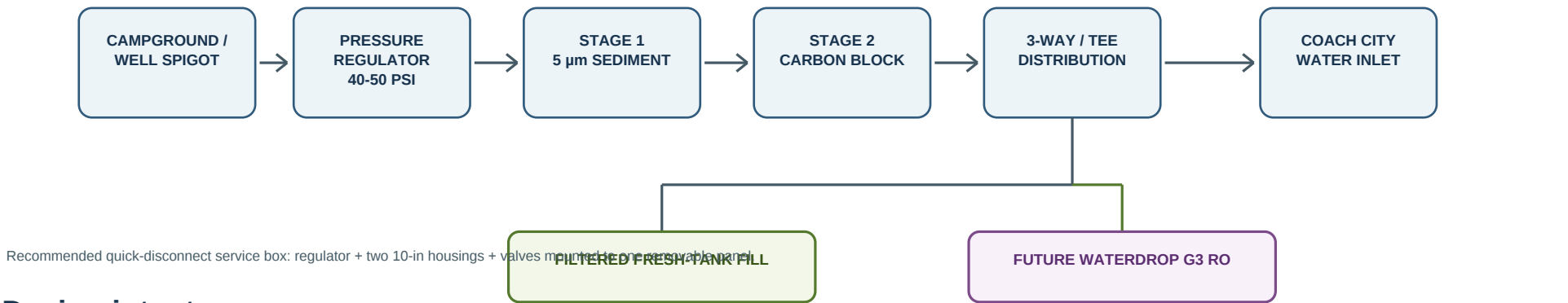


Falcon Water Filtration System

Whole-coach campground / well-water conditioning with filtered tank fill and a future Waterdrop G3 drinking-water branch.

Document: FAL-WTR-001	Status: Concept / Build Planning	Revision: A
-----------------------	----------------------------------	-------------



Design intent

Make ordinary campground water materially cleaner, clearer, and better tasting before it reaches the Falcon plumbing, while also allowing the fresh tank to be filled through the same filters. The system is intentionally modular so it can live in a compact service box if permanent mounting space is tight.

Safety boundary

Filtration is not disinfection. Sediment and carbon stages do not make an unknown microbiologically unsafe source potable. For unverified well/surface water, disinfect/boil or use a validated treatment stage and follow local guidance. The Waterdrop RO branch is for drinking-water polishing, not permission to ingest visibly contaminated source water.

Recommended flow architecture

Mode	Valve / connection state	Result
City-water camping	Source -> regulator -> sediment -> carbon -> city inlet	Whole coach receives conditioned water.
Filtered tank fill	Open tank-fill branch after carbon stage	Fresh tank is filled with conditioned water.
Off-grid tank use	Disconnect source; use onboard pump normally	No external filter pressure drop while pumping from tank.
Drinking-water RO (future)	Tee filtered cold-water feed to Waterdrop G3	Dedicated high-quality drinking / ice / coffee water.

Bill of materials - Rev A

Item	Suggested specification / example	Qty	Budgetary price	Notes
Pressure regulator	Camco lead-free brass, 40-50 PSI preset (40055)	1	\$10.80-\$16.99	Place at source before hose/filter box.
Stage 1 cartridge	Pentek P5, 10 x 2.5 in, 5 micron spun polypropylene	1	\$13.13	Sediment, rust, sand, visible debris.
Stage 2 cartridge	Pentek CBC-10, 10 x 2.5 in, 0.5 micron carbon block	1	\$31.82	Taste/odor/chlorine + fine particulates; watch pressure drop.
10 in filter housings	3/4 in ports, PR button, wrench/bracket; clear sump preferred for Stage 1	2	\$25-\$45 ea target	Use standard 2.5 in cartridges to keep package narrow.
Isolation / bypass valves	Lead-free full-port ball valves, 3/4 in	3-4	\$20-\$35 total	Inlet isolation, outlet isolation, tank-fill branch; bypass optional.
Quick connects	Drinking-water-safe brass/stainless GHT quick disconnects	2 sets	\$20-\$30	Source and coach ends; cap when stored.
Fittings / nipples / sealant	Lead-free 3/4 in NPT/GHT adapters, short nipples, PTFE sealant	lot	\$20-\$35	Final count depends on enclosure layout.
Mount / enclosure	HDPE panel or compact tote/service box	1	\$10-\$25	Leave wrench clearance below housings.

Expected DIY total: roughly \$145-\$225 depending on housing choice and how much plumbing hardware is already on hand. The target configuration can stay near \$200 by using economical standard 10-in housings rather than premium preassembled RV systems.

Current price references checked 16 Aug 2026

Reference	Observed price / detail
Camco 40055 regulator - Camco / RV Parts Source	\$16.99 manufacturer regular price; \$10.80 observed at RV Parts Source.
Pentek P5 sediment cartridge - WaterAnywhere	\$13.13.
Pentek CBC-10 carbon block - RC Worst	\$31.82 single-cartridge regular price.
Pentek 150550 10-in housing - Fresh Water Systems	\$43.65 (availability can vary).
iSpring WGB31B 3-stage benchmark	\$224.79 promotional price; useful as a buy-vs-build comparison.

Compact service-box layout

Mount the housings vertically on one removable panel. Keep the regulator and inlet connection high on the left, filters centered, and outlet / tank-fill valves high on the right. Maintain enough clear space below each sump to unscrew it with the supplied wrench. Do not bury the pressure-relief buttons.

LEFT / INLET ZONE	CENTER / FILTER ZONE	RIGHT / OUTLET ZONE
GHT source quick-connect Pressure regulator Inlet isolation valve	Stage 1 clear sediment housing Stage 2 carbon housing Vertical mounting; 12-14 in service drop below	Outlet isolation Tee to coach city inlet Branch valve to fresh-tank fill Capped tee reserved for RO

Assembly notes

No.	Build note
1	Use only drinking-water-rated hose, fittings, sealants, and lead-free wetted components.
2	Regulate pressure before the service box. Target 40-50 PSI unless the Falcon plumbing manufacturer specifies otherwise.
3	Flush new carbon cartridges until fines clear before connecting to the coach.
4	Winterize the filter assembly separately: drain housings, remove cartridges, and store dry; do not leave water trapped in the service box.
5	Sanitize the Falcon fresh tank and distribution plumbing periodically; filtration does not replace tank sanitation.
6	If flow becomes poor, check Stage 1 first. A 0.5-micron carbon block can become restrictive on very dirty sources.
7	Future RO: feed only from the filtered cold-water side and ensure the Waterdrop unit's inlet pressure and power requirements are satisfied.