SPARTAN CONTROLS

SpartanPRO™ Surge Relief

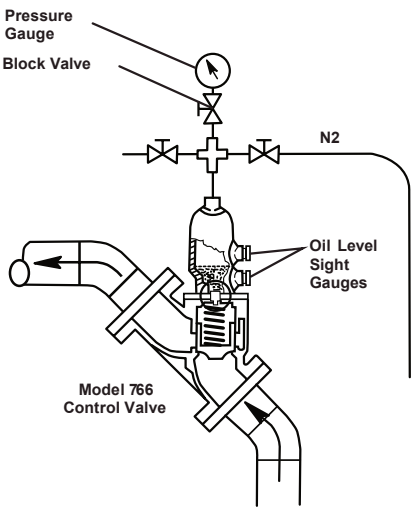
Nitrogen Pressure Control System

The SpartanPRO™ Surge Relief is a highly accurate pressure control panel designed for the control of pipeline surge relief valves. The panel is optimized for low maintenance, low cost of ownership, and easy integration. It supplies one or more surge relief valve simultaneously with up to 0.5 psig accuracy.

Overview

During normal operation, liquid pipeline surge events are caused by rapid changes in flow rate due to opening or closing valves, starting, and stopping pumps, or the activation of ESD devices.Therefore, it is imperative to have reliable surge relief in place to prevent leaks, damages, and injuries.

The purpose of a surge relief loading system is to control the nitrogen gas used to operate the relief valve. These valves need to be fast acting and relied upon to open fully in the event of a surge. Nitrogen gas is used to pressurize the valve piston and keep it in the closed position during normal operation. As pipeline pressure increases, the spring and gas pressure is overcome, and the valve opens.



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The SpartanPRO™ Surge Relief was developed to meet industry needs. It consists of an electronic pressure controller, color touchscreen HMI, digitally-controlled solenoid valves, a single stage high-pressure letdown regulator, flow metering valves, pressure relief valves, high-pressure nitrogen gas supply cylinders and plenum cylinders. Each are installed within a heated and insulated NEMA 4 cabinet, certified for Class 1, Div 2 / Zone 2 hazardous area locations.

Features& Benefits

- Maximize product throughput by enabling operation closer to pipeline pressure limits
- Eliminate setpoint drift associated with regulator-based systems
- Lower maintenance costs by reducing site visits
- Continuous health diagnostic reporting
- Embedded processor for fully autonomous operation
- Intuitive, simple front panel user interface allows access to each function
- Reduce operating costs by lowering nitrogen consumption
- Minimize unnecessary relief events by using reliable and fault-tolerant system components

SpartanPRO™ Surge Relief leads the industry in performance, functionality and reliability. Designed, manufactured, and supported by Spartan Controls, Western Canada's leading process automation provider.

Applications

- Liquid Pipeline
- Refineries
- Terminals
- Marine Loading
- Tank Farms

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Advantages

Accurate nitrogen pressure control

- Reliable surge overpressure protection, even at pipeline pressures close to maximum allowable operating pressures
- No setpoint drift normally associated with regulator-based designs
- Advanced dual PID pressure control
- Digital setpoints, alarm limits, and deadband

Extremely low nitrogen consumption

- Up to 1 year per nitrogen supply cylinder
- Continuous monitoring of remaining nitrogen
- Alerts and alarms of abnormal nitrogen supply and plenum pressures or excessive consumption

Full color touchscreen operator interface

- Intuitive graphic-based operation
- Full configuration capability from screen – no laptop required
- Real-time and historical trends
- Low ambient temperature and bright sunlight display

Robust and fault-tolerant design

- Redundant high-cycle solenoid valves
- Solenoid valve cycling duty optimization
- Abnormal event alarms
- Automatic preservation of plenum pressure on loss of power, loss of nitrogen supply, or system fault detection
- Upon power failure, the system will automatically switch to manual pressure control

Advanced remote connectivity

- Local PLC connectivity (Modbus over ethernet)
- Cellular connectivity
- Monitoring for operation, events, trends, nitrogen consumption
- Alarms and alerts
- Remote troubleshooting
- Downloadable historical data and alarm summary

