Oval 80 Sentinel

辐射管式育雏取暖器

AR080 (1) 23.4 kW
AT 125 36.6 kW

可用于丙烷气
或天然气

(1) 美国注册专利号：9,303,880

在线查看手册可登录网站 www.lbwhite.com

注意

本育雏取暖器经 L.B.White 公司测试、评估，可作为 正规燃气直燃式育雏取暖器，用于家禽圈舍设施的供暖。

如果您正考虑将本产品用于其他用途，请事先联系您的燃气供应商或 L.B.White 了解相关情况。 您可以拨打电话 001-608-783-5691 联系位于美国的 L.B.White 公司。

www.lbwhite.com

恭喜您！

您刚刚购得了世界上品质
最佳的家禽圈舍用辐射管式育雏取暖器。

L.B.White 辐射式育雏取暖器性能出众，
由资深育雏取暖器厂商采用最新技术研发而成。

L.B.White 感谢您对于我们产品的信赖。如果您有任何的意见或建议，欢迎拨打免费电话 001-608-783-5691 联系我们。

请参见
内部装配
说明

适用海拔高度信息详见内封面。

请扫描二维码

您可以用手机扫描查看链接
或登录网站
http://i.youku.com/lbwhite
查看 L.B.White 育雏取暖器的维护视频。*

** 须在您的安卓或苹果手机上安装二维码识别应用程序*

目录

⚠ 警告

标准设备应置于海拔 0 - 610 米处方可实现最大工作效率。

海拔过高将会导致设备无法正常运作，同时伴随一定风险。 公司正考虑推出可用于不同海拔高度的设备。

如果您需要在高海拔地区使用本产品，但在订购时又无法知悉该型号产品所适用的海拔高度，请联系我们寻求技术支持。

⚠ 一般危险警告

■ 失于遵守随本育雏取暖器提供的注意事项和说明，可能导致：
- 人员死亡
- 人员肢体重伤或烧伤
- 火灾爆炸，进而造成财产损失
- 因缺乏足够的空气供应或一氧化碳中毒而窒息
- 触电

■ 安装、使用本产品前请先阅读本用户手册。
■ 本产品的用户和维修人员须能够阅读、理解并遵守说明书中的内容要求。
■ 请收好本用户手册，便于今后参考使用。
■ 用户手册与更换标签均免费。 查看网站或寻求协助，请致电 +1-608-783-5691 联系 L.B.WHITE。

⚠ 警告

■ 在育雏取暖器的燃气入口处必须提供适当的燃气供应压力。
■ 供气压力具体值请参照参数标牌。
■ 供气压力不得高于育雏取暖器入口所示的上限值，否则可能导致火灾或爆炸。
■ 火灾、爆炸可能引起严重的人员伤亡或栋舍损毁。
■ 供气压力不得低于育雏取暖器入口所示的下限值，否则可能导致燃烧不充分。
■ 燃烧不充分可能引起窒息或一氧化碳中毒，进而导致严重的人员伤亡。

⚠ 警告

火灾、爆炸风险

■ 不适合住宅或休闲车使用。
■ 在住宅或休闲车内安装本育雏取暖器可能导致起火或爆炸。
■ 火灾、爆炸可引起财产损毁或人员死亡。

⚠ 警告

火灾、烧伤、有害物吸入，以及爆炸风险。

■ 确保固体可燃物远离本产品。
■ 固体可燃物包括木材、纸制品、羽毛、稻草和灰尘。
■ 如果某区域内含有挥发性或可通过空气进行传播的可燃物，则严禁在该区域内使用本产品。
■ 挥发性或可通过空气进行传播的可燃物包括天然气、汽油、溶剂、油漆稀释剂、尘埃颗粒或未知化学品。
■ 违规操作可能引发火灾、爆炸。
■ 火灾、爆炸可能导致财产损失和人员伤亡。

出于您的安全考虑

请勿在本产品或其他电器附近，储存或使用汽油或其他易燃汽液。

出于您的安全考虑

如果闻到了燃气味，您应当：
1. 开窗。
2. 远离电路开关。
3. 扑灭明火。
4. 立即通知您的燃气供应商。

规格

<table>
<tr><th colspan="4"></th><th>AR080</th><th>AT125</th></tr>
<tr><td colspan="3">可用管道长度（米）</td><td colspan="2">6.1</td><td>12.2</td></tr>
<tr><td colspan="3">每小时最大输入功率（千瓦）</td><td colspan="2">23.4</td><td>36.6</td></tr>
<tr><td rowspan="2">每小时燃料消耗（最大）</td><td colspan="2">液态丙烷气（千克）</td><td colspan="2">1.7</td><td>2.63</td></tr>
<tr><td colspan="2">天然气（立方米）</td><td colspan="2">2.27</td><td>3.54</td></tr>
<tr><td rowspan="4">可用于输入调节的供气压力（千帕/毫巴/英寸水柱）</td><td rowspan="2">最大</td><td>液态丙烷气</td><td colspan="3" rowspan="2">3.36/33.6/13.5</td></tr>
<tr><td>天然气</td></tr>
<tr><td rowspan="2">最小</td><td>液态丙烷气</td><td colspan="3">2.74/27.4/11.0</td></tr>
<tr><td>天然气</td><td colspan="3">1.74/17.4/7.0</td></tr>
<tr><td colspan="2" rowspan="2">燃烧器歧管压力(千帕/毫巴/英寸水柱)</td><td>液态丙烷气</td><td colspan="3">2.49/24.9/10.0</td></tr>
<tr><td>天然气</td><td colspan="3">1.0/10.0/4.0</td></tr>
<tr><td>燃烧所需通风量（立方米/小时）</td><td colspan="5">238</td></tr>
<tr><td>电机参数</td><td colspan="5">30 瓦特/每分钟 2500 转，顺时针旋转</td></tr>
<tr><td>电力供应（伏特/赫兹/相）</td><td colspan="5">220-230/50/1</td></tr>
<tr><td rowspan="2">安培值</td><td colspan="2">启动安培值</td><td colspan="3">1.0</td></tr>
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<tr><td rowspan="4">育雏取暖器与最近可燃物间的最小安全距离（米），详见第5页图1。</td><td colspan="2">顶部</td><td colspan="3">0.3</td></tr>
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<tr><td>温度传感器位置</td><td colspan="5">详见用户手册第5页图2。</td></tr>
</table>

一般信息

本用户手册包含育雏取暖器所有的常用功能和配件。 但针对所购不同型号的设备，其所包含的功能或配件可能存在差别。

在打电话寻求技术协助或询问其他特定信息时，请提供设备型号及序列号。

您可以通过本手册了解使用、保养辐射式育雏取暖器的方法。 请与设备安装人员一同阅读本手册，确保您能够全面理解育雏取暖器及其工作原理。

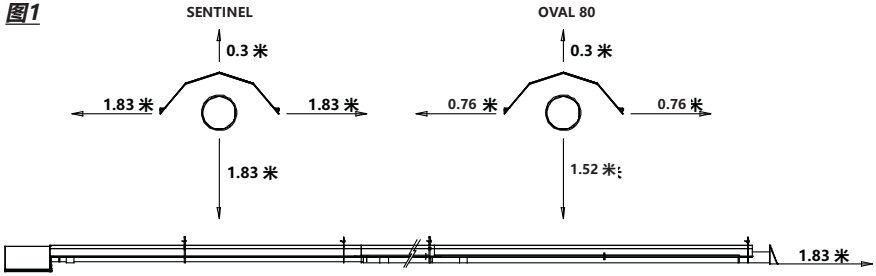
燃气管道的安装和维修，育雏取暖器的安装和维护都需要持续的专家培训和具备燃气育雏取暖器的相关知识，不得交由无资格人士负责。

如果对于设备使用您还有任何的问题，请联系当地 L.B.White 产品经销商 或者联系 L.B.White 总公司寻求协助。

L.B.White 施行产品持续优化的政策， 有权自行变更产品的规格与设计方案，无需告知他人。

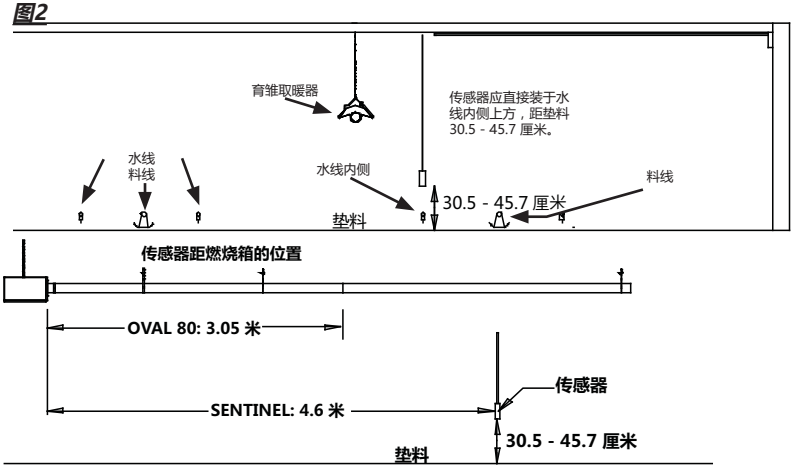
距可燃物安全距离

图1



温度传感器位置

图2



安全注意事项

⚠ 警告

针对窒息险情。

- 本产品不得用于人类住所的供暖。
- 请勿在封闭环境内使用本产品。
- 请确保燃烧和通风气流的通畅。
- 确保正常通风，以维持育雏取暖器的持续燃烧供热。
- 了解育雏取暖器燃烧通风要求，可阅读对应育雏取暖器用户手册的规格部分、参照育雏取暖器参数标牌，或联系 L.B.White 公司。
- 通风不当将导致燃烧不充分。
- 燃烧不充分可能引起人体一氧化碳中毒，进而导致严重伤亡。 一氧化碳中毒症状包括头痛、眩晕和呼吸困难。
- 燃烧不完全会使禽畜发病、饲料转化率下降，甚至死亡。

燃气气味

丙烷气和天然气具有人工添加的气味，便于察觉燃气泄露。如果有燃气泄漏情况发生，您便能闻到对应的燃气气味。

此时，您应当立即采取应对措施！

- 请勿采取任何可能引燃燃气的行为。请勿操作任何电力开关。 请勿拉扯任何电源线或延长线。请勿点燃火柴等火源。请勿使用电话。
- 引导众人迅速撤离房屋，远离泄漏区。
- 关闭所有丙烷气罐或气缸供给阀；对于天然气，应立即关闭计量表处的主燃料供给阀。
- 丙烷气比空气重，可沉积至较低区域。当认为丙烷气存在泄漏情况时，应远离较低区域。
- 借用邻居电话呼叫燃气供应商和消防队。切勿返回发生泄漏事故的建筑内或地点处。
- 远离泄漏事故地点，直至燃气供应商和消防队员宣布已排除险情。
- 最后，由燃气维修人员与消防队员检测是否还有逃逸的燃气存在。 在您返回前，嘱咐他们保持屋内通风流畅。 专业的维修人员应妥善解决泄露问题，预防泄露再次发生，并为您重新启动设备。

气味减弱 - 未检测到气味

- 某些人群不适合闻燃气味。 某些人群在闻到丙烷气或天然气的人工化学气味时，会表现出不适症状。 您需要事先确认自己是否可以识别燃气味道。
- 掌握辨别丙烷气和天然气气味的方法。您可以向本地丙烷气经销或天然气供应商索要一本“刮嗅”手册。 借此来熟悉燃气的味道。
- 吸烟会导致嗅觉的减弱。 长期身处某气味氛围中，会导致人体对于该气味的敏感度降低。 动物圈舍的气味可能会掩盖住燃气的气味。
- 丙烷气和天然气的气味添加剂为无色物质，且在某些环境中，其气味强度会有所减弱。
- 若泄漏情况发生在地下，气体穿过土壤时便会滤出气味添加剂。
- 丙烷气的气味添加剂会根据水平高度的不同而呈现出不同的气味强度。 因为丙烷气比空气重，因而较低区域的气味会显得更加浓重。
- 即使是最轻微的燃气气味也不要放过。 持续探测燃气味，即使是轻微的味道，也应慎重对待。请立即采取如前所述的行动 。

注意 - 切记以下要点！

- 丙烷气和天然气拥有各自独特的气味。请掌握分辨二者气味的方法。（详见前文“燃气气味”和“气味减弱”两部分内容）

- 未经专业培训，请勿擅自维修丙烷气和天然气育雏取暖器，请勿擅自启动育雏取暖器进行维修，也不得擅自调整育雏取暖器的燃气系统。

- 但即便如此，您也可以通过查找燃气气味来发现危险。

- 用户可定期在育雏取暖器周围或其连接件处（如：软管、连接点等）进行“气味测试”。此举不受环境条件制约，并可有效确保设备安全。即便是闻到极其微量的气味，也要立即联系燃气供应商。一定不要犹豫！

1. 未经长期专业培训，且无燃气育雏取暖器相关知识的用户，请勿尝试安装、修理或维护本育雏取暖器或其燃气供应线。

维修与安装资格：

a. 欲获取燃气育雏取暖器维修人员资格，需要经过燃气育雏取暖器修理、维护方面的培训，在故障诊断、零件更换和设备测试等方面具备充足的经验，以确保装置能够始终处于安全、正常的运行环境中。须通过阅读并遵守对应育雏取暖器的安全说明、标签、用户手册中的注意事项，完全了解每个型号的育雏取暖器。

b. 欲获取燃气育雏取暖器安装人员资格，须经充分培训，具备安装、维修、更换各类燃气管线的经验，包括选装正确设备，选取尺寸适合的管道和气罐。以上工作，应依照所有当地、省份及国家的规范，并且符合厂商要求进行。

2. 所有 L.B.White 育雏取暖器 应依照所有当地、省份及国家的相关规范进行安装和使用。包括燃气系统、燃气装置、电力和安全等方面的现行规范。您可向您的燃气供应商、当地执业电工、当地消防部门等政府机构，或您的保险代理人，了解相关规范要求。

3. 室内安装仅限农业家禽圈舍。不得用于人类住宅。

4. 育雏取暖器运行，或已接通电源或燃气时，请勿对其进行移动、操作或维修。

5. 妥善选择本育雏取暖器安装地点，便于对设备进行彻底冲洗。水洗仅可用于本育雏取暖器外壳组件。详见“清洗说明”。燃烧箱或管道的内部严禁水洗。清洗育雏取暖器内部及内部组件时，仅能使用压缩空气、软刷和干布。经外部冲洗的育雏取暖器，在彻底晾干之前严禁运行。在任何情况下，外部冲洗后须等至少一个小时，方可再次使用育雏取暖器。

6. 出于安全考虑，本育雏取暖器配有空气压差开关。安全装置进行旁路连接时，严禁运行本设备。在空气压差开关完整运转时，方可操作本育雏取暖器。

7. 运行本育雏取暖器时，请确保燃烧器检修门处于闭锁状态。严禁在燃烧箱检修门开启时运行本设备。

8. 请保持育雏取暖器进气口和排放口的畅通。否则可能导致燃烧不充分，或损坏育雏取暖器组件，进而引起财产损失或禽畜伤亡。

9. 每年须对软管组件进行观察检验。若发现有软管过度磨损或断裂，请立即更换；在此之前，严禁运行本育雏取暖器。确保软管组件在使用时，远离禽畜以及高温表面。软管组件须由制造商指定。详见部件清单。

10. 鸡舍再放养前或安装设备时，须查看是否存在燃气泄漏、运行异常等问题。

11. 由合格的维修人员检验设备是否能够正常运行；该检验每年至少进行一次。

12. 不使用时，请切断设备的燃气供应。

13. 本设备配备三线电力系统。火线、零线和地线。育雏取暖器的电源线可带或者不带插头，并且插头带有或者没有地线插销。在任何情况下，育雏取暖器必须使用电源线中的地线正确连接至接地电源。未能正确使用接地插座会导致触电、人身伤害或者死亡。
14. 直燃式育雏取暖器会进行至多三次的点火尝试。 若三次点火均未能成功，控制系统将“锁死”燃气控制阀。 若控制阀锁死后，仍能闻到燃气气味，请立即关闭燃气供应阀。 逸出的燃气可能产生集聚，在确认将其彻底清除前，严禁重启设备。 无论何时，请至少等候 5 分钟再重启设备。

15. 对于丙烷气和天然气，一律只能使用正规的燃气软管或经认可的易弯曲的连接。

进气要求

⚠ 警告
燃烧风险

- 确保育雏取暖器新鲜空气入口的安装位置无误，且尺寸合适。
  -- 可参考进气要求说明。
- 如果无法提供新鲜空气，可能导致：
  -- 煤烟，可造成建筑设施损坏
  -- 高浓度一氧化碳，可造成严重的人畜伤亡。
  -- 前端 3.05 米管道的过热，可引起火灾，造成建筑损毁或人畜伤亡。
  -- 管道各部分间的巨大温差，将对温控和生产性能造成不利影响。

本育雏取暖器正常运行、燃烧时所用的空气，应为取自正常大气压环境下的清洁、新鲜的空气。 关于育雏取暖器的安装，如果您还有任何问题，可联系 L.B.White 公司。

入口空气可抽自阁楼，或通过护檐下的侧墙取得。 详见图3和图4。

-- 进气口的所有接缝和接头均须密封。
-- 请勿在进气系统中使用过滤器。
-- 进气系统应尽可能保持笔直。无法避免弯曲时，角度应在1-90°。
-- 关于育雏取暖器的安装，如果您还有任何问题，可联系 L.B.White 公司。

严禁 从以下场所抽取用于燃烧的入口空气：

- 圈舍内部。
- 存在负压（真空）的阁楼或其他位置，负压会影响育雏取暖器风扇的抽气作业。 相关位置包括，但不限于：
  a. 阁楼拱腹通风区小于脊盖通风区的房屋。
  b. 育雏取暖器进气口位于圈舍风机 6.1 米之内。
  c. 因风等自然元素引起了负压的场所。

图3

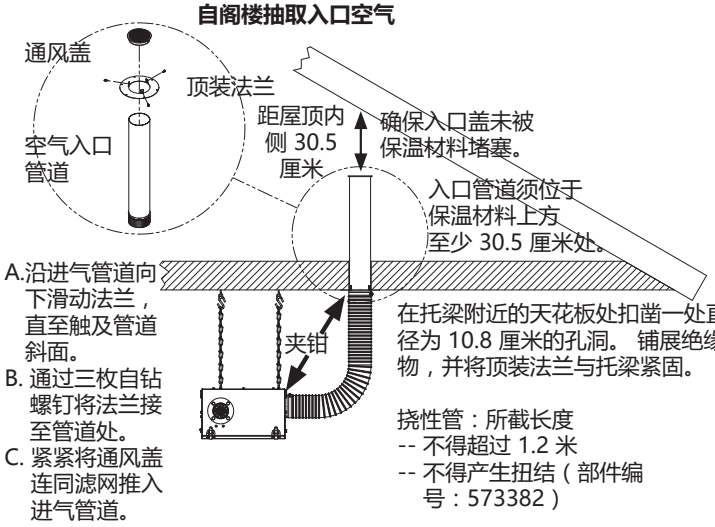
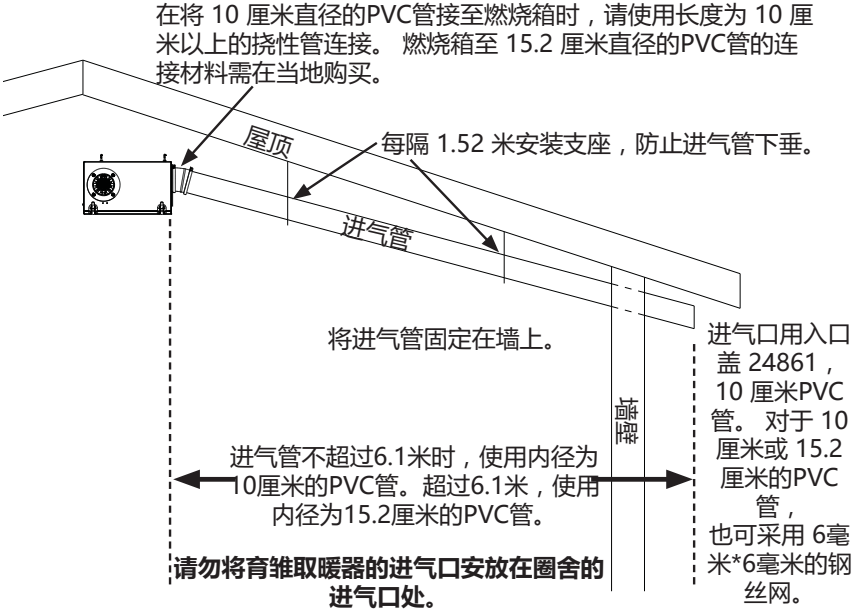


图4

侧墙进气



总体安装说明

1. 安装本育雏取暖器时，请完整阅读安全防护内容， 遵守 L.B.White 公司安全建议。 在设备安装的过程中，若发现损件或存在缺陷的部件，请联系专业维修机构予以修理或更换。

2. 安装时，须由专业维修机构对育雏取暖器进行检查，且该检查应定期施行。 检查包含以下内容：

-- 开启并关停育雏取暖器，测试其能否正常运行。
-- 检查所有燃气管道接口与燃气软管接点处是否存在燃气泄漏的情况。
-- 燃气压力检查。
--确保育雏取暖器正确摆放，远离可燃物。

3. 育雏取暖器安装时，须考虑合适的吊装高度，确保取暖器与捕捉机、垫料散播机等设备间留有足够空间。

4. 确保育雏取暖器的安装不会干扰到水、气、电等线路的正常运行。

5. 选定燃气软管的安置位置，确保其远离管道、育雏取暖器反射罩和燃烧箱。

6. 请确保所有随育雏取暖器运至的附件，均已自货箱中取出并正确安装。附件包括燃气软管、调压阀、支架、吊架，等等。

7. 所供燃气须经调节后，方可输往育雏取暖器燃气进口：

-- 调压阀须采用本设备专用调压阀。

--调压阀须将育雏取暖器的入口压力控制在参数标牌所要求的范围内。

-- 应对室外安装的调压阀做好防护措施，以应对不利的天气条件。

-- 配有泄压阀的调压阀应当装至室外。

-- 室内安装的调压阀应将排放口引导至室外。

-- 安装调压阀时，应遵守当地、省市和国家的相关规范。

8. 请使用不受液化气或天然气影响的管道连接脂。

9.请借助正规的燃气泄露探测器，检验所有燃气接点的连接情况。 燃气泄露检验包含如下内容：

⚠ 警告

火灾、爆炸风险

- 检查燃气泄漏时，请勿使用明火（火柴、火把、蜡烛，等等。）-
- 请一律使用正规的燃气泄漏探测器。
- 无视上述警告可能导致火灾或爆炸。
- 火灾、爆炸可能导致财产损失和人员伤亡。

