

ROOTEK FlowOne™

Intelligent Flow Controller for
Water-Fed Pole Window Cleaning Systems



USER MANUAL

Model RTFC01

Firmware v1.0



rootek-designs.co.uk
Designed and assembled in the UK

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1 Welcome

Thank you for choosing the Rootek FlowOne™ — the intelligent pump controller for water-fed pole systems. The FlowOne is full of smart features, yet simple and intuitive to use: it guides you through first-time setup, calibrates itself to your system, and puts everything else in plainly-named menus on a bright backlit LCD.

This manual covers everything the FlowOne can do. You don't need to read it to get started — the Quick Start Guide in the box (and Sections 4–5 here) will have you cleaning within minutes. Come back to the rest whenever you want to go deeper.

Important safety information

- For water-fed pole systems only.
- **Do not use without the supplied fuse.** The battery lead must always remain fused (15A inline).
- Input 12–30 V DC only. Observe correct polarity (the controller is reverse-polarity protected, but the pump will not run with reversed connections).
- The enclosure is splash-resistant, not waterproof. Do not submerge, and avoid directing water at the connectors.
- Always use the correct fuses. The 15A inline fuse in the battery lead is designed to blow first — if the controller loses power, check it before anything else. The internal 20A fuse is a backup and should rarely blow; if it does, replace it like-for-like with a 20A fuse only.

2 What's in the box

- Rootek FlowOne™ controller (your choice of colour)
- Battery cable with 15A inline fuse — with battery terminals (100 cm) or XT60-only (75 cm), depending on the option chosen
- Pump cable, 50 cm, with easy plug-in pump connector
- Quick Start Guide

Optional accessories (sold separately): 1 m XT60 extension cable (12 AWG), FlowOne Click™ wireless control module, FlowOne Sense™ TDS & temperature module, and the FlowOne Heat™ hot water & frost control module (coming soon).

3 Getting to know your FlowOne

Controls



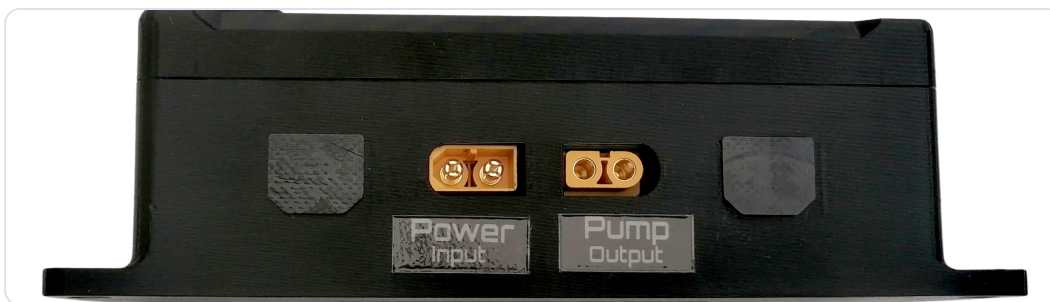
Menu (≡) and Back (◀) on the left, Up and Down on the right, power switch bottom left.

Control	Location	Function
Menu / Select (≡)	Top left	Open the menu · confirm a selection · hold ~1 s on the home screen for the Info screen
Back / Pause (◀)	Bottom left	Pause / resume the pump · go back in menus · hold ~1 s to switch between Mode 1 and Mode 2
Up (↑)	Top right	Increase flow rate · move up in menus · increase a value
Down (↓)	Bottom right	Decrease flow rate · move down in menus · decrease a value
Power switch	Bottom left, round	Physical on/off. Off means off — zero standby battery drain

Press a button briefly for a single step; **hold** it to repeat quickly (when adjusting values) or to trigger the hold function (about 1 second).

