

# CGA Energy Nexus & Annual Technical Conference 2025

## Limited Vent Regulators for Meter Sets

Isaac Droessler  
Cavagna North America



# Venting Indoor & Outdoor Meters



*Images courtesy of [savewright.org](http://savewright.org)*

# Venting Requirements

Outdoors: Z662

Clearance in m (ft) from service regulator vent based on relief capacity				
Clearance From	CSA 6.18 certified OPCO regulators with limited relief of 1.5 m <sup>3</sup> /h (50 SCFH) or less	Natural gas up to and including 55 m <sup>3</sup> /hr (1900 SCFH)	Natural gas over 55 m <sup>3</sup> /h (1900 SCFH)	Propane
Building Opening	0.3 (1 ft)	0.9 (3 ft)	3.0 (10 ft)	0.9 (3 ft)
Appliance Vent Outlet	Dimension A	Dimensions B	Dimensions B	Dimensions B
Moisture exhaust duct	0.9 (3 ft)	0.9 (3 ft)	0.9 (3 ft)	0.9 (3 ft)
Mechanical air intake	0.9 (3 ft)	3.0 (10 ft)	3.0 (10 ft)	3.0 (10 ft)
Appliance air intake	0.3 (1 ft)	0.9 (3 ft)	3.0 (10 ft)	3.0 (10 ft)
Source of ignition	0.3 (1 ft)	0.9 (3 ft)	0.9 (3 ft)	3.0 (10 ft)

Indoor: 6.22/Z21.80

**Table V**  
**Maximum Allowable Vent Limiter Venting Rate**

	Specific Gravity	Maximum Allowable Flow Rate, Cubic Feet Per Hour (cm <sup>3</sup> /s)	
Vent Limiter for Use Only With Natural, Manufactured, Mixed gases and LP Gas-Air Mixtures	0.64	2.5	(19.7)
Vent Limiter for Use With Liquefied Petroleum Gas	1.53	1.0	(7.87)

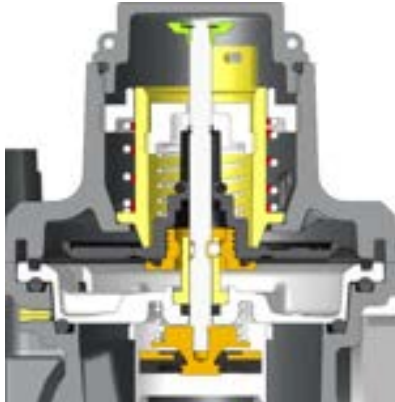
Or run a vent outside!

