



SlipStream®

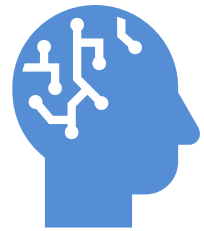
Low Pressure Vent Capture
EPA approved option for reciprocating compressor
rod packing by routing emissions to a process

Challenge, Solution, and Value



Challenge

- Increased regulation around monitoring/controlling methane (CH₄) and volatile organic compounds (VOC)
- Reducing or eliminating low pressure, low-flow vent gas is a challenging task
- Lowering Green House Gas (GHG) emissions footprint
- Near atmospheric pressure emissions capture and utilization



Solution

- Patented SlipStream technology
- Redirects low-pressure vented hydrocarbon emissions, including CH₄ and VOCs, to a natural gas engine to be used as a secondary fuel source



Value

- Engine air-fuel ratio control performance, emissions, and reliability are unaffected
- Return on investment through fuel savings, carbon credit offset programs, and reduced exposure to carbon tax
- No recompression requirement of vented gas
- High destruction efficiency of CH₄ and VOCs
- Continuous monitoring and destruction of vented emissions
- Less testing

Applications and Vent Gas Sources

Applications

SlipStream can be installed on most industrial natural gas carbureted 4-cycle engines. The system is not applicable on most fuel-injected and all 2-cycle engines.

Vent Gas Sources

Vented emissions are found at most compression facilities involved in the production, processing, and transportation of natural gas. Methane is one of the most common vented gases found at these facilities. At this time SlipStream is not suitable for use with vent gasses containing H₂S.



Sources Include:

- Compressor packing vents
- Instrument gas vents
- Petroleum liquid storage tanks
- Dehydrators
- Pneumatic pumps



Benefits of Combusting Vented Gas in Engines

Fuel Replacement

- SlipStream has the capability to supply up to 10% of the total fuel used by an engine

Methane (CH₄) Destruction; Green House Gas Reduction

- Vented gas typically consists of 95% methane

Volatile Organic Compounds (VOC) Destruction

- > 99% destruction

Benzene, Toluene, Ethylbenzene and Xylene (BTEX) Destruction

- > 99% destruction

Odor Elimination!

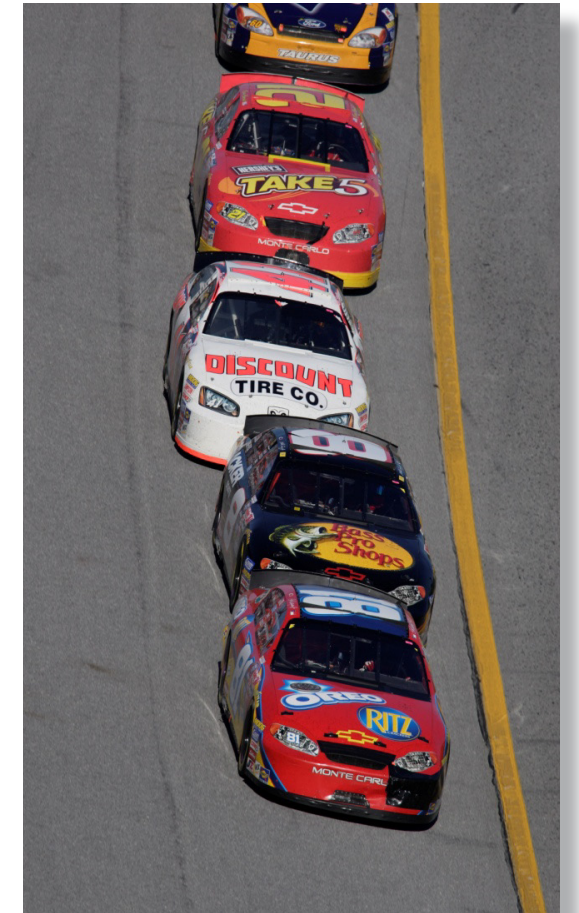


SlipStream® Technology Overview

- No vent gas compression required
- Continuously measures vent gas flow and records totals and averages
- Can provide up to 10% of total engine fuel required
- Minimal back pressure on vent gas source(s)
- No impact on engine reliability
- Multiple process hazard reviews completed

Six Flow Ranges Available

SCFH	kg/hr
240	5
385	8
673	14
1251	26
1588	33
2070	43

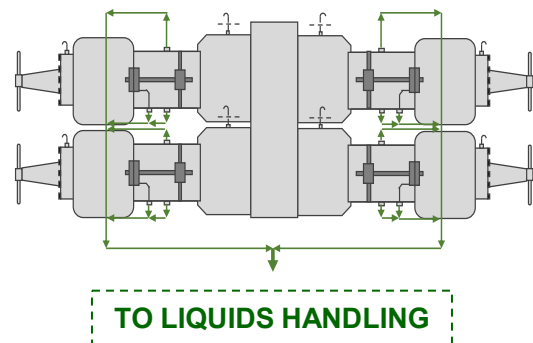


GET A FREE BOOST!

