

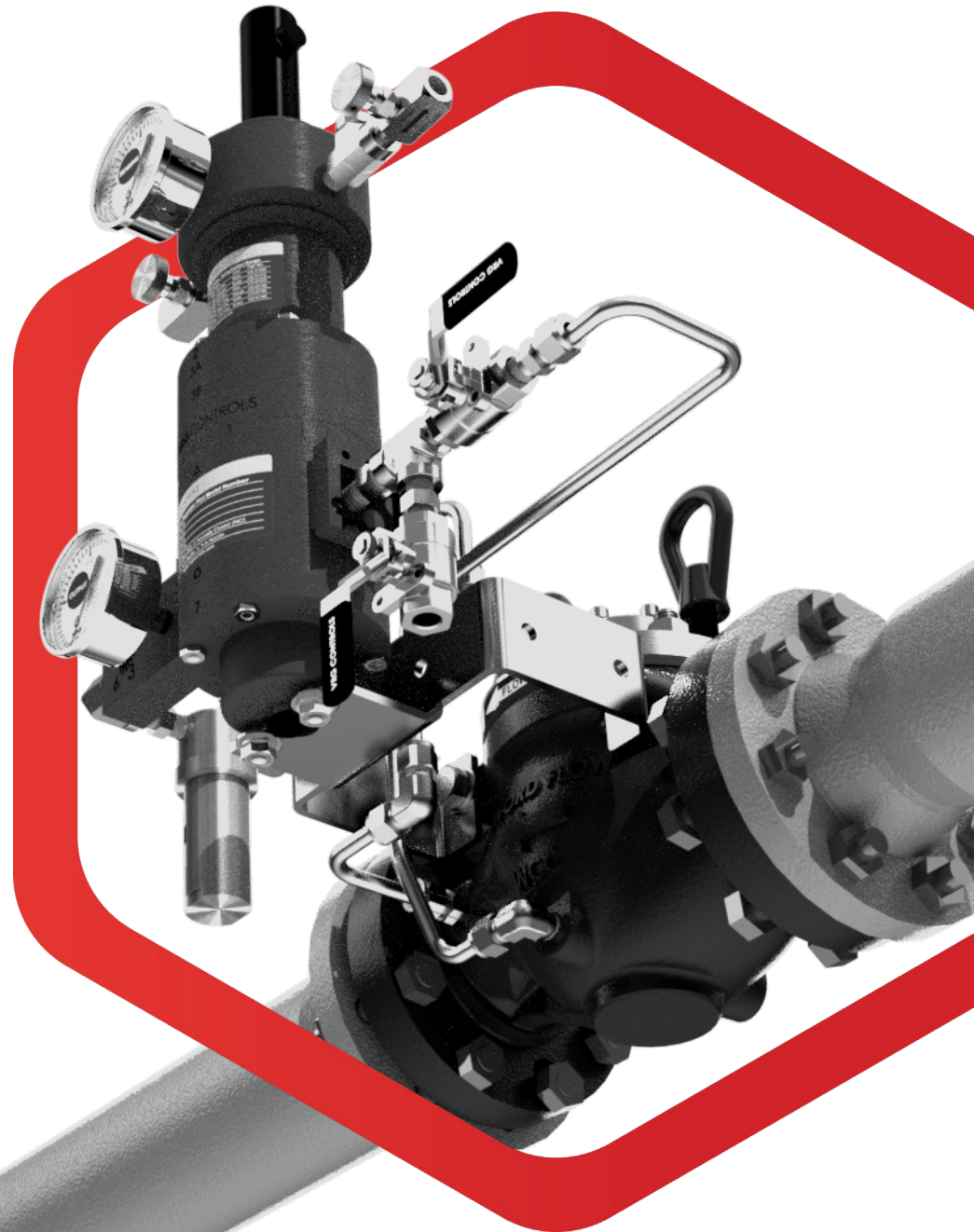


RED OX





The Red Ox Regulators product line highlights the partnership of Oxford Flow and VRG Controls to offer industry leading solutions for the most challenging and critical natural gas pressure regulation applications.



REGULATORS



IMC (TOP-ENTRY)

The IMC Series range offers excellent pressure or flow control for gas transmission, gas distribution, fuel gas control, and various industrial applications. 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.