# Over Pressure Protection Methods Today

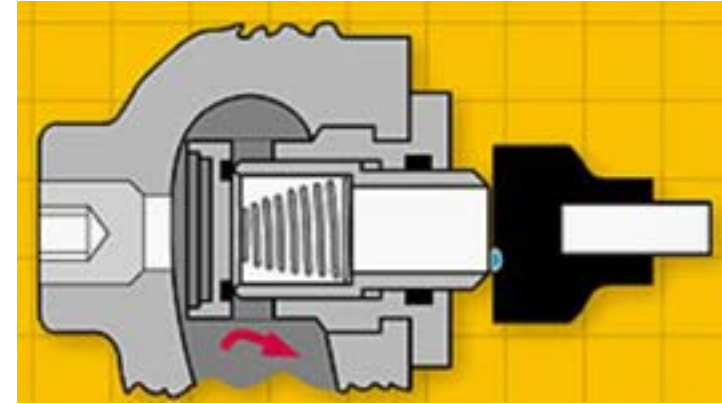
## Relief Valves



## Slam Shut/Shut Off

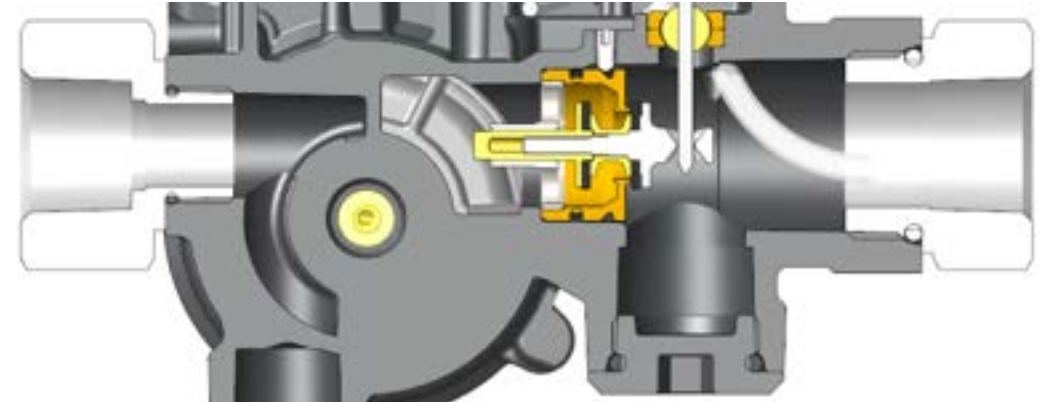


## Internal Monitor



*Image  
courtesy of  
Roots*

## EFV/LPCO



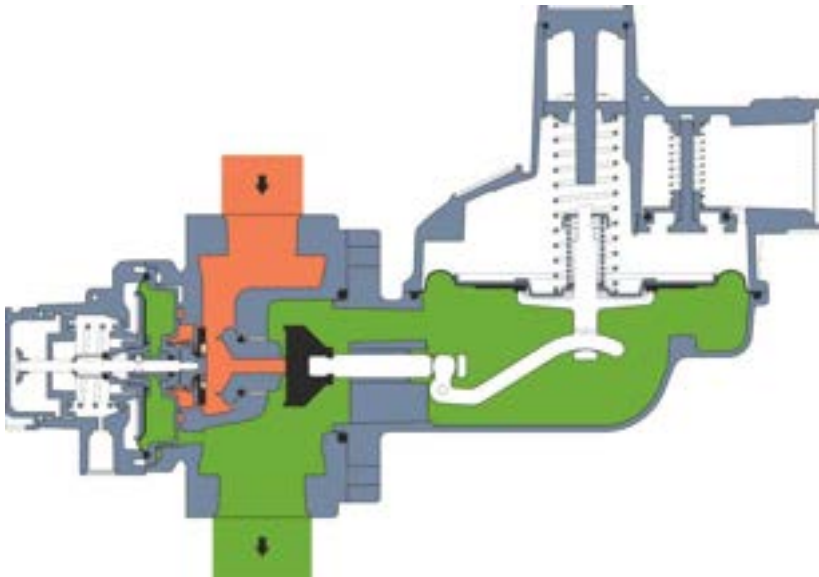
# Evaluating Over Pressure Protection Devices

Safety Option:	Full Safety Device	Provides Alarm	Minimizes Emissions (Ease of Install)	Keep Customer Online
Relief Valve				
Internal Monitor				
Slam Shut (OPSO)				
LPCO/EFV				

# “Shut Off Regulators”

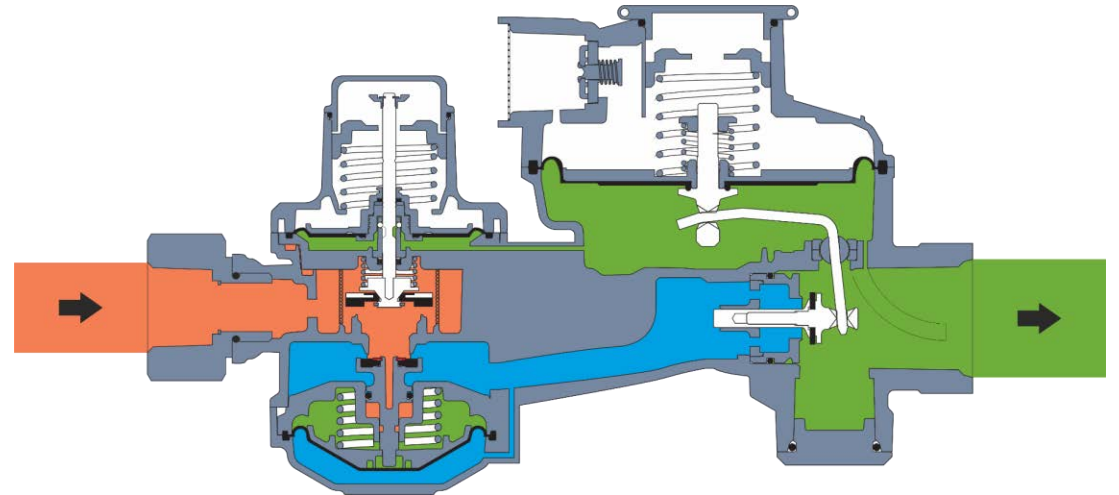
## Single Stage/Lever Style

- Limited options for residential
- More options for commercial
  - Higher capacity IRV drives the desire to reduce venting



