

# Flexflo\* Surge Relievers

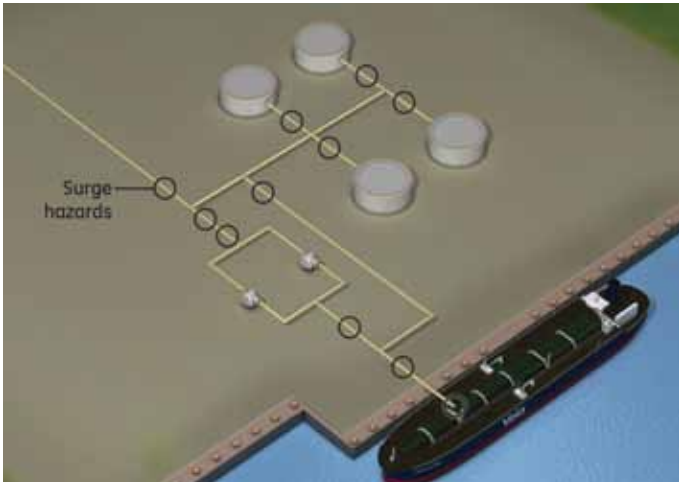
Fast, reliable pipeline protection



imagination at work

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 INCLUDE

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

GE Flexflo Surge Relievers and regulators have been protecting pipelines all around the world for over 40 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.

Surge Sources

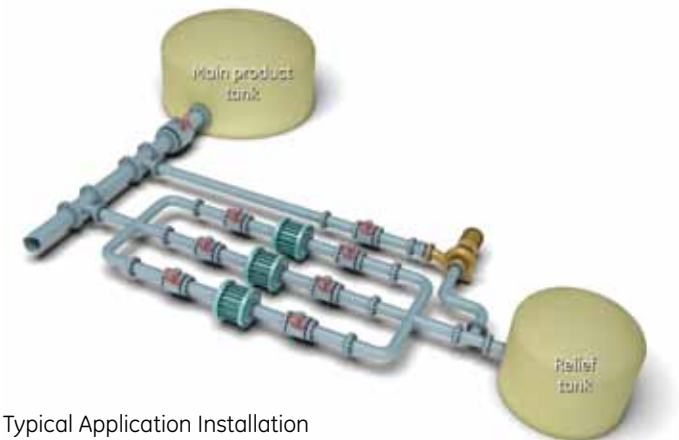
#### APPLICATIONS FOR THE FLEXFLO LINE INCLUDE

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

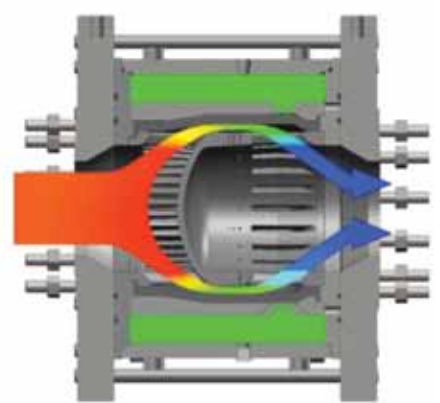
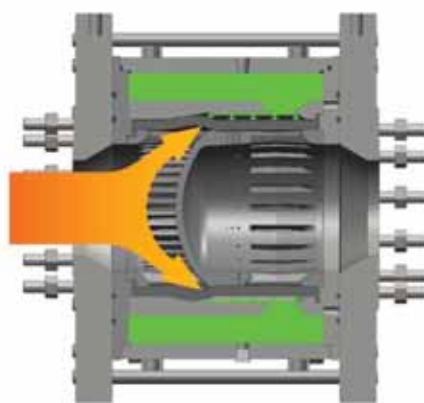
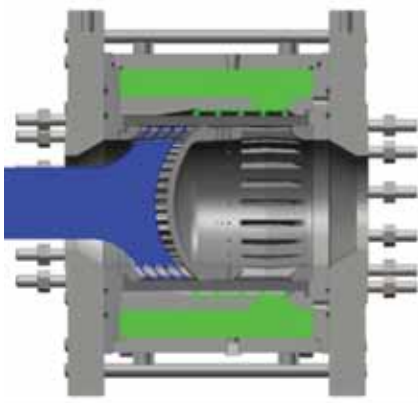
#### PRINCIPLES OF OPERATION

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.



Typical Application Installation



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

<sup>1</sup>Limited by Flexflo tube selection and control system selection.

<sup>2</sup>16" flanges available.

