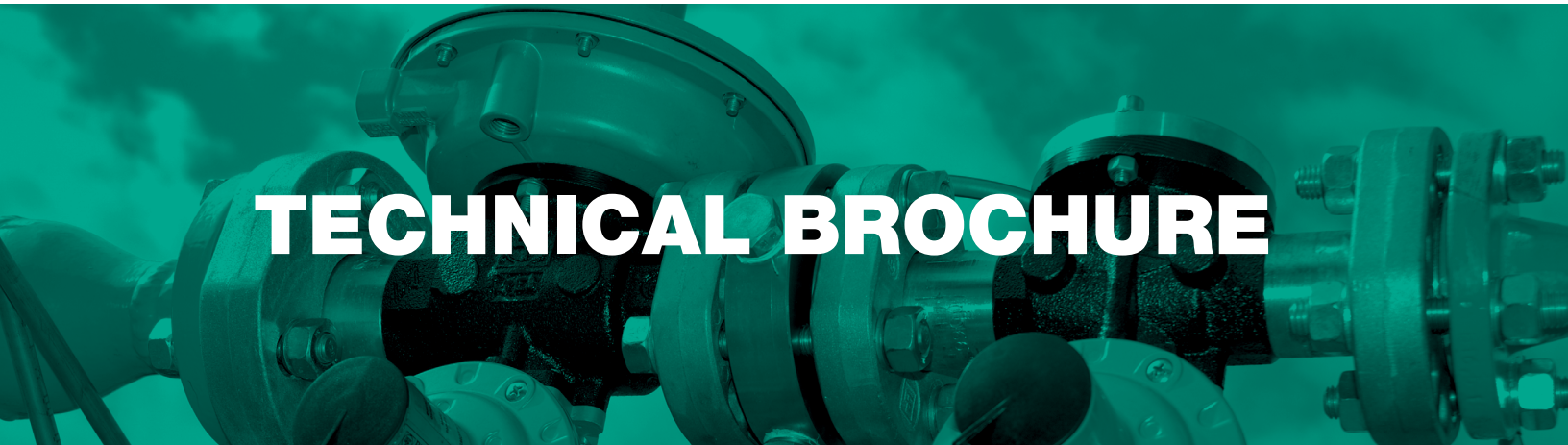
Pietro Fiorentini

NeoR

Low-pressure gas regulator



TECHNICAL BROCHURE

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NeoR_technicalbrochure_USA_revA

Who we are

We are a global organization that specializes in designing and manufacturing technologically advanced solutions for natural gas treatment, transmission and distribution systems.

We are the ideal partner for operators in the Oil & Gas sector, with a business solutions that span the whole natural gas chain.

