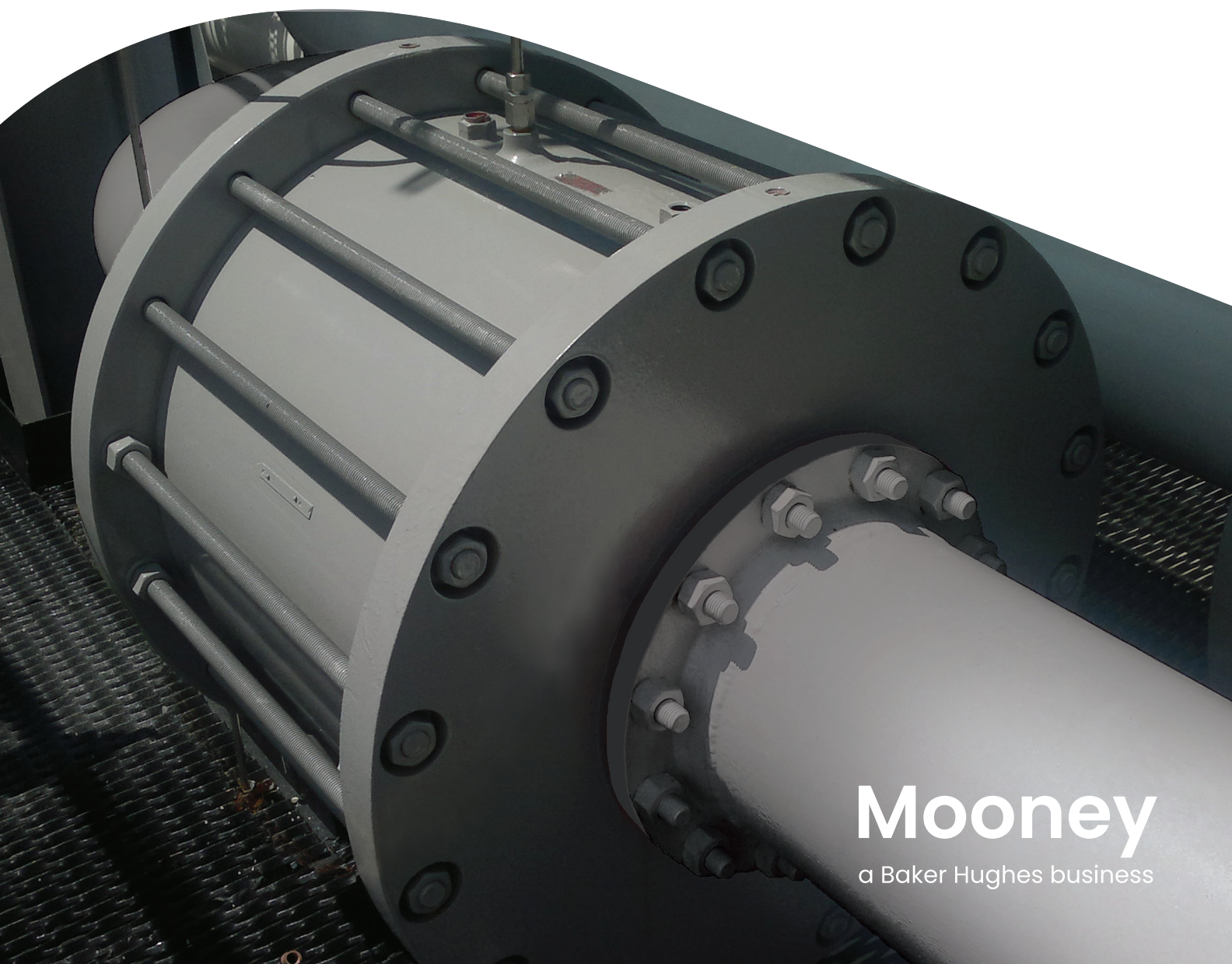


Mooney™ Flexflo™ Surge Relievers

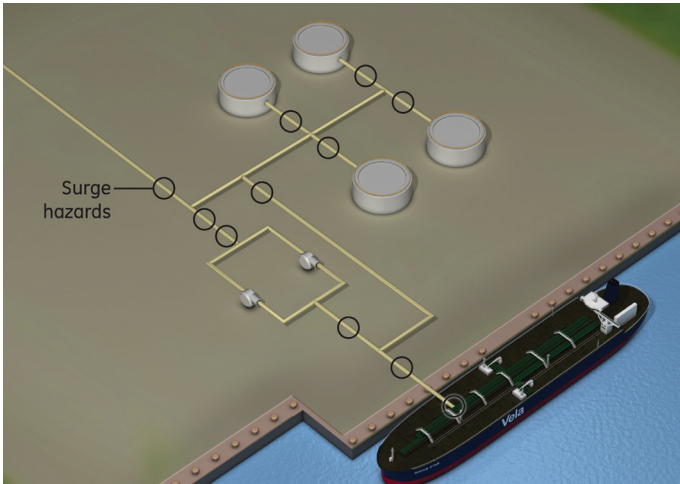
Fast, reliable pipeline protection



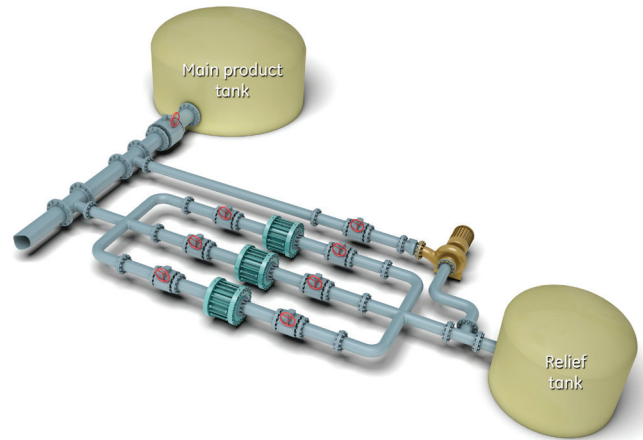
Mooney
a Baker Hughes business

A transient pressure surge develops when there is a change in liquid flow velocity. The greater the change in flow velocity, the higher the pressure will rise. These pressure surges can travel through a pipeline at sonic velocities, and if left unabated, can cause serious damage and costly inspection of the line.





Surge Sources



Typical Application Installation



Surge sources include

- Valves opening and closing
- Pumps starting or stopping
- ESD devices engaging
- Check valves actuating
- Sudden demand variation