Connections

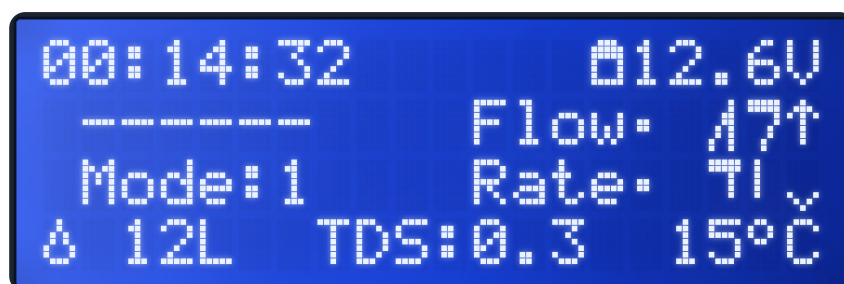
- **Power Input** (XT60) — from your battery, via the supplied fused battery cable.
- **Pump Output** (XT60) — to your pump, via the supplied pump cable. Join the pump cable to your pump's wires with the connector provided.
- **Two expansion ports** — for FlowOne plug-in modules (sold separately). All modules can be used simultaneously.



The underside: Power Input and Pump Output (XT60), with an expansion port either side.

Your pump's pressure switch may be left connected or disconnected — the FlowOne works either way, though we recommend bypassing it while running Auto Calibrate (see Section 5).

The home screen



The home screen: work timer and battery on top, flow rate in big digits, mode and readings below. TDS and temperature appear with a FlowOne Sense™ module connected.

What you see	Meaning
00:17:01	Work timer — time since power-on
12.6V / 85%	Battery voltage (or percentage, if enabled), shown after a small battery icon. In percentage mode, shows Char above 13.0 V (charging). Flashes when below your low-battery warning level
Big digits + Flow·Rate·	Current flow rate (1–99). Press Up/Down to change
Dead·End·	The system is dead-ended — pump stopped, waiting for you to open the tap
Mode:1 / Mode:2	Which of your two saved profiles is active
Paused	Pump manually paused — press Back (or Up/Down) to resume
Auto Pause	Paused automatically after a long time dead-ended (see 8.6)
TDS Paused	Paused because TDS exceeded your TDS Stop level (Sense™ module, see 12.2)
DE FAULT	With Run Auto Calibration: calibration data missing or invalid — run Auto Calibrate (Section 5)
air (flashing)	Possible airlock — the pump is running but unloaded. Usually clears as the pump primes
P.S (flashing)	Pressure switch — the pump is commanded on but drawing no power (e.g. its pressure switch has cut in)
♦ 12L	Water used since power-on, in litres (if enabled)

TDS: 0.3 /

Live water purity (Sense™ module). TDS HIGH! appears above 300

TDS HIGH!

11 °C

Water temperature (Sense™ module). Flashes at 0 °C and below

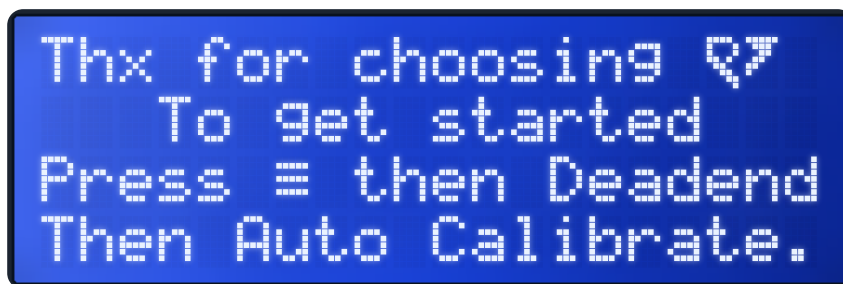
4 Installation

1. **Mount the controller** using the four 3.5 mm mounting holes, somewhere splash-free and visible. Unit size is 175 × 92 × 57 mm.
2. **Connect the pump cable** to the Pump Output. Join it to your pump's wires using the connector provided, observing polarity — match the wire colours (red to red, black to black).
3. **Connect the battery cable** to the Power Input, then to your battery — fit the terminals to your battery posts, or join it to your power lead with the quick connector, matching the wire colours. **Ensure the inline 15A fuse stays in the battery lead.**
4. Need more reach? A 1 m XT60 extension cable (sold separately) fits either the battery or pump side.

