



**ZG**<sup>®</sup>  
**ZONE GUARDIAN**  
Smart flow test technology

**INSTALLATION  
& OPERATION  
INSTRUCTIONS**



## Installation & Operation Instructions



### 1. Brief description

The unit comprises a powder coated BS EN 10255 steel pipe with grooved ends, complete with:

- LPC approved flow switch with adjustable retard (factory set to '0').
- Circulator pump for the purposes of testing the above flow switch.
- Isolation valves to allow the above circulator (head) to be maintained or replaced.
- Non-return valve to protect against undesirable backflow through the pump.
- Ball valves for bleeding and/or manual testing and/or draining.

The packed unit also includes:

- A key-operated Test Module.
- Special plugged/sealed cable for pump.
- These Installation & Operation instructions.
- Flow switch instructions (Potter).
- Sticker to indicate location of zone isolation valve.
- Operating & Test Card for client.
- Any special tools required.

**\* SAFETY \***

*THIS PRODUCT IS DESIGNED AND BUILT ONLY FOR USE WITHIN FIRE SPRINKLER SYSTEMS.*

*ELECTRICITY CAN BE DANGEROUS, AND POTENTIALLY LETHAL.*

Installers and users must employ safe working practices when using this equipment. Your attention is drawn to the Health and Safety at Work Act 1974, the latest electrical regulations any other current, pending or future safety requirements.

DO NOT install, commission, maintain or operate this unit until you have read and fully understand the contents of these operation & maintenance instructions, particularly with regard to maintenance and safety.

*Installation should be carried out only by a competent fire sprinkler systems installer, and the wiring must be carried out only by a competent electrician.*

This booklet must be kept with the unit for reference purposes. An electronic version is also available to download from our website if further copies are required.

The following safety signs and symbols may be used:



Read instructions before use



Dangerous voltage may be present



General safety information

**\* IMPORTANT \***

The unit is for use only in in **wet-pipe sprinkler systems**.

If the local zone is to be drained after commissioning, then the circulator isolation valves must be closed (to prevent pump de-priming) and the local engineers advised accordingly. The unit must only be activated to test when the sprinkler system is full of water and the circulator valves are open.

The unit may be installed separately, but must be fully commissioned, tested and handed over to the client by the installer in a single site visit.

**2. Before Installation:**

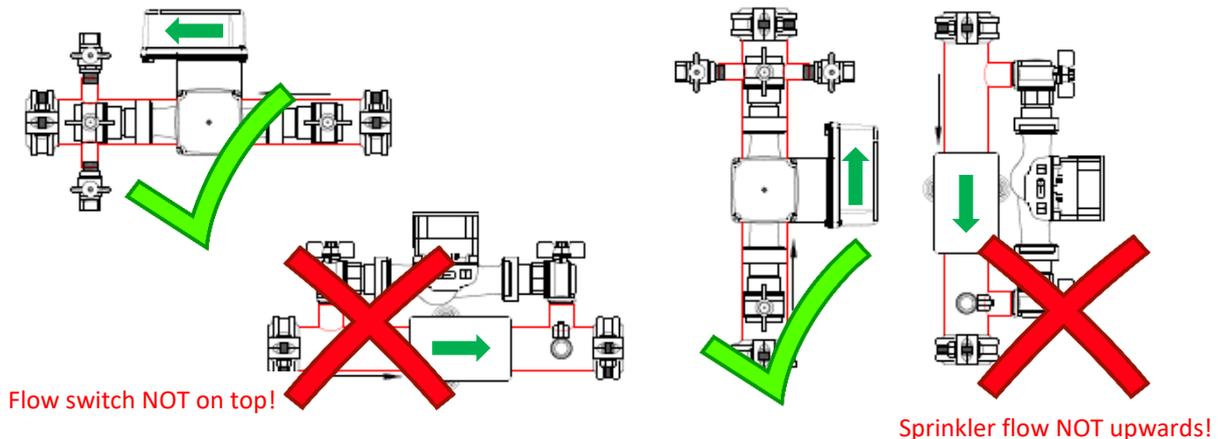
- 2.1. Check the packaging for integrity in case any contents are damaged or missing.
- 2.2. Open the box, remove packaging and ensure you have the correct size and direction of unit.
- 2.3. Ensure you have all parts, and have located the test module and accessories package ('installation pack').
- 2.4. Remove and check the unit for any damage or tampering, and notify your supplier immediately if this is the case.

### 3. Installation:

3.1. Only competent installers and electricians should install this unit, and all local and building management requirements should be observed. If installing or replacing an entire unit in situ then local isolation and draining will be required.