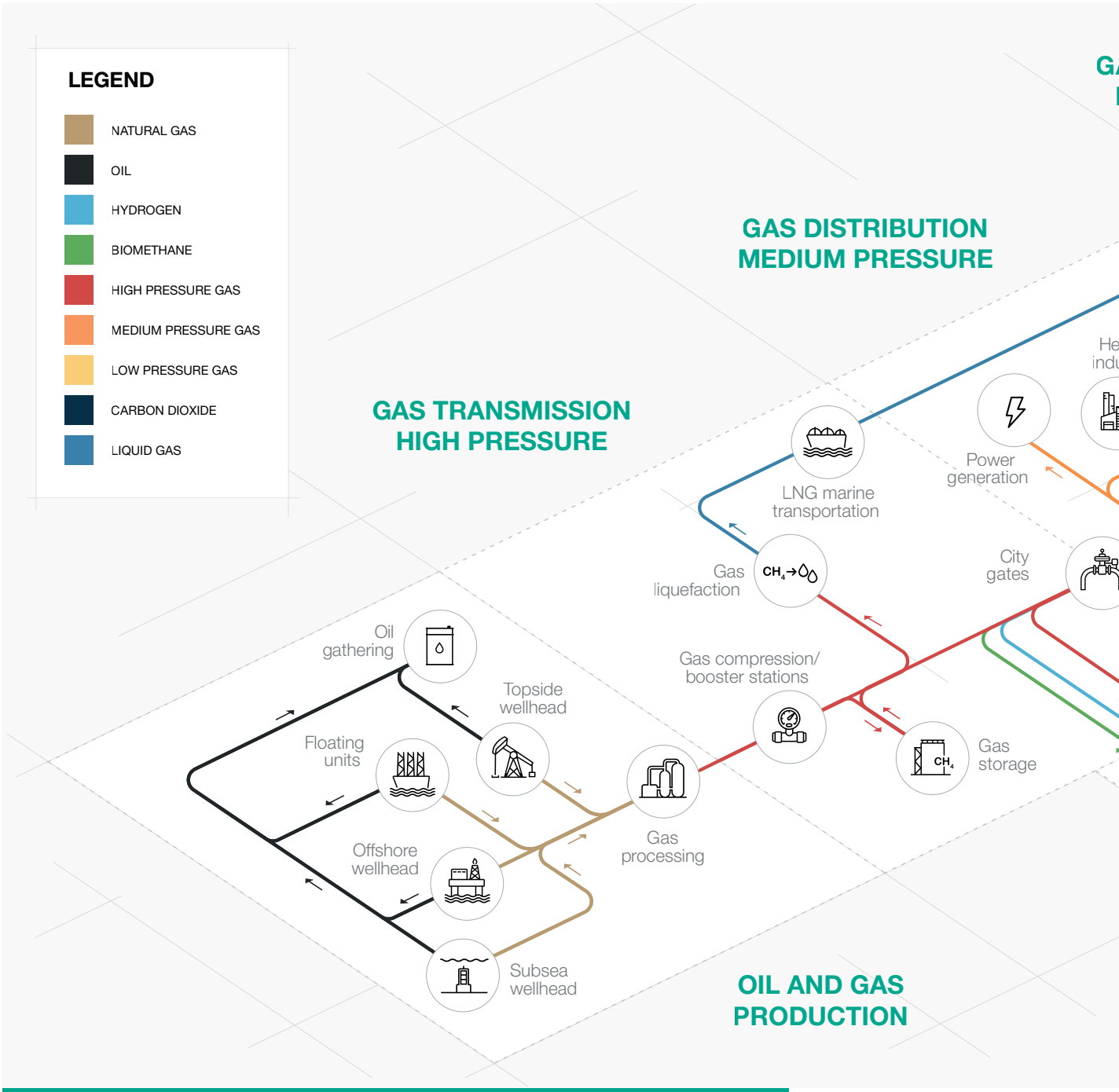
We are constantly evolving to meet our customers' highest expectations in terms of quality and reliability.

Our aim is to be a step ahead of the competition, with customized technologies and an after-sale service program undertaken with the highest level of professionalism.

Pietro Fiorentini advantages

- Localized technical support
- Experience since 1940
- Operating in over 100 countries