That's the wiring done — two plugs and a fuse. Now do the one-time setup below.

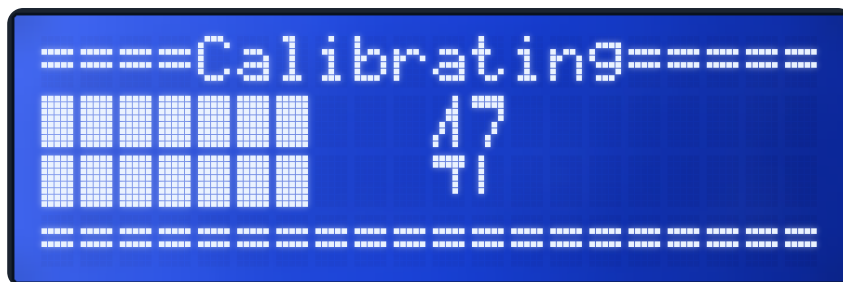
5 First-time setup — Auto Calibration

The first time you switch on, the FlowOne introduces itself and asks you to run Auto Calibration. This teaches the controller your pump and system so dead-end shut-off is accurate from day one. It takes about two minutes, and it doesn't need doing again unless something about your system changes.



The first-time welcome screen. Press Menu (≡) to begin.

1. Fully extend your pole — for best results calibrate with the setup you'll actually clean with. If your pump has a pressure switch, we recommend bypassing it during calibration.
2. Open your tap/valve so water can flow freely through the pole.
3. Switch the FlowOne on and press **Menu**, then choose **Dead End** → **Auto Calibrate**.
4. Follow the on-screen prompts — the FlowOne will prime the pump and ask you to confirm water is flowing from the brush head.
5. Let the calibration run. A progress bar counts up to 100% while the controller steps the pump through its full power range (typically 1–2 minutes). Leave the tap open and don't touch anything.
6. When you see **Calibration Complete**, you're done — press the **Down** button (bottom right) to return to the home screen, ready to work.



Auto Calibration in progress — the bar and percentage count up as the FlowOne learns your system.

Tip: Auto Calibrate sets your dead-end trip point and recovery values automatically, for both modes. You can re-run it any time from Menu → Dead End → Auto Calibrate.

6 Everyday use

Change flow

Press Up / Down — tap for one step, hold to sweep

Pause / resume

Press Back once

Switch Mode 1 ↔ 2

Hold Back for ~1 second

Timers & meters

Hold Menu for ~1 second

Adjusting flow

Press **Up** or **Down** on the home screen. Tap for one step, hold to sweep. The big digits show the rate (1–99). Your setting is remembered automatically.

Pause and resume

Press **Back** once to pause the pump; press it (or Up/Down) again to resume. The screen shows **Paused** while paused.

Dead-end shut-off

Close your tap and the FlowOne senses the pressure rise and stops the pump — the display shows **Dead·End·**. Open the tap and it restarts automatically within a couple of seconds, with a gentle soft-start ramp. While dead-ended you may notice a tiny pump "nudge" every second or two: that's the controller checking whether the line is free. It's normal and uses almost no power. You can change the gap between nudges with Advanced → DE Rate — Fast, Normal, Slow or Plod. Fast is the most responsive; Plod is kindest to the pump and battery.



Dead-ended: the pump has stopped and the labels change to Dead-End. Open your tap and it restarts by itself.

Auto pause

If the system stays dead-ended for a long time, the controller stops nudging altogether and parks itself. Set the time in Advanced → Auto Pause (30, 60, 120, 240 or 480 minutes, or off). Press any button to wake.

