

W.J. Horrod Ltd

Est. 1950

Operating Instructions for Safe Use of Thermostat Control Bitumen Boilers SMS2

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**1 Leaway
off Lea Bridge Road
Leyton
London
E10 7QW**

**Phone
0208 539 8746**

**Terry Horrod
07947 876203**

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Thank you for choosing to purchase a new W.J. Horrod Thermostat Control 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 operational and maintenance instructions will give a good and long lasting service. Operatives must always read manufacturers user instructions before attempting to operate machine. No. attempt must be made to carry out any repairs/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 equipment. Faulty equipment should be immediately shut down and reported directly to the person in charge and not used again till the fault has been rectified.

Setting Up Procedure:

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the boiler is situated correctly to allow space for the safety pouring bucket to be placed under the outlet tap and withdrawn without obstruction from the tray.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

Propane Cylinders:

Always remember propane is a liquid and if the cylinders are laid down to be moved they should always be placed up right for at least 30 minutes to allow liquid to settle before connection or cylinder is opened.

Boilers must be at least 3 metres from the propane cylinders – 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.

Loading – Emptying & Re-Charging the Boiler:

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.

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. Pilot burner should now stay alight - if pilot goes out repeat 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.

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Blue Button = Flame failure button
Black Dial = Thermostat knob
Clock in the centre = Temperature gauge
Clock to the right = Gas pressure gauge

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 – contact number on the front cover.

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Working Temperature:

The correct working temperature of bitumen as stated by the B.S.I. (British Standards Institute) BS 800 Part 4 1989 says 'DO NOT HEAT BONDING BITUMEN ABOVE 260°C'

Permanite say 'TEMPERATURE FOR 3 LAYER WORK – NOT ABOVE 240°C.

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.

DUE TO THE FACT THAT NEW MATERIAL IS BEING INTRODUCED ALL THE TIME SOME OF THE ABOVE DOES NOT APPLY AND 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', where as 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

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Recovery Period:

This relates to the time between the shut down 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 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.

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 cylinder storage container).

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 where by the operative would place his open top bucket on the edge of the bitumen pan, with the lid removed he would scope the bitumen out with the ladle and empty into the bucket. This method for obvious reasons presents many Health and Safety concerns and is frowned on 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.

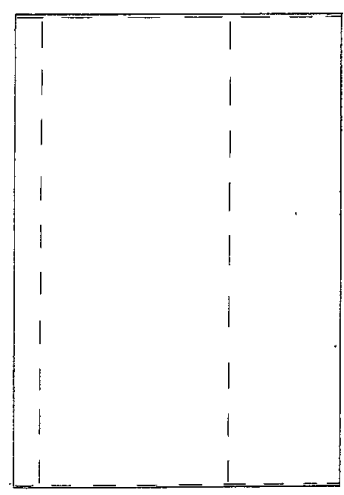
- 1] The lid is in place and in the closed position.
- 2] Bitumen temperature should not be any higher than 260°C – this can be checked with a hand held purpose made bitumen thermometer – if boiler is fitted with thermostat control always remember the bitumen within the boiler will be at least 10°C hotter 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 to 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.
- 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

Health & Safety:

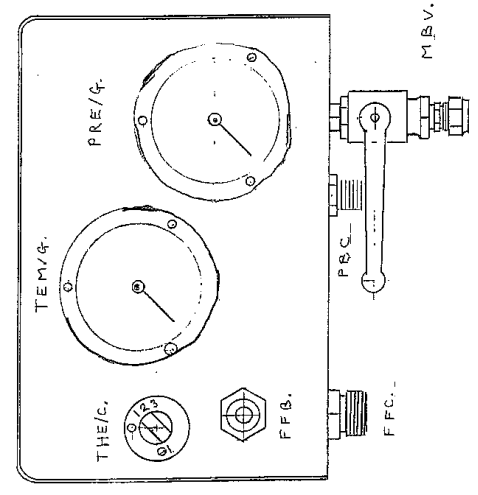
- 1} **Equipment should only be used by a trained certificated operative.**
- 2} **Protective clothing and full face mask should always be worn when operating or loading material.**
- 3} **Never leave equipment unattended when alight or running.**
- 4} **If a fault occurs shut down equipment immediately and report fault to the person directly responsible.**
- 5} **Always turn propane cylinders and burner off 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 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.**

EV MODIFICATION.	DATE	SIG.	MATERIAL.	DRN	W.J. HOKKOU LIL W.
				CHKD	PLEAYAY LONDON IO-7AM REF
			FINISH.	DATE	TEL. 0161. 539. 5746.
					TEMP CON 2000 THERMOSTAT
					CONTROL BOX LAYOUT.

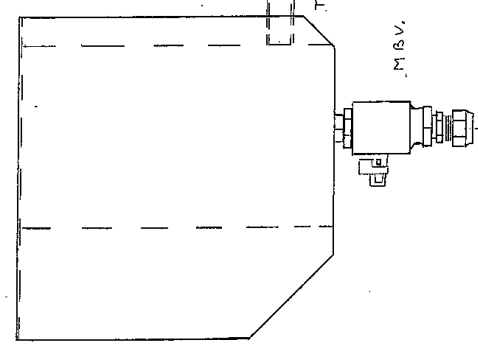
ABBREVIATIONS.	PART DESCRIPTION.	POSITION.
TEM/G.	TEMPERATURE GAUGE.	FRONT.
PRE/G.	PRESSURE GAUGE.	"
THE/C.	THERMOSTAT CONTROL KNOB	"
F F B.	FLAME FAILURE BUTTON. (BLUE)	"
M B.V.	MAIN BURNER ON/OFF BALL VALVE.	BOTTOM.
T H.S.	THERMOSTAT SENSOR TUBE.	BACK.
T H.C.	FLAME FAILURE THERMOCOUPLE CONNECTION.	"
F F.C.	FLAME FAILURE GAS INLET CONNECTION.	BOTTOM.
P B.C.	PILOT BURNER GAS OUTLET CONNECTION.	"



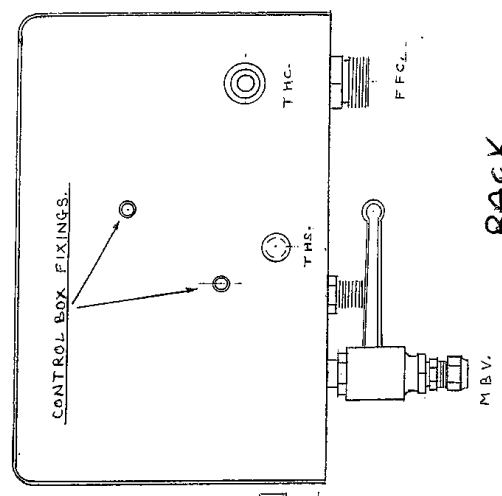
PLAN.



FRONT.



SIDE



BACK

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