



VRG CONTROLS

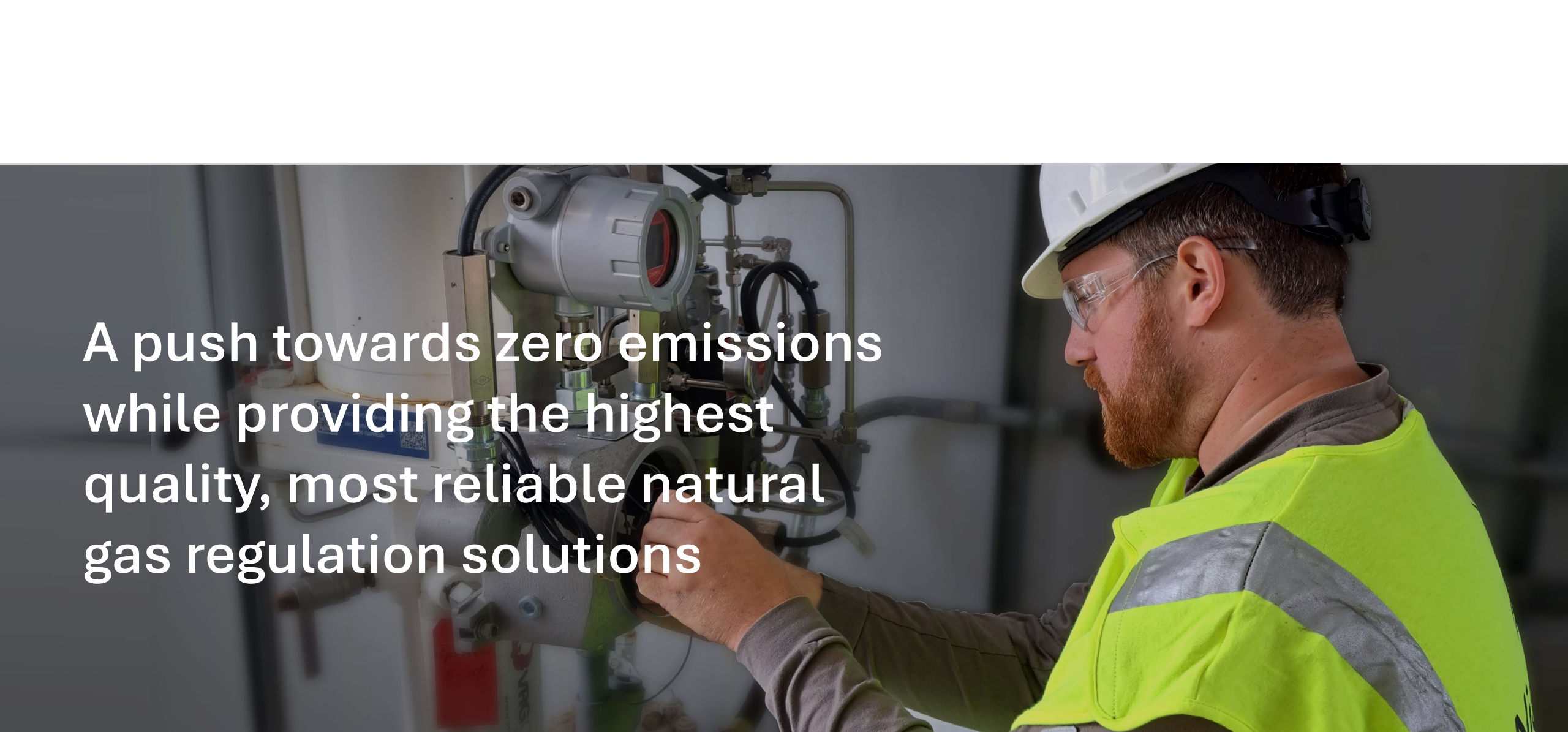
More Expertise. Less Emissions.

Emissions Reduction Technologies

01/18/24



Platinum Natural Gas Solutions | 101 W. Eagle Rd. Ste 237 | Havertown, PA 19083 | 484.897.0345 | info@ptngs.com | ptngs.com



A push towards zero emissions while providing the highest quality, most reliable natural gas regulation solutions

Background Information - 0000b/c Legislation

NEW Legislation

- Natural Gas Control Valves Commonly Utilize Pneumatic or Electro-Pneumatic Power Sources for Operation
- Many Manufacturers Control Instrumentation Solutions Exhibit High Emissions Rates Detrimental to the Atmosphere
- VRG Controls Manufactures Solutions to Minimize and Potentially Eliminate Atmospheric Emissions
- **RECENT LEGISLATION:** For process controllers, there are effectively 3 methods of achieving the “no identifiable emissions” standard for 0000b/c compliance:
 - Carbon Capture Technology
 - Eliminate Pneumatic Supply
 - Alternate Solutions



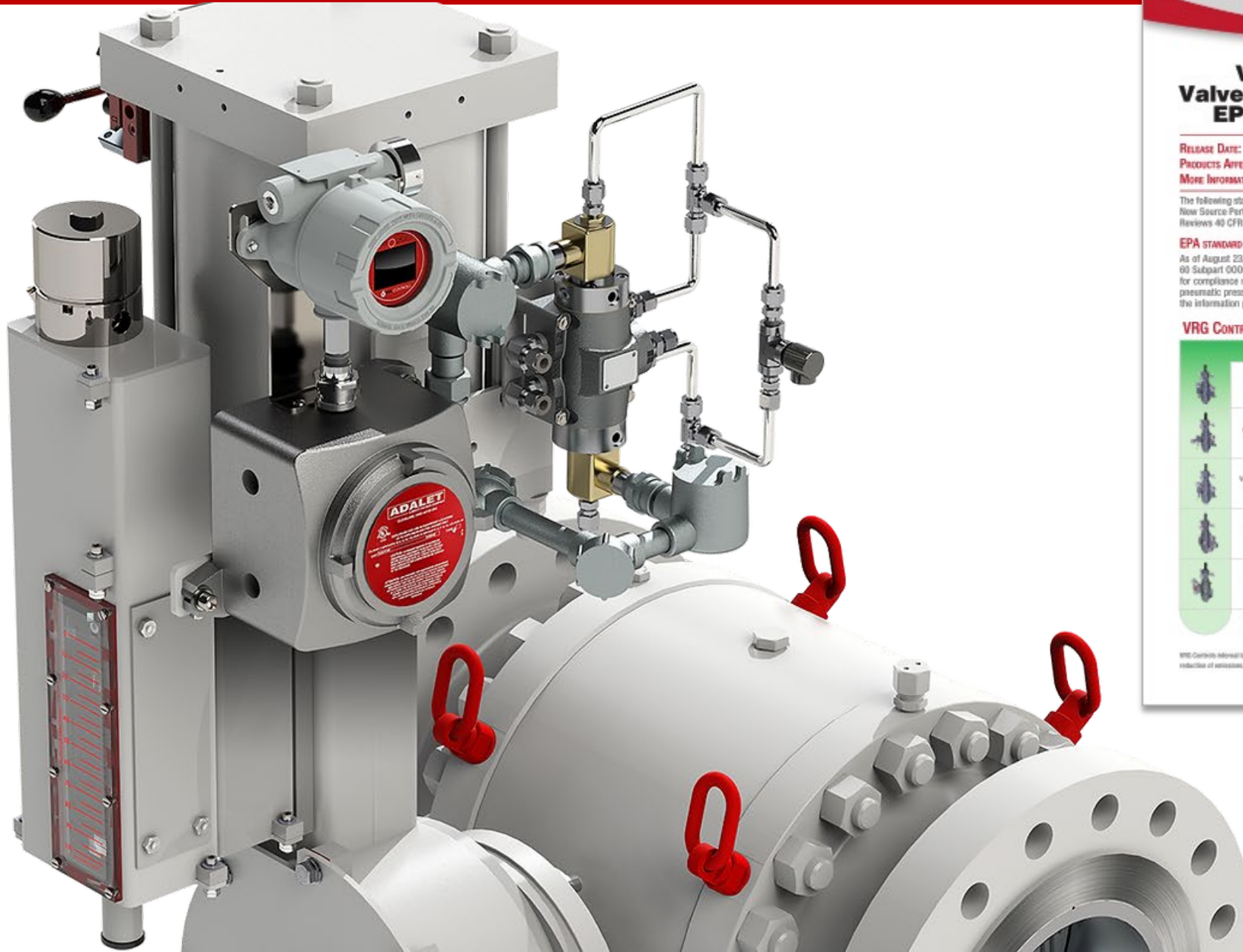
Facilities Since Dec 6, 2022

Deadline 12/31/2024

All Existing Facilities

**Deadline Estimated
12/31/2028**

VRG Controls Manufactures Control Valves for Natural Gas Pipelines



VRG Controls' VPC Series Valve Pressure Controllers Surpass EPA Emissions Requirements