-- 通过正规的燃气泄漏探测器，检查所有管道接点、软管接点、燃气控制配件和上游转接头。

-- 发现燃气泄漏后，请在旋紧接点前，先检查并清洁相关的组件，酌情使用密封胶

-- 之后，旋紧燃气接点，阻止气体泄漏。

-- 所有接点检查完毕，且泄露事故得到有效控制后，开启主燃烧器。

-- 若泄露燃气未清理彻底，此时可能引起回火，因而主燃烧器点火时，请各人员务必远离。

-- 在主燃烧器运行时，请通过正规的燃气泄漏探测器，检查所有接点、软管接点、配件和接头，以及燃气流量控制阀出入口接点。

-- 发现燃气泄漏后，请在旋紧接点前，先检查丝接的相关组件并清洁，酌情使用密封胶。

-- 之后，旋紧燃气接点，阻止气体泄漏。

-- 泄露无法阻止，可在必要时更换相关部件或组件。

-- 确保所有的燃气泄露事故，在进一步发展前，均能被及时发现并得到妥善的解决。

10. 请于燃气控制阀入口处安装除垢阀，以防异物（管道杂质、管道鳞屑）进入气阀。碎屑吹入气阀可能导致阀门失灵，因而引起严重的漏气事故。漏气事故会招致火灾或爆炸，造成设备、设施的损毁，甚至人员死亡。 正常安装的除垢阀能够有效防止异物进入气阀，并确保气阀的安全运行。

11. 接有管道系统的育雏取暖器须配有一处易接触到且正规的手动截流阀，距离其所控制的育雏取暖器在1.82米以内

12. 为确保育雏取暖器正常运行，所装燃气供应管道的尺寸必须正确。 您可以通过您的燃气供应商或 L.B.White 公司 了解管道尺寸和安装方面的信息。

13. 启动设备时，务必遵循育雏取暖器机身所示说明或用户手册内容。

14. 本育雏取暖器仅限用于液化气或天然气。请勿使用本设备进行液化气汽化。 请勿将液态丙烷通入育雏取暖器中。

15. 动物圈舍中的锈蚀性气体可能引起组件故障或育雏取暖器失灵。 请根据本手册的“维护与清洗说明”内容，对育雏取暖器进行定期的检查和清洗。 确保设备装有独立备用警报系统，可用于限制温度过高或过低并触发警报，从而保护禽畜安全。

16. 请花费一定时间，通过用户手册了解运行、维护本育雏取暖器的方法。 对于圈舍和育雏取暖器，请您务必掌握关闭其各自燃气供应的方法。 如果您还有任何疑问，可联系您的燃气供应商。

17. 维修过程中发现的任何设备缺陷应当第一时间排除，并将育雏取暖器重新投入使用之前，再次进行测试。 请将育雏取暖器重新投入使用之前，再次进行测试。

18. 本育雏取暖器参数标牌上印有其额定输入功率，运行时请勿超出该功率。参数标牌处可见设备燃烧器歧管压力，运行时请勿超出该值。所用节流孔尺寸应与育雏取暖器额定输入功率、燃料类型和海拔高度相匹配。

初始安装

1.安装步骤。 选定育雏取暖器安装位置，使其供暖效率能够最大化，时刻留意屋内温度较低的区域（端墙和窗帘），及与可燃物间的距离。

2. 悬吊燃烧箱。 详见图5。 根据图1，确保设备与可燃物间留有足够距离。

3. 在安装 Sentinel 或 Oval 80 育雏取暖器的过程中，请从燃烧箱的链条处，测量如图6或图7所示的距离长度。 **与燃烧箱排气口中央对齐**，在这些点位处通过开式眼钩悬挂链条。

图5

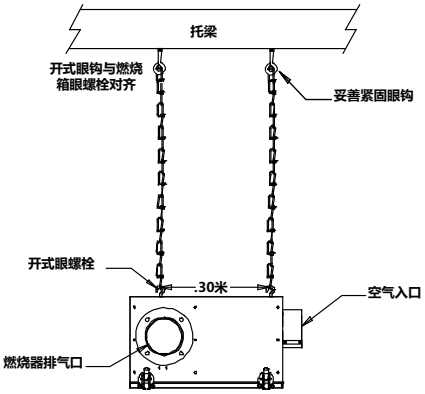


图6 SENTINEL

吊链距离

桁架中央	育雏取暖器长度	A - B (米)	B - C (米)	C - D (米)	D - E (米)	E - F (米)
1.22 米	12.2 米	1.22	1.22	3.65	2.43	3.65
1.5 米	12.2 米	1.52	1.52	3.05	3.05	1.52
3.05 米	12.2 米	1.52*	1.52	3.05	3.05	1.52*

* 支架须位于两桁架之间

图7 OVAL 80

吊链距离

桁架中央	育雏取暖器长度	A - B (米)	B - C (米)	C - D (米)	D - E (米)
1.22 米	6.1 米	1.22	1.22	1.52	2.43
1.52 米	6.1 米	1.52	1.52	1.52	1.52
3.05 米	6.1 米	1.52*	1.52	1.52*	1.52

* 支架须位于两桁架之间

吊装管道

您可以参照图8（下页）及以下说明内容：

1. 通过管夹固定 3.05 米亮镀铝管或不锈钢管的非嵌合端。 每个管套件对应一根镀铝管或不锈钢管。

2. 将该管套在燃烧器壳的嵌合端上。

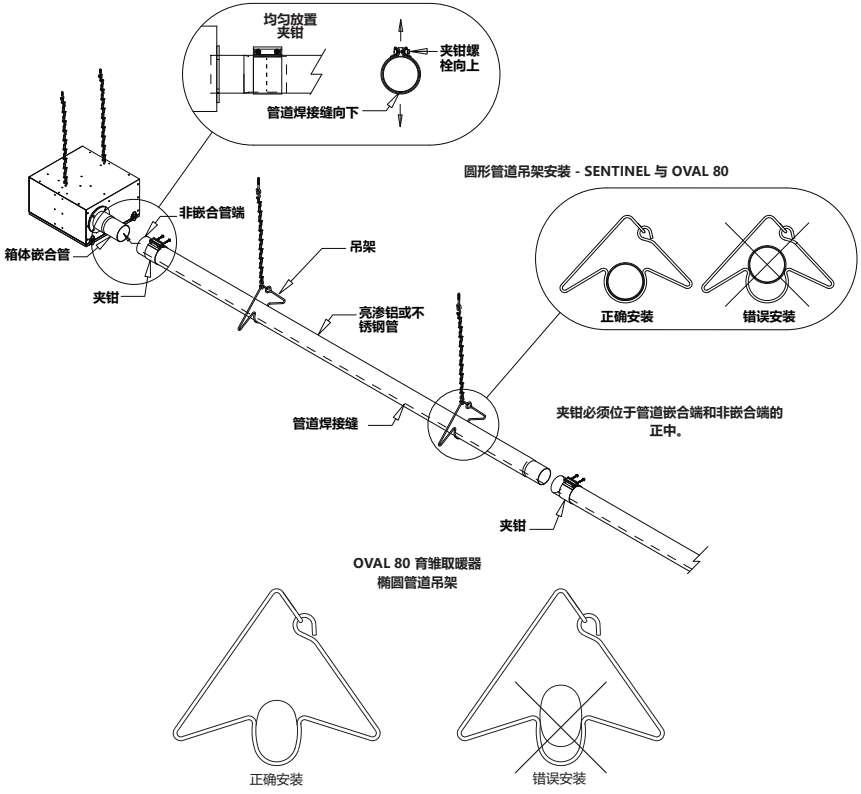
a. 管道焊接缝必须向下。
b. 管道非嵌合端须完全推至邻近管道的嵌合端中。
c. 夹钳须位于管道接点中央。
d. 夹钳螺栓须向上。
e. 夹钳螺栓须旋紧。
-- 紧固双螺栓。
-- 紧固双螺栓至 47.5 牛顿米。
-- 完成螺栓紧固：
-- Sentinel 育雏取暖器： -- 最终紧固螺栓至 88 牛顿米。
--Oval 80 育雏取暖器：-- 最终紧固螺栓至 59.7 - 80 牛顿米。

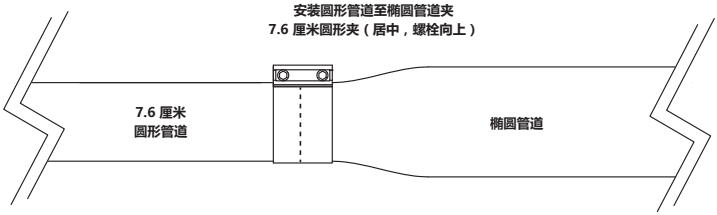
3. 套上吊架，连接链条。

4. 连接并悬吊剩余管道。 **继续步骤 2 中的流程。**

5. 悬吊管道组件时，应使其保持水平或斜向下；管道每隔 3.05 米与燃烧箱的坡度不得超过 2.54 厘米。

图8



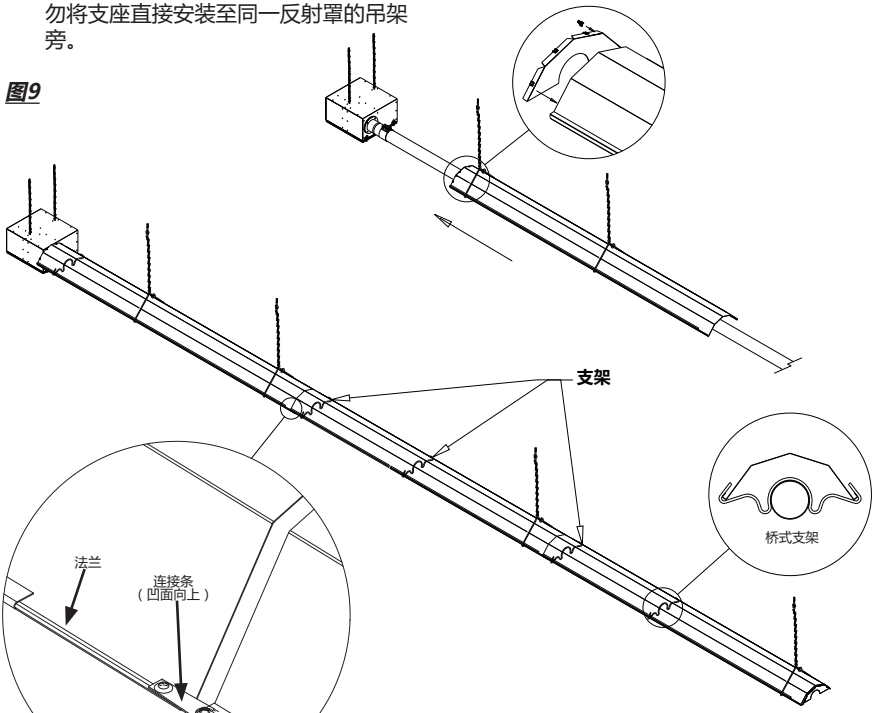


安装反射罩与支架

您可以参照图9及以下说明内容：

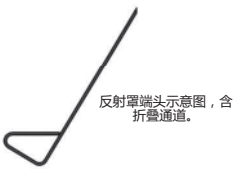
1. 通过吊架滑动反射器，直至其距离燃烧箱 0.3-0.6 米。
2. 在反射罩端套上端盖。需用到 4 枚 U 型夹。 向上推动反射罩至燃烧箱止。
3. 以下步骤仅限 Sentinel 育雏取暖器： 在反射罩最靠近燃烧箱的一端安装支架，反射罩的中央及各端头也需安装支架。 请勿将支座直接安装至同一反射罩的吊架旁。
4. 请使用带凹面的连接条连接反射罩。详见下图。
5. 其余反射罩的安装，请重复步骤 3 和 4。
6. 使用U型夹将剩下的盖板固定至最后一个反射罩上。

图9



连接条：

- 将连接条半插至反射罩两侧的折叠通道中，端头不装法兰。
- 通过吊架滑动反射罩端头，并用力将其推入燃烧箱反射罩的折叠通道中。
- 反射罩未装法兰的一端将覆盖邻近反射罩装有法兰的一端。



空气扰流条与排气口

Sentinel 育雏取暖器：装配连接条，并将其插入末管中，详见图10。扰流条边缘应与管道端头齐平。

Oval 80 育雏取暖器： 将两侧扰流条正常装入椭圆管道中。 安装期间，确保扰流条紧贴椭圆管道，不得超出管道后端。

图10

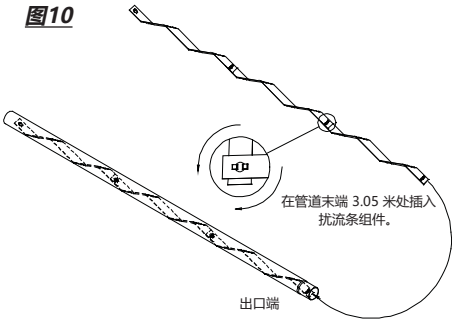
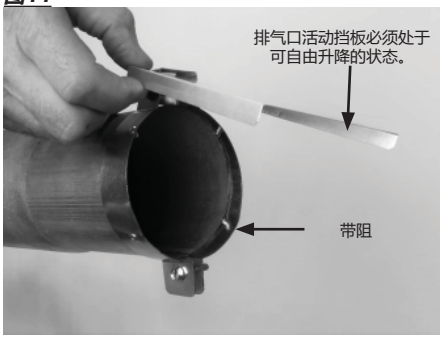


图11

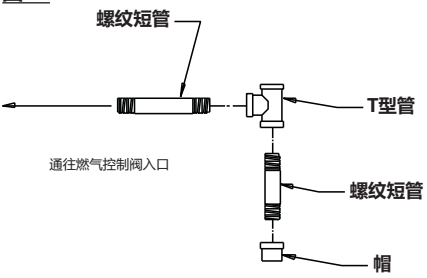


无论管道采用何种设计：
-- 在最后一根管道的尾端套紧排气罩固夹带。
-- 请勿直接将排气罩固夹带缠在管道上。
-- 用力推动带阻，至触及管道边缘为止。
详见图11。
-- 妥善紧固固夹带螺钉。
-- 确保活动挡板升降自由。

除垢阀装配

将 T 型管、螺纹短管和帽装至育雏取暖器燃气进口处。 详见图12。 妥善紧固。 除垢阀组件须垂直安装。 请借助正规的燃气泄露探测器，检验所有燃气接点的连接情况。

图12

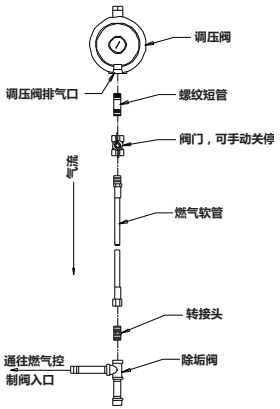


手动断流阀、软管和调压阀

1.组装各组件。 详见图13。本示意图仅限用于展示各组件的整体装配情况。无论安装至何处，调压阀的排气口必须始终向下。确保软管的安装位置远离育雏取暖器。

2. 妥善紧固所有接点，
并检查是否有燃气泄漏。

图13



育雏取暖器控制

确定设备燃气控制属于一级还是两级控制，可查看育雏取暖器的带合页检修面板，或参照本手册启动说明的相关内容。

⚠ 警告
触电风险
- 在与温控模块互连之前，请先断开育雏取暖器电源。
- 否则可能导致触电。
- 触电可能引起人员重伤或死亡。

在将恒温器或控制器连接至燃烧箱时，先拔出接头塞，再通过电源线旁的水密接头铺设接线。详见图14。 若连接器经紧固后未能彻底密封，请在连接器接线入口处涂抹硅树脂。

所有互连的恒温器接线须至少配有 18 号线，以防电压降低。 确保点火控制的 W 端头所接收电压为来自恒温器或栋舍控制器的 24 伏交流电压。

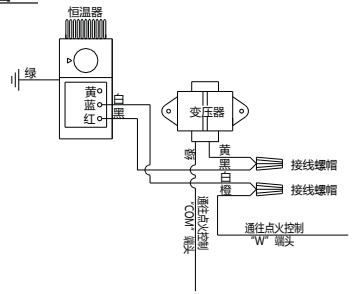
图14

A. 配有单级燃气控制阀的育雏取暖器

1.连接恒温器组串联线路。
-- 将育雏取暖器电源线接至恒温器线组的凹孔。
--将线组阳插头插入正规的延长电线或者墙壁插座内。

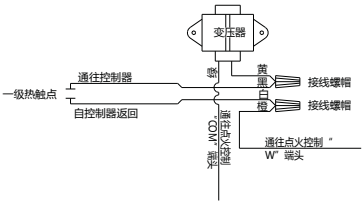
2. 恒温器接线
(详见图15)
-- 旋下黄色及橙色电线的接线螺帽。
-- 参照育雏取暖器上的电路图，为恒温器接线。

图15



3. 连接栋舍控制器(详见图16)
-- 旋下黄色及橙色电线的接线螺帽。
-- 根据图示连接控制器触点。

图16



启动说明

育雏取暖器安装完毕后，请按照步骤 1 - 6 初步启动设备。正常启动时，将恒温器调至高于室温即可。育雏取暖器便可启动。

1. 开启所有手动燃料供应阀，并借助正规的燃气泄漏探测器探明是否存在燃气泄漏的情况。 燃气控制阀配有一处手动断流阀，包含在阀门组件内。 确保阀门指示器处于“开启”的位置。 单级燃气控制阀详见图17。

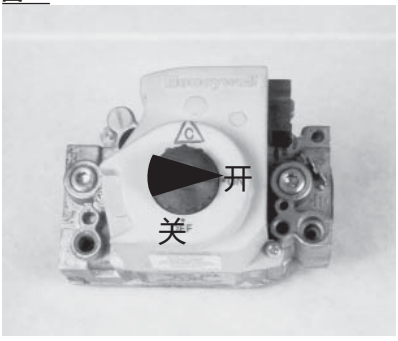
2. 将电线连至正规的电源插座。

3. 将恒温器设置至目标温度。

4. 本育雏取暖器包含直接点火控制模块，用于控制育雏取暖器点火过程的时间点，还可用于监测设备功能是否正常运行。 在燃烧箱外壳上，装有一枚红色的 LED（发光二极管）状态灯。 红光恒定表示育雏取暖器运行正常。 **红光闪烁表示育雏取暖器运行出现故障。** 您可以参照位于检修门内部的故障诊断标记，以获取故障诊断协助。

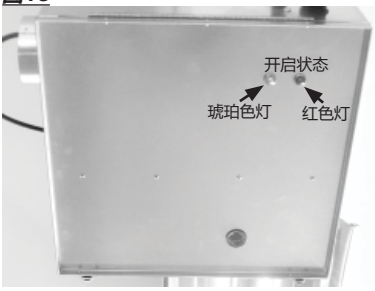
5. 发出供暖指令后，红色 LED 状态灯发光。电机启动，并运行五（5）秒。 点火前，为确保人员安全和设备的正常运行，需事先进行“预先纯化”过程。 五（5）秒后，点火器将开始打火。

图17



-- 成功点火后，琥珀色 LED 灯发光，此时表明燃气控制已开启，且热量输出已达到最大值。 详见图18。

图18



6. 点火控制会至多进行三次的点火尝试。每次点火尝试耗时约 10 秒。 若主燃烧器未能成功点燃，系统将被锁死，同时红色 LED 灯发三闪模式光。

注意：新装设备的燃气软管中易残留空气。 在空气最终纯化完成并点火之前，本育雏取暖器可能会进行一次以上的点火尝试。

关停说明

以清洗、维护、修理为目的，欲关停本育雏取暖器时，须遵循步骤 1 - 4。 除非将恒温器切至“关”或“不供暖”处，进行标准关停。

1. 关闭所有手动燃气供应阀。

2. 使育雏取暖器点火，燃尽燃气供应软管内的残余燃气。

3. 将恒温器切至“关”或“不供暖”处。

4. 断开育雏取暖器电源。

清洗说明

1. 清洗前，请先关闭育雏取暖器的燃气供应阀，并切断电源。使育雏取暖器进行冷却。

2. 定期对本育雏取暖器进行除尘和除垢。

   a. 在运送各批禽畜或调整圈舍位置期间，可通过压缩空气或软刷对设备燃烧箱、反射罩和管道等进行一次整体的清洗。

   b. 对育雏取暖器的彻底清洗，每年应至少进行一次。 彻底清洗时，请打开燃烧箱，并对控制组件和风扇电机组件进行刷洗或吹洗。 确保燃烧器进风口文氏管口和铸件喉部无灰尘聚集。

   c. 水洗时，严禁将水溅入燃烧箱或管道中。请留意并遵循清洗说明中的警告内容。相同警告内容也可见于育雏取暖器机身。

⚠ 警告

火灾、烧伤和爆炸风险

- 本育雏取暖器的燃气管理系统、安全系统和气流系统包含有电力与机械组件。
- 电力与机械组件可能因尘土、污垢、撕扯、老化，以及动物圈舍产生的锈蚀性气体而失灵或报废。
- 为避免人员受伤或财产损失，务必定期对设备进行清洗、检查，以及正规的维护。

⚠ 警告

水洗仅可用于本育雏取暖器外部，水洗时应确保：

- 燃烧箱已断开电源。
- 燃烧箱检修窗处于闭锁状态。
- 水喷嘴喷水时，距离燃烧箱和辐射管不少于6英尺。
- 水洗燃烧箱各个面时，请于 10 秒内将水压维持在 3.10 巴以下。
- 燃烧箱水洗后，应至少晾晒 1 小时或完全干透后方可再次通电使用。