## Dual Stage

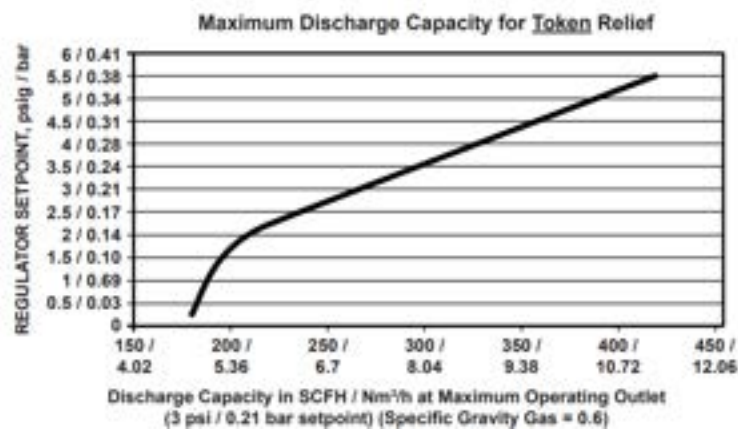
- Lots of options available, but they're more common on dual stage:
  - OPCO
  - UPCO
  - Double diaphragm
  - EFV



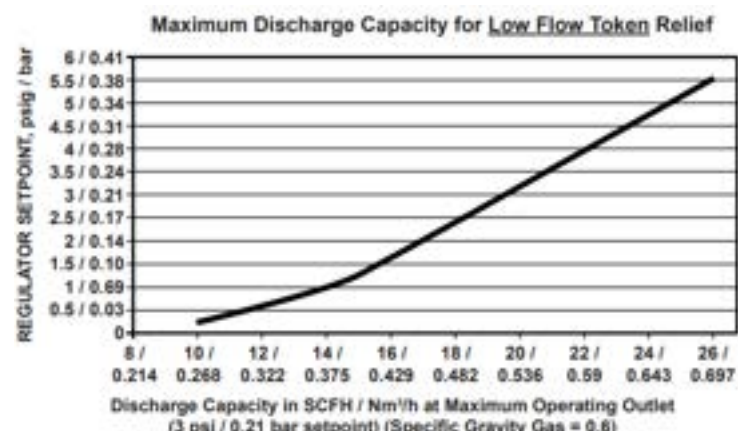


# Reduce Emissions for Outdoor Meters

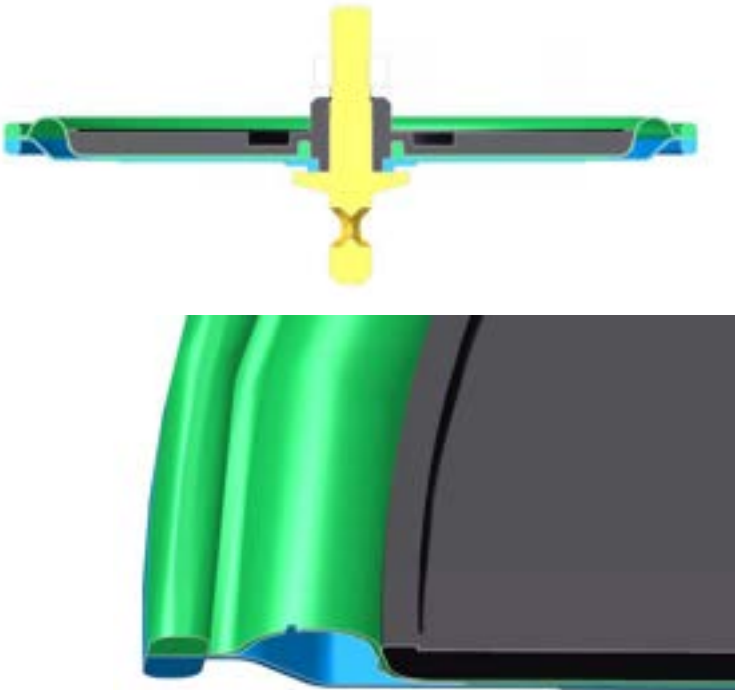
## Token IRV



## Low Flow IRV



## No IRV - Safety Diaphragm



*IRV capacity curves courtesy of Emerson*

# Indoor Meters

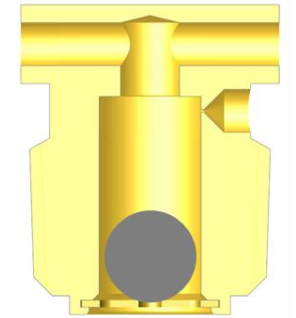
## Combined Vents

---

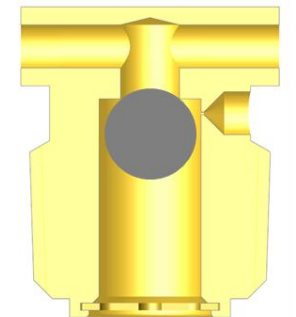


## Vent Limiters

---



Normal Operation



Limiting Operation