RELEASE DATE: 03/06/15
PRODUCTS AFFECTED: All VPC Valve Pilot Controllers (Pneumatic Pressure Controllers)
MORE INFORMATION: sales@vrgcontrols.com or Your Local VRG Controls sales representative

The following statements reference U.S. Environmental Protection Agency (EPA) Oil and Natural Gas Sector: New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants Reviews 40 CFR Part 60 Subpart 0000, 60.5380 (b)(c) and with 40 CFR Part 98 Subpart W table W-1A.

EPA STANDARD

As of August 23, 2011, the EPA has mandated that operating companies comply with NSPS 40 CFR Part 60 Subpart 0000 and 40 CFR Part 98 Subpart W as published in the Federal Register. The key criteria for compliance mandates that controllers must have a bleed rate no greater than 6.0 scfh. VRG Controls pneumatic pressure controller published rates for "Low or No-Bleed Pneumatic Devices" are included in the information presented below:

VRG CONTROLS PUBLISHED RATES FOR VALVE PRESSURE CONTROLLER EMISSIONS

MODEL	TYPE	EPA EMISSIONS REQUIREMENTS	VRG PUBLISHED	STATUS
VPC-6A-BV	Single Acting Throttling	≤ 6.0 scfh	2000 ¹	Surpass EPA Requirements
VPC-6A-6V-B	Single Acting Throttling	≤ 6.0 scfh	2000 ¹	Surpass EPA Requirements
VPC-6A-6V-SAF	Single Acting On-Off	≤ 6.0 scfh	2200 ²	Surpass EPA Requirements
VPC-6A-BV	Double Acting Throttling	≤ 6.0 scfh	2000 ¹	Surpass EPA Requirements
VPC-6A-6V	Double Acting Throttling	≤ 6.0 scfh	2000 ¹	Surpass EPA Requirements

1. EPA Emissions Standards of Steady State
 2. 2000 Steady State Emissions, All Positions
 3. 2200 Emissions at Full Open / Full Closed w/ No-Vent Device
 4. No Atmospheric Emissions When Discharge to Pressure System Enabled

VRG Controls internal laboratory testing and in field verification at customer sites has confirmed VRG published rates exceed EPA mandates for reduction of emissions.



 VRG CONTROLS Engineers and manufacturers high performance pilot-type pneumatic pressure controllers and accessories for use with natural gas control valves. VRG Valve Pilot Controllers represent the next generation of pilot-type controllers for gas pressure control applications. Our personnel lead the industry in pilot-controller technology development with performance and operational advancements that set them apart from the competition. Contact the VRG Controls team to help you improve the performance of your natural gas regulation and control facilities while minimizing environmental impact.



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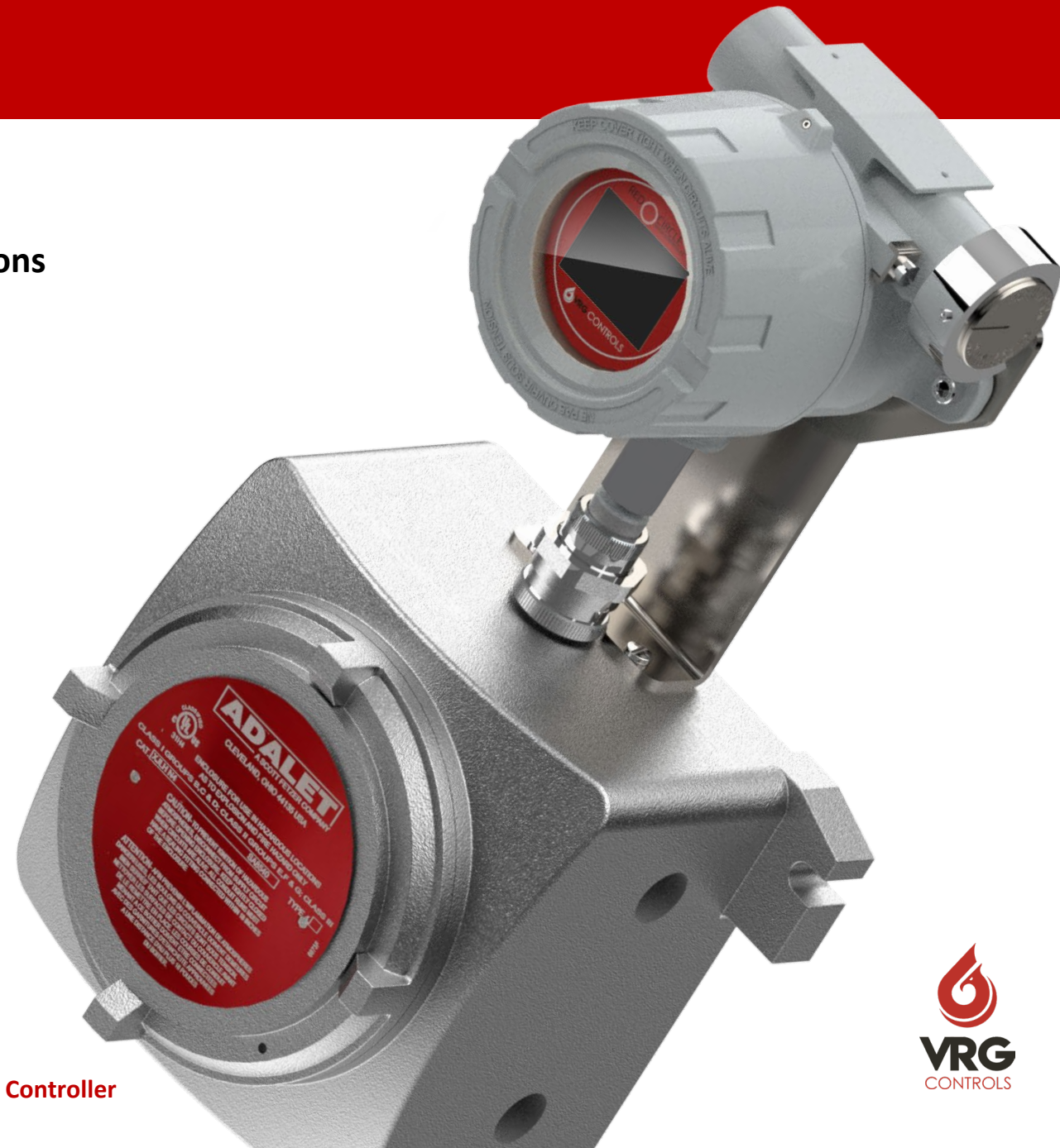
- [Steady State Emissions Calc XLS](#)
- [Transient Emissions Calc XLS](#)
- [Emissions Rates VRG PDF](#)



Reduced Emissions Technology

ZERO Steady State Emissions

- ZERO Emissions at Steady State
- When Process is Satisfied and Static, There are ZERO Emissions
- Eliminates Majority of Emissions
- Will Emit Gas When Control Valve Moves
- See VRG Transient Emissions Calculator - Online
- Unique to VRG Controls
- Control Instrumentation with ZERO Steady State Emissions
 - RCVC Red Circle Valve Controllers – All Models
 - VPC Valve Pilot Controllers – Single Acting Units Only
 - VGP Valve Gas Positioners – Single Acting Units Only