Top-entry design

Available for easy in-line servicing





CONTROL CARTRIDGE

**UPPER CARTRIDGE
O-RING**

THROAT SEAL

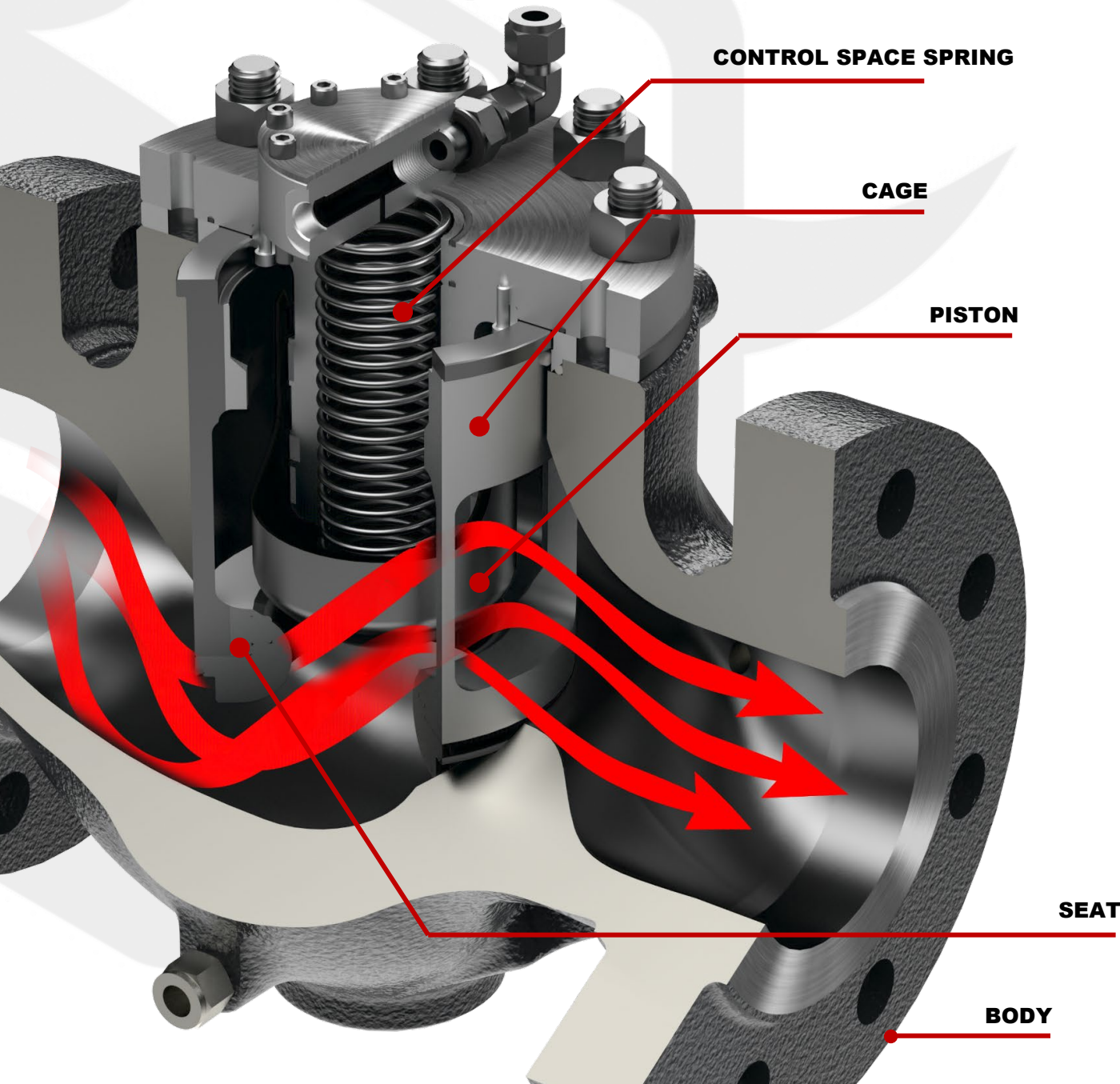
IMC THROAT

LOWER CARTRIDGE O-RING

REGULATOR BODY

TOP-ENTRY CONVENIENCE

The Red Ox IMC features a top-entry design commonly requested by operators to accommodate efficient maintenance protocol. The simple design of IMC regulator can be rebuilt rapidly without the need to remove the RP Regulator Pilot. Efficiency saves time! Efficiency saves money!



SINGLE MOVING PART. NO DIAPHRAGM.

The Red Ox IMC incorporates a unique top-entry cartridge configuration that ensures easy maintenance. The patented piston design eliminates diaphragms and ensures reliability.

IMC SPECIFICATIONS

TABLE 1.0 – IMC SERIES – KEY SPECIFICATIONS

Size	NPS 2, 3, 4, 6, and 8 (DN50 to DN200)
Pressure Classes	ANSI Class 150, 300, and 600
Connections	RFFE per ASME B16.5
Temperature Range	-20 to 180°F (-29 to 82°C)
Flow Profile	Linear
Leakage	ANSI FCI 70-2; Class VI
Lock Up Class	Bubble Tight
Accuracy Class	±1.0% or better
Instrument Ports	0.250" Female NPT
Body Ports	0.250" Female NPT (QTY 2 Upstream / QTY 2 Downstream)
Face-Face Dimensions	Per ANSI / ISA-75.08.01-2016

TABLE 2.0 – IMC SERIES – CAPACITIES & SIZING DATA:

Size	C _v	C _G	K _v	K _G
2 in (DN50)	50.2	1446	43.4	1521
3 in (DN75)	108.9	3058	94.2	3217
4 in (DN100)	172.0	5023	148.8	5284
6 in (DN150)	355.0	10213	307.2	10744
8 in (DN200)	547.2	15830	473.5	16653



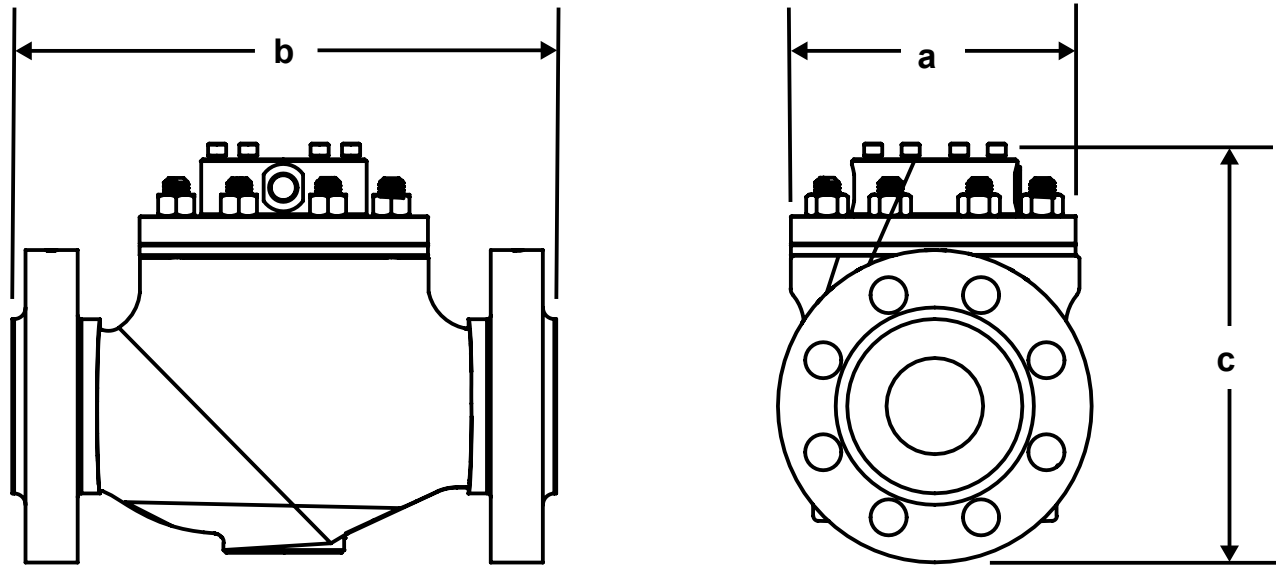
DIMENSIONS IMC

TABLE 3.0A - IMC SERIES, ANSI CLASS 600, RFFE



Size	Cartridge Diameter (a)	Face-to-Face ¹ (b)	Height (c)	Weight ²
2 in / DN50	6.0 in / 152 mm	11.25 in / 286 mm	9.0 in / 228 mm	64 lbs / 29 kg
3 in / DN80	7.0 in / 178 mm	13.25 in / 337 mm	11.1 in / 283 mm	116 lbs / 53 kg
4 in / DN100	8.8 in / 223 mm	15.50 in / 394 mm	13.8 in / 349 mm	222 lbs / 101 kg
6 in / DN150	12.4 in / 315 mm	20.00 in / 508 mm	17.3 in / 439 mm	476 lbs / 216 kg
8 in / DN200	15.4 in / 391 mm	24.00 in / 610 mm	21.0 in / 533 mm	855 lbs / 388 kg

- Notes:
- 1. All face-to-face dimensions per ISA-75.08.01-2016.
 - 2. Weight does not include pilot control instrumentation or other accessories.