违规清洗可能导致以下险情的发生，进而引起人员重伤或财产损失：

- 因燃烧箱内电力组件、接点和电线导致的触电或组件故障。
- 因燃气控制组件导致的锈蚀，锈蚀可进一步引起燃气泄露，从而招致火灾或爆炸。

清洗燃烧箱内部组件时，请使用压缩空气，或柔软、干燥的刷子和布。

维护说明

设备使用前：

■检查以确保育雏取暖器周围无可燃物、汽油和其他易燃汽液。

■调压阀须定期检查，确保其排气孔畅通。碎屑、昆虫、虫巢、积雪或冰块都能阻塞调压阀的排气孔，造成设备压力过大。

■检查所有软管与管道组件是否存在开缝、断裂、磨损或破裂等情况。 更换所有疑似存在问题的软管。

■检查燃烧箱垫片情况，以及风机室出风情况。 确保各项运转正常。 更换疑似存在问题的垫片材料。

■确保反射罩支座与吊架安装牢固，反射罩无下垂，位置正常。

■检查育雏取暖器整体情况，观察是否存咋开裂、受损的组件，松脱的螺钉、螺栓，缺裂、断裂的电路引线，等等。同时更换任何疑似存在问题的组件。

■为确保安全，及设备功率的最大化，须保持育雏取暖器外部清洁无尘垢，同时远离可燃物。 若有运行组件出现锈蚀迹象，请立即更换该组件。

■检查所有含警告或说明内容的标签、参数标牌等。若出现所印信息模糊不清的情况，应立即更换。 在阅读并理解所有说明内容之前，请勿运行本育雏取暖器。

年检：

■检查进气组件。确保进气口及其管道畅通无阻。

■请您的燃气供应商对所有的燃气管道进行泄露或燃气管线限制检查。 同时，请您的燃气供应商清洗在燃烧箱入口除垢阀处集聚的碎屑。

■老化的调压阀可能运行不佳。 请您的燃气供应商检查所有已装调压阀的生产日期码，并检查其至设备的输送压力，从而确保调压阀可继续使用。

总体维修说明

⚠ 警告
烧伤风险
- 在育雏取暖器停止运行后的一段时间内，其表面温度依然很高。
- 在对育雏取暖器进行修理、维护、清洁前，让设备先冷却一段时间。
- 无视上述警告将导致人员烧伤。

⚠ 警告
火灾、爆炸风险
- 请勿擅自拆卸或修理育雏取暖器或燃气阀的任何组件。
- 所有报废的组件须立即更换。
- 无视上述警告将导致火灾或爆炸，进而引起财产损毁、人员伤亡。

1. 除非维修需要开启阀门或接通电源，否则在维修前，务必关闭育雏取暖器的燃气供应阀，并断开设备电源。

2. 打开燃烧箱检修窗查看控制组件。维修完成后，请将检修窗闭锁。

3. 重装设备时，将对应维修步骤倒施即可。 确保各燃气接点均已妥善紧固。

4. 清洁设备燃烧器节流孔及压力开关节流孔时，请使用压缩空气，或柔软、干燥的碎布。 请勿使用锉刀、钻头、凿子等清洁节流孔。 否则将导致节流孔扩大，引起点火或燃烧问题。 若节流孔无法正常清洁，应予以更换。

5. 维修时，应断开相关组件的电线。 **维修结束后，启动育雏取暖器确保设备能够正常运行，并检查是否有燃气泄漏。**

点火器尖头长期暴露在高温及燃烧物的严酷

环境中。 因而须定期对点火器尖头进行维修。

点火器

A.替换

1. 旋下点火器固定螺钉。 详见图19。

2. 转开点火器直至燃烧器清楚显现。
   示例详见图20(Sentinel)。

在卸除点火器时，严禁使用蛮力或弯折点火器。在卸除点火器时，严禁使用蛮力或弯折燃烧器叶片。

图19

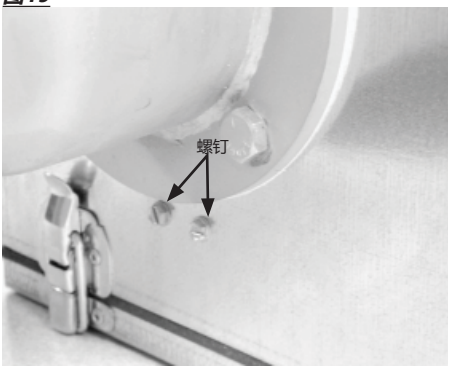
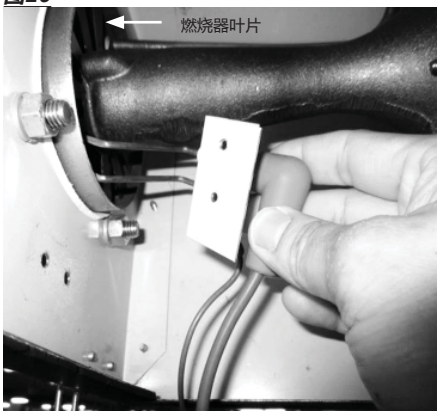


图20



3.将点火缆线的橡胶套从点火器上取下。

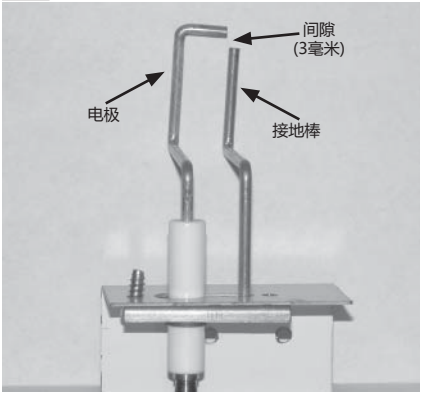
B. 维护

1. 确保间隙为 3 毫米。 详见图21。
   （所示为 Sentinel 点火器）

2. 通过砂布清洁电极与接地棒。

3. 确保电机绝缘基座未开裂。

图21



电机与风扇组件

1. 卸下风扇外罩所有的固定螺帽。 详见图22。

2. 将风扇与电机组件从燃烧箱上卸下，并根据需要重新放置。 详见图23。 风扇/电机/外罩应视为同一组件。

图22

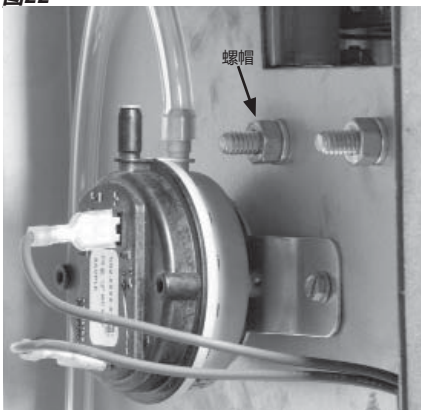
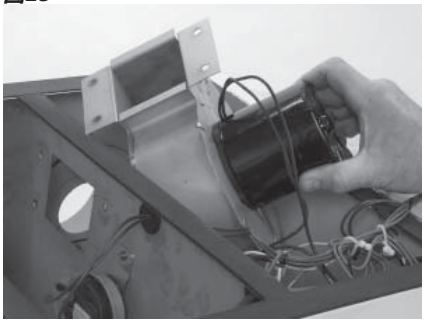


图23



空气压差开关、软管与压力孔口

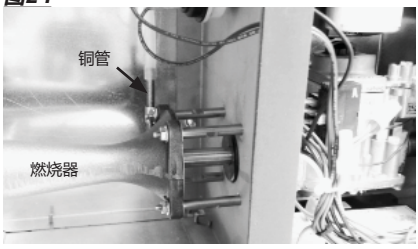
为使育雏取暖器能够正常运行：

请确保透明软管清洁无垢，已正常与燃烧器铜管及压差开关配件相连。 详见图24与图25。

- 请保持空气压差开关节流孔畅通。必要时，使用压缩空气进行清洁：

-- 从开关移除相应的节流孔。详见图25。
-- 将其对准光源，查看是否堵塞。 若已堵塞，请清洁节流孔。
-- 确保节流孔已推回至开关上的正常位置。（绿色对应开关黑色立管，蓝色对应白色立管）

图24

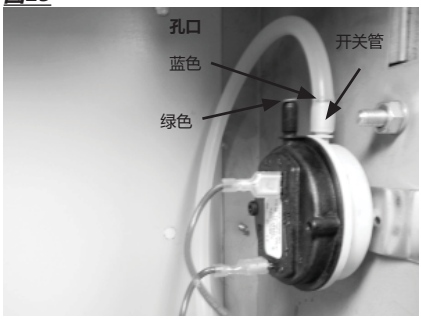


在维修空气压差开关时：

- 请勿调节压差开关。 若管道、节流孔检查后，开关无法接通电路，须更换开关。

- 请勿使开关跳线。 否则育雏取暖器的点火控制将被锁死。

图25



燃气控制阀与燃烧器节流孔

按以下步骤进行卸除：

a. 将燃气软管从除垢阀处卸除。

b. 将带管道的除垢阀从燃气控制阀入口处卸除。

c. 将点火器从燃烧箱处卸除。

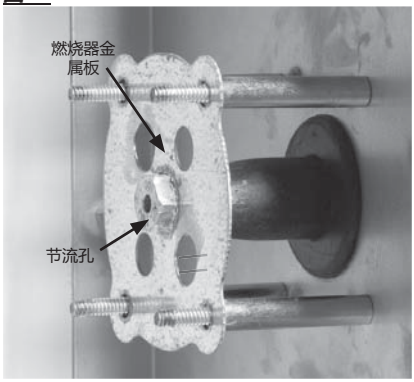
d. 将透明软管从燃烧器铜管处卸除。图26。

e. 将 4 枚螺母连同接地线从燃烧器安装螺柱处卸除。 详见图26。 轻滑燃烧器，将其从燃烧器管道处取下。

图26

燃烧器节流孔：
卸除燃烧器节流孔。旋开 4 枚燃烧器安装螺柱，取下燃烧器金属板。详见图27。

图27



燃气控制阀：

遵循先前“燃气控制阀与燃烧器节流孔中的步骤。 之后，参照以下 Sentinel 或 Oval 80 育雏取暖器的步骤。

Sentinel 育雏取暖器：

旋下燃气控制阀固定架螺钉，螺钉位于燃烧箱顶外部。 详见图28。

图28

Oval 80 育雏取暖器：
旋下 4 枚燃气控制阀固定螺钉。
详见图29。

图29

变压器

变压器（图30）可将主电源电压减为 24 伏交流电压。 24 伏交流电压将通过恒温器（如使用），或直接输往点火控制器。 点火控制器接收 24 伏交流电压后，便会启动点火程序。 红色 LED 灯发光。

如果变压器接收主电源电压，但端头却无 24 伏交流电压输出，则表明该变压器已损坏。此时，育雏取暖器无法运行，燃烧箱的红色 LED 也不会发光。

图30

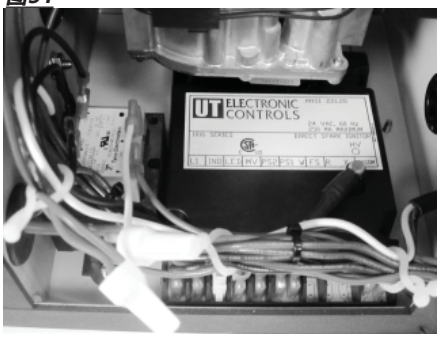
点火控制

点火控制用于发送、接收电压，从而运行组件或确认组件运行。 进行电压检测时，可参照下文及图31，理解点火控制端子标记。

L1：从电源至点火控制的线路电压。
IND：从点火控制至风扇电机的线路电压。
LED：连接点火控制诊断灯接线线束。
MV：从点火控制至燃气控制阀的 24 伏交流电压。
PS2：从空气压力开关返回点火控制的 24 伏交流电压。
PS1：从点火控制至空气压力开关的 24 伏交流电压。
W：从变压器至点火控制的 24 伏交流电压。（电压未达到要求将使点火控制失灵）
FS：无端子。
R：无端子。
X：无端子。
C/COM：控制与燃烧器接地。

也可根据需要，参考本手册“运行顺序”内容，了解供暖指令下的点火控制的运行方式。

图31



燃气压力检查

- 以下是燃气压力检查的一般流程。
- 详见育雏取暖器参数标牌或本手册第 4 页。 不同燃气的燃气压力存在差异。
- 在燃气控制阀入口处测得的燃气压力为入口压，在燃气控制阀出口处测得的燃气压力为燃烧器歧管压。

所需材料

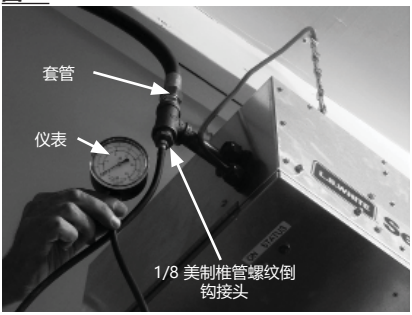
数量	描述
2	燃气压力计，最大读数 9 千帕。（可从 L.B.White 处订购，部件编号：00764）
1	套管，1/2 英寸 × 1/8 英寸
1	1/8 英寸倒钩接头
1	3/16 英寸内六角扳手

A. 准备

1. 断开育雏取暖器电源，并关闭育雏取暖器入口处的燃气供应阀。

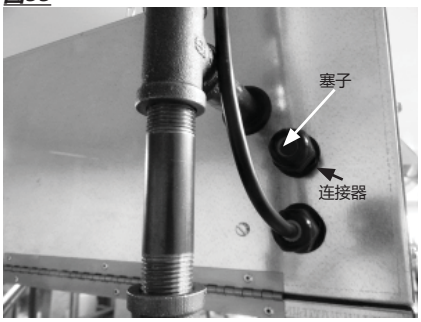
2. 从除垢阀移除低位螺纹管与盖帽，并安装套管与 1/8 英寸 美制椎管螺纹倒钩接头。 详见图32。

图32



3.拔出电源线旁的连接器塞子，并通过连接器铺设仪表软管。 详见图33。 将连接器塞子妥善保管。

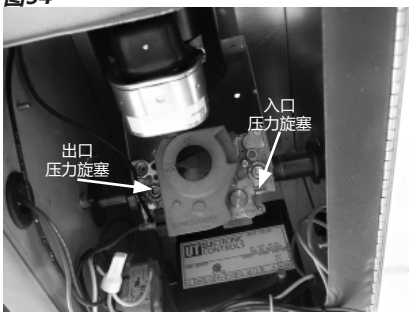
图33



4.打开燃烧箱检修窗。

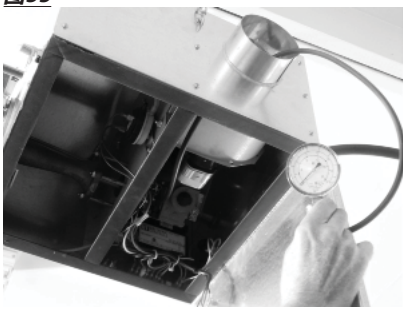
对于 Sentinel 育雏取暖器：
为方便取下燃气控制阀出口处的压力旋塞，可先旋下两枚螺钉，即用于将阀门固定架固定在燃烧箱顶的螺钉。 根据需要旋转阀门，取下压力旋塞。 详见图34。

图34



-- 无论何种款型的育雏取暖器，若连接器（图33）被恒温器接线所占，可移除燃烧箱进气管，并沿燃气控制阀入口至出口的路径铺设仪表管道。 详见图35。

图35



5.关闭并锁住燃烧箱。 打开育雏取暖器的燃气供应阀，重新通电，启动设备。

B. 压力读数

1. 育雏取暖器运行时，压力计所示压力读数应符合参数标牌要求。

2. 入口和出口处的压力计读数是否参数标牌要求？ 如是，无需进一步检测或调整。 直接跳至步骤 D。

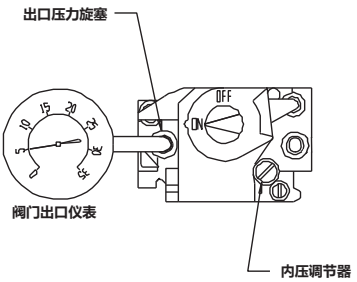
3. 若入口压力不符合参数标牌要求，则育雏取暖器的调压阀需要进行调节。

4. 若入口压力正确，但燃烧器歧管压力不符合参数标牌要求，则燃气控制阀内的压力调节器将请求调整。 请参照以下说明。 为精确设定燃气控制压力，可根据需要选择将燃烧箱开启或关闭/锁存。

C. 设置燃气控制。

将恒温器设至最高设定值。 此时，位于燃烧箱窗口处的琥珀色指示灯点亮，同时燃气控制启动。 若歧管气压与参数标牌不符，可沿顺时针或逆时针方向，调节内压调节器。 详见图36。

图36



D. 完成

1. 关闭育雏取暖器燃料控制阀，使其燃尽残余燃料。

2. 断开育雏取暖器电源。

3.移除仪表及关联硬件。 在燃气控制阀和连接器中安装塞子。 妥善紧固所有部件。 关闭并锁住检修窗。 在必要时，可再次将进气管接至燃烧箱处。

4. 再次将软管和转接头接至除垢阀处，并加以紧固。

5. 开启燃料供应阀，并重新接通育雏取暖器电源。 启动育雏取暖器，检验是否存在燃气泄漏。 将恒温器设置至目标温度。

故障诊断资料

故障诊断前，请完整阅读本节内容。

警告

- 育雏取暖器可能随时启动。
- 对本系统进行故障诊断时，可能需要在通电、通气的情况下运行机组设备。在育雏取暖器工作时务必时刻警惕。
- 无视上述警告可能导致财产损毁、人员伤亡。

阅读以下故障诊指南，了解排查设备故障的流程。 本指南供燃气育雏取暖器专业维修人员使用。 **未接受正规培训者，严禁维修本育雏取暖器。**

所需测试设备

为最高效、快速地完成故障诊断，需用到以下设备。

- **数字万用表** - 用于测量交流电压及电阻。
- **低压力计** - 用于检测燃气控制阀入口和出口处压力是否符合参数标牌要求。

- 肉眼检查设备是否存在明显损坏。
- 检查所有接线是否存在松动或老化的情况。

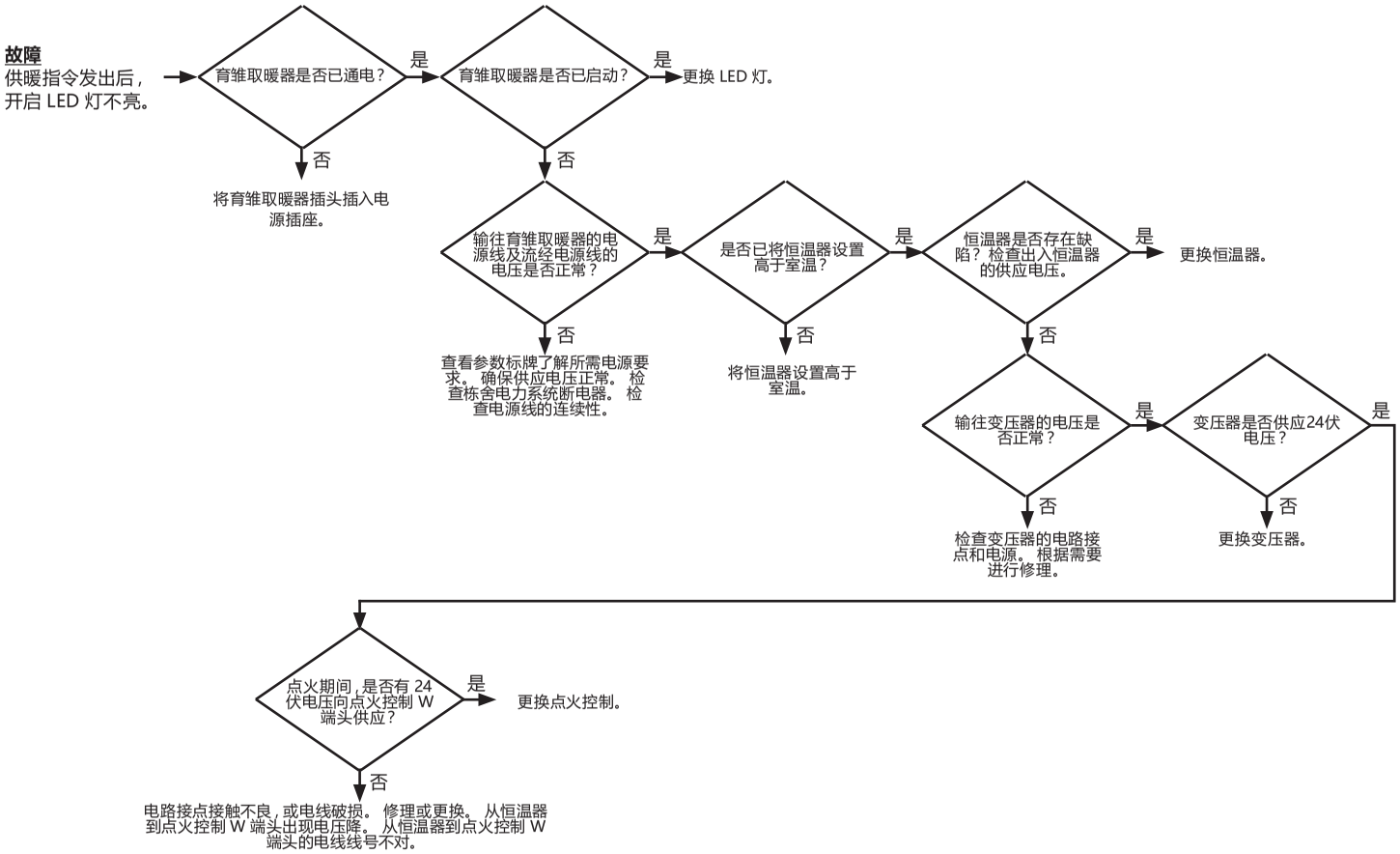
参照本节的系统运行顺序，了解在供暖指令下设备运行的方式。 了解点火模块与相关组件的运行顺序具有十分重要的意义，与流程图提供的解决方案直接相关。

点火控制模块具有自我诊断功能。 根据诊断出的故障，燃烧箱上的红色 LED 灯会作相应的闪烁。 为能更好地利用流程图，您需要先明白，红色诊断灯的各种闪烁模式分别对应于哪些故障。