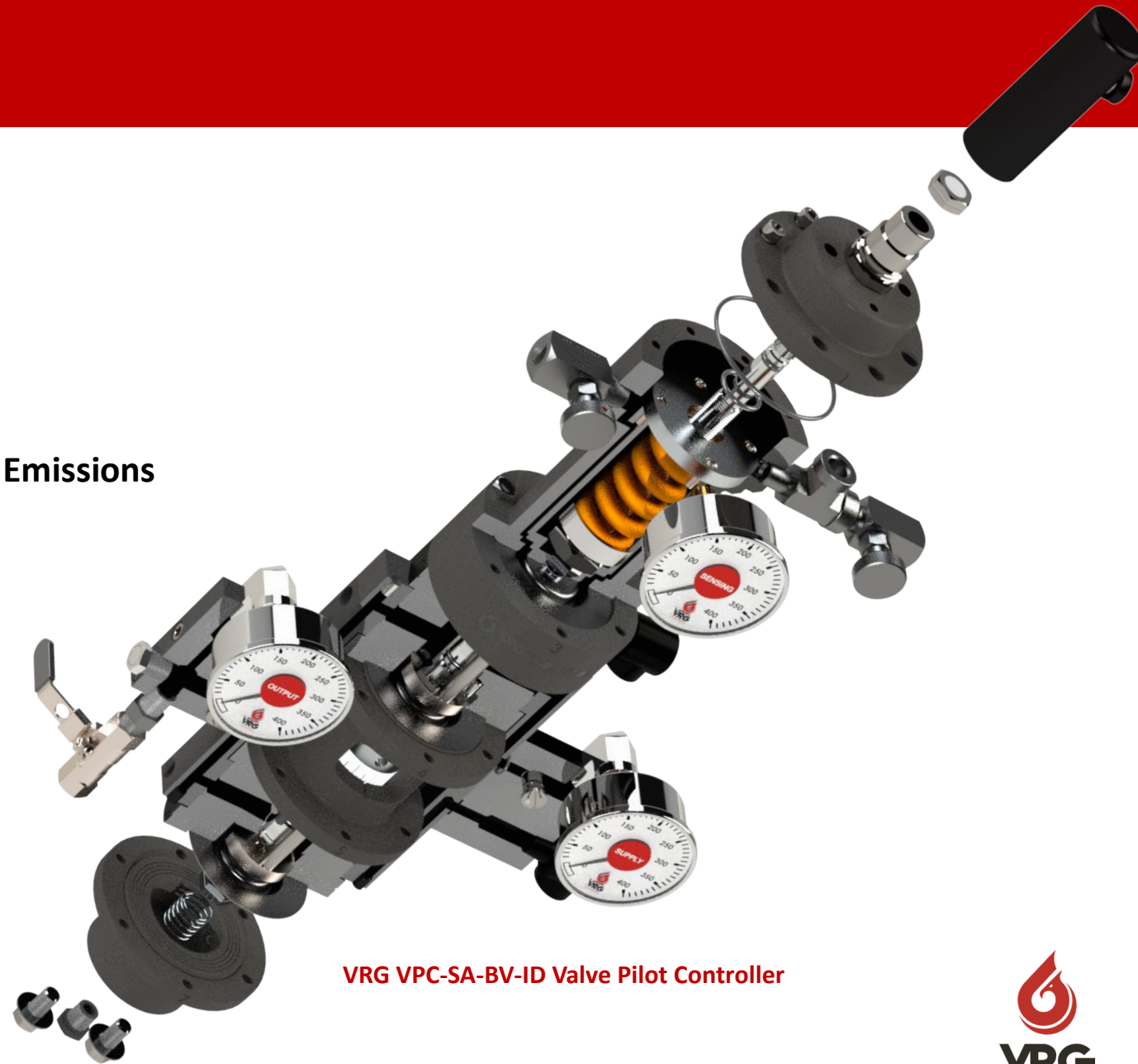


VRG RCVC Red Circle Valve Controller

Reduced Emissions Technology

ZERO Emissions Standby

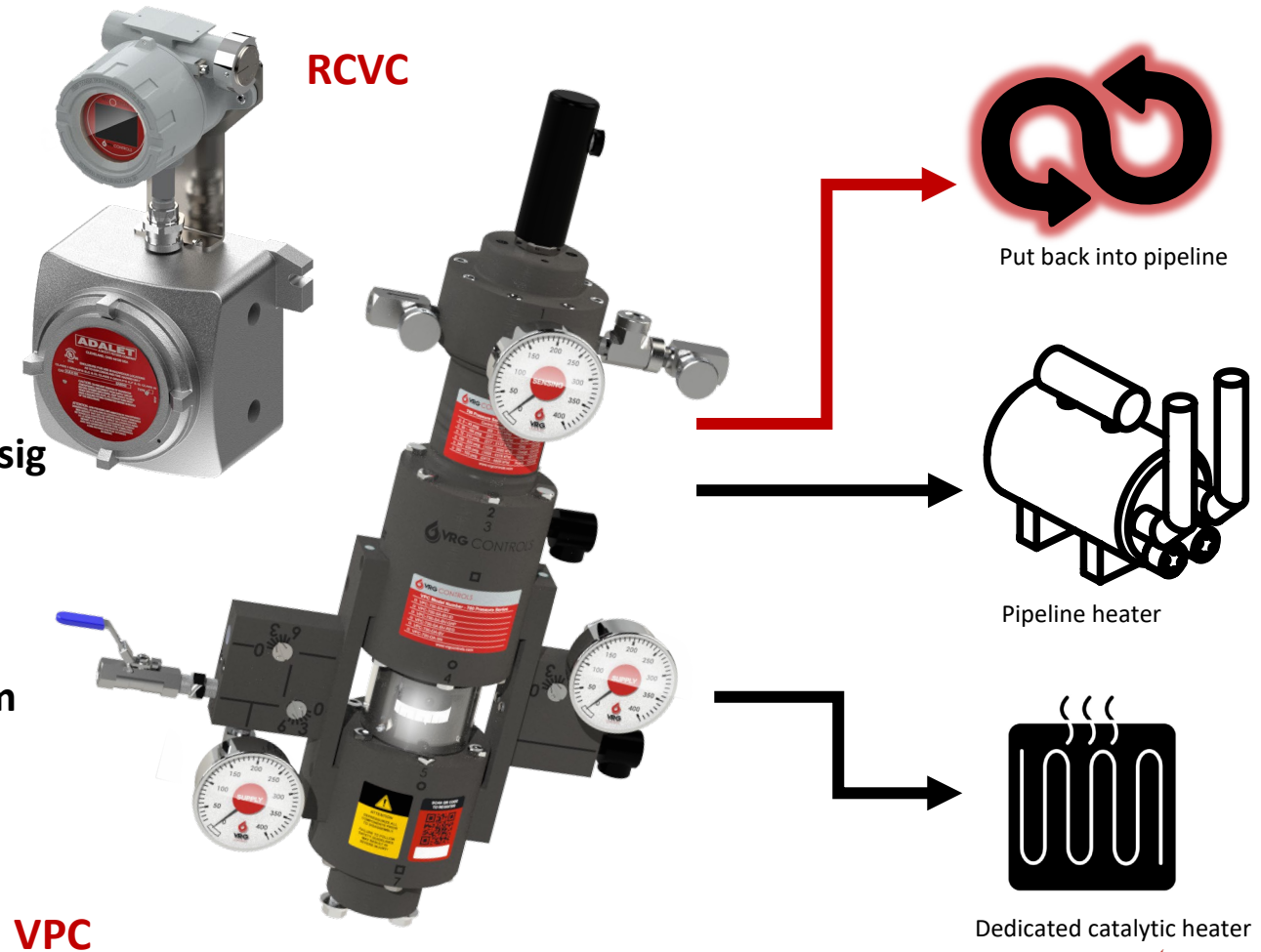
- ZERO Emissions at Standby
 - Full Open Monitor
 - Full Closed Standby
 - Full Closed Relief
- When Control Valve in Standby Mode, There are ZERO Emissions
- Will Emit Gas When Control Valve Comes Into Service
- See VRG Transient Emissions Calculator - Online
- Unique to VRG Controls
- Control Instrumentation with ZERO Standby Emissions
 - RCVC Red Circle Valve Controllers – All Models
 - VPC Valve Pilot Controllers – All Models
 - VGP Valve Gas Positioners – All Models