Area of Application



Green icon indicates the application where this product is suitable for

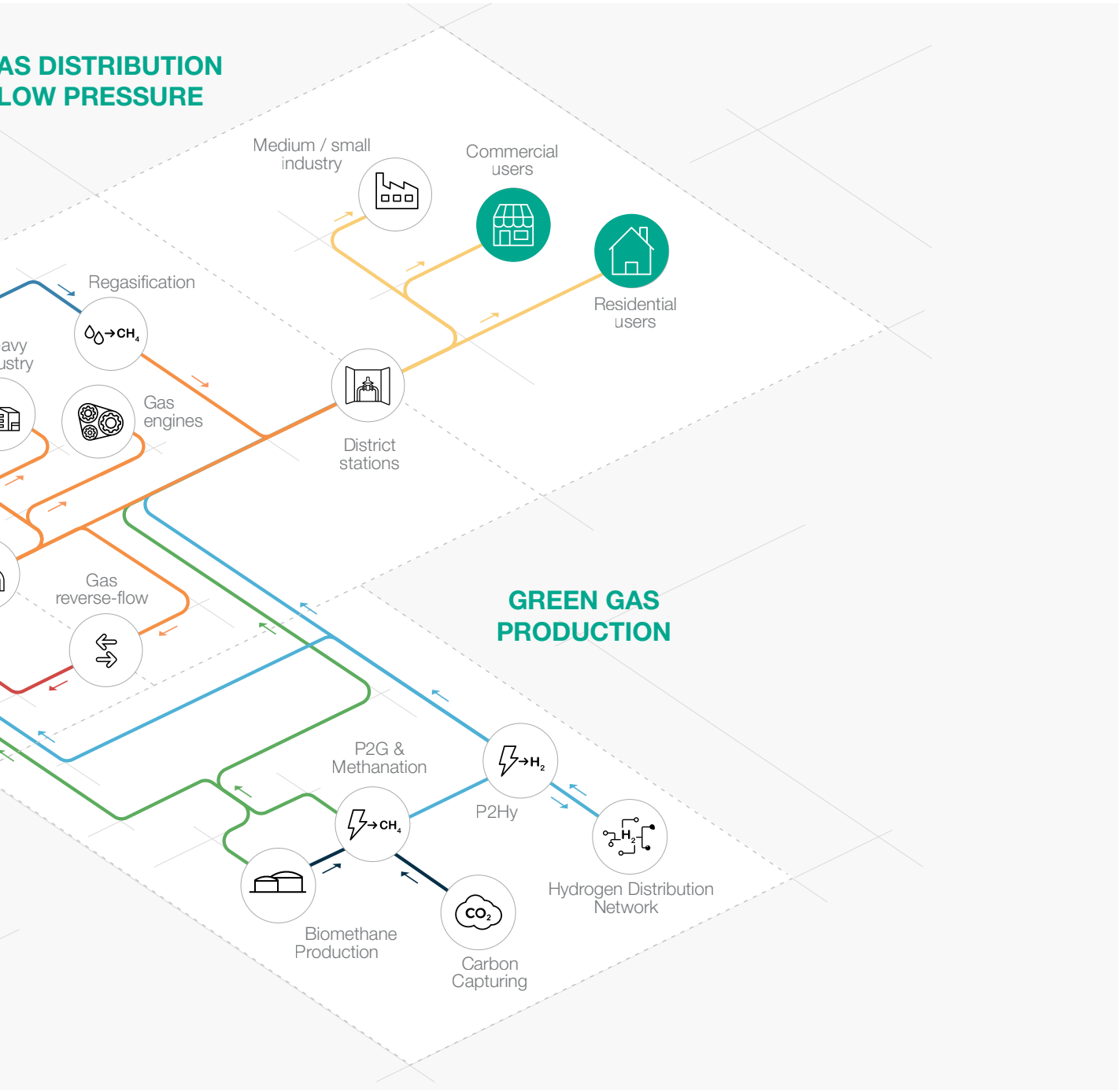


Figure 1 Area of Application Map

Introduction

The **NeoR** is a double stage gas pressure regulator by Pietro Fiorentini. Designed to ensure continuous gas supply while maintaining a high level of safety with reduced emission. The NeoR is a service regulator without slam-shut device, incorporating a double token relief valve (IRV) with partial capacity.

It is particularly suitable for low pressure natural gas distribution systems for commercial and residential users. It should be used with previously filtered non-corrosive gases including biomethane and RNG (Renewable Natural Gas)

The NeoR is **Hydrogen Ready** for NG-H2 blending.