3.2. Check appropriate positioning, flow direction and orientation *before you start*:

- **Horizontal** pipework: *flow switch must be on top and the 'Sprinkler Flow' direction as per the pipe label and flow switch;*
- **Vertical** pipework: *sprinkler flow (flow switch direction) must be upwards.*



3.3. The flow switch should be at least 60cm from a valve or drain (per the flow switch installation instructions). On the unit, the flow switch is 22.5cm from the end of the pipe therefore a grooved spacer pipe of at least 37.5cm should be used if necessary.

3.4. Fix the unit into place using approved grooved couplings (standard sizes listed below; not supplied but available to purchase), after ensuring that the 'sprinkler flow' label arrow is pointing in the correct direction. Ensure at this stage that the isolation valves either side of the circulator are open, and that the other valves (vent and test/drain) on the pipe are closed.

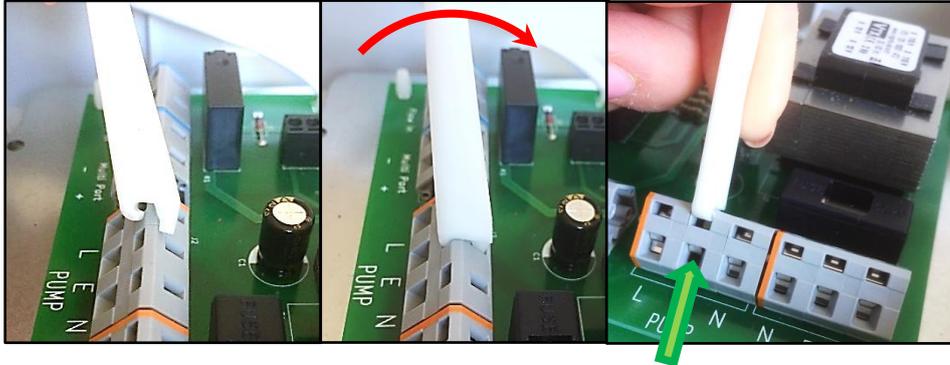
**Grooved coupling sizes** are (as standard, unless clearly marked otherwise):

- |                             |                   |
|-----------------------------|-------------------|
| • 2"/50mm units             | 60.3mm couplings  |
| • 2½"/65mm units            | 76.1mm couplings  |
| • 3"/80mm units             | 88.9mm couplings  |
| • 4"/100mm units            | 114.3mm couplings |
| • 6"/150mm (standard) units | 165.1mm couplings |
| • 6"/150mm (optional) units | 168.3mm couplings |

3.5. Fix the test module to the wall in an accessible location (if you wish to flush-mount the module, a cut-out cover/'collar' is available). The lid of the module can be opened by loosening the corner screws; if the left-hand screws are loosened approximately half-way then the test module lid can be hinged. On no account must the Test Module lid be left hanging by the cable.

## 4. Electrical Connections

4.1. The test module connections are clearly printed on the surface of the PCB, as per the illustration below; the connections are modern 'Cage Clamp' rather than screw-type; a special tool or small flat screwdriver is used to open the clamp, allowing the wire to be inserted, before then releasing.



4.2. Connect the circulator pump to the test module:

- *Circulator pump*: simply plug in the pre-wired plug, ensuring it locks into place;
- *Test module*: use 'PUMP' block as below – live/brown to 'L', earth/green/yellow to 'E' and neutral/blue to 'N'.

4.3. Connect the flow switch to the test module:

- *Flow switch*: refer to flow switch leaflet included in the installation pack;
- *Test module*: use 'Flow In' block as below for the signal loop.

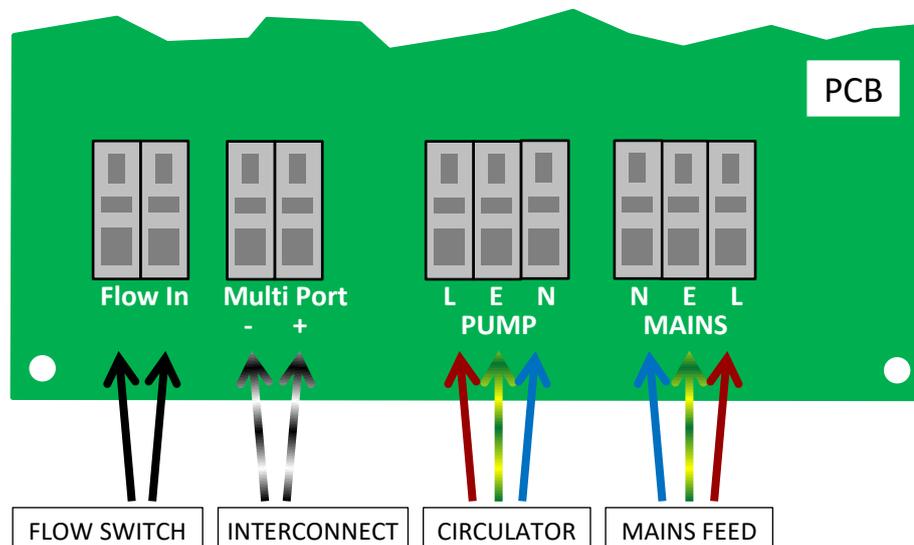
4.4. Connect the flow switch to the fire alarm/detection panel: refer to flow switch leaflet included in the installation pack.