## CAPACITY TABLE

Valve Size	Class	Performance Curve Slope (C <sub>s</sub> ) (gsm)	Maximum Flow Factor (C <sub>v</sub> ) (gpm)
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 80

## PRODUCT OVERVIEW AND APPLICATIONS

The Flexflo Model 80 is used as a liquid, surge reliever, a backpressure control device and pressure reducing regulator for liquids and gas. The Model 80 does not have the annular space around the tube and core that the Model 887 has, and therefore is not as fast as the Model 887. The Model 80 can be operated with a Mooney Series 20 pilot or with a nitrogen source.

## FEATURES AND BENEFITS

- Millisecond speed of response – initial response typically under 200 milliseconds to relieve system surges
- One moving part (tube) for simple operation and maintenance
- Rugged design
- Bubble tight seal to prevent leaking
- Low noise
- Controlled closing prevents secondary surges
- Can relieve minor surges without any fluid flow, which means less fluid into a relief tank

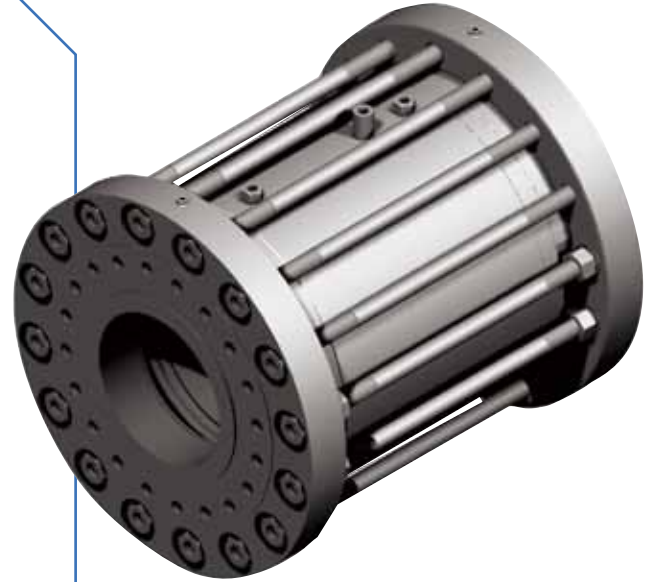
## SPECIFICATIONS

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

<sup>1</sup>Limited by Flexflo tube selection and control system selection.

## CAPACITY TABLE

Working Pressure	Size	Cv (W Body)	Cp (N Body)	Xt
Class 150	4	283	230	0.357
	6	564	528	0.395
	8	1000	910	0.385
	10	1385	1145	0.400
	12	2020	1610	0.400
Class 300	4	283	245	0.365
	6	564	528	0.393
	8	1000	910	0.385
	10	1385	1145	0.499
	12	2020	1610	0.400
Class 600	4	121	95	0.365
	6	262	207	0.360
	8	742	642	0.390
	10	990	742	0.395
	12	1437	1072	0.400



THE ORIGINAL  
FLEXIBLE ELEMENT  
REGULATOR

## SKID CAPABILITIES



Through a global network of skid partners, GE can design and fabricate your entire surge relief system.

# 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

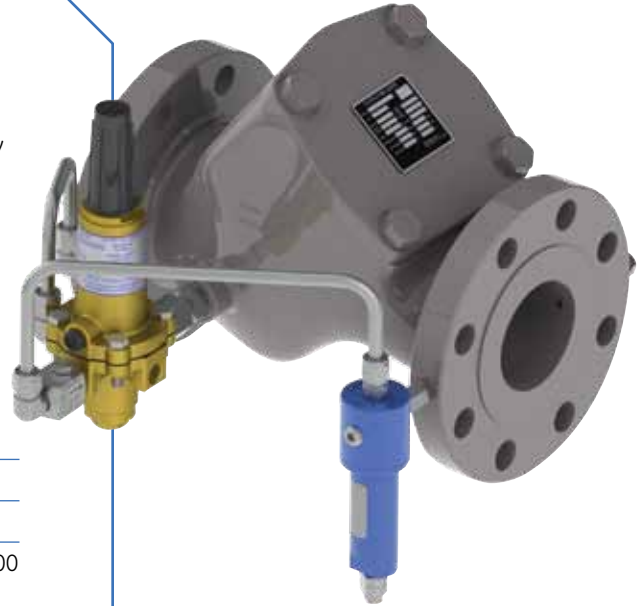
Sizes (inches)	2", 3", 4", 6"
Sizes (DN)	50, 80, 100, 150
Body Materials	Carbon Steel
End Connections	Raised Face Flange, 150, 300, 600 ANSI ASME/ANSI B16.10
Working Temperature <sup>1</sup>	-40°F to 212°F (-40°C to 100°C)
Max Operating Differential <sup>1</sup>	1200 psid (83 bar)
Max Emergency Differential <sup>1</sup>	1480 psid (102 bar)
Control Range <sup>1</sup>	0-1480 psig (102 bar)

<sup>1</sup>Limited by Flexflo tube selection and control system selection.

