



LDR系列电加热蒸汽锅炉
LDR Series Electric Steam Boiler

使用说明书

Installation And Operation Manual



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敬爱的用户:

请在使用本设备前详细阅读本使用说明书。

本设备的操作只能由合格的工作人员执行。

如操作处理不当，有可能会引起危险事故。

目 录

一. 产品特点及用途	1
二. 重要注意事项	1
三. 安装说明	2
四. 部件名称及主要部件介绍	3
五. 产品使用方法	4
六. 控制系统	7
七. 日常维护与保养	8
八. 常见故障排除	12
九. 敬请用户注意	13

LDR系列电加热蒸汽锅炉

一、产品特点及用途

LDR系列电加热蒸汽锅炉是一种采用管状电热管直接加热水而连续产生一定压力蒸汽的小型蒸汽锅炉，广泛使用于服装熨烫、医用消毒、食品加工、洗涤行业，同时也可为其他行业部门在需要0.7MPa压力以下蒸汽源时使用。

LDR系列电加热蒸汽锅炉结构紧凑，机内设自动加水泵，可连续不间断工作。电热管选用优质不锈钢制造，用高效绝热材料保温，使用寿命长，能源省，升温快，汽量足。由电子线路和特种工业探测电极组成测控加水系统，反应灵敏，维护简单。蒸汽输出阀可直接与标准蒸汽胶管总成相连，气密性好。移动、装接、使用都十分方便。

二、重要注意事项

- »» 请在使用本产品前及进行维护保养时详细阅读本说明书；
- »» 锅炉用水的水质必须符合国家标准，锅炉应配备软水器，不使用软化水会造成锅炉结垢，影响锅炉使用效率和寿命，严重时会引起事故；
- »» 请勿使用蒸馏水、纯净水等类似电导率低的介质而影响水位控制检测的正确性；
- »» 与本设备相连的管道须符合国家相关标准要求；
- »» 锅炉用电的配电终端必须接入锅炉相应参数规格的漏电保护器（自备），并且接入可靠接地线，以确保用电安全；
- »» 每周由专业人员对主回路连接件、动力线、冷压头、断路器、接触器、加热管等紧固件进行检查；
- »» 维护、维修锅炉时必须切断供电电源；
- »» 每周必须对安全阀做手动排放试验，若不执行产生的后果则由使用单位负责；
- »» 产品使用过程中每天至少带压（0.15MPa以下）排污2次；排污管道应妥善连接至安全处；
- »» 为防止锅炉内产生负压，排污后，在下次锅炉运行前，请不要关闭排污阀。
- »» 定期冲洗水位筒（带压0.15MPa以下），清理水位电极，定期清理给水箱；
- »» 若环境温度在0°C以下，请注意供水管路的防冻工作，并且在工作完毕后，把水泵泵头的余水放空，避免泵头冻裂。

- » 锅炉如有转移，必须将有关所有技术文件同时移交。
- » 产品持续改进及国家规范的变动等，有时实际产品可能与本说明书有些地方不同，具体按提供的各部件使用说明书及最新国家规范为准，恕不另行通知。
- » 如有因进行任何本手册未提及的维护操作，或不正确的操作设备而引起的故障和人身伤害，本公司不负任何责任。
- » 在使用本产品前，请按国家相关规定向所在地质量技术监督部门申报，取得同意后方可使用。