# Vent Limiter vs. Limited Relief

## ANSI Z21.80/CSA 6.22

“Vent limiters used with regulators shall limit the flow through the vent of the regulator as shown in Table V...”

Table V

Maximum Allowable Vent Limiter Venting Rate

	Specific Gravity	Maximum Allowable Flow Rate, Cubic Feet Per Hour (cm <sup>3</sup> /s)	
Vent Limiter for Use Only With Natural, Manufactured, Mixed gases and LP Gas-Air Mixtures	0.64	2.5	(19.7)
Vent Limiter for Use With Liquefied Petroleum Gas	1.53	1.0	(7.87)

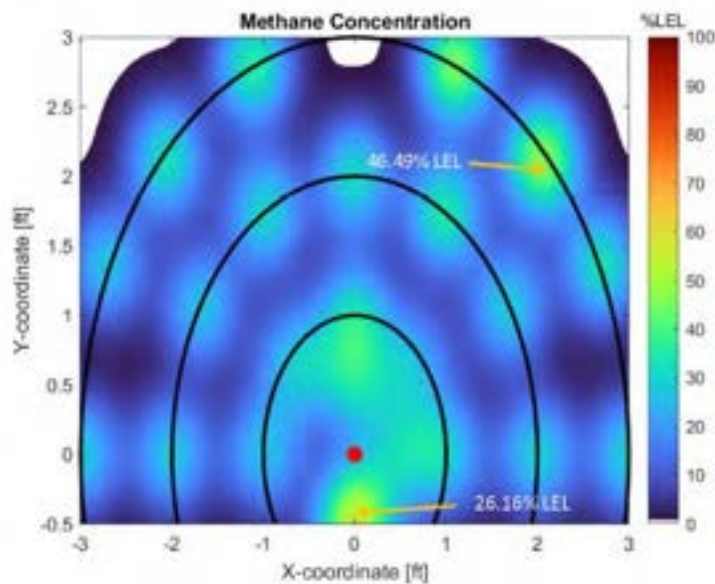
## ANSI B109.5

“Limited Relief: A relief valve with a capacity up to 2.5 scfh (0.07 Sm<sup>3</sup>/h) at specified conditions”

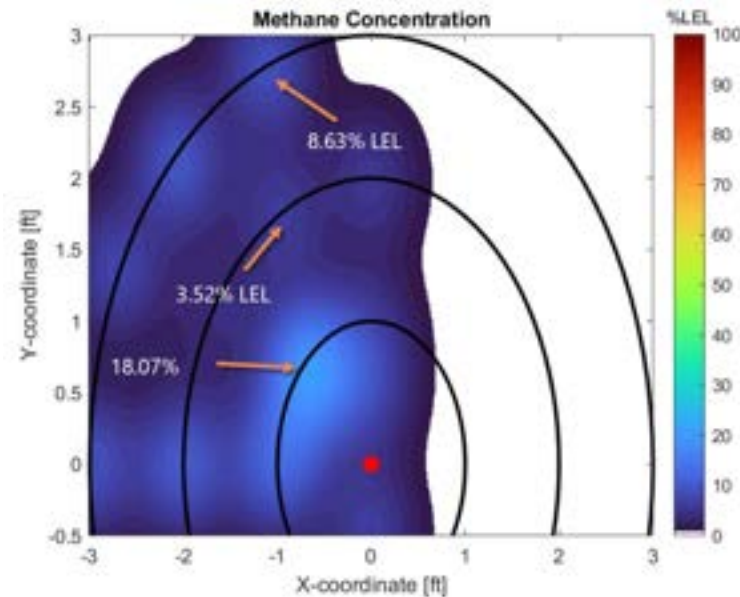
- MAOP of downstream system
- OPSO set point

