

It's Not Your Meter. It's Your Pipes.

During high-demand periods, the dynamics of your piping system can push your water meter to over-register, inflating both your water and sewer bills. The Flow Conditioning Device (FCD) corrects it.

Why buildings overpay at peak demand

Every building has high-demand periods when water moves through the service line at high velocity:

Multifamily

Morning and evening shower peaks and laundry

Industrial

Process water draws, CIP cycles, washdowns, and cooling tower makeup

Commercial

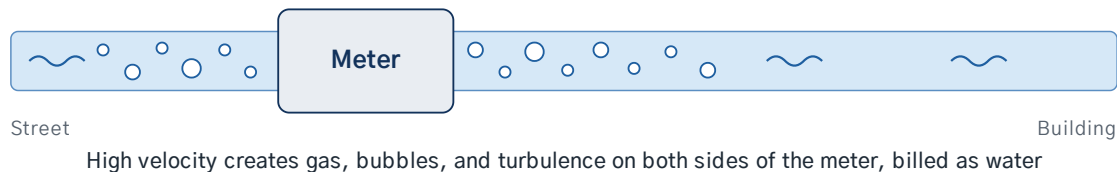
Restroom peaks at opening, lunch, and breaks, plus HVAC makeup

Restaurants

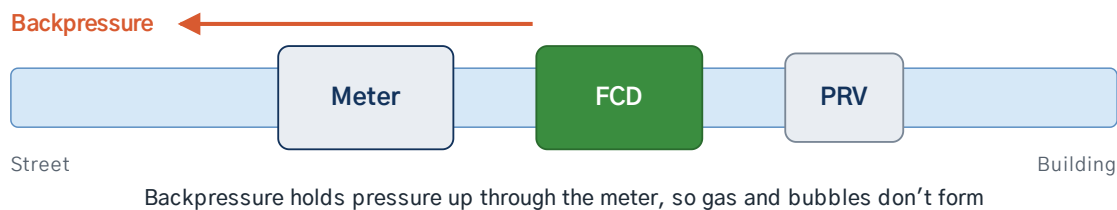
Dish machines, pre-rinse stations, and prep during service rushes

At high velocity, pressure inside the meter drops so sharply that the water breaks apart, creating gas, vapor bubbles, and turbulence. These expand to fill space inside the pipe that should be occupied by water. Meters measure volume and can't tell water from gas or bubbles, so that expanded volume is registered and billed as water. Because sewer charges are commonly based on your meter reading, you pay for it twice.

Without FCD, at high demand



With FCD installed directly after the meter



How the FCD works

The FCD installs directly after your water meter. Like putting your thumb over the end of a garden hose, it creates a small, controlled backpressure that extends back through the meter. Water is nearly incompressible, so that pressure is felt instantly upstream. The same gallons flow, with negligible pressure loss to your building, but the meter now operates under steadier, higher pressure, and the water stays intact as it's measured.

Up to 30%

lower metered water and sewer charges

~1 hour

typical installation

6-month

money-back guarantee (install labor non-refundable)

The bottom line: Your meter isn't defective, and your utility isn't doing anything wrong. Over-registration is a predictable result of piping system dynamics at high demand, and it's correctable.

The Science Behind the FCD

1 Same flow, different pressure

$$Q = A \times v$$

Continuity equation. Flow rate (Q) equals pipe area (A) times velocity (v). The same water passes through the meter and the FCD, so velocity through the meter is unchanged. Only pressure changes.

2 Backpressure travels upstream

$$P_1 = P_2 + \Delta P_{\text{FCD}}$$

Bernoulli's principle. Pressure at the meter (P_1) equals pressure after the FCD (P_2) plus the pressure the FCD holds back. The meter sits at higher pressure.

3 The effect grows with velocity squared

$$\Delta P = K \times \frac{1}{2} \rho v^2$$

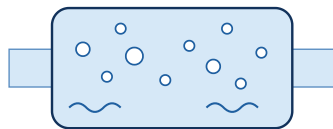
Pressure-loss equation. Double the flow speed and the effect roughly quadruples, which is why high-demand hours drive over-registration.

4 Keeping the water intact

$$P_{\text{meter}} > P_v$$

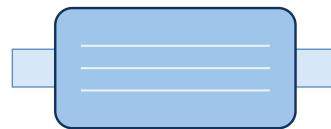
Cavitation threshold. Bubbles form when meter pressure drops below the water's vapor pressure (P_v). Backpressure keeps it above that line.

Inside the meter at high demand



Without FCD

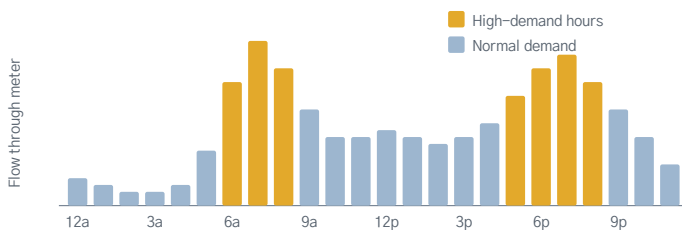
Meter pressure drops below P_v ; water breaks apart



With FCD

Pressure held above P_v ; solid water only

When over-registration happens



Over-registration concentrates in a building's high-demand hours, when velocity through the meter is highest. A building that looks fine on average can lose the most during a few hours a day.

Our **24-Hour Flow Profile Bill Reduction Calculator** shows when your building is most affected and estimates your savings.

Chart: illustrative multifamily profile. Actual profiles vary by building.

Recommended installation



The FCD installs directly after the meter and ahead of the pressure-reducing valve, where higher line pressure gives the greatest correction. Installing after the PRV is possible when site conditions require it, with reduced savings.

What the FCD does

Corrects meter over-registration caused by piping system dynamics, lowering metered water and sewer charges.

What it doesn't do

It doesn't reduce actual water use, and it doesn't modify, replace, or tamper with your meter.

Key: P = pressure, ρ = water density, v = velocity, Q = flow rate, A = pipe area, K = loss coefficient, P_v = vapor pressure of water.

Estimate your savings: Water Bill Cost Savings Calculators & Tools

Includes the 24-Hour Flow Profile Bill Reduction Calculator, Water & Sewer Bill Savings Calculator, Sewer Double-Impact Calculator, Cost of Waiting Calculator, NOI & Property Value Calculator, and more

waterflowinnovations.com/calculators

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Lifetime transferable warranty
(transfer fee applies)