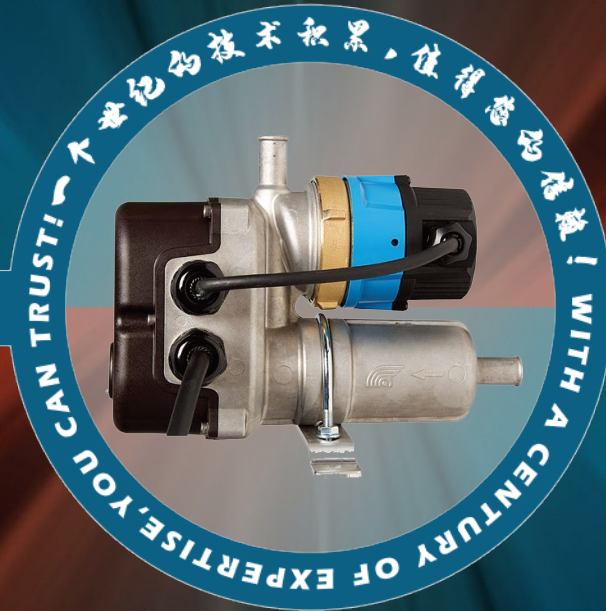
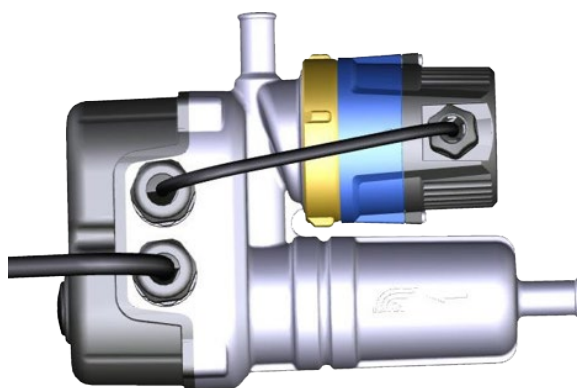


# FlowStart

(0.5 - 2.5 kW)



**使用说明书**  
**USER MANUAL**



**FlowStart**是一种通用紧凑型、带有循环泵的循环水电加热器，使用者需使用**50%纯水、50%乙二醇混合物**作为循环水，本产品可用于发电机组、车用发动机、船用发动机、工业用发动机及各种室内外机械、车辆（安全环境中）的加热。

The FlowStart is a universal and compact electric coolant heater with circulating pump which heats the coolant liquid of a motor with a mixture of 50/50 water / glycol. It can be used to heat engines in generating sets, on-road engines, marine engines, industrial applications and all types of vehicles located inside or outside (protected area only).

### 重要提示 IMPORTANT REMARKS:

为了保证您的产品具有最佳的工作表现和延长使用寿命，请注意以下几点：

In order to warranty an optimal working and useful life to your product, than please respect the following remarks:

- 正式运行前，请务必排尽管路中的空气。  
While running, please check that the circuit is air free.
- 请使用合格的循环水，确保循环水中不含有任何可能堵塞或损坏泵及加热元件的杂质。  
Make sure that the liquid doesn't contain any particle that could block the pump or damage the heating element.
- 本产品安装位置需位于被加热的机器循环水液面最低位置以下。  
Make sure that the apparel is located at the low position of the system under the minimum level.

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# 重要安全说明

## IMPORTANT SAFETY INSTRUCTIONS



本手册包含产品安装和启动阶段需要完成的步骤，请仔细阅读，以便正确安装和使用本产品。安装后请务必妥善保存本手册。

*The present user's guide contains instructions to be fulfilled during the mounting and the starting stage. Please read carefully for a correct installation and a proper use of the heater. Keep these instructions after installation.*

### ➤ 安装人员资质 **Qualified personnel**

安装必须由合格的技术人员进行。

The mounting should be carried out by a qualified technician only.

### ➤ 不遵守本说明书的危险 **Danger in case of non-compliance with the present guidelines**

不遵守本说明书可能会威胁人身安全、损坏设备，丧失质保资格。电气及机械安装需要严格遵从使用说明。

The non-compliance of the present guidelines could have serious consequences for the safety of people and could damage the equipment, thus making the warranty non-existent. The strictest rigor is required for the electrical and mechanical aspects of the mounting.

### ➤ 用户安全事项 **Safety measures for the user**

为了避免产品使用风险，请严格遵守使用说明以及产品使用地的电气安装安全规定。

Avoid any risk by strictly observing the notice in use. Avoid any danger linked to the electrical / cable network by observing the local safety instructions in force.