# Why 2.5 SCFH?

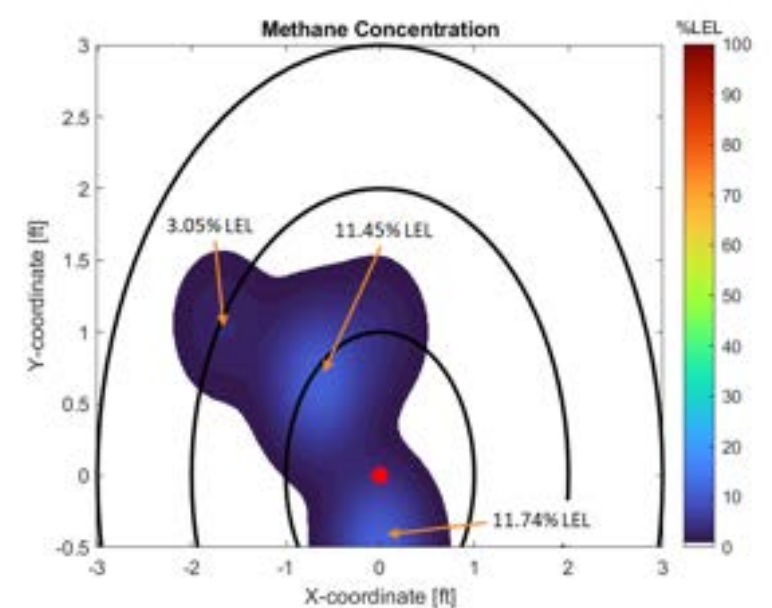
## Full Capacity IRV



## Token/Low Flow IRV



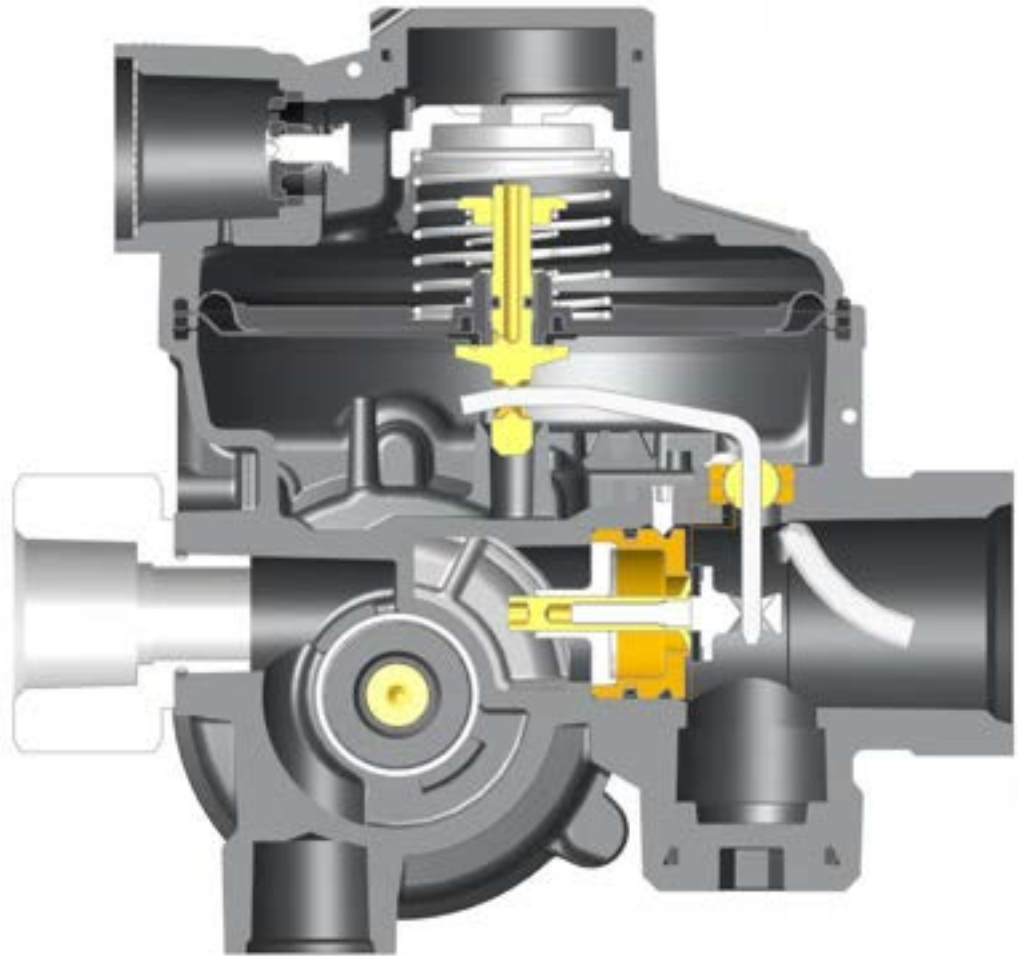
## Limited IRV



Heat maps taken from PHMSA #693JK32110001POTA/GTI Energy Project Number 23059. All data is Lever Disconnect for regulators delivering 7" w.c.

