

Operating Instructions

for Safe Use of Thermostat Control Bitumen Boilers SMS4/5



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I n t r o d u c t i o n

Thank you for choosing to purchase a new W.J. Horrod Ltd Safety Melt Series Thermostat-controlled bitumen boiler.

All our products are made to a very high, and recognised engineering standard, and if used correctly by a trained, certificated operative, to our operating and maintenance instructions, will increase the machines longevity.

Operatives must always read the manufacturers operating instructions before attempting to use the machine.

No attempt must be made to carry out any repairs or maintenance whilst equipment is in operation. Safe working practise is a legal requirement and must always be adhered to. Protective clothing should always be worn when operating this equipment.

Faulty equipment should be immediately shut down and reported directly to the supervisor/person in charge, and not used again until the fault has been rectified.

PLEASE NOTE

This unit was manufactured for use with bitumen only. Using any other materials goes against its intended use.

Using this unit for any other material is done so at your own risk and could nullify the manufacturer's warranty.

**T h e s e o p e r a t i n g i n s t r u c t i o n s s u p e r s e d e a n y p r e v i o u s
v e r s i o n s .**

Setting Up Procedure:

You have a SMS4/5 bitumen boiler which is fitted with a fixed anti-splash lid complete with loading chute and will either be fixed to the rear of your vehicle or mounted on a trailer. Before you start you should make sure your vehicle/trailer is situated on flat level surface (where applicable).

To avoid water entering the pan area when not in use, please pull the loading chute (SMS4) drawer out from the boiler and leave tilting downwards, towards the floor (this will help prevent rainwater etc., from entering the pan through the chute.)

IMPORTANT: PLEASE ENSURE THERE IS NO WATER LYING INSIDE THE PAN BEFORE YOU USE THE BOILER.

Propane Cylinders:

Remember that propane is a liquid, and if the cylinders are laid down (horizontal) at any time or to be moved, they should always be placed upright for at least 30 minutes to allow liquid to settle before connection to your appliance, or the cylinder is opened.

Boilers must be at least 3 metres from the propane cylinders. **Vehicle mounted boilers should have the cylinder carriers mounted at the front of the body (behind the cab).** Depending on type of trailer the same applies with regards to the cylinders. **On our fast tow trailers there is a dividing panel/heat shield between the gas cylinder, and the boiler due to the proximity of the cylinder to the boiler.**

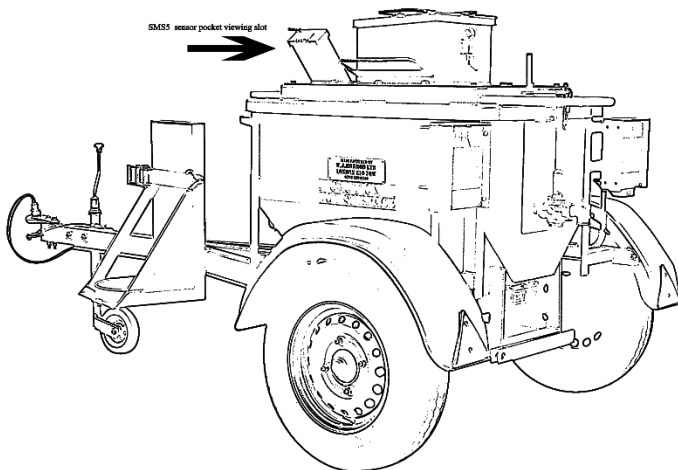
Loading, Emptying & Re-charging the Boiler:

SMS4 Only Break the bitumen into small pieces and load the boiler – filling as many voids as is possible.

Always use clean surfaces to break the bitumen on to avoid foreign material becoming stuck to the bitumen, and eventually causing the tap to clog.

NEVER drain the material lower than the sensor pocket and ensure that the boiler is re-charged as before, breaking bitumen into small pieces.