灯光闪烁表明设备出现故障。
诊断灯会先按模式进行闪烁，之后有停顿，再重复之前的闪烁模式，直至故障排除。故障诊断时，您可以通过下表了解所查找的内容位于哪一页。

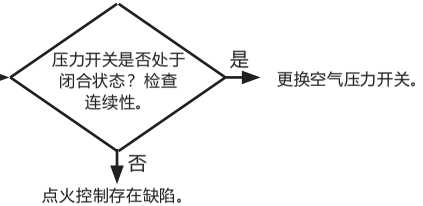
只有在完成了每个步骤且流程图中建议更换时，才应更换部件。根据流程图发现故障后，您可以根据需要参考“维修”部分的内容，了解拆卸、更换组件的流程方法。

直接点火运行顺序：
-- 线路电压被送往点火控制与变压器。
-- 变压器将线路电压减为 24 伏电压，并送往恒温器。
-- 恒温器发出供暖指令。
-- 恒温器将 24 伏电压送往点火控制。
-- 点火控制模块执行自我安全检测。
-- 内部组件受到检测。
-- 检查空气压力开关回路。
-- 点火控制模块开始点火运行步骤。
-- 点火控制模块将 24 伏电压输送至空气压力开关。
-- 点火控制将线路电压送至电机。
-- 风扇电机开始运行。
-- 空气压力开关触点闭合，同时 24 伏电压被送回点火控制模块。
-- 点火控制模块将高压输往点火器电极。
-- 点火器打火。
-- 点火控制模块将 24 伏电压输往燃气控制阀。
-- 燃气控制阀开启。
-- 开始点火。
-- 点火器连续打火 4 秒。
-- 切断点火火花。
-- 燃气阀门依旧开启。
-- 室内温度升至设定温度。
-- 恒温器关停。
-- 育雏取暖器关停。
-- 发出新的供暖指令后，重复上述流程。

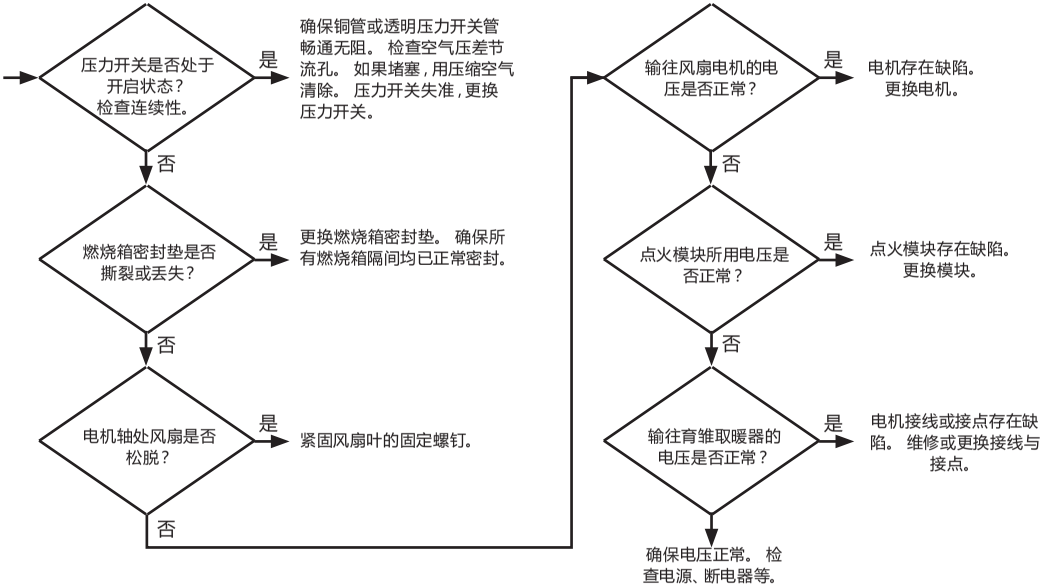

故障
供暖指令发出后，开启 LED 灯不亮。
育雏取暖器是否已通电？
是
育雏取暖器是否已启动？
是
更换 LED 灯。
否
将育雏取暖器插头插入电源插座。
否
输往育雏取暖器的电源线及流经电源线的电压是否正常？
是
是否已将恒温器设置高于室温？
是
恒温器是否存在缺陷？检查出入恒温器的供应电压。
是
更换恒温器。
否
查看参数标牌了解所需电源要求。确保供应电压正常。检查栋舍电力系统断电器。检查电源线的连续性。
否
将恒温器设置高于室温。
否
输往变压器的电压是否正常？
是
变压器是否供应24伏电压？
是
否
检查变压器的电路接点和电源。根据需要进行修理。
否
更换变压器。
点火期间，是否有 24 伏电压向点火控制 W 端头供应？
是
更换点火控制。
否
电路接点接触不良，或电线破损。修理或更换。从恒温器到点火控制 W 端头出现电压降。从恒温器到点火控制 W 端头的电线线号不对。

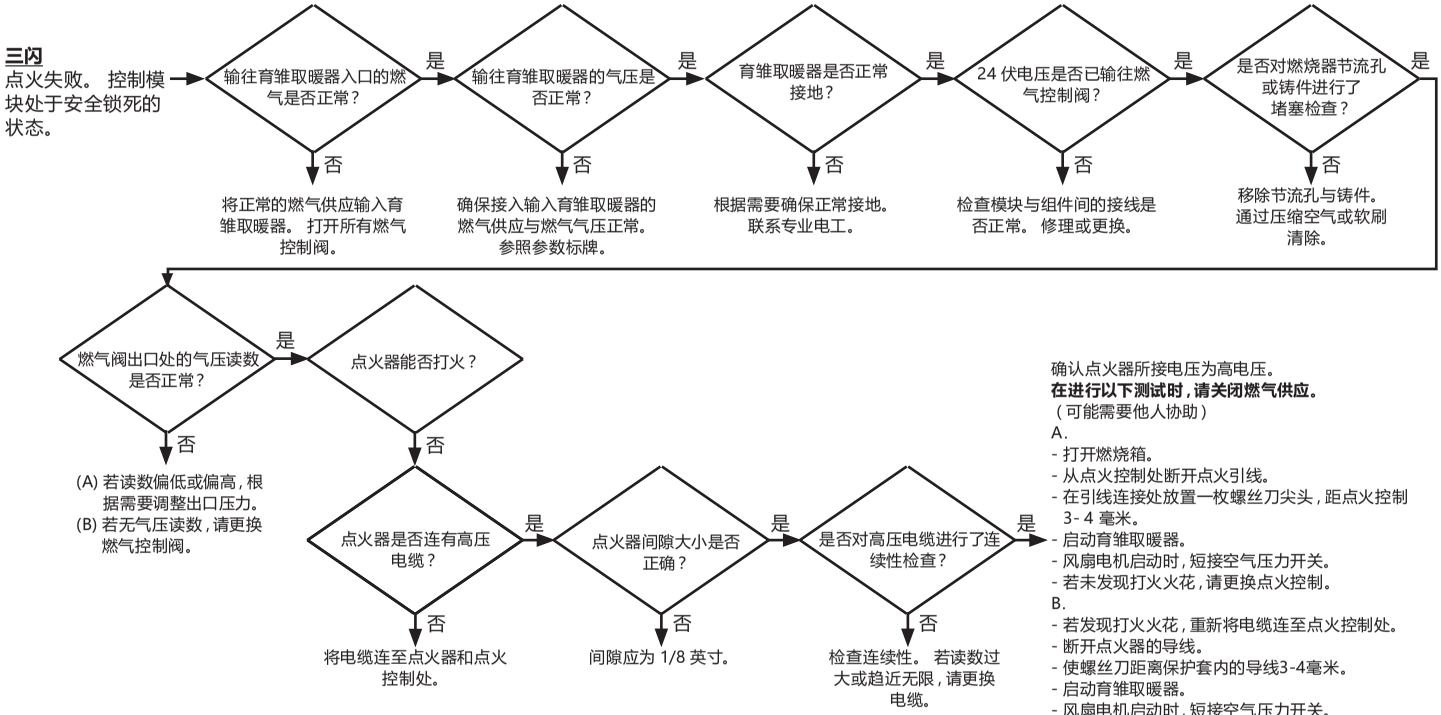
红色 LED 灯闪烁

一闪
风扇电机开启前，空气压差开关触点处于闭合状态。



两闪
空气压差开关触点未处于闭合状态。表明育雏取暖器风机无法完成空气验证。





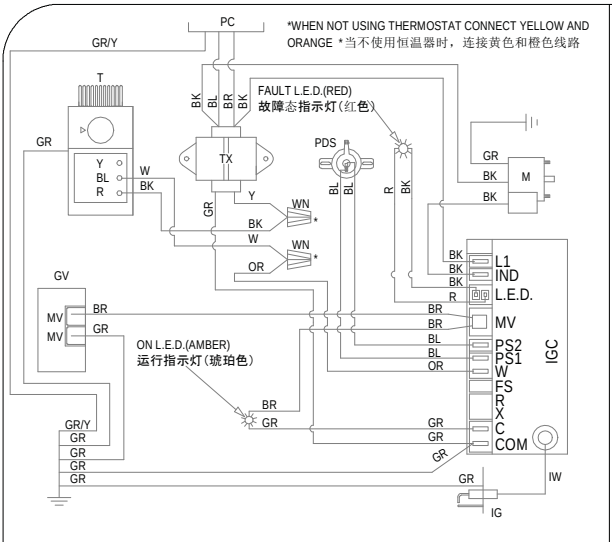
四闪

因火焰缺失过多而锁闭。 → 火焰传感故障。 检查点火器是否开裂或沾染污垢，检查火焰传感是否接地不良。

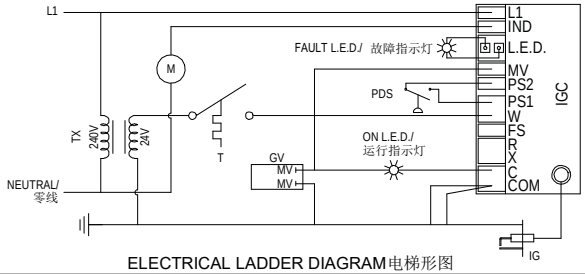
五闪 → 若控制模块无法复位，请予以更换。（内部电路板故障）
若模块复位，请专业电工检查电源，排查电源质量问题。（频率、线路噪声、线路尖峰电压、接点松动、接线线号错误。）

电路接线梯形图

单级恒温器与燃气控制



ELECTRICAL CONNECTION DIAGRAM/电连接图



ELECTRICAL LADDER DIAGRAM电梯形图

BK: BLACK/黑
BL: BLUE/蓝
BR: BROWN/棕
GR: GREEN/绿
OR: ORANGE/ 橙
R: RED/红
W: WHITE/白
Y: YELLOW/黄

GV: GAS VALVE/燃气控制阀
IG: IGNITER/点火器
IGC: IGNITION CONTROL/ 点火控制盒
IW: IGNITION WIRE/ 高电压点火导线
M: MOTOR/马达
PDS: PRESSURE DIFFERENTIAL SWITCH/压差开关
PC: POWER CORD/电源线
T: THERMOSTAT (OPT) /温控器（可选择）
TX: TRANSFORMER/变压器
WN: WIRE NUT/接线螺帽
⏚: EARTH GROUND/地线

CAUTION - REFER TO THE BROOD HEATER'S ELECTRICAL CONNECTION DIAGRAM WHEN SERVICING TO AVOID WIRING ERRORS & BROOD HEATER MALFUNCTION. CHECK FOR PROPER OPERATION AFTER SERVICING.
注意 - 维修时请参阅育雏取暖器的电连接图以免接线错误和育雏取暖器故障维修后请检查确认育雏取暖器工作正常

IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE BROOD HEATER MUST BE REPLACED, IT MUST BE REPLACED WITH WIRING MATERIAL HAVING A TEMPERATURE RATING OF AT LEAST 302° F (150° C)
倘若必须更换育雏取暖器的任何原装导线，则换上的导线材料必须具有不低于摄氏 150度的温度指标。

育雏取暖器组件功能

燃烧器
铸铁组件，用于引导燃气，为引燃提供场所。

燃烧器节流孔
黄铜制计量装置，用于限定燃烧器供气量。

燃烧器管道
用于传导燃烧器点燃燃气生成的热量。

空气压差开关
安全装置，在开启气阀前，用于确保燃烧箱内正压与真空压正常。

电火花点火控制模块
电子印刷电路板，可于自动点火系统中收发各控制模块的电压。 该控制面板具有重大的安全意义，若燃烧器火焰熄灭，可通过该面板关停整个育雏取暖器，从而切断燃气供应。

风机外壳
用于为实现高效空气移动而输送空气的腔室。

风机叶轮
与电机及风机罩配合的部件，用于在燃烧器壳内产生压力，此压力会将燃烧器火焰沿着燃烧器管散布。

燃气控制阀
电力装置，由低压调节器和电磁阀构成，用于燃烧器组件的燃气控制。

燃气软管
具有弹性的连接装置，用于将栋舍内的燃气管道向育雏取暖器输送燃气。

点火器
点火装置，用于自动直接火花点火控制系统。 可通过火花点燃燃气。

电机
电力装置，可将空气输入燃烧箱形成气压，用于育雏取暖器点火。

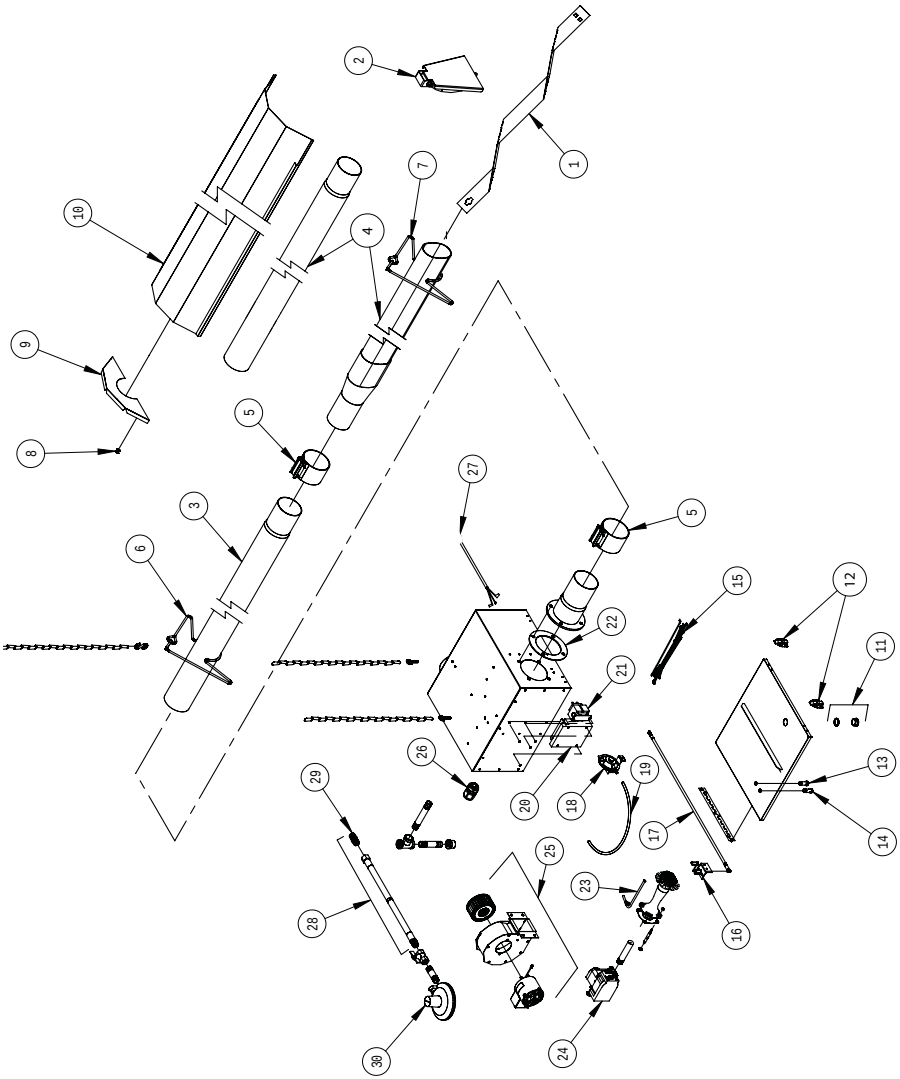
反射罩
经抛光的铝制伞盖，由燃烧器管道支撑。可聚集燃烧器管道的辐射热，并将其反射至地面。

调压阀
机械装置，用于液化气与天然气的分配系统，能够将较高的入口压减至预设的低压值。调压阀负责向育雏取暖器供应稳定的出口压力而不受入口压力、育雏取暖器需求及天气条件诸方面变化的影响。

恒温器
可对温度变化做出反应的部件。

变压器
电力控制装置，可将较高的进线电压转变为较低的出线电压，便于特定的控制装置使用。

维修零件信息原理图



部件清单

品名	描述	部件编号
1	空气扰流条 (Oval 80 需 2 根 ; Sentinel 需 3 根)	572892
2	排气口盖	572886
3	镀铝钢 , 4英寸/10公分*10英尺/3.05米 , 配夹钳 (Sentinel 125/40 英尺)	573010
	镀铝钢 , 3英寸/7.6公分*10英尺/3.05米 , 配夹钳 , Oval 80	572894
4	无涂层管道 , 4英寸/10公分*10英尺/3.05米 , 圆形配夹钳 , Sentinel	573011
	管道 , 椭圆形配夹钳 , 用于 Oval 80	572893
5	夹钳 , 用于 4英寸/10公分圆形管道 , Sentinel	573009
	夹钳 , 用于 3英寸/7.6公分圆形管道 , Oval 80	572842
6	吊架 , 用于 4英寸/10公分圆形管道	573004
	吊架 , 用于3英寸/7.6公分圆形管道	572852
7	吊架， 用于椭圆管道	572870
8	U 型夹 (4 枚)	572868
9	端帽 , 配 4 枚 U 型夹	572869
10	反射罩 , 配端帽和 U 型夹	572895
11	窗口塞配 O 型环	570002
12	闩锁	572867
13	红色 LED 灯	571333
14	琥珀色 LED 灯	572813
15	接线安全带	572848
16	点火器 , 配托架 , Sentinel	500-24972
	Oval 80	572855
17	点火电缆	572847
18	空气压差开关	500-26809
19	软管 , 空气压差开关	572883
20	点火控制	500-25865
21	变压器	571900
22	垫片 , 燃烧器	573006
23	铜管 , 配夹钳	572889

(续见下页)

部件清单（续）

24	燃气控制阀	丙烷或丁烷	522076
		天然气	522078
25	电机，配风机外壳组件	Sentinel	573422
		Oval 80	573358
26	接点，配塞子		500-22571
27	电源线		571734
28	燃气软管，1.83 米，12.7 毫米，配转接头，刚性带转环		550-20713
29	转接头，1/2 美制椎管螺纹 × 1/2 美制平行管螺纹		500-25873
30	调压阀，二级，丙烷或丁烷燃气	（附件 - 单独出售）	550-06553*
	调压阀，二级，天然气	（附件 - 单独出售）	500-24414*
31	燃烧箱完整密封垫组件。	（未安装）	572896

注意：

保修政策

育雏取暖器
L.B.White 承诺，本公司所售育雏取暖器，在根据安装维护说明、安全指南和设备标签所示要求进行正确安装、使用及维护时，其组件部分不存在任何材质或工艺上的缺陷。自设备购入之日起的 12 个月内，若您发现有任何缺陷，L.B.White 将按美国威斯康辛州奥纳拉斯卡市离岸价对存在缺陷的部件或育雏取暖器进行维修或更换。
您可以在线登记设备信息，便于 L.B.White 根据保修政策，自动为您的零部件匹配新件。 若未在 L.B.White 处登记设备信息，您需要出示发票副本，以证实您的保修资格。 若您无法在线登记信息，也无法出示发票，则您的保修期将限于 L.B.White 发货日起的 12 个月内。

部件
L.B.White 承诺，自本公司购买的替换件均可正常用于 L.B.White 生产的设备， 且自购入之日起的 12 个月内，上述替换件将不存在任何材质或工艺上的缺陷。 自部件生产日期码所示之日起的 12 个月内，您若发现上述替换件存在缺陷，我公司可自动予以保修。若部件发现于上述 12 个月之后，但尚处设备购入之日起的 12 个月内，您需要出示发票副本，以证实您的保修资格。

L.B.White 所提供担保仅限上述保修服务，其他所有担保，包括任何默示担保、适销性，或针对某特定用途的适用性等，本公司明确表示，均将不予承诺。 若因法律程序，使默示担保未能被有效免责，则该默示担保的持续时间将被限定为上述适用担保的持续时间。 上述担保的补救仅限此处可用的补救。 对于因销售、操作使用设备而直接或间接导致的附带损失或间接损失， L.B.White 将不予赔偿；同时， 在任何情况下，L.B.White 针对某设备的赔偿，包括因过失或严格赔偿责任而产生的索赔，不得超过该设备的购买价格。

一些国家禁止对默示担保的持续时间进行限制，即您可能不适用于上述限制条款。一些国家禁止对附带或间接损失进行排除或限制，即您可能不适用于上述限制或排除条款。 本担保赋予您特定的法律权利，同时根据不同国家的相关政策，您还可以获得其他权利。您可以登录网址：http://www.lbwhite.com/product-registration 登记您的设备信息，从而获取完整的保修服务。登记时，您需要输入所购设备的序列号及型号，望您事先牢记。

维修

如果您需要更换部件或维修设备， 获取更换件和维修服务，您可以联系您当地的 L.B.White 经销商。 您也可以通过电话 001-608-783-5691， 或电话 001-608-783-5691 或电邮customerservice@lbwhite.com 向 L.B.White 寻求协助。

届时，您需要出示所购育雏取暖器的型号及配置号，望您事先牢记。

全球供应商 — 创新型供暖解决方案
411 Mason Street, Onalaska, WI 54650
001-608-783-5691 • techsupport@lbwhite.com

www.lbwhite.com

Owner's Manual and Instructions

Oval 80 Sentinel

Radiant Tube Brood Heaters

AR080 (1)	23.4 kW
AT 125	36.6 kW

Propane Vapor Withdrawal or Natural Gas

(1) Listed under U.S. Patent #: 9,303,880

View this manual online at www.lbwhite.com

Attention

This brood heater has been tested and evaluated by L.B. White Company, LLC as a direct gas fired brood heater with the intended use of heating poultry confinement buildings. Please contact your fuel gas supplier on the L.B. White Company, LLC if you are considering using this product for any application other than its intended use. Contact L.B. White Company, LLC in the U.S.A. at 001-608-783-5691.

www.lbwhite.com

Congratulations!

