L.B.WHITE 绿博·温特

I-17 / I-40

养殖舍辐射式育雏取暖器

I-17 5kW
I-40 11.7kW

液化气
或天然气

访问 www.lbwhite.com 网站在线查看本手册。

注意

本育雏取暖器已经过 L.B.White 公司测试和评估，可用作燃气直燃辐射育雏取暖器为农用畜禽棚舍中的禽畜供暖。如果您想要把本产品用于并非其预期用途的任何场合，请联系您的燃气供应商或 L.B.White。

www.lbwhite.com

恭喜！

您购买了最优质的辐射育雏取暖器，该产品可用于为农用畜禽棚舍中的畜禽供暖。

您的新 L.B.White 辐射育雏取暖器结合了最有经验的供暖产品制造商使用最先进技术研发的多种优势。

我们 L.B.White 全体同仁真诚感谢您对本公司产品的信赖，并且欢迎您提出宝贵建议或意见……请拨打免费电话 1-800-345-7200 与我们联系。

参见组装说明（内部）

用您的智能手机

扫描此 QR 码或
访问 http://goo.gl/uqadY 即可观看 L.B.White 育雏取暖器的维护视频。

* 适用于 Android 或 iPhone 的 QR Droid 应用程序

全球供应商——创新供暖解决方案

411 Mason Street, Onalaska, WI U.S.A. 54650 • 800-345-7200 • 608-783-5691 • 608-783-6115（传真） • www.lbwhite.com

目录

⚠ 一般危险警告

■ 不遵守本育雏取暖器规定的注意事项和说明可能会导致：
— 死亡
— 严重的人身伤害或烧伤
— 由火灾或爆炸造成的财产损坏或损失
— 因缺乏足够的空气供应或一氧化碳中毒而窒息
■ 安装或使用本产品之前，请阅读本《用户手册》。
■ 只有能够阅读、理解和遵循本使用说明书的人员才可以使用或检修本育雏取暖器。
■ 请保存本《用户手册》以备日后使用和参考。
■《用户手册》和更换标签可免费提供。请查看网站，或者拨打 1-800-345-7200 联系 L.B.White 公司以获得协助。

⚠ 警告

■ 在育雏取暖器的入口处必须提供适当的燃气供应压力。
■ 请参阅参数标牌，了解适当的燃气供应压力。
■ 若燃气压力超过育雏取暖器入口处规定的最大入口压力，可能会造成起火或爆炸。
■ 起火或爆炸可能会导致严重的人身伤害、死亡或棚舍损坏。
■ 若燃气压力低于育雏取暖器入口处规定的最小入口压力，可能会造成不当燃烧。
■ 不当燃烧可能会导致窒息或一氧化碳中毒，因此会造成人畜严重伤害或死亡。

⚠ 警告

火灾与爆炸危险

■ 不适合在住宅或休闲车内使用。
■ 在住宅或休闲车内安装本育雏取暖器可能会导致火灾或爆炸。
■ 起火或爆炸可能会造成财产损失或人身伤亡。

⚠ 警告

起火、烧伤、吸入与爆炸危险

■ 请在育雏取暖器与固体可燃物之间保持一定的安全距离。
■ 固体可燃物包括木材、纸制品、羽毛、秸秆及粉尘。
■ 请勿在含有或可能含有挥发性或空浮可燃物的空间内使用本育雏取暖器。
■ 挥发性或空浮可燃物包括储粪池排气、汽油、溶剂、油漆稀释剂、粉尘颗粒或不明化学物质。
■ 不遵循上述说明可能会导致起火或爆炸。
■ 起火或爆炸可能会导致财产损失或人身伤亡。

为了您的安全

请勿在本设备或任何其他电器附近存放或使用汽油或其他易燃气体或液体。

为了您的安全

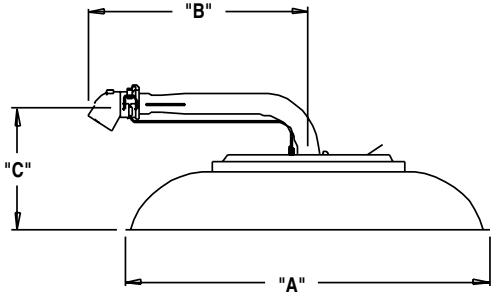
如果您闻到燃气味：
1.打开窗户。
2.请勿触摸电气开关。
3.熄灭任何明火。
4.立即打电话给您的燃气供应商。

规格

			I-17	I-40
最大输入功率 (kW)			5	11.7
助燃通风量 (m^3/h)			340	795
完全输出压力 (kPa)	液化气或天然气		34.5	
手动点火低热量压力 (kPa)	液化气或天然气		2.5-3.0	
育雏取暖器尺寸 (cm)（参见图 1）		A	41.9	78.1
		B	26.3	40.6
		C	17.1	24.1
燃料耗量/小时		液化气 (kg)	0.36	.84
		天然气 (m^3)	0.48	1.13
育雏数/育雏取暖器 (1)		鸡	1250-2000	2900-4400
		火鸡	350-500	920-1100
		猪	170	(3)
推荐的畜禽棚舍助燃锥筒端点到地面安装高度 (m)		鸡	1.52-1.82	1.98-2.28
		火鸡	1.21	1.67-1.98
		猪	1.21-1.52	(3)
与可燃材料的最小安全间距 (m)	罩顶到天花板		0.91	
	助燃锥筒端点到地面		1.06	1.37
	两侧		0.91	
畜禽所在区域的温度控制传感器位置	家禽	距地面垂直高度	15.2-30.5 cm (2)	
		距育雏器水平距离	2.43-3.65 m	
	猪	距地面垂直高度	高于畜禽的高度	(3)
		距育雏器水平距离	1.21-2.43 m	(3)

(1) 还有其他因素会影响每台育雏取暖器的育雏数量。这些因素包括棚舍通风和控制系统、棚舍保温层、棚舍尺寸以及畜禽密度等。请咨询 L.B.White 经销商或致电 L.B.White，有关人员将会为您的应用提出具体建议。
(2) 这是典型的家禽设备传感器高度范围。传感器的高度取决于所养畜禽的大小和类型、育雏取暖器间距及高度等因素。在操作过程中，应该始终注意确保传感器所处的高度足以避免畜禽损坏设备。
(3) 不推荐用于猪

图 1



一般信息

本《用户手册》包括本育雏取暖器常用的全部选项和附件。致电寻求技术服务协助或了解其他具体信息时，请务必提供型号、配置编号和序列号。上述信息包含在参数标牌中。

本手册将指导您如何操作和保养您的设备。请让合格的安装人员与您一起仔细阅读本手册，以便您能够完全了解本育雏取暖器及其工作原理。

燃气供应管线安装、育雏取暖器安装、以及育雏取暖器检修均需要持续的专家培训以及有关燃气育雏取暖器的知识，任何不合格的人员都不应尝试进行上述工作。参见第 7 页，了解必要的资格定义。

如需协助，或有关于本设备或其应用的任何疑问，请联系您当地的 L.B.White 产品分销商或 L.B.White。

L.B.White 的政策是不断完善其产品，因此保留不经通知而更改规格与设计的权利。

安全注意事项

⚠ 警告

窒息危险

- 请勿使用本辐射育雏取暖器向人居住宅供暖。
- 请勿用于不通风的场所。
- 不得阻碍助燃空气和通风空气的流通。
- 必须提供适当通风，以满足所用育雏取暖器的助燃空气要求。
- 请参阅《用户手册》的规格部分、育雏取暖器的参数标牌，或者联系 L.B.White 公司，确定育雏取暖器的助燃空气通风要求。
- 缺乏适当的通风将会导致不当燃烧。
- 不当燃烧可能会引起人体一氧化碳中毒，从而导致严重伤害或死亡。一氧化碳中毒的症状可能包括头痛、头晕和呼吸困难。
- 不当燃烧影响畜禽的症状可能为疾病、饲料转化率降低或死亡。

燃气气味

液化气和天然气含有专门用于探测燃气泄漏的人造添味剂。
如果发生燃气泄漏，您应该能够闻到燃气味。

这是您需要立即采取行动的信号！

- 请勿采取任何有可能点燃燃气的行动。请勿操作任何电气开关。请勿拔出任何电源或延长线插头。请勿点燃火柴或任何其他火源。请勿使用电话。
- 立即通知所有人撤离该棚舍并且远离该区域。
- 请关闭所有液化气罐、气瓶的燃料供应阀，如果使用天然气，请关闭天然气表处的总管燃料供应阀。
- 液化气比空气重并且可能会在低洼区域沉积。当您有理由怀疑丙烷泄漏时，请远离所有低洼区域。
- 借用邻居的电话，致电燃气供应商和消防部门。请勿重新进入该棚舍或区域。
- 在消防人员和燃气供应商宣布安全前，留在该棚舍外面并且远离该区域。
- 最后，让燃气检修人员和消防人员检测是否有燃气泄漏。在您返回之前，让他们给该棚舍和区域通风。必须由经过适当培训的检修人员对泄漏之处进行维修，让其检测是否有其他泄漏，然后重新为您点燃设备。

气味消退——没有探测到气味

- 有些人嗅觉不好。有些人闻不到丙烷或天然气中所添加的人造化学物质的气味。您必须确定您是否能够闻到这些燃气中的添味剂。
- 学习识别液化气和天然气的气味。当地液化气经销商以及您当地的燃气供应商（公用事业公司）将会乐意向您提供“一刮即嗅”折页宣传册。请用它来熟悉燃气的气味。
- 吸烟会降低您的嗅觉能力。长时间闻某种气味也会影响您对该气味的敏感性。畜禽棚舍中存在的气味会掩盖燃气的气味。
- 液化气和天然气中的添味剂没有颜色，并且其气味强度在某些情况下可能会消退。
- 如果有地下泄漏，燃气在土壤中的流动可能会过滤掉添味剂。
- 液化气气味的强度可能会随高度变化。由于液化气比空气重，因此低处的气味可能比较强。
- 请始终对轻微的燃气气味保持高度警惕。如果您不断闻到有任何燃气气味，不管多么轻微，都应该将其作为严重泄漏对待。请立即采取如前所述的行动。

注意——需要牢记的关键点！

- 液化气和天然气具有独特的气味。学习识别这些气味。（请参阅前面的“燃气气味”和“气味消退”章节。）

- 如果您未接受过检修液化气和天然气育雏取暖器的适当培训，请勿尝试点燃育雏取暖器进行检修，或者对使用液化气或天然气燃料系统的育雏取暖器进行任何调整。

- 即使您未接受过维修育雏取暖器的适当培训，请始终对液化气和天然气的气味保持高度警惕。

- 围绕育雏取暖器以及育雏取暖器的连接处（即软管和接头等）定期进行“嗅闻测试”，在任何情况下都是一项良好的安全实践。哪怕您只闻到轻微的气味，也请立即与燃气供应商联系。切勿拖延！

1.除非您接受过持续的专家培训并且拥有燃气育雏取暖器方面的知识，否则请勿尝试安装或维修本育雏取暖器或供气管线。

下面是检修和安装本设备所需的资格条件：

a. 要成为合格的燃气育雏取暖器检修人员，您必须接受过燃气育雏取暖器检修方面的培训，并且还拥有足够的经验，能够进行故障排除、更换有故障的零件和测试育雏取暖器，使育雏取暖器进入持续安全的正常工作状态。您必须阅读和遵循每台育雏取暖器随附的安全说明、标签、《用户手册》等资料，完全熟悉各种型号的育雏取暖器。

b. 要成为合格的燃气安装人员，您必须接受足够的培训并且拥有足够的经验，能够处理燃气管线安装、维修及更换等各方面工作，包括选择和安装适当的设备，以及选择适当的管道尺寸以供使用。必须根据所有当地、省市及国家规范以及制造商的要求进行这项工作。

2.L.B.White 公司的辐射育雏取暖器的全部安装或应用都应当符合当地、省市及国家的液化石油气和天然气、电气及安全规范。您的燃气供应商、当地持有许可证的电工、当地消防部门和政府机构可以帮助您确定这些要求。

3.如果您在任何时候注意到育雏取暖器的操作不正常（例如燃气异味、过热，火焰超出助燃锥筒区域等），请立即撤离该区域并且联系消防部门以及燃气检修机构。经消防部门证实该区域无燃气之后，再尝试重新点燃育雏取暖器。

4.育雏取暖器上需要手动操作的部件只能通过手部压力完成。如果操作比较费劲，请合格的燃气育雏取暖器检修机构更换整个零件。请勿尝试进行维修。

5.本育雏取暖器仅适合在农用畜禽棚舍内给畜禽供暖。育雏取暖器只应安装在畜禽棚舍内。不得将其用于室外供暖应用。

6.请勿在育雏取暖器供暖区域内的任何地方放置燃气容器或燃料供应软管。

7.请勿堵塞空气入口或燃烧器散热装置区域，否则可能会引起不当燃烧或损坏育雏取暖器部件，导致财产损失或畜禽损失。

8.在操作或连接到燃料供应管时，请勿移动、搬运或检修育雏取暖器。

9.必须定期检查软管总成。应该至少每年检查一次，或在清理棚舍时进行检查。如果明显存在过度磨蚀或磨损，或者软管有切口，必须在育雏取暖器投入使用之前更换软管。在使用过程中，应当防止软管总成触及畜禽、棚舍材料，避免与热表面接触。更换软管总成应当符合制造商的规定。参见零件列表。

10.在重新迁入畜禽之前和重新放置育雏取暖器时，须检测是否有燃气泄漏以及安装后功能是否正常。

11.如果气流中断并且燃烧器火焰熄灭，立即切断燃气。在您确信育雏取暖器中积聚的全部燃气都已清除前，请勿重新点燃育雏取暖器。至少等待五分钟后，才能重新点燃育雏取暖器。

12.如果要重新放置育雏取暖器，请确保所有燃气接头都已封住并且切断气源。在断开连接之后以及重新连接之后，必须对所有连接点进行泄漏检测。

⚠ 警告

烧伤危险

- 在操作期间和关闭后不久，育雏取暖器的散热装置和顶罩非常炙热。
- 当您靠近育雏取暖器时，请始终保持高度警惕，避免在操作期间或操作后不久与其热表面接触。
- 不遵循此警告可能会导致灼伤，从而造成严重的人身伤害。

13.饲养人员应当在棚舍重新迁入畜禽之前检查育雏取暖器。检查应该包括但不限于以下要点：

-- 确保育雏取暖器与最近的可燃材料之间保持适当的间距。

-- 检测总体清洁度。根据需要进行清洁。

-- 检测燃气软管连接的紧固性。

14.A 应当由合格的检修人员至少每年检查一次育雏取暖器及其燃气阀组。这应该包括但不限于以下要点：

-- 启动和关闭育雏取暖器

-- 对所有管道接头和软管接点进行泄漏检测。

-- 彻底清洁育雏取暖器的外部、其燃烧器总成和散热装置。

-- 彻底检查育雏取暖器的零部件是否有腐蚀、螺纹剥裂等，随后根据需要更换部件。

-- 燃气压力检测。

15.不使用育雏取暖器时，请切断气源。

一般安装说明

1.安装本育雏取暖器时，请阅读全部安全注意事项并且遵循 L.B.White 公司的建议。如果在育雏取暖器的安装或重新放置过程中，您怀疑有零件受损或有故障，请找合格的检修机构进行维修或更换。

2.使用之前，请根据有关可燃材料间距、离地间距、倾角的要求正确放置育雏取暖器，并且防止育雏取暖器触及畜禽。参阅图 2 以及本手册第 4 页中的规格表，了解有关安装和间距的信息。

3.将燃气软管放置在育雏取暖器正上方的热区之外，以避免与育雏取暖器的顶罩热表面发生任何接触。参阅图 2。

4.确保您为育雏取暖器订购的所有附件都已从育雏取暖器的装运箱内取出且安装完毕。这包括燃气软管、过滤器等。

5.育雏取暖器的燃气调节器（带减压阀）应该安装在棚舍之外。棚舍内部的任何调节器都必须适当地向外排气。调节器安装应该始终遵循当地、省市及国家规范。

6.保护任何安装在棚舍之外的调节器免受天气影响，特别是结冰。结冰可能会导致调节器超压，随后发生燃气泄漏。参见涵盖适当保护的规范。

7.始终使用可耐受液化石油气、天然气的

管道接头填塞料。

8.使用经认可的泄漏探测器对所有燃气接点进行燃气泄漏检测。燃气泄漏测试应按如下说明完成：

⚠ 警告

起火、烧伤与爆炸危险

- 检测是否有燃气泄漏时，请勿使用明火（火柴、火炬、蜡烛等）。
- 仅使用经认可的泄漏探测器。
- 不遵循此警告可能会导致起火或爆炸。
- 起火或爆炸可能会导致财产损失或人身伤亡。

-- 使用经认可的燃气泄漏探测器检测育雏取暖器燃气控制上游的全部管道接点、软管接点、配件及联管件。

-- 如探测到燃气泄漏，检测有关部件是否清洁，在进一步拧紧之前适当应用管道填塞料。

-- 根据需要进一步拧紧燃气接点，以阻止泄漏。

-- 在全部接点都已检测完毕并且任何泄漏都已停止之后，开启主燃烧器。

-- 在主燃烧器点火时站远一点，以防因隐蔽泄漏产生的回火而受伤。

-- 当主燃烧器运行时，使用经认可的燃气泄漏探测器检测全部软管接点、配件和接头，以及燃气控制阀的入口和出口接点。

-- 如果探测到泄漏，检测有关部件是否清洁，在进一步拧紧之前适当应用管道填塞料。

-- 根据需要拧紧燃气接点，以阻止泄漏。

-- 如果无法阻止泄漏，根据需要更换有关零部件。

-- 在继续操作之前，确保所有燃气泄漏之处都已经确定和维修。

9.合格的检修机构必须在安装育雏取暖器后检测操作燃气压力是否适当。

10.使用适当的供气管线，确保育雏取暖

器发挥正常功能。通常情况下，可使用内径为 19mm 的黑色铁管将燃气传送到该区域控制面板的入口，使用内径为 12.7mm 的黑色铁管将燃气传送到育雏取暖器。然而，如需了解正确的管线尺寸和安装，请务必咨询燃气供应商或 L.B.White 公司。

12.Infraconic 育雏取暖器在燃气入口需要经过调节的气源。超出燃气入口压力额定值可能会导致性能变差和操作不可靠。有关特定型号燃气压力的信息，请参阅本手册第 4 页。

13.本育雏取暖器是专为 液化石油气或天然气设计的，具体情况视型号而定。请勿将育雏取暖器用于液化石油气液相提取系统。在任何时候都不得让液态形式的液化石油气进入育雏取暖器。

14.畜禽棚舍内的腐蚀性气体可能会造成部件故障或育雏取暖器失灵。应该根据本手册中的维护与清洁说明，定期检查和清洁育雏取暖器。确保采用限制高温和低温的备用警报系统来保护畜禽并激活适当的警报。