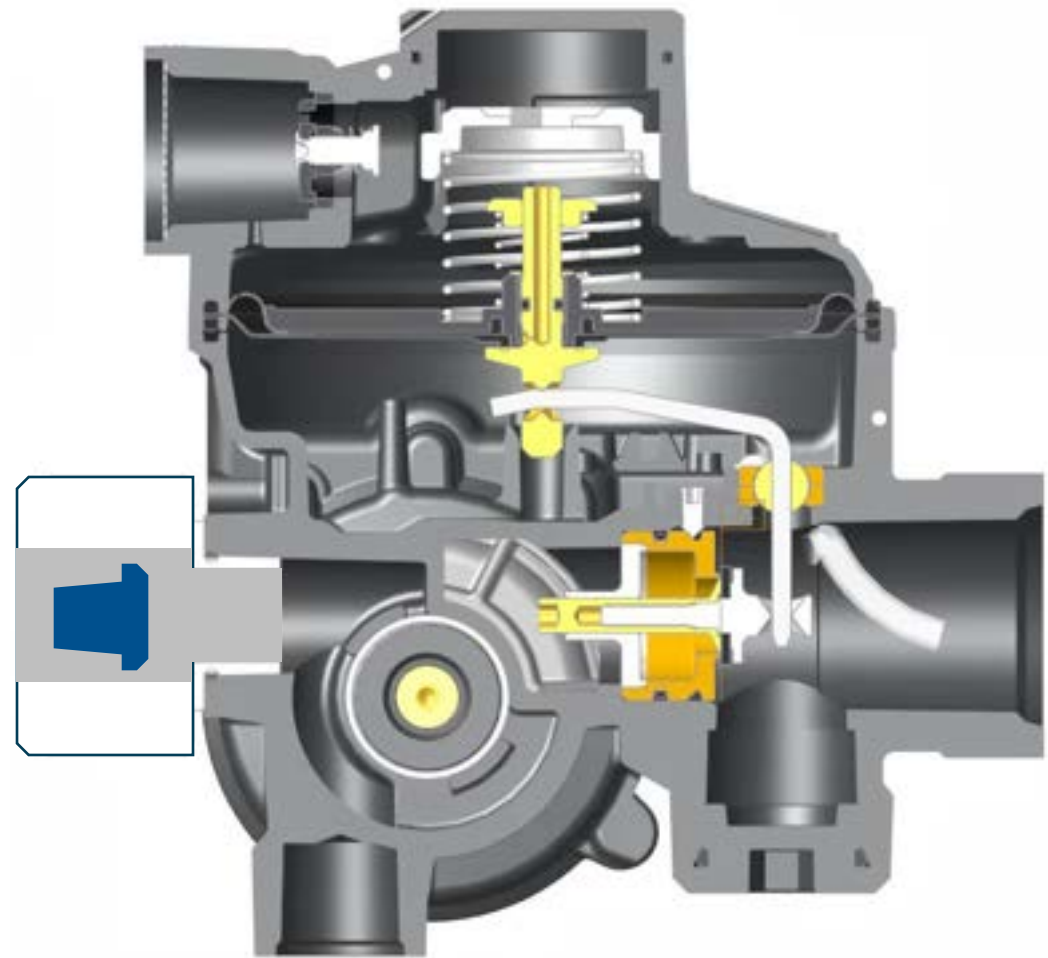
# Limited IRV

- Functions the same as a full capacity or Token IRV
  - Start to discharge
  - Reseat
  - Factory set point
- Safe for installation outdoors
- No impact on regulator operation