三、安装说明

1. 安装前的准备工作

按制造厂出厂清单，对照产品图纸，检查安全附件的完整性及锅炉本体外包是否有损坏变形情况，锅炉大件如需起吊，起吊时应避免破坏绝热层。

1.1 组织及人员的配备

锅炉安装必须由专人负责，司炉工参加，并配备管道工、钳工、冷作工、合格的电焊工及辅助工。

1.2 组织有关人员学习资料

组织有关人员熟悉《锅炉安全技术监察规程》、使用说明书、锅炉图纸等文件，以了解和掌握安装、运行操作等有关事项。

1.3 确定安装地点

1.3.1 安装地点最好能接近供热的地点，目的在于缩短输水管路，降低基建费用，减少管路压降和散热损失。

1.3.2 动力线配置应符合有关规定。

1.3.3 给水和排水方便。

1.3.4 锅炉房的布置应符合TSG G0001《锅炉安全技术监察规程》第八章锅炉房的规定。

注意：请在使用本产品前，按国家有关规定向所在地质量技术监督部门申报，取得同意后方可使用。

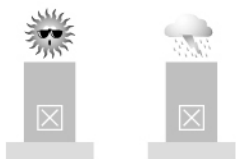
LDR系列电加热蒸汽锅炉

2. 放置要求

2.1 放置时注意事项



➤ 请勿置于不平或倾斜之处，保持通风



➤ 避免放置阳光直射、雨淋或潮湿之处



➤ 请远离火源及高温，机器上方勿放置物品



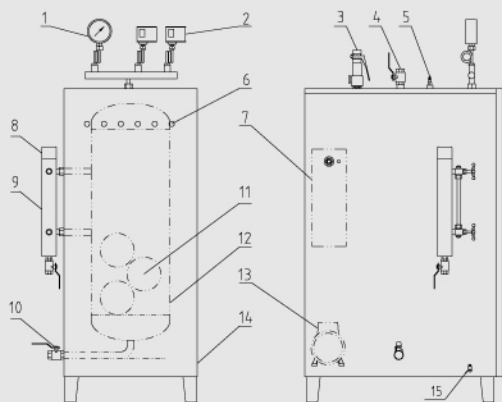
➤ 避免置于含腐蚀性气体、易燃易爆气体处

2.2 使用环境：

- ◎ 环境温度：+5°C ~ +40°C (+41°F ~ +104°F)
- ◎ 相对湿度：45% ~ 85% 无结露
- ◎ 良好的通风条件和适当的照明

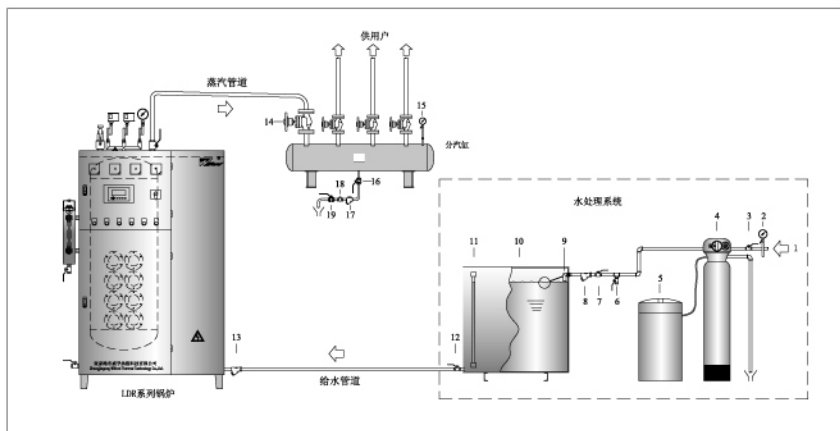
四、部件名称及主要部件介绍

1. 主要部件说明



- 1、压力表；
- 2、压力控制器；
- 3、安全阀；
- 4、主汽阀；
- 5、缺水电极；
- 6、控制按钮；
- 7、给水箱；
- 8、水位电极；
- 9、水位表；
- 10、排污阀；
- 11、电加热管；
- 12、锅炉本体；
- 13、给水泵；
- 14、锅炉外壳；
- 15、接地线标记

2. 系统参考图



- | | | | |
|--------|--------|---------|--------|
| 1、进水管 | 6、取样口 | 11、水位计 | 16、排污阀 |
| 2、压力表 | 7、进水球阀 | 12、出水球阀 | 17、过滤器 |
| 3、进水球阀 | 8、过滤器 | 13、过滤器 | 18、疏水阀 |
| 4、水处理 | 9、浮球阀 | 14、截止阀 | 19、排污阀 |
| 5、盐箱 | 10、软水箱 | 15、压力表 | |

五、产品使用方法

1. 安装前检查

机器在运输、装卸等过程中可能会引起损伤，必须在开机前作如下检查：

- 1.1 各种管路、仪表及接口应紧固，无松动；
- 1.2 电气线路无破损，接头无松脱现象，重点检查动力线接头是否松动。
- 1.3 是否有其它受损现象。
- 1.4 检查现场执行的所有电气连接与电路图中的说明是否准确相符。



注意：必须具备可靠的接地线，连接至机器外壳（接地线规格不小于6mm²）。

LDR系列电加热蒸汽锅炉

2. 安装必要条件

2.1 动力线的选用应根据加热器功率选用，具体选用标准请参阅附表。

2.2 LDR0.2以下型号水箱内置，水位由浮球阀控制，给水源须保证有0.05-0.15Mpa压力。

(LDR0.2以上型号须另配水箱)

2.3 接软水源至水箱进水口处，禁用深井水和河水等非软化水。

注意：由于使用非软化水导致的产品故障，不在保修范围之列。

请勿使用蒸馏水、纯净水等类似电导率低的介质而影响水位控制检测的正确性；

2.4 第一次使用或使用过程中水泵内进入空气时，请旋开水泵出水口旁注水塞螺丝，让其充满水后

将注水塞旋紧，详见**日常维护与保养**

2.5 关闭排污阀和蒸汽输出阀。

注意：请把安全阀出口接到室外安全处，排污阀固定接入下水道。

在使用本设备前，请检查漏电保护功能是否正常。

✓ **上述各项检查合格后才能开启本产品。**

动力线配线表 必须接接地线！

型号	LDR0.1-0.7	LDR0.15-0.7	LDR0.2-0.7	LDR0.3-0.7
动力进线 参考规格	铜芯绝缘电线			
	3x50+1x16	3x70+1x16	3x95+1x16	3x185+1x16
	聚氯乙烯绝缘电缆			
	(VV-3x70)+1x16	(VV-3x95)+1x16	(VV-3x120)+1x16	(VV-3x70)x2根+1x16 或(VV-3x185)+1x16

注：1. 动力线错误选用会导致：①加热缓慢，出现功率不够的假象；②可能造成烧线。

2. 动力线接线请有经验的持证电工操作并严格按照接线柱标记接线，请参考电气总接线图。

3. 锅炉用电的配电终端必须接入漏电保护器（自备），规格、容量请参考电气总接线图。

4. 建议采用VV电缆线，如选用VV电缆线需符合GB/T12706-2002。

3. 开机、运行步骤

3.1 打开“电源”开关（见图1），“电源”指示灯亮，控制器声光报警（因锅炉内缺水），同时水泵开始运转，补水至超低水位后控制器停止报警，锅炉运行指示灯点亮，自动补水至高水位，水泵停。



- 3.2 补水到低水位，炉压为低时，电热管自动开始加热。
- 3.3 锅炉压力达到设定值时，自动停止加热，此时便可打开汽阀，使用蒸汽。
- 3.4 使用蒸汽时，炉内压力下降，降到压力下限设定值时，自动开始加热。
- 3.5 使用蒸汽时，炉内水位不断下降，当降低到低水位时，即启动水泵，向炉内补水至高水位。（当水位低于低水位，补水系统未正常工作时，补水120秒后水位未到达低水位电极，电热管停止加热，如水位继续下降低于超低水位电极，控制器报警并停炉保护。）