15.请花些时间阅读用户手册，了解如何操作

和维护育雏取暖器。确保您知道如何切断棚舍及单个育雏取暖器的气源。如果您有任何疑问，请咨询您的燃气供应商。

16.必须消除在任何检修程序中发现的任何缺陷，并且立即更换有故障的零件。再次投入使用之前，重新测试育雏取暖器。

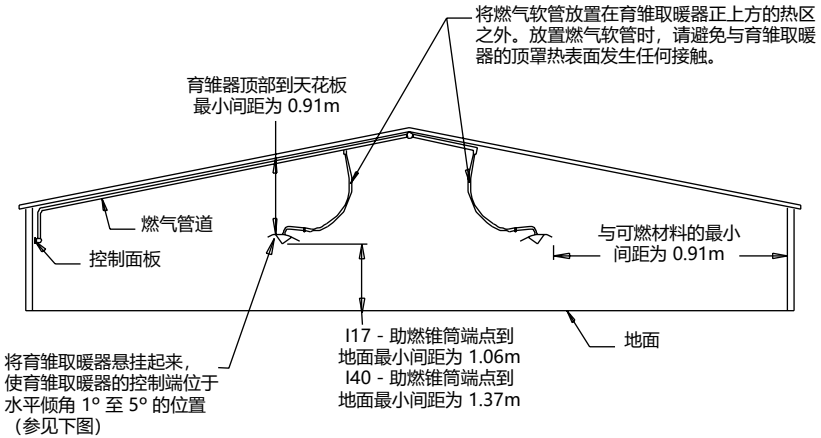
安装布局

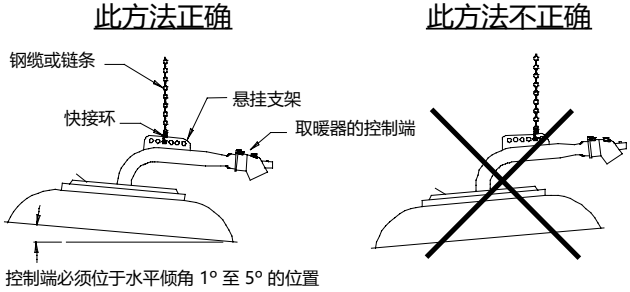
注意：

- 这些育雏取暖器通过带快接环的悬挂配件进行悬吊。
- 仅将钢缆或链条连接到快接环。请勿使用可燃的悬挂材料，例如绳索、线绳等。
- 安装人员必须在安装燃气软管之后确保育雏取暖器悬挂起来，使育雏取暖器的控制端位于水平倾角 1° 至 5° 的位置。这让育雏取暖器能够适当通风并且避免对选配的防尘过滤器产生潜在热损坏。
- 可能需要将出厂安装的快接环重新安装到悬挂支架上。
- 参阅以下插图。

图2

安装布局
关于安全间距





燃气阀组总成

您的育雏取暖器配有以下一种燃气阀组总成。
参阅相应的插图。

图3

标准软管

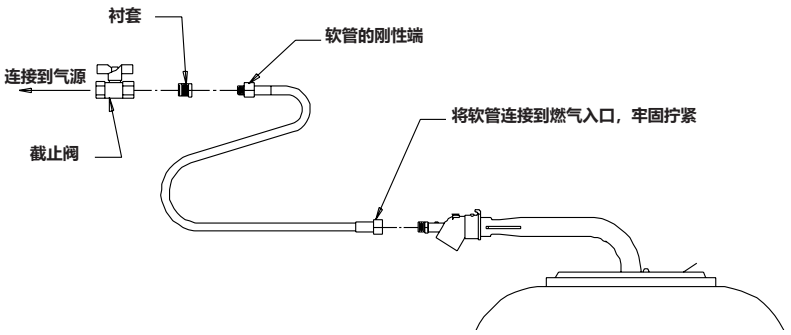
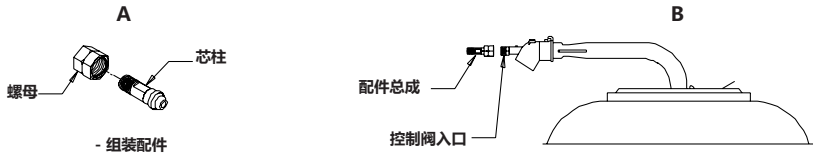


图4

1/8 美标锥度螺纹配件套件，零件编号 23406

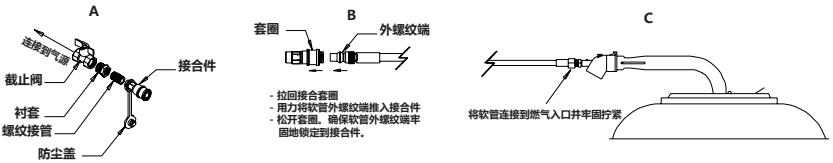


- 组装配件

- 将配件连接到燃气入口并牢固拧紧。
- 将经认可的带有适当接头的燃气软管总成连接到 1/8 美标锥度螺纹配件。

图5

软管和快速接头套件



- 拉回接合套圈
- 用力将软管外螺纹端推入接合件
- 松开套圈，确保软管外螺纹端牢固地锁定到接合件。

- 组装接合套件（零件编号 21335）并紧固部件。
- 连接到气源。

区域控制面板
部件功能和安装

区域控制面板是远程安装的控制系统，让您能够在棚舍的某个区域内操作特定数量的育雏取暖器。

该面板将控制以下数量的育雏取暖器。

区域控制面板容量		
型号和热量输出	燃料	高容量面板
		数量
I-17 (5kW)	液化石油气	40
	天然气	
I-40 (11.7kW)	液化石油气	17
	天然气	

区域控制面板必须安装在棚舍内部平稳的墙壁上。使用提供的尖端螺丝。

必须注意，确保恒温控制器不会暴露于外部空气温度下。恒温控制器暴露于外部空气温度下（例如：当侧壁帘打开时）可能会导致育雏取暖器提供多余的热量。

区域面板必须有一个安装在区域面板上游的可调节燃气压力的调压阀。该调压阀可作为选配附件从 L.B.White 公司购买。对于液化石油气，调压阀必须能够处理 69 kPa 的最大入口压力，同时提供标称值为 34.5 kPa 的出口压力。该压力传送给区域控制或单独控制的育雏取暖器。对于天然气，必须安装一个能够提供标称值为 34.5 kPa 的出口压力调压阀。
对于您的特定应用，请咨询您当地的 L.B.White 经销商或分销商或致电 L.B.White 公司，了解区域面板的最佳配置建议。

安装防尘过滤器（附件 - 某些型号不包括）

当 Infraconic 育雏取暖器安装在多尘的环境中时，尽管没有要求，但是建议采用过滤器套件为其提供额外的除尘过滤功能和容量。

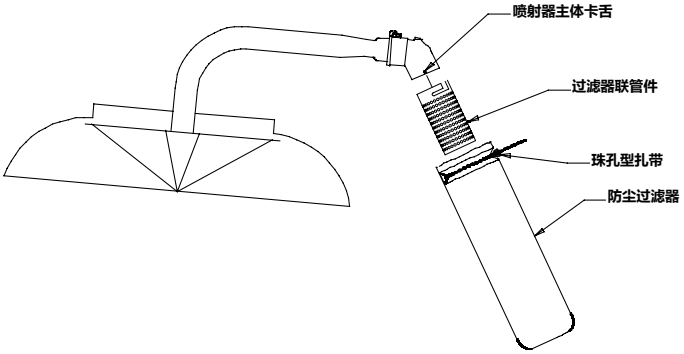
1.将过滤器套筒连接到气室壳体。将气室壳体卡舌装入套筒上的插槽中。旋转套筒，将其锁定在气室壳体上。

2.将过滤器放置在套筒上。确保过滤器覆盖所有套筒孔。

3.使用珠孔型扎带将过滤器牢固地连接到套筒上。

4.确保过滤器不会下垂或者接触育雏取暖器的顶罩。

图6



启动说明

警告

起火与爆炸危险

- 请勿强行用力按压安全控制阀的按钮。
- 仅用您的手按下燃气控制按钮。切勿使用任何工具。
- 如果通过正常手部压力无法压下按钮，应该由合格的检修人员更换控制器。
- 强行用力按压或尝试维修可能会导致起火或爆炸，造成财产损失、严重伤害或死亡。

将畜禽重新迁入棚舍之前，按照步骤 1-4 进行初始启动。对于正常启动，只需将恒温控制器调至高于室温。

1.打开育雏取暖器的所有燃气供应阀，并且使用经认可的泄漏探测器对所有接点进行燃气泄漏检测。

2.将位于区域控制面板或单独控制的育雏取暖器（直接位于育雏取暖器上）上的恒温控制器调至其温度设置最大值。参见图 7 所示的区域面板。

图7

3.完全按下安全控制阀上的按钮，同时向内侧锥筒端点点火。根据需要，从安全阀上拆下塑料盖帽。参见图 8 所示 I-17。完全按下钮按持续约 30 秒，直到内侧锥筒保持长久不熄为止。松开按钮。让外侧助燃锥筒完全加热。将盖帽更换到安全控制阀上。

图8

4.将恒温控制器设置为所需温度。育雏取暖器将会根据恒温控制器设置点进行循环操作，从低热量升到高热量。

- 新装育雏取暖器的燃气管线中夹带有空气是正常现象。
- 松开安全控制阀的按钮之后，可能需要稍长时间才能点燃育雏取暖器并且保持长久不熄，直到全部空气从燃气管线中排出为止。

关闭说明

若要降低温度，只需调低区域面板或单个育雏取暖器上的温控器温度。

若要进行维护、清洁或检修，关闭育雏取暖器：

1.关闭育雏取暖器的所有燃气供应阀。

2.让育雏取暖器烧完供气管中剩余的燃气。

3.将恒温控制器调低至设置最小值。

清洁说明

定期清洁育雏取暖器非常重要，以维持适当的燃烧并且避免未来发生问题。

清洁的频率将会根据饲养的畜禽以及棚舍的整体通风情况而有所不同。

因缺乏清洁而引起的问题通常为：
- 顶罩里面产生碳黑。
- 燃气在文氏管或气室壳体中发生回火。
- 燃烧器火焰出现超越外侧锥筒的现象。

育雏取暖器

A. 当育雏取暖器未积聚大量灰尘或污垢时，请使用背携式鼓风机进行一般清洁。

如“使用压缩空气进行清洁”部分所列内容，按照相同的步骤进行清洁。

如果使用背携式鼓风机无法有效地清除灰尘和污垢，那么请使用压缩空气清洁方法清洁育雏取暖器。

B. 使用压缩空气进行清洁（参见图 9）

1.关闭育雏取暖器的气源，让育雏取暖器冷却。

2.将空气引导到助燃锥筒，尽力清洁锥筒总成的整个表面。

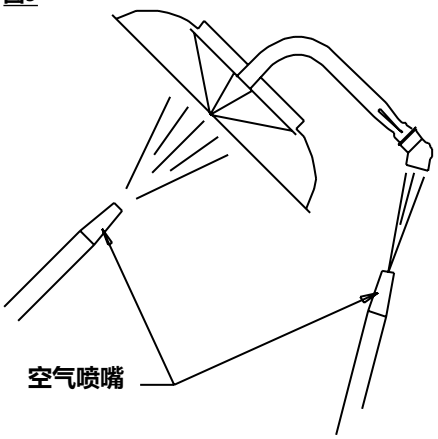
3.通过文氏管中的空气入口开口处吹送空气，通过助燃锥筒吹出任何松散的灰尘。

4.重复步骤 2 和步骤 3，直到锥筒和文氏管不再散出灰尘为止。

5.检查锥筒和文氏管，确保这些区域清洁。

6.将育雏取暖器放回到其正常悬挂位置，重新点燃育雏取暖器。

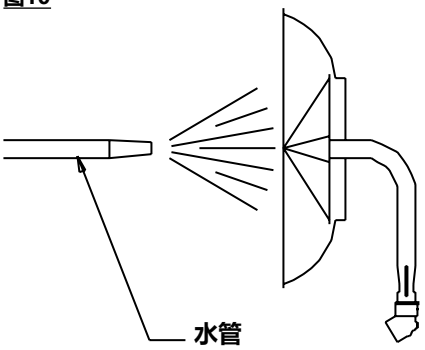
图9



C. 用水进行清洁

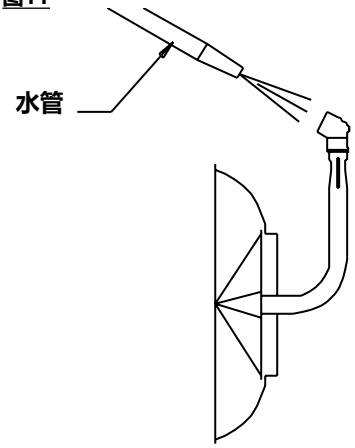
仅当通过压缩空气方法无法充分清洁育雏取暖器时，才应该启动以下工作。请勿使用高压清洗机！

图10



1.如图 10 所示放置育雏取暖器，用水冲洗整个锥筒并且让水通过文氏管的端部流出。然后如下页图 11 所示的过程，以相反顺序进行操作。

图11



2.重复这些步骤，直到水变干净为止。

3.检查锥筒和文氏管，确保这些区域清洁。

4.大力摇动育雏取暖器，清除助燃锥筒上的水分，确保内侧锥筒处的燃气适当点燃。

5.将育雏取暖器放回到其原始挂起位置。

6.重新点燃育雏取暖器，烘干锥筒和文氏管。

过滤器（附件）

A. 持续使用时：
- 拆下过滤器并除去灰尘。
- 请勿挤压或敲击安装在育雏取暖器上的过滤器，否则会导致灰尘吹入文氏管或助燃锥筒。

B. 持续使用之后或重新将畜禽迁入棚舍之前：

- 拆下过滤器并除去灰尘。
- 使用压缩空气或水（标准水龙头压力）进行清洁。
- 请勿使用高压水、空气或清洗机。过滤器材料可能会发生损坏。
- 如果使用水，请在安装之前挤出过滤器中的多余水分。
- 点燃育雏取暖器之前，让过滤器风干。

维护
说明

每次使用之前：

- 检测育雏取暖器周围的区域，确保其清洁，无可燃材料、汽油和其他易燃气体和液体。
- 请您的燃气供应商检测燃气管线中的所有燃气接点是否有泄漏或限制。
- 检查燃气调压阀排气口，确保其排气口未堵塞。调压阀上的杂物、昆虫、虫巢、冰雪可能会阻塞排气口并且造成育雏取暖器处压力过高。
- 在育雏取暖器安装、重新放置之后，以及育雏取暖器投入使用之前，检测软管总成。确保正确定位。（参见图 2）。
- 确保软管没有切口，或者过度磨蚀或磨损。如果有上述情况，必须在育雏取暖器投入使用前进行更换。
- 检查育雏取暖器的整体情况，确认没有裂纹、损坏、生锈或腐蚀的部件、螺丝或螺栓松动等。立即更换任何可疑部件。
- 为了安全起见以及确保育雏取暖器发挥最佳性能，有必要保持育雏取暖器的内部和外部没有灰尘、污垢或任何可燃材料。
- 检测三个燃烧器面板螺母，确保所有螺母都已紧固。
- 在维护时检查所有育雏取暖器标签是否都清晰可辨。确保没有切口、撕裂或其他损坏。如果发现任何损坏的标签，请联系 L.B.White 公司，必须立即进行更换。

每年：

- 调压阀可能磨损和功能不正常。请您的燃气供应商查看所有已安装调压阀的日期码，并且检测向育雏取暖器输送的压力，确保调压阀可靠。

检修
说明

⚠警告

烧伤危险

- 育雏取暖器关闭之后，育雏取暖器表面在一段时间内还会炙热。
- 请务必等育雏取暖器冷却后进行检修、维护或清洁。
- 不遵循此警告将会导致烧伤，造成人身伤害。

⚠警告

起火与爆炸危险

- 请勿拆解或尝试维修育雏取暖器部件或燃气阀组部件，例如燃气阀门或燃气软管。
- 如果发现缺陷，必须更换所有零部件。
- 不遵循此警告将会导致起火或爆炸，造成财产损失或伤亡。

1.除非有必要打开阀门进行检修，否则请关闭燃料供应阀。

2.在检修一些部件时，可能需要拆下燃气软管或过滤器。

3.如需重新组装，请以相反顺序执行相应的检修程序。确保燃气接点紧固。

4.检修之后，启动育雏取暖器以确保正确操作，并且检测是否有燃气泄漏。

5.使用压缩空气或柔软干布清洁育雏取暖器的节流孔。请勿使用锉刀、钻头、拉刀等清洁节流孔，否则会扩大孔径，造成助燃或点火问题。更换无法适当清洁的节流孔。

燃气压力检测

A. 准备

1.获取压力计测试套件（零件编号 20736）。

2.关闭育雏取暖器的燃料供应阀。

3.刷掉或吹掉燃气控制阀上或其附近的任何灰尘和污垢。

4.断开燃气软管与育雏取暖器的连接。

B. 压力计安装

1.如图 12 所示，将压力测试套件连接在育雏取暖器及其供气软管之间。**将该套件连接到育雏取暖器和气源时，确保测试套件上的两个燃气截止阀都处于关闭位置。**

2.打开育雏取暖器的燃料供应阀。

3.仅打开与燃气软管连接的测试套件上的燃气截止阀。

4.将恒温控制器调至其最大设置值并且点燃育雏取暖器。

C. 读取压力数值

1.育雏取暖器在全额热量输出和最小热量条件下运行时，压力计应该读取区域面板参数标牌上指定的压力。

2.测试套件上的读数是否与参数标牌上指定的数值一致？如果一致，无需进一步检测或校准。按照 D 部分继续操作。

3.如果压力与参数标牌上指定的压力不一致，则需要调整控制育雏取暖器燃气压力的调压阀。

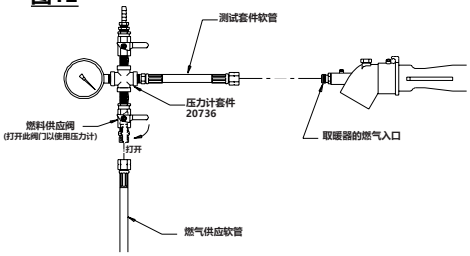
D. 完成

1.确认和/或适当地设置燃气压力后，关闭通往育雏取暖器的燃料供应阀，让育雏取暖器烧完供气软管中的全部剩余燃气。

2.取下压力计套件并且将育雏取暖器的燃气软管重新连接到育雏取暖器。

3.打开育雏取暖器的主燃料供应阀。点燃育雏取暖器。

图12



检修说明

安全燃气控制阀（图 13）
I-17

1.断开燃气软管连接。

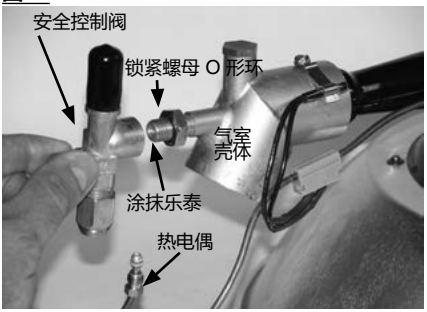
2.断开热电偶与安全阀的连接。

3.松开气室壳体上的锁紧螺母。

4.**用文火烘烤与气室壳体螺纹连接的安全控制阀的阀体。**这将会软化工厂涂抹在气室壳体螺纹上的螺纹密封胶。以逆时针方向旋转，拆下安全控制阀。

重新组装时：
-- 确保 O 形环位于锁紧螺母中。
-- 将乐泰涂抹在气室壳体的前四圈螺纹上。
-- 将安全控制阀拧到气室壳体上，至少拧四整圈，并且根据需要将阀门安装在竖直位置。
-- 紧靠控制阀主体用手拧紧锁紧螺母并且用扳手固定到位。

