

# Operating Instructions

for Safe Use of Thermostat Control  
Bitumen Boiler SMS2



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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 material 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 .**

# **I m p o r t a n t   I n f o r m a t i o n**

- 1] **Important! Never** attempt to operate the equipment before carefully reading the following instructions, and having been shown to do so by a trained, qualified person.

Always wear the correct safety clothing and a full-face shield

- 2] **Never** attempt to carry out any repairs or servicing before the burner has been shut down. Always turn the propane gas off at the cylinders, and allow the boiler to go cold.
- 3] If faults are discovered, the machine should be shut down as above (paragraph 3). The problem should then be reported to the person directly responsible. The machine should, on no account, be used again until all faults have been corrected.
- 4] The equipment should never, under any circumstances, be left unattended when in use.
- 5] Always ensure that the material outlet tap is in the closed position.
- 6] 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.

## S e t t i n g   U p   P r o c e d u r e :

The boiler should be placed in the correct sized, rectangular safety tray, on a flat level surface (where applicable). Always ensure that the boiler is situated correctly within the tray, to allow space for the safety pouring bucket to be placed under the outlet tap, and withdrawn without obstruction from the tray.

**IMPORTANT: PLEASE ENSURE THERE IS NO WATER LYING INSIDE THE PAN.**

## P r o p a n e   C y l i n d e r s :

Always remember propane is a liquid and if the cylinders have been in a horizontal position (laid down) to be moved, they should always be placed upright for at least 30 minutes to allow liquid to settle, before any connections, or the cylinder is opened.

Boilers must be at least 3 metres from the propane cylinders. The cylinders should be stood on a flat surface and not left free standing - hose should lie along the floor and not suspended from the bottles to the boiler as this is a trip hazard. Propane gas should always be used in accordance with the supplier's recommendations.

## L o a d i n g ,   E m p t y i n g   &   R e - C h a r g i n g   t h e   B o i l e r :

Wearing the correct protective clothing, we recommend breaking the bitumen into small pieces to 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).

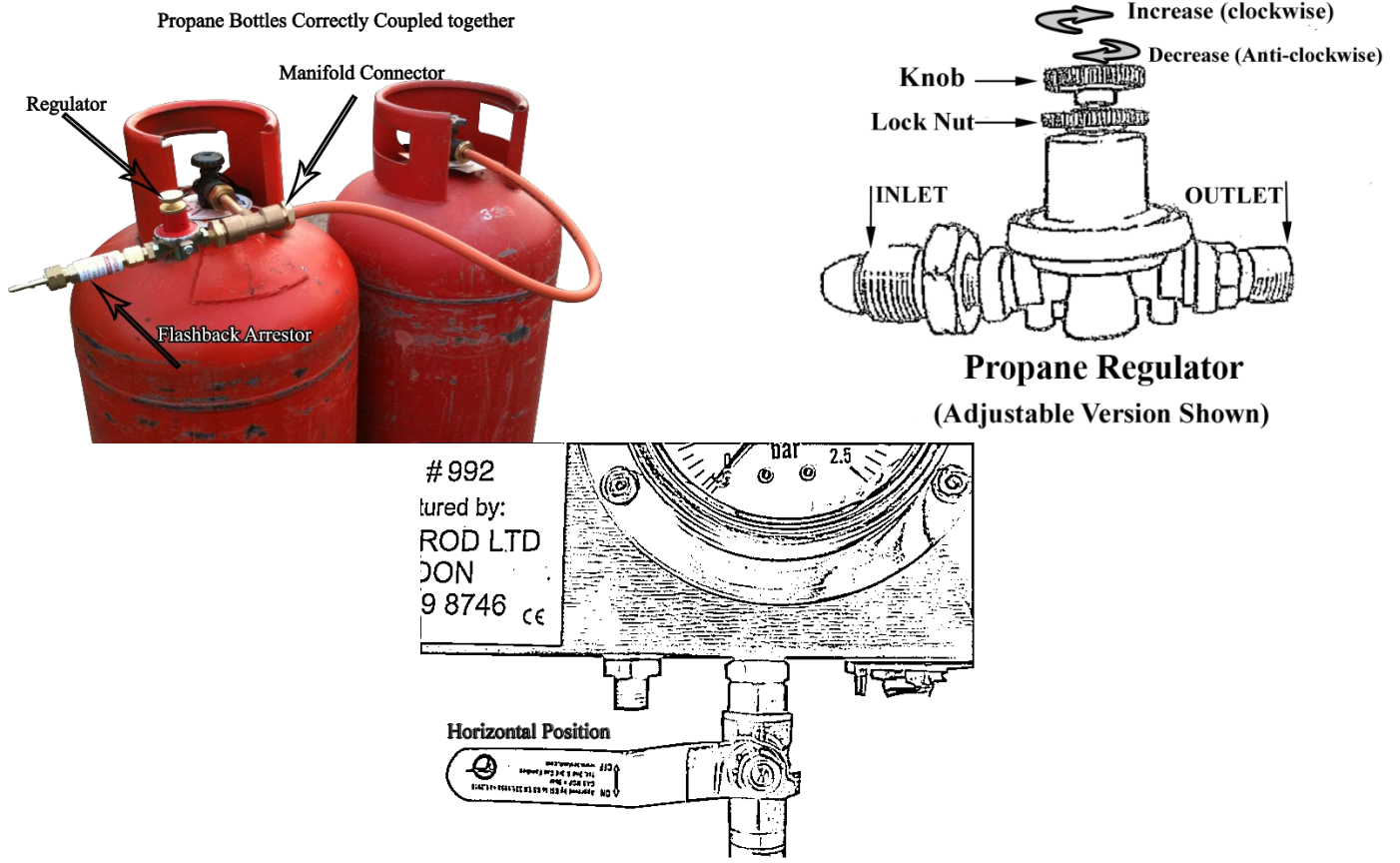
**NEVER drain the material lower than the sensor pocket and ensure that the boiler is re-charged as before, breaking bitumen into small pieces.**

It is imperative that all operatives wear full face protection and clothing, and broken pieces are placed carefully into the boiler to avoid the bitumen splashing back.