4. 负荷调节

客户可根据用汽量要求，选择“功率选择”开关，调节加热管工作组数。

5. 紧急手动停炉的条件和方法

- 5.1 出现以下情况之一，紧急手动停炉：
- 5.1.1 锅炉压力超过安全阀起跳压力而安全阀未动作，又不能自动停炉时，应紧急手动停炉。
- 5.1.2 水位计水位失灵（超出正常范围显示时如缺水或满水）既没有自动补水，又不能自动停炉时，应紧急手动停炉。
- 5.1.3 给水泵异常不能补水时或补水长时间未达到正常水位，应紧急手动停炉。
- 5.1.4 报警器报警时。
- 5.1.5 电气路线故障时。
- 5.1.6 紧急停炉的操作：按“急停”按钮锅炉即停止运行。
- 5.2 停炉后的保护：
- 5.2.1 锅炉停止运行后，切断总电源。
- 5.2.2 排除故障后可继续运行锅炉。（运行前右旋“急停”按钮释放，再打开电源。）

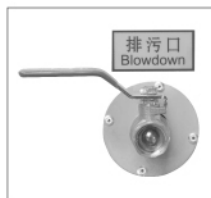


LDR系列电加热蒸汽锅炉

注：为确保蒸汽锅炉正常运行及安全，锅炉运行时司炉人员应经常观察锅炉的压力、水位及加热状况是否正常。当蒸汽锅炉发生故障，应立即停机检查，排除故障后才可重新启动。

6. 关机步骤

- 6.1 工作完毕，按“电源”开关关闭电源，电源指示灯熄灭，关闭电源总开关。
- 6.2 待压力表指针降到0.15~0.1Mpa时，将排污阀门打开进行排污，关闭进水阀门。



注：为防止锅炉内产生负压，排污后，在下次锅炉运行前，请不要关闭排污阀。

六、控制系统

本蒸汽锅炉控制系统具有锅炉水位控制、蒸汽压力控制、缺水保护控制、超压保护控制等自动控制功能，具体接线请参考电加热蒸汽锅炉电气总接线图。



1. 状态显示

本机具有丰富的显示功能，可将采集到的压力、水泵、电热管等的工作状态准确直观的显示出来。设置功率切换功能，用户可根据用汽量自主调节功率，以达到更节能目的。

2. 输入输出

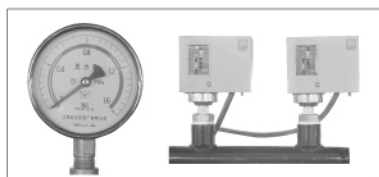
2.1 输入信号：

(1) 压力传感器：

机器压力通过压力控制器控制。当压力低于整定值时压力控制器输出信号接通；压力高于整定值时信号断开；信号断开后当压力下降到回差整定值时再次接通。

(2) 水位信号：

控制器使用水位电极测量水位，使用时应注意水位电极两端的绝缘，不要受潮。当水位



电极两端的电阻低于100K时，控制器即认为水面已高于电极；当水位电极两端电阻升至500K以上时，控制器即认为水面已低于电极。

2.2 控制输出执行泵控制

控制器可配接功率小于1KW的单相水泵，具体接线参考电加热蒸汽锅炉电气总接线图。

3. 报警保护

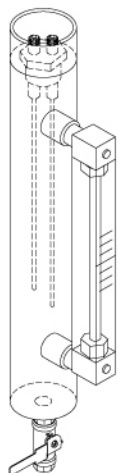
控制器开启后即不间断地对压力传感器、水位电极以及自身电路进行检测，发现故障立即报警并停炉保护。控制器自动显示故障点，机内蜂鸣器发出报警声，具体排除方法请参阅“**常见故障排除**”。



七、日常维护与保养

<p>1</p> 	<p>安全阀</p> <p>安全阀是锅炉的重要安全附件。由当地安全技术监督检查部门认可的单位校验，每年至少校验一次。</p> <p>为防止安全阀的阀瓣与阀座粘住，每周对安全阀做手动排放试验。</p> <p>严禁用任何手段提高安全阀整定压力，导致安全阀失效。</p>
<p>2</p> 	<p>排污</p> <p>这项操作至为重要，即使采用软化水或除垢剂时，经过长时间的设备运行，在炉内也会产生水垢和矿物质。排污能延缓水垢的产生和对炉壁的沉积，能延长锅炉使用寿命，提高锅炉运行效率。</p> <p>每日带压（0.1-0.15MPa）排污至少2次，必须在工作结束后排空炉内存水。排污管固定接入安全处。</p>

3



水位筒冲洗

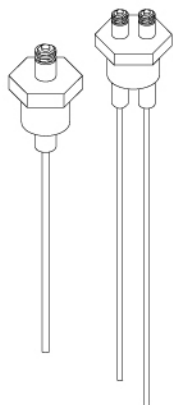
本产品水位筒位于锅炉右侧，通过上下活接螺母与锅炉本体连接，下部装有水位筒冲洗球阀，用于显示锅炉运行时的水位情况，及稳定锅炉运行时水位的波动，提高水位电极检测的正确性。

较长时间运行或水质状况，锅炉内会生成水垢堵塞水位筒接管，影响水位电极的正常检测及锅炉水位的正常显示，为防止水位电极失效，保证锅炉的安全稳定运行。

应每周对水位筒进行冲洗（水质差或连续使用时须每天冲洗，与排污同时运行）。带压（0.1-0.15MPa）打开水位筒球阀冲洗。

冲洗管道固定接入安全处。

4



电极清理

炉内供水控制系统能否自动可靠的工作，取决于锅炉水位筒内的高低水位电极探针及锅炉本体内置缺水电极的检测灵敏度，因此必须每二至三个月内擦洗水位电极探针一次。若使用水质较差时应半个月清理一次。

电极清理具体方法如下：在锅炉完全泄压后，拆下锅炉右侧水位筒顶盖，（缺水电极位于锅炉顶部）卸下电极上的导线（做好标记），按逆时针方向拧下电极，除去金属棒上的结垢；若结垢严重，可用砂皮打磨表面使其露出金属光泽，用万用表电阻档测量金属棒和外壳间应有500KΩ以上的电阻值，且越大越好。