图13



检修说明

安全燃气控制阀（图 14）
I-40

1.断开燃气软管。

2.松开旁路燃气供应管的螺母，并将其旋离安全控制阀。

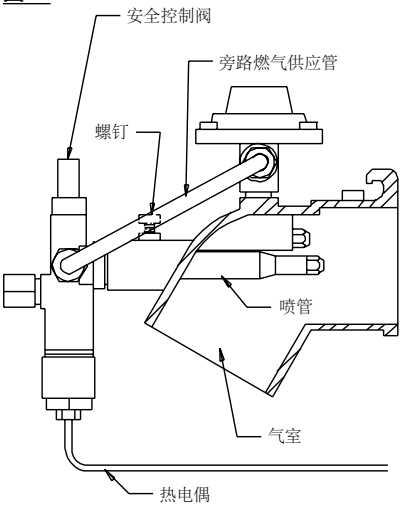
3.移除安全阀的热电偶。

4.拧松气室上的固定螺钉。

5. 从育雏取暖器移除安全控制阀和喷管。

6. 移除喷管。

图14



恒温控制器和调节阀
单独控制的育雏取暖器和
区域控制面板

■ 控制器总成包括可调恒温控制器、感应线路和传感器。恒温控制器的零件编号为：

-- 区域面板：零件编号 - 574049 带有 7.9m 感应线路
-- 单独控制器：零件编号 - 574050 带 2.0m 感应线路

在正常操作期间，恒温控制器逐渐增加或减小抵靠调节阀销的力量，以便增加或减少对助燃锥筒提供的燃气压力。

如果恒温控制器设置的温度较低，但助燃锥筒的热量输出没有减少，请参阅以下内容：

-- 松开位于恒温控制器和阀体上的固定旋钮，使阀销露出来。参见图 15。
-- 使用工具（例如标准螺丝刀的平面），用力逐渐向下推动调节阀销。
-- 如果热量未减少或者您必须使用很大的压力来推动销，说明阀门粘连，需要更换。确保阀门上的流向箭头与燃气流向一致。
-- 如果在推动销时热量减少，说明恒温控制器有故障。该控制器仅适用于带传感器的感应线路。

图15

必须在阀体上牢固地拧紧控制器固定旋钮，否则会影响温度检测。

控制器传感器和感应线路所处高度必须高于畜禽的身高，以避免因触及畜禽而导致损坏。

旁路节流孔
单独控制的育雏取暖器

旁路节流孔位于单独控制的育雏取暖器的阀体中。其用途是在满足供暖需求时向内侧助燃锥筒供应低压燃气。

在大量使用育雏取暖器之后，污垢可能会堵塞节流孔。堵塞节流孔的典型症状为：

-- 内侧锥筒在恒温控制器循环时熄灭，育雏取暖器回到低热量状态。

参阅以下说明：
1.用扳手夹住阀体和联管件螺母的平面。参见图 16。

2.松开阀体出口处的联管件螺母。参见图 16。

3.从阀体拉出带有联管件和联管件螺母的控制总成。

4.使用 6mm 螺母扳头，从阀体上拆下节流孔。参见图 17。根据需要进行清洁或更换。重新安装时，请勿拧得过紧，因为可能损坏螺纹。

图16

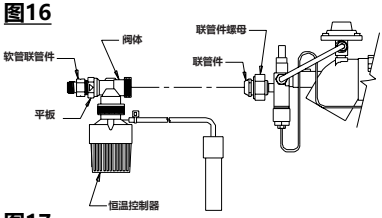
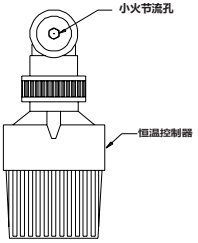


图17



燃烧器节流孔

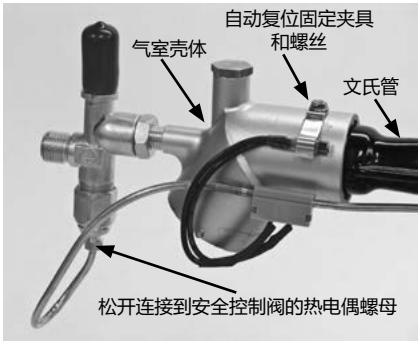
■ 节流孔尺寸刻在节流孔六角平面上，以毫米为单位显示尺寸。（例如：（44 代表用于液化石油气的主节流孔为 0.44mm。）参见下表。

节流孔尺寸			
型号和热量输出	**燃料类型**	**辅助节流孔（上端）**	**主节流孔（下端）**
I-17 (5kW)	液化石油气	44	44
	天然气	61	52
I-40 (11.7kW)	液化石油气	68	63
	天然气	84	79

■ 如果节流孔反转，育雏取暖器的燃烧特征将会在小火时改变。

1.在安全控制阀处松开热电偶螺母，并且拆下自动复位的固定螺丝和夹具。参见图 18。

图18

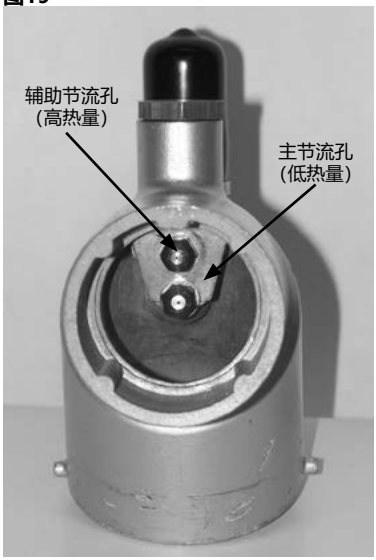


2.从文氏管中拉出气室壳体，以便能够触及节流孔。

3.使用 6mm 六角螺母扳头，拆下节流孔。根据需要进行清洁或更换。

4.重新安装时，请勿拧得过紧，因为可能损坏螺纹。

图19



燃烧器助燃锥筒和垫圈

助燃锥筒和垫圈的检修要求极低。定期清洁足以确保锥筒不会因灰尘和污垢阻塞。定期拧紧三个燃烧器面板螺母，确保育雏取暖器在操作时能够发挥正常的燃烧特性。

如果未进行清洁，文氏管和内侧助燃锥筒将会堵塞，造成燃烧不良，通过气室壳体的燃气发生回火或中断。如果无法通过正常的（空气）清洁方法去除堵塞物，则可能需要拆卸。参阅以下说明。

外锥移除：I17

a. 使用钳子，拉直桁架夹具的卡舌。参见图 20。夹具将会落到育雏取暖器的锥筒一侧。

图20

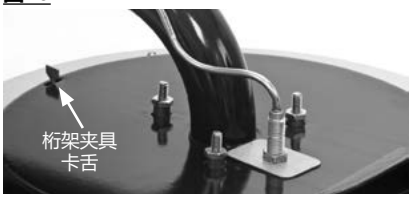
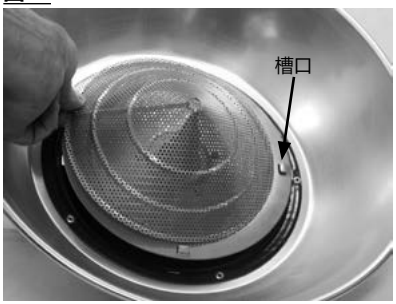
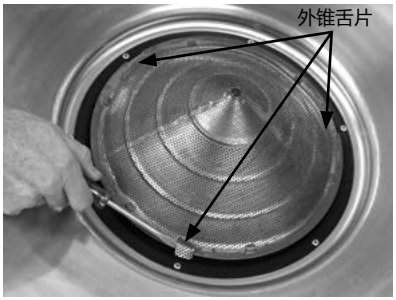


图21



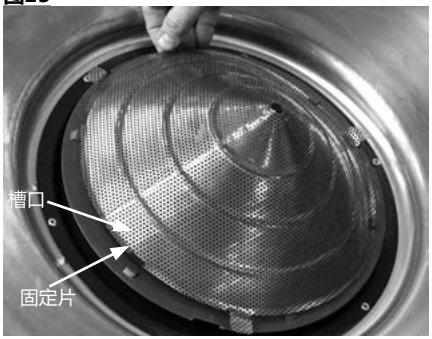
外锥移除：I40

a.使用尖嘴钳子或者螺丝刀，小心撬起折叠在燃烧器板下的外燃烧锥固定的舌片。见图22



b.小心旋动外锥，使椎体边缘的凹槽与燃烧器板的护圈重合。将椎体从燃烧器板提起并拉出。见图23

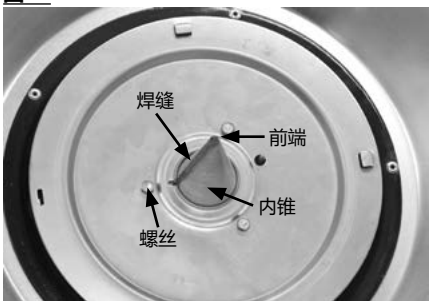
图23



c.不考虑育雏取暖器类型，外锥移除后，检查内锥。见图25，如果椎体状态良好，（焊缝无分离，尖部无缺失）使用压缩空气清洁。需要瓶刷将文氏管内的堵塞物刷出。在椎体端，使用压缩空气，将碎屑吹出文氏管。

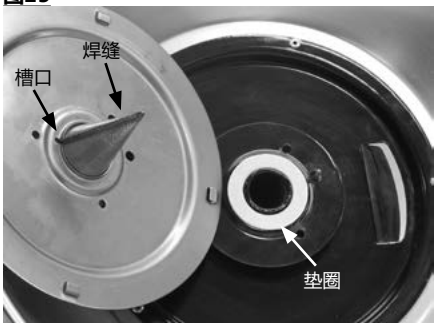
d.如果内锥损坏，移除将燃烧器板固定至育雏取暖器的3个螺钉，螺母和间隔件。见图24

图24



e.移除燃烧器板，更换内锥。见图25，一旦移开内锥，必须更换垫圈。在垫圈固定之前，清洁固定面。

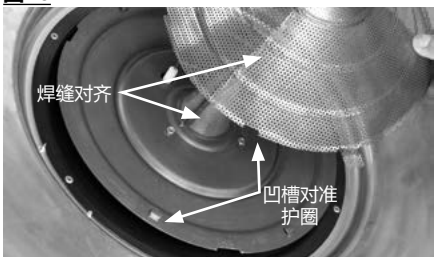
图25



f.重新组装时，请确保：

-- 内锥焊缝对准燃烧器板的凹槽。
-- 所有的燃烧器螺母和螺钉都牢固拧紧。
-- 最终安装前，确保椎体的焊缝对齐，见图26
-- I-17型号：外锥边缘置于所有护圈内。
-- I-40型号：外锥舌片折叠固定至燃烧器板。

图26



热电偶

A. 更换

1.松开安全控制阀上的热电偶接头螺母。参见图 27。

2.松开将热电偶的自动复位温度开关固定到气室壳体上的螺丝。参见图 27。

3.松开热电偶上的上端固定螺母。参见图 28。

4.从育雏取暖器中拆下带有螺母和护盖的热电偶。

5.如图 29 所示，将热电偶护盖和螺母放置在热电偶替换件上。使用原热电偶上的护盖以及与替换件配套提供的螺母。

6.略微倾斜热电偶，使其尖端和下端螺母穿过锁孔插槽。尖端必须位于燃烧器面板的热电偶定位孔内。向上拉热电偶导线，使下端螺母紧紧嵌入育雏取暖器壳体内部。紧靠护盖和壳体拧紧上端螺母。

7.安装结束时，热电偶的顶部边缘处于育雏取暖器壳体上方 12.7mm 至 14mm 处。参见图 30。

8.将热电偶上的螺母拧入燃气控制阀。用手指拧紧并且固定到位。将热电偶的自动复位开关放置在固定夹具下并且拧紧螺丝。

图27

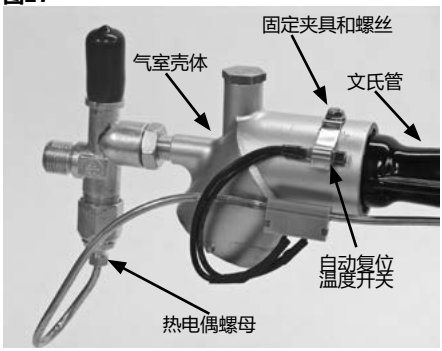


图28

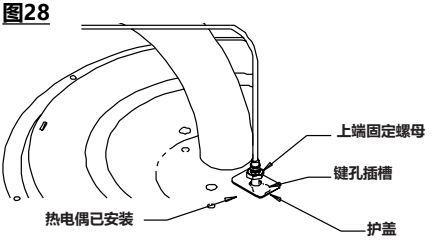


图29

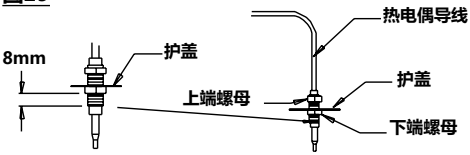
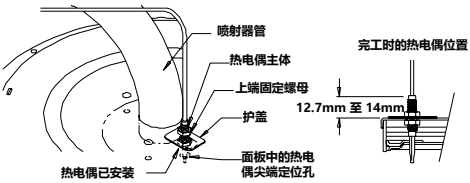


图30



B. 测试

热电偶包括自动复位温度激活开关。参见图 27。如果气室壳体的温度异常升高，开关将会打开热电偶回路并且关闭安全阀。若要测试热电偶，请按以下步骤操作：

-- 从育雏取暖器中拆下热电偶。

-- 在热电偶触点螺母和尖端之间连接一个欧姆表。

-- 小于 1 欧姆的读数是可以接受的。读数显示过载或电阻无穷大表示打开自动复位开关。

-- 如果打开，让热电偶冷却 5 分钟。重新测试热电偶。如果读数不是 1 欧姆或更小，请更换热电偶。

故障排除指南

在开始解决故障问题之前，请通读本节。

以下故障排除流程图提供了排除育雏取暖器问题的系统化程序。图表仅供合格的燃气育雏取暖器检修人员使用。除非您接受过适当的培训，否则请勿试图检修育雏取暖器。

必要的测试设备

为了用最少的时间和精力来对本系统进行故障排除，您将需要以下几件测试设备。

- 数字万用表——使用热电偶诊断套件时，用于测量直流电压。
- 热电偶诊断套件——（L.B.White 零件编号 21188）使用标准数字万用表时，此套件能够测试热电偶和电磁动力装置。
- 压力计——（L.B.White 零件编号 20736）用于检测育雏取暖器的入口压力。

