1secs pulses then the valves may not switch on at all.</p>	<p>Reduce air pressure on lhs regulator to 1-2bar and rhs regulator to 1-5bar</p>
		<p>If you really want to use more than 5bar you can, but you may have to increase the pulse times for coolant and airblast profiles to 0.2secs or 0.3secs to ensure the valves open and close in time.</p>



7.0 More information on ThermublastMQL:

Website : thermublastmql.com

- Information about Thermublast and all its accessories.
- FAQ's
- Technical discussions

Youtube channel: ThermublastMQL

- Applications and installation examples.
- A more in depth explanation of thermublast

Contact us via email: sales@thermulan.com