请使用者或经过授权的技术人员检查所有的电气系统是否包含安全保护断路装置，接地线的安装是否符合使用地的安全规定。

Check or let check an authorized technician that your electrical installation is well protected by a differential current system and that the earthing is in compliance with the local safety prescriptions.

### ➤ 私自改装或使用非原厂零件 **Modifications of the heater and use of unauthorized parts**

未经厂家允许不得对加热器进行拆装，建议用户只使用原厂配件以保证使用安全，如私自拆装或使用非原厂配件，厂家将不再承担任何安全、质量等一切责任。

Any modification of the heater will be made only in agreement with the manufacturer. The use of official spare parts and accessories guarantees your safety. The manufacturer disclaims any liability in case of non-original parts use.

### ➤ 使用说明 **Instructions for use**

本使用说明书应用于说明书中描述产品的安装应用。FlowStart不能在爆炸危险环境中安装使用。

The equipment supplied with the present user guide is exclusively meant for the applications described in this user guide. The FlowStart is not made to be installed in an explosive environment.

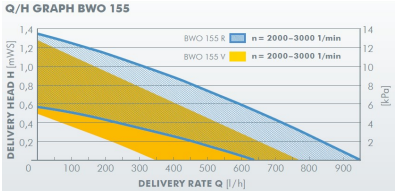
## 2. 技术规格说明 SPECIFICATIONS

### 2.1 技术规格表 Technical Characteristics

FlowStart是一种通用紧凑型、带有循环泵的循环水电加热器。本产品采用优质的零部件和材料以保证加热器的可靠性。产品结构紧凑，便于安装。该强制循环加热器由加热腔体、加热元件、固定区间温控器、带有手动复位功能的过温保护温控器和循环水泵组成。The FlowStart is a universal and compact electric coolant heater with circulating pump. High-quality components and materials are used to guarantee the reliability of the heater. Its compactness makes it easy to install. The heater is made of a heating body, a heating element, a fixed regulating thermostat, an overheat thermostat with manual reset (option) and a circulating pump.

加热器通电工作后，循环水就会被吸入加热腔体，然后被产品自带的循环水泵排回发动机，使发动机快速均匀的升温。加热元件以及水泵的工作状态由温控器控制，带有手动复位功能的过温保护温控器可以在过热的情况切断电源，保护加热元件和循环水泵。

As soon as the heater is plugged in, the coolant of the engine is sucked into the heating body and then expelled by the pump back into the engine. The pump allows a progressive and uniform warming of the engine. The thermostat controls the heating element (and eventually the pump). The safety thermostat protects the heating element and the pump in case of overheating.

电压 - 频率 Voltage and Frequency	120V - 60Hz; 230V - 50Hz
防水等级 IP Class	IP44 (更高等级可选) Standard IP44 (Higher IP level possible)
电压 - 功率 Voltage - Power	230V - 500W / 1,000W / 1,500W / 2,000W / 2,500 W 120V - 500W / 1,000W / 1,500W
循环水泵功率 Pump Power	2.5 - 9 W
电流 Current draw	2.2 - 12.6 Amp. Depending of the models
最大工作压力 Maximum working pressure	10 bars (150psi)
循环水泵工作温度 Pump working temperature range	-10 - 95°C (循环水温 Coolant)
循环水泵流速 Pump flow	
温控器控制区间 Regulation thermostat range	35-50°C (95-122°F) ; 34-40°C (93-104°F)
过温保护温控器 Safety thermostat	110°C, 手动复位 110°C With manual reset
重量 Weight	2.6 Kg

### 3. 安装须知 MOUNTING INSTRUCTIONS

#### 3.1 拆箱和安装准备 Unpacking and installation preparations

在丢弃产品包装，准备安装之前，请确保您有以下部件：

**Make sure that you have the following components and accessories before disposing of the packaging material:**

为了正确安装，请您使用FlowStart产品包装内附带的零部件

For a correct installation use the spare parts and accessories delivered with the FlowStart.

##### ➤ FlowStart 加热器本体 FlowStart Heater

##### ➤ 安装附件包 Connection kit

安装支架*1	1 Mounting bracket
安装固定环*1	1 Mounting clamp collar
M6螺母*4	4 Nuts M6



#### 3.2 注意事项 Precautions

安装必须由合格的技术人员严格按照本说明书进行。在未阅读本说明书及未确认循环水管路中是否排尽空气前，请勿连接电源。

**The installation has to be made by an authorized technician in strict compliance with the instructions of the manufacturer. NEVER connect to the mains before having followed the present instructions. Do not connect the heater to the mains if you are not sure that it is filled with coolant.**

#### 3.3 安装说明 Installation instructions

##### ➤ FlowStart应水平安装。循环水泵的中心轴决不能呈垂直状态。

The FlowStart should be mounted in a horizontal position. The axis of the pump should never be placed in a vertical position.