初步准备

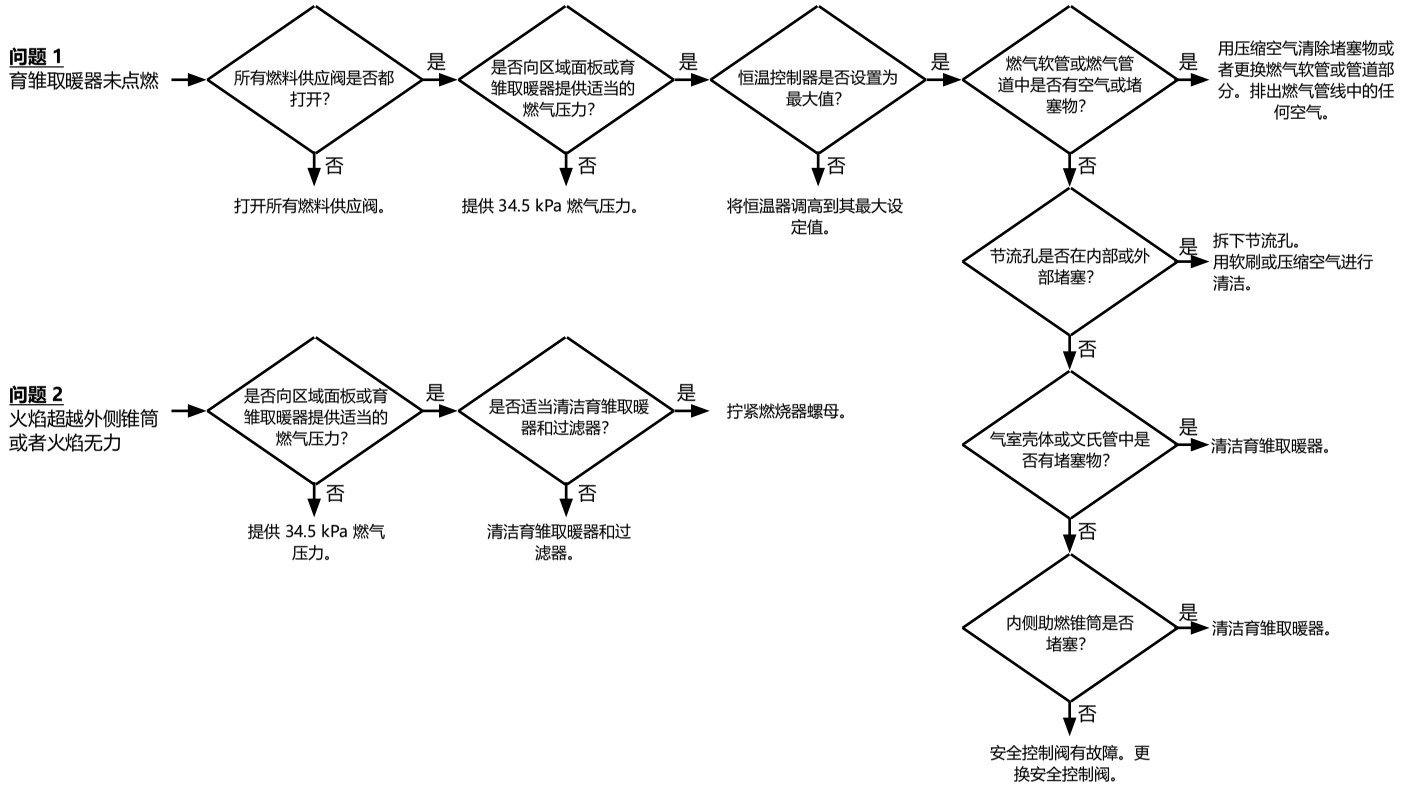
-- 检查育雏取暖器是否损坏。
-- 彻底清洁育雏取暖器。

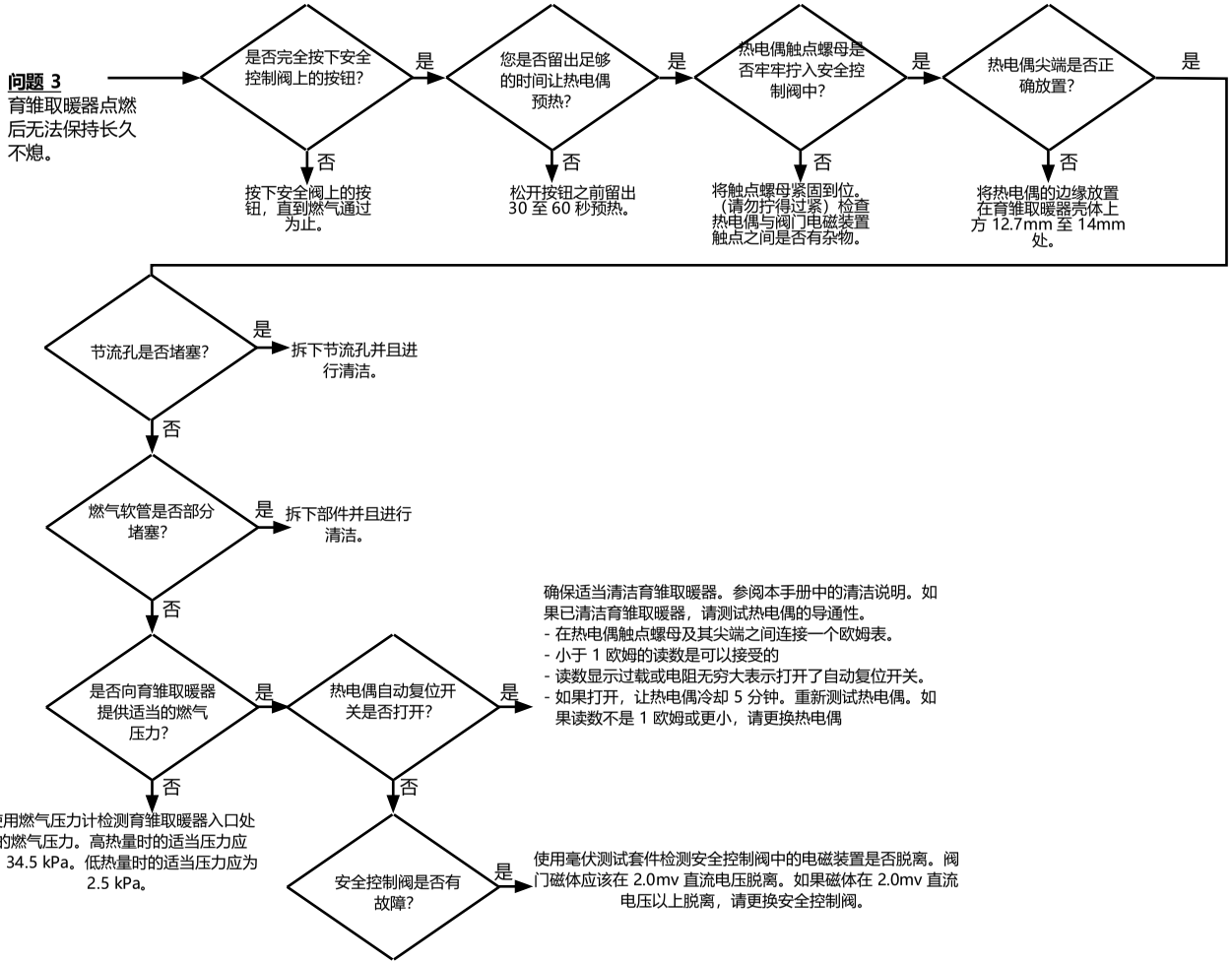
⚠ 警告

烧伤危险

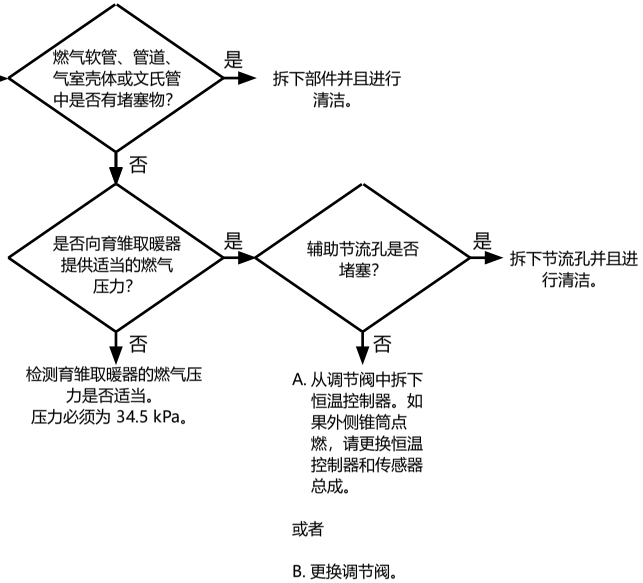
- 对本系统进行故障排除可能需要在燃烧器打开的情况下对育雏取暖器进行操作。对育雏取暖器进行操作时要特别小心。
- 不遵循此警告将会导致烧伤，造成严重伤害。

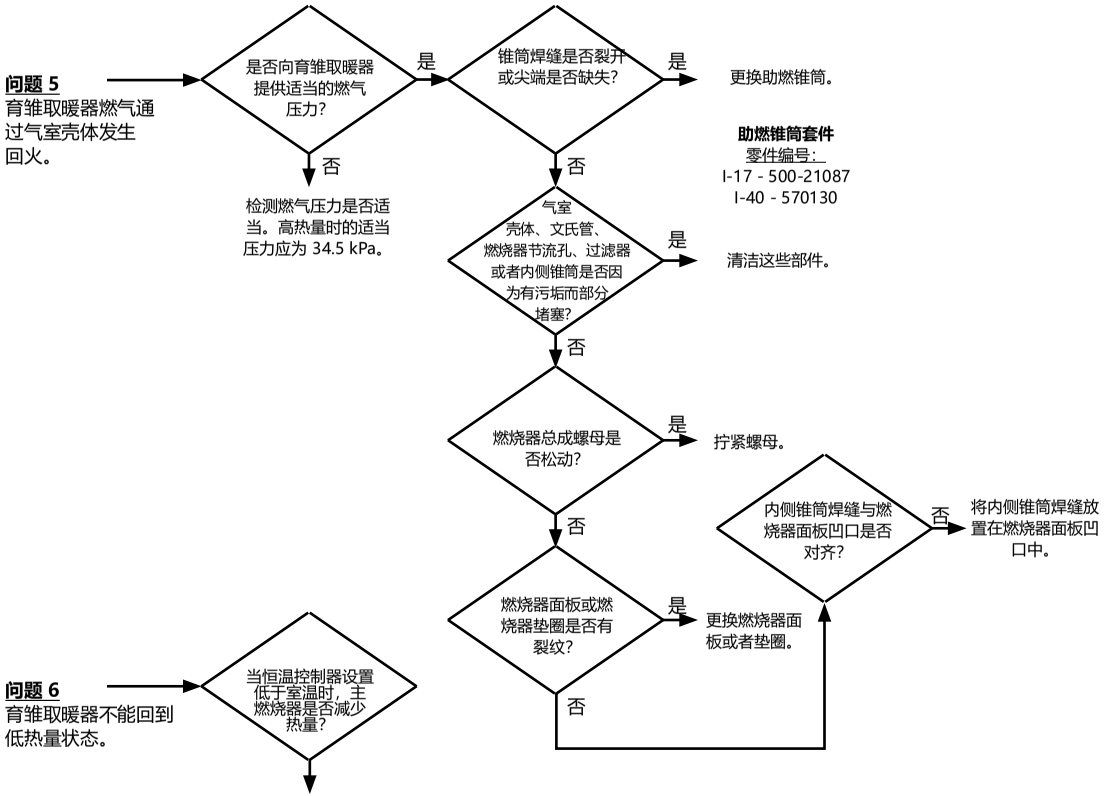
只有在完成每个步骤并且流程图中建议要更换时，才应更换部件。根据流程图确定问题后，请参阅检修章节，了解有关拆卸和程序的信息。


问题 1
育雏取暖器未点燃
所有燃料供应阀是否都打开?
是
否
打开所有燃料供应阀。
是否向区域面板或育雏取暖器提供适当的燃气压力?
是
否
提供 34.5 kPa 燃气压力。
恒温控制器是否设置为最大值?
是
否
将恒温器调高到其最大设定值。
燃气软管或燃气管道中是否有空气或堵塞物?
是
用压缩空气清除堵塞物或者更换燃气软管或管道部分。排出燃气管线中的任何空气。
否
节流孔是否在内部或外部堵塞?
是
拆下节流孔。用软刷或压缩空气进行清洁。
否
气室壳体或文氏管中是否有堵塞物?
是
清洁育雏取暖器。
否
内侧助燃锥筒是否堵塞?
是
清洁育雏取暖器。
否
安全控制阀有故障。更换安全控制阀。
问题 2
火焰超越外侧锥筒或者火焰无力
是否向区域面板或育雏取暖器提供适当的燃气压力?
是
否
提供 34.5 kPa 燃气压力。
是否适当清洁育雏取暖器和过滤器?
是
否
清洁育雏取暖器和过滤器。
拧紧燃烧器螺母。


问题 3
育雏取暖器点燃后无法保持长久不熄。
是否完全按下安全控制阀上的按钮?
是
否
按下安全阀上的按钮，直到燃气通过为止。
您是否留出足够的时间让热电偶预热?
是
否
松开按钮之前留出 30 至 60 秒预热。
热电偶触点螺母是否牢牢拧入安全控制阀中?
是
否
将触点螺母紧固到位。（请勿拧得过紧）检查热电偶与阀门电磁装置触点之间是否有杂物。
热电偶尖端是否正确放置?
是
否
将热电偶的边缘放置在育雏取暖器壳体上方 12.7mm 至 14mm 处。
节流孔是否堵塞?
是
拆下节流孔并且进行清洁。
否
燃气软管是否部分堵塞?
是
拆下部件并且进行清洁。
否
是否向育雏取暖器提供适当的燃气压力?
是
否
使用燃气压力计检测育雏取暖器入口处的燃气压力。高热量时的适当压力应为 34.5 kPa。低热量时的适当压力应为 2.5 kPa。
热电偶自动复位开关是否打开?
是
确保适当清洁育雏取暖器。参阅本手册中的清洁说明。如果已清洁育雏取暖器，请测试热电偶的导通性。
- 在热电偶触点螺母及其尖端之间连接一个欧姆表。
- 小于 1 欧姆的读数是可以接受的
- 读数显示过载或电阻无穷大表示打开了自动复位开关。
- 如果打开，让热电偶冷却 5 分钟。重新测试热电偶。如果读数不是 1 欧姆或更小，请更换热电偶
否
安全控制阀是否有故障?
是
使用毫伏测试套件检测安全控制阀中的电磁装置是否脱离。阀门磁体应该在 2.0mv 直流电压脱离。如果磁体在 2.0mv 直流电压以上脱离，请更换安全控制阀。

问题 4
恒温器设置到高档时，外侧助燃锥筒不加热。





从调节阀总成中拆下恒温控制器:

A. 当您按下阀门的柱塞销时,如果育雏取暖器回到微火状态,请更换恒温控制器/传感器总成。

B. 如果育雏取暖器仍然没有循环到微火状态,说明调节阀粘连,应该进行更换。

育雏取暖器部件功能

气室壳体
将安全控制阀固定于文氏管，同时让喷射器管能够吸入助燃空气，结合燃气气流助燃。

燃烧器节流孔
用于以特定流量将燃气供给助燃锥筒的计量装置。

顶罩
用于育雏取暖器的反射式铝制隔热罩。

双燃烧腔
由不锈钢制成。这是燃气发生燃烧的地方，提供升温过程中所用的辐射热量。

燃气软管
用于把燃气从燃气供应管线传送到育雏取暖器入口的挠性连接件。

安全控制阀
用于向育雏取暖器助燃锥筒供给燃气进行加热的安全切断装置。如果燃气火焰熄灭，将会完全切断燃气气流。与热电偶配合使用。如果热电偶的自动复位温度开关打开，安全控制阀内部的磁体会关闭，切断育雏取暖器中的所有气流。

热电偶
当热量施加到热电偶尖端时，使安全燃气控制阀中的电磁装置保持打开状态的安全装置。如果内燃火焰熄灭，它也会使燃气气流停止。热电偶还包括自动复位温度开关。如果气室壳体处的温度异常升高，该安全装置将会关闭安全控制阀。

恒温控制器和传感器总成。
用于循环育雏取暖器和维持特定温度的装置。用于调节区域面板和单独控制的育雏取暖器。

文氏管
将燃气控制阀和燃烧器节流孔连接到助燃锥筒的喉形钢管。燃气通过文氏管供给助燃锥筒。

检修零件识别示意图
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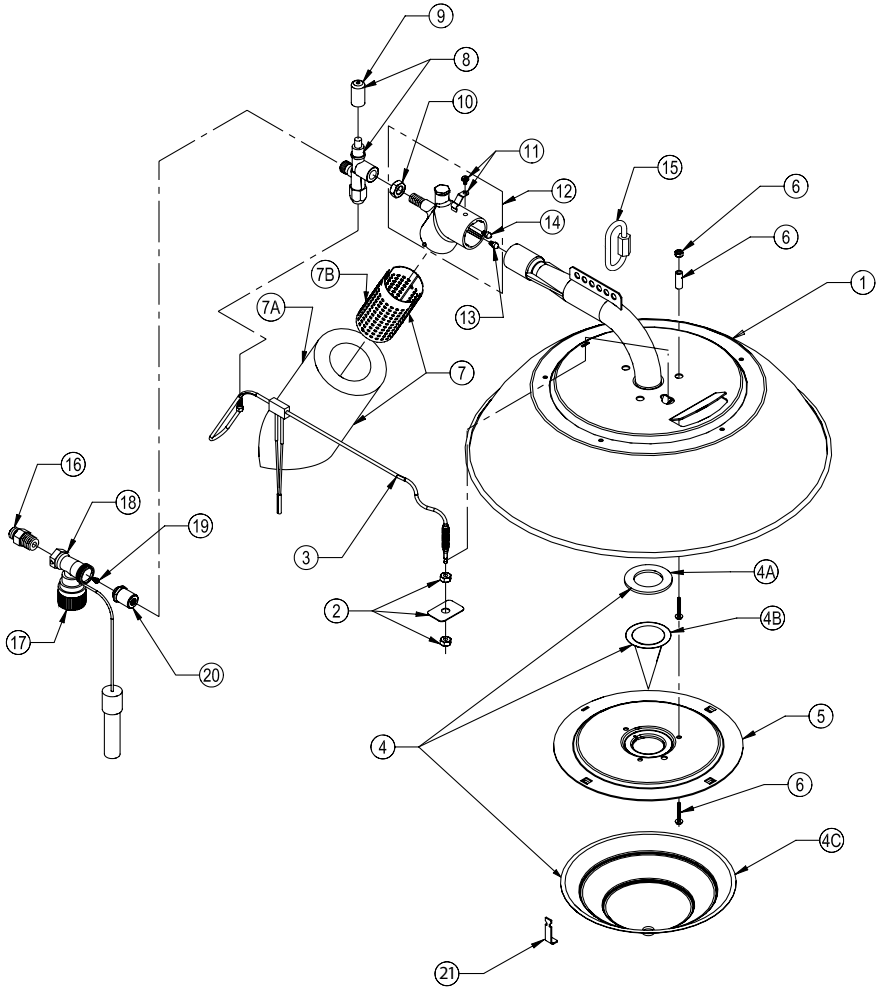


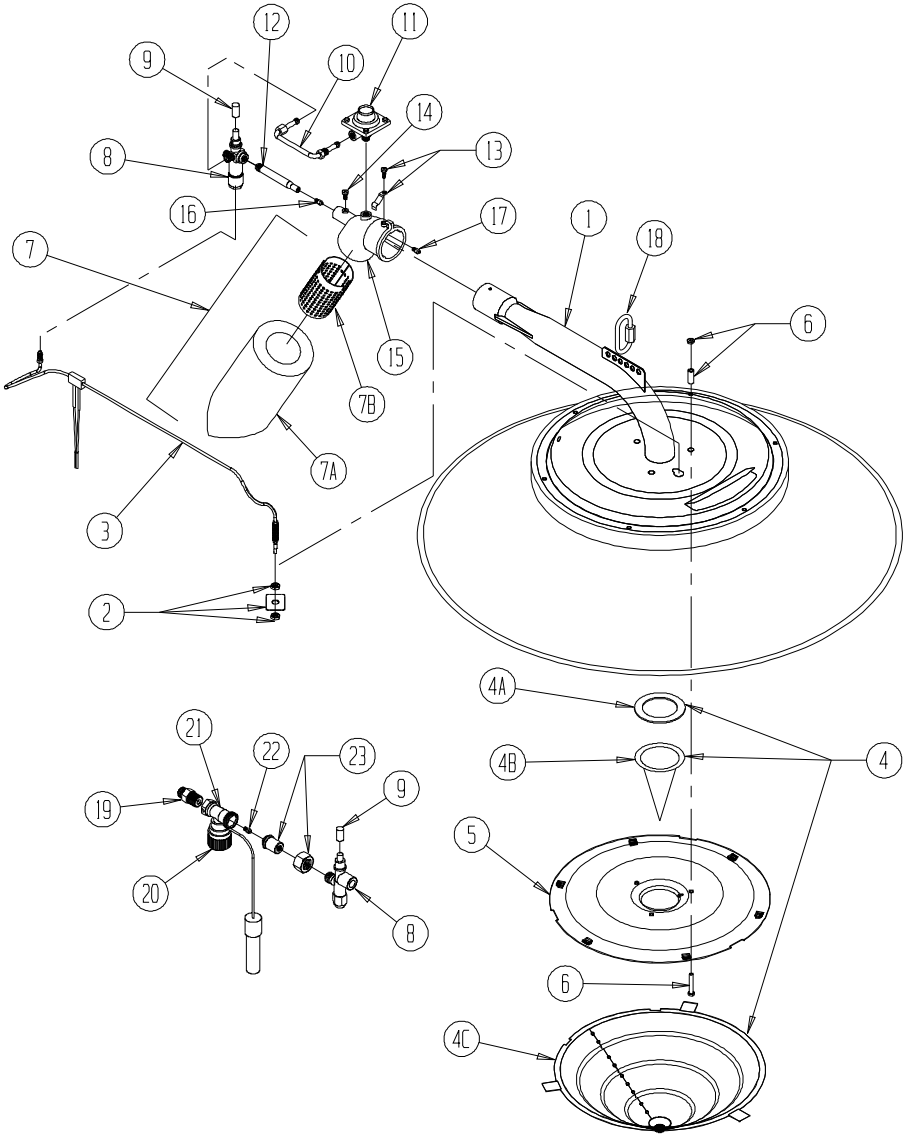
零件列表

项目	描述		零件编号
1	文氏管和燃烧器总成		500-09639
2	带有螺母的盖板		572736
3	带有自动复位温度开关的热电偶		573167
4	套件，助燃锥筒和垫圈		500-21087
4A	垫圈		571070
4B	内侧锥筒		570126
4C	外侧锥筒		570088
5	带有五金件的燃烧器面板		570204
6	用于燃烧器面板的五金件（螺母、螺丝、垫片 x 3）		500-26141
7	过滤器套件		500-20427*
7A	过滤器		570108
7B	过滤器套筒		573134
8	带有盖帽的安全控制阀	区域控制的育雏取暖器	572732
		单独控制的育雏取暖器	572733
9	安全控制阀的盖帽		572737
10	锁紧螺母，用于安全控制阀		572734
11	夹具，带有螺丝的热电偶		572730
12	气室壳体，带有对位板、燃烧器节流孔、压力阀和锁紧螺母	液化气——区域和单独控制	572731
		天然气——区域和单独控制	572735
13	主燃烧器节流孔（低热量）	液化气	570568
		天然气	570569
14	辅助节流孔（高热量）	液化气	570568
		天然气	573711
15	快接环		572121
16	联管件，软管，单独控制		572940
17	恒温控制器，单独控制带有 6 英尺导线和传感器		574050
18	阀门，调节，单独控制	液化气	574051
		天然气	574054