<p>5</p> 	<p>加热管的维护</p> <p>由于锅炉长期使用及水质影响，加热管容易结垢而影响工作效率，严重时影响加热管的使用寿命，应根据锅炉运行及水质情况定期对加热管清理（一般2~3个月一次）。重新装加热管时，应注意连线的复原、法兰上的螺丝紧固，以免发生漏水现象。</p>
<p>注意：4.5项可根据锅炉运行和水质情况同步进行。</p>	
<p>6</p> 	<p>清洁止回阀</p> <p>当发现锅炉有回水现象时，及时拆下止回阀清除里面的水垢和杂质，当摇晃止回阀时，里面的挡板能自由运动、密封好。如无法清理，请更换。</p>
<p>7</p> 	<p>给水箱</p> <p>给水箱内置于锅炉外包中,应定期打开给水箱①，清理水箱滤网③杂物，检查水箱电极④是否正常,以保证水泵补水正常，如遇溢水口溢水请检查浮球阀②关闭是否正常。</p> <p>（LDR0.2以上规格水箱须另配）</p>
<p>8</p> 	<p>水泵</p> <p>水泵进水口①与水箱连接，出水口③通过止回阀连接至锅炉进水口，新水泵第一次运行或长期停用再启动时，可能导致水泵的叶轮转动不灵活或卡住，可用螺丝刀通过风罩④孔拨动电机后面的风叶，直至水泵运转灵活。（此项工作应在关闭电源状态下操作）</p> <p>水泵第一次运行或长期停用再启动时应旋开放空气螺栓（注水塞②），注水满后，将注水塞旋紧（可以点动水泵以帮助注水）。</p> <p>天气寒冷时，注意泵内存水结冰。</p>

9 定期紧固

加热管上连接导线螺丝和法兰上的螺帽应定期紧固。并且由于加热管易结垢，应定期拆卸下来去除水垢（一般2~3个月一次）。经常检查主回路（动力线冷压头、断路器、接触器、电热管等），控制板、给水泵、电控箱、压力开关和安全阀等主要部件的运行状况，出现异常及时查找原因或更换。

10 软水器

在锅炉运行工程中，可能由于水质问题而带来不安全因素而影响产品的正常使用。水垢的热传导系数很小，不但会引起锅炉能耗的增加，而且会影响到锅炉的安全运行。因此，进行水处理的目的是非常明确的，我们要消除水垢给锅炉带来的危害，节省能源消耗，延长锅炉的使用寿命，获得较高的运行效率。

按照国家标准《低压锅炉水质》对锅炉运行时的水质要求，可采用炉外除去钙镁离子方式，即采用软化水作为锅炉的给水。最普遍的软化方式是离子树脂法。

注意：具体操作说明请参阅水处理操作使用说明书

11 其它注意事项

锅炉停止运行时间较长时，应切断电源，同时将锅炉、管道内的水放尽以防止出现冻坏、生锈现象。平时不使用机器时，切断电源，打开控制箱，对所有电器件接线端子紧固件进行检查，对松动的应紧固，以防接触不良导致烧焦电线及电器元件。

注意：电控箱不得进水或蒸汽及易燃易爆气体，在锅炉运行时必须关好电控箱门。

八、常见故障排除

故障现象		故障原因	排除方法
故障报警		锅炉新启用或刚排污	补水泵放空气
		水箱缺水或水箱电极脱落，水箱底部螺丝松动	给水箱补水，重新连接
		控制器出错	修理或更换
系统控制	锅炉不加水	高低水位电极棒击穿漏电或补水泵不良	拆下清除污垢或更换水泵
	锅炉补水不停	高低水位电极棒结垢，水位线脱落	拆下清除污垢、修理或更换
	锅炉频繁补水	电极接线错误或用汽量大	检查接线、用汽量
	锅炉回水	止回阀有水垢和杂质	清理或更换止回阀
	锅炉不加热	缺水电极断裂，电极线脱落或高压控制器接线脱落	检查水位电极、压力控制器
	加热慢或蒸汽量不够	电热管结垢老化或止回阀失效或断路器坏	修理或更换
	水泵进水慢	补水泵泵头中有空气或叶轮损坏	放空气或更换叶轮
	安全阀喷水、水位偏高	水位电极结垢、水位筒进水口堵塞	拆下清除污垢、炉胆除垢
	升压快而汽量不足	锅炉水位过高、没有排污	排污阀放水至正常水位
漏电断路	加热管损坏	加热管老化漏电	更换电热管
		电极棒击穿导致缺水干烧	拆下清除污垢
	补水泵漏电或短路		修理或更换
	断路器或控制器损坏		修理或更换
溢水孔溢水	浮球阀损坏或浮球掉落		检查或更换
	进水压力过高 $\geq 0.25\text{Mpa}$		降低出水压力

注意：控制主板上发光管指示 ED2：超低水位；ED3：高水位；ED4：低水位；ED5：水箱水位。
如设备运行异常请根据主板指示作出相应维护，维护时必须切断电源。

LDR系列电加热蒸汽锅炉

九、敬请用户注意

请您保存好产品质量书，以便维修服务工作。

向制造厂查询有关LDR系列电加热蒸汽锅炉技术资料，应注明产品编号。锅炉如有转移，必须将有关所有技术文件同时移交。

产生下列情况，本公司实行收费维修

- a. 不按正确方法使用及随意改选及不正确的维护；
- b. 因运输和搬运不当、碰撞、震动而引起的破坏；
- c. 没有使用软化水，所用水质较差而引起的故障；
- d. 自然灾害等不可抗力因素造成的故障或破损。

☆ 非常感谢您使用本公司产品 ☆

Dear All,

Please read the manual carefully before operating boiler.
Boiler should be operated by qualified staff.
Wrong operations could cause accidents.