##### ➤ 加热器的安装位置应尽可能的低，安装位置必须低于循环水下液位，加热器循环水进口位置必须低于发动机循环水出口，这对避免空气进入加热器非常重要。

Fix the heater as low as possible. The heater should be below the lowest level of the water jacket and the coolant inlet must be below the point of removal of the coolant from the engine. This is very important to avoid any air trapped before the inlet of the heater.

##### ➤ 请使用包装内的安装附件将加热器固定在底盘或任何其它合适的位置，如果您不适用我们提供的安装附件进行固定，请您务必确保加热器的固定支架及安装方式足够坚固。

Fix the FlowStart to the chassis or any other suitable place with the fixation kit supplied with the heater. If you don't use the supplied fixation kit, the support for the fixing of the heater should be rigid enough.

##### ➤ 应尽量选择靠近发动机进出水口的安装位置，缩短连接水管的长度。

Select a mounting location that allows to reduce the length of the tubing to a minimum.

- 请勿将加热器、连接水管、电源连接线安装在靠近发动机排气的位置。

Be careful not to mount the heater, the hoses or the power cord close to the engine exhaust.

### 3.4 循环水管路的连接 Connecting the coolant circuit

---

- **排尽循环水路中的所有循环水 Drain off completely the coolant circuit**

在安装加热器之前，必须排尽循环水路中的所有循环水。可以通过打开排水塞或者断开底部的循环水管以便排尽循环水路中的所有循环水。

Before placing the heater, it is imperative to drain the coolant circuit. Unscrew the drain plug or disconnect the lower hose in order to completely drain off the coolant circuit.

- **连接加热器的进出水口 Connecting the heater inlet and outlet**

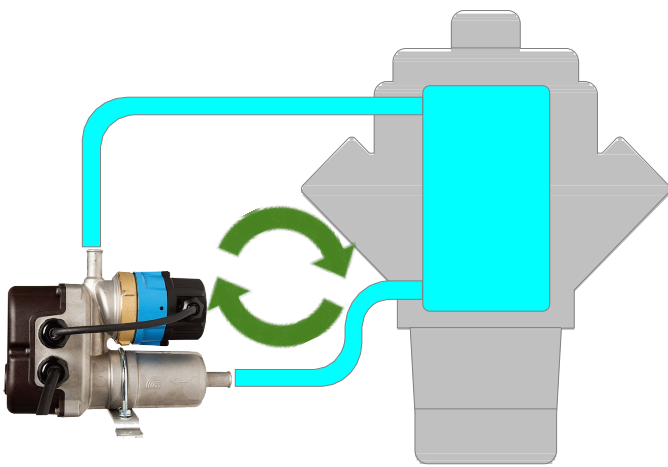
加热器连接至循环水路需使用内径为5/8 "(16mm)的耐高温水管。对于安装了排水塞的发动机需要使用内径16mm的水管转接头替换排水塞以便于加热器进水口的连接。请务必使用软管将加热器连接至发动机本体或者金属管道上以防震动传递至加热器。发动机回水口应选择处于尽可能高的位置并尽量远离出水口，从而增强加热效果。

The heater inlet and outlet are meant for hoses (not supplied) with an internal diameter of 5/8" (16 mm). For engines equipped with a drain plug, replace the plug by a hose connector with an internal diameter of 16 mm in order to make the connection to the heater inlet. If the heater is connected to a rigid pipe, use a piece of flexible radiator hose that is long enough to prevent engine vibrations being transmitted to the heater. In order to guarantee an optimum heating of the engine the coolant return hose from the heater to the engine should be placed at the highest possible point on the engine and as far as possible from the suction port to enhance heat distribution throughout the engine.