19	节流孔，旁路，单独控制	液化气	572140
		天然气	570326
20	联管件套筒，单独控制		500-26143
21	桁架夹具		509559
以下零件没有图示			
	接合，快速断开，套件		500-21335*
燃气软管	6.35mm x 1.57m，刚性 x 旋转，家禽		550-29674*
	6.35mm x 1.83m，刚性 x 旋转，家禽		550-20495*
	6.35mm x 3.05m，刚性 x 旋转，家禽		550-20496*
	6.35mm x 3.65m，刚性 x 旋转，家禽		550-20497*
	6.35mm x 1.83m，旋转两端，猪		550-20499*
	6.35mm x 3.05m，旋转两端，猪		550-20242*
	6.35mm x 4.57m，旋转两端，猪		550-20500*
	套件，1/8 美标锥度螺纹配件		500-23406*

*附件——必须单独订购

检修零件识别示意图
I-40



Item	Description		Part Number
1	文氏管和燃烧器总成		500-23261
2	带有螺母的盖板		572736
3	带有自动复位温度开关的热电偶		500-09596
4	套件，助燃锥筒和垫圈		570130
4A	垫圈		570273
4B	内侧锥筒		570308
4C	外侧锥筒		500-24543
5	带有五金件的燃烧器面板		572937
6	用于燃烧器面板的五金件（螺母、螺丝、垫片 x 3）		500-26141
7	过滤器套件		500-27522
7A	过滤器		572429
7B	过滤器套筒		573135
8	带有盖帽的安全控制阀	区域控制的育雏取暖器	500-22285
		单独控制的育雏取暖器	500-22286
9	安全控制阀的盖帽		572737
10	管道，安全控制阀至压力阀		570457
11	压力阀		500-09861
12	喷管		500-09562
13	夹子，带螺钉热电偶		572730
14	喷管固定螺丝		572939
15	带信息牌的气室，燃烧器	液化气	500-24773
	节流孔，压力阀	天然气	500-24761
16	主燃烧器节流孔（低温）	液化气	570094
	液化气	天然气	572747
17	次燃烧器节流孔（高温）	液化气	573710
	液化气	天然气	572938
18	快接环		572121
19	接头，软管，单独控制		572940
20	调温头，单独控制带1.83米导线和传感器		574050
21	阀，调节，单独控	液化气	574055
	制	天然气	574056
22	节流孔，旁路，单独控制	液化气	570577
		天然气	570578
23	接头套筒，单独控制		500-26143

以下零件没有图示		
接合，快速断开，套件		500-21335*
燃气软管	6.35mm x 1.57m，刚性 x 旋转，家禽	550-29674*
	6.35mm x 1.83m，刚性 x 旋转，家禽	550-20495*
	6.35mm x 3.05m，刚性 x 旋转，家禽	550-20496*
	6.35mm x 3.65m，刚性 x 旋转，家禽	550-20497*
	6.35mm x 1.83m，旋转两端，猪	550-20499*
	6.35mm x 3.05m，旋转两端，猪	550-20242*
	6.35mm x 4.57m，旋转两端，猪	550-20500*
套件，1/8 美标锥度螺纹配件		500-23406*

保修政策

育雏取暖器
L.B.White 保证其育雏取暖器的零部件，在根据每台设备包含的安装与维护说明、安全指南及标签进行适当安装、操作与维护的情况下，没有材料与工艺缺陷。如果在自最终用户购买日期起 12 个月内，发现任何部件有缺陷，L.B.White 公司将依其选择，以美国威斯康星州奥纳拉斯卡离岸价用新的零件或育雏取暖器维修或更换有故障的零件或育雏取暖器。在 L.B.White 公司网站在线注册您的产品，相应的设备及其零部件将会自动符合保修资格。如果产品未在 L.B.White 公司网站注册，则需要提供销售凭据副本以确定是否符合保修资格。如果上述两种情况均不适用，则保修期为自 L.B.White 公司发货日期起 12 个月。

零件
L.B.White 保证，从该公司购买并且用于适当的 L.B.White 设备上的更换零件，自最终用户购买日期起 12 个月内不会出现材料和工艺方面的缺陷。如果某部件在标明的日期码之后 12 个月内发现有缺陷，则保修自动生效。如果缺陷发生在日期码的 12 个月后，但在最终用户购买之日起的 12 个月内，则需要提供销售凭据副本以确定是否符合保修资格。

上述保证为 L.B.White 的仅有保证，所有其他保证，包括任何默示保证或适销性或特定目的适用性，均明确否认。倘若任何默示保证由于依法行动未于此有效否认，该默示保证的持续期限限于上述适用保证的期限。根据本文件，上述补救措施是唯一可行的补救措施。L.B.White 公司不对与设备的销售、搬运或使用相关的任何附带或间接损害负责；并且在任何情况下，L.B.White 公司与该设备相关的赔偿责任，包括基于疏忽或严格责任的索赔责任，仅限于购买价格。

有些地区不允许限制默示保证的持续期限长度，因此上述限制可能对您不适用。

有些地区不允许排除或限制附带或继发损害，因此上述限制或排除情况可能对您不适用。本保证赋予您特定的法律权利，而且您还可能享有其他权利，具体权利因地区不同而异。
若要注册您的产品和确保完全符合保修条件，请访问 http://www.lbwhite.com/customer_care_center/product-registration/。请准备好您要注册的产品的序列号和型号。

服务

如需更换部件和服务，请联系您的当地 L.B.White 经销商。您也可以拨打 1-800-345-7200 致电 L.B.White, 或者发送电子邮件至 customerservice@lbwhite.com 以获得协助。

联系时，请务必准备好育雏取暖器的型号和配置编号。

全球供应商——创新供暖解决方案
411 Mason Street, Onalaska, WI U.S.A. 54650
800-345-7200 • 608-783-5691
608-783-6115（传真）
techsupport@lbwhite.com

www.lbwhite.com

Owner's Manual and Instructions

I-17 / I-40

Agricultural Building Radiant Brood Heaters

I-17 5 kW
I-40 11.7 kW

Propane Vapor Withdrawal or Natural Gas

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 radiant brood heater with intended use for the heating of livestock in agricultural animal confinement buildings. If you are considering using this product for any application other than its intended use, then please contact your fuel gas supplier, or the L.B. White Company, LLC.

www.lbwhite.com

Congratulations!

You have purchased the finest radiant brood heater available for the heating of livestock in agricultural animal 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 youfor your confidence in our products and welcome any suggestions or comments you may have...call us toll free at 1-800-345-7200.

SEE ASSEMBLY INSTRUCTIONS INSIDE

SCAN THIS

with your smartphone or visit http://goo.gl/uqadY to view maintenance videos for L.B.White brood heaters.

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

WORLD PROVIDER - INNOVATIVE HEATING SOLUTIONS

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TABLE OF CONTENTS

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
- 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 1-800-345-7200.

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 BROOD 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

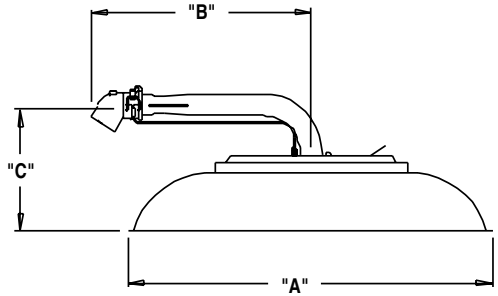
			I-17	I-40
Maximum Input (kW)			5	11.7
Ventilation Air to Support Combustion (m3/h)			340	795
Full Output Pressure (kPa)	Propane Gas or Natural Gas		34.5	
Manual Ignition Low Heat Pressure (kPa)	Propane Gas or Natural Gas		2.5-3.0	
Brood heater Dimensions (cm) (See Fig. 1)		A	41.9	78.1
		B	26.3	40.6
		C	17.1	24.1
Fuel Consumption Per Hour		Propane Gas (kg)	.36	.84
		Natural Gas (Cubic Meters)	.48	1.13
Animal Coverage Per Brood heater (1)		Chickens	1250-2000	2900-4400
		Turkeys	350-500	920-1100
		Swine	170	(3)
Recommended Height Installation for Livestock from Point of Combustion Cone to Floor (m)		Chickens	1.52-1.82	1.98-2.28
		Turkeys	1.21	1.67-1.98
		Swine	1.21-1.52	(3)
Minimum Safe Clearances to Combustible Materials (m)	Top of Hood to Ceiling		.91	
	Point of combustion cone to floor		1.06	1.37
	Sides		.91	
Animal Occupied Zone Temperature Control Sensor Location	Poultry	Vertical from floor	15.2-30.5 cm (2)	
		Horizontal from Brooder	2.43-3.65 m	
	Swine	Vertical From Floor	Above animal height	(3)
		Horizontal from Brooder	1.21-2.43 m	(3)

(1) There are other factors that will affect the quantity of animals each brood heater can cover. These include building ventilation and control systems, building insulation, building size and population density, etc. Consult your L.B. White dealer or call L.B. White for specific recommendations for your application.

(2) This is a typical sensor height range for poultry installations. The size and type of livestock being grown, brood heater spacing and height, etc. will dictate sensor height. Care should always be taken to ensure that the sensor is sufficiently high as to not be damaged by the animal during operation.

(3) Not recommended for swine

FIG. 1



General Information

This Owner's Manual includes all options and accessories commonly used on this brood heater. When calling for technical service assistance, or for other specific information, always have model number, configuration number and serial number available. This information is contained on the dataplate.

This manual will instruct you in the operation and care of your unit. 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, installation of the brood heater, and repair 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. See page 7 for definition of the necessary qualifications.

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 equipment 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.

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, brood 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 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 brood 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 brood 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 or applications of L. B. White Co., Inc.'s radiant brood heater shall meet the requirements of local, state and national L.P. gas and natural gas, electrical and safety codes. Your gas supplier, local licensed electrician, local fire department and government agencies can help you determine these requirements.

3. If at any time you notice something unusual about the operation of your brood heater such as gas odor, overheating, flames other than in the combustion cone area, etc., evacuate the area immediately and call your fire department and your gas service agency. Get assurances from the fire department that the area is free of gas before you attempt to relight the brood heater.

4. The components on the brood heater that call for hand operation should work with hand pressure only. If more force is required, have a qualified gas brood heater service agency replace the complete part. Do not attempt to repair.

5. This brood heater is intended for the heating of livestock in agricultural animal confinement buildings only. The brood heater shall only be mounted inside the animal confinement building. It shall not be used for outside heating applications.

6. Do not locate fuel gas containers or fuel supply hoses anywhere within the heating zone of the brood heater.

7. Do not block the air intake, or burner emitter area. Doing so may cause improper combustion or damage to the brood heater components, leading to property damage or animal loss.

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

9. The hose assembly must be inspected on a regular basis. This should be done at least once a year, or when the building is cleaned out. If it is evident there is excessive abrasion or wear, or if the hose is cut, it must be replaced prior to brood heater being put into operation. The hose assembly shall be protected from animals, building materials, 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 installation, before building repopulation and when relocating.

11. If the gas flow is interrupted and the burner flame is extinguished, immediately shut off the gas. Do not relight the brood heater until you are sure that all of the gas that may have accumulated through the brood heater has cleared away. Do not relight the brood heater until at least five minutes have passed.

12. If the brood heater is to be relocated, make sure that all gas connections are capped and the gas supply is shut off. All connection points must be leak checked after disconnection and after reconnection.

⚠WARNING
Burn Hazard

- The brood heater's emitter and canopy are extremely hot during operation and shortly after shutting down.
- Always be aware of your proximity to the brood heater and avoid contact with its hot surfaces during or shortly after operation.
- Failure to follow this warning can result in burns leading to severe personal injury.

13. The grower shall inspect the brood heater before building repopulation. Such inspection should consist of, but is not limited to, the following points of action:

-- Insure proper clearance of brood heater to nearest combustible materials.

-- Check for general cleanliness. Clean if necessary.

-- Check for tightness of the gas hose connections.

14. A qualified service person shall inspect the brood heater and its gas train at least on an annual basis. This should consist of, but is not limited to, the following points of action:

-- Start-up and shut down of the brood heaters

-- Leak check of all pipe joints and hose connections.

-- Thorough cleaning of the exterior of the brood heater, its burner assembly, and emitter.

-- Thorough inspection of the brood heater's component parts for corrosion, stripped threads, etc. with subsequent parts replacement as necessary.

-- Gas pressure checks.

15. Turn off the gas supply when the brood heater is not in use.

General Installation Instructions

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

2. Position the brood heater properly before use in accordance with requirements for combustible clearances, ground clearance, tilt angle, and to protect the brood heater from livestock. Refer to Fig. 2 as well as the specification table on page 4 in this manual, for information on installation and clearances.

3. Position the gas hose outside of the hot zone directly above the brood heater to avoid any contact with the hot surface of the brood heater's canopy. Refer to Fig. 2.

4. Insure that all accessories that you have ordered for the brood heater have been removed from inside of brood heater's shipping container and installed. This pertains to gas hose, filters,etc.

5. The brood heater's gas regulator (with pressure relief valve) should be installed outside of building. Any regulators inside the buildings must be properly vented to the outside. Local, state and national codes always apply to regulator installation.

6. Any regulator mounted outside the building be protected against the weather, particularly ice formation. Ice formation can lead to overpressurization of the regulator and subsequent gas leaks. See codes covering proper protection.

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

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

⚠WARNING

Fire, Burn, 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, personal 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.

-- Further 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 hose connections, fittings and joints as well as the gas control valve inlet and outlet connections with approved gas leak detectors.

-- 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.

9. A qualified service agency must check for proper operating gas pressures upon installation of the brood heaters.

10. Use the proper gas supply line to assure proper functioning of the brood heaters. Typically, 19 mm. ID black iron pipe is used to supply gas to the inlet of the zone control panel with 12.7 mm. ID black iron pipe used to convey the gas to the brood heaters. However, always consult your fuel gas supplier, or the L. B. White Co., Inc. for proper line sizing and installation.

12. High pressure brood heaters require a regulated gas supply to the gas inlet. Exceeding

the gas inlet pressure rating can result in poor performance and unreliable operation. Refer to page 4 of this manual for information on gas pressures relating to specific models.

13. The brood heater is designed for either L.P. vapor withdrawal or natural gas, depending on model number. Do not use this brood heater in an LPG liquid withdrawal system. Do not permit LPG in liquid form to enter the brood heater at any time.

14. 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.

15. 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 individual brood heaters. Contact your gas supplier if you have any questions.

16. 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.

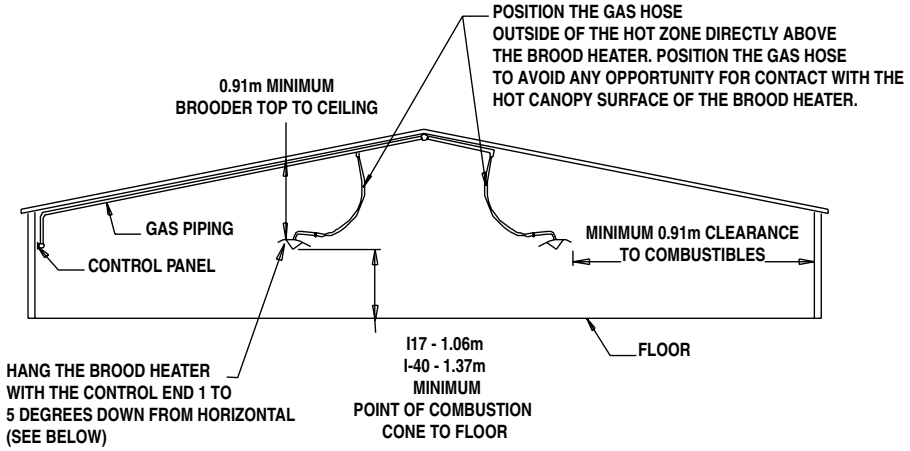
Installation Layout

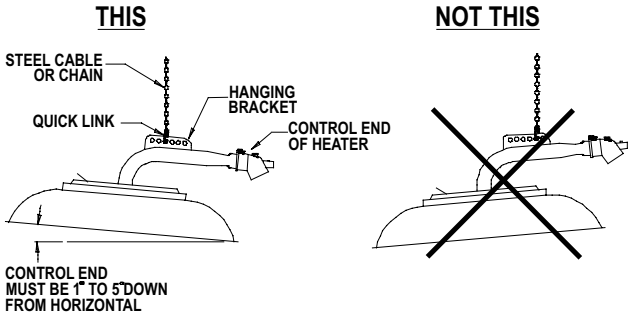
ATTENTION:

- The brood heaters use an integral hanging bracket with quick link for hanging the brood heater.
- Attach only steel cable or chain to the quick link. Do not use combustible hanging materials such as ropes, lines, etc.
- The installer must make sure that the brood heater is hung so control end of brood heater is positioned 1° to 5° down from horizontal after gas supply hose is attached.This allows proper venting of brood heater and eliminates potential heat damage to optional dust filter.
- Repositioning of factory installed quick link into hanging bracket may be required.
- Refer to following illustrations.

FIG. 2

INSTALLATION LAYOUT
FOR SAFE CLEARANCES





Gas Train Assembly

Your brood heater is supplied with one of the following gas train assemblies. Refer to the appropriate illustrations.

FIG. 3

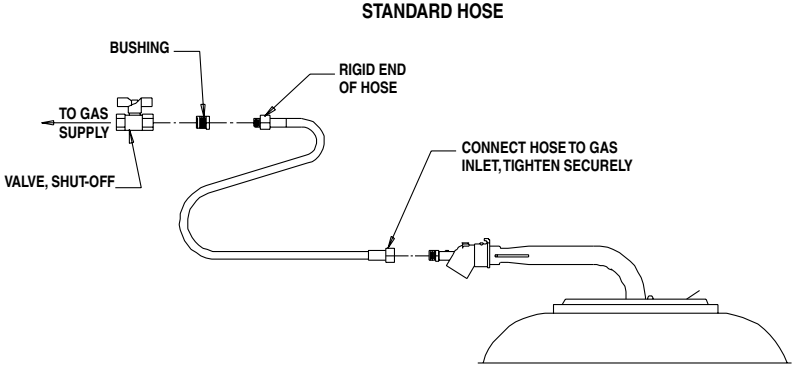


FIG. 4

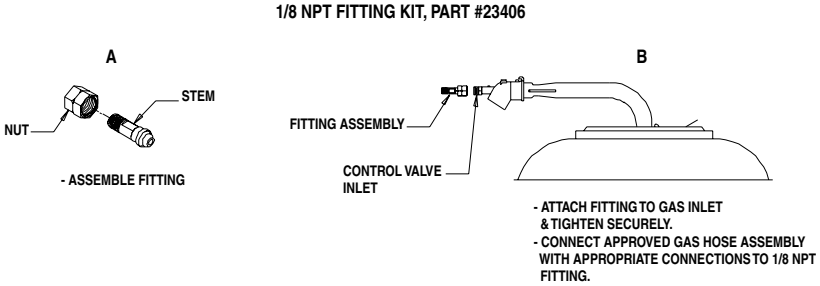
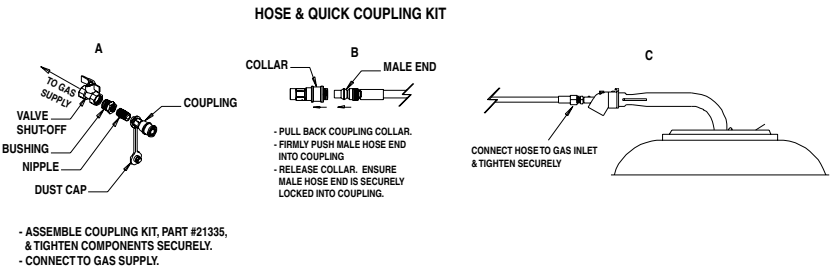


FIG. 5



Zone Control Panel
Component Function and Installation

The zone control panel is a remote mounted control system allowing the operation of a specific amount of brood heaters within a certain zone of the building.