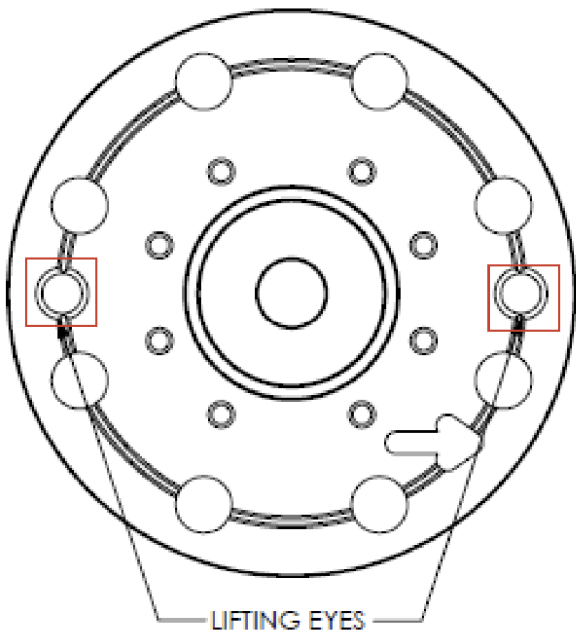
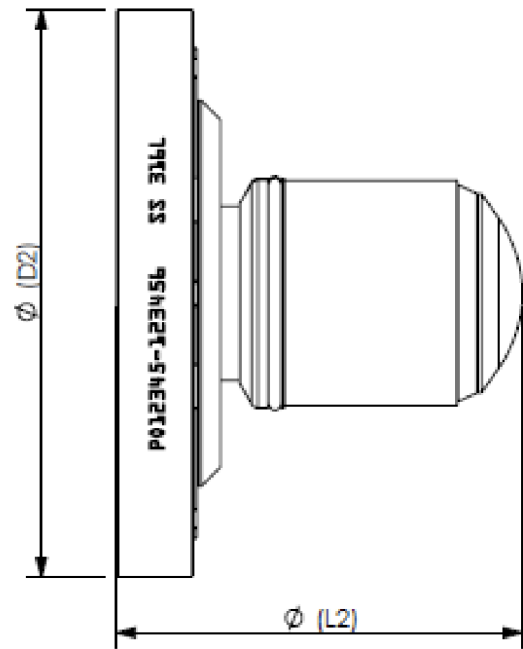


DIMENSIONS IMC CARTRIDGE

TABLE 3.0B - IMC SERIES CARTRIDGE DIMENSIONS AND WEIGHTS

Size	Cartridge Diameter (a)	Length (b)	Weight ¹ (c)	Lifting Eye Bolt (b)
2 in / DN50	6.0 in / 152 mm	4.3 in / 108 mm	8.6 lbs / 4 kg	½" – 13 UNC
3 in / DN80	7.0 in / 178 mm	5.3 in / 135 mm	14.6 lbs / 7 kg	
4 in / DN100	8.8 in / 223 mm	6.5 in / 165 mm	27.4 lbs / 13 kg	
6 in / DN150	12.4 in / 315 mm	8.1 in / 206 mm	72.5 lbs / 33 kg	
8 in / DN200	15.4 in / 391 mm	10.6 in / 270 mm	169 lbs / 77 kg	

Notes: 1. Weight does not include pilot control instrumentation or other accessories.

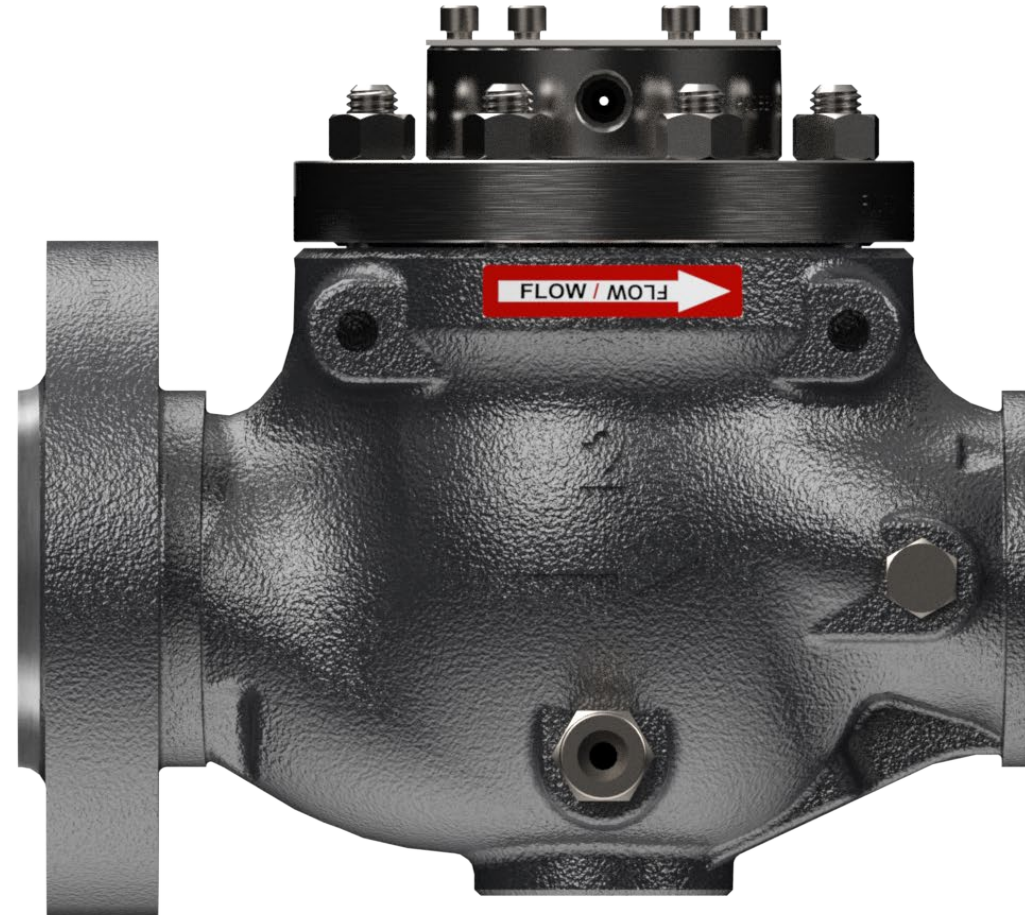


STANDARD MATERIALS IMC

Component	Material
Body	WCC Carbon Steel
Cap	316L SS
Trim	316L SS
Fittings	316L SS
Seat / Throat Seal	Viton™ (FKM)* / Buna-N (NBR)
Static Seals	Viton™ (FKM)* / Buna-N (NBR)
Piston Seal/Tri-lobe	Viton™ (FKM) / Buna-N (NBR)*

Notes:

1. * - Indicates standard issue material for stock product
2. Alternate materials available upon request.



IMC REGULATOR SCOPE OF PRODUCT MATRIX



Size	150 ANSI RFFE	300 ANSI RFFE	600 ANSI RFFE
2 in	IN STOCK	IN STOCK	IN STOCK
3 in	IN STOCK	IN STOCK	IN STOCK
4 in	ON ORDER	IN STOCK	IN STOCK
6 in	N/A	IN STOCK	IN STOCK
8 in	N/A	ENG. ORDER	ENG. ORDER

GREEN – IN STOCK

ORANGE – ON ORDER

RED – VIA FACTORY

CAPACITY LIMITER



IMC CAPACITY LIMITER

IMC Red Ox Regulators can be supplied or retrofit with the IM SERIES CAPACITY LIMITER. The Capacity Limiter restricts the opening travel of IMC Red Ox regulators. The Capacity Limiter restricts the full open flow without compromising controllability. Flow restriction can be beneficial when considering overpressure and relief valve sizing requirements.

