

# 3P RainForce T Series

## Electronic Rainwater Control Systems

- **Automatic Rainwater and Mains Water Control**
- **Adjustable Pressure**
- **Intuitive Menu System**
- **Advanced Fault Tracking**
- **Works with pumps up to 10 bar pressure**
- **Integrates with thermal overloads/overcurrent relays in single and 3 phase systems**
- **Sensor fault detection and automatic failover**
- **All sensors, pumps and accessories can be swapped without shutdown for maximum uptime**
- **Designed, Built, Programmed and Assembled in the UK**

## Overview

The 3P RainForce T direct rainwater controller performs all the functions you would expect of a commercial system such as adjustable pressure start and stop points for each pump, duty standby/assist with alternation, fully adjustable mains water top-up control, fault handling and logging, and BMS output, whilst remaining extremely compact.

Pressure control is achieved by activation of the pumps at fixed speed which are run as required to maintain pressure within a specified range, avoiding the loss of efficiency associated with variable speed systems when running at full flow.



*RainForce Control Unit*

Two modes of operation are available,

- Auto Mode adds mains water to the rainwater tank as necessary.
- Rain Mode uses only available rainwater without mains water top-up.

Unlike suction or hybrid based systems which typically need adaptation for UK use in above ground plant rooms (an extra in tank pump) Rainforce T Series can operate with pumps in any location. Submersible pumps let you take advantage of maximum pumping efficiency whilst reducing the overall component count of the system. Pumps can also be installed above ground, with an optional booster pump if required to meet specification.

The installation is completely modular, no water ever needs to go through the control panel. The panel, pumps, pressure vessel, solenoid and sensors can be installed in any suitable location, either locally or distant to each other.

Any electric pumps, solenoids, motorised valves, etc can be used. Single or 3 Phase<sup>1</sup>, Rainforce does not need to 'know' the pumps it uses. Optional hardware (contactors) allows pumps of any power up to the limit of your electrical supply. Pumps can be replaced with other makes and models at any time and don't need to be matched in performance or power consumption. Downtime or long lead times due to reprogramming or customisation for a specific choice of pump are eliminated.

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### 2 Versions of the T series are available

#### 200T - Tank level sensing by float switch

A standard float switch operated at low voltage (+15Vdc) for enhanced durability detects water in the rainwater tank, with top-up and pump isolation controlled by float switch height. (Usually needs someone to enter the tank to install)

#### 300T - Tank level sensing by pressure transmitter

A precise pressure transmitter is used to determine the exact level of stored rainwater. No other float switches or probes are needed for top-up activation or pump protection, which are all software controlled. This provides the user with the added flexibility of being able to select pump shut-off and top-up levels from the panel, with no need to access the tank. Level measurement fluctuations due to electrical interference or water turbulence can also be eliminated at the control panel by adjusting the sampling speed of the probe.

Top-up duration over the selected minimum level can be as little as 1 minute, for precise control of mains water usage.

Overfilling of the rainwater tank with mains water is unlikely, as top-up is prevented at 90% full regardless of the top-up duration set by the user. Wastage of mains water is prevented.

All RainForce systems have intuitive menu driven settings. There are no hidden menus, and almost everything is adjustable, including pump cut-in and cut-out pressures, overpressure alarm, pump failure pressure, top up level, overfill duration, time-out alarm, etc. Safe default settings (3 bar) will operate straight away in single pump mode with auto tank level calibration.<sup>2</sup>

Rainforce also features Advanced Fault Tracking. Fault codes are stored in memory until you choose to erase them, allowing easy identification of intermittent and historical faults.

Fault tolerance is enhanced by Rainforce's ability to fail over automatically to mechanical pressure switches or a float switch in the event of a failure of either of the analogue pressure sensors (line pressure and tank level). Operation will continue,



with reduced functionality, allowing time for the replacement of the original sensor.

A pressure vessel is required for the pumps to adjust and maintain system pressure correctly. In the event that the air in the pressure vessel becomes discharged or the vessel is isolated or insufficiently sized an error will be generated and the restart interval of the pumps is then reduced to prevent possible motor failure.

Clever design of the circuit board makes Rainforce the most robust unit on the market today, with overvoltage and brownout protection, immediate recovery from power failures with no loss of setting and auto reboot, individually fused outputs with high rupture current fuses, oversized power supply to electronics, removable MCU chip (software) for easy on-site upgrades, automatic failover of pumps, and automatic search for spare pumps even if not configured for twin pump use. Modular connector design and tolerant software allows pumps and all other accessories to be 'hot-swapped' while the system is in use without switching off the controller or shutting down the remaining pump.