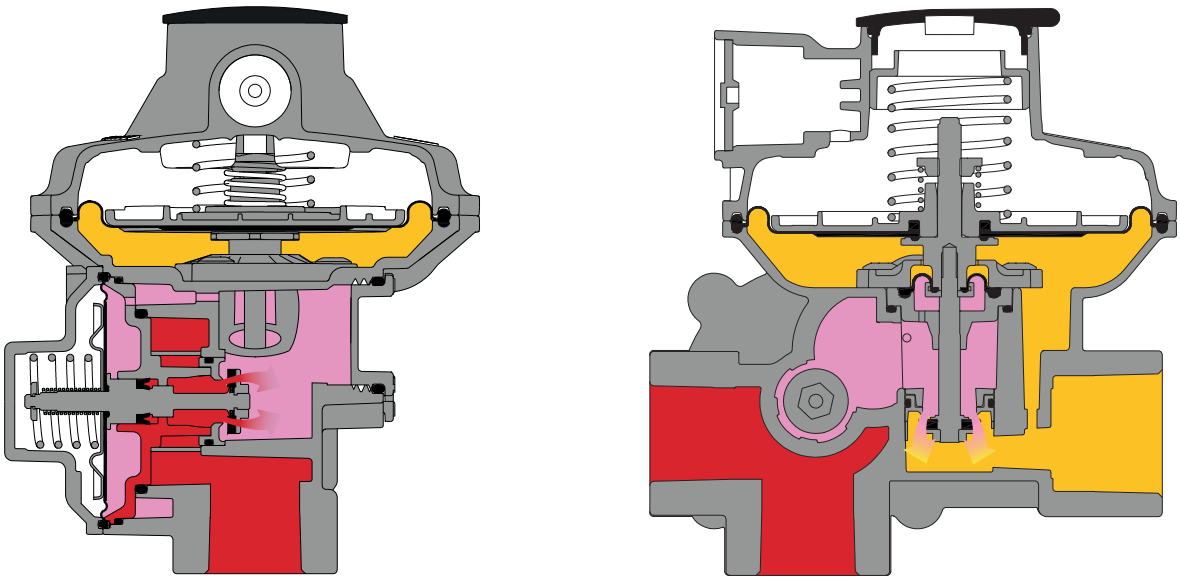


Figure 2 NeoR

Inlet pressure

Intermediate pressure

Outlet pressure

Features and setting ranges

The NeoR is a service regulator without slam-shut device, incorporating a double token relief valve (IRV) with partial capacity.

The balanced 1st stage regulation limits the pressure variation to the 2nd stage, so it is possible to reach high accuracy of the regulated outlet pressure. Therefore, a balanced double stage regulator has a single-size orifice for all pressure and flow conditions.

The NeoR can be installed in vertical or horizontal position.

Figure 3 NeoR

NeoR competitive advantages

- Operates with low differential pressure
- Overpressure protection without slam-shut or full capacity IRV
- Two-stage single orifice regulator
- 3 ft or more clearance installation according to 49 CFR § 192
- Built-in thermal valve option
- Built-in strainer
- Suitable for outdoor installations
- Biomethane (RNG) compatible and 20% Hydrogen blending compatible. Higher blending available on request

Features NeoR

Features	Values		
Design pressure* (PS[1] / DP[2])	up to 860 kPa up to 125 psig		
	Standard version	**Arctic version**	
Ambient temperature* (TS[1])**	-30°C to +65°C | -20°F to +150°F	-40°C to +65°C | -40°F to +150°F	
Inlet gas temperature*,***	-20°C to +65°C | -4°F to +150°F	-30°C to +65°C | -20°F to +150°F	
Inlet pressure (MAOP / p_{umax} [1])	from 69 kPa to 0.69 MPa from 10 psig to 100 psig		
Nominal capacity	18 Sm3/h | 630 scfh	28 Sm3/h | 1000 scfh	40 Sm3/h | 1400 scfh
Minimum inlet pressure	69 kPa | 10 psig	69 kPa | 10 psig	69 kPa | 10 psig
Overpressure protection (OPP)	12.8 kPa | 1.85 psig	13.8 kPa | 2 psig	34.5 kPa | 5 psig
Range of downstream pressure Wds	from 1.5 kPa to 13.8 kPa from 6" w.c. to 2 psig		
Accuracy	According to ANSI B109.4 and CSA 6.18		
Lock-up pressure	According to ANSI B109.4 and CSA 6.18		
Connections*	In-line / 90° configuration 3/4" or 1" NPT according to ANSI B1.20.1, other configurations or connections on request		

([1]) according to EN334 standard
([2]) according to ISO 23555-1 standard
(*) NOTE: Different functional features and/or extended temperature ranges may be available on request. Stated inlet gas temperature range is the maximum for which the equipment's full performance, including accuracy is guaranteed. Product may have a different pressure or temperature ranges according to the version and/or installed accessories.
(**) NOTE: Stated temperature range is the operating range for which the equipment's mechanical resistance and leakage rate are guaranteed. Some body materials, if multiple choices are available, may not be suitable for all the available versions shown.
(***) NOTE: Stated temperature range is the range for which the equipment's full performance, including accuracy and lock-up are guaranteed. Some body materials, if multiple choices are available, may not be suitable for all the available versions shown.

Table 1 Features NeoR

Materials and Approvals

Part	Material
Body	Aluminum
Cover	Aluminum
Diaphragms and seats	Nitrile rubber
Sealing rings	Nitrile
NOTE: The materials indicated above refer to the standard models. Different materials can be provided according to specific needs.	