Available Capacity Limits: 40%, 50%, and 75%
Compatible Models: IMC Series
Compatible Sizes: 2, 3, 4, 6, 8 in Bore

Applications:

- Max Flow Restriction
- Improve Efficiency of Relief Valve Sizing and Selection
- Prevention of Excess Noise or Flow Velocity



2 in – 40% Travel Limiter

IMC THROAT MODIFICATIONS REDUCED PORT THROATS

IMC Red Ox Regulators can now be supplied or retrofitted with the reduced port throats for varying the overall capacity of our regulators



"100%" THROAT



REDUCED PORT THROAT



RED OX
CONTROLS



IMC SERIES THROAT MODIFICATIONS REDUCED PORT THROATS

Available Versions:

2"x1" & 2"x1-1/2"
3"x1", 3"x1-1/2", & 3"x2"
4"x2" & 4"x3"
6"x3" & 6"x4"
8"x4" & 8"x6"

Compatible Models:

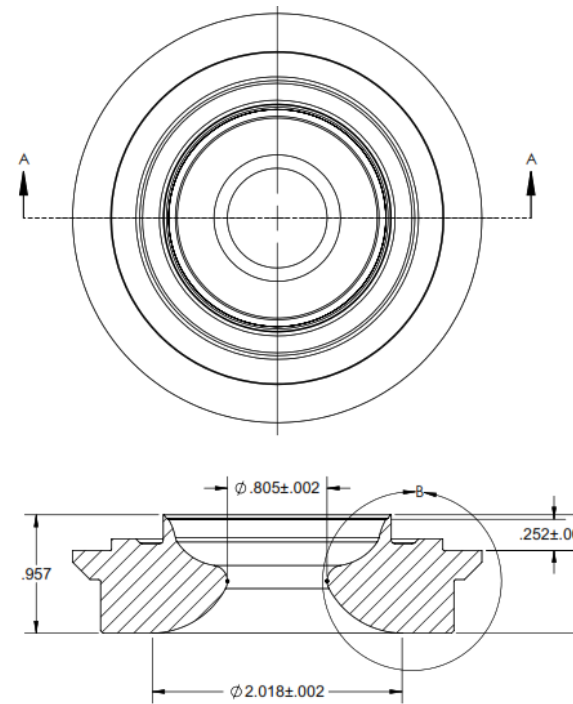
IMC Series

Compatible Sizes:

2, 3, 4, 6, 8 in Bore

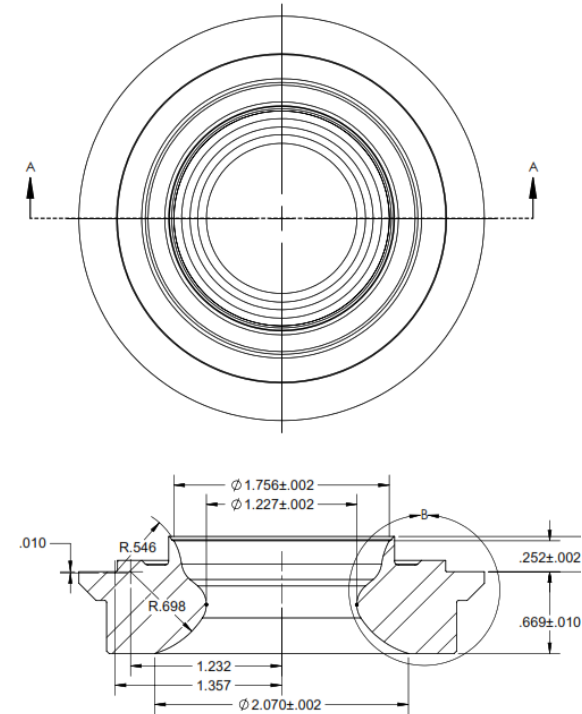
Applications:

- Lower flow rate applications with process conditions that would have excessive exit velocity issues at the outlet flange



