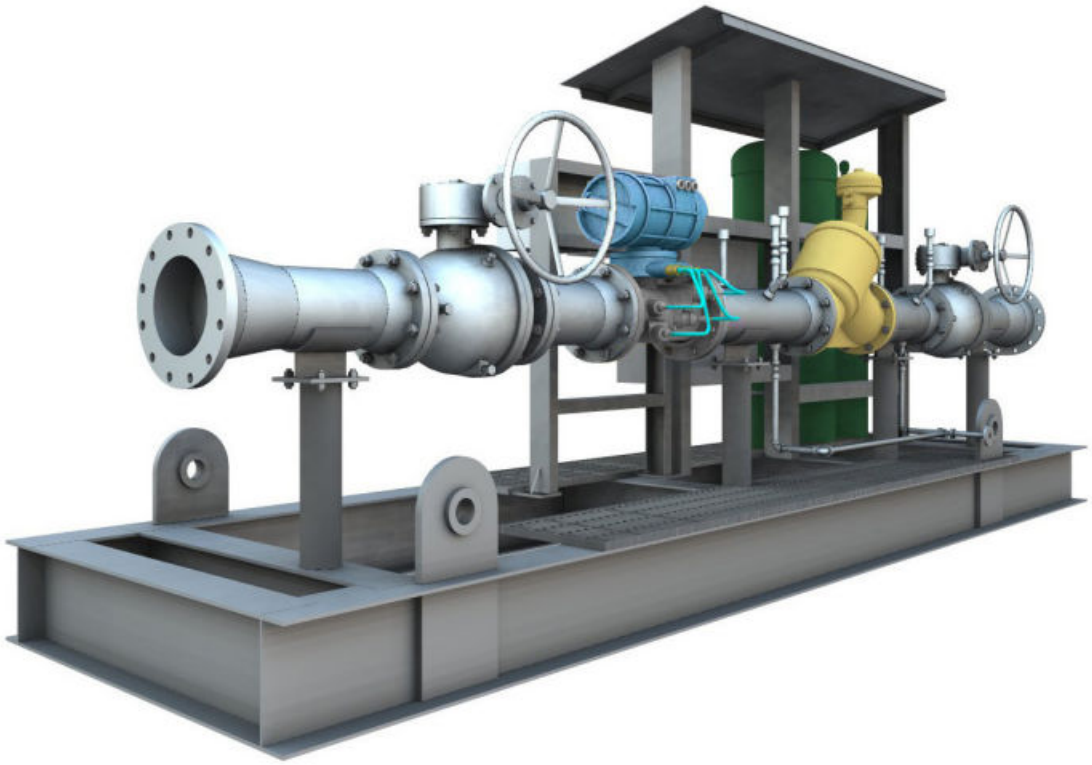
Product Data Sheet
00813-0100-3566, Rev AB
December 2022

Emerson's Surge Relief Systems

The total solution



EMERSON

Surge Relief Systems

Compact reliable integrated safety solutions

Protect your assets by ensuring pipeline integrity. Emerson's Surge Relief Systems combine field proven technologies and deep application expertise to ensure a total solution that offers the ultimate line of defense for surge protection. Each system delivers exceptional value by continuously regulating and controlling maximum pipeline pressures to protect assets and extend the lifecycle of equipment.

Applications

- Liquid pipelines
- Refineries
- Tank farms
- Marine loading and unloading
- Terminals
- Floating, Production, Storage and Off-loading (FPSO)

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Features and benefits

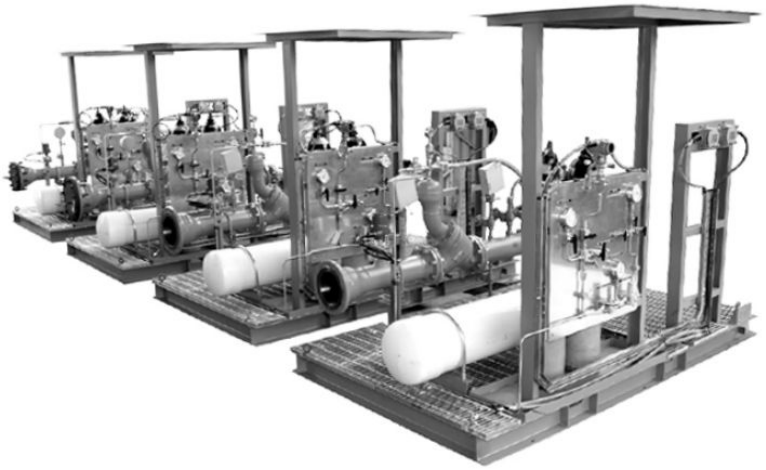
- Packaged, easy-to-integrate total solution for surge detection and measurement
- Exceptionally fast response speed
- Integrated Nitrogen supply and control system designed to optimize valve performance
- Minimal Nitrogen consumption
- Tight and stable set point control
- Tolerent of dirty or viscous products
- High flow capacity reduces system size and weight
- 45° piston valve operation minimizes maintenance
- Inline testing port
- Factory tested to ensure system integrity
- Lifecycle service system audits and services

Principles of operation

Emerson's Surge Relief Systems are fast-acting, high capacity systems designed to track and abate surge pressures. Each system utilizes a surge relief control valve and a Nitrogen control system composed of other core Emerson technologies that work in tandem to quickly open and relieve surge pressure from the line.

The control valve is a normally closed valve and a light spring combined with pressurized Nitrogen gas on the valve piston keeps the valve in the closed position during normal operating conditions. The pressurized Nitrogen gas is maintained under tight set point control and is regulated by the Nitrogen control system, which is a closed loop system comprised of Nitrogen supply bottles, a Nitrogen control panel, and a plenum.