SlipStream® Design and Safety

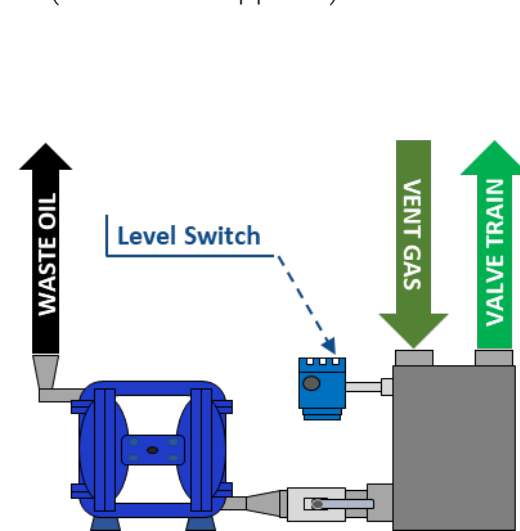
Vent Gas Capture

Captures vent gases from hydrocarbon sources and directs them to the liquids handling system.



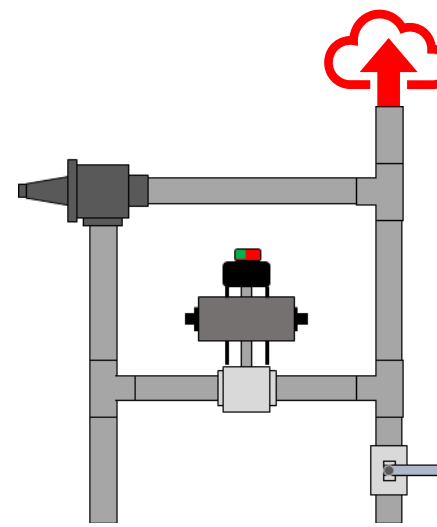
Liquids Handling

Captured vent gases are directed through a vessel where liquid dropout occurs. A level switch controls liquids pump out. (Customer supplied.)



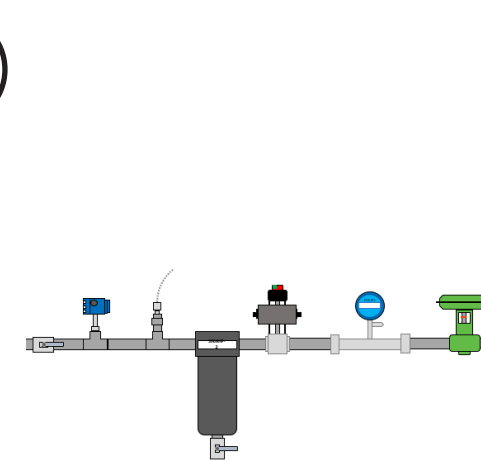
Over Pressure Relief

Provides over-pressure protection for the vent source and SlipStream valve train. (Customer specified.)



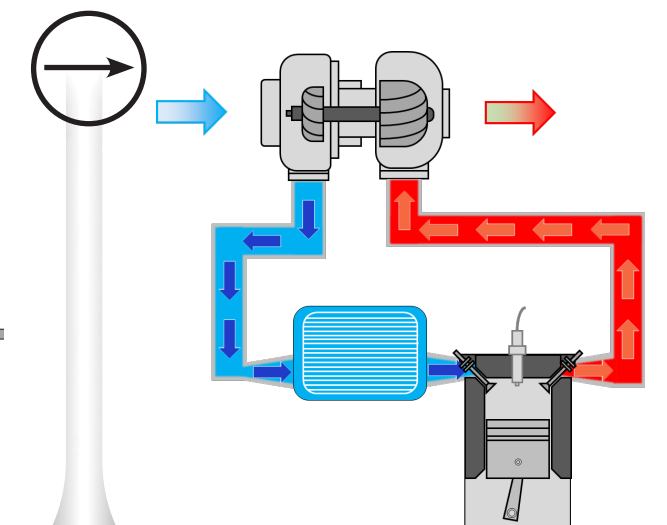
Valve Train

Monitors and controls the delivery of vent gas to the engine based off of vent gas pressure and flow rate.