Modes 1 and 2 — two saved profiles

The FlowOne stores two complete profiles, each with its own flow rate and dead-end setting. **Hold Back** (~1 second) to switch between them; the status line shows `Mode:1` or `Mode:2`. Use them for two different users sharing the van, two different poles, or a normal rate and a high "rinse boost" rate. With the FlowOne Click™ module, you can switch modes from the pole.

Priming the pump

Menu → **Dead End** → **Prime Pump** runs the pump at high power for a few seconds to purge air — useful after changing filters or hoses. Press any button to stop early.

7 The menus

Press **Menu** on the home screen. Up/Down moves the highlight, Menu selects, Back goes back. When a value is selected, Up/Down adjust it (hold to repeat) and Back deselects.



The Settings menu — the arrows mark the highlighted item.

HOME SCREEN

- └ Hold Confirm → Info screen. Press again to toggle info.
- └ Single Press Confirm → SETTINGS
 - └ Dead End
 - └ Dead End: Set pressure trip point, 1–100
 - └ Auto Calibrate: Starts the Auto Calibrate tool
 - └ Prime Pump: Run the pump at full power for a short period
 - └ Battery
 - └ Low Warning: Turns warning on / off
 - └ Warning V: Set the battery voltage you wish to be warned at
 - └ Show Bat as %: Choose to display volts or percent charge (based on a standard 12v lead acid battery)
 - └ Home Display
 - └ Battery V: Show battery
 - └ Timer: Show time since power on timer
 - └ Water Usage: Show litres used
 - └ Auto Cal Flow: Starts the Calibrate Flow tool for water usage
 - └ Usage ml/min: The stored value for flow rate. Can be set manually or by the Auto Cal Flow tool
 - └ TDS Stop: OFF Stop the pump above the selected TDS level
 - └ TDS Tune: 0 Trim the TDS reading. Live value is displayed at the top of the screen while this is selected
 - └ Advanced
 - └ Motor Power: Set your pump/motor power in Amps. 10 is default and is fine for most pumps. Run auto calibrate after changing
 - └ Load Defaults Erases your settings and restores to factory default settings
 - └ Auto Pause: Inactivity timeout in minutes at which point the controller stops DE checks. Wake with any button.
 - └ DE Rate: Change the rate of DE checks. Faster = more responsive resume, slower = less strain on system.
 - └ Debug: Displays debug information on the home screen.
 - └ Reset Pump Age: Zero the pump lifetime work hours counter. Use when replacing the pump
 - └ Recover DE: Change the stored resume point on flow release. Do not change unless instructed.
 - └ Smart DE: Disables the auto adjustment system. ON is default and recommended

TDS items appear only when a FlowOne Sense™ module is connected.

8 Dead-end detection in depth

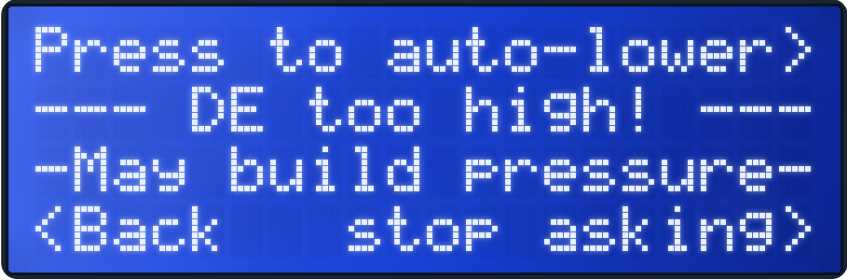
Most users never need this section — Auto Calibrate handles it all. But everything is adjustable if you want it.

8.1 Dead End (Menu → Dead End → Dead End, 1–100)

The trip sensitivity: how much pressure builds before the pump shuts off. Higher = more pressure before tripping. Auto Calibrate sets this for you. Adjust manually with: Menu / Dead End / Dead End / Up or Down.