SECTION A-A

2"x1" Example

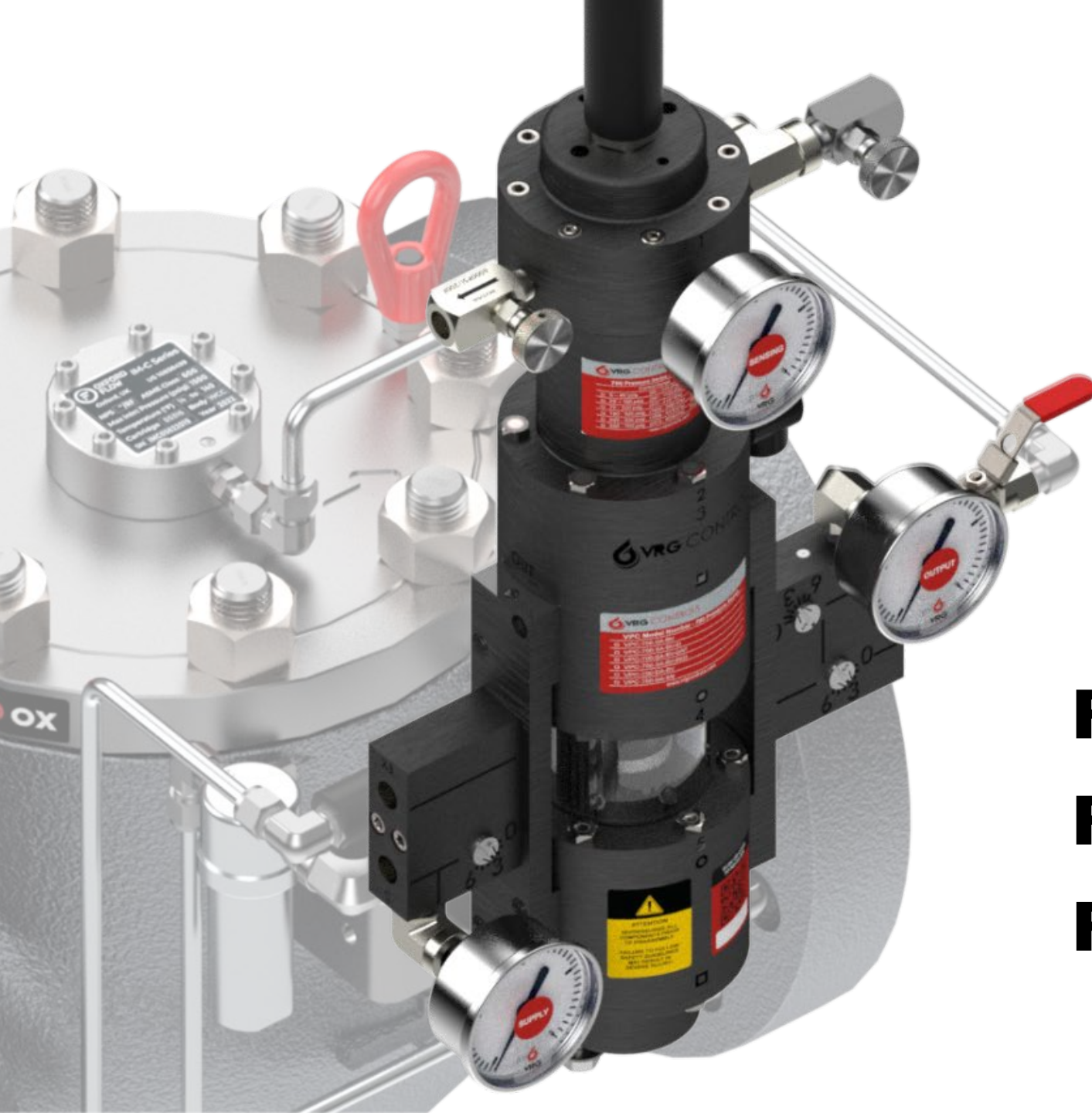


SECTION A-A

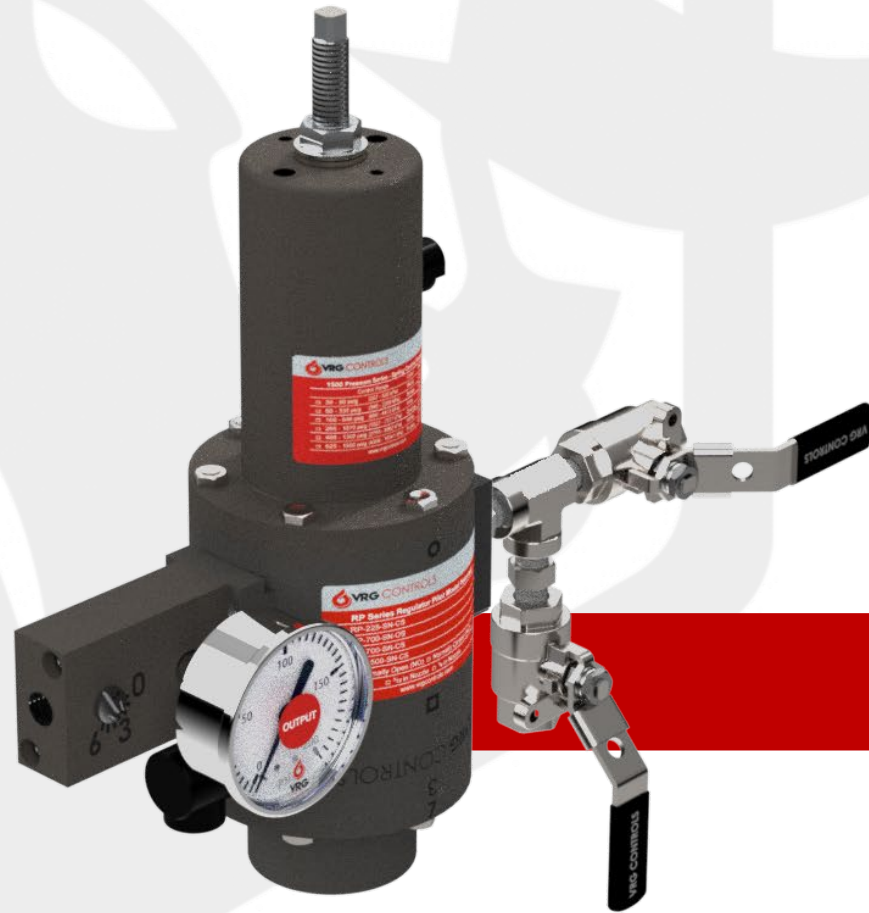
2"x1.5" Example

CONTROLS





RP-SN-OS PILOTS
RP-SN-CS PILOTS
RPID-SN-CS PILOTS



RP-SN-OS PILOTS

VRG RP-SN-OS Regulator Pilots: VRG Controls' RP-SN-OS Regulator Pilots are well suited for use with Red Ox Regulators for high-performance pressure control applications. The OS "Open Spring" design provides high performance in a moderate cost platform and ensures "enhanced" pressure control accuracy compared to the competition in installations like gas utility and pipeline applications.

ENHANCED

- **Applications:** BETTER Accuracy Pressure Control
- **Available Setpoint Ranges:** 9.0 – 700 psig



RP-SN-CS PILOTS

VRG RP-SN-CS Regulator Pilots: VRG Controls' RP-SN-CS Regulator Pilots are the perfect complement to Red Ox Regulators for the most demanding pressure control applications. The CS "Closed Spring" sensing chamber protects the Control Spring from aggressive environments and ensures "optimum" pressure control accuracy compared to the competition in installations industrial gas feeds and pipeline applications.

OPTIMUM

- **Applications: BEST** Accuracy Pressure Control
- **Available Setpoint Ranges:** 1.25 – 1500 psig