On the SMS5 model there is a built-in viewing opening fitted to the top. (See image)

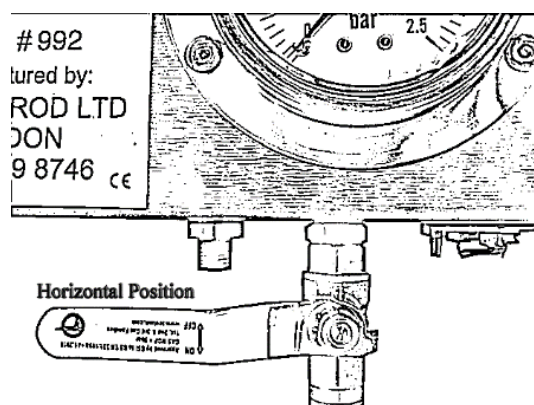
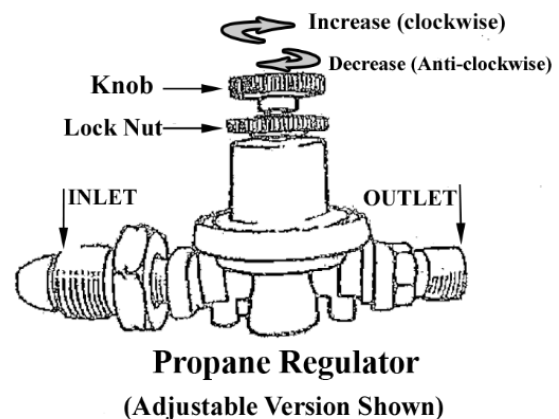
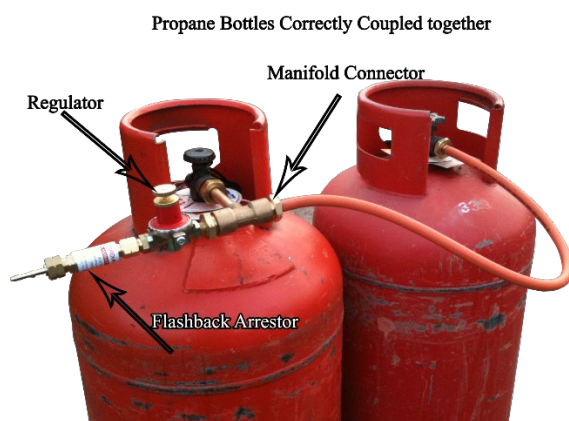


It is imperative that all operatives wear full face protection and clothing when operating this equipment. Broken pieces of bitumen are placed carefully into the loading chute and before dispensing (opening the loading plate to drop the broken bitumen pieces into the boiler) the material that the lid is closed to avoid the bitumen splashing back.

All gas equipment should be checked thoroughly for any damage prior to use. Hoses, regulators, connectors, and the LPG propane gas bottle thread into which the POL nut is inserted must be free of any debris. **Leak Detector spray** should be used to check for any gas leaks. **Never use a naked flame to check for leaks.**

Lighting/Thermostat Control Unit – Tempcon 2000

Making sure all your gas carrying connections are clean and undamaged, connect 2 No. 47kg propane cylinders together using a bottle manifold, fitting the 0-2 bar (30 PSI) regulator to the final exit from the manifold, then connect metal braided hose to the regulator and the underside of the Tempcon unit. Make sure that the regulator is set to zero by turning fully anti-clockwise. PLEASE NOTE: Make sure you use the correct spanner/adjustable spanners to avoid damage to brass nuts. Always use LEAK DETECTOR spray to test for gas leaks. **NEVER** use a naked flame to detect a gas leak.