8.2 "DE too high!" helper

If your dead-end setting is much higher than it needs to be (which means unnecessary pressure builds each time you close the tap), the FlowOne notices after a minute of steady running and offers to fix it:



```
Press to auto-lower>
--- DE too high! ---
-May build pressure-
<Back stop asking>
```

Press Up to accept the suggested lower setting, Back to dismiss it for now, or Down if you never want to be asked again.

8.3 Recover DE (Advanced, 2–80)

The reference the FlowOne uses to decide the line is free again after a dead end. Set automatically by Auto Calibrate.

If the pump seems slow to restart after you open the valve, rule out two things before touching this value. First, check your DE Rate setting (8.5) isn't on one of the slower settings — a slow check rate alone adds a delay. Second, remember the FlowOne restarts gently and the pressure change from opening the valve has to travel all the way back to the pump — with a long hose run, and especially with soft hose in hot weather, that can take a noticeable few seconds. That's the physics of the hose, not the controller. Only once you've ruled both out should you raise Recover DE — and then only by the minimum needed to get the pump resuming reliably.

8.4 Smart DE (Advanced, on/off — default on)

While you work, the FlowOne fine-tunes its dead-end release point: a false restart nudges it more cautious, clean running relaxes it again. It learns per session and returns to your saved settings each power-up. Turn it off to pin behaviour exactly to your saved values.

8.5 DE Rate (Advanced: Fast / Normal / Slow / Plod)

How often the FlowOne checks for release while dead-ended — every 1.0 / 1.5 / 2.0 / 2.5 seconds. Faster = quicker restarts; slower = even gentler on the system.

8.6 Auto Pause (Advanced: OFF / 30 / 60 / 120 / 240 / 480 minutes — default 240)

If the system stays dead-ended continuously for this long (lunch break, forgotten tap), the FlowOne pauses fully to save your battery and shows `Auto Pause`. Press Back (or the Click™ remote) to resume.

8.7 Micro dead-end check

The brief pulse you may notice while dead-ended. It probes at low power so pressure can't build, conserving energy while staying ready to restart the moment your tap opens.

9 Timers, meters and the Info screen

Hold Menu (~1 second) on the home screen to open the Info screen. Press **Menu** to cycle its three pages, **Back** to exit.



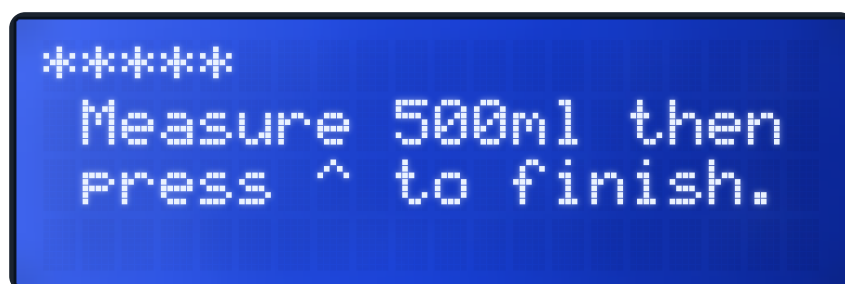
The Info screen: work timer on top, your job timer below. Up starts/pauses the job timer, Down resets it.

- **Page 1 — Timers.** The **work timer** counts total time since power-on (always running, not resettable). The **job timer** is yours to control: press **Up** to start/pause it, **Down** to reset to zero. Time individual jobs without touching your phone.
- **Page 2 — Power.** Live current draw (amps) and amp-hours used since power-on — see exactly what your pump asks of your battery.
- **Page 3 — Odometer.** **Sys** hours (total controller-on time, lifetime) and **Pump** hours (total pump running time, lifetime). Pump hours can be reset when you fit a new pump (Advanced → Reset Pump Age).