RED OX
CONTROLS



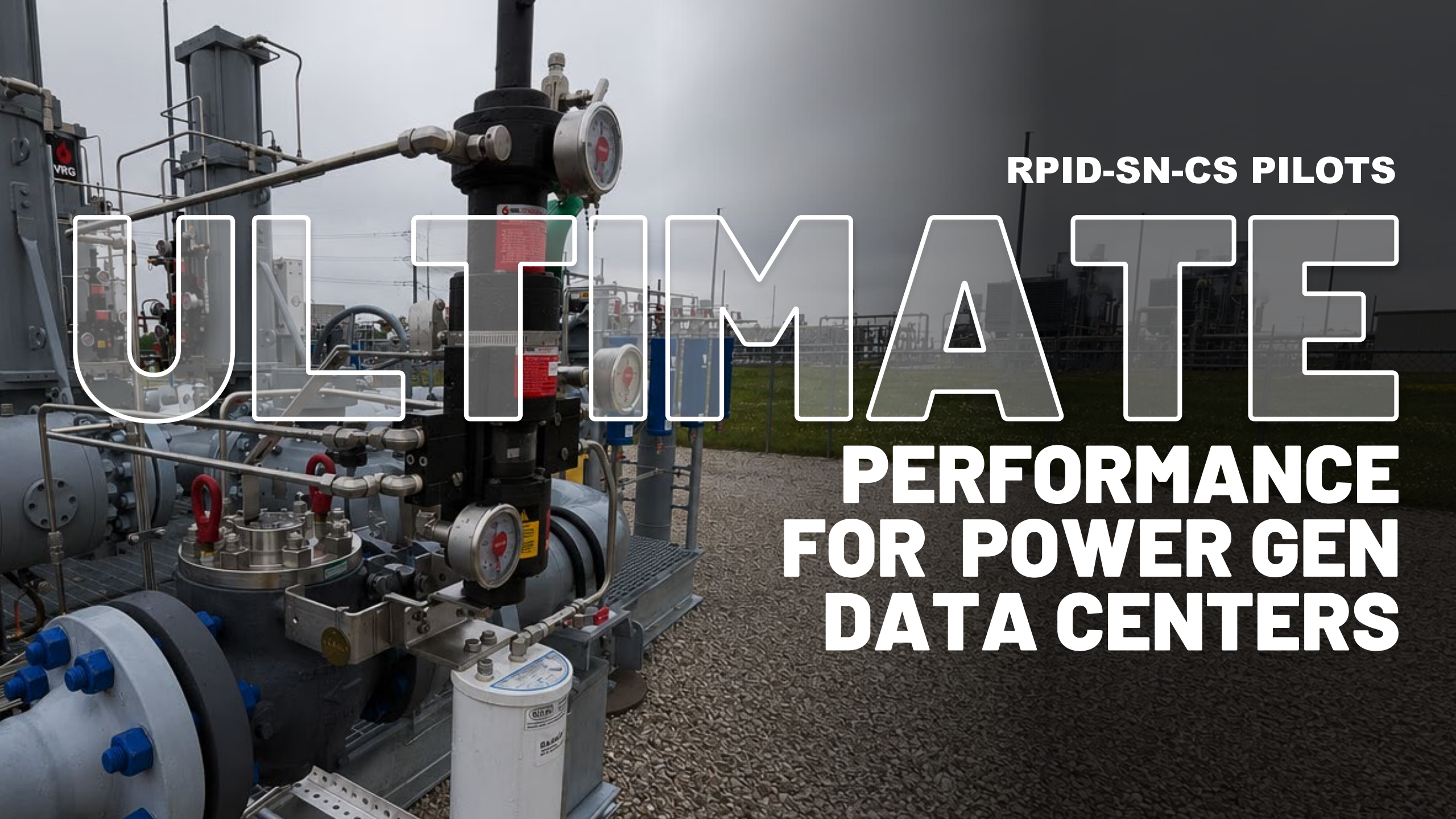
RPID-SN-CS PILOTS

VRG RPID-SN-CS Regulator Pilots: VRG Controls' brand new, patented RPID-SN-CS Regulator Pilots are the ultimate complement to Red Ox Regulators for the most demanding pressure control applications similar to the RP-SN-CS Pilot with the state-of-the-art P-I-D controller design which provides adjustable gain, reduced droop effect associated with wide ranging inlet pressures and station flow rates, and improved lockup. This takes control of pipeline, industrial gas feed, and power plants to the next level.

ULTIMATE

- **Applications: ULTIMATE** Accuracy Pressure Control with Minimal Droop Achieve by True P-I-D Control
 - Power Plants and Data Centers
 - Industrial Feeds
- **Available Setpoint Ranges:** 3 – 1500 psig



The background of the image shows a complex industrial facility, likely a power plant or refinery. In the foreground, there is a large piece of machinery with various pipes, valves, and gauges. A prominent vertical pipe has several pressure gauges attached to it. To the left, a large cylindrical tank is visible. The ground is covered in gravel. In the background, there are more industrial structures and a fence. The sky is overcast.

RPID-SN-CS PILOTS

ULTIMATE

**PERFORMANCE
FOR POWER GEN
DATA CENTERS**

RPID-SN-CS PILOTS

ULTIMATE

**PROPORTIONAL
DERIVATIVE
INTEGRAL CONTROL
NO EMISSIONS**



ACCESSORIES





RED OX
CONTROLS



RCV RESEARCH CONTROL VALVES

The Model RCV research Control Valve is a pneumatically operated control valve that is used in conjunction with Red Ox Regulators to provide control of a variety of processes. The RCV is typically used for flow control, remote electronic control, or “droopless” pressure control. The RCV is available in “fail open” or “fail closed” configurations.

Input: 3-15 psig, 6-30 psig, Split Range Capable

Failure Modes: Fail Open or Fail Closed

Applications:

- Cascade Control / Velocity Control
- Flow Control
- “Droopless” Pressure Control
- Electronic Pressure Control
- Override Applications

ERCV ELECTRONIC RESEARCH CONTROL VALVES

The Model ERCV research Control Valve is a electrically operated control valve that is used in conjunction with Red Ox Regulators to provide control of a variety of processes. The ERCV is typically used for electronic flow or pressure control. The ERCV is typically controlled via 4-20 mA command signal with 12 V_{DC}, 24 V_{DC}, or 120 V_{AC} power supply. The unit can “lock” last loading pressure upon loss of signal or power supply.

Input: 4-20 mA
Power: 12 V_{DC}, 24 V_{DC}, or 120 V_{AC}
Failure Mode: Lock Last Loss Signal / Power

Applications:

- Cascade Control / Velocity Control
- Electronic Flow Control
- Electronic Pressure Control
- Override and Underride Applications





ESC ELECTRONIC SETPOINT CONTROL

Module provides remote setpoint adjustment capability when paired with VRG Controls' RP Series Regulator Pilots. ESC modules may be powered with 120 V_{AC} or 24 V_{DC} Power. 4-20 mA analog or 24 V_{DC} discrete command signal will raise / lower pressure setpoint. In event of loss of command signal or power, the ESC will render the RP pilot to "lock" at last pressure setpoint, thereby maintaining control of the process. The ESC features an easy pushbutton programming and 4-20 mA feedback of ESC motor position.



ELIMINATOR PILOT FILTER

The Eliminator Pilot Filter provides 50 μ filtration of pilot inlet gas to ensure reliable operation of your Red Ox control devices. The Eliminator features 316 Stainless Steel construction in a compact design with 0.250" FNPT inlet, outlet, and drain connections. The standard sintered polyethylene filter element can easily be changed inline.

Inlet / Outlet:	0.250" FNPT
MAOP:	5000 psig
Filtration:	50 μ
Body:	316L Stainless Steel
Media:	Sintered Polyethylene



RED OX
ACCESSORIES



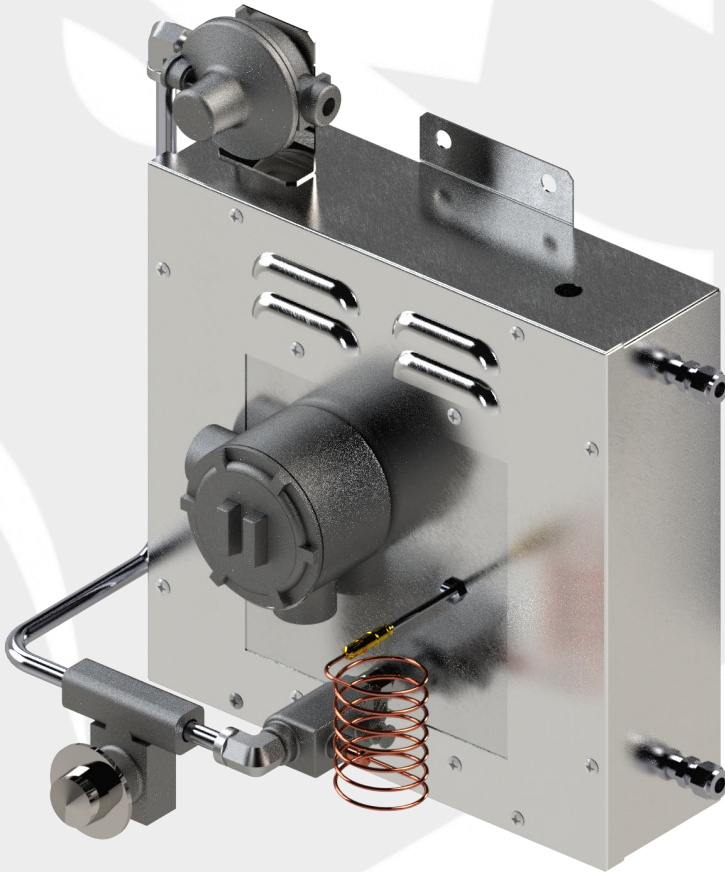
FD FILTER DRYER ASSEMBLIES

The FD Series of Filter assemblies provide high capacity, long-life 10 μ filtration. The FD Series features a heavy-duty, high-pressure carbon steel construction with 0.250" FNPT inlet, outlet and drain connections. Various filter/dryer media filters are available to remove entrained moisture, gas odorant and trace sulfur.