This panel will control the following quantity of brood heaters.

Zone Control Panel Capacities		
Model and Heat Output	Fuel	High Capacity Panel Quantity
I-17 (5kW)	L. P. Gas	40
	Natural Gas	
I-40 (11,7 kW) (5kW)	L. P. Gas	17
	Natural Gas	

The zone control panel must be mounted to a flat, stable wall inside the building. Use lag screws provided.

Care must be taken to ensure that the thermostatic head is not exposed to outside air temperatures. Exposure of the thermostatic head to outside air temperatures (Example: when sidewall curtains are open) may cause the brood heater to provide unwanted heat.

The zone panel must have an adjustable high pressure regulator installed upstream of the zone panel. This regulator may be purchased from the L. B. White Co. as an optional accessory. For L.P. gas, the regulator must be capable of handling a maximum inlet pressure of 69 kPa, while supplying an outlet pressure of 34.5 kPa nominal. This pressure is supplied to the zone control or individual controlled brood heater. For natural gas, a regulator must be installed to supply an outlet pressure of 34.5 kPa nominal.

Consult your local L. B. White dealer or distributor or call the L. B. White Co. for recommendations on the best configuration of zone panels for your specific application.

Installing Dust Filter (Accessory - not included with some models)

Although not required, the filter kit is recommended to provide additional dust filtration capability and capacity for brood heaters when installed in severely dusty environments.

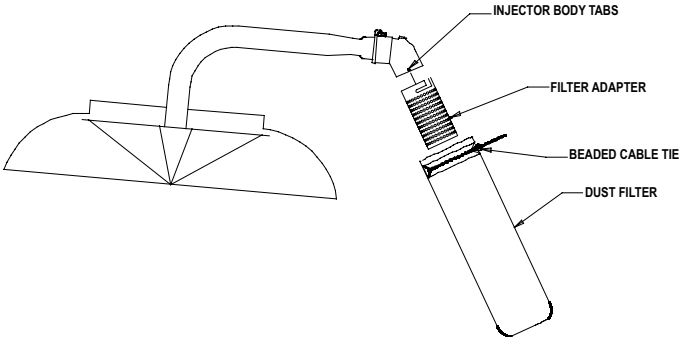
1. Attach filter sleeve to air housing. The air housing tabs fit into the slots on the sleeve. Rotate the sleeve to lock it onto the air housing.

2. Position the filter onto the sleeve. Ensure all sleeve holes are covered by the filter.

3. Securely attach the filter to the sleeve using the beaded cable tie.

4. Ensure filter does not sag or touch brood heater's canopy.

FIG. 6



Start-Up Instructions

WARNING
Fire and Explosion Hazard

- Do not force the safety control valve's button.
- Use only your hand to depress the gas control button. Never use any tools.
- If the button will not depress by normal hand pressure, the control should be replaced by a qualified service person.
- Force or attempted repair may result in fire or explosion, causing property damage, severe injury, or death.

Follow steps 1-4 on initial start-up before building repopulation. For normal start-up, simply turn the thermostatic head above room temperature.

1. Open all gas supply valves to the brood heater(s) and check for gas leaks at all connections using approved lead detectors.

2. Adjust the thermostatic head, located on either the zone control panel, or for individually controlled brood heaters, (located directly on the brood heater), to its maximum temperature setting. See Fig. 7, zone panel is shown.

FIG. 7

3. Fully depress the button on the safety control valve while applying flame to the inner cone point. Remove the vinyl cap from the safety valve if necessary. See Fig.8, I-17 shown. Keep the button fully depressed for about 30 seconds until the inner cone stays lit. Release the button. Allow outer combustion cone to heat up completely. Replace the cap onto the safety control valve.

FIG. 8

4. Set thermostatic head to desired temperature. The brood heater will cycle from low heat to high heat based upon thermostatic head set point.

- It is normal for air to be trapped in the gas line on new installations.

- It may take slightly longer for the brood heater to light and stay lit after releasing the safety control valve's button until all air is purged from the gas line.

Shut-Down Instructions

To reduce temperature, simply turn down the thermostatic control on the zone panel or on the individual brood heater.

To shut down the brood heaters for maintenance, cleaning or service:

1. Shut off all gas supply valves to the brood heaters.

2. Allow brood heaters to burn off fuel gas remaining in the gas supply line.

3. Turn down the thermostatic head to minimum setting.

Cleaning Instructions

It is important to clean the brood heater on a regular basis to maintain proper combustion and to eliminate future problems.

The frequency of cleaning will vary depending upon livestock being raised and overall ventilation of the building.

Problems associated with lack of cleaning typically are:

- Black soot on inside of canopy.
- Gas backflashing in venturi tube or air housing.
- Burner flame appearing beyond outer cone.

BROOD HEATER

A. CLEANING WITH BACKPACK BLOWERS
For general cleaning when the brood heaters do not have heavy accumulations of dust or dirt, use a backpack type of blower.

Follow the same procedures for cleaning as listed for Cleaning with Compressed Air.

If the dust and dirt cannot be removed effectively using the backpack blower, then clean the brood heater using the Compressed Air Cleaning method.

B. CLEANING WITH COMPRESSED AIR
(See Fig. 9)

1. Turn off the gas supply to the brood heater and let the brood heater cool.

2. Direct the air at the combustion cones, working your way around entire surface of cone assembly.

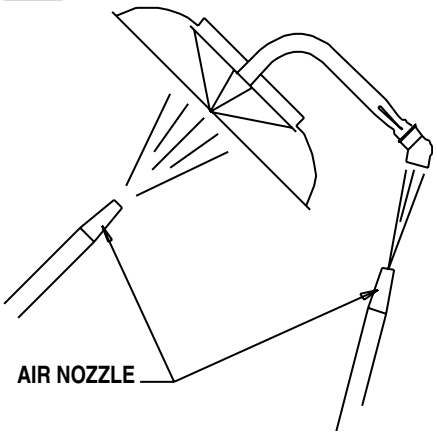
3. Blow air through air inlet opening in the venturi tube to blow back out any loosened dust through combustion cones.

4. Repeat Steps 2 and 3 until the cones and the venturi tube are no longer emitting dust.

5. Inspect the cones and venturi tube to make sure these areas are clean.

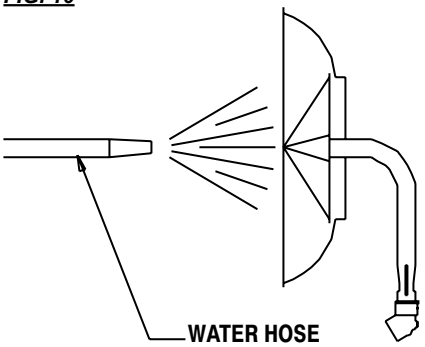
6. Return the brood heater to its normal hanging position and relight the brood heater.

FIG. 9



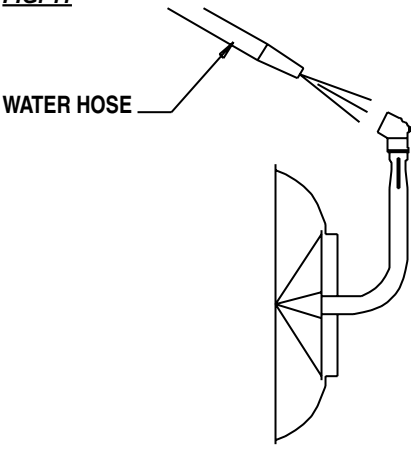
C. CLEANING WITH WATER
The following should be accomplished only if the brood heater cannot be cleaned adequately by the compressed air method. DO NOT USE HIGH PRESSURE WASHERS!

FIG. 10



1. Position the brood heater as shown in Fig. 10 and run water down through the cones and out through the end of the venturi tube. Then reverse the process as shown in Fig. 11, on next page.

FIG. 11



2. Repeat steps until water runs clean.

3. Inspect the cones and venturi tube to make sure these areas are clean.

4. Shake the brood heater vigorously to clear water off of the combustion cones to allow proper ignition of gas at the inner cone.

5. Return the brood heater to its original hanging position.

6. Relight the brood heater to dry out the cones and the venturi tube.

FILTER (Accessory)

A. During continued use:
- Remove filter and shake off dust.
- Do not squeeze or tap filter while filter is installed on brood heater. Doing so will cause dust to be blown into venturi tube or combustion cones.

B. After continued use or before building repopulation:

- Remove filter and shake off dust.
- Use compressed air or water (standard faucet pressure) to clean it.
- Do not use high pressure water, air, or a washing machine. Filter material damage may occur.
- If water is used, squeeze out excess water from filter before installation.
- Let filter air dry before lighting brood heater.

Maintenance Instructions

BEFORE EACH USE:

- Check the area surrounding the brood heater to ensure it is clear and free of combustible materials, gasoline, and other flammable vapors and liquids.
- Have your gas supplier check all gas connections for leaks or restrictions in gas lines.
- Inspect the gas regulator vent to make sure its vent is not blocked. Debris, insects,insect nests, snow, or ice on a regulator can block vents and cause excess pressure at the brood heater.
- Check the hose assembly after brood heater installation, relocation and before the brood heater is put into use. Ensure proper positioning. (See Fig.2).
- Ensure the hose is not cut, or if there is excessive abrasion or wear. If so, it must be replaced prior to the brood heater being put into operation.
- Check overall condition of the brood heater for cracked, damaged, rusted or corroded components, loose screws or bolts, etc. Replace any suspect components immediately.
- For safety as well as for optimum performance of the brood heater, it is necessary to keep the inside and the outside of the brood heater free of dust, dirt, or any combustible material.
- Check the three burner plate nuts to ensure all are snugged securely.
- Review all brood heater labels at the time of maintenance for legibility. Make sure none are cut, torn, or otherwise damaged. Any damaged labels must be replaced immediately by contacting the L.B. White Co., Inc.

ANNUALLY:

- 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 brood heater to make sure that the regulator is reliable.

Service Instructions

WARNING
Burn Hazard

- Brood heater surfaces are extremely 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 such as gas valves, or gas hoses.
- 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 unless it is necessary to have the valve open for services.
2. In servicing some components, it may be necessary to remove the gas hose, or filter.
3. For reassembly, reverse the respective service procedure. Ensure gas connections are tightened securely.
4. After servicing, start the brood heater to ensure proper operation and check for gas leaks.
5. Clean the brood heater's orifices with compressed air or a soft, dry rag. Do not use files, drills, broaches, etc. to clean the orifice holes. Doing so will enlarge the hole, causing combustion or ignition problems. Replace the orifice if it cannot be cleaned properly.

GAS PRESSURE CHECKS

A. Preparation

1. Obtain a pressure gauge test kit part no. 20736.

2. Close the fuel supply valve to the brood heater.

3. Brush or blow off any dust and dirt on or in the vicinity of the gas control valve.

4. Disconnect the gas hose from the brood heater.

B. Gauge Installation

1. Connect the pressure test kit between the brood heater and its gas supply hose as shown in Fig. 12. **Ensure both gas shut-off valves on the test kit are in the closed position when connecting the kit to the brood heater and gas supply.**

2. Open the fuel supply valve to the brood heater.

3. Open only the gas shut-off on the test kit to which the gas supply hose is connected.

4. Adjust the thermostatic head to its maximum setting and light the brood heater.

C. Reading Pressures

1. With the brood heater operating at full heat output and at minimum heat, the pressure gauge should read the pressure specified on the dataplate of the zone panel.

2. Does the reading on the gauge of the test kit agree with that specified on the dataplate? If so, then no further checking or adjustment is required. Proceed to Section D.

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

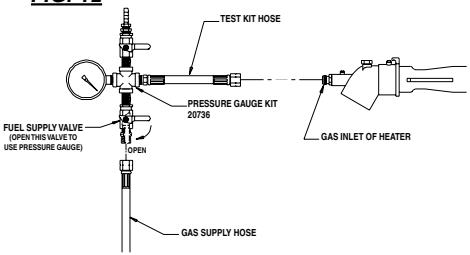
D. Completion

1. Once gas pressure has been confirmed and/or properly set, close the fuel supply valve to the brood heater and allow the brood heater to burn off any gas remaining in the gas supply hose.

2. Remove the gauge kit and reconnect the brood heater's gas hose to the brood heater.

3. Open the main fuel supply valves to the brood heater. Light the brood heater.

FIG. 12



SAFETY GAS CONTROL VALVE I-17 (Fig. 13)

1. Disconnect the gas hose.

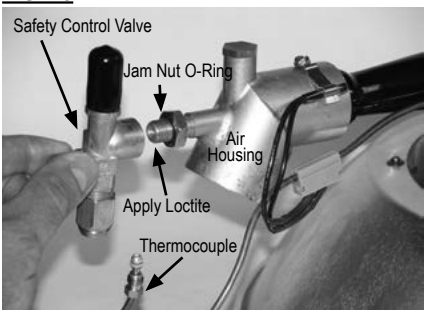
2. Disconnect the thermocouple from the safety valve.

3. Loosen the jam nut on the air housing.

4. **Apply a soft flame to the body of the safety control valve where it threads to the air housing.** This will soften the thread sealant which is factory applied to the air housing threads. Turning counterclockwise, remove the safety control.

When reassembling:
-- Ensure o-ring is seated in jam nut.
-- Apply Loctite (supplied with replacement) to first four threads of air housing.
-- Thread the safety control valve onto the air housing at least four full turns, and as needed to allow the valve to be installed in an upright position.
-- Thread the jam nut hand tight against the body of the control and secure in place with a wrench.

FIG. 13



SAFETY GAS CONTROL VALVE MODEL I-40 (Fig. 14)

1. Disconnect the gas hose.

2. Loosen the bypass gas supply tube compression nuts and swing the tube away from the safety control valve.

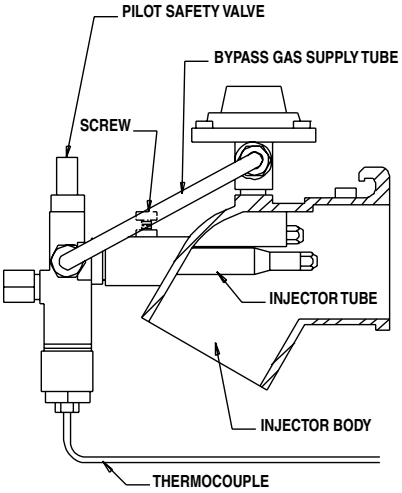
3. Remove the thermocouple from the safety control valve.

4. Loosen the screw on the injector body.

5. Remove the safety gas control valve with injector tube from the heater.

6. Remove the injector tube.

FIG. 14



THERMOSTATIC HEAD AND MODULATING VALVE
Individual Control Brood Heaters and Modulating Zone Panels

■ The head assembly includes the adjustable thermostatic head, capillary and sensor. The part numbers for the thermostatic heads are:

-- Zone panel head: Part No. - 574049 w/ 7.9m. capillary
-- Individual control head: Part No. - 574050 w/ 2.0m capillary

During normal operation, the thermostatic head gradually increases or decreases force against the modulating valve pin to allow more or less gas pressure to the combustion cones.

If the thermostatic head is set to a lower temperature but the heat output from the combustion cones does not decrease, refer to the following.:

-- Loosen the attachment knob located at the thermostatic head and valve body so the valve pin is exposed. See Fig. 15.
-- Using a tool such as the flat of a standard screwdriver, firmly but gradually push down on the pin of the modulating valve.
-- If the heat does not decrease or you must use significant pressure to force the pin, the valve is sticking and needs replacement. Ensure flow arrow on valve follows gas flow.
-- If the heat does decrease when the pin is pushed, the thermostatic head is defective. The head is available only with capillary with sensor.

The attachment knob at the head must be securely threaded onto the valve body, otherwise temperature sensing will be affected.

The head's sensor and capillary must be positioned above animal height to avoid contact and subsequent damage by livestock.

BYPASS ORIFICE
Individual Control Brood heaters

The bypass orifice is located in the valve body of the individual controlled brood heaters. Its purpose is to supply low pressure gas to the inner combustion cone when heat demand is satisfied.

The orifice may become plugged with dirt after significant brood heater use. A typical symptom of a plugged orifice are:

-- Inner cone goes out when thermostatic head cycles brood heater back to low heat.

Refer to the following instructions:
1. Apply wrenches to the flats of the valve body and the adapter nut. See Fig. 16.

2. Loosen the adapter nut at the outlet of the valve body. See Fig. 16.

3. Pull the control assembly with adapter and adapter nut from the valve body.

4. Using a 6mm. nut driver, remove the orifice from valve body. See Fig. 17. Clean or replace if necessary. At reinstallation, do not overtighten as thread damage may occur.

FIG. 15

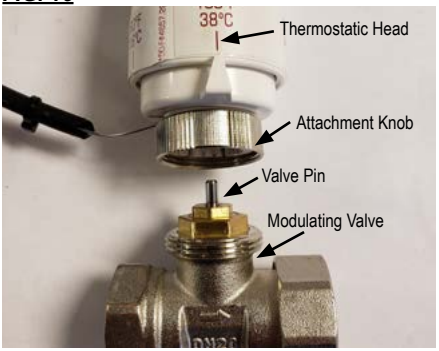


FIG. 16

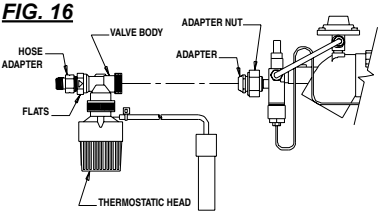
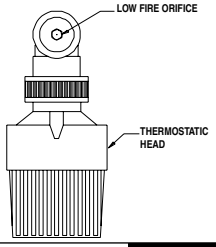


FIG. 17



BURNER ORIFICES

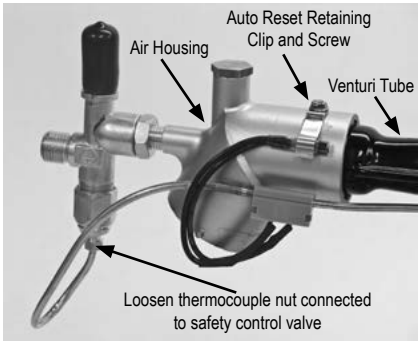
■ Orifice sizes are stamped on the flat of orifice hex, indicating size in millimeters. (Example: 44 is 0.44 mm for LP primary orifice.) See table below and Fig. 19.