Specifications

Value	
Pressure control accuracy	+/- 3.5 kPag (+/- 0.5 psig)
Adjustable N2 loading setpoint	70 to 4950 kPag (10 to 720 psig)
Configurable deadband	3.5 to 175 kPag (0.5 to 25 psig)
Performance	
Nitrogen consumption	Typically, less than 30 SL per day (based on average conditions)
Cylinder life	Typically, 6-12 months per bottle
History collection sample rate	5 seconds
History storage size	6 months
Environmental	
Ambiant operating temperature	-40° to 60°C (40 to 140 °F)
Communications	
Remote communications	Cellular modem
Digital communication outputs	Modbus RTU, RS485, and Ethernet IP
Electrical rating	
Power requirements	120 VAC, 60 Hz, 8 amps
Hazardous area classification	Class I, Zone 2, EX IIA/IIB T3 (Class I, Div 2, Groups C, D T3)
Electrical certification	cETLus
Physical	
HMI display	7" LCD touch screen
Cabinet type	NEMA 4, 12 GA steel, white powder coat epoxy paint
Supply cylinder pressure	K or T size supply bottles, CGA 580 (Panel holds two parallel bottles) 15168 kPag (2,200 psig) – Optional high pressure up to 5,000 psig
Plenum cylinder water volume	Qty 2, 66.7 liter (2.36 cu. ft.)
Cabinet dimensions	1780mm W x 864mm D x 1980mm H (70" W x 34" D x 78" H) (including lifting lugs and HMI door)
Weight	Approx. 453 kg (1,000 lbs) excluding cylinders
Outlet gas port connector	¾" Swagelok tube fitting

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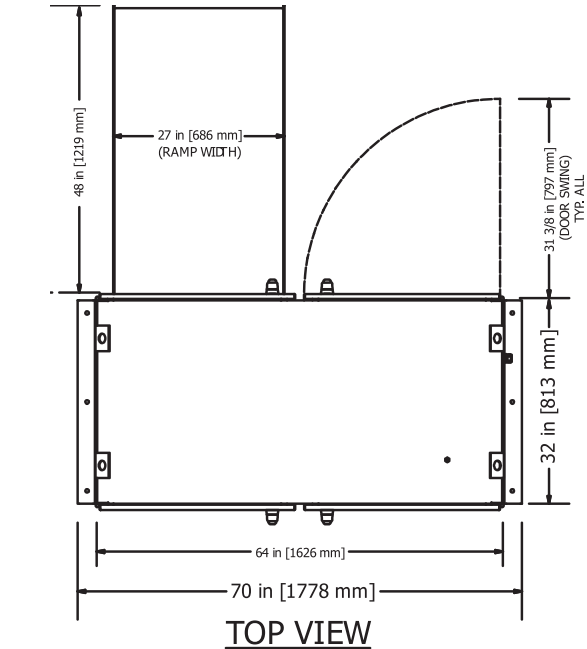
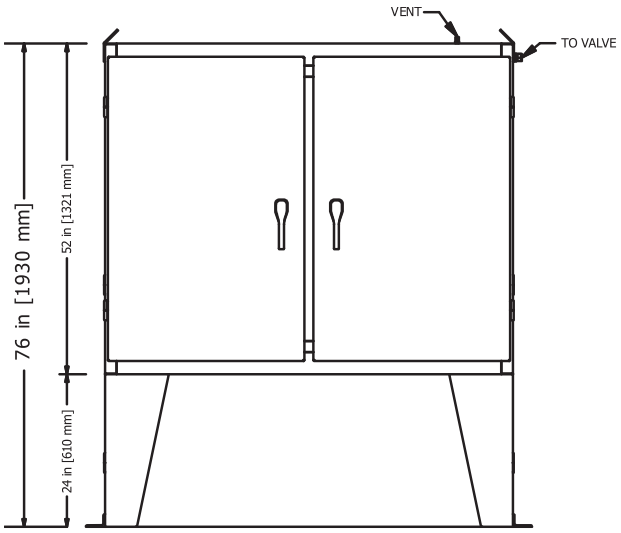
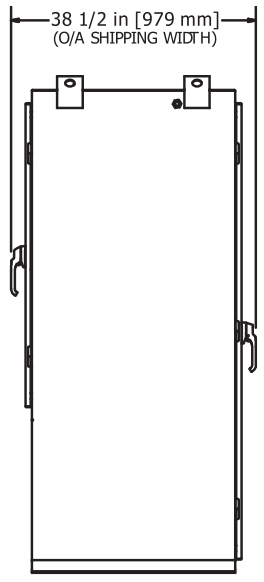
Dimensions



TOP VIEW



FRONT VIEW



RIGHT SIDE VIEW