VRG VPC-SA-BV-ID Valve Pilot Controller

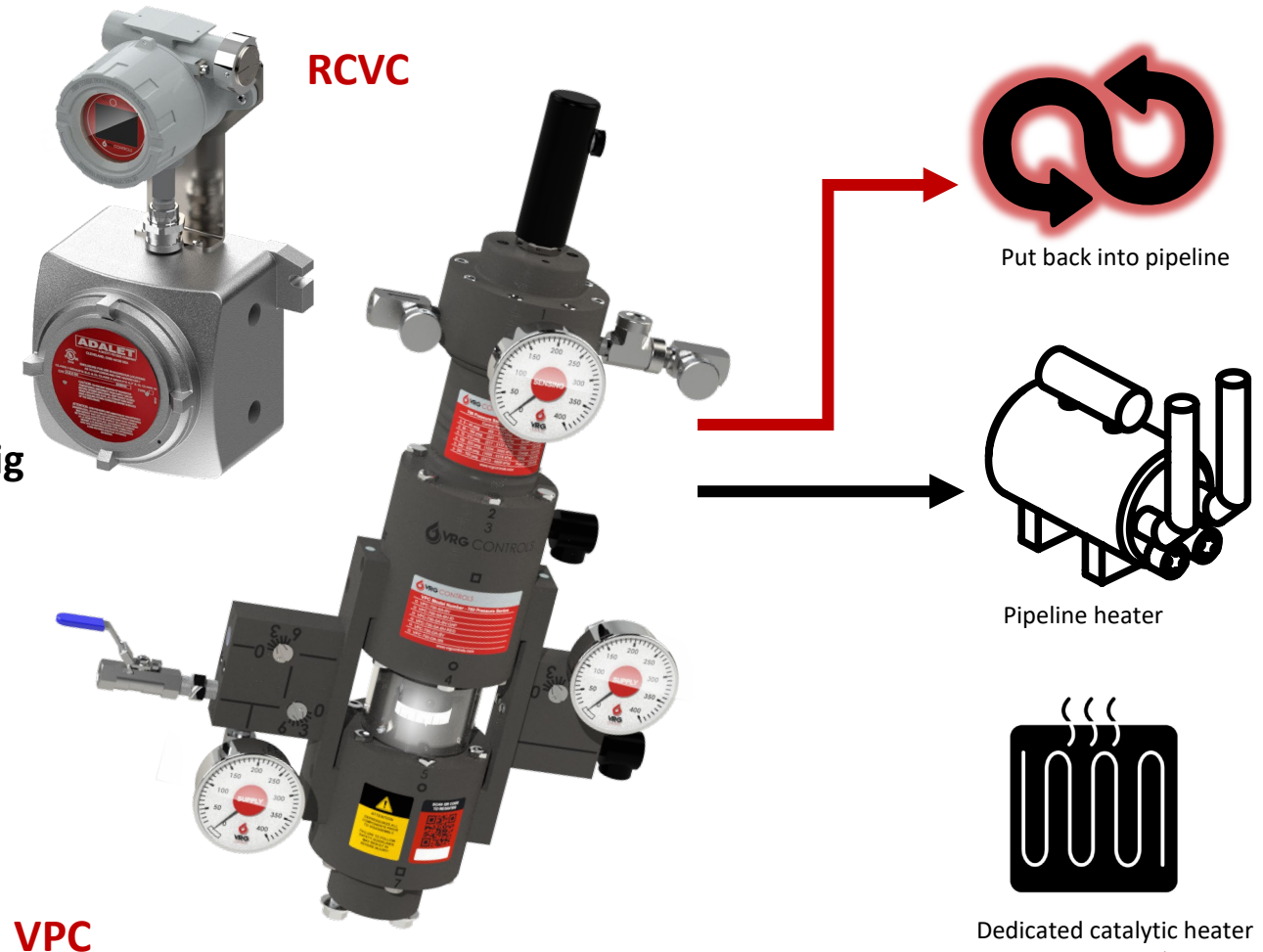
Carbon Capture Technology (CC) Discharge Downstream

- ZERO Atmospheric Emissions!
- Vent / Exhaust Captured in Downstream Piping System
- Typical Guidelines
 - Discharge Pressure \leq 250 psig
 - Requires Effective Supply Differential \geq 50-100 psid
 - Example: Supply Gas @ 220 psig + Discharge @ 120 psig
- Unique to VRG Controls
- BP Sensor Installed to Protect System Integrity
- Control Instrumentation Capable of Discharge Downstream
 - RCVC Red Circle Valve Controllers – All Models
 - VPC Valve Pilot Controllers – All Models
 - VGP Valve Gas Positioners – All Models



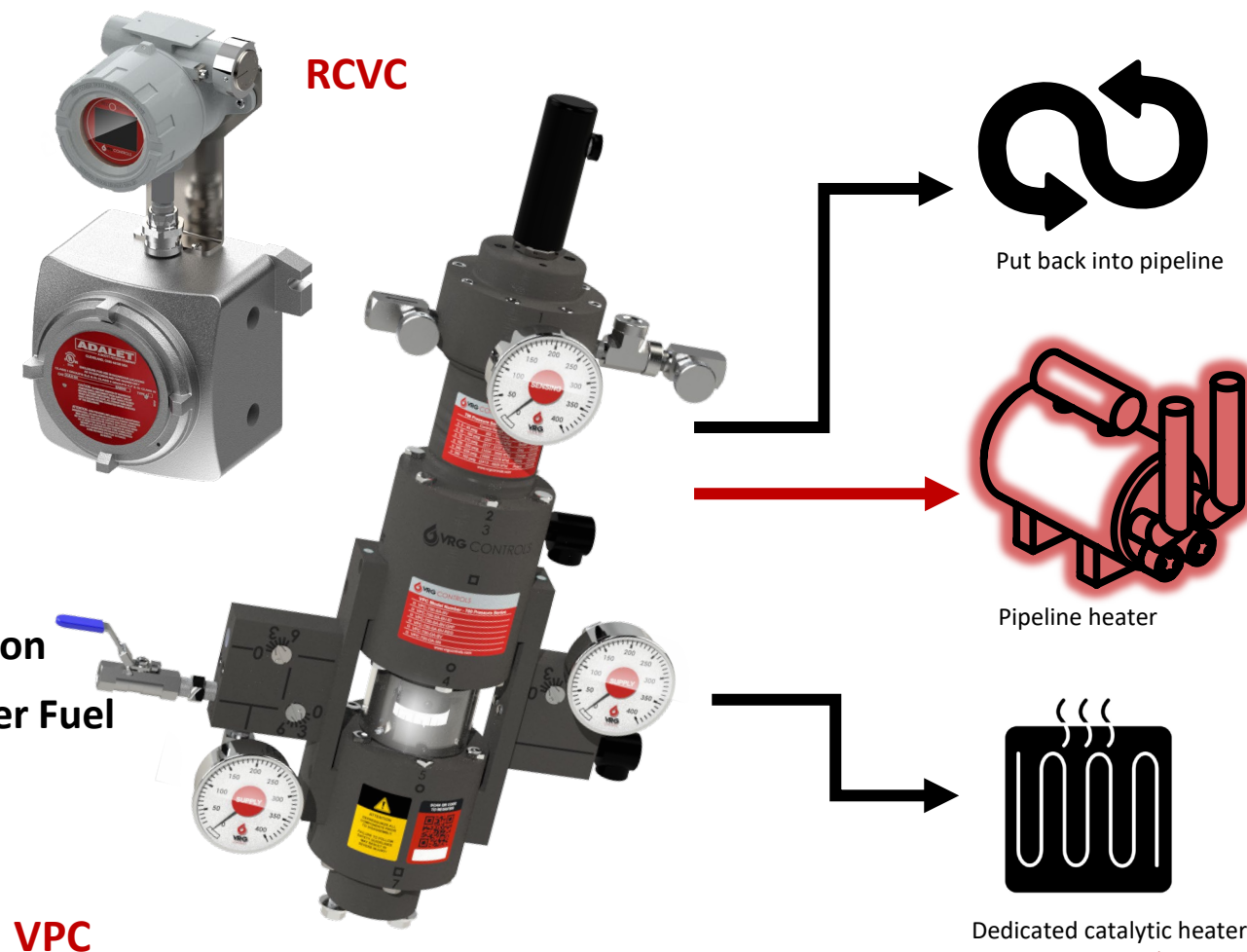
Carbon Capture Technology (CC) Discharge Nearby Pressure System