Baker Hughes Flexflo Surge Relievers and regulators have been protecting pipelines all around the world for over 50 years. Flexflo Surge Relievers are durable, reliable, and extremely fast acting.

When loaded with nitrogen, Flexflo valves are capable of relieving fast acting transient surges. For overpressure conditions where pressure is building steadily, or in cases with less demanding speed requirements, some models can be operated with a pilot and process fluid. A variety of materials are available to match each individual application.

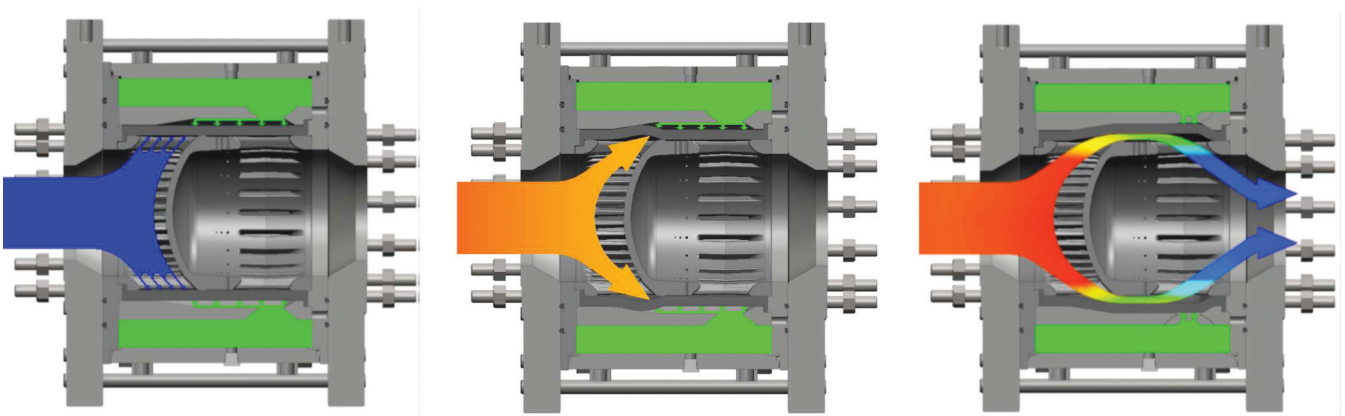
Applications for the Flexflo line include

- Loading/unloading terminals
- Tank farms
- Refineries
- Storage
- Floating production, storage, and offloading (FPSO)
- Offshore platform
- Mining
- Transmission and distribution pipelines
- Power plants

Principles of Operation

Flexflo valves share a common basic principle of operation.