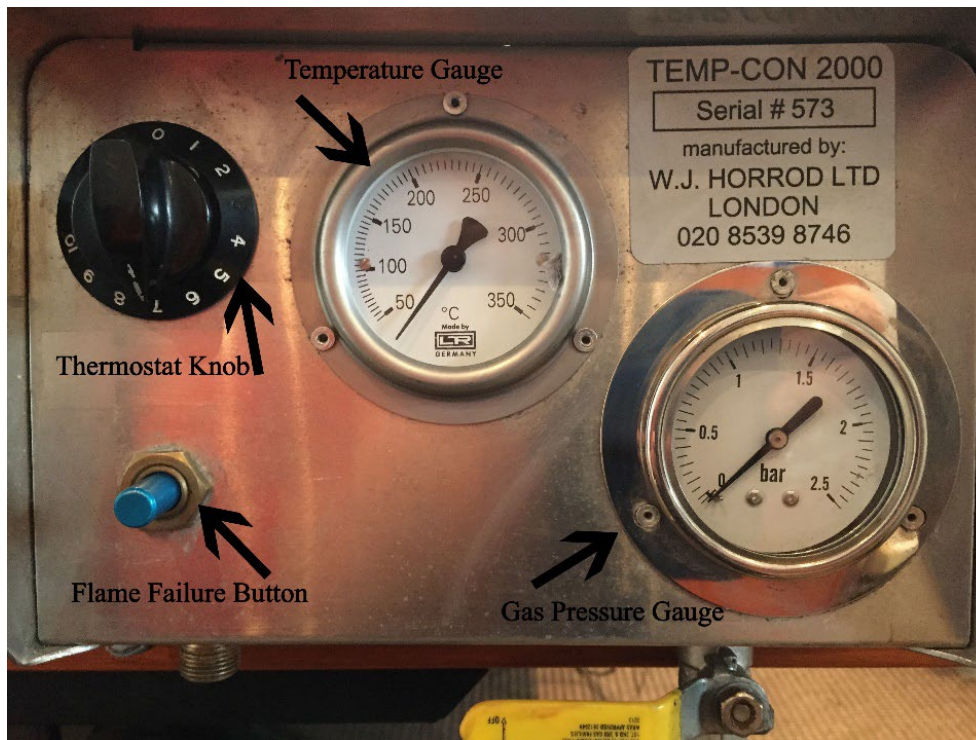
Ensure that main burner tap is in the off position i.e., horizontally across the tap is off, vertically is on. Insert the burner into boiler until you have the capillary sensor probe 3-4" into the pocket. Turn on the gas at the cylinder and adjust the regulator clockwise until some resistance can be felt from the spring. You should now test, using your leak detector spray, all the gas carrying connections. Once all connections have been safely established, turn on and light the auto torch (if fitted), depress the flame failure button, and hold in, whilst you light the pilot burner, using the auto torch/ or other means.

Keep the button depressed for approx. 15 seconds then release. Pilot burner should now stay alight. If the pilot goes out repeat procedure until it remains successfully lit.

Push the burner fully into the boiler and lock into place by means of the anti-luce fastener.

Now the pilot flame has been established, open the main burner ball valve slowly till fully open adjust the propane regulator on the bottle until 1.5 bar (22 PSI) is registering on the pressure gauge located on the control box. NOTE: – The burner should not be operated above 1.5 bar (22 PSI).

The Thermostat can be set once the material has reached your required temperature by turning the thermostat knob anti-clockwise until main burner flame goes out; this point will now become your set temperature and you should not change this. The main burner will now be controlled thermostatically.



Fault Finding:

Should the pilot fail to stay lit when the flame failure button is released, check the following:

- 1} There is a strong flame on the pilot burner (a weak flame will indicate dirt in the pilot jet) this will prevent the pilot from sufficiently heating the thermocouple.
- 2} Check the thermocouple connection where it connects to the Tempcon unit. Make sure the hot junction of the thermocouple electrode is correctly situated in the hottest part of the pilot flame. (Approx. ¼" (6 mm).
- 3} Having checked 1 & 2 you may find it necessary to replace the thermocouple.

If in any doubt, please contact the manufacturers. The contact number is on the front cover.

Working Temperature:

The materials used within the industry require different laying temperatures. Please consult your supplier/manufacture's Safety Data Sheet to ensure the correct laying temperature of the particular type of bitumen you are using and to ensure you do not overheat/damage the materials.

The information below is for guidance only.

The flash point is approximately around 300°C.

The ignition point is anything above 300°C.

Manufacturers – i.e., Permanite & Ruberoid have always maintained that

When overheated all bitumen products lose the 'PEN' value and this is

Particularly noticeable where polyester modified products are used.

The Heating Process:

The 'Lump'.

What do we mean by the heating process? This is an understanding of what takes place with the bitumen inside the pan, and the appliance itself. We often hear operatives refer to the 'LUMP' when using thermostat-controlled boilers. To explain, by this they mean the un-melted portion of bitumen in the pan when the majority of the material may be at laying temperature – this 'LUMP' has always been there, but in the past operatives have not necessarily noticed it because; a) bitumen was being ladled & b) boilers were not thermostatically controlled.

The reason the lump exists is when heated, bitumen transfers the heat from the bottom to the top and therefore the hot bitumen is being ladled from the top thus not revealing the 'Lump', whereas when drained from the bottom it is far more evident to the operatives. The other main reason for this was also that the uncontrolled boilers were always heated to approximately 40/60°C above what the correct thermostat control boilers now provide, this also means that the heating process is slightly longer.