- ZERO Atmospheric Emissions!
- Vent / Exhaust Captured in Downstream Piping System
- Typical Guidelines
 - Discharge Pressure \leq 250 psig
 - Requires Effective Supply Differential \geq 50-100 psid
 - Example: Supply Gas @ 160 psig + Discharge @ 60 psig
- Unique to VRG Controls
- BP Sensor Installed to Protect System Integrity
- Control Instrumentation Capable of Discharge Nearby Pressure System
 - RCVC Red Circle Valve Controllers – All Models
 - VPC Valve Pilot Controllers – All Models
 - VGP Valve Gas Positioners – All Models



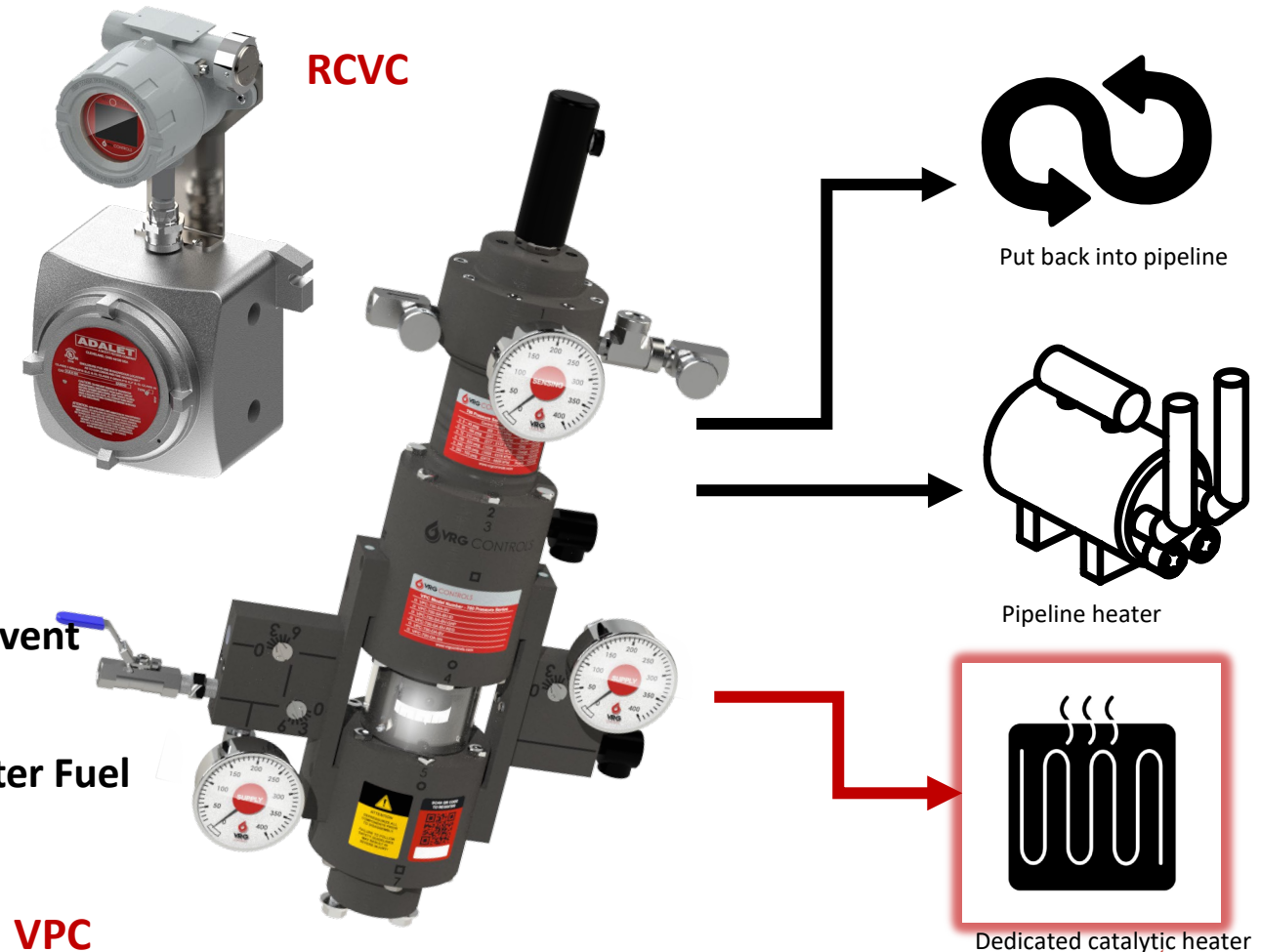
Carbon Capture by Combustion Technology (CCC) Discharge to Pipeline Heater Fuel Supply

- ZERO Atmospheric Emissions!
- Vent / Exhaust Captured in Pipeline Heater Fuel Supply
- Typical Guidelines
 - Typical Pressure ≤ 30 psig
 - Requires Effective Supply Differential ≥ 50 -100 psid
 - Example: Supply Gas @ 130 psig + Discharge @ 30 psig
- Pipeline Heater Can Only Accept Discharge When Running
- Unique to VRG Controls
- BP Sensor Installed to Protect System Integrity
- Typically, Limited to Zero Steady State Control Instrumentation
- Control Instrumentation Capable of Discharge Pipeline Heater Fuel Supply
 - RCVC Red Circle Valve Controllers – All Models
 - VPC Valve Pilot Controllers – Typ Single Acting Only
 - VGP Valve Gas Positioners – Typ Single Acting Only



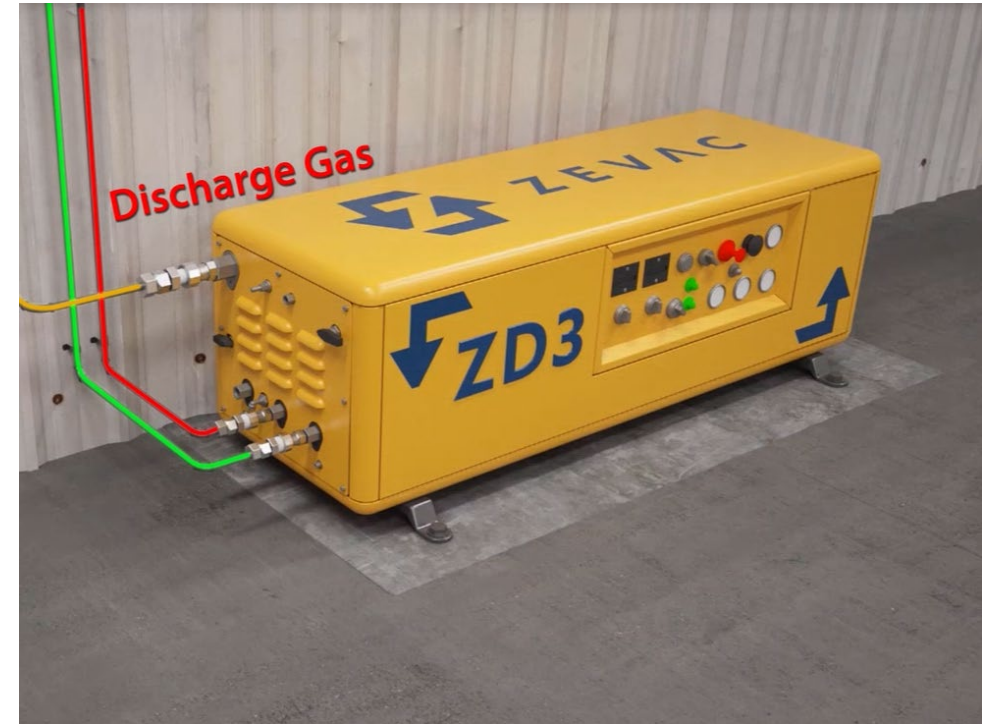
Carbon Capture by Combustion Technology (CCC) Discharge to Dedicated Catalytic Heater