They consist of a slotted core, around which a tube is stretched. This tube is the Flexflo Surge Reliever's only moving part. The process fluid expands the tube and passes through the upstream slots in the core, around the center barrier, and out through the downstream slots. Process fluid or nitrogen (the green area in the illustrations below) is loaded outside the tube to maintain a bubble tight seal while not in operation.



Flexflo Model 887

Product Overview and Applications

The Flexflo Surge Reliever Model 887 was designed specifically to protect against damage from high-speed transient pressure surges. It is the fastest acting valve in the Flexflo line and is a nitrogen-loaded device, typically operated with a Baker Hughes control panel.

Features and Benefits

- Initial opening in under 100 milliseconds, and as low as 20 milliseconds to relieve the fastest system surges
- Single moving part for simple operation and maintenance
- Can relieve minor surges without any fluid flow, which means less fluid into a relief tank
- Achieves bubble tight seal even with small debris or dirt present to prevent leaking
- Controlled closing prevents secondary surges
- Can perform maintenance without taking flanges out of line

Specifications

Sizes (inches) ²	4", 6", 8", 10", 12"
Sizes (DN)	100, 150, 200, 250, 300
Body Materials	Carbon Steel
End Connections	Raised Face Flange, 150, 300, 600 ASME/ANSI B16.5
Working Temperature ¹	-40°F to 212°F (-40°C to 100°C)
Max Operating Differential ¹	1200 psid (83 bar)
Max Emergency Differential ¹	1480 psid (102 bar)
Control Range ¹	0-1480 psig (102 bar)

1. Limited by Flexflo tube selection and control system selection.

2. 16" flanges available.

Capacity table

Valve Size	Class	Performance Curve Slope (C _s)	Maximum Flow Factor (C _v)
4	150/300	2.42	240
	600	1.46	161
6	150/300	4.84	479
	600	3.21	352
8	150/300	8.59	850
	600	6.67	731
10	150/300	11.9	1177
	600	8.25	905
12	150/300	17.39	1720
	600	11.94	1309



Protects against damage from high speed transient pressure surges

Flexflo Model 900TE

Product Overview and Applications

When gas-loaded, the Flexflo Model 900TE can act as a surge reliever. When operated with a pilot, the Model 900TE is used for backpressure control, pressure reduction, differential pressure control, and relief valve applications in liquid and gas. Its top entry design allows for extremely simple in-line maintenance.

Features and Benefits

- Top entry design for easy in-line maintenance
- Single moving part for ease of operation and maintenance
- Low noise
- Rugged design for a long service life

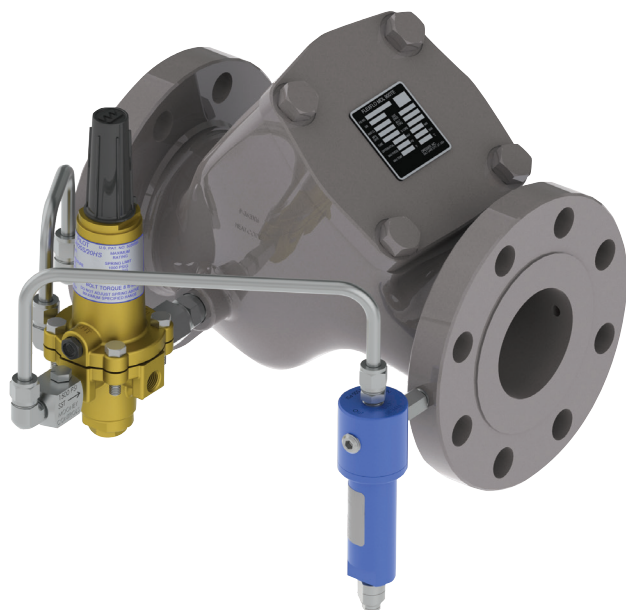
Specifications

Sizes (inches)	2", 3", 4", 6"
Sizes (DN)	50, 80, 100, 150
Body Materials	Carbon Steel
End Connections	Raised Face Flange, 150, 300, 600 ASME/ANSI B16.5
Working Temperature ¹	-40°F to 212°F (-40°C to 100°C)
Max Operating Differential ¹	1200 psid (83 bar)
Max Emergency Differential ¹	1480 psid (102 bar)
Control Range ¹	0-1480 psig (102 bar)