Table 2 Materials

Construction Standards and Approvals

The NeoR regulator is designed according to ANSI B109.4 and CSA 6.18

ANSI B109.4

CSA 6.18

Design pressure

Design pressure (PS according to EN334)		
	Body	
	MPa	psig
all versions	0.86	125

Table 3 Design pressure for body

Maximum allowable operating pressure

MAOP Maximum Allowable Operating Pressure (p_{umax} according to EN334)			
Version		Control head	
		NeoR	
		MPa	psig
WITHOUT CE MARKING	all versions	0.86	125

Table 4 MAOP Maximum Allowable Operating Pressure without CE marking

Springs ranges

Pressure ranges		
Model	kPa	" w.c.
NeoR (630 scfh)	1.5 - 2.2	6 - 9
NeoR (1000 scfh)	1.5 - 2.2	6 - 9
		psig
NeoR (1400 scfh)	11 - 14	1.6 - 2.0

Table 5 Settings table

Range of the springs for NeoR			
Color	Code	Range	
		kPa	" w.c.
RED	US64470604RO	1.5 - 2.2	6 - 9
		kPa	psig
VIOLET	US64470605V	11 - 14	1.6 - 2.0

Table 6 Settings table for NeoR

Accessories

For the pressure regulators:

- Thermal safety valve

IRV

The NeoR has an integrated token relief valve that discharges a small volume of gas into the atmosphere when the regulator exceeds the relief valve set point.
In case of catastrophic failure, it keeps the pressure below the safety limit and allows a small amount of gas to escape, making the failure detectable while continuing to supply the gas to the consumer.

The NeoR is equipped with two IRVs, one on each stage. The discharge rate depends on the regulator's set point: the higher the set point, the greater the volume of gas released.

Relief valve adjustment springs					
Spring item code	Spring color	Spring range			
		Min.		Max.	
		kPa	" w.c.	kPa	" w.c.
US64470027VER	Green	2 + Pd	8 + Pd	5 + Pd	20 + Pd
US64470029GIA	Yellow	1.1 + Pd	4.4 + Pd	2 + Pd	8 + Pd
US64470213BL	Blue	0.8 + Pd	3.2 + Pd	1.1 + Pd	4.4 + Pd
US64470027VER	Green	15 + Pd	60.2 + Pd	25 + Pd	100.3 + Pd
US64470029GIA	Yellow	Max 14.9 + Pd	Max 59.8 + Pd	Max 14.9 + Pd	Max 59.8 + Pd

Table 7 Relief valve adjustment springs table

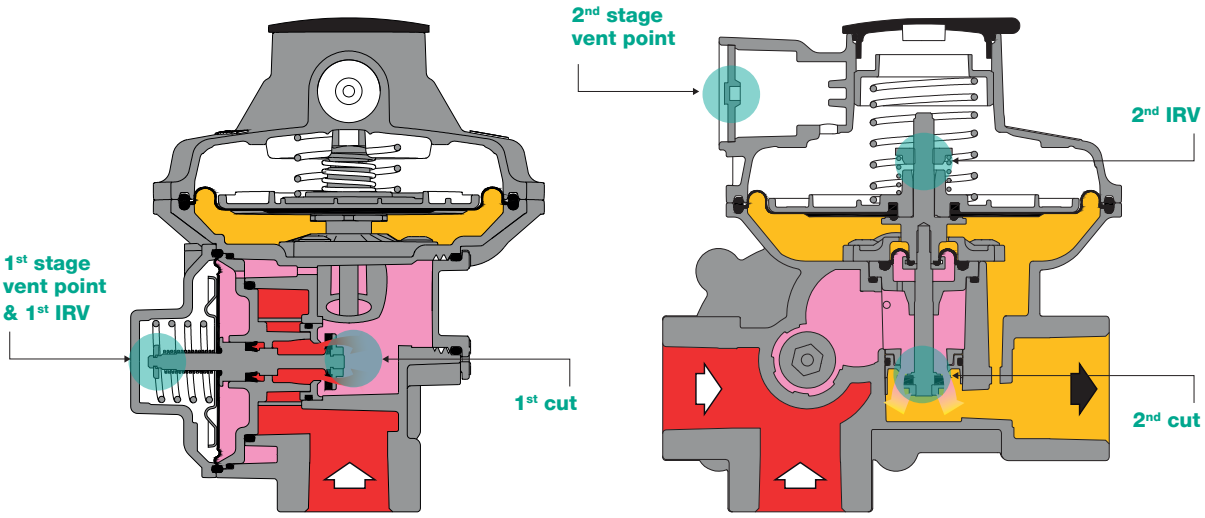
Overpressure protection without slam-shut or full capacity IRV

The NeoR is a service regulator without slam-shut device, incorporating a double token relief valve (IRV) with partial capacity.