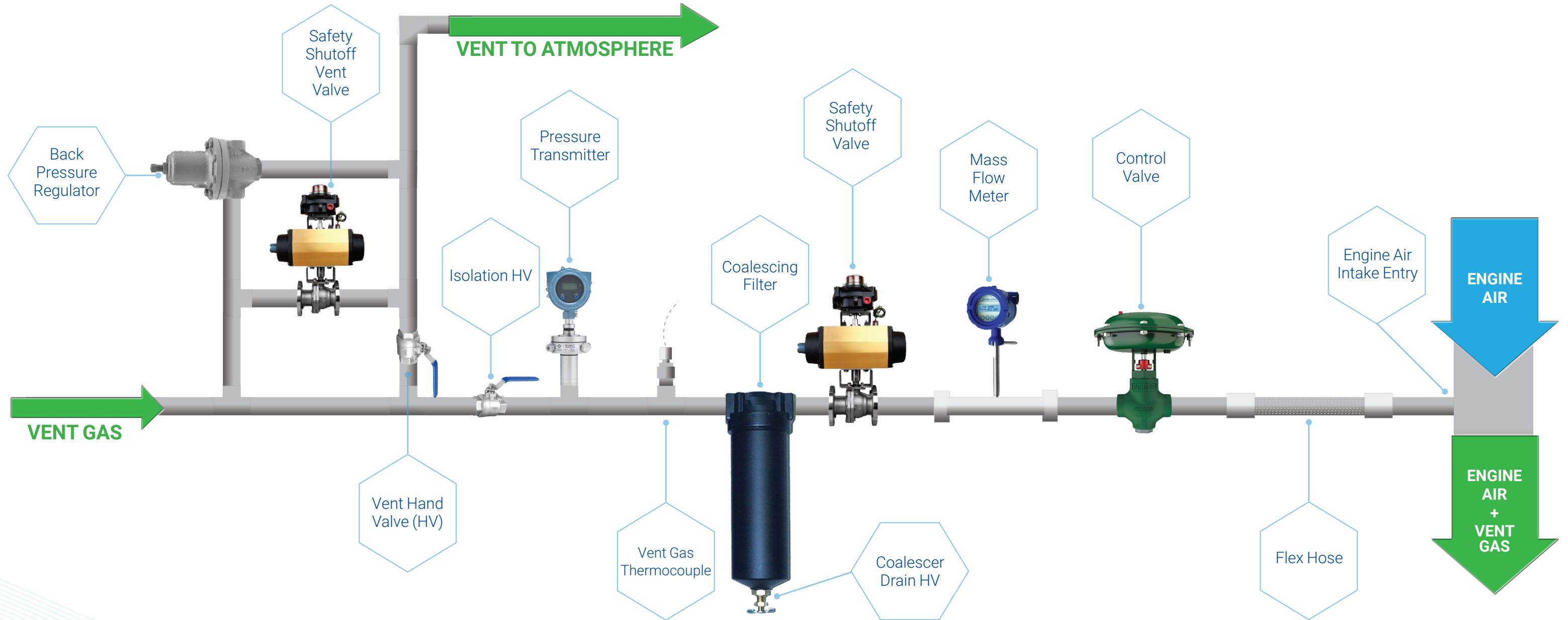


Engine Air Intake

Vent gas delivered to the low-pressure side of the engine air intake allowing for the entrainment of near atmospheric pressure vent gas.



SlipStream® Technology Overview



SlipStream® is Available in Three Hardware Platforms/Configuration

SlipStream®



Stand-Alone SS10

- Built-in PLC and I/O
- Ethernet communications
- Sixnet/Red Lion PLC platform
- Integrated I/O
- Pro-face HMI
- Optional engine communication



REMVue®



REMVue-500

- Sixnet/Red Lion PLC platform
- SlipStream integrated into main controller – Pro-face HMI
- All compressor and SlipStream® information on one HMI