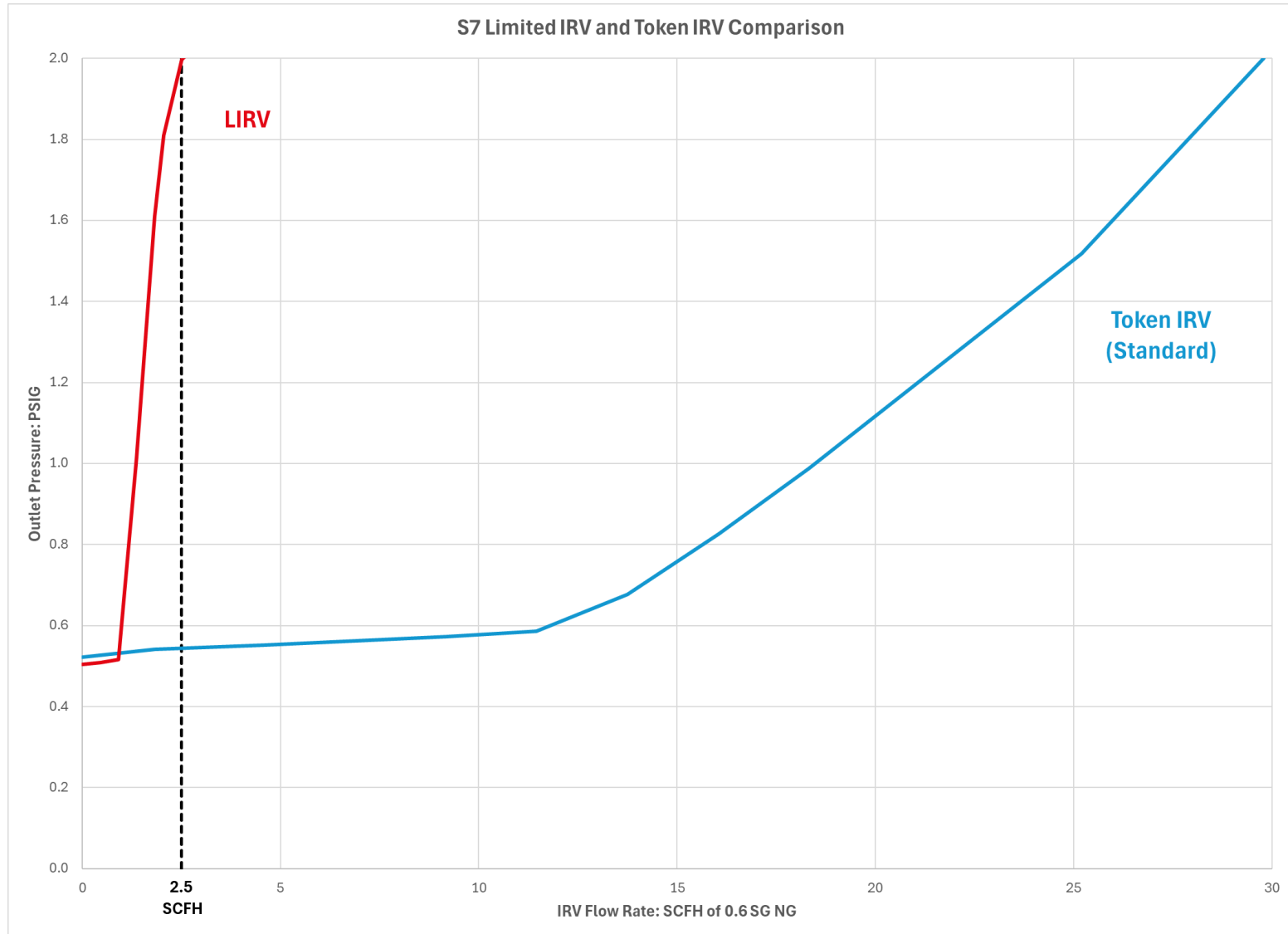
# CSA 6.22 ANSI Z21.80

- Dual Diaphragm with Limited IRV meets the venting requirements of Z21.80/6.22
- Does not meet Temperature Requirements of 6.22
- Addition of Thermal Shutoff at the inlet meets full 6.22 requirements