In the event of a 1st stage catastrophic failure, the 1st IRV automatically opens to discharge excess gas to the atmosphere, maintaining the outlet pressure within the set value and ensuring gas supply continuity.

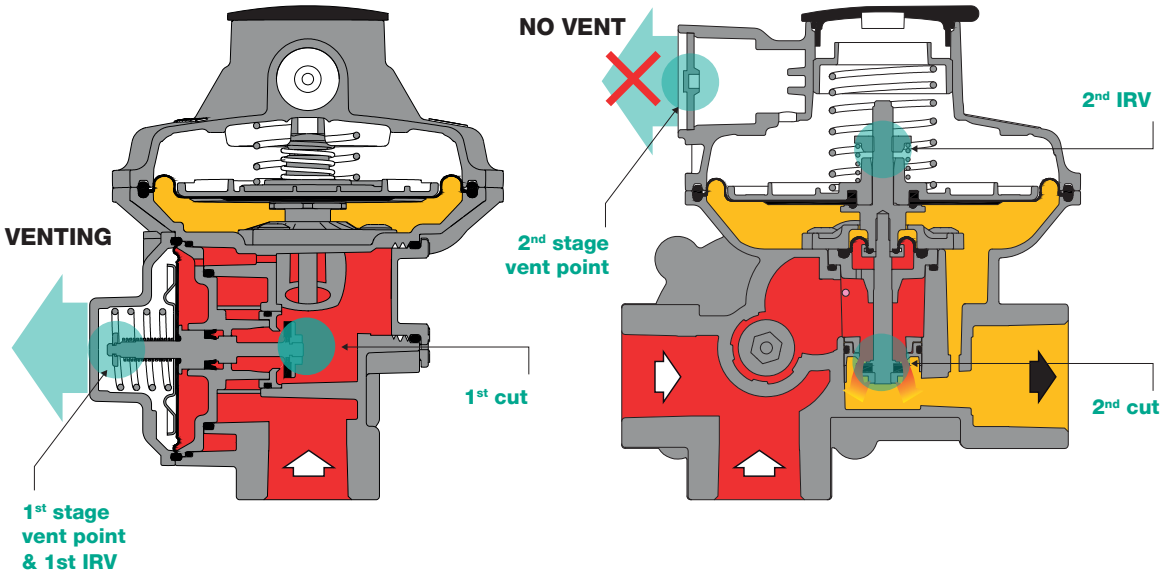
In the event of a 2nd stage catastrophic failure, the outlet pressure rises to the intermediate pressure level remaining below the defined safety threshold. The 2nd IRV activates, venting excess gas to the atmosphere. Both IRVs make failures detectable and provide an additional layer of safety.

