

Operation & Maintenance Manual

Leak Detection System

Leak Guard 02

V2.01 2005

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1.0 Overview

The Leak Guard 02 is a leak detection system designed for use in industrial & commercial applications.

Although primarily designed for generator installations, the optical sensor used means that the system can be calibrated to the refractive index of almost any liquid.

If used for its primary purpose, generator installations with a bulk tank feeding day tanks, the Leak Guard 02 can control most aspects of the installation. It can override transfer pumps, close off control valves, power external alarms, monitor bunds for leaks, etc.

Good practice would be to have the bulk tank outlet via a controllable valve located within the bulk tank bunded area. This valve can then be controlled via the Leak Guard 02 to automatically close when a leak was detected. A motor open /spring close valve is always the preferred option as it gives a 'fail safe' operation. However, the Leak guard 02 can be configured for any configuration if specified when ordering. A sample fuel transfer system is shown in section 5.0.

Optionally the unit can power valves closed, 230 vac or 24vdc control, and a battery backup option is available for the 24vdc circuits in case of a failure of the mains power. The duration of backup required must be specified when ordering. As standard the battery backup will power a 1 amp load for 1 hour.

The unit and sensors require minimal maintenance and unlike 'tape' detection systems the sensing of a diesel spill is non-destructive to the sensor.

2.0 Installation

Electrical

The electrical installation **MUST** be undertaken by a qualified and competent person in accordance with current IEE regulations.

The control panel should be mounted away from sources of high heat or vibration.

The unit requires a single phase, 230 vac supply rated at no more than 4 amps.

Ensure that the mains voltage is within 10% of 230 vac phase to neutral.

Ensure that the earth wire (green/yellow) is connected before switching the unit on.

All outputs, except across terminals 1 & 2 are 24vdc.

Mechanical

The optical sensor should be mounted with the tip touching the floor of the area to be monitored. The will give an alarm when a liquid rises 3-4mm above the tip. Should a lesser amount need to be detected the floor can be countersunk to allow the tip to be slightly below floor level. The sensor should be mechanically protected.

Bunded area alarms can be sensed from standard 'make on rise' float switches.

3.0 Terminal Connections (see section 4 – Wiring & general diagrams)

Terminals L , N, E

These are the main 230vac power input terminals

Terminals 1 & 2

These terminals are used to power open a 230 vac spring return main fuel transfer valve. If a leak is detected from the optical sensor then the power is removed from these terminals and the valve should spring return to the closed position. If specified when ordering, these terminals can power a normally open valve to the closed position.

Terminals 3, 4, 5

These terminals are used to control a fuel transfer pump. The pump control can be wired through terminals 3 & 4 or 3 & 5. Use 3 & 4 if the main fuel valve has a status switch to indicate if it is open or closed (see below) otherwise use 3 & 5.

Terminals 6 & 7

If the main fuel valve has a status switch to indicate if it is open or closed connect the switch across these terminals such that the switch is contact is closed when the valve is open.

Terminals 8 & 9

Connect a 'make on rise' standard float switch across these terminals to monitor a leak into a bunded area. The operation of this circuit will give an alarm but will not close any valve or stop any pumps. The alarm is only present when the switch is operated. If the liquid level falls and the float drops then the alarm will be removed.

Terminals 10 & 11

These terminals give a 24vdc output for a remote audible or visual alarm. The circuit is rated at 1 amp maximum.

Terminals 12 & 13

These terminals are used to power open a 24 vdc spring return main fuel transfer valve. If a leak is detected from the optical sensor then the power is removed from these terminals and the valve should spring return to the closed position. If specified when ordering, these terminals can power a normally open valve to the closed position.

Terminals 14, 15, 1

These terminals are used to connect the optical sensor to the control panel. Care should be taken to connect the correct colour cable to the correct terminal as the sensor is polarity sensitive.

Terminals 17, 18, 19

These are volt free changeover contacts to signal a leak within a banded area. They can be used to signal to a BMS etc.

Terminals 20, 21, 22

These are volt free changeover contacts to signal a leak external to a banded area. They can be used to signal to a BMS etc.

4.0 Testing

Once the mains supply is connected the 'Mains On' led should illuminate. If it does not check the mains supply and fuse FS1 in the leak detection panels.

The 'Fuse Failed' led monitors the DC power supply output fuse located on the power supply itself. It does not indicate the status of any other fuses.

Turn the control keyswitch on the front of the panel to the 'ON' position.

Outputs will be present on terminals 1&2 (230vac) and terminals 12 & 13 (24vdc). If connected to a main fuel valve the valve will be power open as standard. (powered closed option is available)

If a main fuel valve status switch is fitted and wired correctly and if the valve is open then the 'Main Valve Open' led will be lit.

