



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 process cooling and chiller plant makeup, dry room support utilities, electrode process water, and facility domestic demand. 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 dry room environmental control, electrode process parameters, and cell formation systems — no process change is required. Complete technical documentation is provided to support your internal change control review.

DIAGNOSTIC CHECKLIST — SIX SIGNS YOUR METER IS OVER-READING

- ☐ **Cost per GWh above manufacturing targets**
Water cost per GWh of capacity produced persistently exceeds manufacturing targets.
- ☐ **Intake doesn't reconcile with accounting**
Metered intake exceeds documented process water and cooling volumes.
- ☐ **Disproportionate ramp-period spikes**
Bills climb during production ramps beyond proportional utility demand.
- ☐ **Intensity per kWh above OEM benchmarks**
Water intensity per kWh of cell capacity runs above OEM sustainability benchmark targets.
- ☐ **NPDES balance shows intake gaps**
Permit water balances show unexplained intake-to-discharge gaps on the intake side.
- ☐ **Water accepted as gigafactory overhead**
Municipal water is treated as uncontrollable overhead in the operating model.

WHERE OVER-READING HITS THE OPERATION

- Cost per GWh at Gigafactory Scale**
At gigafactory volumes, even single-digit over-reading percentages compound into substantial annual overpayment on water and sewer.
- OEM & ESG Water Intensity**
OEM sustainability scorecards and ESG disclosures benchmark water per kWh — over-reading overstates yours against contractual targets.
- NPDES Water Balance Closure**
The unexplained intake gap in permit balances is frequently the over-read itself — correction closes it.
- Critical Production Unaffected**
Dry room dew point, electrode quality, and formation systems are untouched — the FCD is passive and ahead of everything.

ENGINEERING Q&A

Q: Will the FCD affect dry room dew point, electrode quality, or cell formation?

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 all plant systems. Dry room environmental control, electrode process water treatment, and formation cooling are effectively unchanged.

Q: How is installation handled at a continuously ramping plant?

A: The FCD installs in approximately one hour with municipal supply off — chiller plant reserves and storage buffer a scheduled window. Full technical documentation supports your change management process.

Q: Why doesn't our water balance reconcile?

A: Chiller makeup cycling and process demand under ramping load create repeated high-velocity events at the supply meter — generating air and turbulence billed as volume. The unexplained intake gap is frequently the over-read itself.

Q: Will this improve our reported water intensity for OEM commitments?

A: Yes — legitimately. Intensity is computed from metered intake, so correcting over-reading lowers reported water per kWh to its true value. Before-and-after bills document the change for OEM scorecards and CDP disclosure.

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 · OEM Supplier Sustainability Requirements · CDP