- ZERO Atmospheric Emissions!
- Vent / Exhaust Captured in Dedicated Catalytic Fuel Supply
- Vent / Exhaust Captured in Pressure Buffer Tank
- Pipeline Heater Can Only Accept Discharge When Running
- Unique to VRG Controls
- BP Sensor Installed to Protect System Integrity
- Limited to Zero Steady State Control Instrumentation
- Catalytic Heater Must Have Parallel Fuel Supply Loop to Prevent “Flame Out”
- Control Instrumentation Capable of Discharge Pipeline Heater Fuel Supply
 - RCVC Red Circle Valve Controllers – All Models
 - VPC Valve Pilot Controllers – Typ Single Acting Only
 - VGP Valve Gas Positioners – Typ Single Acting Only



Carbon Capture Technology (CC) Reinjection System (Compression)

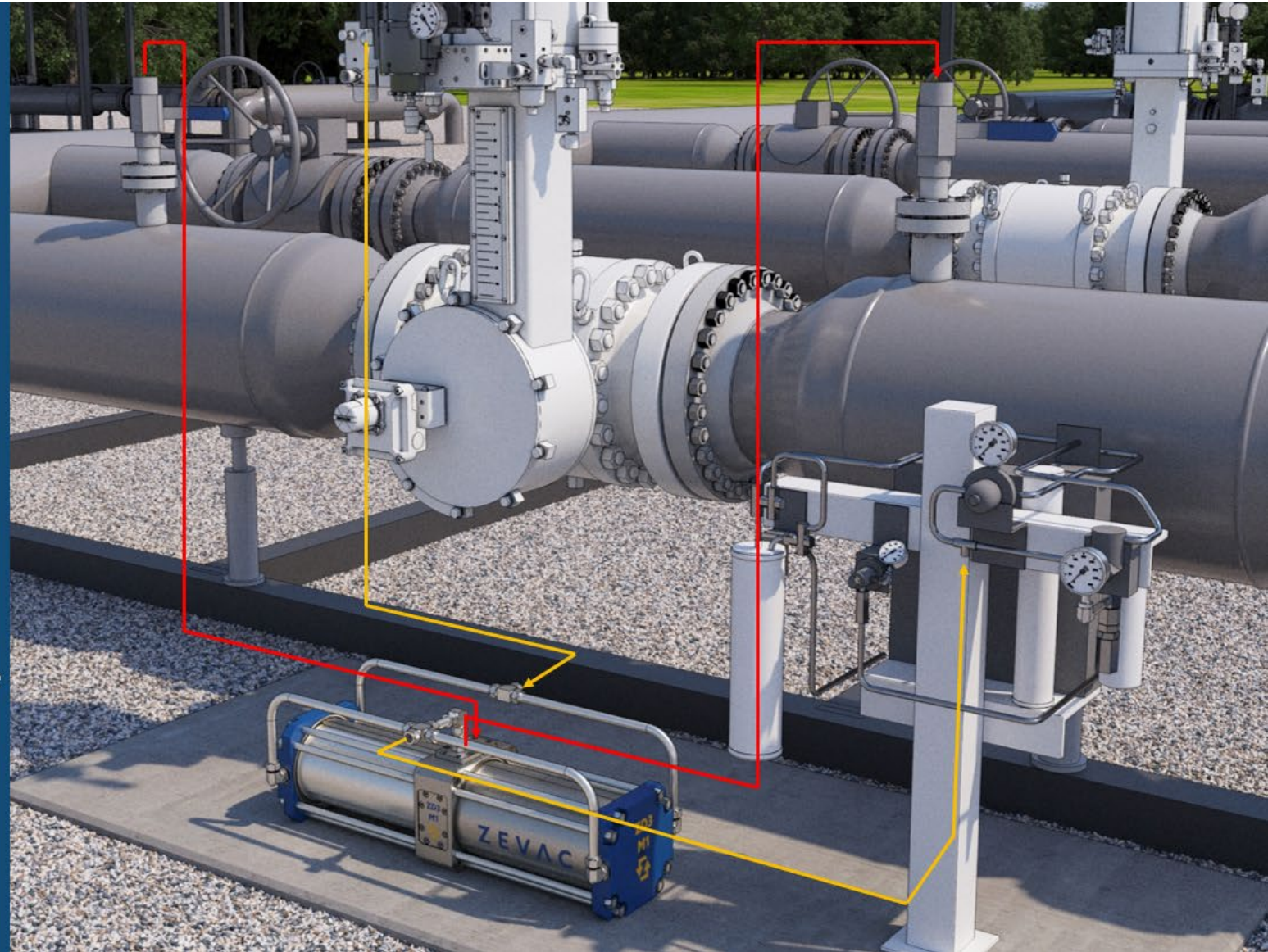
- ZERO Atmospheric Emissions!
- Vent / Exhaust Captured and Recompressed into Supply Gas
- Energy for Compressor From Pressure Differential Across Process
- Provides Wider Range of Implementation of Carbon Capture Technology
- No Electricity or Outside Power Required
- Control Instrumentation MUST Be Able to Accept Backpressure
- Unique to VRG Controls
- Technology In Development with Near Term Release
- Developed in Partnership with ZEVAC
- Control Instrumentation Capable Compatible with Reinjection System
 - RCVC Red Circle Valve Controllers – All Models
 - VPC Valve Pilot Controllers – All Models
 - VGP Valve Gas Positioners – All Models



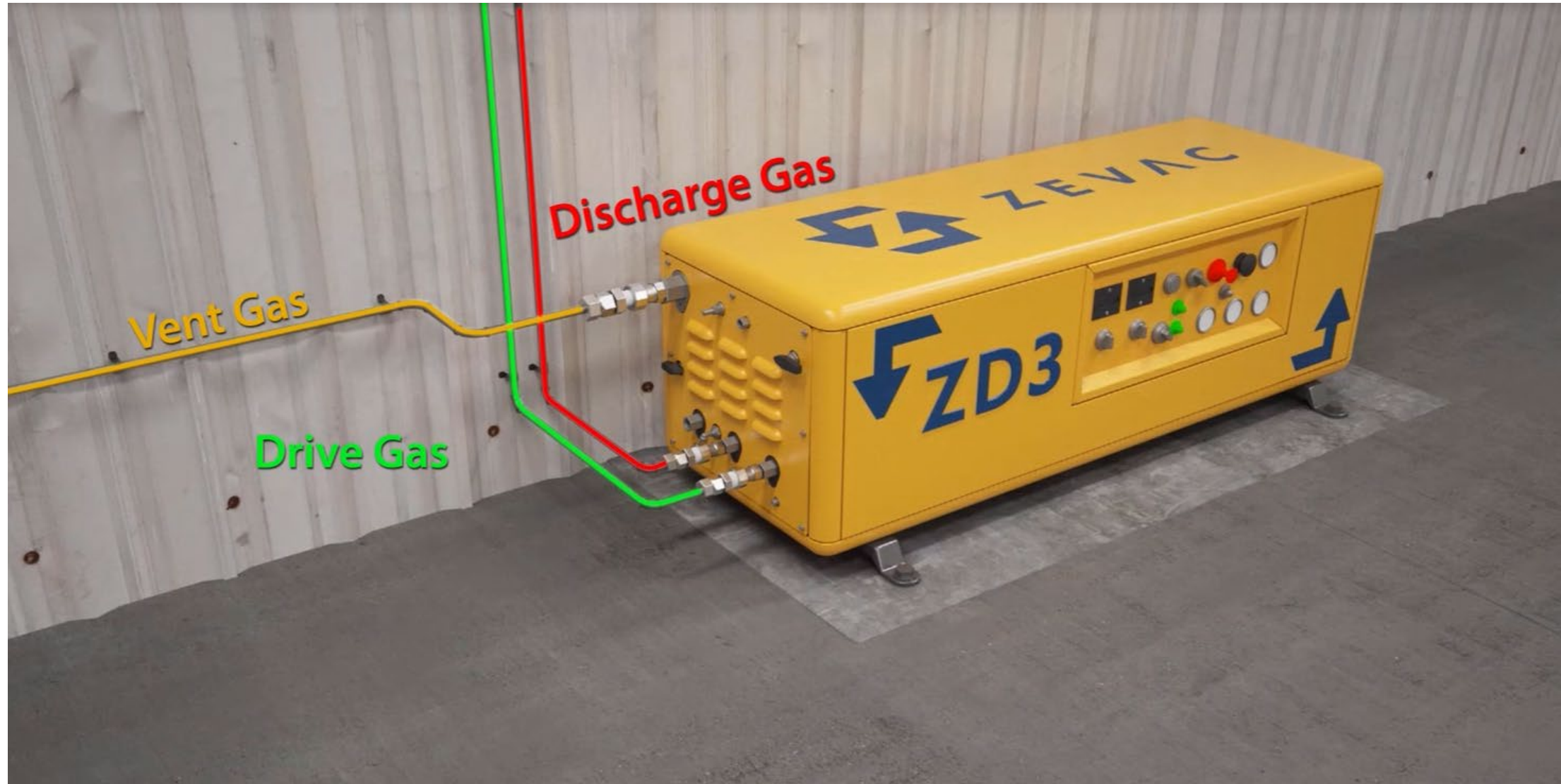
Carbon Capture Technology (CC) Reinjection System (Compression)