Contents

1. Boiler characteristics and usage	1
2. Important notes	1
3. Installation descriptions	2
4. Parts details	3
5. Product usage method.....	4
6. Control system	8
7. Daily maintenance	9
8. Common faults and solutions	13
9. Notice	14

LDR Series Electric Steam Boiler

1、Boiler characteristic and usage

LDR series electric steam boiler can produce steam at a certain pressure by heating elements heat water directly. It is widely used in cloth ironing, medical sterilizing, food processing, cleaning, and any other industrial fields with steam pressure below 0.7Mpa.

LDR series are designed with smart structure, with auto water pump, and it could run continuously. Heating elements are made of stainless steel, good insulations, with long service life, energy-saving, quick heating, enough steam. Feed water system is composed of electronic circuit and special industrial test electrode, which is sensitive and easy for maintenance. Steam valve is connected to rated steam pipe directly, with well sealing. It is convenient to ship, connect and use.

2、Important notes

- »» Pls. read the manual in details when operating and maintaining the products.
- »» Boiler feed water must meet the state standards. Boiler should be equipped with water softener, otherwise it is easy to be scaled and cause lower efficiency and service life, even an accident.
- »» Pipe connected to boiler must meet the state standards.
- »» Do not use low conductivity medium such as distilled water, pure water, it will affect level controlling and measuring.
- »» To make sure operating safety, terminal electricity should be equipped with suitable leakage protector and be connected to ground reliable by customers.
- »» Professionals should tighten and check main circuit connections, power line, wire terminals, breaker, contactor, heating elements every week.
- »» Cut electricity when maintaining and repairing boiler.
- »» Pls. discharge safety valve by manual every week, otherwise any consequence is none of manufacturer's business.
- »» Boiler should be blowdown twice everyday below pressure 0.15Mpa. Blowdown pipe should be connected to safety place.
- »» To avoid boiler operating in negative pressure, after blowdown, do not shut down blowdown valve before start up boiler.
- »» Washing water level gauge (when pressure blow 0.15Mpa), electrode, water tank regularly.
- »» When environment temperature is below 0 °C, take care of feed water line to avoid

damage. After operating, pls. discharge rest water in water pump.

- »» When shift boiler, do make sure shift documents are together with boiler.
- »» No particular notice when boiler technology is improved and state' s regulations changed. There will be some difference between products and the manual, pls. operate as detail parts manual and state updated regulations.
- »» Any consequences caused by incorrect operation of equipment, or ways not mentioned in the manual, are not in manufacturer' s responsibility.
- »» Before operating boiler, pls. apply permission from local institution.

3. Installation descriptions

1. Preparations

Check boiler safety parts integrity and for any damage of packing as per packing list and product drawings. If needed lifting, make sure boiler outside insulations safety.

1.1 Organization and operator

Boiler must be installed by professional staff and also boiler operator, plumber, fitter, qualified welder and auxiliary laborer.

1.2 Arrange related person for learning instructions:

Arrange related person for learning < Boiler safety technical supervision administration regulation>, manual, boiler drawings. It is better for installing and operating.

1.3 location

1.3.1 It is better to be close to steam consuming to shorten water supply pipe, reduce infrastructure cost and pipe pressure and heat lose.

1.3.2 Power wire should meet related laws.

1.3.3 Easy feed water and blowdown.

1.3.4 Boiler room should be met the requirs of the chapter VIII of the TSG G0001 < Boiler safety technical supervision administration regulation>.

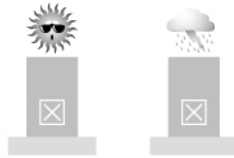
Note: Before operating the boiler, pls. apply permissions from local related office.

LDR Series Electric Steam Boiler

2. Place requirements



➤ Don't keep it on the inclination or un-flat position.



➤ Avoid keeping it on the position which has direct sunlight, rain or wet, Keep for ventilation.



➤ Keep away from the fire resources or high temperature. No other articles should be placed on the upside of the products.



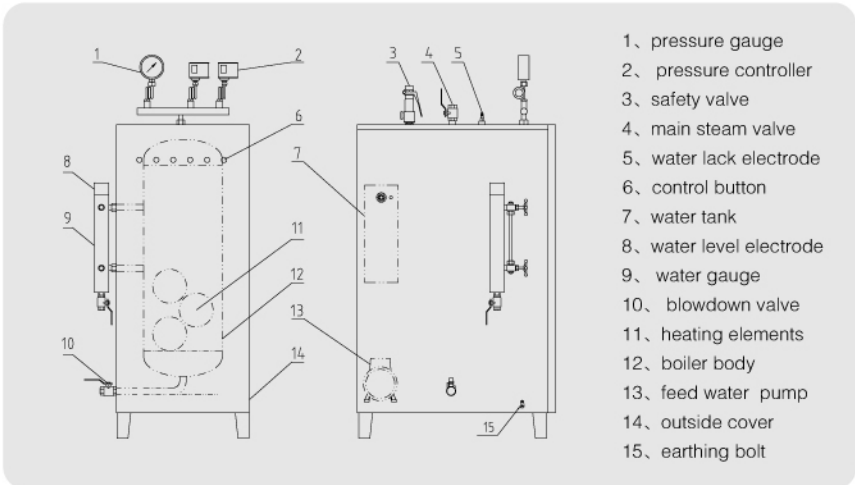
➤ Avoid keeping on the position which contains corrosive gas, inflammable and explosive gas.