Designed, programmed, built and assembled in the UK. With full UK based technical support, rapid spares availability, and spare parts supply from UK stocks. Full repair/recon service to component level.

<sup>1</sup> 3 Phase via optional connection kit.

<sup>2</sup> 300T only

*Like all variable pressure systems, a suitably sized pressure vessel is required for correct operation.*

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## Electronic Rainwater Control Systems

### Features

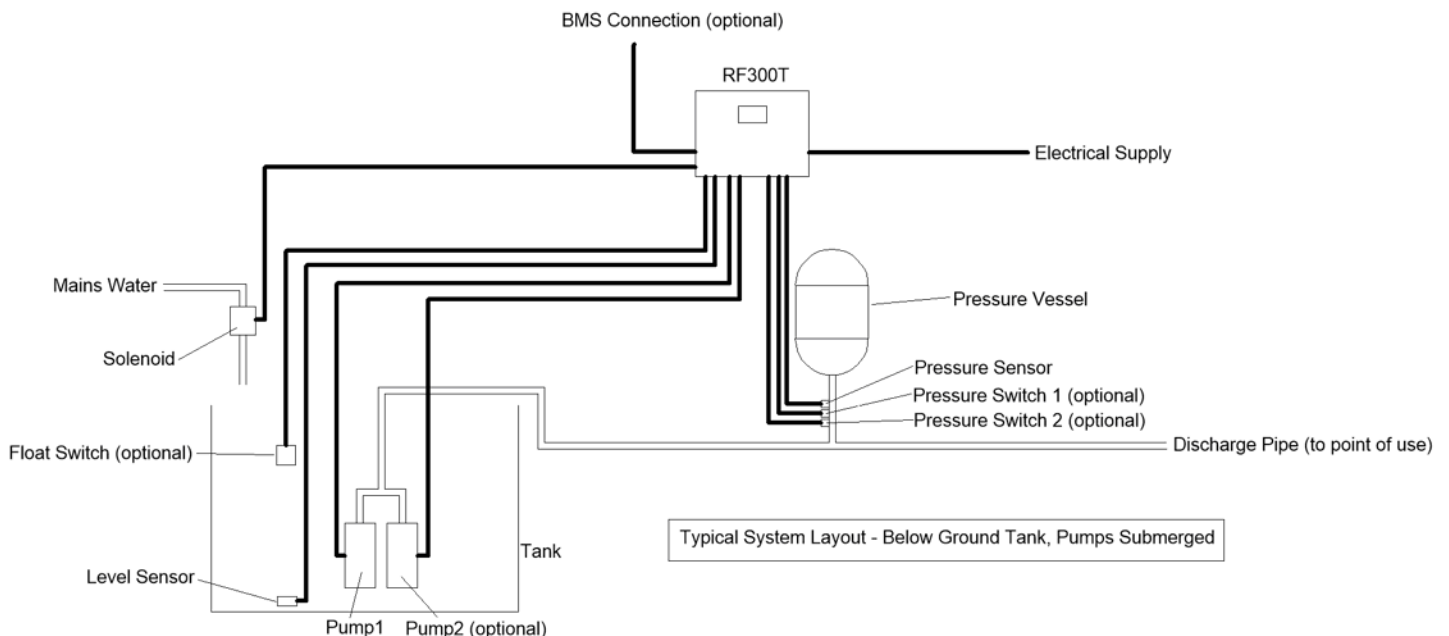
- Adjustable pressure control (10bar max)
- Pressure vessel fault detection
- Periodic pump test and anti-sieze function
- Mains top-up from 1 minute (min) to 48 hours (max)
- Duty Standby/Duty Assist with alternation
- Modular 'hot swap' of pumps, sensors and solenoids
- Automatic Tank Level Calibration
- Multiple pump model support at 230Vac 50Hz or any supply voltage/phase via contactors/overloads
- BMS Switched output
- Optional BMS serial output
- Advanced Fault Tracking
- Fault Warning LED
- Auto hunt for redundant spare pump during pump failure in single pump mode
- Swappable MCU chip (software)
- Solenoid valve isolation on fault - reducing fire risk from overheat.
- System Overpressure Alarm - protects pipework and attached appliances (UV system, etc) from overpressure due to faulty installation or incorrect pressure setting.