Closed Loop Power Gas

A ZEVAC Valve Power Gas Recycling (VPGR) System will utilize dP on the main line to drive the vent gas back into the power gas supply.



Carbon Capture Technology (CC) Reinjection System (Compression)



Alternate Technologies Electric Actuators



- **3-Phase AC Power Required to Obtain Modulating Duty > 1200 STARTS / HR**
- **Direct Drive w Control Valve Stem**
- **Pair w Rotork Quarter Turn Gear Assembly**
- **Can Retrofit to Exist Quarter Turn Control Valves**
- **Cannot Retrofit to Existing VRG Below Ground Control Valves (Need Linear)**
- **Has Failsafe Options**

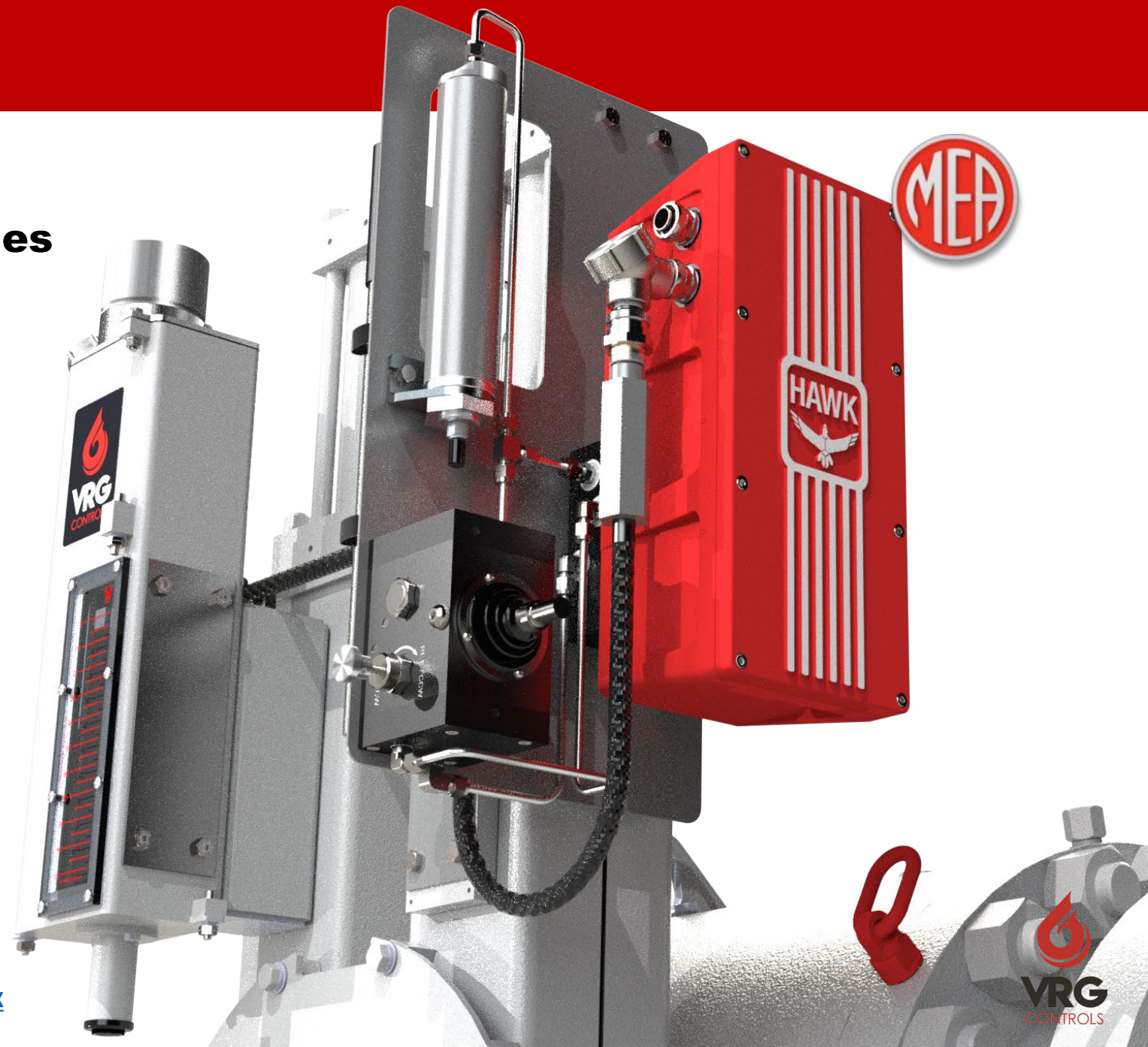
Alternate Technologies

Electro-Hydraulic Actuators

Setting The Trend for Emissions Elimination in Natural Gas Pipelines

- Electro-Hydraulic “EH” Actuators and Control Systems
- Modulating Control Valve Applications
- On-Off Isolation Valve Applications
- New or Retrofit Installations
- ZERO Emissions Electronic Control
- Superior Valve Positioning Accuracy
- 24 VDC Power Primary Solution
- Easy Interface to UPS / Battery Backup Systems
- Low Power Consumption Ensures Service Reliability
- Easy Interface with VRG Controls Control Valves
- Compatible with Rotary or Linear Control Valves
- Manual Override Standard Accessory
- Accumulator Systems Available for Extended Operation
- Eliminate Supply Gas Systems

- [EH Actuators Presentation PPTX](#)
- [EH Actuators How it Works Presentation PPTX](#)



Alternate Technologies Pilot Operated Regulators



RED OX

IMC (TOP ENTRY)