2.2 Using Surrounding Requirements:

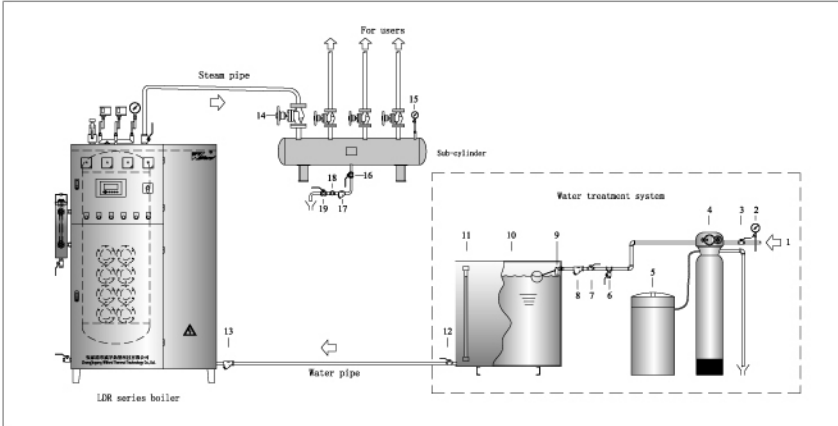
- Surrounding Temperature +5°C ~ +40°C (+41°F ~ +104°F)
- Relative Humidity: 45% ~ 85% no dew
- Good Ventilation Conditions and Proper Illumination

四、Parts details

1. Parts description



2. System installation drawings



- | | | | |
|-------------------|---------------|-------------------|-------------------|
| 1、headwaters | 6、sampling | 11、water gauge | 16、blowdown valve |
| 2、pressure gauge | 7、globe valve | 12、globe valve | 17、filter |
| 3、globe valve | 8、filter | 13、filter | 18、Traps |
| 4、water treatment | 9、Float valve | 14、Shut-off valve | 19、blowdown valve |
| 5、water tank | 10、water tank | 15、pressure gauge | |

5. Product Usage Method

1. Installation and Check:

For the machine, there may cause any damage in transport, loading or unloading, so it should be checked before operation:

- 1.1 Check all kinds of pipeline and interface to see whether there are any loosening or damages.
- 1.2 The electric line should be checked to see whether there are looses or other damages.
- 1.3 Check all the electric line to see whether they match with the instructions in the circuit diagrams.



Note: The credible earth wire which is connected to the machine shell must be equipped.

LDR Series Electric Steam Boiler

2. Necessary Conditions for Installation

- 2.1 The power line must be chosen according to the electric power of the heater, for details you can refer to the following table.
- 2.2 Water tank is located in boiler below LDR0.2 series and the water level is controlled by float ball valve. Make sure feed water pressure between 0.05–0.15Mpa.(Above LDR0.2 the water tank needs additional configuration)
- 2.3 The head waters should be connected with the inlet of the magnetic valve, it is forbidden to using non-soft water such as well water, river water and so on.

Note: Any damage caused by non-softened water is not in our guarantee.

To make sure water level electrodes work in good condition, it is not allowed to use low conductivity media, such as distilled water, purified water.

- 2.4 For the first time to use the water pump, if the air enters the pump, you should loosen the screw of the add water plug beside the outlet of the pump, then fill it with water and tighten the water plug.
- 2.5 Shut the blow down valve and the steam outlet valve.

Note: Before operating boiler, check whether leakage protection function is normal.

One can start the steam generator after finishing all the inspection mentioned above. Power line wiring There must be earth connection!

Model		LDR0.1–0.7	LDR0.15–0.7	LDR0.2–0.7	LDR0.3–0.7
Power line Reference specifications	mm ²	Rubber-insulated copper wire			
		3x50+1x16	3x70+1x16	3x95+1x16	3x185+1x16
		PVC insulated cable			
		(VV-3x70)+1x16	(VV-3x95)+1x16	(VV-3x120)+1x16	(VV-3x70)x2 pieces+1x16 or (VV-3x185)+1x16

Note:

1. if the power wire for wrong use, it will: ① heat very slowly, appear false appearance of un-sufficient power; ② it may cause burning of wire.
2. the connection of the power wire should be done by experienced and certified electrician, also strictly comply with the signals of wiring post, for details please refer to < general electrical wiring diagram of electrical heating generator >
3. the wiring terminal of the boiler should have current leakage protection unit that is supplied by users, for the size and volume, please refer to < general electrical wiring diagram of electrical heating generator >.
4. Recommended VV cables, if choose VV cables must be in accordance with GB/T12706-2002

3. Starting up and operating steps

3.1 Turn on the key (as photo 1), power indicator lightening, controller alarming (the boiler and inner feed water tank are lack of water), when tank with water, alarming stopped, meanwhile, water pump start up, feed water to low water level, boiler operating indicator lightening, heating elements working. When it is up to high water level, water pump stops.



Note: controller alarming is because of boiler inner tank lack of water. It is very important to make sure water level in water tank before operating.

3.2 Feeding water to the low level, the boiler pressure is in low status, the heating tubes start heating automatically.

3.3 When the boiler pressure goes to the set point, heating stopped automatically, now you can open the steam valve and use steam.

3.4 While using the steam, the pressure inside the boiler will drop until it goes to the limit low set point, heating will start again automatically.

3.5 While using the steam, the water level inside the boiler will be down continuously until it goes to the low water level, the water pump started automatically, feeding water to the boiler until it goes to the high water level (when the boiler water level is lower than the low level, the feeding water system doesn't work as normal, or it can't go to the low water level electrode in 120 seconds, the heating tube will stop heating. If the water level continues drop and then lower than the limit low water level electrode, the controller will send alarm signal and stop running the boiler).



4. Load adjustment

Customer could adjust load by turn "power switch" button as steam requirements.



LDR Series Electric Steam Boiler

5. emergency manual shut down condition and ways

5.1 In case of one of following conditions, shut down boiler by manual:

- 5.1.1 Boiler pressure is over safety valve, and safety valve is not working, not able to auto stop.
- 5.1.2 Water level gauge no use(exceed normal scope, such as lack water or full water), not able auto make up water or auto shut down.
- 5.1.3 Water pump is abnormal, no feed water or after a long feeding water time , it is not up to the low water level.
- 5.1.4 Annunciator alarm.
- 5.1.5 Electric wire is in trouble
- 5.1.6 Emergency shut down step: press “emergent stop” button.