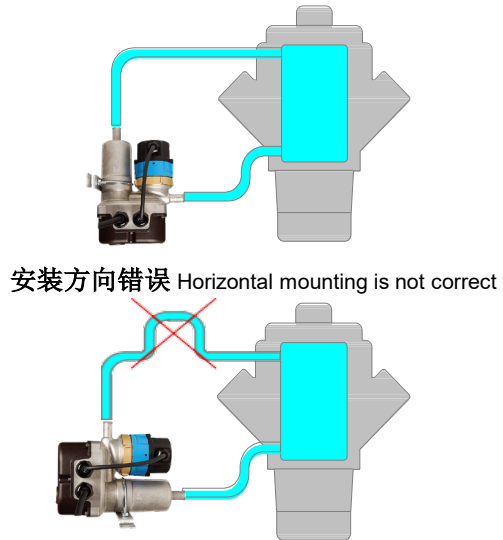
- **循环水的添加及水路检查 Checking and re-filling of the coolant circuit**

确保循环水管连接处卡箍拧紧锁死。请务必使用干净、高质量的循环水，推荐使用乙二醇比例不超过50%的乙二醇 & 纯水混合物作为循环水。为了尽量延长加热器的使用寿命，保证加热器的正常工作，请经常检查循环水的质量并确保加热器表面无污垢。为了消除管路里的空气，获得良好的循环水循环，请在注入循环水后，先运行发动机几分钟，检查水路的清洁度、水路各个部位的密封度、卡箍的锁死程度，当发动机冷却后，再次检查循环水液位，必要时需要进行添加。

Make sure that the hose clamp collars are properly tightened. Fill the coolant circuit with a high quality and clean mixture glycol/water without impurities and without exceeding the recommended proportion 50% glycol / 50% water. It is necessary to check its quality frequently to ensure that the heater is not dirty, has no grimes and does not suffer from deterioration. The life and the proper functioning of the heater depend on it. In order to eliminate air pockets and obtain a good circulation, run the engine a few minutes. Then shut off the engine and check that the water circuit is properly flushed. Check that all connections are watertight and that hose clamps are properly tightened. When the engine has cooled down, check the level of coolant in the circuit and adjust if necessary.



**正确的安装示范**  
Example of correct installation



**错误的安装示范**  
Example of wrong installation

### 3.5 电气连接 Electrical connections

#### ➤ 固定电源线 Fixing the power supply cord

请务必使用固定卡扣固定电源线，避免与任何发热或运动部件接触。建议使用软管保护电源线。

Fix the cord with clamp collars in order to avoid any contact with hot or moving parts. It is recommended to use a protection sheath for the cord.

#### ➤ 加热器通电之前的检查 Checking of the installation before connecting the heater to electricity

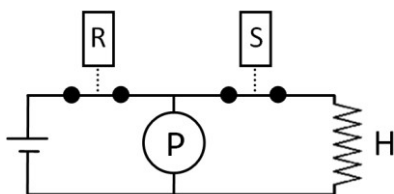
在加热器通电之前，请检查加热器标签上电压、功率、频率等信息，FlowStart加热器工作频率为50Hz或60Hz。

Check the information regarding voltage and power on the heater label before connecting the heater to electricity. All the Flowstart heaters work with 50 or 60 Hz.

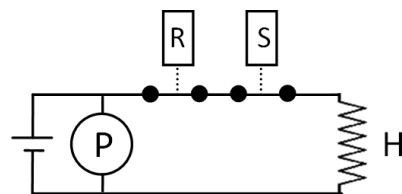
电源连接不当会对加热器造成不可逆转的损伤，请务必确保电压正确，接地线连接符合使用地的安全规定。

An improper connection to the mains could irremediably damage your heater. Make sure that the voltage is correct and the earthing is following local rules.

#### 电路示意图 Electrical diagrams 120/208/230 V - 50/60 Hz



⊕ 循环泵随加热元件启停的产品  
Configured such that the pump switches off with heating el.



⊕ 带有连续模式产品的示意图  
Configured for continuous pump operation

R.NC 工作温控器 Regulation thermostat  
S.NC 过温保护温控器 Safety thermostat

H. 加热元件 Heating element  
P. 循环水泵 Circulation pump

## 4. 使用说明 DIRECTIONS FOR USE

### 4.1 加热器使用说明 Putting the heater into service

**注意:请勿在循环水不足或无循环水的情况下启动加热器。**

**BEWARE: DON'T START THE HEATER IF NOT FILLED WITH COOLANT AND NEVER RUN THE PUMP WITHOUT LIQUID.**

**请务必遵循以下步骤启动加热器** Follow the procedure described hereafter:

- 接通电源。工作温控器将在34 - 40°C(93 - 104°F) / 35 - 50°C(95 - 122°F)范围内调节循环水的温度。

Connect the plug. The regulating thermostat will adjust the temperature in the range from 34°C to 40°C (93° F to 104°F) or from 35°C to 50°C (95°F to 122°F).

