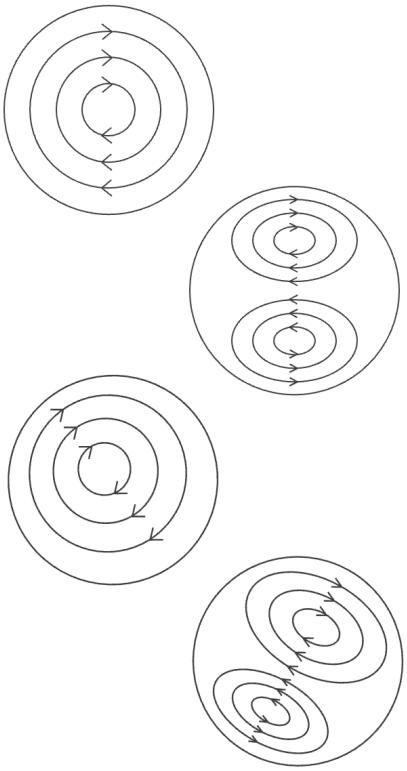
CALDON BFC

Brownian Flow Conditioner

FEATURES AND BENEFITS

- Suitable for liquid or gas applications
- Designed specifically for use with ultrasonic meters
- Approximately 3 to 6 times lower pressure loss than a typical plate style flow conditioner, BFC delivers K = 0.55.
- Dramatically reduces swirl and crossflow, without introducing undue turbulence and pressure loss
- Balanced hydraulic hole geometry for consistent performance over a wide range of Reynolds numbers
- Reproducible and predictable performance



Reduce swirl and crossflow

The BFC flow conditioner has been designed and tested by CALDON ultrasonic flow metering experts and is ideally suited for use in liquid or gas ultrasonic metering applications where flow conditioning is preferred.

Certain ultrasonic meter configurations are robust to the changes in axial velocity profile that typically occur in custody transfer applications but are adversely affected by non-axial flow. For example, chordal ultrasonic meters with 4-paths based on the principles of Gaussian integration are very tolerant of changes in axial profile but are sensitive to the swirl and/or crossflow that is generated when flow changes direction in a pipeline system.

CALDON engineers have combined decades of experience with ultrasonic meters and detailed research into the various forms of flow conditioners developed since the 1960's to produce a flow conditioner that is optimised for use with ultrasonic meters.

Traditional plate-type conditioners are good at removing swirl and crossflow but do so with a relatively high pressure-loss penalty. Tube bundles, which are more common in liquid applications, have lower pressure loss in turbulent flow than traditional plate conditioners but have an adverse effect on the axial velocity profile, a higher frictional resistance in laminar flows, and are generally more difficult to manufacture with good reproducibility.

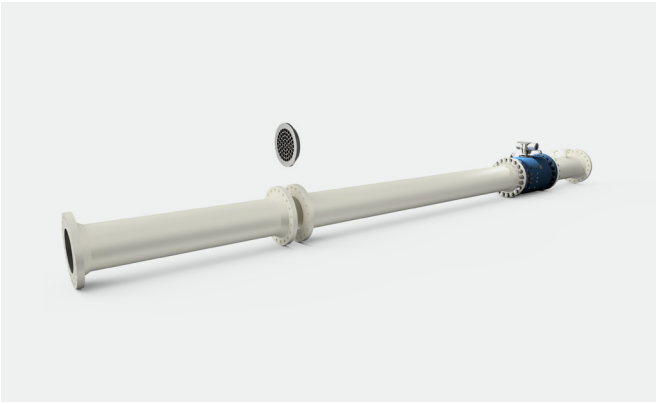
The patented* BFC flow conditioner combines the reproducibility and performance benefits of a plate-style conditioner with the low-loss characteristics of a tube bundle, as well as eliminating the higher frictional losses associated with the long tubes used in traditional tube bundles. In gas applications where pressure drop plays a key role in generation of acoustic/ audible noise, the significantly reduced pressure drop and balanced hole geometry of the BFC can alleviate the noise problems that can be encountered with typical plate conditioners.