To test the bund leak alarm operate the bund area float switch.

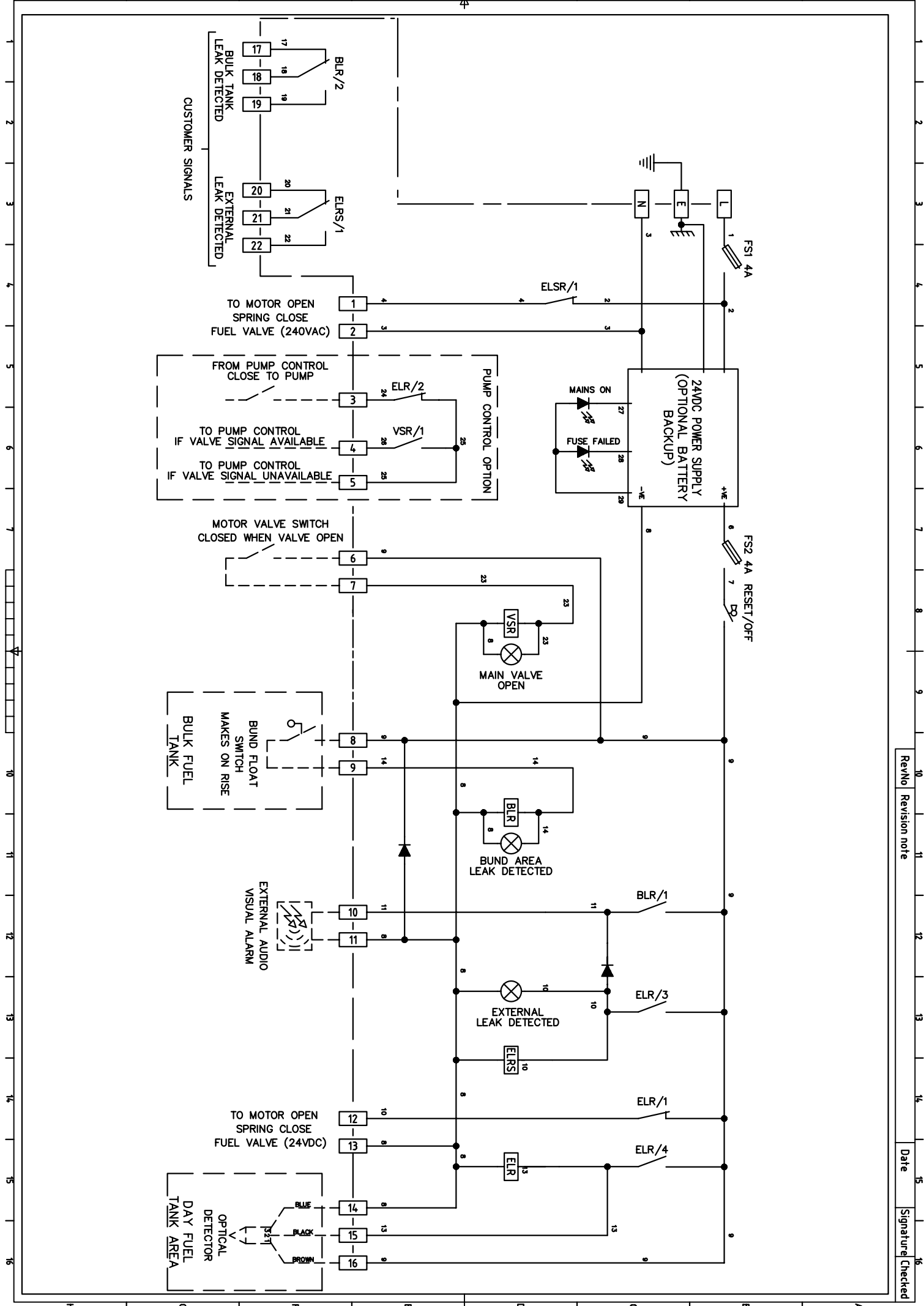
The 'Bulk Tank Leak' should be lit and the alarm sounding for as long as the switch is active. When the switch is opened the alarm should clear.

To test the optical leak alarm immerse the detector 3-4mm into the liquid it has been calibrated for (Diesel Oil by default).

The 'External Leak' should be lit and the alarm sounding. Power should be removed from terminals 1 & 2 and 12 & 13 unless the 'power to close' option has been fitted, then these terminals will become 'live'. If the pump control has been wired then the pump should stop.

When the sensor is removed from the liquid the alarm should continue. Clear the alarm by turning the control switch to the 'Off/Reset' position and then back to the on position.

Periodically clean the optical sensor with a mild detergent and a soft cloth. NEVER use any abrasive substance.



RevNo	Revision note
Date	Signature/Checked