



TSR Series

Smart Header Tank Control Module

Installation Manual

Table of Contents

Description Of Operation	2
Installation	2
Safety Precautions.....	2
Included Components.....	3
Layout.....	3
Control Panel Mounting.....	3
Connections.....	4
TSR23012.....	4
TSR23012A.....	4
TSR23012D.....	4
TSR23012DA.....	4
Level Sensor Installation.....	5
Timer Adjustment.....	5
Specifications	5

Description Of Operation

This system electronically controls the filling of a small tank, typically a header tank or break tank from a pump, solenoid or motorised valve without the need to install a float valve or ball cock, and so provides much greater efficiency and faster fill times. Reliability and accuracy are both increased in comparison to a float switch system, and an additional level of security against failure is provided by a second sensor which will shut down the system in the event of a potential overflow.

Pumps benefit from increased flow rate and cooling, reduced run-time, and hence reduced electricity consumption.

Pump or valve activation occurs when the water level drops to the lower sensor, and continues until this level has been exceeded, plus a time delay to prevent frequent pump/valve activation.

4 Versions are available

TSR23012 –	Single fill function
TSR23012A –	Single fill function & high level safety shut-off
TSR23012D -	Dual fill function
TSR23012DA -	Dual fill function & high level safety shut-off

Installation

Safety Precautions

Mains Voltage – There are exposed electrical conductors inside this appliance. This appliance must

be installed and serviced by a competent electrical technician to the current requirements of BS7671 and IEEE recommendations. Before servicing this appliance, normal safe isolation procedures should be implemented.

Do not touch any connection terminals while energised.

Do not attempt to service this item when wet, or in a wet or high humidity environment.

If the housing of the control panel becomes damaged, you must shut down and securely isolate this appliance immediately.

Included Components

TSR23012A Alarm Panel

Attached cables

Reed Switch Level Sensors

x 1 – TSR23012A

x 2 – TSR23012A/TSR23012D

x 3 - TSR23012DA

Installation & Operation Manual

Layout

The control panel cannot be mounted outside, it is not fully weather resistant, but can be installed in sheltered outdoor locations (barns, covered areas, etc). It is usually installed attached to or mounted near the header tank or break tank.

Voltage drop will affect the cable size needed to take power to any pump used. The more current is drawn the greater the effect over distance. Over very long runs, you may find it more economical to install contactors near to the pumps, allowing you to control the pumps with a sensible cable size. It is strongly recommended that you calculate voltage drop for cable runs which exceed the length of cable supplied with the pump. Failure to do so may result in cable overheating, conductor migration, and risk of fire.

Suitable circuit protection must be installed and should include as a minimum a suitable earth, overcurrent protection, and residual current protection at 30mA, ideally on it's own circuit, but always in accordance with BS7671 and applicable regulations.

Control Panel Mounting

Open the cover of the control panel. There are 4 recesses, one on each corner of the panel. Drill through at these locations and attach to the wall or a suitable support, taking care not to damage cabling inside the panel. Fixings are not included and should be selected to suit the material to which the panel will be mounted.

Connections

TSR23012

Cables are pre-fitted and marked accordingly. With the cables glands facing towards you, the rightmost cable is low voltage (12vdc) to the level sensor.

The cable 2nd from the left supplies power to the pump at supply voltage (230-240vac), and is switched on and off by the controller as needed.

The leftmost cable is the power supply cable and is supplied longer than the other cables for ease of connection to a supply point at 230-240vac.

TSR23012A

Cables are pre-fitted and marked accordingly. With the cables glands facing towards you, the rightmost 2 cables are low voltage (12vdc) to the level sensors. These are marked and should be connected to the upper and lower sensors as indicated.

The cable 2nd from the left supplies power to the pump at supply voltage (230-240vac), and is switched on and off by the controller as needed.

The leftmost cable is the power supply cable and is supplied longer than the other cables for ease of connection to a supply point at 230-240vac.

TSR23012D

Cables are pre-fitted and marked accordingly. With the cables glands facing towards you, the rightmost 2 cables are low voltage (12vdc) to the level sensors (solenoid left, pump right). These are marked and should be connected to the upper and lower sensors as indicated.

The cable 2nd from the left supplies power to the pump at supply voltage (230-240vac), and is switched on and off by the controller as needed.

The leftmost cable is the power supply cable and is supplied longer than the other cables for ease of connection to a supply point at 230-240vac.

TSR23012DA

Cables are pre-fitted and marked accordingly. With the cables glands facing towards you, the rightmost 3 cables are low voltage (12vdc) to the level sensors. These are marked and should be connected to the upper, lower, and shut-off sensors as indicated.

The cable supplying power to the pump from the controller is clearly marked and provides power at supply voltage (230-240vac) to the pump as needed.

The leftmost cable is the power supply cable and is supplied longer than the other cables for ease of connection to a supply point at 230-240vac.

Level Sensor Installation

The level sensor for the pump should be fitted in the header tank or break tank at the level at which you want the pump to activate. If there is any additional fill system such as a mains water float valve in a rainwater system, you would set the sensor height accordingly depending on which fill system you want to activate first.

The 2nd fill function on TSR23012D/TSR23012DA is usually used in rainwater harvesting systems for mains cold water top-up via a solenoid valve but can be used for an additional pump. This should be the lowest sensor installed closer to the bottom of the tank, but allowing enough space for a useful reserve capacity of water.

The uppermost sensor on TSR23012A/TSR23012DA acts as a fail-safe in the event of a potential overflow due to a failure of a sensor beneath it. It should be fitted just above the tank's overflow pipe or weir but below the level of any slot or type A-B air gap. This will allow a small amount of overflow water to be seen, while preventing the tank itself from being over-topped.

All sensors should be installed so that the toggles flap upwards and sit horizontal when down. A minimum separation of 70mm should be maintained between level switches.

Timer Adjustment

The timer sets the over-run duration during which the controller will continue to fill the tank after the low level switch has been exceeded. It can be set within a range of 0 to 60 seconds. Adjustment is made at the potentiometer (small blue dial) on the PCB inside the unit. TSR23012D/TSR23012DA have 2 timers, one for each output.

Note – It is highly recommended that all header tanks or break tanks are fitted with an adequately sized overflow pipe.

Specifications

Dimensions	180mm x 110mm x 90mm
Enclosure Material	Polystyrene
Ingress Protection	IP66
Electrical Protection	Class 2
Voltage	230VAC 1~