The control panel features TESCOM regulators designed to efficiently maintain the accuracy and stability of the Nitrogen set point and minimize Nitrogen consumption. The system operates on a hydraulically balanced-piston principle. When the line pressure on the inlet side of the valve exceeds the Nitrogen gas pressure and force of the spring on the piston, the valve will quickly begin to open and relieve the surge pressure. Once the surge pressure is relieved, the valve will close again.



Specifications and materials of construction

If your requirements are outside the specifications noted below, then please consult our system specialists . Depending on the application, other material offerings may be available. For world area locations and contact information, refer to the back cover.

System specifications

Characteristics

- Gas loaded surge relief valve
- Nitrogen control and supply system
- Complete field instrumentation
- Millisecond response time
- Inline testing port
- Surge relief and/or measurement
- Stream manual isolation valves
- Flow meter (optional)
- All piping and supports

Mechanical ratings

Pipeline surge system sizes

- 100 mm to 1250 mm (4-in to 50-in)

Valve sizes

- 50 mm to 400 mm (2-in to 16-in)

Temperature(1)

- -29 °C to +66 °C (-20 °F to +150 °F)

Table 1: Flow capacity (Cv)

Nominal meter size	GPM	m^3/hr
DN50 (2-in)	86	20
DN75 (3-in)	186	42
DN100 (4-in)	309	70
DN150 (6-in)	688	156
DN200 (8-in)	1,296	294
DN250 (10-in)	2,040	463
DN300 (12-in)	2,920	663

(1) Subject to material specifications.

Table 1: Flow capacity (Cv) *(continued)*

Nominal meter size	GPM	m^3/hr
DN400 (16-in)	5,360	1,217

Table 2: Flange connections/ratings

150 ANSI MWP at +38 °C (+100 °F)	300 ANSI MWP at +38 °C (+100 °F)	600 ANSI MWP at +38 °C (+100 °F)
285 psi	740 psi	1,480 psi
20 kg/cm^2g	54 kg/cm^2g	104 kg/cm^2g

Table 3: Paint specifications

Carbon Steel External Surface Non-Insulated with Temperature	<+100 °C	+100 °C to +200 °C
Blast Clean	SA 2.5 (Profile 50-75Mic)	SA 2.5 (Profile 50-75Mic)
Primer	Zinc-rich epoxy	Inorganic Zinc Silicate
Intermediate	Epoxy MIO	-
Finish	Polyurethane Acrylic	Aluminium Silicate

Material specifications

Table 4: Structural material: ASTM A36 Carbon Steel

150 ANSI	300 ANSI	600 ANSI
-29 °C to +149 °C (-20 °F to +300 °F)	-29 °C to +149 °C (-20 °F to +300 °F)	-29 °C to +427 °C (-20 °F to +800 °F)
20 to 16 kg/cm^2g	52 to 46 kg/cm^2g	104 to 58 kg/cm^2g

Piping material

- Carbon steel base ASTM A106

Control valve material

Main valve body

- ASTM A352 Gr LCC steel

Main valve cylinder: 150 to 600 ANSI

- Stainless steel, 50 mm to 100 mm (2-in to 4-in)
- Steel, nickel coated, 150 mm to 400 mm (6-in to 16-in)

Main valve piston

- Stainless steel standard 50 mm to 400 mm (2-in to 16-in)

Seat ring

- Stainless steel on 600 ANSI 50 mm to 400 mm (2-in to 16-in)
- Steel, nickel coated on 150 to 300 ANSI 50 mm to 400 mm (2-in to 16-in)
- O-Rings

  - Standard: Viton® Dynamic, Buna-N Static
  - Optional: Neoprene, EPR, all Viton, GFLT, all Buna-N, aggresive product (AP) options
- Other internal parts: Stainless steel
  - Reservoir: ASTM A333 carbon steel
  - Cylinder head: ASTM A516 Gr 70
  - Elbow, cap, reducers: ASTM A350 LF2
  - Studs and nuts: A193 Gr BT, 194 Gr 2H

Approvals

- NACE

Ordering Information

Online product configurator

Many products are configurable online using our Product Configurator. Select the **Configure** button or visit our website to start. With this tool's built-in logic and continuous validation, you can configure your products more quickly and accurately.

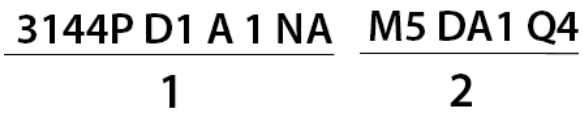
Specifications and options

For more details on each configuration, see the Specifications and options section. The purchaser of the equipment must specify and select product materials, options, or components. For more information, see the Material selection section.

Model codes

Model codes contain the details related to each product. Exact model codes will vary. An example of a typical model code is shown in the following figure.

Figure 1: Model Code Example



1. Required model components (choices available on most)
2. Additional options (variety of features and functions that may be added to products)

Optimizing lead time

The starred offerings (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Required model component

Valve type

Code	Description
765	Control Valve

Line size

Code	Description
02	DN 50 (2-in.)
03	DN 75 (3-in.)
04	DN 100 (4-in.)
06	DN 150 (6-in.)
08	DN 200 (8-in.)
10	DN 250 (10-in.)
12	DN 300 (12-in.)
16	DN 400 (16-in.)

Class code

Code	Description
1	1 - 150 #
2	2 - 300 #
3	3 - 600 #

Flow configuration

Code	Description
1	1 - 1 X 100%
2	2 - 2 X 50%
3	3 - 3 X 33%

Primary feature

Code	Description
S	Surge Relief
M	Surge Relief and Flow Measurement

Note
This is for informational purposes only. Please consult factory for assistance in designing your optimal Surge Relief System.

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For more information: **Emerson.com**