WaterLeakStop Manual

Detection and Management of Water Leaks

WLS-1

Contents:

Brief description

Specifications:

Input voltage / Current:	12 V DC / 25mA(min) / 155 mA(max)
Buzzer:	85 dB / 10 cm
Relay contacts (Rated Voltage/Ampere):	250VAC / 12A
Dimensions:	106 x 86 x 58 mm (L x W x H)
Weight:	180 grams
Mounting:	M-36 DIN-rail (EN50022)

Functions:

Start flow detection (lit/min): According to the sensor's sensitivity.

Flow sensors: Flow switch (NC), Flow sensor (Hall Effect type 12VDC).

Water leak sensors: Points detection probe, Sensor cable.

Flow management: A SPDT relay, manage a solenoid or electrical water valve.

Remote control for: Reset, Open/Close solenoid water valve, Exclude valve.

Notification: Internal buzzer, SPDT relay to trigger an (External siren, GSM module, House alarm).

MCFT table: 8 different options (Figure 3).

Modes: Normal, Bypass 1 Cycle, Exclude Valve (only notification).

Functional Stability: Watchdog timer, Supervised EEPROM storage.

Pictures - Tables:

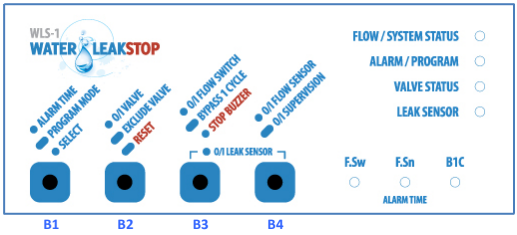

Figure 1 – Front panel

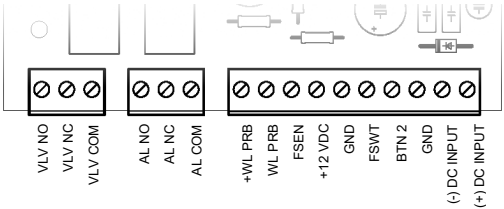

Figure 2 - Terminal blocks

Recommendation: It is recommended to be used **LIYCY** cable, for the connections between the sensors and the WLS-1. The shield is connected at the negative pole (-).

Terminal Blocks

VLV NO, NC, COM: Relay contacts for driving the electric valve.

AL NO, NC, COM: Relay contacts for driving an alarm system or a communication system.

WL PRB: Terminal blocks for the connection of water leak sensors. The connection is made in parallel. The type of sensors is (NO). If the sensor haw polarity, (+) is connected to the left terminal.

FSEN: Input terminal from flow sensor (Hall Effect type). If not used, must be set a bypass operation (*Button 4*).

IMPORTANT: *You may need to connect a resistor between the sensor's terminal **FSEN** and **+12V**. Look in the user manual of the flow sensor, for the proper connections.*

+12 VDC: Flow sensor's power supply.

GND: Flow sensor's power supply.

FSWT: Input terminal from the flow switch sensor (NO). The other terminal of the sensor must be connected to (-). If not used, must be set a bypass operation (*Button 3*).

BTN 2: Terminal for the connection of a remote button or other systems that can simulate the pressing time of a button, aiming the remote control. To trigger, a (-) must be applied.

GND: (0V) terminal for a flow switch or functions listed in **BTN 2**.

(-), (+) DC INPUT: Power supply block terminals, 12VDC/155mA (minimum)

Indicators / Buttons

Flow / System Status:	***Continuous Lit*:**	Active surveillance.
	***Flash*:**	Flow indication.
	No Lit:	Disabled surveillance.
Alarm / Program:	**Continuous Lit:**	Programming mode.
	Flash:	Alarm mode.
Valve Status:	**No Lit:**	Valve relay condition Normal.
	Continuous Lit:	Valve relay condition Triggered.
	Flash:	Valve relay stay in Normal condition, if an alarm occur.
Leak Sensor:	**Continuous Lit:**	Detection of water leakage. (***In alarm mode***, indicating that alarm came from a water sensor).
	No Lit:	Leak sensor in operation.
	Flash:	Leak sensor has be bypassed.
F.Sw (Flow Switch):	**Continuous Lit:**	Flow switch sensor in operation.
F.Sn (Flow Sensor):	**Continuous Lit:**	Flow sensor in operation.
B1C (Bypass 1 cycle):	**Continuous Lit:**	Setting the MCFT[1] in six (6) hours, until a stop of water flow occur. If the flow stops, the MCFT returns to the last programming, automatically. If the flow exxceeds the six hours, an alarm triggers.
Alarm Time (LED):	**(for 6secs after push the B1):**	Depiction the MCFT limit, the completion of, trigger an alarm (Figure 3).