The BFC is suitable for use with other primary technologies subject to consideration of compliance with international standards or qualifications. Please consult Sensia for specific advice.

*US Patent No. 9,506,484: Flow conditioner and method for optimization

Product Information

+ 4-inch to 36-inch pipe diameters, larger sizes on request
+ Standard material 316 Stainless Steel; other options such as Duplex, Hastelloy, Inconel, Monel on request.
+ ANSI raised-face flange-on-end design as illustrated below provided as standard; other options including full-width flange and RTJ flange on request

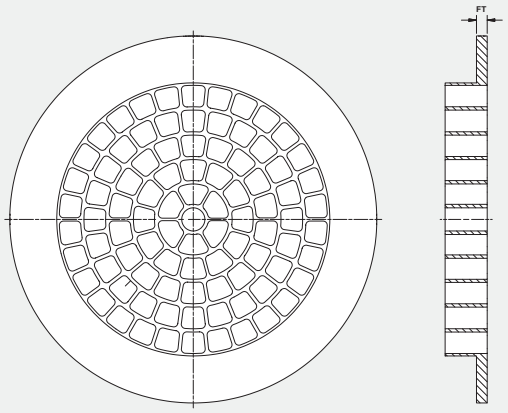


Typical installation - Consult Sensia for specific guidelines

Typical Dimensions

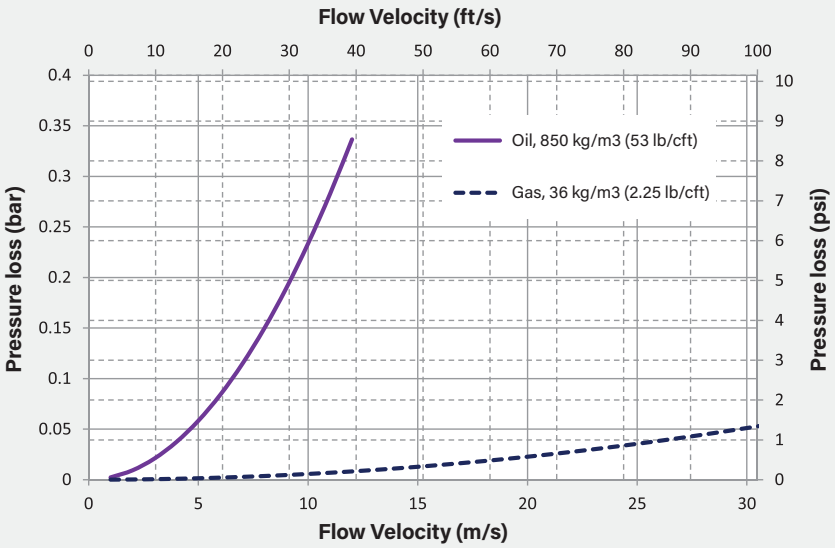
(Consult factory for specific applications)

Nominal diameter	Conditioner flange thickness (FT)		Conditioner flange Diameter	
inches	inches	mm	inches	mm
4	0.25	6.4	6.18	157
6	0.25	6.4	8.50	216
8	0.25	6.4	10.63	270
10	0.25	6.4	12.76	324
12	0.25	6.4	15.00	381
14	0.38	9.5	16.26	413
16	0.38	9.5	18.50	470
18	0.38	9.5	20.98	533
20	0.50	12.7	22.99	584
24	0.50	12.7	27.24	692



Typical Pressure Loss

(Consult factory for specific applications)



Pressure Loss Calculation

Metric

$\Delta P = 0.5 * K * \rho * V^2 / 100000$
where
ΔP is the pressure loss (bar)
K is the loss coefficient (unitless)
ρ is the density (kg/m^3), and
V is velocity (m/s)

Imperial

$\Delta P = 10.792 * K * \rho * V^2 / 100000$
where
ΔP is the pressure loss (psi)
K is the loss coefficient (unitless)
ρ is the density (lb/cft), and
V is velocity (ft/s)

Loss Coefficient

K = 0.55 for the Caldon BFC
K = 2 to 3.2 for typical plate conditioners

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