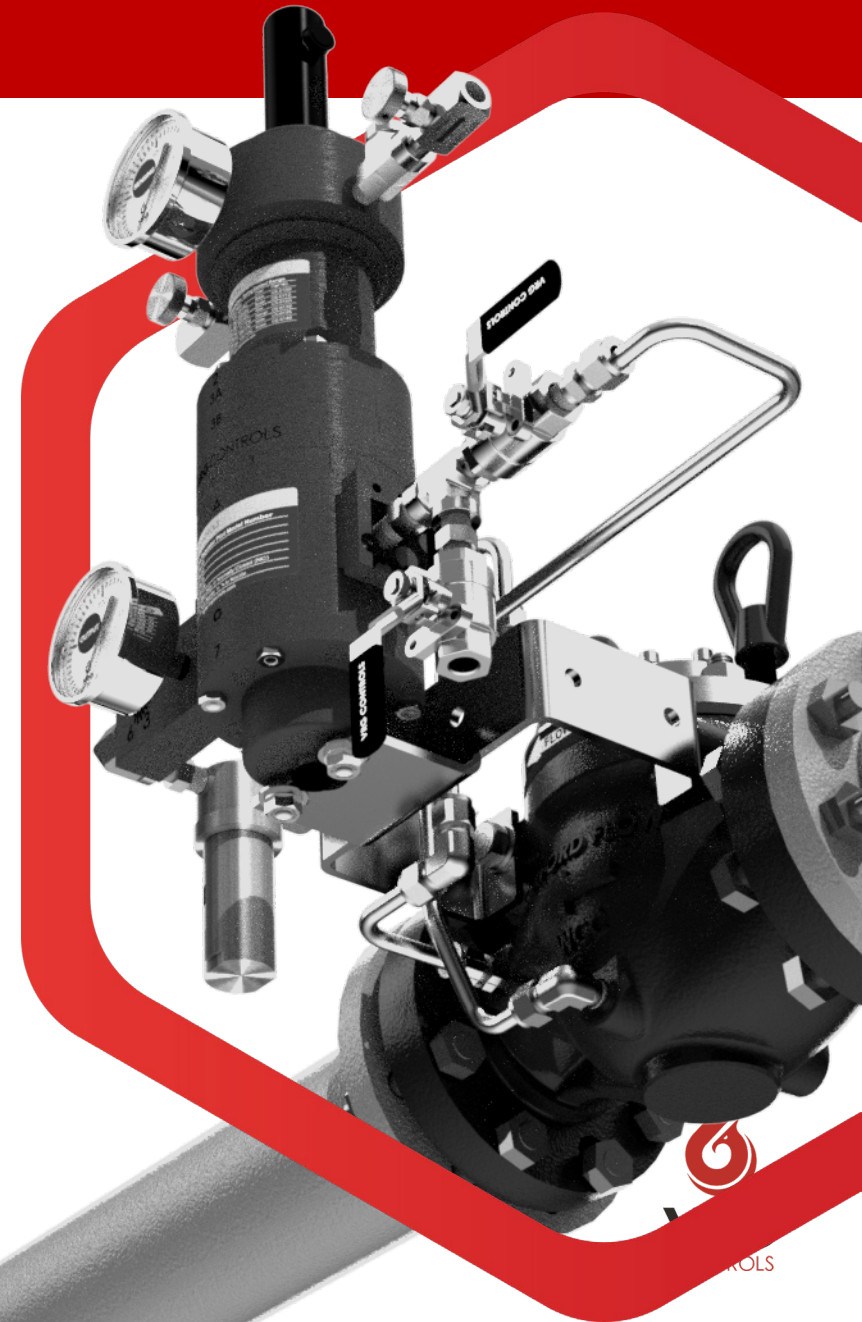


The innovative cartridge insert design utilizes the patented piston control system to deliver superior process control in an easily accessible body for inline servicing. The unique design employs a single piston instead of a diaphragm, increasing reliability and reducing maintenance costs.

- www.redoxregulators.com
- [Red Ox Regulators IM Presentation PPTX](#)
- [Red Ox Regulators IM Technology Video](#)



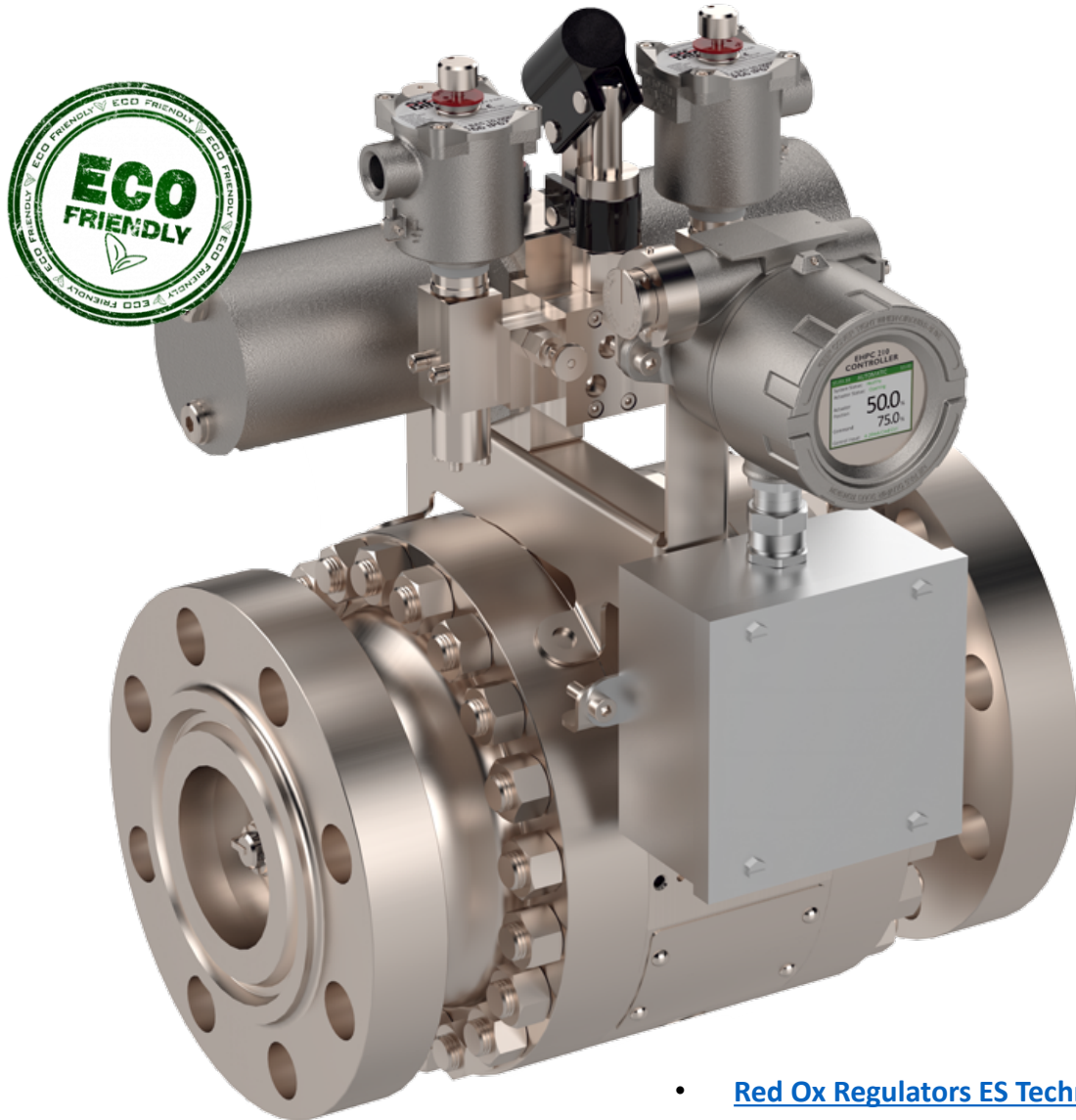
The compact design utilizes the patented piston control system to deliver superior process control in a full stainless-steel construction. The unique design employs a single piston instead of a diaphragm, increasing reliability and reducing maintenance costs. The IMS Series is fully tested and proven for use in newer hydrogen applications up to 100% H₂ content.



ROLS

Alternate Technologies

Electro-Hydraulic Regulators



- **Eliminates Actuator**
- **Eliminates Emissions**
- **Suitable for Natural Gas and Liquids Applications**
- **Current Installations BP Whiting**
- **Utilize VRG RCVC Red Circle Technology**
- **Available with Noise / Anti-Cavitation Trims**
- **4-20 mA Command Signal**
- **VDC and VAC Power Supplies Available**
- **CI 1 / Div 1 and CI 1 / Div 2 Available**

- [Red Ox Regulators ES Technology Video](#)



VRG
CONTROLS

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