[1] Maximum continued flow time

Button B1:	***Push*:** Show the programmed MCFT / Select MCFT/Acknowledge of memory restore. ***(Hold 2 sec)*:** Insert to the MCFT program mode.
Button B2:	***Push*:** On/Off Water supply. ***(Push 2 sec)*:** On/Off Management function of electric valve, when alarm occurs. ***(Push 2 sec)*** ***in alarm mode*:** Alarm reset.
Button B3:	***Push*:** On/Off Flow switch function. ***(Push 2 sec)*:** On/Off Bypass 1 Cycle function. ***Push*** ***in alarm mode*:** Stop Buzzer.
Button B4:	***Push*:** On/Off Flow sensor function. (***Push 2 sec)*:** On/Off Surveillance.
Buttons B3 & B4:	***Push:*** On/Off Leak sensor
Buttons B1 & B3:	(***Push 2sec)*** **when system *is deactivated*:** Switches the first value of the MCFT table (no LED lit), between 10sec (test mode) / 5min.

Maximum continuous flow time

Figure 3 – Mapping table combination Led, with maximum continuous flow time (MCFT).

Functional Description

Features

The device WaterLeakStop (WLS-1), is a comprehensive system for protecting water leakage. Provides monitoring and management of the central water supply of a home or on a subsection thereof, by monitoring the MCFT. In addition makes water leakage detection in selected areas of supervised areas, using local sensory water.

By using a suitable flow sensor, at the starting point of the controlled pipe network of a home and an electric valve (or solenoid valve), the WLS-1 is capable of handling the water flow and in accordance with the initial configuration of the user, to remove or reduce the risk extensive damage from a leak. The measurement accuracy depends only on the flow sensor / switch sensitivity to be used, giving the flexibility to the user to choose one, in accordance with the requirements of the application.

The system supports two sensor types. The first type is a flow switch (no flow - open contact / flow - closed contact). The second type is a flow sensor, with pulse output 12V. Sensors, where use similar output commands during detection, can be used.

The detection function is based on the maximum continuous flow time (MCFT) before the system diagnose a leakage and go to alarm mode. The MCFT selected by the user, between eight (8) preset values. With its completion, will be activated local notification (buzzer) and relay contacts for:

1. The interface with an existing alarm system, a GSM communicator or any other notification way.
2. Closing the water valve, driving a suitable external electric valve circuit, unless different programmed by the user.

The direct management of the water supply and the alarm notification will operate also if a water leak detection occurs, on the corresponding water sensors zone. More than one sensors may be connected in parallel. The

normal condition of the zone, is in open circuit state while the detection mode is in closed circuit state. For example, the circuit closed via of an external set of pin water detectors and through the water leakage.

The user can close / open the main electric water valve, easily from the device, by pressing the corresponding key control “B2”. Remote management functions for the button “B2”, provided with connecting an external button or with the connection to a PGM, of an already installed alarm system.

The 'Bypass 1 Cycle' (B1C) feature, allows us an extended period of water flow time, without changing the program that already used. If selected, the MCFT will be set to six hour, for a single cycle flow. The system will return to normal operation, when the water flow have stop. If exceeded this six hour setting, will trigger an alarm. Usefulness of this function is for example the filling of a swimming pool. Unlimited use of water can be done by disabling the surveillance.

Functional Stability

The WLS-1 is equipped with **'Watchdog Timer**' function, which ensures immediate reset of the device to proper operation in case of a problem in the implementation of the internal program.

The user settings, are protected from the sudden loss of power supply, by storing that data in a non-volatile memory (**EEPROM**). Further, a suitable firmware checks the correctness of the EEPROM memory, immediately after restoration of power to the device and attempting to restore the internal memory to functional state, if detected lesion leading device in non-functional state. There are two cases of restoration. Partial restoration in factory default settings with the user settings retention or complete factory reset. The correction capability is not applicable in damaged EEPROM, but in the case of non-registration of correct data, e.g. power loss during EEPROM write cycle and on alterations that affecting the operation of the device in its entirety and not user settings where can verified by him.

The process take place automatic and is executed after an OFF – ON sequence of the device (soft or hard) or after the restoration of the device's

power supply. This procedure is made known with one continuous audible signal (Buzzer) and one optical signal (Alarm/Program).

To clear this signal, of the restoration of memory, press once **B1** button.

Handling description

Button B1 functions

With the button "B1", performed operations related with the setting of the maximum continuous flow time (MCFT), which trigger an alarm.