You have purchased the finest radiant tube brood heater available for the heating of poultry confinement buildings.

Your new L.B. White radiant brood heater incorporates the benefits from the most experienced manufacturer of heating products using state-of-the-art technology.

We, at L.B. White, thank you for your confidence in our products and welcome any suggestions or comments you may have... call us toll free at 001-608-783-5691.

SEE ASSEMBLY INSTRUCTIONS INSIDE

Please refer to important elevation information on inside cover.

SCAN THIS

with your smartphone or visit http://i.youku.com/lbwhite to view maintenance videos for L.B.White heaters.*

** Requires an app like QR Droid for Android or for iPhone*

TABLE OF CONTENTS

⚠ WARNING

Standard products are manufactured to operate at optimum efficiency at elevations between 0 and 610m above sea level.

If operated at higher elevations the product will not function correctly and may function in an unsafe nature. Products providing proper operation for alternate elevations may be available.

If you require a high elevation product, did not specify when ordering, and/or the box this unit came in does not have an alternate altitude designation sticker please contact technical support.

⚠ GENERAL HAZARD WARNING

- FAILURE TO COMPLY WITH THE PRECAUTIONS AND INSTRUCTIONS PROVIDED WITH THIS BROOD HEATER CAN RESULT IN:
  - — DEATH
  - — SERIOUS BODILY INJURY OR BURNS
  - — PROPERTY DAMAGE OR LOSS FROM FIRE OR EXPLOSION
  - — ASPHYXIATION DUE TO LACK OF ADEQUATE AIR SUPPLY OR CARBON MONOXIDE POISONING
  - — ELECTRICAL SHOCK
- READ THIS OWNER'S MANUAL BEFORE INSTALLING OR USING THIS PRODUCT.
- ONLY PERSONS WHO CAN READ, UNDERSTAND, AND FOLLOW THE INSTRUCTIONS SHOULD USE OR SERVICE THIS BROOD HEATER.
- SAVE THIS OWNER'S MANUAL FOR FUTURE USE AND REFERENCE.
- OWNER'S MANUALS AND REPLACEMENT LABELS ARE AVAILABLE AT NO CHARGE. SEE WEBSITE, OR FOR ASSISTANCE, CONTACT L.B. WHITE AT 001-608-783-5691.

⚠ WARNING

- PROPER GAS SUPPLY PRESSURE MUST BE PROVIDED TO THE INLET OF THE BROOD HEATER.
- REFER TO DATA PLATE FOR PROPER GAS SUPPLY PRESSURE.
- GAS PRESSURE IN EXCESS OF THE MAXIMUM INLET PRESSURE SPECIFIED AT THE BROOD HEATER INLET CAN CAUSE FIRES OR EXPLOSIONS.
- FIRES OR EXPLOSIONS CAN LEAD TO SERIOUS INJURY, DEATH, OR BUILDING DAMAGE.
- GAS PRESSURE BELOW THE MINIMUM INLET PRESSURE SPECIFIED AT THE BROOD HEATER INLET MAY CAUSE IMPROPER COMBUSTION.
- IMPROPER COMBUSTION CAN LEAD TO ASPHYXIATION OR CARBON MONOXIDE POISONING AND THEREFORE SERIOUS INJURY OR DEATH.

⚠ WARNING

FIRE AND EXPLOSION HAZARD

- NOT FOR HOME OR RECREATIONAL VEHICLE USE.
- INSTALLATION OF THIS BROOD HEATER IN A HOME OR RECREATIONAL VEHICLE MAY RESULT IN A FIRE OR EXPLOSION.
- FIRE OR EXPLOSIONS CAN CAUSE PROPERTY DAMAGE OR LOSS OF LIFE.

⚠ WARNING

FIRE, BURN, INHALATION, AND EXPLOSION HAZARD

- KEEP SOLID COMBUSTIBLES A SAFE DISTANCE AWAY FROM THE BROOD HEATER.
- SOLID COMBUSTIBLES INCLUDE WOOD, PAPER PRODUCTS, FEATHERS, STRAW AND DUST.
- DO NOT USE THE HEATER IN SPACES WHICH CONTAIN OR MAY CONTAIN VOLATILE OR AIRBORNE COMBUSTIBLES.
- VOLATILE OR AIRBORNE COMBUSTIBLES INCLUDE PIT GASES, GASOLINE, SOLVENTS, PAINT THINNER, DUST PARTICLES OR UNKNOWN CHEMICALS.
- FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN A FIRE OR EXPLOSION.
- FIRE OR EXPLOSIONS CAN LEAD TO PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

FOR YOUR SAFETY

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

FOR YOUR SAFETY

If you smell gas:

1. Open windows.
2. Don't touch electrical switches.
3. Extinguish any open flame.
4. Immediately call your gas supplier.

Specifications

			AR080	AT125
Available Tube Lengths (m)			6.1	12.2
Maximum Input per Hour kW			23.4	36.6
Fuel Consumption per Hour (Max.)	LPG (kg)		1.7	2.63
	NG (m³)		2.27	3.54
Gas supply pressure acceptacle for the purpose of input adjustment (kPa/mbar/In.W.C.)	MAX.	LPG	3.36 / 33.6 / 13.5	
		NG		
	MIN.	LPG	2.74 / 27.4 / 11.0	
		NG	1.74 / 17.4 / 7.0	
Burner manifold pressure (kPa/mbar/In.W.C.)		LPG	2.49 / 24.9 / 10.0	
		NG	1.0 / 10.0 / 4.0	
Ventilation air required to support combustion (m³/hour)	238			
Motor characteristics	30 Watts / 2500 RPM CW Rotation			
Electrical supply (Volts/Hz/Phase)	220-230 / 50 / 1			
Amp draw	Starting		1.0	
	Continous Operation		0.7	
Minimum safe distances of heater from nearest combustible materials (m) See Fig. 1 on page 5.	Top		0.3	
	Sides		0.76	1.83
	Discharge End		1.83	
	Below radiant tubes		1.52	1.83
Temperature sensor location	See Fig. 2 on page 5 of the owner's manual			

General Information

This owner's manual includes all options and accessories commonly used on or with this brood heater. However, depending on the configuration purchased, some options and accessories may not be included.

When calling for technical service assistance, or for other specific information, always have the model number and serial number available.

This manual will instruct you in the operation and care of your radiant brood heater. Have your qualified installer review this manual with you so that you fully understand the brood heater and how it functions.

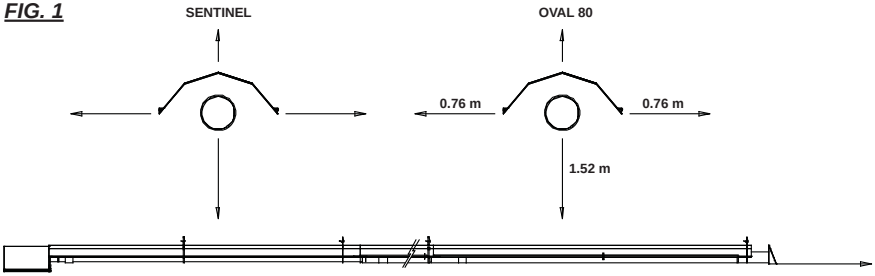
The gas supply line installation, and the repair, installation and servicing of the brood heater requires continuing expert training and knowledge of gas brood heaters and should not be attempted by anyone who is not so qualified.

Contact your local L. B. White distributor or the L.B. White Company, LLC for assistance, or if you have any questions about the use of the brood heater or its application.

The L.B. White Company, LLC has a policy of continuous product improvement. It reserves the right to change specifications and design without notice.

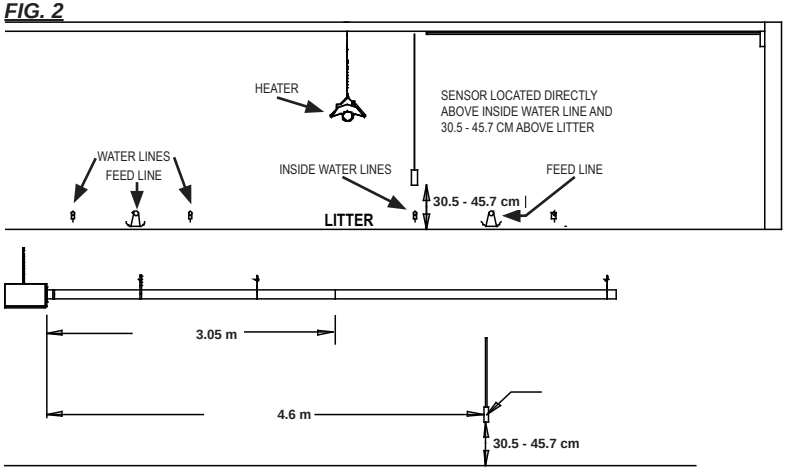
Safe Clearance from Combustibles

FIG. 1



Temperature Sensor Location

FIG. 2



Safety Precautions

⚠ WARNING

Asphyxiation Hazard

- Do not use this radiant brood heater for heating human living quarters.
- Do not use in unventilated areas.
- The flow of combustion and ventilation air must not be obstructed.
- Proper ventilation air must be provided to support the combustion air requirements of the brood heater being used.
- Refer to the specification section of the Owner's Manual, heater's dataplate, or contact the LB White Company to determine combustion air ventilation requirements of the brood heater.
- Lack of proper ventilation air will lead to improper combustion.
- Improper combustion can lead to carbon monoxide poisoning in humans leading to serious injury or death. Symptoms of carbon monoxide poisoning can include headaches, dizziness and difficulty in breathing.
- Symptoms of improper combustion affecting livestock can be disease, lower feed conversion, or death.

Fuel Gas Odor

Propane gas and natural gas have man-made odorants added specifically for detection of fuel gas leaks. If a gas leak occurs, you should be able to smell the fuel gas .

THAT'S YOUR SIGNAL TO GO INTO IMMEDIATE ACTION!

- Do not take any action that could ignite the fuel gas. Do not operate any electrical switches. Do not pull any power supply or extension cords. Do not light matches or any other source of flame. Do not use your telephone.
- Get everyone out of the building and away from the area immediately.
- Close all propane gas tank or cylinder fuel supply valves, or the main fuel supply valve located at the meter if you use natural gas.
- Propane gas is heavier than air and may settle in low areas. When you have reason to suspect a propane leak, keep out of all low areas.
- Use your neighbor's phone and call your fuel gas-supplier and your fire department. Do not re-enter the building or area.
- Stay out of the building and away from the area until declared safe by the firefighters and your fuel gas supplier.
- FINALLY, let the fuel gas service person and the firefighters check for escaped gas. Have them air out the building and area before you return. Properly trained service people must repair the leak, check for further leakages, and then relight the appliance for you.

Odor Fading - No Odor Detected

- Some people cannot smell well. Some people cannot smell the odor of the man-made chemical added to propane or natural gas. You must determine if you can smell the odorant in these fuel gases.
- Learn to recognize the odor of propane gas and natural gas. Local propane gas dealers and your local natural gas supplier (utility) will be more than happy to give you a "scratch and sniff" pamphlet. Use it to become familiar with the fuel gas odor.
- Smoking can decrease your ability to smell. Being around an odor for a period of time can affect your sensitivity to that particular odor. Odors present in animal confinement buildings can mask fuel gas odor.
- The odorant in propane gas and natural gas is colorless and the intensity of its odor can fade under some circumstances.
- If there is an underground leak, the movement of gas through the soil can filter the odorant.
- Propane gas odor may differ in intensity at different levels. Since propane gas is heavier than air, there may be more odor at lower levels.
- Always be sensitive to the slightest gas odor. If you continue to detect any gas odor, no matter how small, treat it as a serious leak. Immediately go into action as discussed previously.

Attention - Critical Points to Remember!

- Propane gas and natural gas have a distinctive odor. Learn to recognize these odors. (Reference "Fuel Gas Odor" and "Odor Fading" sections above.

- If you have not been properly trained in repair and service of propane gas and natural gas fueled brood heaters, then do not attempt to light the brood heater, perform service or repairs, or make any adjustments to the brood heater on a propane (LP) gas or natural gas fuel system.

- Even if you are not properly trained in the service and repair of radiant brood heaters, ALWAYS be consciously aware of the odors of propane gas and natural gas.

- A periodic "sniff test" around the brood heater or at the heater's joints; i.e. hose, connections, etc., is a good safety practice under any conditions. If you smell even a small amount of gas, CONTACT YOUR FUEL GAS SUPPLIER IMMEDIATELY. DO NOT WAIT!

1. Do not attempt to install, repair or service this brood heater or the gas supply line unless you have continuing expert training and knowledge of gas heaters.

QUALIFICATIONS FOR SERVICING AND INSTALLATION:

a. To be a qualified gas brood heater service person, you must have been trained in gas-fired brood heater servicing, repair and also have sufficient experience to allow you to troubleshoot, replace defective parts, and test brood heaters in order to get them into a continuing safe and normal operation condition. You must completely familiarize yourself with each model brood heater by reading and complying with the safety instructions, labels, owner's manual, etc. that is provided with each brood heater.

b. To be a qualified gas installation person, you must have sufficient training and experience to handle all aspects of installing, repairing and altering gas lines, including selecting and installing the proper equipment, and selecting proper pipe size to be used. This must be done in accordance with all local, state and national codes as well as the manufacturer's requirements.

2. All installations and applications of L.B. White brood heaters must meet all relevant local, state and national codes. Included are L.P. gas, electrical, and safety codes. Your local fuel gas supplier, a local licensed electrician, the local fire department or similar government agencies, or your insurance agent can help you determine code requirements.

3. For indoor installation only in agricultural poultry confinement buildings. Not for use in residential dwellings.

4. Do not move, handle, or service the brood heater while in operation or connected to a power or fuel supply.

5. This brood heater may be installed in areas subject to washdown. This brood heater may only be washed on the external components. See Cleaning Instructions. Do not wash the interior of the burner box or the tubes. Use only compressed air, soft brush or dry cloth to clean the interior of the brood heater and it's components. After external washdown, do not operate this brood heater until it is completely dry. In any event, do not operate the brood heater for at least one hour after external washdown.

6. For safety, this brood heater is equipped with an differential air pressure switch. Never operate this brood heater if this safety device has been bypassed. Do not operate this brood heater unless this feature is fully functioning.

7. The brood heater is designed to operate only with its burner access door closed and latched. Do not operate the brood heater with its burner box access door open.

8. Do not block air intakes or discharge outlets of the brood heater. Doing so may cause improper combustion or damage to brood heater components leading to property damage or animal loss.

9. The hose assembly shall be visually inspected on an annual basis. If it is evident there is excessive abrasion or wear, or if the hose is cut, it must be replaced prior to the brood heater being put into operation. The hose assembly shall be protected from animals, and contact with hot surfaces during use. The replacement hose assembly shall be that specified by the manufacturer. See parts list.

10. Check for gas leaks and proper function upon brood heater installation and before building repopulation.

11. This brood heater should be inspected for proper operation by a qualified service person at least annually.

12. Always turn off the gas supply to the brood heater when not in use.

13. This brood heater is equipped with a three-wire electrical system. There is a hot lead, neutral lead, and ground lead. The brood heater may or may not incorporate a plug on the power cord for the brood heater and may or may not incorporate a pin for the ground wire. In any case, the brood heater must be properly connected into a grounded electrical supply using the ground lead in the power cord. Failure to use a properly grounded receptacble can result in electrical shock, personal injury, or death.

14. Direct ignition brood heaters will make up to three trials for ignition. If ignition is not achieved, the control system will lock out the gas control valve. If gas is smelled after system lock out has occurred, immediately close all fuel supply valves. Do not relight until you are sure that all gas that may have accumulated has cleared away. In any event, do not relight for at least 5 minutes.

15. Use only approved gas hose or approved flexible connectors which are rated for use with propane or natural gas.

Inlet Air Requirements

⚠ WARNING
Combustion Hazard

- Provide a properly located and sized fresh air inlet for the brood heater.
  -- Refer to Inlet Air Requirements instructions.
- Failure to provide a fresh air inlet can lead to:

-- Sooting causing building damage
-- High carbon monoxide levels, causing serious injury or death to livestock and humans.
-- Overheating of the first 3.05 m tube, causing fires leading to building damage and injury to livestock and humans.
-- Higher temperature differences over the length of the tubes, causing problems in temperature control and bird performance

This brood heater requires clean, fresh air from a normal, atmospheric pressure environment for proper operation and combustion. Contact L.B.White Company if you have any questions regarding the installation of this brood heater.

Inlet air may be drawn from the attic or through side walls under a protective eve. See Figs. 3 and 4.

-- All inlet air seams and joints must be sealed
-- Do not use any filters on the air inlet system
-- The air inlet system must be kept as straight as possible. No more than 1 - 90º bend is allowed.
-- Contact L.B.White Co. if you have any questions regarding the installation of the heater.

Inlet air for combustion **MUST NOT** be drawn from:

- Inside the confinement room.
- An attic or location where negative pressure (vacuum) affects the air draw of the heater's fan. Examples include, but are not limited to:
  a. Houses with attic soffit vent area smaller than ridge cap vent area
  b. Brood heater air inlet located within 6.1 m of building ventilation fans
  c. Locations where wind and/or the elements can create a negative pressure.

FIG. 3

DRAWING INLET AIR FROM ATTIC

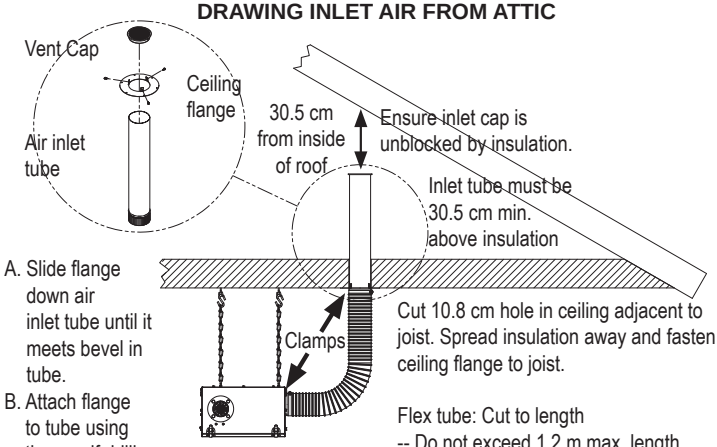
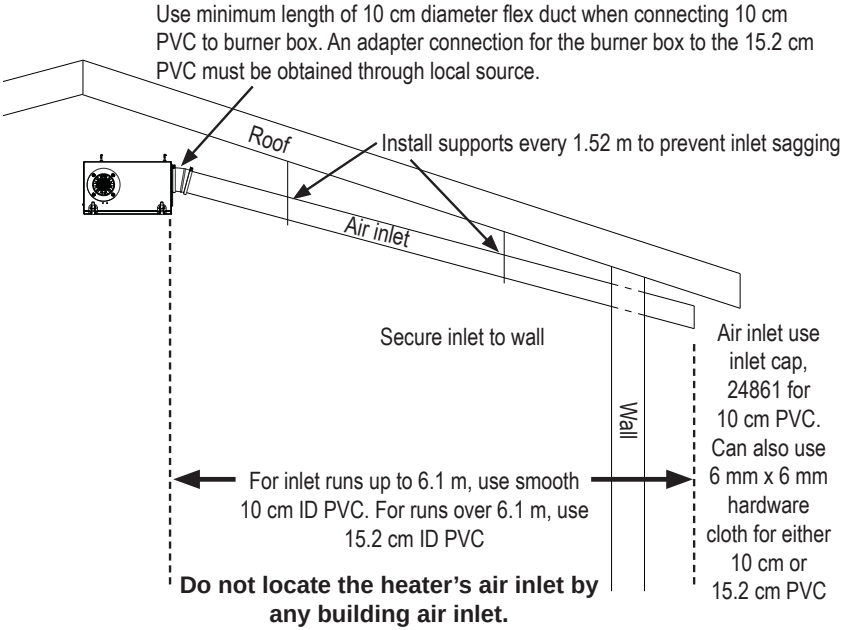


FIG. 4

DRAWING INLET AIR THROUGH SIDEWALLS



General Installation Instructions

1. Read all safety precautions and follow L.B. White recommendations when installing this brood heater. If during the installation of the heater, you suspect that a part is damaged or defective, call a qualified service agency for repair or replacement.

2. A qualified service agency must check the heater upon installation and periodically. This shall consist of the following:

-- Start up and shut down of the brood heaters to test for proper operation.
-- Leak check all gas pipe joints and gas hose connections.
-- Gas pressure checks.
-- Ensuring the brood heater is properly positioned away from combustible materials.

3. Brood heater installation must take into consideration proper hanging height to allow for clearance of catching machines, litter spreaders, and any other equipment used.

4. Ensure the brood heater installation does not interfere with water, gas, or electrical lines.

5. Position the gas hose to prevent any contact with the tubes, brood heat reflectors, and burner box.

6. Ensure that all accessories that ship with the brood heater have been removed from shipping containers and installed. This pertains to gas hose, regulators, supports, hangers, etc.

7. This brood heater requires a regulated gas supply to its gas inlet :

-- The regulator must be the proper design for the application.

-- The regulator must control the inlet pressure to the brood heater within the range specified on the dataplate.

-- Regulators mounted outside must be protected from adverse weather conditions.

-- Regulators with pressure relief valves should be installed outside the building.

-- Regulators installed inside should be vented outside.

-- Local, state and national codes apply to regulator installation.

8. Always use pipe joint compound that is resistant to liquefied petroleum gas and natural gas.

9. Check all connections for gas leaks using approved gas leak detectors. Gas leak testing is performed as follows:

⚠ WARNING
Fire and Explosion Hazard
- Do not use open flame (matches, torches, candles, etc.) in checking for gas leaks.
- Use only approved leak detectors.
- Failure to follow this warning can lead to fires or explosions.
- Fires or explosions can lead to property damage, injury or death.

-- Check all pipe connections, hose connections, fittings and adapters upstream of the gas control with approved gas leak detectors.

-- In the event a gas leak is detected, check the components involved for cleanliness and proper application of pipe compound before further tightening.

-- Tighten the gas connections as necessary to stop the leak.

-- After all connections are checked and any leaks are stopped, turn on the main burner.