4.5. Ensure mains power is isolated; connect the mains supply to the test module:

- Use 'MAINS' block as below – live to 'L', earth to 'E' and neutral to 'N'.

4.6. If the ZONE GUARDIAN units are being used in a multi-connection situation, then use 'Multi Port' block as below to interconnect multiple units.

4.7. Close and screw down the lid before turning on power to the module; this will be indicated by illumination of the green 'Power' LED.



## 5. Initial setup

- 5.1. All local and building management requirements should be observed as necessary, and alarm panel controllers informed of the installation if required.
- 5.2. Open the zone valve to allow water into the unit and system pipework.
- 5.3. The circulator pump is self-venting and therefore does not require separate bleeding; however, the pipework in the vicinity *will* need to be vented as normal; insufficient venting is one of the main causes of test signal problems.
- 5.4. Remove the cap from the uppermost vent valve and attach a hose to drain; open the valve slowly to allow water pressure in the unit to remove any air, until water is present at the hose outlet; close the valve and replace the cap.
- 5.5. Ensure that the test module's power is on (the green 'Power' LED should be illuminated), then attach hose to a test valve at the other end of the zone (or use the test/drain valve on the unit); open the valve and allow water to drain.
- 5.6. Check that the red 'Flow Switch' LED on the test module illuminates within 60 seconds, bearing in mind the retard setting on the flow switch (NB: the flow switch instructions state that the retard should be used only if necessary due to false alarms, and should be kept at a minimum). Close the test valve.
- 5.7. Advise the fire alarm panel controller that a test is being carried out - turn the key in the test module to 'Single Test' (the yellow LED should illuminate); the red 'Flow Switch' LED should illuminate within 60 seconds afterwards (refer to above note on retard setting) – and confirm that the flow switch signal has been received by the fire panel.
- 5.8. If you are able to hear the pump running, it should be an almost silent 'whisper' – if you can hear 'gurgling and/or whooshing' then it's likely that further venting is required. Excess air may lead to signal failure and possibly pump seizure.
- 5.9. Turn the key in the test module to 'standby' (  ) and remove the key; retain the key in a secure location.
- 5.10. Affix the 'User Operating Guide & Test Card' adjacent to the test module; affix the 'ZONE GUARDIAN Isolation Valve' location sticker in the best position.
- 5.11. Ensure that instruction is given to the client, if required. Refer to 5.1 and advise accordingly that installation is complete.

## 6. Testing

- 6.1. All local and building management requirements should be observed as necessary, and alarm panel controllers informed of the installation if required.
- 6.2. To test a single unit – ensure that the test module green 'Power' LED is illuminated; insert the key into the switch and turn to 'Single Test' - the yellow LED will illuminate, followed by the red 'Flow Switch' LED within 60 seconds.
- 6.3. To test a group of units - ensure that the test module green 'Power' LED is illuminated; insert the key into the switch and turn to 'Multi Test' - the yellow LED will illuminate, followed by the red 'Flow Switch' LED within 60 seconds. The red 'Flow Switch' LED illuminating on the test module being used indicates only that the *local* flow switch is activated. The central control panel will need to be observed remotely to ensure that all other relevant flow switch activation signals are received.
- 6.4. In the event of any signal failure, please refer to the Troubleshooting guide.

## 7. Spare Parts

Certain spare and replacement parts are available to purchase from Sale Engineering Products Limited, Zeffire Limited or your installer/maintainer. Some parts, however, are not recommended for replacement due to the difficulty of ensuring a leak-free joint in situ.

Only use genuine spare parts, since the use of non-genuine spare parts will invalidate the warranty and may affect the reliability and service life of the unit.

## 8. Troubleshooting & Further Assistance

The following brief troubleshooting guide is offered as a starting point for simple on-site diagnostics (air venting and excess retard setting are the most common causes of test signal failure); in the event of any difficulty understanding these instructions, or operating the unit, contact your installer or maintainer immediately.