Boilers with taps are fitted with a mesh guard on the inside of the pan in front of the tap aperture to avoid clogging from the un-melted bitumen

Recovery Period:

This relates to the time between the shutdown of the burner at reaching the correct temperature set by the thermostat, until the stat reads a sufficiently decreased temperature to reintroduce the burner and begin the heating process again.

This 'recovery' period occurs for the following reasons:

A thermostatically controlled bitumen boiler such as the SMS4 controls the temperature and shuts down the burners in keeping with the safety advice of both BSI, and that of material manufacturers.

The moment the Tempcon thermostat on the safety melt boiler shuts down the main burner, the whole of the boiler starts to lose heat, it is only when a heat loss is detected that the thermostat will re-ignite the main burner, the temperature will however, continue to drop until the lost heat has been recovered after which the temperature will start to climb.

Boilers **without** thermostat control cannot sense the temperature, thus they do not shut down at the appropriate time. Whilst this means there is no recovery period, there is the danger of flashing, material degradation, and burning the bitumen to the pan bottom. making it less efficient and in the long run it will reduce the life of the unit

NEVER LET MATERIAL FALL BELOW THE TEMPERATURE SENSOR CAPILLARY TUBE.

Latent Heat:

Latent heat refers to the heat remaining in the boiler after the temperature has been reached and the burner cuts out. The latent heat within the combustion chamber of the boiler will extend the temperature by as much as 10/20°C especially when the ambient temperature is quite high this excess temperature is known as the 'overshoot'.

(Ambient refers to surrounding temperature).

Expansion:

Bitumen when heated will expand approximately 20% and therefore it is important not to over fill the boiler when loading.

Shutting Down & Leaving the Boiler Safe:

- 1} Turn off the gas from the cylinder so that the burner can use up any gas left in the hose, when pilot and main burner flames have gone out close burner tap, slacken off pressure on propane regulator.
- 2} Empty bitumen out from the drain tap, no lower than the top of the sensor pocket gusset plate, this will be subject to when the boiler is used next, i.e., if job is finished or boiler is to be used on same site the next day.
- 3} Close the drain tap fully when emptied.
- 4} Close the lid.
- 5} Withdraw the burner from the boiler. (Always take the burner, where possible, away from boiler and store gas cylinders in a suitable 'lockable' cylinder storage container).
- 6} The boiler must be cleaned weekly to avoid build-up of material, which will affect the boilers performance, and could prevent the thermostat from working correctly.

Bitumen Boiler Decanting:

The most common method over the last 30 or more years, has been to use a ladle (a large, long handle spoon) whereby the operative would place his open top bucket on the edge of the bitumen pan, with the lid removed, he would scoop the bitumen out with the ladle and pour it into the bucket. This method, for obvious reasons are now outlawed by companies due to the obvious Health and Safety concerns it creates, and is frowned upon today.

Horrod's have overcome this, and have developed and supplied bitumen boilers certified by FRA formerly the FRCAB, which have outlet taps and are thermostat controlled. Taps are a much safer option and come in three different types: cast iron plug cock, immersed and banjo/gate type.

Plug and gate type taps are not without their problems, due to the nature of the material (bitumen) being an adhesive can cause the tap to seize up. The process is accelerated if the tap is not constantly in use, the material being used at a much lower temperature, and in winter conditions. This is mainly due to the working parts of the tap being sited on the outside of the boiler.

Should this occur, operatives can use a gas torch to free it up by carefully warming the tap making sure, before they do so, that the following procedure is carried out;

- 1] The lid is in place and in the closed position.
- 2] Bitumen temperature should not be any higher than the material manufacturer specifies, (due to variation of materials) please refer to the manufacturer's data sheet/specification. This can be checked with a hand-held purpose made bitumen thermometer. **If boiler is fitted with thermostat control always remember the bitumen within the boiler will be at least 10°C hotter than that recorded on thermostat control box gauge.**
- 3] Place a clean bucket beneath the tap.
- 4] Light the torch and apply a gentle heat to the body of the tap, making sure not the overheat causing tap to expand and allow bitumen to seep out between the faces.
- 5] Most importantly, before attempting to open the tap turn gas off at the cylinder and wait for the torch flame to go out.
- 6] Attempt to open tap, should this fail, repeat the process above.
- 7] IMPORTANT. Please note, failure to carry out this procedure can lead to the following; if the bitumen was at flash point, and the torch is left alight upon opening the tap it could cause bitumen from the tap to flash and self-ignite