# Limited IRV

- Avoid nuisance trips of SSV
- Eliminate vent piping
- Minimize emissions





# Simplify Installation & Improve Safety

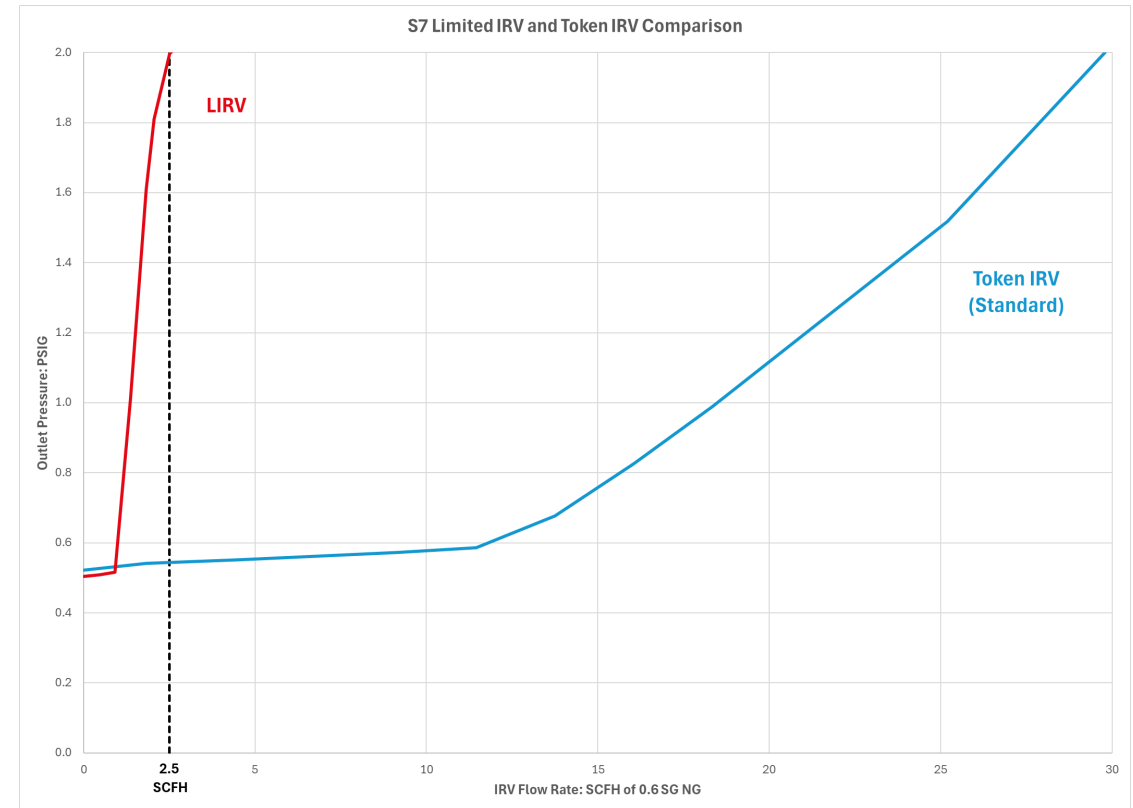




# Limited IRV

- Avoid nuisance trips of SSV
- Eliminate vent piping
- Minimize emissions

Safety Option:	Full Safety Device	Provides Alarm	Minimizes Emissions (Ease of Install)	Keep Customer Online
Relief Valve				
Internal Monitor				
Slam Shut (OPSO)				
LPCO/EFV				
SSV with LIRV				



# Questions?

A Cavagna Group Brand

**Residential**

**Commercial**

**Industrial**

**Distribution**

**Farm Tap**



**Learn More About  
Limited IRV Here:**



**Or stop by  
Booth #28**