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 Plant Water System

The Flow Conditioning Device (FCD) installs between two pipe joints on the main water line immediately after your water meter — ahead of the plant's internal distribution to cooling tower makeup, pretreatment and demineralizer trains, boiler and HRSG makeup, chilled water and thermal storage systems, and campus or site distribution. 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 during a planned outage window; large-diameter units are built to order.

Mechanically, the FCD creates a small, controlled back-pressure that extends back through the meter. During demand surges, pressure inside the meter drops, dissolved gas comes out of solution, and vapor forms; holding pressure up through the meter means far less gas and vapor form and are counted as water. Municipal meters register volume, so gas and vapor that form inside the meter register as billable water. Pressure loss through the device is under 0.8 psi across all flow conditions; downstream pressures, temperatures, and flow rates see no practical change. Because the FCD sits just after the utility meter, ahead of pretreatment and demineralization, boiler feedwater quality, cycle chemistry, and cooling tower treatment see no practical change. Complete technical documentation is provided to support your management-of-change (MOC) review.

DIAGNOSTIC CHECKLIST — SIX SIGNS YOUR METER IS OVER-READING

- ☐ **Water cost per MWh above plant targets**
  Water and sewer cost per MWh or per ton-hour persistently exceeds engineering baselines despite treatment and cycles improvements.
- ☐ **Utility meter doesn't close against the plant water balance**
  Utility meter totals exceed the sum of tower makeup, demineralizer feed, and domestic sub-meters.
- ☐ **Sewer charges outpace blowdown and drains**
  Sewer billed from metered intake runs well ahead of measured tower blowdown, regeneration waste, and drains.
- ☐ **Costs spike with load swings and startups**
  Water charges climb in peak cooling season, during startups, and while thermal storage charges, beyond proportional usage.
- ☐ **Pressure variation at the supply header**
  Observable pressure swings when makeup valves open, demineralizers regenerate, or pumps start — the same demand surges that drop pressure inside the meter.
- ☐ **Water treated as fixed plant overhead**
  Water is accepted as a fixed operating cost rather than a measured, controllable input — over-reading hides in that assumption.

WHERE OVER-READING HITS THE OPERATION

Operating Cost & Plant Economics
Inflated intake flows directly into cost per MWh and the plant budget — every over-read gallon is billed on both the water and sewer side.

Sewer Billing & Evaporation Credits
Most tower makeup evaporates, yet sewer is often billed from metered intake. Evaporation credits remove vapor loss; an over-reading meter still inflates what remains.

Sustainability & Water Reporting
Water intensity (gallons per MWh) and campus or corporate sustainability reports reference metered intake — over-reading overstates it.

Operations & Engineering
Water balances, cycles-of-concentration reviews, and efficiency projects all start from a meter reading that includes volume that never arrived.

ENGINEERING Q&A

Q: Will the FCD affect tower makeup, demineralizer feed, or boiler and HRSG makeup?

A: No. Pressure loss through the FCD is under 0.8 psi across all flow conditions, and the device installs ahead of your internal distribution. Downstream pressures, flow rates, makeup quality, and cycle chemistry see no practical change — the FCD acts at the meter and does not interact with any downstream plant system.

Q: How does the FCD fit our management-of-change process?

A: Treat it like any change at the service entrance: it installs just after the utility meter, outside the steam cycle and cooling water treatment. Full technical documentation is provided for your MOC review, and installation is scheduled for a planned outage window.

Q: How does the FCD work with an evaporation or consumptive-use sewer credit?

A: They are complementary. A credit removes sewer charges on water that evaporates from towers or leaves as steam, usually measured with sub-meters. The FCD corrects the utility meter reading on the water that is billed. Confirm with your utility how your credit is calculated.

Q: Can the FCD be sized for large plant services, such as a 12-inch main?

A: Yes. Each FCD is custom-built for the site from the meter, pipe size, operating pressure, and demand profile. Large-diameter units (10 inches and larger) are built to order, so allow lead time in your outage planning.

Q: How quickly do savings appear?

A: The correction starts at installation, and savings start on the next full water and sewer billing cycle. Before-and-after bills verify the result.

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 during a planned outage window.
4. **Verified Bill Reduction**
   Before-and-after bill comparison verifies the reduction, starting on the next full billing cycle.

RESULTS & TERMS

Results
The FCD can save up to 30% on monthly water and sewer bills; results vary by site. Savings start on the next full billing cycle.

Large Services
Custom-built for each site, including large-diameter mains. Units 10 inches and larger are made to order; ask for lead time.

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: U.S. DOE Combined Heat and Power Program · EPA CHP Partnership · International District Energy Association (IDEA) · Cooling Technology Institute (CTI) · EPA NPDES Permit Program · ASME boiler water guidance

FREE SAVINGS ESTIMATE

Models your building's 24-hour flow profile. No contact info required.
waterflowinnovations.com/water-bill-savings-calculator

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CERTIFICATIONS

IAPMO · NSF/ANSI/CAN 61 · KIWA · GMP · SQF

Patented (AquaFlow Technologies, Inc.)
316L Stainless Steel · Made in USA
Under 0.8 psi pressure loss
Save up to 30% on monthly water and sewer bills