-- Stand clear while the main burner ignites to prevent injury caused from hidden leaks that could cause flashback.

-- With the main burner in operation, check all connections, hose connections, fittings and joints as well as the gas control valve inlet and outlet

-- If a leak is detected, check the components involved for cleanliness in the thread areas and proper application of pipe compound before further tightening.

-- Tighten the gas connection as necessary to stop the leak.

-- If necessary, replace the parts or components involved if the leak cannot be stopped.

-- Ensure all gas leaks have been identified and repaired before proceeding.

10. Install a sediment trap at the gas valve inlet to prevent foreign materials (pipe compound, pipe chips and scale) from entering the gas valve. Debris blown into the gas valve may cause that valve to malfunction resulting in a serious gas leak that could result in a possible fire or explosion causing loss of products, building or even life. A properly installed sediment trap will keep foreign materials from entering the gas valve and protect the safe functioning of that important safety component.

11. Any brood heater connected to a piping system must have an accessible, approved manual shut off valve installed within 1.82 m of the brood heater it serves.

12. Install the proper size of gas supply line to assure proper functioning of the brood heaters. Consult your fuel gas supplier, or the L.B. White Co., Inc. for proper line sizing and installation.

13. Light according to instructions on brood heater or within Owner's Manual.

14. The brood heater is designed for L.P. vapor withdrawal or natural gas only. Do not use this brood heater in a propane liquid withdrawal system. Do not permit propane in liquid form to enter the brood heater.

15. The corrosive atmosphere present in animal confinement buildings can cause component failure or brood heater malfunction. The brood heater should be periodically inspected and cleaned in accordance with the Maintenance and Cleaning Instructions in this manual. Make sure that livestock is protected by a back up alarm system that limits high and low temperatures and also activates appropriate alarms.

16. Take time to understand how to operate and maintain the brood heater using the owner's manual. Make sure you know how to shut off the gas supply to the building and to the brood heater. Contact your gas supplier if you have any questions.

17. Any defects found in performing any of the service procedures must be eliminated and defective parts replaced immediately. Retest the brood heater before placing it back into service.

18. Do not exceed input rating stamped on the data-plate of the brood heater. Do not exceed the burner manifold pressure stated on the dataplate. Do not use an orifice size different than specified for the specific input rating of this brood heater, fuel type configuration and altitude.

Initial Setup

1. Plan the installation. Determine location for the brood heater to optimize its heat pattern, keeping in mind cooler regions in the house (end walls, and curtains) and clearances to combustibles.

2. Hang the burner box. See Fig. 5. Maintain clearances to combustibles as shown in Fig. 1.

3. From the burner box chain, measure the distances shown in Fig. 6 or 7 depending on if a Sentinel or Oval 80 brood heater is being installed. **Aligning to the center of the burner box discharge**, hang chains at these points, using open eye hooks.

FIG. 5

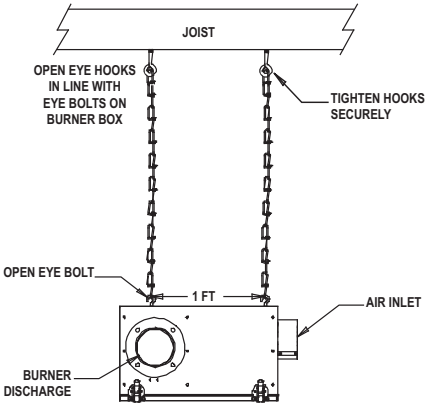
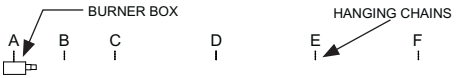


FIG. 6 SENTINEL

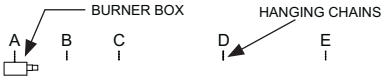


HANGING CHAIN DISTANCES

TRUSS CENTERS	HEATER LENGTH	A - B (m)	B - C (m)	C - D (m)	D - E (m)	E - F (m)
1.22 m	12.2 m	1.22	1.22	3.65	2.43	3.65
1.5 m	12.2 m	1.52	1.52	3.05	3.05	1.52
3.05 m	12.2 m	1.52*	1.52	3.05	3.05	1.52*

* A SUPPORT MUST BE CREATED BETWEEN THE TRUSSES

FIG. 7 OVAL 80



HANGING CHAIN DISTANCES

TRUSS CENTERS	HEATER LENGTH	A - B (m)	B - C (m)	C - D (m)	D - E (m)
1.22 m	6.1 m	1.22	1.22	1.52	2.43
1.52 m	6.1 m	1.52	1.52	1.52	1.52
3.05 m	6.1 m	1.52*	1.52	1.52*	1.52

* A SUPPORT MUST BE CREATED BETWEEN THE TRUSSES

Hanging the Tubes

Refer to Fig. 8 (on next page) and the following instructions:

1. Slide a tube clamp over the non-swaged end of the 3.05 m bright aluminized tube or stainless steel tube. One aluminized tube or stainless steel tube per tube kit.

2. Install the tube over the swaged discharge tube on the burner box:

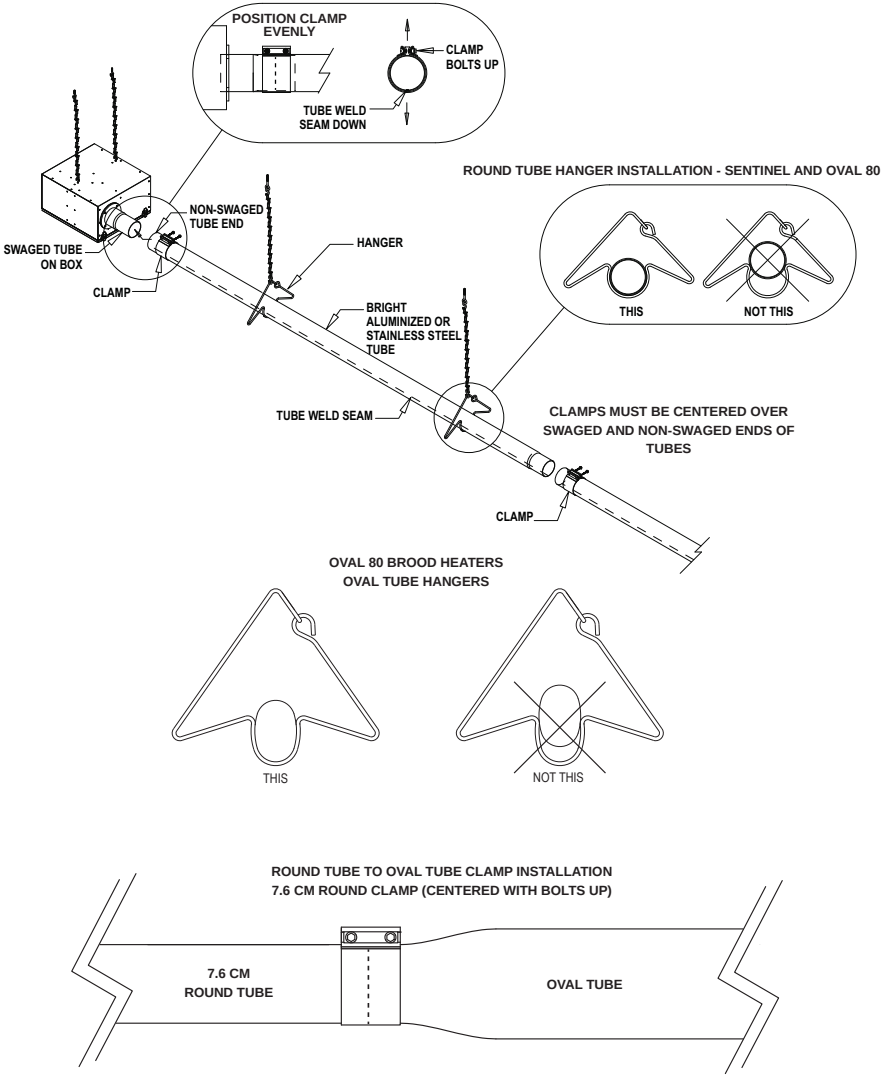
a. Tube weld seam must be down.
b. Non-swaged end of tube must be completely pushed over swaged end of adjoining tube.
c. Clamp must be centered over tube connection.
d. Clamp bolts must be up.
e. Clamp bolts must be tight.
-- Tighten both bolts firmly.
-- Tighten both bolts to 47.5 newton meters.
-- Finish tightening bolts:
  -- Sentinel Brood Heaters: Finish tightening bolts to 88 newton meters.
  -- Oval 80 Brood Heaters: Finish tightening bolts to 59.7-80 newton meters.

3. Slide on hangers and connect to chains.

4. Connect and hang remaining tubes. **Follow the procedures given in Step 2.**

5. The tube assembly should be either hung level, or with a downward slope away from the burner box not exceeding 2.54 cm for every 3.05 m of tube.

FIG. 8

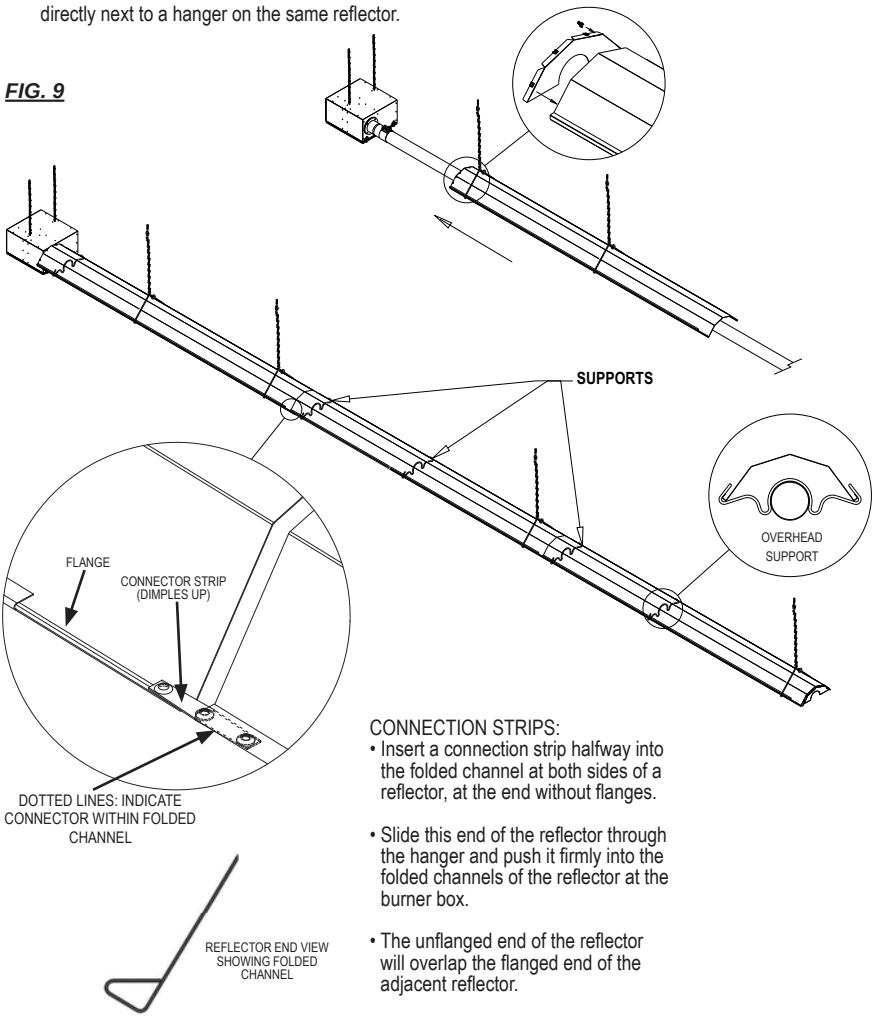


Installing Reflectors & Supports

Refer to Fig. 9 and the following instructions:

1. Slide the reflector through the hangers until it is about .3 m or .6 m away from the burner box.
2. Attach end cap to end of this reflector. Use 4 U-clips. Push this reflector up to burner box.
3. Sentinel Brood Heaters Only: Install a support at end of reflector nearest burner box and at middle and ends of all reflectors. Do not install a support directly next to a hanger on the same reflector.
4. Connect the reflectors using the dimpled connector strips. See below.
5. Repeat Steps 3 and 4 for remaining reflectors.
6. Attach remaining end cap to last reflector with U-clips.

FIG. 9



CONNECTION STRIPS:

- Insert a connection strip halfway into the folded channel at both sides of a reflector, at the end without flanges.
- Slide this end of the reflector through the hanger and push it firmly into the folded channels of the reflector at the burner box.
- The unflanged end of the reflector will overlap the flanged end of the adjacent reflector.

Air Turbulation Strips & Vent

SENTINEL BROOD HEATERS: Assemble the strips and insert into last tube, see Fig. 10. Edge of strip is flush with end of tube.

OVAL 80 BROOD HEATERS: Both strips are factory installed into the oval tube. At installation, ensure strips are snugly fit into oval tube and do not extend past end of tube.

FIG. 10

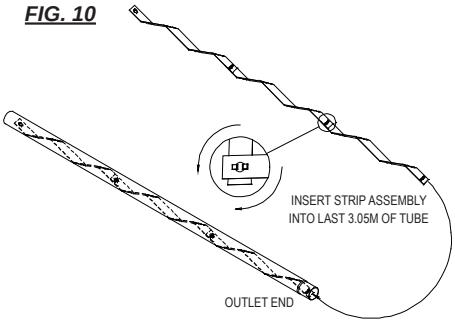
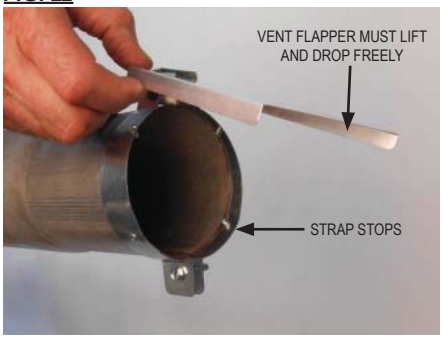


FIG. 11

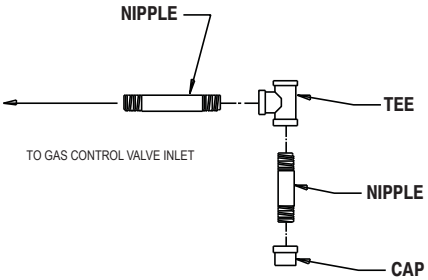


REGARDLESS OF TUBE DESIGN:
-- FORM THE VENT'S STRAP AROUND END OF LAST TUBE.
-- DO NOT WRAP THE VENT STRAP DIRECTLY ONTO TUBE.
-- PUSH THE STRAP STOPS FIRMLY AGAINST EDGE OF TUBE. SEE FIG. 11.
-- TIGHTEN THE STRAP SCREW SECURELY.
-- ENSURE FLAPPER DOES NOT BIND

Sediment Trap Assembly

Assemble the tee, nipple, and cap to the nipple at the gas inlet of brood heater. See Fig. 12. Tighten securely. The sediment trap assembly must always be mounted in a vertical position. Check all connections for gas leaks using approved gas leak detectors.

FIG. 12

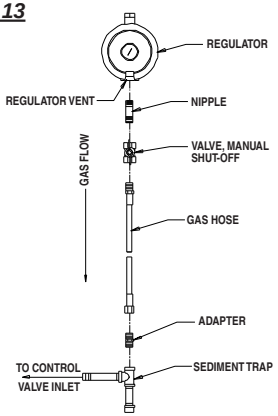


Manual Shut-off Valve, Hose & Regulator

1. Assemble the components together. See Fig. 13. This view shows general assembly of the components. The regulator must always be mounted so its vent, regardless of location on the regulator, is always pointed downward. Ensure hose is positioned away from the heater.

2. Tighten all connections securely and check for gas leaks

FIG. 13



Brood Heater Controls

Refer to the brood heater's burner box hinged access panel, or refer to Start-up instructions in this manual to determine if your brood heater has a single or two stage gas control.

⚠ WARNING
Electrical Shock Hazard
- Disconnect the brood heater's electrical supply before interconnecting the temperature control.
- Failure to disconnect the electrical supply will result in electrical shock.
- Electrical shock will cause severe injury or death.

When connecting a thermostat or building controller to the burner box, route the wiring through the watertight connector near the power cord after removing the connector's plug. See Fig.14. If the connector does not completley seal around the wiring after tightening, apply silicone at the wire entry of the connector.

All interconnecting thermostat wiring must be at least 18 gauge to prevent voltage drop. Ensure the terminal marked W on the ignition control receives 24 VAC from the thermostat or building controller.

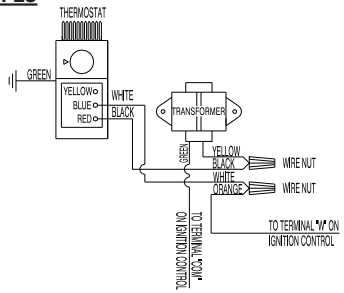
FIG. 14

A. Brood heaters with Single Stage Gas Control Valve

1. Connecting series tap thermostat kit.
-- Connect power cord of brood heater to female side of thermostat cord set.
-- Plug the male side of cord set into an approved extension cord or to wall outlet.

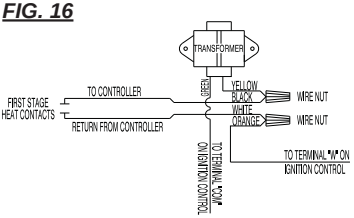
2. Wiring Thermostat (See Fig. 15)
-- Remove wire nut at yellow and orange wire.
-- Connect wiring of thermostat as shown or refer to electrical diagram on heater

FIG. 15



3. Building Controller Connections (See Fig. 16)
-- Remove wire nut from yellow and orange wires.
-- Connect controller contacts as shown.

FIG. 16



Start-Up Instructions

Follow steps 1 - 6 on initial start-up after brood heater installation. For normal start-up, simply turn thermostat above room temperature. The brood heater will start.

1. Open all manual fuel supply valves and check for gas leaks using approved leak detectors. The gas control valve has a manual shut-off feature incorporated into the valve assembly. Ensure the indicator on the valve is turned to the ON position. See Fig. 17, single stage gas control valve shown

2. Connect the electrical cord to an approved electrical outlet.

3. Set the thermostat to desired room temperature

4. This brood heater includes a direct ignition control module for purposes of controlling the timing of the ignition process of the brood heater as well as monitoring of the safety functions. A red fault LED (light emitting diode) is on the burner box cover. **A flashing red light identifies a problem in the operation of the brood heater.** Refer to the troubleshooting decal on the interior of the access panel for assistance in troubleshooting.

5. On a call for heat, the motor will start up and run for five (5) seconds. This pre-purge is a safety feature and a normal operational characteristic prior to ignition taking place. After five (5) seconds, the igniter will spark.

-- When lit, the amber light indicates the gas control opening to full heat output. See Fig.18.

FIG. 17

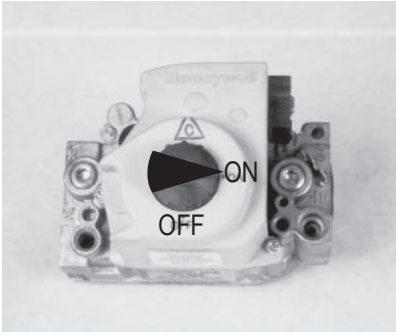


FIG. 18

6. The ignition control will make up to three trials for ignition. Each trial for ignition will take approximately ten seconds. If the main burner does not light, the system will lock out, and a three flash pattern will be given by the red LED.

NOTE: It is normal for air to be trapped in the gas hose on new installations. The heater may try more than once for ignition before the air is finally purged from the line and ignition takes place.

Shut-Down Instructions

If the brood heater is to be shut down for cleaning, maintenance or repair, follow steps 1 - 4. Otherwise, set the thermostat to off or no heat for standard shut down.

1. Close all manual fuel supply valves.

2. With the brood heater lit, allow heater to burn off excess fuel in gas supply hose.

3. Turn thermostat to off or no heat position.

4. Disconnect the brood heater from the electrical supply.

Cleaning Instructions

1. Before cleaning, close the fuel supply valve to the brood heater and disconnect the electrical supply. Allow heater to cool.

2. The brood heater should have dirt or dust removed periodically:

   a. After each flock or between building re-population, give the brood heater a general cleaning using pressurized air or a soft brush on its burner box, reflectors, and tubes.

   b. At least once a year, give the brood heater a thorough cleaning. At this time, open the burner box and brush or blow off control components, and fan motor assembly. Ensure the burner air inlet venturi ports and the throat of the casting are free of dust accumulation.

   c. When washing with water, do not spray water into the burner box or the tubes. Observe and obey the Warning within these Cleaning Instructions. This same Warning is supplied on the brood heater.

⚠ WARNING

Fire, Burn and Explosion Hazard

- This brood heater contains electrical and mechanical components in the gas management, safety and airflow systems.
- Such components may become inoperative or fail due to dust, dirt, wear, aging, or the corrosive atmosphere of an animal confinement building.
- Periodic cleaning and inspection as well as proper maintenance are essential to avoid serious injury or property damage.

⚠ WARNING

This brood heater may be washed only on its external areas provided:

- The burner box is disconnected from the electrical supply.
- The burner box access panel is closed and securely latched.
- Water spray nozzle shall not discharge within 6 feet of the burner box and its tubes.
- The water pressure does not exceed 3.10 BAR for 10 seconds on each side of burner box.
- The burner box is not reconnected to electrical supply for a minimum of 1 hour or until the it is thoroughly dry.

Improper cleaning can cause severe personal injury or property damage due to water and/or cleaning solution:

- In electrical components, connections and wires within the burner box causing electrical shock or component failure.
- On gas control components causing corrosion which can result in gas leaks and fire or explosion from the leak.

Clean internal components of the burner box with a soft, dry brush or cloth, or compressed air.