Problem	Resolution
<p>Nothing seems to happen when I turn the Test Module key...</p>	<ul style="list-style-type: none"> <li>• Check green 'Power' LED is on (this should be on all the time).               <ul style="list-style-type: none"> <li>• If not, then have power supply and Test Module internal wiring/fuse checked by electrician.</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• If the green LED is on, is the yellow 'Test' LED coming on when key is turned towards 'Single Test' or 'Multi Test'?               <ul style="list-style-type: none"> <li>• If not, have pump connections and Test Module internal wiring, including the key switch, checked by electrician.</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Is the yellow 'Test' LED coming on, but not the red 'Flow Switch' signal LED?               <ul style="list-style-type: none"> <li>• There may be a problem with the flow switch or its wiring – remove flow switch cover and activate manually to check connections within the switch and wiring.</li> <li>• Check the retard setting on the flow switch; turn the dial to '0' for testing purposes (and ensure that the setting is left on the minimum necessary, only to prevent false alarms).</li> <li>• There may be a problem with the test flow – check that the valves either side of pump are open.</li> <li>• If the pump is noticeably 'gurgling/whooshing', there may be an air lock – ensure thorough venting is carried out.</li> <li>• There may be an installation problem – check the direction and orientation of installation (and if commissioning for the first time, the orientation of the pump and check valve).</li> </ul> </li> </ul>
<p>The pump appears to be running but not circulating water...</p>	<ul style="list-style-type: none"> <li>• The pumps used in our assembly are self-venting and should not require bleeding as long as local pipework is free from air. Remove the plug in the (top) vent valve, attach a hosepipe to drain and carefully open the valve to allow air to be expelled. It may help to do this whilst the pump is running.</li> </ul>
	<ul style="list-style-type: none"> <li>• In the unlikely event of a foreign body blockage or pump jam, a Philips No 2 screwdriver can be inserted through the centre of the Product/Serial label on the pump. With the pump NOT running, push and twist the sprung screw to unblock.</li> </ul>
	<ul style="list-style-type: none"> <li>• Extreme air problems may be released by (1) slowly loosening the large pump connection nuts to create a leak, which will force out any remaining air, and/or (2) closing the valves and removing the pump head and impellor plate for inspection.</li> </ul>

## Appendix 1 – Detailed Specifications

### A. ZONE GUARDIAN assembly:

Pressure rating	12 bar (175 psi)
Nominal Pipe sizes (in/mm)	2"/50, 2½"/65, 3"/80, 4"/100, and 6"/150
Approvals	LPCB (Cert Ref 1423a), FM Approvals PR450692

### B. Flow Switch (subject to current Potter specification):

Make, model & type	Potter VSR-EU, vane type waterflow alarm with retard
Approvals	LPC, FM & VdS approved; UL, CUL & CSFM listed
Trigger flow rate	38 lpm
Retard	0-30 seconds
Contact rating	10A @ 125/250 VAC; 10mA @ 24 VDC
Pressure & IP rating	31 bar (450psi) service pressure, IP54

### C. Circulating Pump:

Make & model	Grundfos UPM4
Operating voltage	1~ 230 VAC 50Hz
Full load current	0.57A max
Power rating	63W max
Pressure & IP rating	10 bar (145 psi) maximum working pressure, IP44

### D. Test Module:

Power input	1~ 230 VAC 50Hz
Power output (multi-test)	24 VDC
IP rating	IP56
Power supply good	Green LED indicator
Test in progress	Yellow LED indicator
Flow switch activated	Red LED indicator

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## UK & EU DECLARATION OF CONFORMITY

WE DECLARE that the product covered by this document, with the serial number noted below, was built in compliance with the following directives and standards:

- 2009/125/EC (Ecodesign)
- 2014/35/EU (Electrical equipment)
- 2014/68/EU (formerly 97/23/EC) (Pressure Equipment Directive)
- 2014/30/EU (Electromagnetic compatibility)
- BS EN 12259-5 (Fixed Firefighting Systems) (Potter Flow Switch)

Serial number	Year	Order	Batch
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This declaration of conformity is issued under the sole responsibility of the manufacturer below.



S Robert Bell, Managing Director, from January 2023

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**Sale Engineering Products Ltd**  
45 Lambeth Road  
Reddish, Stockport  
Greater Manchester, UK, SK5 6TW

T: +44 (0) 161 428 1180  
E: info@saleengineering.co.uk  
W: www.firesprinkler.co.uk



British Automatic Fire Sprinkler Association

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