Health & Safety:

- 1} **This equipment should only be used by a trained, and certificated operative.**
- 2} **Protective clothing and a full-face mask should always be worn when operating this machine.**
- 3} **Never leave equipment unattended when alight or running.**
- 4} **If a fault occurs shut down equipment immediately and report fault to the person directly responsible.**
- 5} **Always turn the propane cylinders and the burner off and allow the boiler to cool down before ANY maintenance or repairs are carried out.**
- 6} **When machine is being used where the general public may come into contact 'hot surface' warnings should be posted on or around machine.**
- 7} **Last, but not least, always remember that safety is everyone's responsibility, never do anything that is likely to put yourself or anybody else at risk.**
- 8} **If you have any questions concerning following any of the procedures herein, please contact us On 020 8 539 8746 or Terry 07947 876203**

Use only certified hoses to BS:3212 or BS: EN:1763-1 or BS: EN:16436-1 which bear the year and name of manufacturer or stainless-steel convoluted hoses marked EN:10380 as LPG attacks and erodes natural rubber.

Regulators must be marked BS:3016 or BS: EN:12864 or BS: EN:16129. Any regulator marked BS:3016 will be over 10 years old and should be replaced.

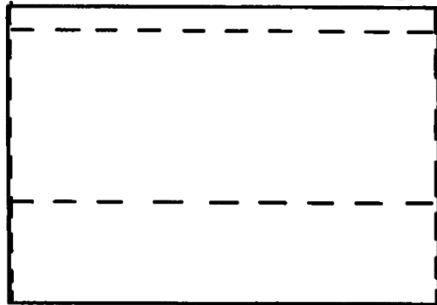
Bitumen materials vary, always consult your suppliers/manufacturer's data sheet to ensure the correct working temperature of the product. Always follow the guidance within the data sheet on using this material.

Tempcon 2000 Thermostat Control Box Layout

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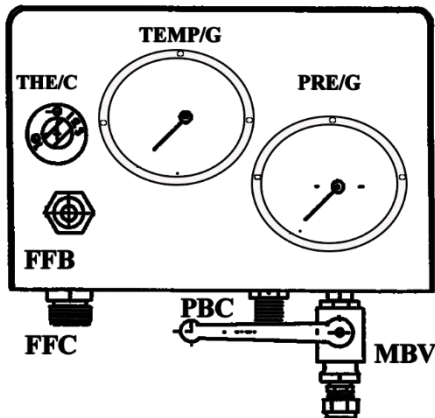


Tempcon 2000 Thermostat Control Box Layout

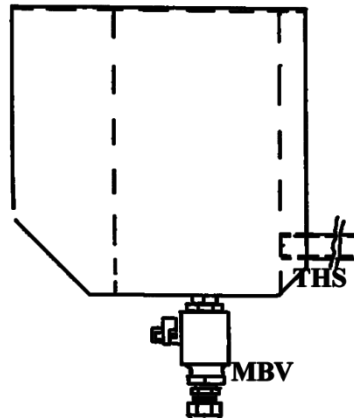


ABBREVIATIONS	PART DESCRIPTION	POSITION
TEMP/G	Temperature Gauge	Front
PRE/G	Pressure Gauge	Front
THE/C	Thermostat Control Knob	Front
FFB	Flame Failure Button (Blue)	Front
MBV	Main Burner On/Off Ball-valve	Bottom
THS	Thermostat Sensor Tube	Back
THC	Flame Failure Thermocouple Connection	Back
FFC	Flame Failure Gas Inlet Connection	Bottom
PBC	Pilot Burner Gas Outlet Connection	Bottom

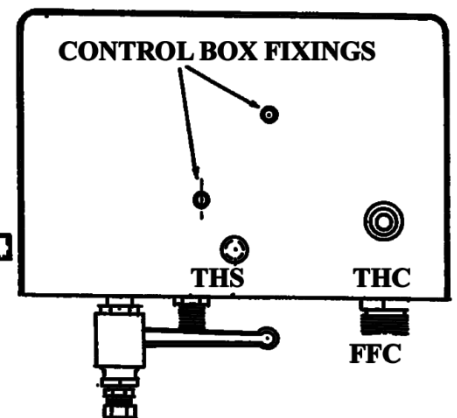
PLAN



FRONT



SIDE



MBV

BACK

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