## CAPACITY TABLE

	2"	3"	4"	6"
Cv (Full Open)	58	94	128.5	304
Xt (Gas)	0.46	0.5	0.46	0.55
FL (Liquid)	0.74	0.77	0.73	0.81
Max Q** (GPM)	300	660	1175	2644

\*\*Max Q based on velocity of 30 ft./sec. for optimal tube life. To adjust Max Q, divide by  $\sqrt{G}$ .



ALLOWS FOR  
EXTREMELY  
SIMPLE IN-LINE  
MAINTENANCE

# Flexflo Model 83

## PRODUCT OVERVIEW AND APPLICATIONS

When gas-loaded, the Model 83 can act as a surge reliever. When operated with a pilot, the Model 83 is used for backpressure control, pressure reduction, differential pressure control, and relief valve applications in liquid and gas. Its stainless steel construction makes it ideal for corrosive environments.

## FEATURES AND BENEFITS

- Single moving part for ease of operation and reliability
- Stainless steel construction for corrosive service
- Compact size
- Rugged design for a long service life
- Low noise

## SPECIFICATIONS

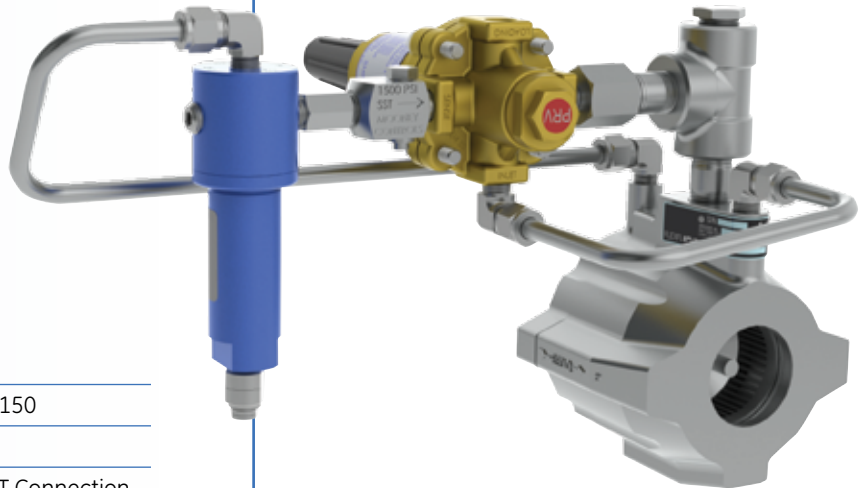
Sizes (inches)	1", 1.5", 2", 3", 4", 6"
Sizes (DN)	25, 40, 50, 80, 100, 150
Body Materials	Stainless Steel
End Connections	1" Screwed End NPT Connection 1.5"-6": Raised Face Flangeless
Working Temperature <sup>1</sup>	-40°F to 212°F (-40°C to 100°C)
Max Operating Differential <sup>1</sup>	1200 psid (83 bar)
Max Emergency Differential <sup>1</sup>	1480 psid (102 bar)
Control Range <sup>1</sup>	0-1480 psig (102 bar)

<sup>1</sup>Limited by Flexflo tube selection and control system selection.

## CAPACITY TABLE

	1"	1.5"	2"	3"	4"	6"
Cv (Full Open)	12	47	77	155	234	390
Xt (Gas)	0.5	0.64	0.56	0.46	0.5	0.47
FL (Liquid)	NA	0.87	0.82	0.74	0.77	0.75
Max Q** (GPM)	75	400	750	1500	2250	3800

\*\*Max Q based on velocity of 30 ft./sec. for optimal tube life. To adjust Max Q, divide by  $\sqrt{G}$ .



IDEAL FOR  
CORROSIVE  
ENVIRONMENTS

# CONTROL OPTIONS



## PILOT OPERATED

Pilot operated systems use process fluid to control the valve.



## LOADING BLOCK

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



## CONTROL PANEL

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



## 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.

## A Trusted Business Partner

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