Normal operation



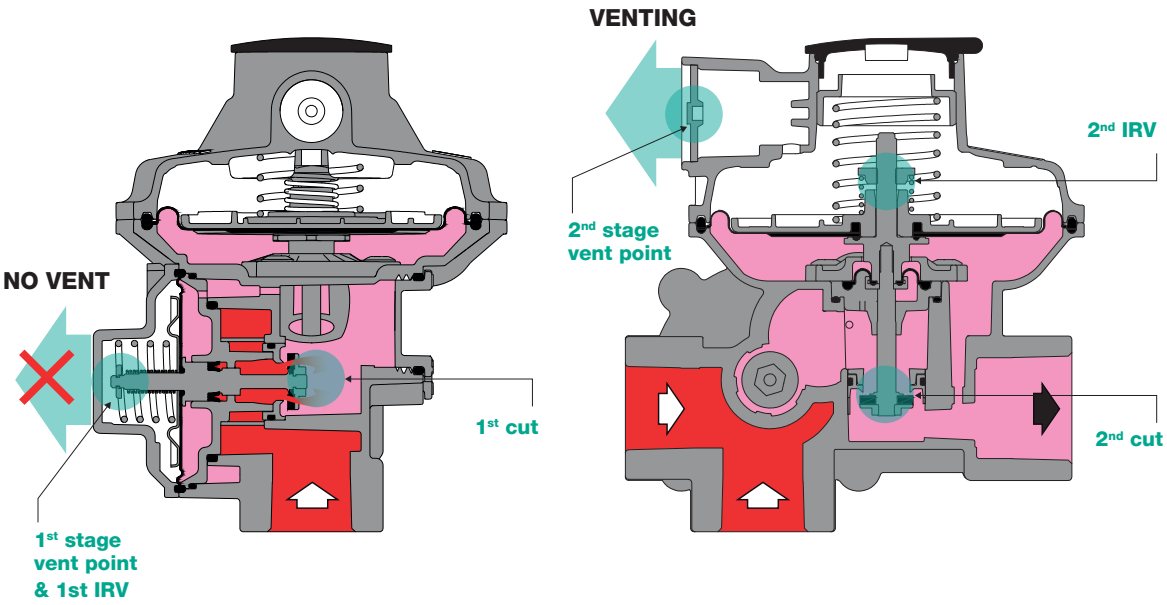
	630 scfh 18 Sm3/h	1000 scfh 28 Sm3/h	1400 scfh 40 Sm3/h
Inlet pressure	10-100 psig	10-100 psig	10-100 psig
Intermediate pressure	< 1.85 psig	< 2 psig	< 5 psig
Outlet pressure	7” w.c. lock-up +2” w.c./-1” w.c.	7” w.c. lock-up +2” w.c./-1” w.c.	2 psig lock-up ± 1% abs.

1st stage catastrophic failure



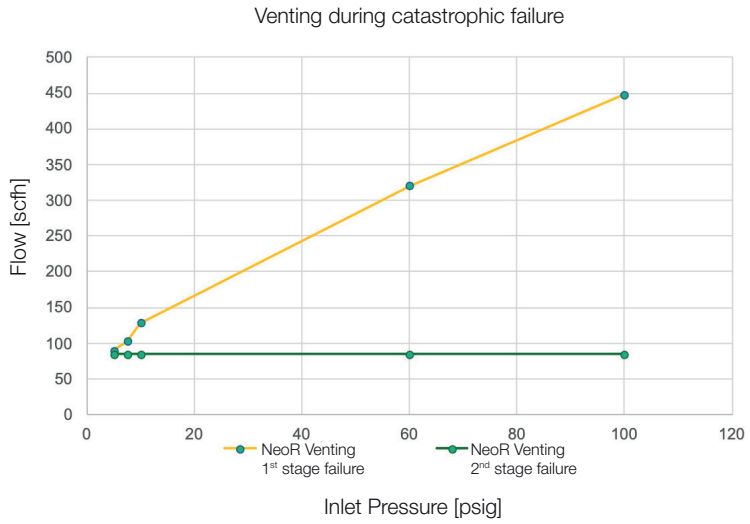
		630 scfh 18 Sm3/h	1000 scfh 28 Sm3/h	1400 scfh 40 Sm3/h
Inlet pressure		10-100 psig	10-100 psig	10-100 psig
Intermediate pressure		10-100 psig	10-100 psig	10-100 psig
Outlet pressure		< 1.85 psig lock-up 1.85 psig	< 2 psig lock-up 2 psig	< 5 psig lock-up 5 psig

2nd stage catastrophic failure



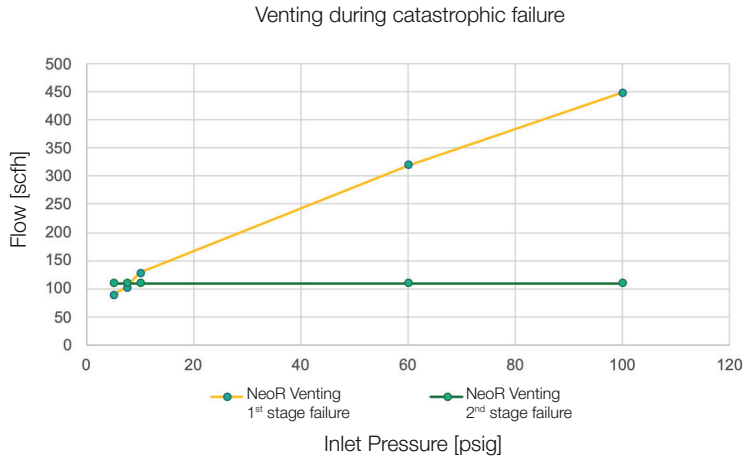
	630 scfh 18 Sm3/h	1000 scfh 28 Sm3/h	1400 scfh 40 Sm3/h
Inlet pressure	10-100 psig	10-100 psig	10-100 psig
Intermediate pressure	< 1.85 psig	< 2 psig	< 5 psig
Outlet pressure	< 1.85 lock-up 1.85 psig	< 2 psig lock-up 2 psig	< 5 psig lock-up 5 psig