Inlet / Outlet:	0.250" FNPT
Drain:	0.250" FNPT w/ Needle Valve
MAOP:	1500 psig
Filtration:	$\geq 3\mu$
Body:	Painted Carbon Steel
Media:	Silica Gel - Standard Sulfa-Gon - Optional Activated Charcoal - Optional

SUPPLY GAS HEATERS

Supply Gas Heaters provide a robust amount of self-contained heat to ensure reliable operation of Control Devices without the need for constant electrical power. Supply Gas Heaters are pre-tubed in a compact, durable stainless steel enclosure that includes an explosion proof catalytic heater, heat exchanger core, and low pressure supply gas heaters. Startup voltages available in 12 V_{DC} or 120 V_{AC}.



Connections:

0.250" FNPT / 3/8 in Tube

Streams:

2 Path Heating

MAOP:

3000 psig

Startup Voltage:

12 V_{DC} or 120 V_{AC}

Heating Capacity:

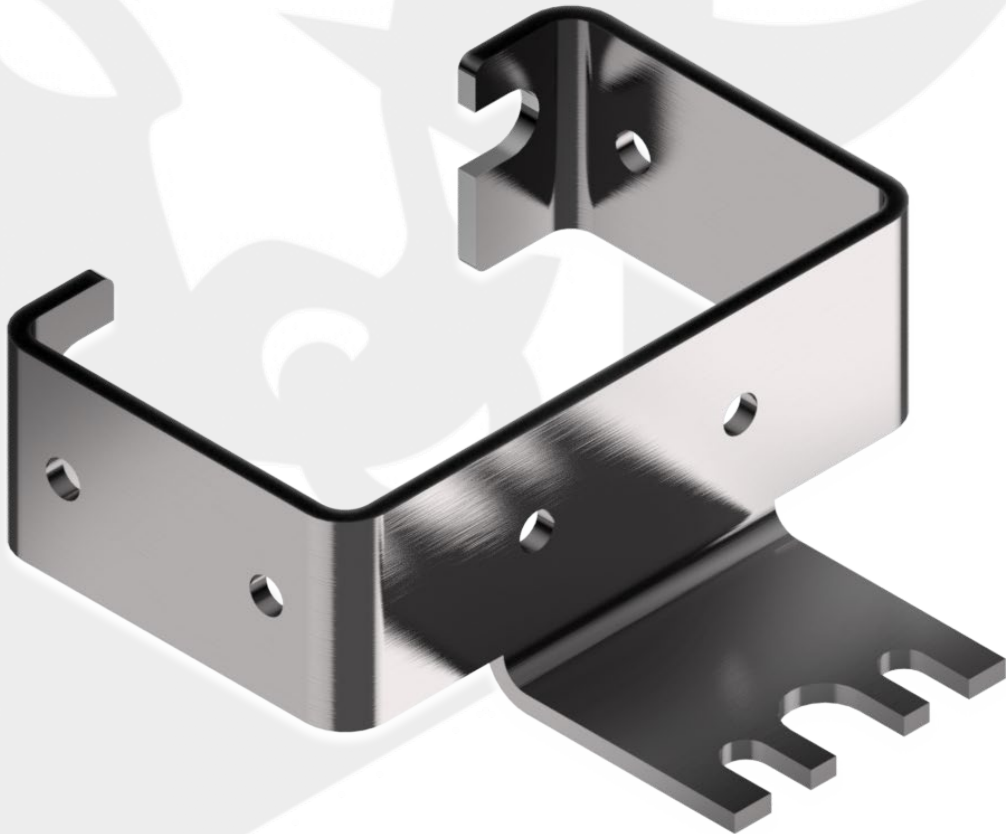
2600 BTU

Case:

Stainless Steel

Rating:

Cl. 1, Div 1 Ex Proof, CAS Approved



IMC RP PILOT MOUNTING BRACKET

The IMC RP Pilot Mounting Bracket provides a robust, convenient ability to mount VRG Controls' RP Series Regulator Pilots and other accessories. The 316SS bracket can be installed on **LEFT or RIGHT** hand side of all sizes of Red Ox IMC Top-Entry Regulators. The bracket allows the IMC Top-Entry Regulator to be rebuilt without removal of the RP Pilot.

NAJ NOISE ATTENUATING JACKETS

NAJ Series Noise Attenuating Jackets provide excellent acoustic noise reduction when paired with Red Ox Regulators. Noise attenuation can typically be reduced between 12-25 dBA when applied to aggressive regulation applications. The NAJ offers a cost-effective solution during design stage or retrofit to existing “problem” facilities. NAJ Jackets are equipped with easy removal and reinstallation without special tools or material.



PROVEN IN THE FIELD.





POWER PLANT MAIN FUEL GAS TRIM RUN



OVERVIEW

- Peaking power generation plant needed reliable and accurate trim run pressure regulator for meshed proportional deadband control application
- Red Ox IMC provided more accurate control in same face-to-face overall dimension
- Red Ox IMC features 100% Stainless Steel piston construction for durability and corrosion resistance to process conditions
- Paired with extreme accuracy Red Ox RP Pilots which are ideal for short system and power plant fuel gas feed