Spartan AB PLC



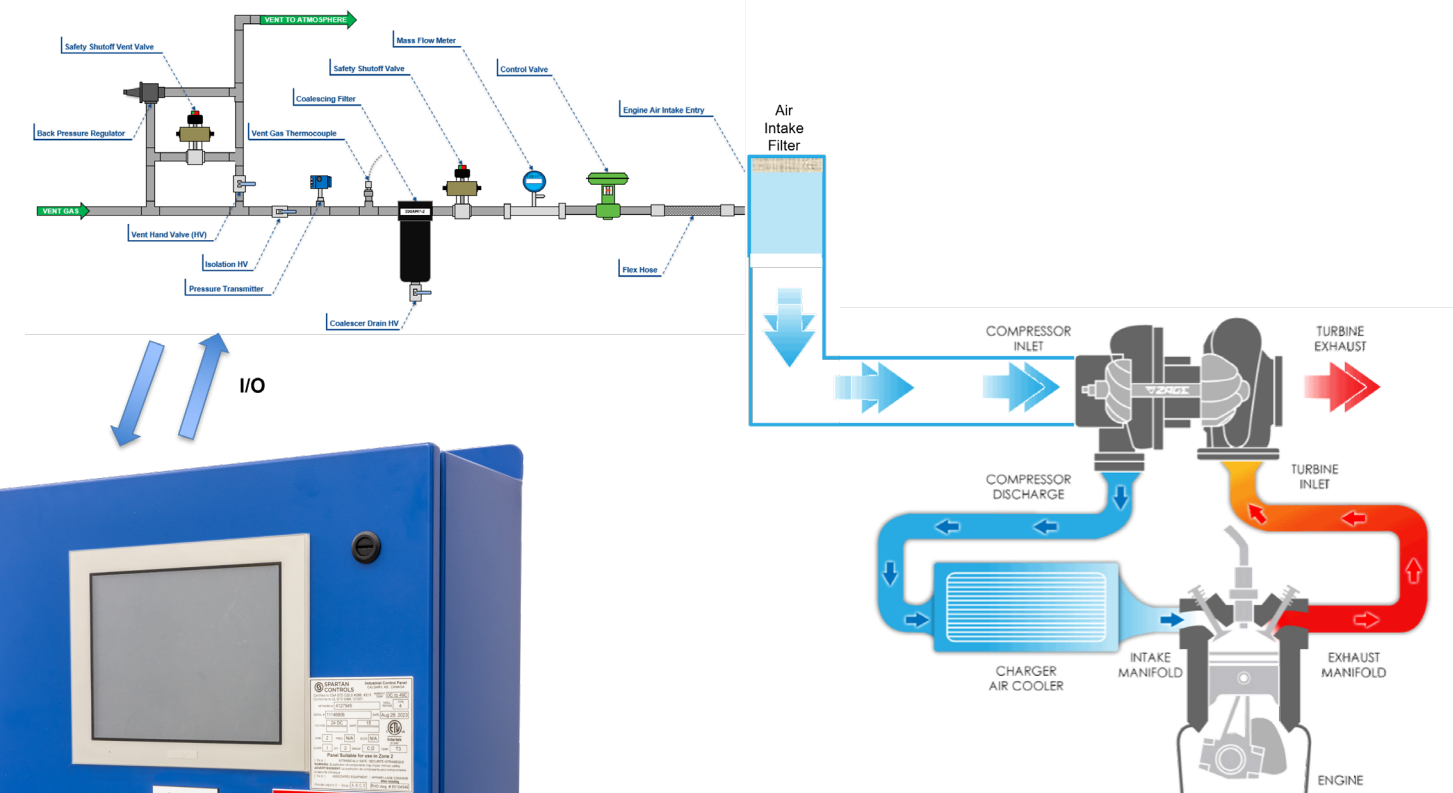
Allen-Bradley PLC

- Allen-Bradley CompactLogix or ControlLogix PLC platform
- SlipStream integrated into main controller – PanelView Plus or Pro-face HMI
- All compressor and SlipStream information on one HMI

Waukesha 9390 with Integrated Compressor Control and SlipStream®



SlipStream® Operation





Features

- Easy to install
- Safely controls SlipStream gas addition to engine fuel
- Real-time flow and greenhouse gas calculations
- Measures vent gas flows and provides totals
- Designed for undiluted gas (i.e., no air mixed with gas)
- PLC base design with Ethernet Modbus
- Does not affect engine or emission performance
- EPA approved option for reciprocating compressor rod packing by routing emissions to a process
- High flow alarm
- Designed for variable gas flow and heat content
- Minimal back-pressure on vent gas source
- Does not affect engine up-time or emissions

Reduced Environmental Effect

Use free fuel to become emissions free. Vented hydrocarbon emissions are found at most compression facilities involved in the production, processing and transportation of natural gas. One of the most common vented gases found at these facilities is methane, a greenhouse gas significantly more potent than carbon dioxide.

SlipStream SS10 technology uses vented emissions as supplementary fuel.





Experience Industrial Innovation



Call us or request a quote online 24/7

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