10 Water usage tracking

The FlowOne can display how many litres you've used (the **12L** figure). To make it accurate, calibrate it once:

1. Menu → **Home Display** → **Auto Cal Flow**.
2. Open your tap and have a measuring jug ready. The pump runs so flow settles to your normal working rate.
3. Press **Up** to start, catch exactly **500 ml** in the jug, and press **Up** again the moment it's full.
4. Done — the FlowOne calculates your flow in ml/min, switches the usage display on, and starts counting.



Flow calibration: the star marches across the top while you catch 500 ml in a jug.

The litres counter runs whenever the pump is pumping and resets each power-up. You can fine-tune the rate manually under **Usage ml/min** (0–9999). Remember the count is based on your calibrated rate — recalibrate if you change your flow rate dramatically or your jets.

11 Battery monitoring

- The home screen shows live battery voltage, smoothed so it doesn't jump around under pump load. Prefer a percentage? Turn on **Battery** → **Show Bat as %**.
- **Low battery warning** (default 12.0 V, adjustable 10.0–13.0 V, can be disabled): when your battery sits below the warning level, the battery display flashes and a **Low Battery** alert pops up (repeating at most

once per hour).

- **Critical battery protection:** below 10.5 V for 10 seconds, the FlowOne pauses the pump and shows **Critical Battery! Motor Paused** — protecting your battery from deep discharge. You can resume manually, but charge soon: the battery display shows **Low** until the next power-up.
- In percentage mode, the display reads **Char** above 13.0 V — the battery is on charge.
- The percentage scale, charge indication and default warning levels are set up for an average 12 V lead-acid leisure battery. If you run a different battery type or voltage (such as a 24 V system), use the volts display rather than percentage — the voltage readout is always accurate — and adjust the warning voltage to suit.



Alerts pop up over the home screen — press Down or Back to dismiss.

12 Expansion modules

Two expansion ports accept FlowOne plug-in modules — and the whole module family can run at once: although there are three modules and two ports, all three can be connected simultaneously using an ethernet Y-splitter cable (sold separately). Power off before connecting or disconnecting a module; the FlowOne detects modules at switch-on.

12.1 FlowOne Click™ — wireless control module

Long-range wireless control of the FlowOne itself, from a remote in your pocket or on its lanyard:

- **Quick press** — pause / resume the pump (also wakes it from Auto Pause).
- **Long press** (~1 second) — switch between Mode 1 and Mode 2. Set Mode 2 as a high flow rate and you've got rinse power on demand, from wherever you're working.

Range is up to 1 km in open air (less through buildings). The remote takes a replaceable 12 V A23 battery.

12.2 FlowOne Sense™ — TDS & temperature module

Adds live water purity (TDS) and water temperature to your FlowOne display — so you know your pure water is pure, and you catch rising TDS before spotting complaints.

- **TDS reading** (bottom line of the home screen): updates whenever the pump pauses or dead-ends — flow stops, reading refreshes. Shows **<1** for very pure water and **TDS HIGH!** above 300.
- **Temperature:** shown bottom-right; flashes at freezing (0 °C and below) as a frost warning.
- **TDS Stop** (Home Display menu, 0 = off, 1–250): the FlowOne pauses the pump automatically if TDS exceeds your chosen level — protecting your reputation and your customer's glass.
- **TDS Tune** (–100 to +100): calibrate the TDS reading against a reference meter. Tune using reference water between TDS 10 and 20 — the live value is shown while you adjust (tuning is blocked above TDS 20).

12.3 FlowOne Heat™ — hot water & frost control (*coming soon*)

Control your hot-water system from the FlowOne:

- **Heater signal wire** — voltage passed through from your battery, outputting a high signal whenever the controller is on, so your heater follows the FlowOne automatically.
- **Frost-stat mode** — set the temperature at which it triggers: when the reading falls to it, the FlowOne turns on the pump and signals the heater, then switches both off once the temperature rises back above it.