ORIFICE SIZE			
Model and Heat Output	**Fuel Type**	**Secondary Orifice (Upper)**	**Primary Orifice (Lower)**
I-17 (5kW)	L.P. Gas	44	44
	Natural Gas	61	52
I-40 (11.7kW)	L.P. Gas	68	63
	Natural Gas	84	79

■ If orifices are reversed combustion characteristics of the brood heater will change on low fire.

1. Loosen the thermocouple nut at the safety control valve, and remove the auto reset's retaining screw and clip. See Fig. 18.

FIG. 18

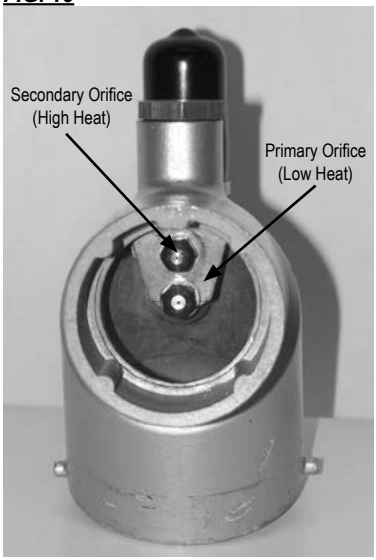


2. Pull the air housing from the venturi tube to allow access to orifices.

3. Using a 6 mm hex nut driver, remove the orifice. Clean or replace if needed.

4. When reinstalling, do not overtighten as thread damage may occur.

FIG. 19



BURNER COMBUSTION CONES AND GASKET

Very little servicing is required for the combustion cones and gasket. Routine cleaning is sufficient to ensure that the cones remain unblocked by dust and dirt. Periodic tightening of the the three burner plate nut ensures that the brood heater operates to normal combustion characterisitics.

If not cleaned, the venturi tube and inner combustion cone will become blocked, creating poor combustion, gas backflashing through the air housing, or outages. This may require some disassembly if the blockage cannot be removed by normal (air) cleaning methods. Refer to the following instructions.

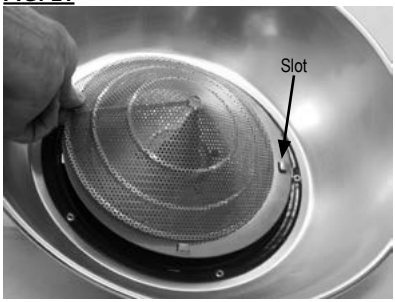
OUTER CONE REMOVAL I-17

a. Using pliers,straighten the tab on the truss clip. See Fig. 20. The clip will drop to the cone side of the brood heater.

FIG. 20

b. Pull the outer cone from the retainer slots in the burner plate. See Fig. 21.

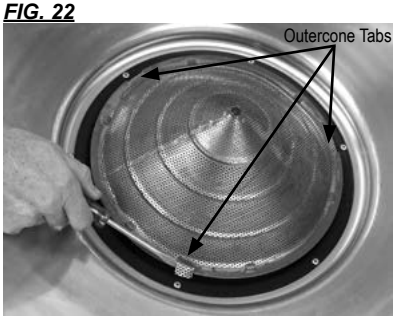
FIG. 21



OUTER CONE REMOVAL I-40

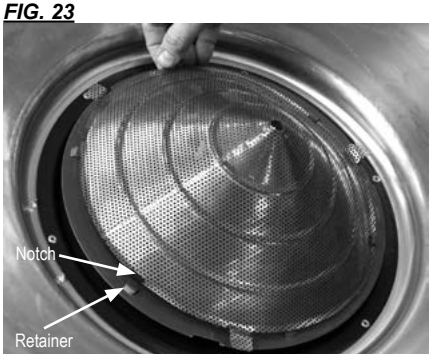
a. Using needle nose pliers or a standard screwdriver, carefully pry up the outer combustion cones tabs folded under the burner plate. See Fig. 22.

FIG. 22



b. Rotate the outer cone slightly so the notches in the cone flange align to the formed retainers on the burner plate. Lift and pull the cone from the burner. plate. See Fig. 23.

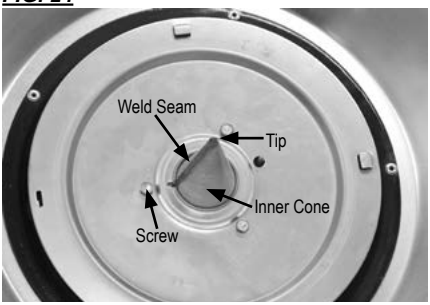
FIG. 23



c. Regardless of heater model, once the outer cone is removed, inspect the inner cone. See Fig. 24. If the cone is in good condition, (cone weld seam not split or tip is not missing) then clean using the compressed air method. A bottle brush may also be run down the venturi tube to force out any blockages. Using air at the cone end, blow back any debris out the control end of the venturi tube.

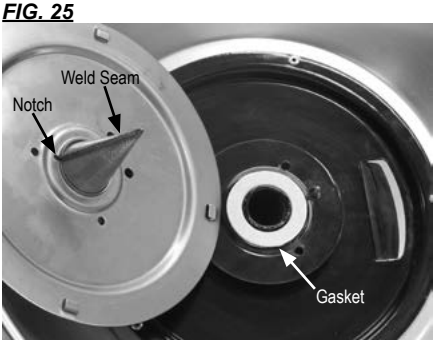
d. If the inner cone is damaged, remove the three screws, nuts, and spacers securing the burner plate to the heater. See Fig. 24

FIG. 24



e. Remove the burner plate and replace the inner cone. See Fig. 25. A replacement gasket must be installed whenever the inner cone is removed. Clean the surface to which the gasket is located before installing replacement.

FIG. 25



f. When reassembling, ensure:

-- Inner cone weld seam aligns to burner plate notch. See. Fig. 26.
-- All burner nuts and screws are securley tightened.
-- Cone weld seams are aligned as shown in Fig. 26 before final installation.
-- Model I-17: Outer cone flange is positioned under all retainers.

-- Model I-40: Outer cone tabs are folded under burner plate.

FIG. 26

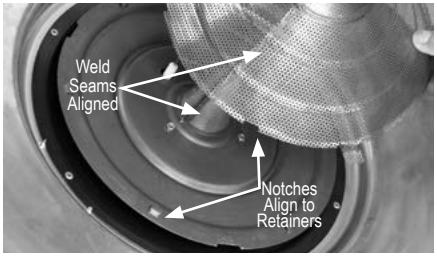
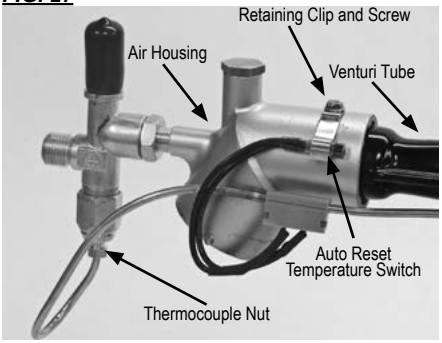


FIG. 27



THERMOCOUPLE

A. REPLACEMENT

1. Loosen the thermocouple connector nut at the safety control valve. See Fig. 27.

2. Loosen the screw securing the clip holding the thermocouple's auto reset temperature switch to the air housing. See Fig. 27.

3. Loosen upper retaining nut on thermocouple. See Fig. 28.

4. Remove the thermocouple, with nuts and cover, from the brood heater.

5. Position the thermocouple cover and nuts onto the replacement thermocouple as shown in Fig. 29. Use the cover from the original thermocouple and the nuts supplied with the replacement.

6. Angle the thermocouple slightly so its tip and lower nut pass through the keyhole slot. The tip must be located within the thermocouple location hole of the burner plate. Pull up on the thermocouple lead so the lower nut is tight against the inside of the brood heater housing. Tighten upper nut against the cover and housing.

7. The installed finished position of the thermocouple is 12.7mm to 14mm from the top edge of thermocouple to the brood heater housing. See Fig. 30.

8. Thread the nut on thermocouple into gas control valve. Tighten finger tight and snug in place. Position the thermocouple's auto reset switch under the retaining clip and tighten the screw.

FIG. 28

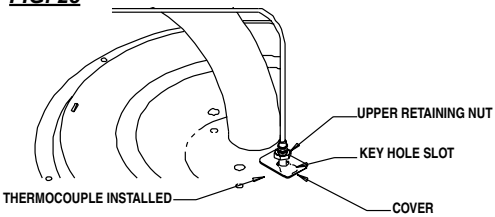


FIG. 29

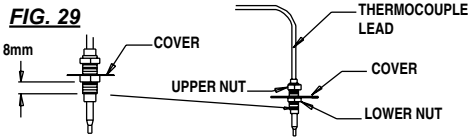
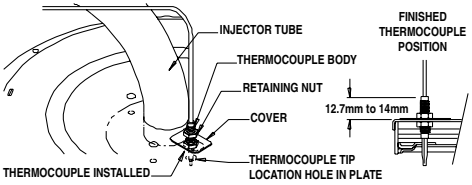


FIG. 30



B. TESTING

The thermocouple includes an auto reset temperature activated switch. See Fig. 27. The switch will open the thermocouple circuit and shut off the safety valve if the temperature at the air housing increases abnormally. To test the thermocouple proceed as follows:

-- Remove the thermocouple from the brood heater

-- Connect an ohm meter between the thermocouple contact nut and tip.

-- A reading of less than 1 ohm is acceptable. A reading showing overload or infinite resistance indicates an open auto reset.

-- If open, allow the thermocouple to cool for 5 minutes. Retest the thermocouple. If the reading is not 1 ohm or less, replace the thermocouple.

Troubleshooting Guide

READ THIS ENTIRE SECTION BEFORE BEGINNING TO TROUBLESHOOT PROBLEMS.

The following troubleshooting flow charts provide systematic procedures for isolating brood heater problems. The charts are intended for use by a QUALIFIED GAS BROOD HEATER SERVICE PERSON. DO NOT SERVICE THE BROOD HEATER 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 DC voltage when using thermocouple diagnostic kit.
- Thermocouple Diagnostic Kit - (L. B. White Part No. 21188) When used with a standard digital multimeter, this kit allows testing of the thermocouple and electromagnetic power unit.
- Pressure Gauge - (L. B. White Part No. 20736) For checking inlet pressures to the brood heaters.

INITIAL PREPARATION

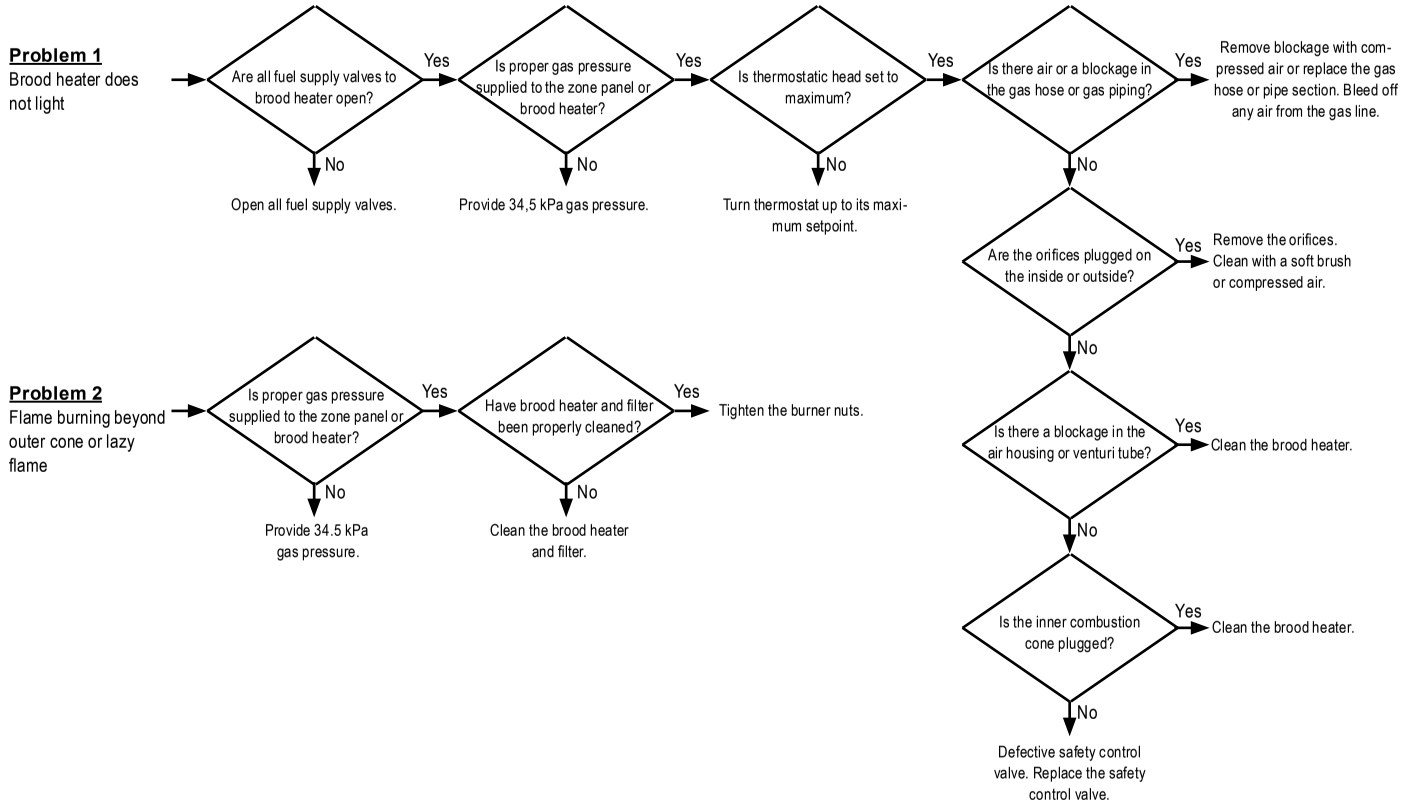
-- Inspect brood heater for damage.
-- Thoroughly clean the brood heater.

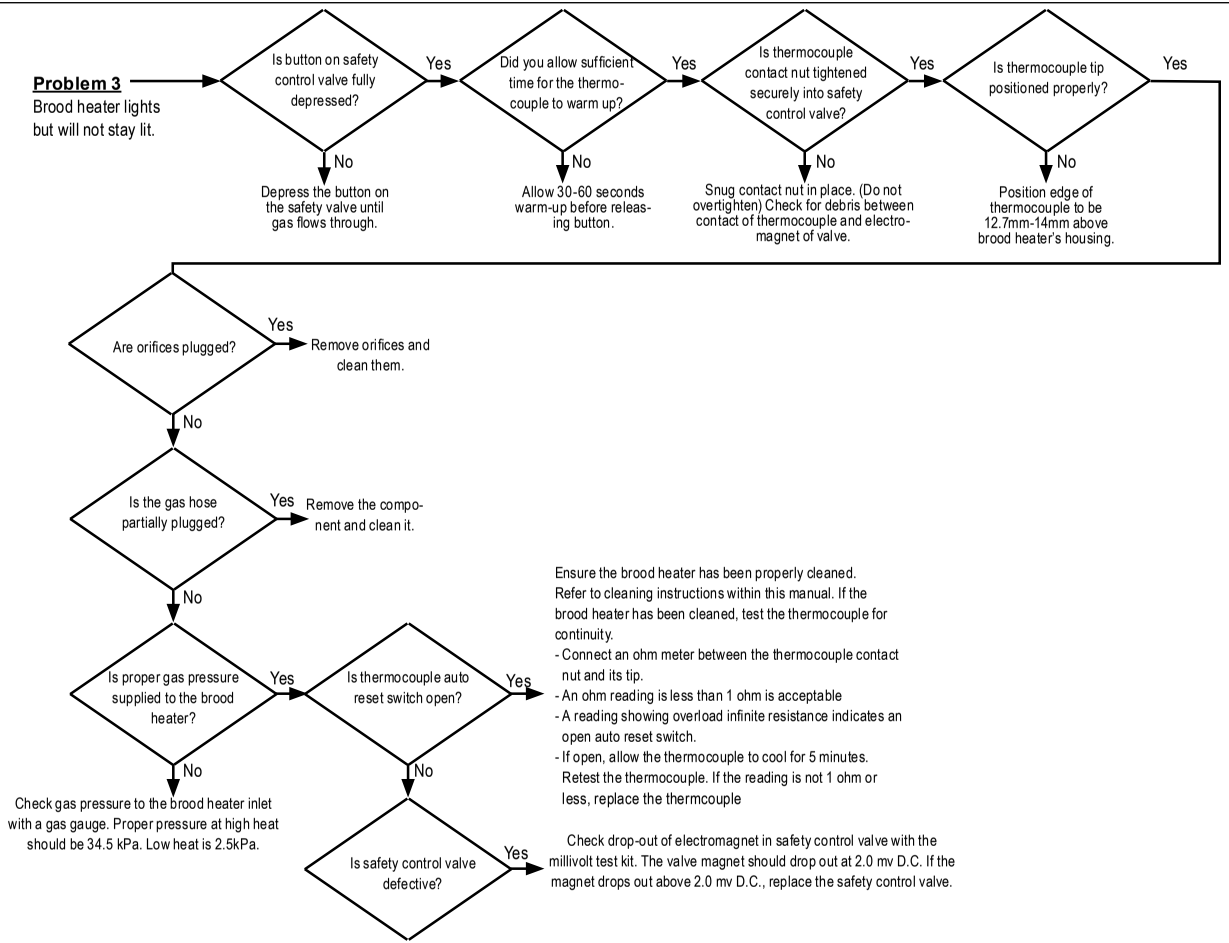
WARNING
Burn Hazard

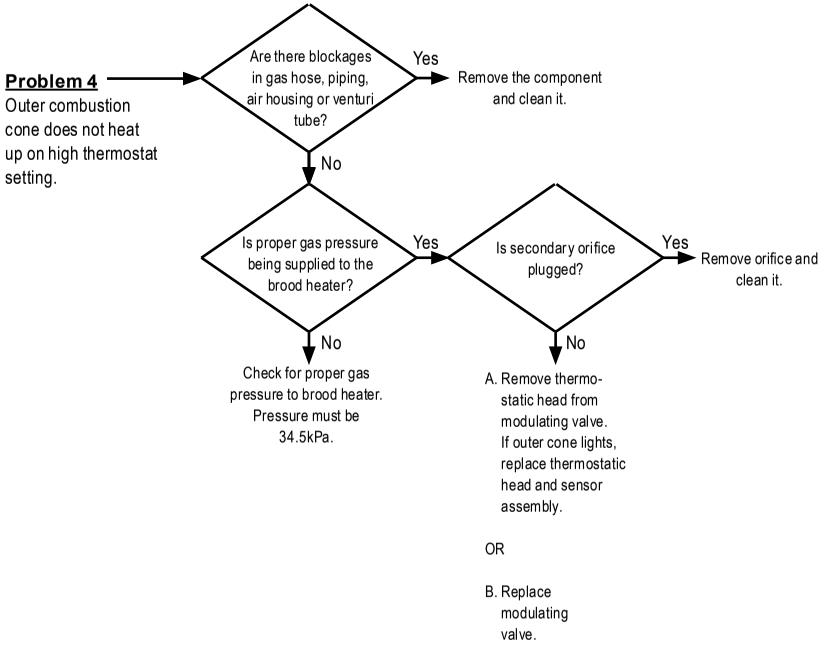
- Troubleshooting this system may require operating the brood heater with the burner on. Use extreme caution when working on the brood heater.
- Failure to follow this warning will result in burns causing severe injury.