Maintenance Instructions

Before Each Use:

- **Check to make sure the brood heater's surrounding area is kept clear and free from combustible materials, gasoline, and other flammable vapors and liquids.**
- Regulators must be periodically inspected to make sure the regulator vents are not blocked. Debris, insects, insect nests, snow, or ice on a regulator can block vents and cause excess pressure at the appliance.
- Check all hose and tubing assemblies for cracks, cuts, abrasions or ruptures. Replace any hoses that are suspect.
- Check all gasketing on burner box and fan housing discharge. Ensure all is in good condition. Replace any gasket material if suspect
- Ensure reflector supports and hangers are secure, reflectors do not sag, and are properly located.
- Check overall condition of heater for cracked or damaged components, loose screws or bolts,nicked or cut electrical leads, etc. Replace any suspect components.
- For safety as well as for optimum performance of the brood heater, it is necessary to keep the outside of the brood heater free of dust, dirt or any combustible material. If any operational component shows signs of rust or corrosion, replace the component immediately.
- Check all warning or instruction labels, dataplates, etc. If any are lost or become hard to read, replace them immediately. Do not operate the brood heater until you have all instructions and can read and understand them.

Annually:

- Check the air inlet assembly. Ensure the air inlet assembly and its duct are free of blockages.
- Have your gas supplier check all gas piping for leaks or restrictions in gas lines. Also, at this time have your gas supplier clean out the sediment trap at the inlet of the burner box of any debris that may have accumulated.
- Regulators can wear out and function improperly. Have your gas supplier check the date codes on all regulators installed and check delivery pressures to the appliance to make sure that the regulator is suitable for continued use.

General Service Instructions

⚠ WARNING
Burn Hazard

- Brood heater surfaces are hot for a period of time after the brood heater has been shut down.
- Allow the brood heater to cool before performing service, maintenance, or cleaning.
- Failure to follow this warning will result in burns causing injury.

⚠ WARNING
Fire and Explosion Hazard

- Do not disassemble or attempt to repair any brood heater components or gas train components.
- All component parts must be replaced if defects are found.
- Failure to follow this warning will result in fire or explosions, causing property damage, injury, or death.

1. Close the fuel supply valve to the brood heater and disconnect the brood heater's electrical supply before servicing unless it is necessary to have the valve open and electrical supply connected for your service procedure.
2. Open the burner box for access to control components. Close and latch after servicing.
3. For reassembly, reverse the respective service procedure. Ensure gas connections are tightened securely.
4. Clean the brood heater's burner orifice and pressure switch orifices with compressed air or a soft, dry rag. Do not use files, drills, broaches, etc. to clean the orifice hole. Doing so will enlarge the hole, causing ignition or combustion problems. Replace the orifice if it cannot be cleaned properly.
5. Disconnect appropriate component electrical leads when servicing. **After servicing, light the brood heater to ensure proper operation and check for gas leaks.**

The tip of the igniter is exposed to a harsh environment consisting of high temperatures and combustion products. Periodic servicing is required.

Igniter

A. REPLACEMENT

1. Remove igniter mounting screws. See Fig. 19.

2. Lift and pivot the igniter until it clears the burner. See Fig. 20 (Sentinel) for example.

DO NOT FORCE OR BEND THE IGNITER DURING IGNITER REMOVAL. DO NOT FORCE OR BEND THE BURNER VANES DURING IGNITER REMOVAL.

FIG. 19

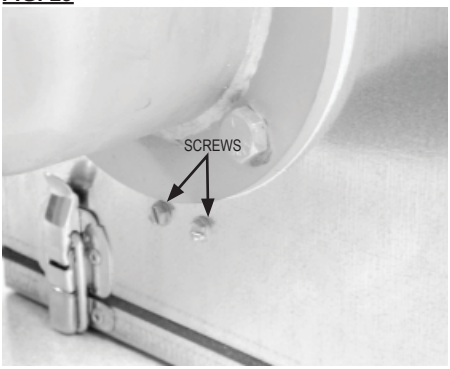
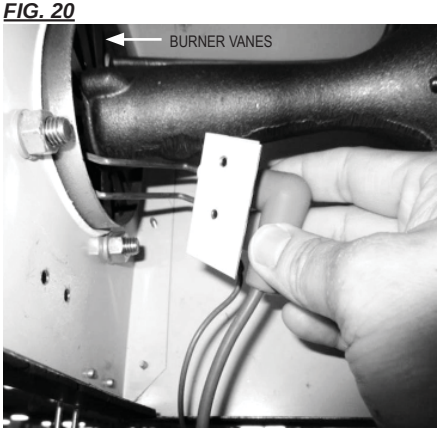


FIG. 20



3. Pull the igntion cable's rubber boot from the igniter.

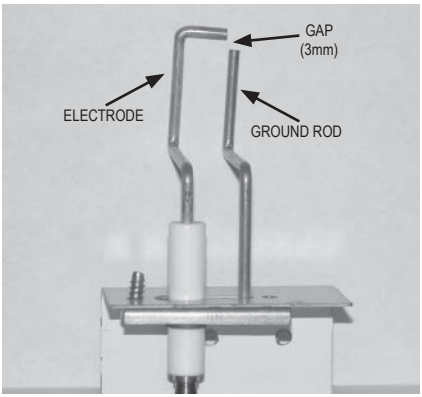
B. MAINTENANCE

1. Ensure the gap is 3 mm. See Fig. 21. (Sentinel igniter shown).

2. Clean the electrode and ground rod using emery cloth.

3. Ensure the insulative base of the electrode is not cracked.

FIG. 21



Motor and Fan Assembly

1. Remove all fan housing mounting nuts. See Fig. 22

2. Reposition the fan and motor assembly as necessary to remove it from the burner box. See Fig. 23. The fan/motor/housing is available only as an assembly

FIG. 22

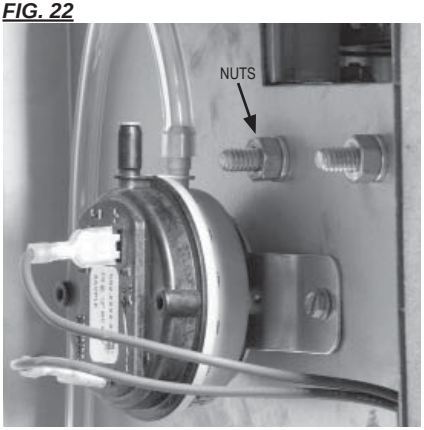
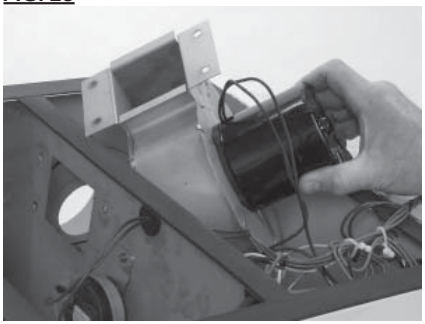


FIG. 23



Air Differential Pressure Switch, Tubing & Pressure Orifices

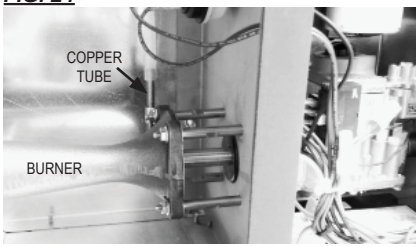
For proper heater operation:

Ensure the clear flexible tube is free of dust and securely connected to the copper tube at the burner and to the fitting at the differential pressure switch. See Figs. 24 & 25.

- The air differential pressure orifices should be free of blockages. If cleaning is required use pressurised air:

-- Remove respective orifice from switch. See Fig. 25.
-- Hold up to light. If blocked clean the orifice.
-- Ensure orifices are securely pushed backed into proper location on switch.(Green into black stem on switch, blue into white stem)

FIG. 24

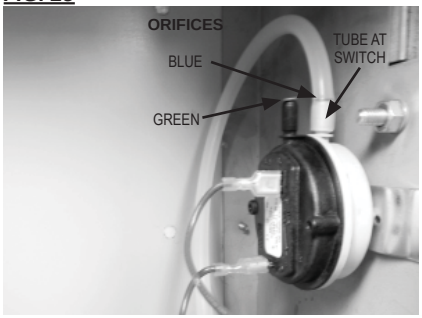


Servicing the differential air pressure switch:

- The differential pressure switch is non-adjustable. If the switch does not make the circuit after inspection of tubes and orifices, it must be replaced.

- Do not jumper the switch. Doing so will cause lock-out of the heater's ignition control.

FIG. 25



Gas Control Valve and Burner Orifice

Remove the following:

a. Hose from the sediment trap.

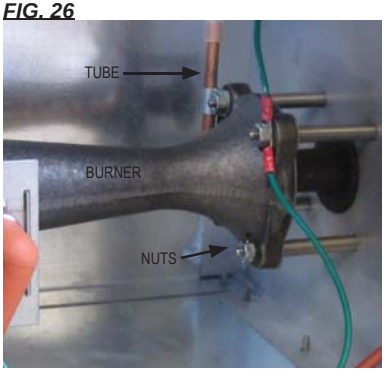
b. Sediment trap with pipe nipple from the inlet of the gas control valve.

c. Igniter from burner box.

d. Clear flexible tube from the copper tube on the burner. Fig. 26.

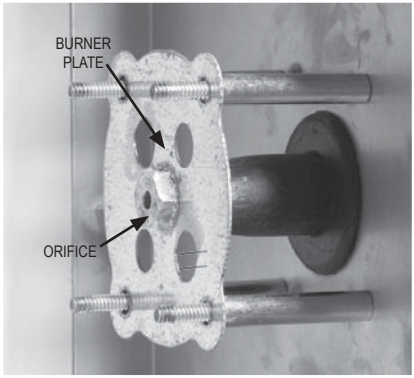
e. Four nuts and ground wire from the burner mounting studs. See Fig. 26. Slide the burner slightly down the burner tube.

FIG. 26



BURNER ORIFICE:
Remove burner orifice. Slide the burner plate from the four threaded burner mounting studs. See Fig. 27.

FIG. 27



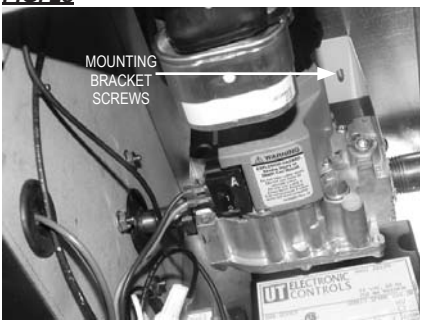
GAS CONTROL VALVE:

Follow all previous steps under Gas Control Valve and Burner Orifice. Then refer to following steps for the Sentinel or Oval 80 brood heaters.

Sentinel Brood Heater:

Remove the screws that secure the gas control valve's mounting bracket, located at exterior top of the burner box. See Fig. 28.

FIG. 28



Oval 80 Brood Heater:
Remove the four gas control valve mounting screws. See Fig. 29.

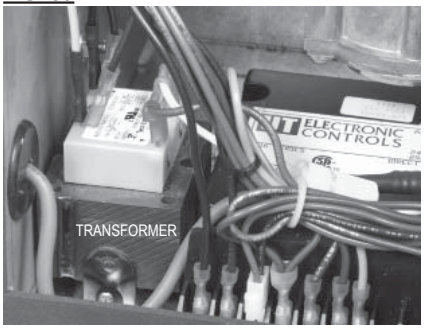
FIG. 29

Transformer

The transformer (Fig. 30) reduces the main power supply voltage to 24 VAC. The 24 VAC is sent through the thermostat (if used) or directly to the ignition controller. Once the ignition controller receives 24 VAC, an ignition cycle begins. The red LED will come on.

If the transformer is receiving main power voltage, but 24 VAC is absent from its output terminals, the transformer is defective. The brood heater will not operate, nor will the red LED on the burner box door be on.

FIG. 30



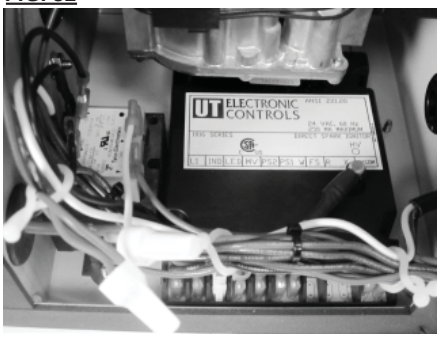
Ignition Control

The control sends and receives voltages to operate or verify operation of components. Refer to the following and Fig. 31 to understand the ignition control's terminal designators if doing voltage checks on the control.

L1: Line voltage to control from power supply.
IND: Line voltage from control to fan motor.
LED: Connection for control's diagnostic light wiring harness.
MV: 24 VAC from ignition control to gas control valve.
PS2: 24 VAC from air pressure switch back to control
PS1: 24 VAC from control to air pressure switch.
W: 24 VAC from transformer to control. (without this voltage the ignition control will not function)
FS: No terminal.
R: No terminal.
X: No terminal.
C/COM: Control and burner ground.

Also refer to "Operation Sequence" within this manual as needed to understand operation of the ignition control during a call for heat.

FIG. 31



Gas Pressure Checks

- The following is a typical procedure to be followed in checking gas pressures.
- Consult the dataplate on the heater or page 4 in this manual for specific pressures. The gas pressures will vary depending upon fuel type.
- Gas pressure measured at the inlet to the gas valve is Inlet Pressure and gas pressure measured at the outlet of the gas valve is Burner Manifold Pressure

MATERIALS REQUIRED

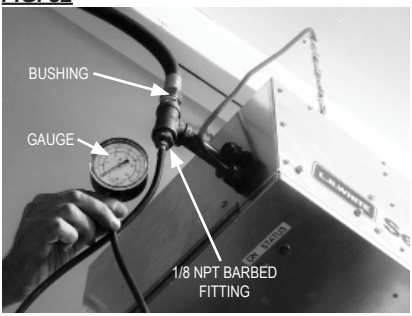
Quantity	Description
2	Gas pressure gauges capable of reading up to 9 kPa (may also be ordered from L.B. White, part number 00764)
1	Bushing, 1/2 in.x 1/8 in.
1	1/8 in. barbed fitting
1	3/16 in. allen key

A. Preparation

1. Disconnect the brood heater from the electrical supply and close the fuel supply valve to the brood heater inlet.

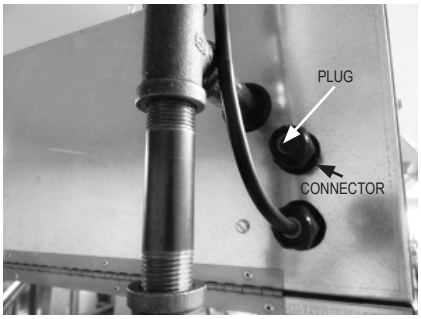
2. Remove the lower nipple and cap from the sediment trap and install the bushing and 1/8 in. NPT barbed fitting. See Fig. 32.

FIG. 32



3. Remove the plug from the connector near the power cord and route the gauge tubing through the connector. See Fig. 33. Keep the connector's plug.

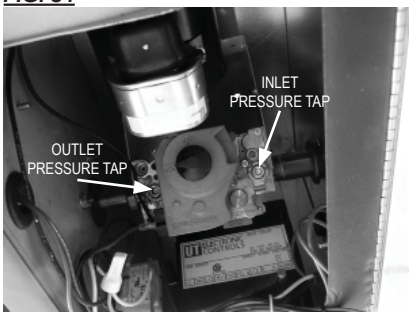
FIG. 33



4. Open the burner box access panel.

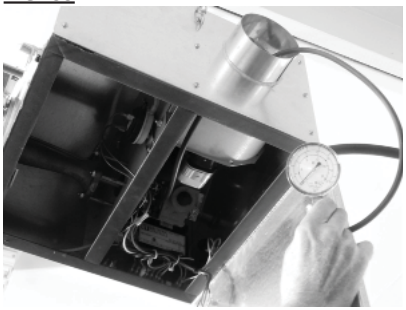
For Sentinel Brood Heaters:
To allow easy access to the pressure tap plug at the gas control's outlet, remove the two screws that hold the valve's mounting bracket to the top of the burner box . Rotate the valve as needed for removal of the pressure taps. See Fig. 34.

FIG. 34



-- Regardless of brood heater, if connector (Fig. 33) is occupied by thermostat wiring, remove the air inlet from the burner box and route the gauge tube through the inlet to the outlet of the gas control valve. See Fig. 35.

FIG. 35



5. Close and latch the burner box. Open the fuel supply valves to the brood heater, reconnect the brood heater's electrical supply, and start the brood heater.

B. Reading Pressures

1. With the brood heater operating, the pressure gauges should read the pressures specified on the dataplate.

2. Do the readings at the inlet and outlet pressure gauges agree with that specified on the dataplate? If so, then no further checking or adjustment is required. Proceed to section D.

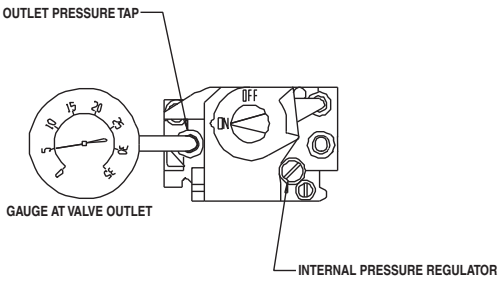
3. If the inlet pressures do not agree with that specified on the dataplate, then the regulator controlling gas pressure to the brood heater requires adjustment.

4. If the inlet pressure is correct but the burner manifold pressure does not agree with that specified on the dataplate, then the pressure regulator internal to the gas control requires adjustment. Refer to the following instructions. The burner box will need to be opened and closed/latched as needed to accurately set the gas control pressures.

C. Setting the Gas Control

Set the thermostat to its highest setting. The single amber light on the burner box panel will come on, and gas control will open. If manifold gas pessure is different than dataplate, adjust the internal pressure regulator clockwise or counterclockwise. See Fig. 36.

FIG. 36



D. Completion

1. Close the fuel supply valve to the heater and allow the heater to burn off any remaining fuel.

2. Disconnect the heater from its electrical supply.

3. Remove the gauges and associated hardware. Install plugs in gas control valve and in connector. Tighten all securely. Close and latch panel. Reconnect air inlet to burner box if necessary.

4. Reconnect hose and adapter to sediment trap. tighten securely.

5. Open fuel supply valve and reconnect electrical supply to heater. Start the heater and check for gas leaks. Set thermostat to desired temperature.

Troubleshooting Information

READ THIS ENTIRE SECTION BEFORE BEGINNING TO TROUBLESHOOT PROBLEMS.

⚠ WARNING

- This brood heater can start at any time.
- Troubleshooting this system may require operating the unit with line voltage present and gas on. Use extreme caution when working on the brood heater.
- Failure to follow this warning may result in property damage, personal injury or death.

The following troubleshooting guide provides procedures for isolating equipment problems. This guide is intended for use by a QUALIFIED GAS BROOD HEATER SERVICE PERSON. **DO NOT ATTEMPT TO SERVICE THESE BROOD HEATERS UNLESS YOU HAVE BEEN PROPERLY TRAINED.**

TEST EQUIPMENT REQUIRED

The following pieces of test equipment will be required to troubleshoot this system with minimal time and effort.

- **Digital Multimeter** - for measuring AC voltage and resistance.
- **Low Pressure Gauge** - for checking inlet and outlet pressures at the gas control valve against dataplate rating.

- Visually inspect equipment for apparent damage.
- Checki all wiring for loose connections and worn

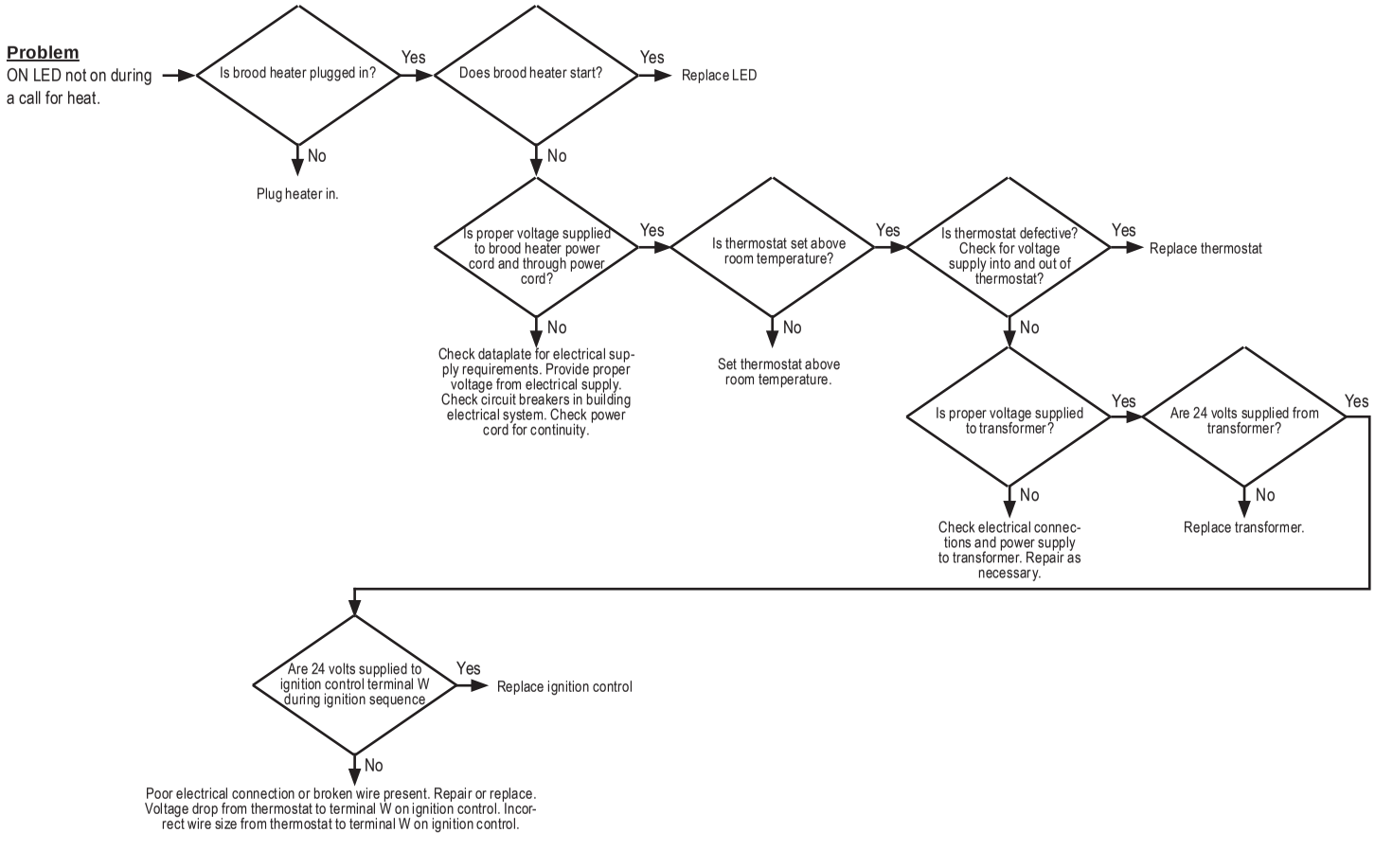
Refer to the system operation sequence in this section to gain an understanding as to how the equipment operates during a call for heat. Understanding the sequence of operation of the ignition module and related components is essential as it will relate directly to problem solving provided by the flow charts.