Pressing, appear the MCFT, for 6 seconds. The presentation is via the indicative 'Alarm Time' LEDs. At the corresponding table (Figure 3), appear the relationship of the LEDs with the MCFT. There are eight (8) value from 5-150 minutes.

When pressing and hold (3 seconds), the WLS-1 enter to program mode. Now the 'Alarm Time' LEDs show the MCFT, and the indicative 'Alarm/Program' is lit. To move at the next position of maximum flow time, press the button "B1" (single press), as long as we are in programming mode. Programming remains active for six (6) seconds after the last "B1" button press.

The indicator 'Alarm/Program', remains lit in programming mode or flashing in alarm mode. If the alarm has come from a water sensor, will be permanently activated and the indicator 'Leakage Sensor'.

Button B2 functions

With the button “B2”, performed operations related to the management of water supply in our network.

Pressing, performing open / close at the electric valve and by extension the water supply. At the same time the indicative ‘Valve Status’ lit. This function can be used even when the surveillance is disabled by the user.

When pressing and hold for three seconds (3 sec), prohibits the closure of the water supply when the system goes into alarm mode. The indicator 'Valve Status', flashes, as long as this function is enabled.

When pressing and hold (3 sec) on alarm mode, the WLS-1 resets to normal operation. The system passes directly to a new detection cycle.

Button B3 functions

With the button "B3", performed operations related with bypass options.

Pressing, you can activate / deactivate the operation of flow switch 'F.Sw'. If not used such a sensor, its function must be overridden.

When pressing and hold (3 sec), activate the bypass function of one cycle. The indicative 'B1C', is lit to indicate that the function is On. Making use of this feature, we can draw water for more than the preset time. The MCFT in this state are six (6) hours. Its use can be applied for example to fill a swimming pool, which takes too long time. With this function, you avoid changing the programming parameters, forgetting bigger MCFT, than the desired. If water flow is greater than six (6) hours, an event of leakage is generated and system go to alarm mode. This function will automatically turn off, at the first stop of water flow. Longer water flow time can be arranged with the deactivation of surveillance.

Pressing in alarm mode, will disabled the built-in buzzer. All other functions associated with the alert, remain in operation.

Button B4 functions

With the button "B4", performed operations related with bypass options and activation of the system.

Pressing, you can activate / deactivate the operation of flow sensor 'F.Sn'. If not used such a sensor, the function must be overridden.

When pressing and hold (3 seconds), you can activate / deactivate the surveillance mode of the system. The indicative 'Flow / System Status', reflects the state of the system. When no lit, means that surveillance is deactivated. When lit, means that surveillance is activated. Finally when blinking, means there is water flow.

Button B3 & B4 functions

With the key combination "B3 & B4", you can control the operation of the Leak sensor.

Pressing simultaneously, you can activate / deactivate the operation of leak sensors 'Leak Sensor'. If not used such a sensor, the function must be deactivated.

Button B1 & B3 functions

With the key combination "B1 & B3", you can enable / disable the testing time.

With the system turned off, press simultaneously and hold (3 seconds), until the system is restarted. This function, is performing toggle the time value in position (1) of MCFT table, between of the value of 10 seconds and 5 minutes. In this way we can easily, making use of time 10 sec, to check the proper functioning of the system.

The user is notified for time of 10 sec, with a 1 sec audible indicator (buzzer) / visual indicator (Alarm/Program) and for time of 5 min, with a two 1 sec audible indicator (buzzer) / visual indicator (Alarm/Program) notification, with intermediate gap of 1 sec.

Alternative management of waste electrical and electronic equipment

For the countries of the European Union

This label is affixed to the product to remind you that the electrical and electronic products must not in any event be considered municipal waste.

Electrical and electronic products, including cables, plugs and accessories should be separated at source, to allow the necessary treatment, with the ultimate goal to reuse or recovery.

These products should be available in specified units with the best techniques of collection, treatment and alternative management.
The separate treatment provides the following significant advantages: valuable materials can be reused and thus prevent the generation of municipal waste.
This action helps to protect the environment and human health. Please be aware that fine may be imposed for illegal disposal of electrical and electronic equipment.
Please drop your old electronic equipment at appropriate recycling electronics or contact your local authorities for further information.

For countries outside the European Union

The management of electric and electronic equipment in countries outside the European Union should be in accordance with local regulations. Please contact your local authorities for further information.

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Declares that this device WLS-1, meets the requirements of European Directives: 2004/108/EK (EMC), 2011/65/EE (RoHS).

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