5.2 Protection after shut down

- 5.2.1 After shut down, cut power
- 5.2.2 After solving troubles, operate boiler. (turn right : emergent button, push it and release, then open power)



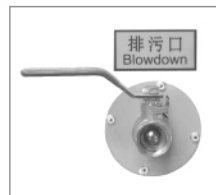
Note: To assure the good running and the safety of the boiler, the stoker should observe whether the boiler pressure, the water level and the heating are running normally. When the boiler goes wrong, it should be shut down and checked immediately, and restart when finishing the trouble shooting.

6. Stop Running Boiler Procedures

- 6.1 After finishing work, push down the switch of “power” , shut off power source, the indication lamp of “power” will be off, close the general switch of power source.
- 6.2 When the indication pin of the pressure gauge point to 0.15 ~ 0.1Mpa, open the blow down valve, start working, close the inlet water valve.



Note: To make preparation against the negative pressure in the boiler, after blowing down, please don't shut off the blow down valve.



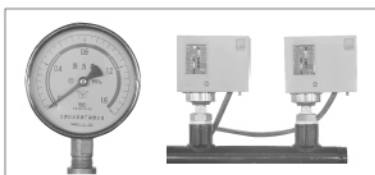
6. Control System

The control system of the steam boiler has the following automatic controlling function: the boiler water level control, the steam pressure control, the protection control for lacking of water, the controlling for protection of over pressure and so on. For the details, please refer to 'General electrical wiring diagram of electrical heating steam generator' .



1. Status Indication

The steam boiler has abundant indication functions as following; the working status of pressure, water pump, electric-heating tube and so on they can be showed correctly and directly, There are power switching settings functions, users can adjust the power according the steam for using so that it will be more energy-saving.



2. Input and Output

2.1 Input Signal

(1) Pressure Sensor

The pressure of steam boiler is controlled by pressure controller. If the pressure is lower than set point, the output signal of pressure transmitter will be put through; if the pressure is higher than set point, the signal will be cut off, and when the pressure drops back to set point again, the signal will be put through again.

(2) Water Level Signal

The controller measures the water level through level electrode. During operation, pay attention to the insulation of two ends of water level electrode, keep them away from damp. If the electric resistance of two ends of water level electrode is less than 100K, it will be deemed that the water level is higher than electrode. If the electric resistance of two ends of water level electrode is over than 500K, it will be deemed that the water level is lower than electrode.

2.2 Controlling for Output Executive Pump

The controller can be matched with mono-phase water pump with power less than 1KVA, for detail, please refer to 《General electrical wiring diagram of electrical heating steam boiler》 .

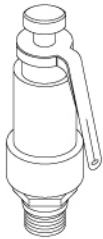
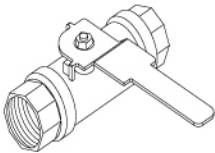
LDR Series Electric Steam Boiler

3. Alarm Protection

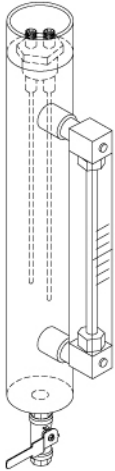
After starting controller, it will check the pressure sensor, water level electrode and self circuit continuously. Once find trouble will alarm immediately and stop running boiler for protection. Controller will indicate the point of trouble automatically, the inside buzzer will send sound alarm. For the detail removal method for troubles, please read the eighth section <common faults and solutions>.



七、Daily maintenance

<p>1</p> 	<p>Safety Valve</p> <p>The safety valve should be calibrated by the department approved by local labor safety supervision division. Every year should be at least calibrated for one time.</p> <p>In order to avoid the sticking between disk and seat of safety valve, every week should do draining test by hand.</p> <p>It is not permitted to increase the set pressure of safety valve by every means, or safety valve will be out of efficiency.</p>
<p>2</p> 	<p>Blow Down</p> <p>The operation is very important, because the scale and the mineral composition will generate in the boiler even already used the soft water or the scale dissolver. The blow down can delay the generation of the scale in the boiler mural, also it can prolong the life span of the boiler, so it must be carried out at least once a day when finished the working.</p>

3



Water level gauge clearing

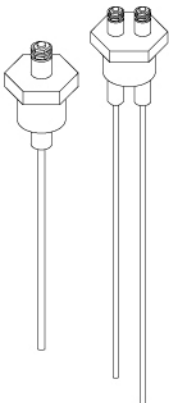
It is located on the right side of boiler, connected to boiler by loose joint nut, blow equip with clear ball valve to display water condition and fluctuation while boiler operating. It could advance test validity.

After long term working and poor water quality, hole will be blocked by scale, electrode will be impacted.

To avoid electrode out of using and boiler operate safety, should check water level gauge regularly (if water quality bad, need to clean every day together with blowdown). Open ball valve (pressure 0.1–0.15mpa) clean.

Cleaning pipe should be connected to safety place.

4


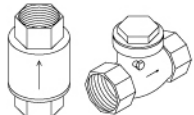
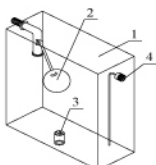
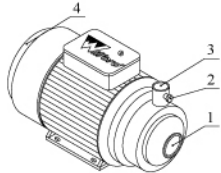


Electrode Cleaning

Whether the feeding water system can work automatically and dependable largely depend on the probe of the high–low water electrode inside the boiler, so the probe must be cleaned once every two to three months. If the local water quantity is poor, it should be cleaned once every half month.

Clean ways: after boiler discharge pressure totally, remove water level gauge top cap (lack of electrode in the top of boiler), remove electrode wire (mark it), and turn in counter–clockwise, clear scale. If scaling seriously, must use rubber polish electrode surface. Use multimeter test metal rod and outside, resistance should be higher than 500K Ω , more higher more better.

