



The Flow Conditioning Device: Installation Point, Mechanism, and Meter Accuracy

Water Flow Innovations LLC

Flow Conditioning Device (FCD)
waterflowinnovations.com

INSTALLATION POINT & MECHANISM

Installed Just After the Meter — Ahead of Every Validated Process System

The Flow Conditioning Device (FCD) installs between two pipe joints on the main water line immediately after your water meter — ahead of your facility's internal distribution to locomotive wash racks, high-pressure wash bays, cooling system fill and top-off, shop and service track demand, and yard facility supply. Each FCD is custom-built to the facility's exact specifications — pipe size, operating water pressure, and existing PRV configuration — and may include an integral check valve depending on the installation requirements. It requires no power and is installed by a licensed plumber or mechanical contractor with water off for approximately one hour.

Mechanically, the FCD creates a slight static back-pressure that extends back through the meter, reducing the air, gas, and turbulence that form during demand events and delivering a laminar-like flow profile through the measurement chamber.

Municipal meters register volumetric displacement — entrained air and turbulent flow register as billable volume. Pressure loss through the device is under 0.8 psi across all flow conditions; downstream pressures, temperatures, and flow rates are effectively unchanged. Because the FCD sits just after the meter, it is outside FRA-regulated operations, wash water reclaim systems, and shop procedures — no operational change is required. Complete technical documentation is provided to support your internal change control review.

DIAGNOSTIC CHECKLIST — SIX SIGNS YOUR METER IS OVER-READING

- ☐ **Water cost per unit washed rising**
Cost per locomotive or railcar washed climbs with no change in throughput or procedure.
- ☐ **Sewer follows the inflated meter**
Sewer charges are billed from metered intake — over-read wash demand is charged twice.
- ☐ **Intake exceeds wash cycle math**
Metered volume won't reconcile against wash cycles, reclaim recovery, and shop demand.
- ☐ **Audits found nothing to fix**
Facility audits confirmed high usage without identifying leaks or an operational cause.
- ☐ **Pressure surges at wash bay startup**
High-pressure wash pumps and rack startups produce visible pressure swings — entrained air registers as billable volume.
- ☐ **Water treated as fixed yard overhead**
Water is budgeted as an uncontrollable yard expense rather than a correctable one.

WHERE OVER-READING HITS THE OPERATION

- Cost per Wash & Yard Economics**
Inflated intake drives cost per unit washed above target — and sewer billed from the same meter doubles the impact of every over-read gallon.
- Reclaim System ROI Distortion**
Over-reading masks the true recovery rate of wash water reclaim systems — correction shows what reclaim is actually saving.
- Wash Rack Demand Events**
High-pressure pump starts and rack cycling create exactly the events that entrain air at the meter — all day, every service window.
- Multi-Yard Benchmarking**
Yard-to-yard cost comparisons are distorted when meters over-read differently — correction gives operations true numbers.

ENGINEERING Q&A

Q: Will the FCD affect wash bay pressure, reclaim systems, or shop water service?

A: No. Pressure loss through the FCD is under 0.8 psi across all flow conditions, and it installs immediately after the meter, ahead of yard distribution. Wash pressures, reclaim operation, and every shop service are effectively unchanged.

Q: Much of our wash water is reclaimed — does the FCD still apply?

A: Yes. The FCD corrects the municipal meter on the makeup and facility supply you're billed for. Reclaim reduces how much you buy; the FCD ensures the volume you do buy is measured accurately — the two work together.

Q: How does the FCD affect sewer charges?

A: Sewer charges are typically calculated from metered intake. When the meter over-reads wash rack and shop demand, both charges are inflated. After installation, intake reflects actual consumption, reducing both line items.

Q: How do I estimate savings for the yard before committing?

A: Use the Water & Sewer Bill Savings Calculator at waterflowinnovations.com for an instant projection, then request the free savings analysis — a documented, yard-specific projection suitable for a facility management package.

Q: How quickly do savings appear?

A: The meter reads accurately immediately after installation. Savings appear on the next full water and sewer billing cycle — no ramp-up period. 90% of installed customers reach full return on investment in under 12 months.

ENGAGEMENT PROCESS — FOUR STEPS

From Analysis to Verified Bill Reduction

1

Free Savings Analysis

We review your water and sewer bills and facility demand profile — no cost, no obligation.

2

Documented Projection

You receive a written savings projection specific to your facility before any commitment.

3

FCD Installation

Licensed plumber or mechanical contractor installs immediately after the meter — water off approximately one hour.

4

Verified Bill Reduction

Before-and-after bill comparison verifies the reduction on your next billing cycles.

GUARANTEE & WARRANTY TERMS

6-Month Money-Back Guarantee

If you're not satisfied within 6 months of installation, the FCD purchase is fully refunded — no questions asked. Installation labor is non-refundable.

Lifetime Transferable Warranty

The FCD carries a lifetime warranty, transferable to the new building owner if the facility changes hands (a transfer fee applies).

DEVICE SPECIFICATIONS

Construction, Certification & Installation

Custom-built to each facility's specifications — pipe size, operating pressure, PRV configuration · 316L stainless steel construction; titanium and specialty alloys available by special order for medical and other specialized applications · Configuration may include an integral check valve per installation requirements · No power required · Under 0.8 psi pressure loss · Certifications: IAPMO, NSF/ANSI/CAN 61, KIWA, GMP, SQF · Installed by licensed plumber or mechanical contractor

Regulatory & Standards References: EPA NPDES · Federal Railroad Administration (FRA) · Association of American Railroads (AAR)