- 请在初次启动的一个小时内定时触摸靠近加热器的进出水口位置的软管，如果加热器工作正常，加热器出水口位置的软管应是热的而进水口位置的软管温度应是相对较低的，如果进水口位置软管温度高于出水口位置，则代表循环水路存在问题，循环水流动不畅。

Touch the heater inlet and outlet hoses at regular intervals during one hour. If the heater works correctly, the outlet hose should be warm and the inlet hose relatively cold. If the inlet hose becomes very hot before the outlet hose, the circulation is not good.

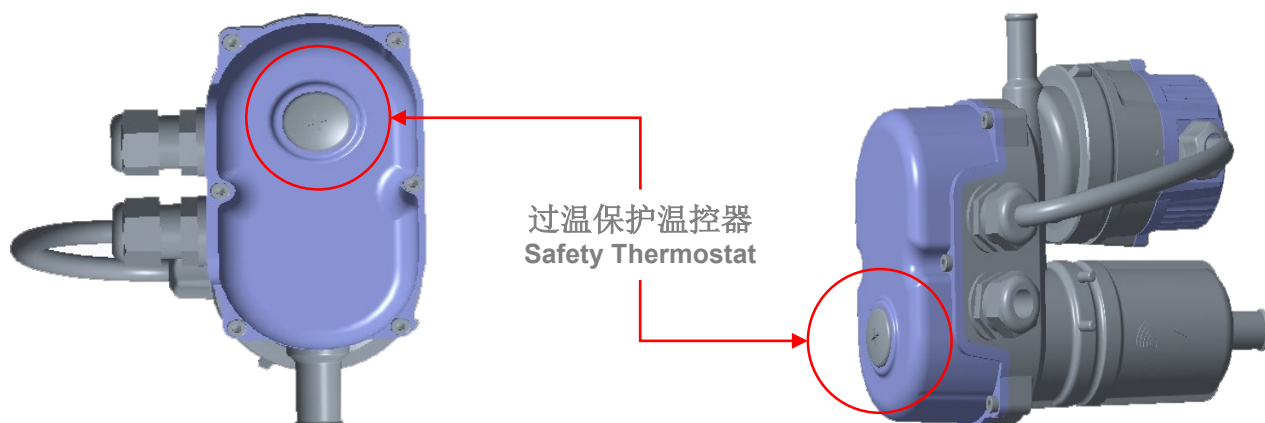
### 4.2 过温保护温控器的重置 Resetting the safety thermostat

在加热器温度过高（ $\geq 110^{\circ}\text{C}$ ）的情况下（例如缺少循环水），过温保护温控器会自动切断加热元件的电源。在检查并维修完整个加热器系统后，您可以拧开加热器保护壳体上的M20螺栓孔塞，按下复位按钮来重启加热器。

In case of overheating (due for example to a lack of water in the circuit), the overheat thermostat (option) is activated and cuts the power supply to the heating element. After having the system checked, the overheat thermostat has to be manually reset. In order to do this, unscrew the M20 screw plug of the heater and push the reset button.

注意，如果按下复位按钮时加热器内温度仍高于 $110^{\circ}\text{C}$ ，加热器不会重新启动。

Beware, the thermostat doesn't start again if the temperature is higher than  $110^{\circ}\text{C}$ .



## 5. 常见问题 TROUBLESHOOTING

请您仔细阅读下列常见问题及解决方案，如您在使用过程中发现不处于下列表格中的问题，请联系您的销售商，我们会向您提供优质的技术服务。

**Before contacting the technical service, please check the following table for causes and remedies:**

- 循环水有杂质  
Contaminated cooling circuit
- 循环水路曲度过大造成排气不尽  
Air pocket caused by a curve in the hoses
- 循环水温度高于工作温控器设定的温度  
Engine temperature higher than the thermostat set temperature.