**Please ensure that you clean the pan i.e., chipping out at least every month to avoid a build-up of burnt material.**

# Lighting/Thermostat Control Unit – Tempcon 2000

Making sure all your gas carrying connections are clean and un-damaged connect your 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 correct spanner/adjustable spanners are used 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 – in line with the tap vertically is on.

Insert burner into boiler until you have the capillary sensor probe 3-4" into the pocket. Turn on the gas at the cylinder and adjust regulator clockwise until some resistance can be felt from the spring. You should now test using your leak detector spray all your gas carrying connections.

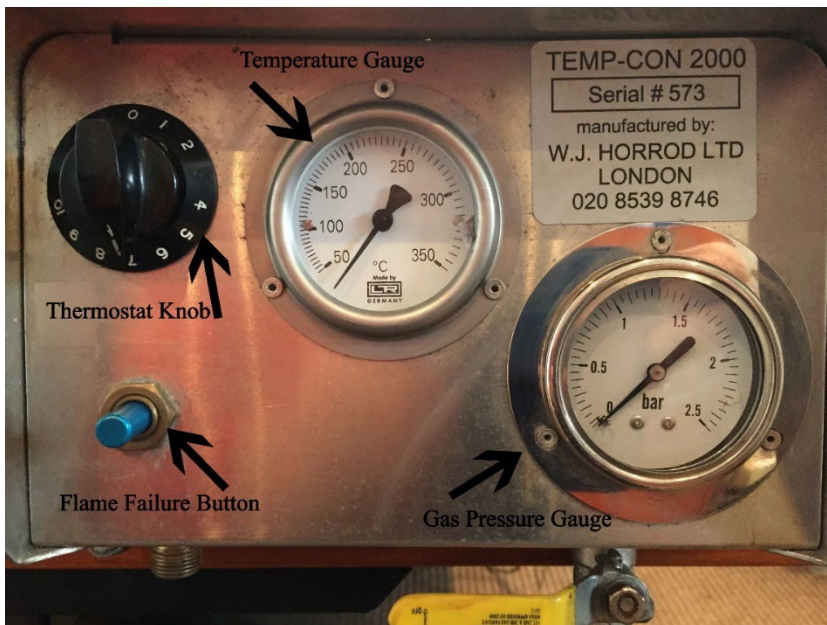
Turn on and light auto torch (if fitted), depress the flame failure button and hold in whilst you light the pilot burner using the auto torch/other means. Keep the button depressed for approx. 15 seconds, then release.

The pilot burner should now stay alight. If pilot goes out repeat the procedure.

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

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

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.



### F a u l t F i n d i n g :

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. Before changing the thermocouple ensure that the gas supply is turned off from the bottles and the area is cool enough to do so.

**If in any doubt please contact the manufacturers – contact number on the front cover.**

## S A F E 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' (penetration) value and this is particularly noticeable where polyester modified products are used.

DUE TO THE FACT THAT NEW MATERIAL IS BEING INTRODUCED INTO THE MARKET PLACE ALL THE TIME, SOME OF THE ABOVE MAY NOT APPLY. IF IN ANY DOUBT PLEASE CONTACT THE MANUFACTURERS OF THE BOILER OR SUPPLY A SPECIFICATION SHEET ON THE MATERIAL SO WE CAN CHECK THAT THIS BOILER IS SUITABLE FOR YOUR APPLICATION.

### 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 thermostat 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.

This 'recovery' period occurs for the following reasons;

Boilers without thermostat control do not sense the temperature thus they do not shut down at the appropriate time – no recovery period, and the danger of flashing.

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 lose 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.

NEVER LET MATERIAL FALL BELOW THE TEMPERATURE SENSOR CAPILLARY TUBE (shown below).

## 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 all bitumen out from the drain tap, no lower than the top of the Capillary tube (sensor probe pocket) if the boiler is to be used on same site the next day.  
If the job is finished and the boiler will not be used for a few days/weeks, fully empty the machine and check pan/capillary tube.
- 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 the boiler and store the gas cylinders in a suitable lockable cylinder storage container/cage).

## Bitumen Boiler Decanting:

The most common method over the last 30 or more years has been to use a ladle (a large long handled 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 presents many Health and Safety concerns 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, this process will be accelerated if tap is not constantly being used, 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 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 faces.
- 5] Most importantly before attempting to open the tap turn gas off at the cylinder and wait for torch flame to go out.
- 6] Attempt to open tap, should this fail repeat the above process, patience is essential with this process.
- 7] IMPORTANT – please note failure to carry out this procedure can lead to the following; if bitumen was at flash point and torch was left alight when tap was opened it could cause bitumen from the tap to flash and self-ignite

# H e a l t h   &   S a f e t y

- 1} This equipment should only be used by a trained, certificated operative.
- 2} Protective clothing and full-face mask should always be worn when operating or loading material.
- 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 propane cylinders, and burner off and allow the unit to cool down before 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 and around the 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 ever in any doubt, or you require additional information please contact us: Tel: 020 8539 8746

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.

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.

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.

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