- Automatic failover for analogue sensors
- Overvoltage protection
- Brownout protection
- Watchdog timer
- Fused Outputs

### Adjustable Settings

- Pump cut-in/cut-out pressure (for each pump)
- System Overpressure Alarm
- Pump failure pressure
- Pump Mode (Pump1, Pump2, Twin pump assist/standby)
- Minimum Rainwater Level (dry run prevention)
- Top-up level
- Top-up overfill delay
- Top-up timeout alarm
- Pump restart delay
- Fault code display
- Fault code erase
- Input test diagnostic screen
- Output test diagnostic screen
- Manual Stop - with BMS activation
- Restore Factory Default Settings

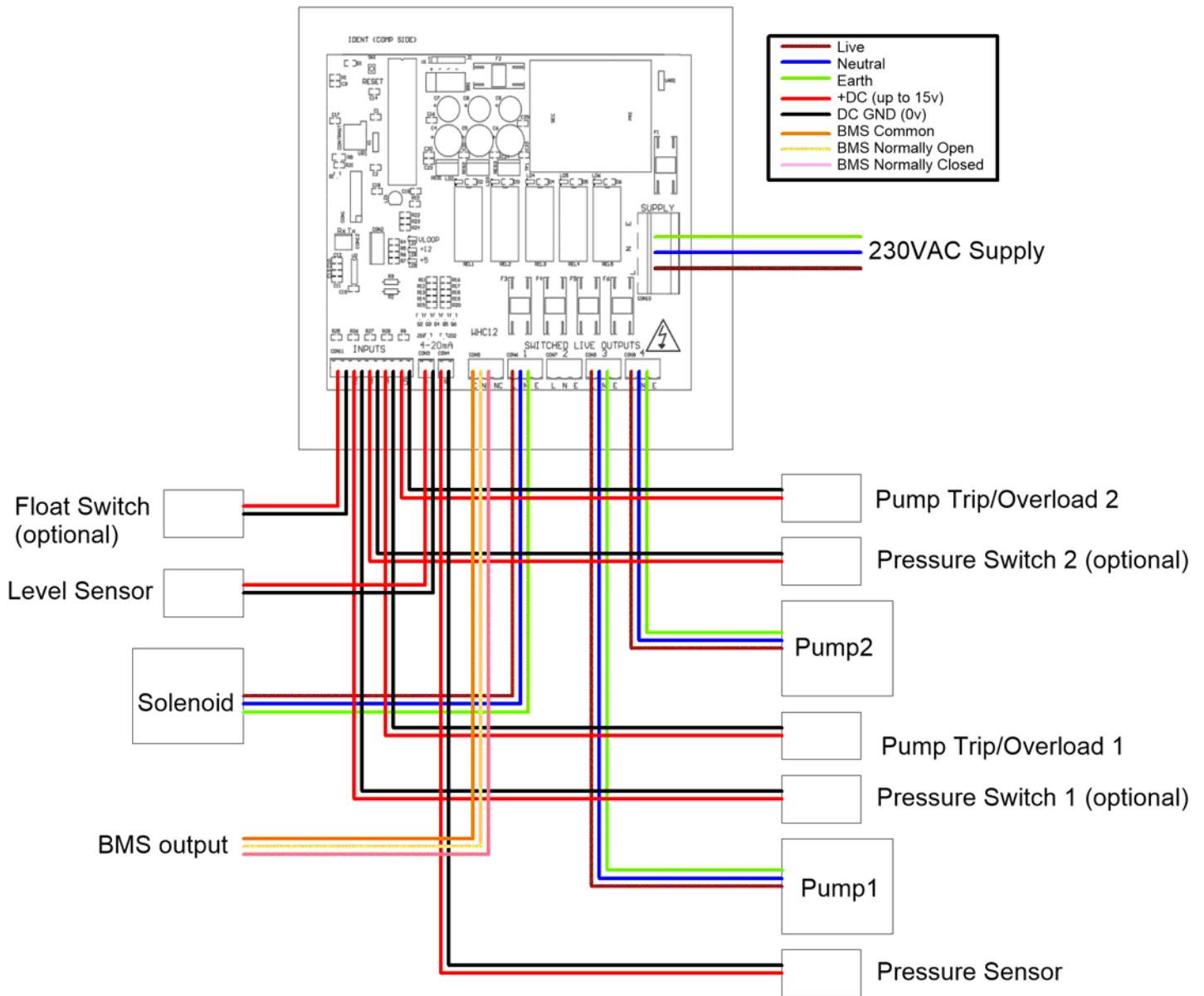
### Typical System Layout (Submerged Tank)