Keep an eye on rootek-designs.co.uk for the FlowOne Heat™ launch.

13 Advanced settings reference

Setting	Range (default)	What it does
Motor Power	1–20 (10)	Matches the controller to your pump's size. Set by Auto Calibrate; only change if advised
Load Defaults	—	Restores every setting to factory (after a confirmation screen), then restarts. You'll need to run Auto Calibrate again. Does not reset the runtime odometers
Auto Pause	OFF–480 min (240)	Full pause after continuous dead end — see 8.6
DE Rate	Fast/Normal/Slow/Plod (Normal)	Dead-end recheck speed — see 8.5
Debug	on/off (off)	On-screen diagnostic values. For support use; switches off at power-off
Reset Pump Age	—	Zeroes the pump-hours odometer (after confirmation) — use when you fit a new pump
Recover DE	2–80	Dead-end release reference — see 8.3
Smart DE	on/off (on)	Self-adjusting dead-end release — see 8.4

14 Troubleshooting

Most issues can be solved by powering the FlowOne off and on again, or by running a fresh Auto Calibrate (Menu → Dead End → Auto Calibrate). Try those first.

Symptom	Likely cause	What to do
DE FAULT — Run Auto Calibration	No/invalid calibration data	Run Menu → Dead End → Auto Calibrate
Pump won't restart after dead end	Release reference too tight; kinked hose	Check hoses; re-run Auto Calibrate; raise Recover DE slightly (see 8.3)
Pump trips to dead end during normal use	Dead End set too low; partially closed valve	Raise Dead End a little, or re-run Auto Calibrate with the pole fully extended
air flashing, weak flow	Airlock in pump or hoses	Run Dead End → Prime Pump with the tap open until flow is solid

P.S flashing, pump silent	Pump's own pressure switch has cut in, or pump disconnected	Check pump connections; if using the pump's pressure switch this can be normal at shut-off
Pump pulses every second or two when tap closed	Micro dead-end check	Normal — see 8.7
Auto Pause shown	Dead-ended longer than the Auto Pause time	Press Back to resume; adjust Advanced → Auto Pause
Battery display flashing	Voltage below your warning level	Charge the battery, or adjust Battery → Warning V
Battery reading looks low while working	Voltage sags under pump load	Normal — pause the pump for a moment to see the true resting voltage
Battery shows Char	Voltage above 13.0 V — normal while charging, or permanent with a higher-voltage battery	To clear it on a higher-voltage battery, switch off Battery → Show Bat as % — the volts display always reads correctly
Critical Battery! Motor Paused	Battery below 10.5 V	Charge the battery before continuing
No TDS reading / ...	Pump running (reading updates when flow stops); module not detected	Pause briefly for a fresh reading; power off and on with the module connected
Water usage stays at 0	Flow calibration not done, or done incorrectly	Run Menu → Home Display → Auto Cal Flow (see Section 10)
Settings changed just before switch-off didn't stick	Power cut within ~2 s of the change	Wait a couple of seconds after your last change before switching off
Controller dead	Blown fuse; battery flat	Check the 15A inline fuse first (it is designed to blow before the internal fuse), then battery voltage; if both are good, check the internal 20A fuse

15 Specifications

Model	RTFC01
Input voltage	12–30 V DC
Maximum current	20 A (peak)
Fusing	15 A inline · 20 A internal
Output	Optimised PWM pump control (high-frequency, silent)
Display	Backlit LCD, menu-driven
Connections	XT60 power in / pump out · 2 × expansion ports
Protection	Reverse polarity · automatic pump protection · fully fused
Enclosure	Splash-resistant, 4 × 3.5 mm mounting holes

Dimensions	175 × 92 × 57 mm
Weight	0.58 kg
Compliance	UKCA · RoHS · WEEE — do not dispose of in household waste
Warranty	12 months
Origin	Designed and assembled in the UK

16 Support

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