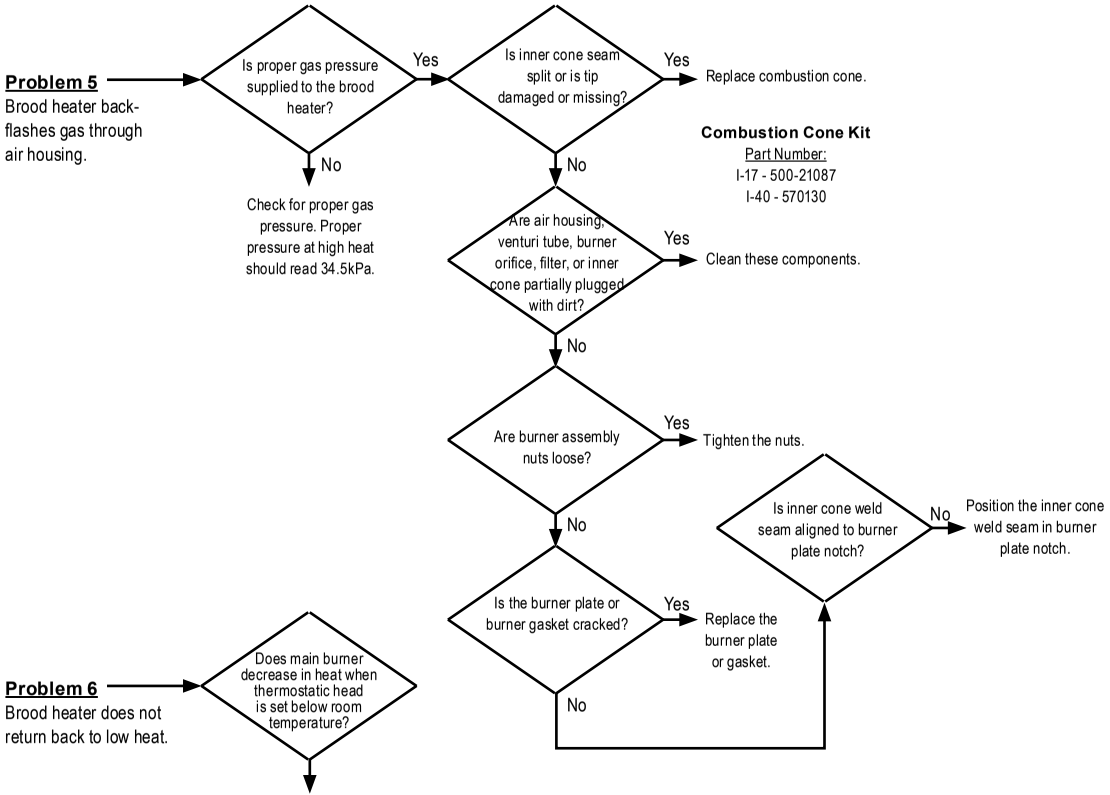
Brood heater Problems **Page**

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.


Problem 1
Brood heater does not light
Are all fuel supply valves to brood heater open?
Yes
No
Open all fuel supply valves.
Is proper gas pressure supplied to the zone panel or brood heater?
Yes
No
Provide 34,5 kPa gas pressure.
Is thermostatic head set to maximum?
Yes
No
Turn thermostat up to its maximum setpoint.
Is there air or a blockage in the gas hose or gas piping?
Yes
Remove blockage with compressed air or replace the gas hose or pipe section. Bleed off any air from the gas line.
No
Are the orifices plugged on the inside or outside?
Yes
Remove the orifices. Clean with a soft brush or compressed air.
No
Is there a blockage in the air housing or venturi tube?
Yes
Clean the brood heater.
No
Is the inner combustion cone plugged?
Yes
Clean the brood heater.
No
Defective safety control valve. Replace the safety control valve.
Problem 2
Flame burning beyond outer cone or lazy flame
Is proper gas pressure supplied to the zone panel or brood heater?
Yes
No
Provide 34.5 kPa gas pressure.
Have brood heater and filter been properly cleaned?
Yes
No
Clean the brood heater and filter.
Tighten the burner nuts.


Problem 3
Brood heater lights but will not stay lit.
Is button on safety control valve fully depressed?
Yes
No
Depress the button on the safety valve until gas flows through.
Did you allow sufficient time for the thermo-couple to warm up?
Yes
No
Allow 30-60 seconds warm-up before releas-ing button.
Is thermocouple contact nut tightened securely into safety control valve?
Yes
No
Snug contact nut in place. (Do not overtighten) Check for debris between contact of thermocouple and electro-magnet of valve.
Is thermocouple tip positioned properly?
Yes
No
Position edge of thermocouple to be 12.7mm-14mm above brood heater's housing.
Are orifices plugged?
Yes
Remove orifices and clean them.
No
Is the gas hose partially plugged?
Yes
Remove the compo-nent and clean it.
No
Is proper gas pressure supplied to the brood heater?
Yes
No
Check gas pressure to the brood heater inlet with a gas gauge. Proper pressure at high heat should be 34.5 kPa. Low heat is 2.5kPa.
Is thermocouple auto reset switch open?
Yes
No
Ensure the brood heater has been properly cleaned. Refer to cleaning instructions within this manual. If the brood heater has been cleaned, test the thermocouple for continuity.
- Connect an ohm meter between the thermocouple contact nut and its tip.
- An ohm reading is less than 1 ohm is acceptable
- A reading showing overload infinite resistance indicates an open auto reset switch.
- If open, allow the thermocouple to cool for 5 minutes. Retest the thermocouple. If the reading is not 1 ohm or less, replace the thermcouple
Is safety control valve defective?
Yes
Check drop-out of electromagnet in safety control valve with the millivolt test kit. The valve magnet should drop out at 2.0 mv D.C. If the magnet drops out above 2.0 mv D.C., replace the safety control valve.


Problem 4
Outer combustion cone does not heat up on high thermostat setting.
Are there blockages in gas hose, piping, air housing or venturi tube?
Yes
Remove the component and clean it.
No
Is proper gas pressure being supplied to the brood heater?
Yes
Is secondary orifice plugged?
Yes
Remove orifice and clean it.
No
Check for proper gas pressure to brood heater. Pressure must be 34.5kPa.
No
A. Remove thermo-static head from modulating valve. If outer cone lights, replace thermostatic head and sensor assembly.
OR
B. Replace modulating valve.



Remove thermostatic head from modulating valve assembly:

A. If brood heater returns to low fire when you push down on plunger pin of valve, replace thermostatic head / sensor assembly.

B. If brood heater still does not cycle to low fire, the modulating valve is sticking and should be replaced.

Brood Heater Component Function

Air Housing
Secures safety control valve to venturi tube. Also allows combustion air to be drawn in to injector tube with gas flow for combustion.

Burner Orifices
Metering devices used to feed gas to combustion cones at a specific flow rate.

Canopy
Reflective aluminum heat shield for brood heater.

Double Combustion Chamber
Made of stainless steel. This is where combustion of gas occurs, providing radiant heat used in the warming process.

Gas Hose
Flexible connector used to convey gas from gas supply line to inlet of brood heater.

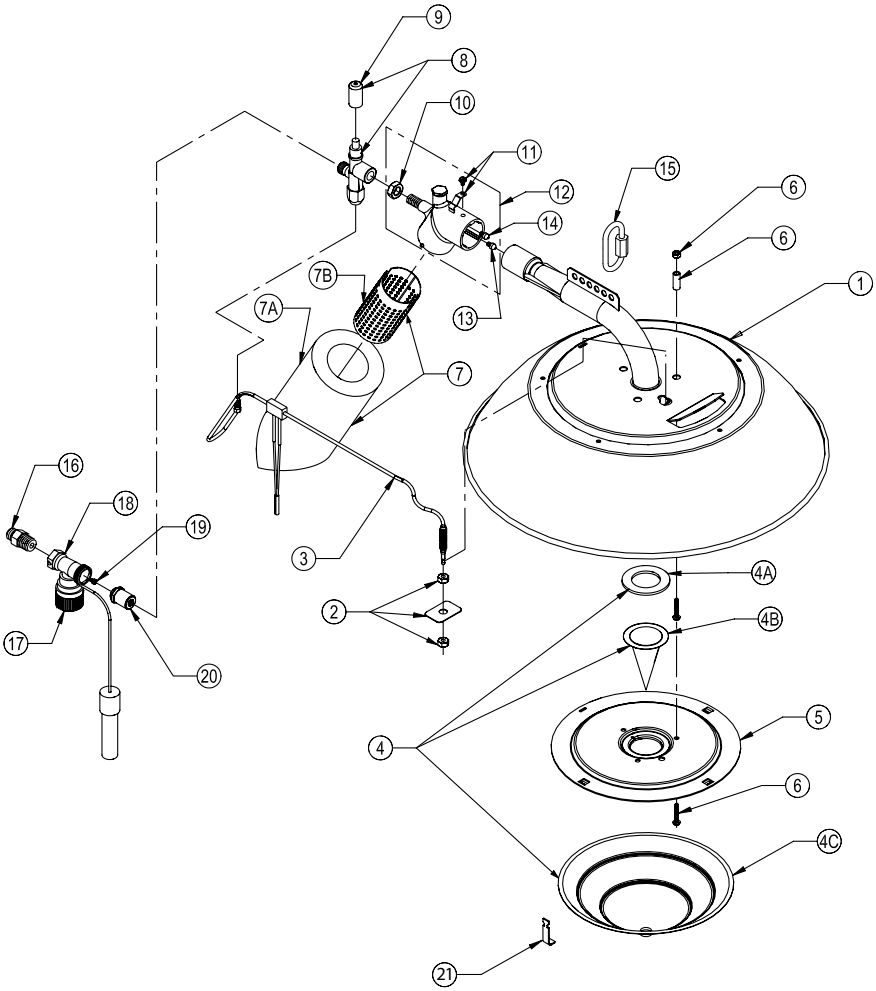
Safety Control Valve
Safety shut off device used to feed fuel gas to the brood heater combustion cones for heating. Will shut off flow of gas completely if gas flame is extinguished. Works in conjuction with the thermocouple. If the thermocouple's auto reset temperature switch opens, the magnet internal to the safety control valve closes, shutting off all gas flow in the brood heater.

Thermocouple
Safety device that holds the electromagnet in safety gas control valve open when heat is applied to thermocouple tip. It will also stop gas flow if inner combustion flame is out. The thermocouple also includes an auto reset temperature switch. This safety device will close the safety control valve if temperature at the air housing abnormally increases.

Thermostatic Head and Sensor Assembly
Device used to cycle the brood heater and to maintain a specific temperature. Used on modulating zone panels and individual control brood heaters.

Venturi Tube
Tubular steel neck connecting the gas control valve and burner orifices to the combustion cones. Gas is fed to the combustion cones through the venturi tube.

Service Parts Identification Schematic
I-17



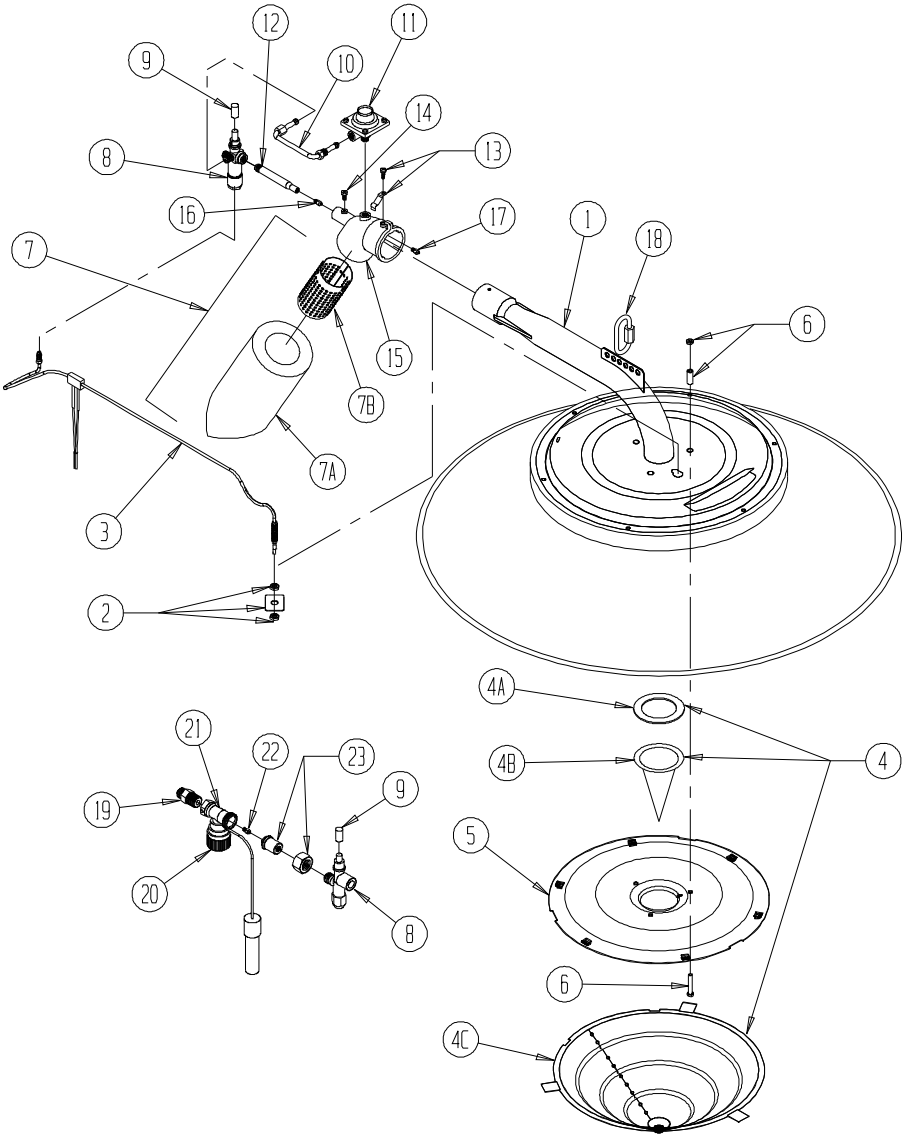
Parts List

Item	Description		Part Number
1	Venturi tube and burner assembly		500-09639
2	Cover plate with nuts		572736
3	Thermocouple with auto reset temperature switch		573167
4	Kit, combustion cones and gasket		500-21087
4A	Gasket		571070
4B	Inner cone		570126
4C	Outer cone		570088
5	Burner plate with hardware		570204
6	Hardware for burner plate (nuts, screws, spacers, x3)		500-26141
7	Filter kit		500-20427*
7A	Filter		570108
7B	Filter sleeve		573134
8	Safety control valve with cap	Zone control brood heaters	572732
		Individual control brood heaters	572733
9	Cap for safety control valve		572737
10	Jam nut, for safety control valve		572734
11	Clip, thermocouple with screw		572730
12	Air housing with register plate, burner orifice, pressure valve and jam nut	Propane gas - Zone and individual control	572731
		Natural gas - Zone and individual control	572735
13	Primary burner orifice (low heat)	Propane gas	570568
		Natural gas	570569
14	Secondary orifice (high heat)	Propane gas	570568
		Natural gas	573711
15	Quick Link		572121
16	Adapter, hose, individual control		572940
17	Thermostatic head, individual control with 1.83m lead and sensor		574050
18	Valve, modulating, individual control	Propane gas	574051
		Natural gas	574054
19	Orifice, bypass, individual control	Propane gas	572140
		Natural gas	570326

20	Adapter sleeve, individual control	500-26143
21	Truss clip	509559
Following are not illustrated		
	Coupling, Quick Disconnect, Kit	500-21335*
Gas Hoses	6.35mm x 1.57 m Rigid x Swivel, Poultry	550-29674*
	6.35mm x 1.83 m, Rigid x Swivel, Poultry	550-20495*
	6.35mm x 3.05 m, Rigid x Swivel, Poultry	550-20496*
	6.35mm x 3.65 m, Rigid x Swivel, Poultry	550-20497*
	6.35mm x 1.83 m, Swivel Both Ends, Swine	550-20499*
	6.35mm x 3.05 m, Swivel Both Ends, Swine	550-20242*
	6.35mm x 4.57 m, Swivel Both Ends, Swine	550-20500*
	Kit, 1/8 NPT Fitting	500-23406*

**Accessory - Must be ordered separately*

Service Parts Identification Schematic
I-40 Manual Ignition



Item	Description		Part Number
1	Venturi tube and burner assembly		500-23261
2	Cover plate with nuts		572736
3	Thermocouple with auto reset temperature switch		500-09596
4	Kit, combustion cones and gasket		570130
4A	Gasket		570273
4B	Inner cone		570308
4C	Outer cone		500-24543
5	Burner plate with hardware		572937
6	Hardware for burner plate (nuts, screws, spacers, x3)		500-26141
7	Filter kit		500-27522
7A	Filter		572429
7B	Filter sleeve		573135
8	Safety control valve with cap	Zone control heaters	500-22285
		Individual control heaters	500-22286
9	Cap for safety control		572737
10	Tube, safety control valve to pressure valve		570457
11	Pressure valve		500-09861
12	Injector tube		500-09562
13	Clip, thermocouple with screw		572730
14	Screw, retaining screw for injector tube		572939
15	Air housing with register plate, burner orifices, and pressure valve	Propane gas - Zone and Individual	500-24773
		Natural gas - Zone and Individual	500-24761
16	Primary burner orifice (low heat)	Propane gas	570094
		Natural gas	572747
17	Secondary orifice (high heat)	Propane gas	573710
		Natural gas	572938
18	Quick Link		572121
19	Adapter, hose, individual control		572940
20	Thermostatic head, individual control with 1.83m lead and sensor		574050
21	Valve, modulating, individual control	Propane gas	574055
		Natural gas	574056

22	Orifice, bypass, individual control	Propane gas	570577
		Natural gas	570578
23	Adapter sleeve, individual control		500-26143
Following are not illustrated			
Coupling, Quick Disconnect, Kit			500-21335*
Gas Hoses		1/4 in. x 62 in. Rigid x Swivel, Poultry	550-29674*
		1/4 in. x 6 ft., Rigid x Swivel, Poultry	550-20495*
		1/4 in. x 10 ft., Rigid x Swivel, Poultry	550-20496*
		1/4 in. x 12 ft., Rigid x Swivel, Poultry	550-20497*
		1/4 in. x 6 ft., Swivel Both Ends, Swine	550-20499*
		1/4 in. x 10 ft., Swivel Both Ends, Swine	550-20242*
		1/4 in. x 15 ft., Swivel Both Ends, Swine	550-20500*
Kit, 1/8 NPT Fitting			500-23406*

Warranty Policy

Brood 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 brood 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 1-800-345-7200, for assistance, or email us at customerservice@lbwhite.com.

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

WORLD PROVIDER - INNOVATIVE HEATING SOLUTIONS

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