问题现象 Type of problem	可能原因 Possible causes	建议解决措施 Control and remedies
循环水泵不运转，加热器壳体和发动机无热度 The pump doesn't work. The heating body of the heater and the engine remain cold	加热器未通电 The heater is not connected to the mains.	<ol style="list-style-type: none"> <li>1. 检查电源线路是否连接 Check that the supplying cable is connected to the mains.</li> <li>2. 检查电源线路是否正确 Check that the supply to the mains is correct.</li> <li>3. 检查配电箱中保险丝状态 Check the fuses in the mains distribution box.</li> </ol>
循环水泵正常工作，但加热器壳体和发动机无热度 The pump works properly but the heating body of the heater and the engine remain cold	<ol style="list-style-type: none"> <li>1. 过温保护温控器已打开 The overheat thermostat has been switched on.</li> <li>2. 加热器中缺少循环水 Lack of water into the heater</li> </ol>	<ol style="list-style-type: none"> <li>1. 断开电源 Disconnect the supplying cable from the mains.</li> <li>2. 重置过温保护温控器 Reset the overheat thermostat (see above).</li> <li>3. 检查循环水液位，如有需要，进行调整 Check the level of water in the motor's circuit. Adjust the level if necessary and drain the circuit.</li> <li>4. 启动发动机运行10分钟 Turn the engine on for 10 minutes.</li> <li>5. 重新连接电源，启动加热器并查看是否正常工作 Reconnect the supplying cable to the mains.</li> </ol>
	<ol style="list-style-type: none"> <li>1. 加热元件失效 Failure of the heating element.</li> <li>2. 过温保护温控器失效 Failure of the regulating thermostat.</li> </ol>	关闭加热器并联系您的销售商寻求技术服务 Put the heater out of service and call the technical service.
电源连接没问题，加热器壳体是热的但是发动机无热度 The connection to the mains is correct and the circuit is correctly purged. The heating body of the heater is hot but the engine remains cold.	<ol style="list-style-type: none"> <li>1. 循环水路不畅 Bad circulation.</li> <li>2. 循环水泵被杂质堵塞 Pump blocked with impurities.</li> <li>3. 循环水泵未工作 The pump is not working.</li> <li>4. 水泵电机短路 Motor's circuit blocked.</li> </ol>	<ol style="list-style-type: none"> <li>1. 解锁循环水泵（打卡电机，清理转子） Unblock the pump. (Unscrew the motor and clean the rotor).</li> <li>2. 检查电机电路 Check the motor's circuit.</li> <li>3. 如果失败请关闭加热器并联系您的销售商寻求技术服务 If unsuccessful, put the heater out of service and call the technical service.</li> </ol>
配电箱中保险丝熔断或断路器已接通 The fuse or the circuit breaker in the distribution box is engaged.	电路过载 Electrical breakdown.	关闭加热器并联系您的销售商寻求技术服务 Put the heater out of service and call the technical service.

## 6. 环境保护须知 INSTRUCTIONS FOR THE PROTECTION OF THE ENVIRONMENT

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我们建议通过适当的回收来减少材料的浪费，加热机整机、安装附件、包装材料都可以通过原材料的不同来进行有选择性的回收。

Recuperation of raw materials rather than elimination of waste. Machines, as well as their accessories and packaging, should be recycled in an appropriate way. Our spare parts can be recycled selectively depending on the type of material.

## 7. 质量检验 QUALITY TESTS

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我们承诺每个FlowStart加热器均由Phillips & Temro Industries集团旗下工厂组装，由于每个加热器出厂前均会进行检查测试，您有可能在加热器中发现残留的循环水。

Each FlowStart produced by Phillips & Temro Industries is controlled and tested before leaving the factory. For this reason, it is possible to find residual water in the heating body.

Phillips & Temro Industries会为每个出厂FlowStart加热器进行以下检查测试

Phillips & Temro Industries runs the following test on each FlowStart:

- 加热性能测试 Test of heating capacity
- 循环水泵性能测试 Test of the circulating pump
- 加热腔体加压气密测试 Air pressure test of the heating body
- 电气绝缘性能测试 Test of electrical insulation

您将会在产品包装中发现包含上述所有测试结果的文件，请您务必妥善保管。

You will find in the packaging a check list of all the tests undergone on your FlowStart. Keep this list carefully.

## 8. 质量保证 WARRANTY

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我们承诺为所有的FlowStart产品提供两年有条件质保,质保有效期从发票日期开始计算,如此时间有别于销售合同规定条款,则按销售合同执行。但在下列情况下您将不再享受此有条件质保:

All our devices FlowStart are guaranteed against all manufacturing errors over a two years period, starting at the invoice date and following general sales conditions. This warranty is voided in each of the following situations:

- 未经Phillips & Temro Industries允许,私自修改或改装本产品。  
The device was transformed or modified without the agreement of Phillips & Temro Industries.
- 未遵循本使用说明安装使用本产品。  
Installation and use are against this use manual.
- 本产品被循环水杂质或外界污垢损坏。  
The heater is damaged by impurities or grimes.