1. Limited by Flexflo tube selection and control system selection.

Capacity table

	2"	3"	4"	6"
C_v (Full Open)	58	94	128.5	304
X_t (Gas)	0.46	0.5	0.46	0.55
F_L (Liquid)	0.74	0.77	0.73	0.81



Allows for extremely simple in-line maintenance

A Trusted Business Partner

A name synonymous with quality, Baker Hughes is a trusted global partner for companies around the world. With a broad range of products and services, Baker Hughes integrated solutions and unique expertise help manage and overcome important challenges in an ever-evolving industry, while ensuring the responsible and sustainable resource savings our customers have come to expect. Through innovation, breakthrough technology and dedicated teams of global experts, we help you successfully compete—and win—in today's natural gas and industrial landscape.

Control Options



Pilot Operated

Pilot operated systems use process fluid to control the valve.



Control Panel

A control panel loads nitrogen, compensates for temperature changes and alerts the user when the nitrogen supply is low.



Loading block

A loading block loads the jacket of the valve with nitrogen at a set point.

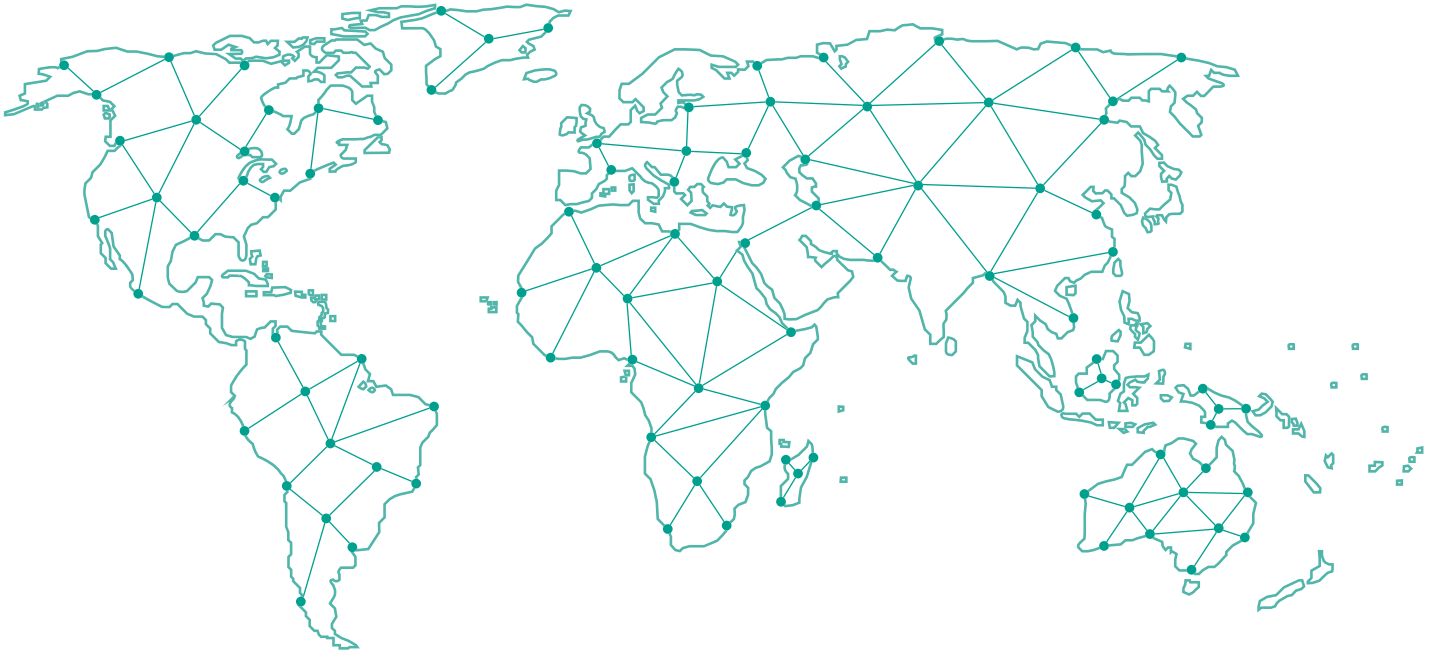


Capacity Boosting Panel

A capacity boosting panel works as a control panel until a certain overpressure amount is reached. At that point, it allows nitrogen to escape the jacket so the tube can open more, increasing capacity at that overpressure percentage. This control device can also feature alarm and test functions.

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