SETPOINT RANGE:
3.0 TO 1500 psig

POWER PLANT INDIVIDUAL UNIT 6" FUEL GAS REGULATORS

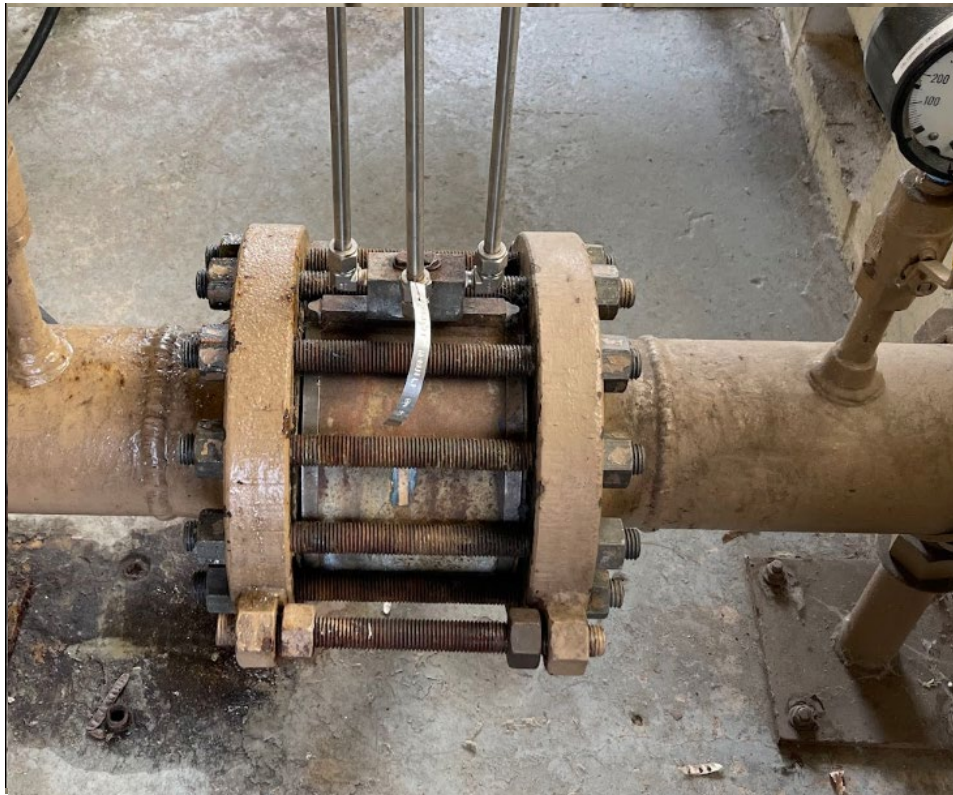




PSEG

e ENERGY
IMPACT
PARTNERS

PSE&G TRENTON STATION IMS RETROFIT



OVERVIEW

- Red Ox IMS provides compact and simple pressure regulation solution in a compact package
- Red Ox IMS features 100% Stainless Steel construction for durability and corrosion resistance
- Paired with extreme accuracy Red Ox RP Pilots which are ideal for short system and power plant fuel gas feed



SETPOINT RANGE:
3.0 TO 1500 psig





e ENERGY
IMPACT
PARTNERS

TC ENERGY EAGLE COMPRESSOR STATION



PROBLEM

- Other Manufacturer's technology exhibited maintenance problems
- Other Manufacturer's spare parts are expensive
- Other Manufacturer's product is complex and requires heavy lifting

SOLUTION

- Red Ox IMC minimizes regular maintenance due to unique piston design
- IMC Spare Parts and New Body Assemblies are cost-effective
- IMC top-entry regulator is simple and eliminates heavy lifting



SETPOINT RANGE:
3.0 TO 1500 psig



VRG RP-SN-CS

VRG Controls' RP-SN-CS Regulator Pilots are the perfect complement to Red Ox Regulators for the most demanding pressure control applications. The CS "Closed Spring" sensing chamber protects the Control Spring from aggressive environments and ensures "optimum" pressure control accuracy in installations like power plants, industrial gas feeds and pipeline applications.



e ENERGY
IMPACT
PARTNERS

TC ENERGY GLADY WV INSTALLATION



PROBLEM

- Other Manufacturer's technology exhibited maintenance problems
- Other Manufacturer's spare parts are expensive
- Other Manufacturer's product is complex and requires heavy lifting

SOLUTION

- Red Ox IMC minimizes regular maintenance due to unique piston design
- IMC Spare Parts and New Body Assemblies are cost-effective
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SETPOINT RANGE:
3.0 TO 1500 psig



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UGI UTILITIES TEMPLE STATION



PROBLEM

- Other Manufacturer's technology exhibited substantial droop characteristics
- Other Manufacturer's spare parts are expensive
- Other Manufacturer's product is complex and requires heavy lifting

SOLUTION

- Red Ox IMC minimizes regular maintenance due to unique piston design
- IMC Spare Parts and New Body Assemblies are cost-effective
- IMC top-entry regulator is simple and eliminates heavy lifting



SETPOINT RANGE:
3.0 TO 1500 psig

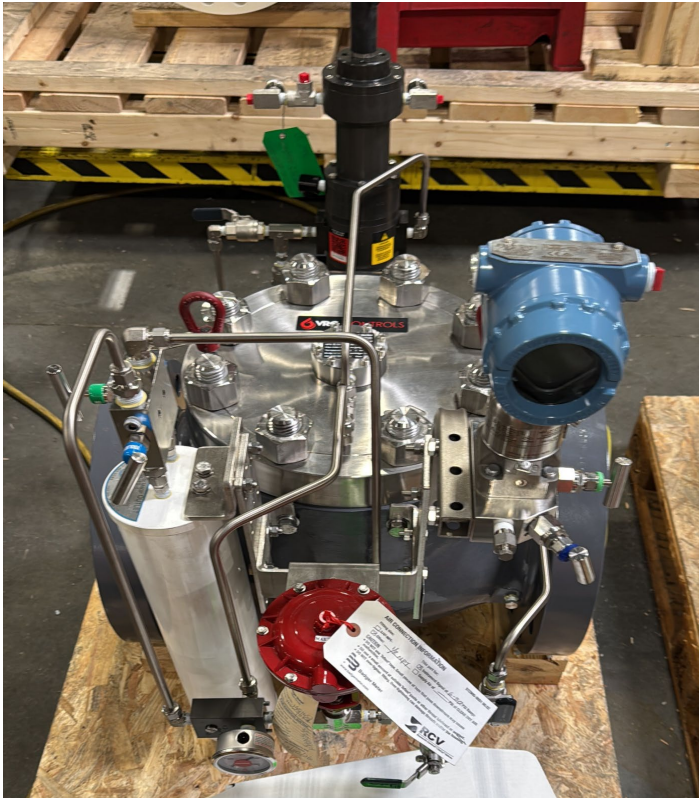


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WILLIAMS CT EAST & WEST



PROBLEM

- Highly transient data center/power plant feed
- To hit the entire flow range three (3) parallel runs need to be split ranged – 2", 4", and 8"
- Regulator position feedback is needed to control line heaters.

SOLUTION

- Red Ox IMC with VPC + Badger RCV for "droopless control" allows cascading of the three (3) parallel runs
- RP Pilot included for a pressure control override (PCO)
- Multi-variable transmitter to infer regulator position and feedback to SCADA
- Red Ox IMC lessens maintenance frequency





WILLIAMS HOCKESSIN PA STATION RETROFIT



PROBLEM

- Existing regulator technology is obsolete
- Existing regulator technology is very heavy and does not permit easy top-entry maintenance

SOLUTION

- Red Ox IMC with RP Pilots provides a rugged, reliable regulator technology
- New Technology supported with large USA inventory
- Technical and Field Support by key customer partner
- Red Ox IMC lessens maintenance frequency



SETPOINT RANGE:
3.0 TO 1500 psig





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