The ignition control module is self-diagnostic. The red LED on the burner box will flash a specific light pattern depending upon the problem which is diagnosed. To effectively use the flow charts, you must first identify what the problem is by the light pattern of the red diagnostic light.

A flashing light indicates a problem.
The flash pattern will be followed by a pause and then a repeat of the flash pattern until the problem is corrected. Refer to the tables below to identify what page to refer to when troubleshooting any problems.

Components should be replaced only after each step has been completed and replacement is suggested in the flow chart. Refer to the Servicing sections as necessary to obtain information on disassembly and replacement procedures of the component once the problem is identified by the flow chart.

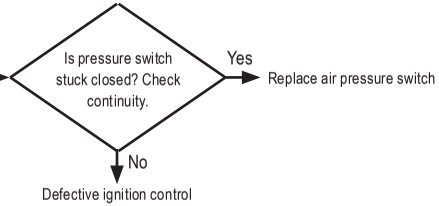
DIRECT IGNITION OPERATION SEQUENCE:
-- Line voltage is sent to ignition control and to transformer.
-- Transformer reduces line voltage to 24 volts which is sent to thermostat.
-- The thermostat calls for heat.
-- The thermostat sends 24 volts to ignition control.
-- Ignition control module performs self safety check.
  -- Internal components are tested.
-- Air pressure switch circuit is checked.
-- Ignition control module begins ignition trial sequence.
-- Ignition control module sends 24 volts to air pressure switch.
-- Ignition control sends line voltage to motor.
  -- Fan motor starts.
-- Air pressure switch contacts close and 24 volts are returned to the ignition control module.
-- Ignition control module sends high voltage to the igniter electrode.
  -- Igniter sparks.
-- Ignition control module sends 24 volts to the gas control valve.
  -- Gas control valve opens.
-- Ignition occurs.
  -- Igniter continues to spark for 4 seconds
  -- Ignition spark is cut off.
-- Gas valve stays open.
-- Room warms to desired temperature.
  -- Thermostat is satisfied.
  -- Heater shuts down.
-- Process starts again on a call for heat.


Problem
ON LED not on during a call for heat.
Is brood heater plugged in?
Yes
No
Plug heater in.
Does brood heater start?
Yes
Replace LED
No
Is proper voltage supplied to brood heater power cord and through power cord?
Yes
No
Check dataplate for electrical supply requirements. Provide proper voltage from electrical supply. Check circuit breakers in building electrical system. Check power cord for continuity.
Is thermostat set above room temperature?
Yes
No
Set thermostat above room temperature.
Is thermostat defective? Check for voltage supply into and out of thermostat?
Yes
Replace thermostat
No
Is proper voltage supplied to transformer?
Yes
No
Check electrical connections and power supply to transformer. Repair as necessary.
Are 24 volts supplied from transformer?
Yes
No
Replace transformer.
Are 24 volts supplied to ignition control terminal W during ignition sequence.
Yes
Replace ignition control
No
Poor electrical connection or broken wire present. Repair or replace. Voltage drop from thermostat to terminal W on ignition control. Incorrect wire size from thermostat to terminal W on ignition control.

Red LED Flashing

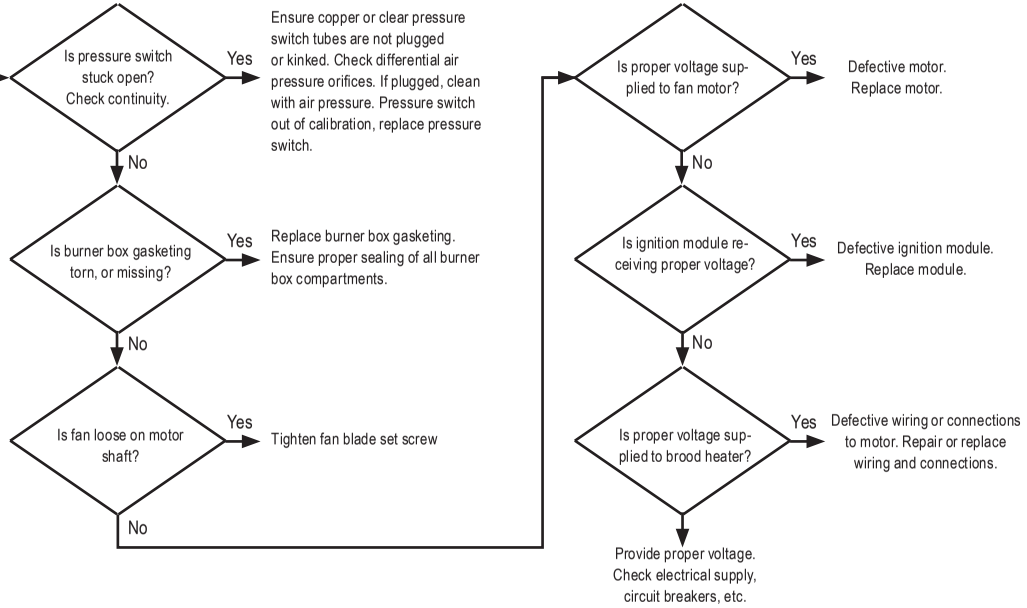
One Flash

Differential air pressure switch contacts are closed before fan motor starts.

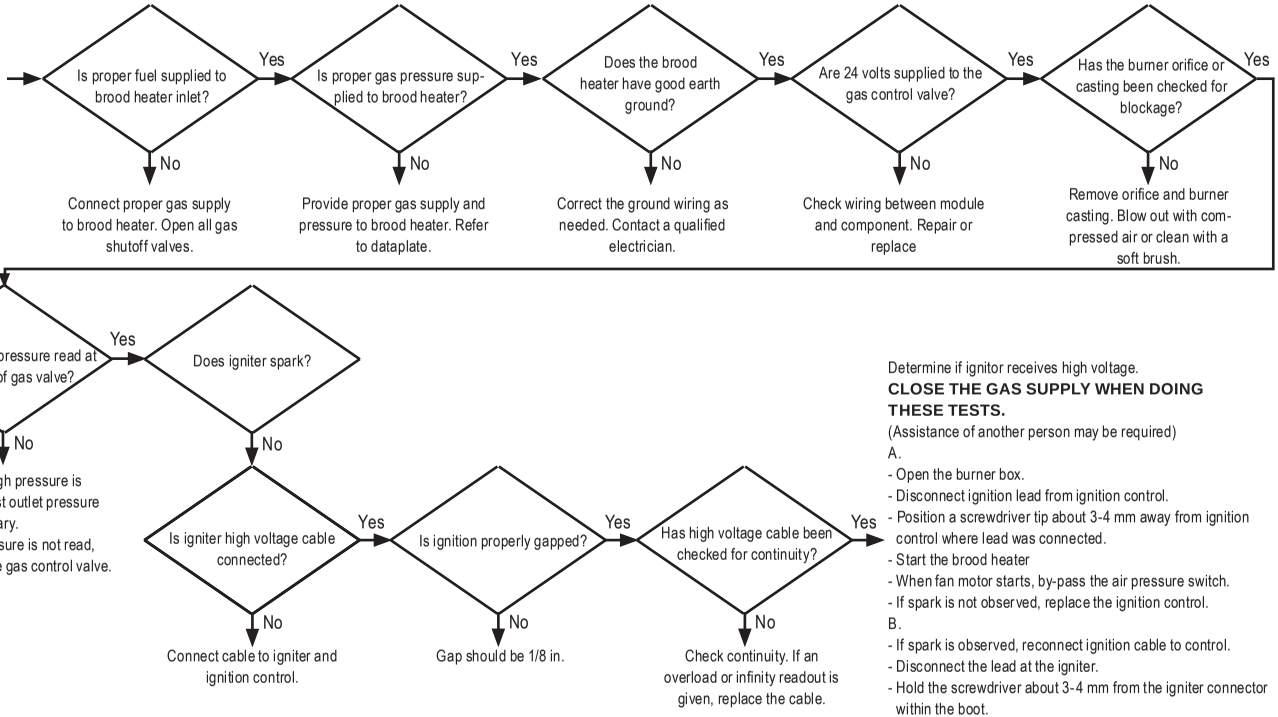


Two Flashes

Differential air pressure switch contacts have not closed. Indicates no air proving in fan section of brood heater



Three Flashes
Ignition failure. The control module is in safety lockout.



Determine if ignitor receives high voltage.
CLOSE THE GAS SUPPLY WHEN DOING THESE TESTS.
(Assistance of another person may be required)
A.
- Open the burner box.
- Disconnect ignition lead from ignition control.
- Position a screwdriver tip about 3-4 mm away from ignition control where lead was connected.
- Start the brood heater
- When fan motor starts, by-pass the air pressure switch.
- If spark is not observed, replace the ignition control.

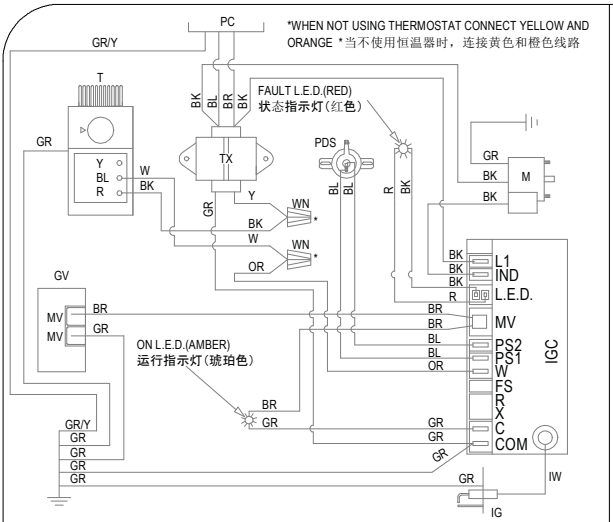
B.
- If spark is observed, reconnect ignition cable to control.
- Disconnect the lead at the igniter.
- Hold the screwdriver about 3-4 mm from the igniter connector within the boot.
- Start the brood heater
- When fan motor starts, by-pass the air pressure switch.
- If spark is not observed, replace the ignition lead.
- Is spark is observed, replace the igniter.

Four Flashes
Lockout from too many flame losses → Flame sense related problems. Check for cracked or dirty igniter or poor flame sense ground.

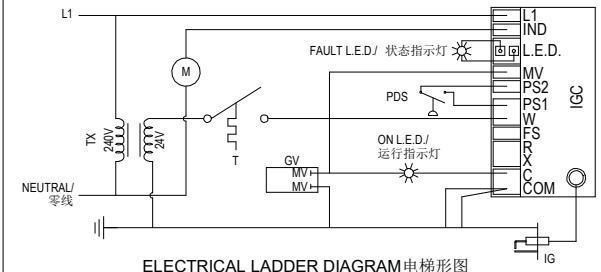
Five Flashes → If control module does not reset, then replace it. (Internal board fault).
If module resets, then have qualified electrician check power source for power quality problems. (Frequency, line noise, line spikes, loose connections, improper wire gauge.)

Electrical Connection and Ladder Diagram

Single Stage Thermostat & Gas Control



ELECTRICAL CONNECTION DIAGRAM/电连接图



ELECTRICAL LADDER DIAGRAM电梯形图

BK: BLACK/黑
BL: BLUE/蓝
BR: BROWN/棕
GR: GREEN/绿
OR: ORANGE/ 橙
R: RED/红
W: WHITE/白
Y: YELLOW/黄

GV: GAS VALVE/燃气控制阀
IG: IGNITER/点火器
IGC: IGNITION CONTROL/ 点火控制盒
IW: IGNITION WIRE/ 高电压点火导线
M: MOTOR/马达
PDS: PRESSURE DIFFERENTIAL SWITCH/压差开关
PC: POWER CORD/电源线
T: THERMOSTAT (OPT) /温控器（可选择）
TX: TRANSFORMER/变压器
WN: WIRE NUT/接线螺帽
⏚: EARTH GROUND/地线

CAUTION - REFER TO THE BROOD HEATER'S ELECTRICAL CONNECTION DIAGRAM WHEN SERVICING TO AVOID WIRING ERRORS & BROOD HEATER MALFUNCTION. CHECK FOR PROPER OPERATION AFTER SERVICING.
注意 - 维修时请参阅育雏取暖器的电连接图以免接线错误和育雏取暖器故障维修后请检查确认育雏取暖器工作正常

IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE BROOD HEATER MUST BE REPLACED, IT MUST BE REPLACED WITH WIRING MATERIAL HAVING A TEMPERATURE RATING OF AT LEAST 302° F (150° C)
倘若必须更换育雏取暖器的任何原装导线，则换上的导线材料必须具有不低于摄氏 150度的温度指标。

Brood Heater Component Function

Burner
Cast iron component used to channel gas and provide an area at which the fuel may ignite.

Burner Orifice
Brass metering device used to feed gas to burner at a specific rate.

Burner Tubes
Conducts the heat provided by the ignition of fuel gas at the burner.

Differential Air Pressure Switch
Safety device used to insure that proper positive and vacuum pressures are within the burner box before the gas valve is opened.

Direct Spark Ignition Control Module
Electronic printed circuit board which sends and receives voltages to various controls in an automatic ignition system. An important safety feature of the control board is that it will shut down the entire brood heater, thereby stopping the flow of fuel gas if burner flame goes out.

Fan Housing
Chamber used for delivering air for efficient air movement.

Fan Wheel
Component used in conjunction with the motor and fan housing. It is used to create pressures within thed burner box used in the distribution of burner flame down the burner tubes.

Gas Control Valve
Electrical device consisting of a low pressure regulator and electrical solenoids used for the control of gas flow to the burner assembly.

Gas Hose
Flexible connector used to convey gas from supply line in building to heater.

Igniter
Ignition device used on automatic direct spark ignition control systems. Ignites gas by spark.

Motor
Electric device used to force air through burner box to create pressure used in the ignition of the brood heater.

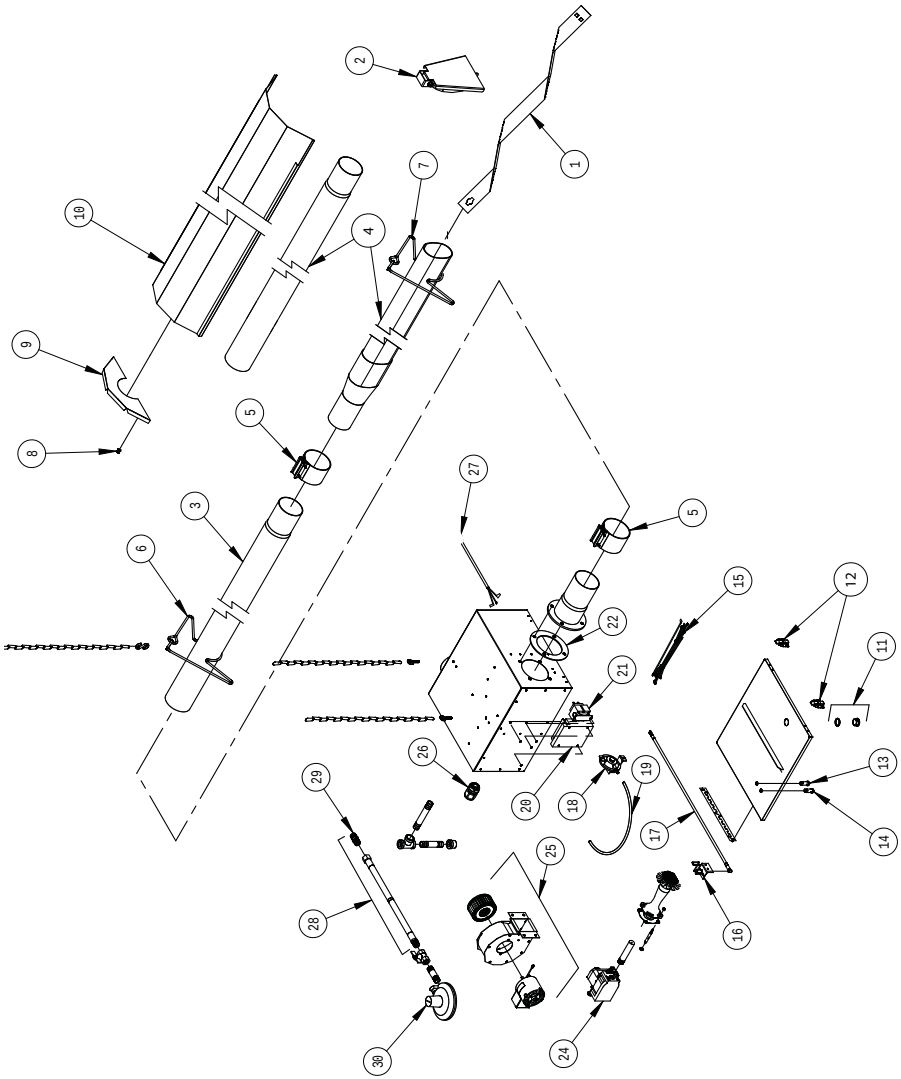
Reflector
Polished aluminum canopy supported over the burner tubes. Used to gather and reflect the radiant heat provided by the burner tubes back down to ground level.

Regulator
Mechanical device used in L.P. and natural gas distribution systems to reduce a higher inlet pressure to a preset lower pressure. The regulator is responsible to supply a steady outlet pressure to the brood heater(s) despite changes in inlet pressure, heater demand and weather conditions.

Thermostat
A component which responds to a change in temperature.

Transformer
Electrical control used to accept line power supply primary voltage and reduce it to lower secondary voltage to operate certain control systems.

Service Parts Identification Schematic



Parts List

	Description	Part #
1	Air turbulation strip (2 for Oval 80 and 3 for Sentinel)	572892
2	Vent cap	572886
3	Tube, aluminized steel, 4 in./10 cm x 10 ft./3.05 m, with clamp (Sentinel 125 / 40 ft. only)	573010
	Tube, aluminized steel, 3 in./7/6 cm x 10 ft./3.05 m, with clamp, Oval 80	572894
4	Tube, uncoated, 4 in./10 cm x 10 ft./3.05 m round w/ clamp, Sentinel	573011
	Tube, oval with clamp, Oval 80	572893
5	Clamp, 4 in./10 cm, round, Sentinel	573009
	Clamp, 3 in./7.6 cm round, Oval 80	572842
6	Hanger, 4 in./10 cm round tube	573004
	Hanger, 3 in./7.6 cm round tube	572852
7	Hanger, oval tube	572870
8	U-clips (4)	572868
9	End cap with 4 u-clips	572869
10	Reflector, with end cap and u-clips	572895
11	Window plug with o-ring	570002
12	Latches and strike	572867
13	Red LED	571333
14	Amber LED	572813
15	Wire harness	572848
16	Ignitor with bracket Sentinel	500-24972
	Oval 80	572855
17	Ignition cable	572847
18	Air differential pressure switch	500-26809
19	Tube, air differential pressure switch	572883
20	Ignition Control	500-25865
21	Transformer	571900
22	Gasket, burner	573006
23	Copper tube with clamp	572889

(CONTINUED ON NEXT PAGE)

Parts List (Cont.)

24	Gas control valve	Propane or Butane	522076
		Natural Gas	522078
25	Motor with fan housing assembly	Sentinel	573422
		Oval 80	573358
26	Connector w/ plug		500-22571
27	Power cord		571734
28	Hose, 1.83 m, 12.7 mm w/adapter, rigid x swivel		550-20713
29	Adapter, 1/2 NPT x 1/2 NPS		500-25873
30	Regulator, second stage, propane or butane gas	(Accessory - sold separately)	550-06553*
	Regulator, second stage, natural gas	(Accessory - sold separately)	500-24414*
31	Complete gasket kit for burner box	(Not illustrated)	572896

Notes

Warranty Policy

HEATER

L.B. White Company, LLC warrants that the component parts of its brood heater are free from defects in material and workmanship, when properly installed, operated, and maintained in accordance with the Installation and Maintenance Instructions, safety guides and labels contained with each unit. If, within 12 months from the date of purchase by the end user, any component is found to be defective, L.B. White Company, LLC will at its option, repair or replace the defective part or brood heater, with a new part or heater, F.O.B., Onalaska, Wisconsin. Registering your product online with L.B.White will automatically qualify a unit and its component parts for warranty consideration. If a product has not been registered with L.B.White, a copy of the bill of sale will be required to establish warranty qualification. If neither is available, the warranty period will be 12 months from date of shipment from L B. White.

PARTS

L.B. White Company, LLC warrants that replacement parts purchased from the company and used on the appropriate L. B. White equipment are free from defects both in material and workmanship for 12 months from the date of purchase by the end user. Warranty is automatic if a component is found defective within 12 months of the date code marked on the part. If the defect occurs more than 12 months later than the date code but within 12 months from the date of purchase by the end user, a copy of a bill of sale will be required to establish warranty qualification.

The warranty set forth above is the exclusive warranty provided by L.B. White, and all other warranties, including any implied warranties or merchantability or fitness for a particular purpose, are expressly disclaimed. In the event any implied warranty is not hereby effectively disclaimed due to operation of law, such implied warranty is limited in duration to the duration of the applicable warranty stated above. The remedies set forth above are the sole and exclusive remedies available hereunder. L.B. White will not be liable for any incidental or consequential damages directly or indirectly related to the sale, handling or use of the equipment, and in any event L.B. White's liability inconnection with the equipment, including for claims based on negligence or strict liability, is limited to the purchase price.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.
To register your product and ensure full warranty, go to http://www.lbwhite.com/customer_care_center/product-registration/. Please have the serial number(s) and model(s) handy for the products you are registering.

Service

Contact your local L.B. White dealer for replacement parts and service. You may also call the L.B. White Company, LLC at 001-608-783-5691, for assistance, or email us at customerservice@lbwhite.com.

Be sure that you have your heater model number and configuration number when calling.

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