LDR Series Electric Steam Boiler

<p>5</p> 	<p>Heating elements maintenance:</p> <p>After boiler long term using, and water quality impact, heating elements are easy scaled. It will cause lower efficiency and less service life. Should clean heating elements regularly every 2–3 month according to boiler and water conditions. When re-connected heating elements, to avoid water leakage, take care of wire and flange connections.</p>
<p>Notice:4.5 items according to the boiler and the water quality situation.</p>	
<p>6</p> 	<p>The check valve clean</p> <p>If find the phenomenon of back water to the boiler, should dismantle the check valve in time, and remove all scale and impurity, shake the check valve, if the baffle plate inside the check valve can move freely, it means that is good. But if can't clean it by any method, should change a new check valve.</p>
<p>7</p> 	<p>Feed water tank:</p> <p>Feed water tank was equipped inner the boiler. Should open tank ①regularly, clean tank filter ③sundries, check electrode④ to ensure water pump work normally, check float valve ②when overflow shut down is normal or not, Above LDR0.2 the water tank needs additional configuration.</p>
<p>8</p> 	<p>Water pump</p> <p>①connect to water tank, outlet ③feed water to boiler water inlet through check valve.</p> <p>The rotation of vane of water pump may be not so well or may be blocked because of scaling forming of water pump during operation and vibration during transportation for new water pump. So when run water pump for first time or re-start pump again after stopping running for a long time, should turn the vane behind the motor through cover hole ④ by screw driver to water pump running very well.</p> <p>Loose the screw for discharging air (discharge plug②), after filling water, screw and tight the adding water plug (can help adding water by spot starting water pump).</p> <p>During cold weather, should pay attention to the frozen ice of deposit water inside pump.</p>

9 Periodically Fixtures

The screw cap of flange and joint bolt of heating tube should be tightened periodically. The scale will be formed on the heating tubes easily, so should remove the scale about every six-month. When re-assemble the heating tubes, should pay attention to reset the connecting wire and tightness of screw of flange to avoid happening water leakage. Should often check the running status of main parts of power line, cool pressure terminals, breaker, contactor, heating element and electric wire, feeding water pump, electric control box, pressure switch, safety valve and so on, if occur abnormal phenomena, should search the reason in time, or change

10 Water Softer

During operating, unqualified water will affect boiler safety. Scale, with low conductive factor, will cause higher electricity consumption and non-safety working. So, it must to softener water to save energy, prolong boiler service life and better operating.

According to state water quality rules < low pressure water quality>, boiler should use soft water, delete Ca^{2+} , Mg^{2+} outside of boiler. Generally, it uses ionic resin ways to softener water.

NOTE: Please refer to the Manual of the water softener.

11 Other Precautions

In order to avoid occurring the phenomena of freezing and rust, after stop running boiler for a long time, should cut off the power resource, at the time should drain the water completely inside boiler and piping. In usual time, if not running boiler, should cut off power resource, open the control box, check all terminals of electrical parts and tightening piece, if find loose parts, should tighten it for preventing burning through the wires and electrical parts because of bad contacting. To avoid poor contact lead to wires and electrical components burnt

Note: It is not permitted that water or steam and explosion & firing gas enter into electric box. During running boiler should close the electric control box.

LDR Series Electric Steam Boiler

8. Common faults and solutions

Trouble phenomena		Causing reason	Removal methods
Alarm for troubles		The boiler starts working for first time or blow down just now	Discharge air by making up water to pump
		The water tank is lacking of water or the electrode is fallen off, Water tank screw loosening at the bottom	Making up water to the water box and re-select it
		The controller has error	Repair or change a new one
System control	Not feeding water	The electrode stick of high-low water level is broken down and have current leakage or make water pump is not in good status	Remove, clean the dirt or change a new inlet water pump
	It can't stop feeding water to the boiler	High and low water level electrode scaled, water level falling	Remove, clean the dirt
	Boiler feed water frequently	The wiring of electrode is wrong connected or the consumption of steam is very large	Check the wiring and steam consumption quantity
	Boiler back water	The check valve has scale formation or impurity	Clean or change a new one
	Boiler not work	lack of water electrode broken, falling, or high pressure controller falling	Check electrode and controller
	Heating is very slow and the steam quantity is not sufficient.	The electrical heating tube has been ageing and the check-valve has been out of efficiency.	Repair or change a new one
	The water inletting of pump is very slow	There is air inside the head of make up water pump or the vane is broken	Vent the air or change a new pump vane
	The safety valve spurt water	There is scale formation inside the electrode of water level	Remove, clean the dirt
	The temperature is up quickly but the steam quantity is not sufficient.	The boiler water level is too high	Discharge water from blow down valve until get to normal water level
Leakage circuit breakers trip	The heating tube is broken	The heating tube has been aging and has current leakage	Change a new heating tube
		The electrode stick is broken down so as to lacking of water and dry burning	Remove, clean the dirt
	The making up water pump has current leakage or short connected		Repair/change a new one
	There is trouble of controller		Repair/change a new one
	leakage breaker or controller broken		Repair/change a new

Overflowing	Float valve damaged or ball falling	Check or replace
	Make up water pressure higher than 0.25MPa	Reduce water pressure

Note: the luminotron in the control plate shows: ED2: super low water level; ED3: high water level; ED4: low waterlevel;ED5: the water level in the water box. If the equipment is running wrong, please make some maintenance according to the indication in the main board. Must shut down power when maintenance.

9、Notice

You are kindly advised to well keep the product quality certification for the convenience of repairing service.

when ask for the relevant paper or technical documents please supply product No to us. When shift boiler, do make sure shift documents with boiler together .

We will charge a fee to repair the boiler for the following items:

- The using is not comply with correct way or change something freely or un-correct maintenance.
- The parts are broken because of un-correct transportation or handling, impacting, vibration and so on.
- There is some trouble because of bad water quality (not use soft water).
- The trouble or broken due to Force Majeure such as natural calamity.

☆ Thank you very much for using our products ☆

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