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RF300T v1.92 Electrical Schematic



Minimum system requirements in addition to the control panel (single pump, no mains water top-up)

- 0-10bar 4-20mA pressure transmitter (supplied)
- 0-0.6bar 4-20mA submersible pressure transmitter (RF300T, supplied)
- Or Float switch (RF200T, supplied)
- Pressure vessel
- 230VAC Pump

Optional components

- 230VAC Solenoid or motorised valve for mains top-up
- Additional pump for duty assist/standby
- Contactors & thermal overload relays for 3 phase pumps
- 2 x mechanical pressure switches (failover)
- 1 x Float switch (300T, failover)

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### OEM Solutions

3P Rainforce is supplied either as a panel only, or can be offered as a kit, comprising of the panel, pumps, cables, solenoid, pressure vessel, hose kits, etc. It is offered only to professional installers and OEM partners who will commission the system before use to ensure the installation has been completed correctly and all accessories are functional.

We work with our customers to provide specific product bundles, with panel and software branded to your requirements.

We provide full training, design and technical support, and will customise the product and accessories to your requirements, and full UK based support and spare parts availability.

### Benefits

Designed for UK type rainwater systems - no requirement for additional booster pumps or other modifications commonly needed with continental systems.

Excellent configurability whilst retaining an intuitive menu driven user interface.

Made in Britain. Designed, built and programmed entirely in the UK by 3P Technik.

Full UK support, with customisations to hardware and software available with very short lead times.

Modular design allows extremely rapid swap-out of parts. Including hot-swap of pumps, solenoid and sensors (no power-off). Also no need to match replacement pumps or solenoids.

Very low lead times. All spare parts stocked by us in the UK for immediate dispatch. We don't follow the 'buy to order' business model of continental manufacturers whose lead times are often unsuitable for UK clients.

We can supply not only the control equipment, but also pumps, filtration and all tank fittings.

### Accessories

Suitable pumps, solenoids valves, floating intakes and turret hoses

RC3P Series 3 Phase 230v/400v IP65 Rated Connection Kits with contactors, thermal overload protection and optional over/under voltage detection, phase loss detection

Failover mechanical pressure switches and float switches

IP65 Rated Isolation Switches

IP68 Rated Cable joints

Vented sensor cables (multiple types)

IP68 Rated Vented cable joints

IP68 rated in-line plugs/sockets

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### Technical Specifications

#### Control Unit

Width	240mm
Height	190mm
Depth	110mm
Material	ABS
Weight (control panel without cables)	1190g
Display	LCD 4 x 20 Monochrome
Backlight	Green
Keypad	Membrane
BMS	Volt-free contact
BMS (optional)	RS-232 Serial
Supply Voltage	230V <sub>AC</sub>
Power Consumption	Max 7W
Operating Temp Range	0 - 40°C
Protection Class	Up to IP65

#### Rainwater Tank Pressure Sensor

Measurement Range	0 - 0.6 bar
Length	20m
Cable Type	0.5mm 2 core flex with external vent tube Or Multicore shielded signal cable with internal or external vent tube
Input	8 - 30 V <sub>DC</sub>
Output	4 - 20 mA
Protection Class	IP68

#### Switched Outputs

Supply Voltage	240V <sub>AC</sub>
Current	10A

#### Float Switch

Type	Microswitch
Length	20m
Cable Type	1mm 3core flex
Medium	Water
Protection Class	IP68

#### Line Pressure Sensor

Measurement Range	0 - 10 bar
Input	8 - 30 V <sub>DC</sub>
Output	4 - 20 mA
Protection Class	IP65

**3P Technik UK Limited**

**Unit 9 Parc Teifi**

**Cardigan**

**SA43 1EW**

**Phone : 01239 623506**

**Fax : 0845 544 3150**

**[Sales@3ptechnik.co.uk](mailto:Sales@3ptechnik.co.uk)**

**[www.3ptechnik.co.uk](http://www.3ptechnik.co.uk)**