Relief curve NeoR (630 scfh) | regulator set point 7” w.c.



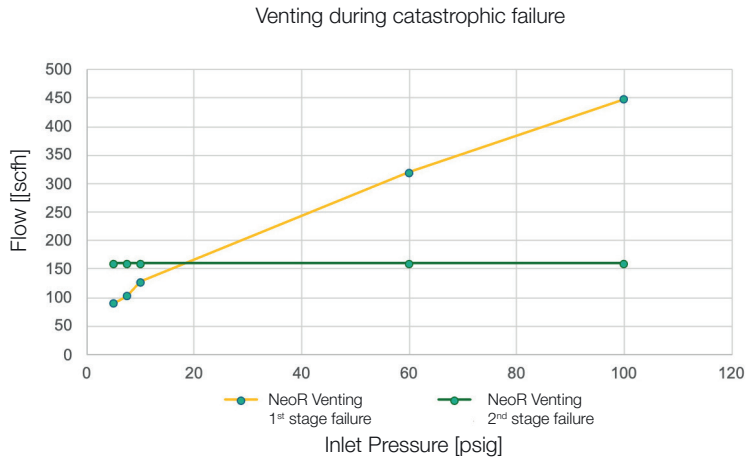
Inlet Pressure	NeoR Venting 1st stage failure	NeoR Venting 2nd stage failure
psig	scfh	scfh
5	90	85
7.5	102	85
10	128	85
60	320	85
100	448	85

Relief curve NeoR (1000 scfh) | regulator set point 7” w.c.



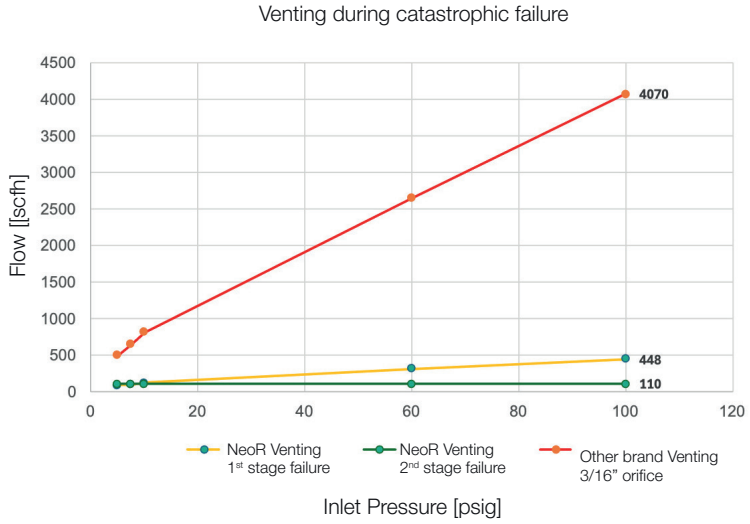
Inlet Pressure	NeoR Venting 1st stage failure	NeoR Venting 2nd stage failure
psig	scfh	scfh
5	90	110
7.5	102	110
10	128	110
60	320	110
100	448	110

Relief curve NeoR (1400 scfh) | regulator set point 2 psig



Inlet Pressure	NeoR Venting 1st stage failure	NeoR Venting 2nd stage failure
psig	scfh	scfh
5	90	160
7.5	102	160
10	128	160
60	320	160
100	448	160

Relief curve NeoR (1000 scfh) vs conventional regulator



Inlet Pressure	NeoR Venting 1st stage failure	NeoR Venting 2nd stage failure	Other brand 3/16" orifice*
psig	scfh	scfh	scfh
5	90	110	500
7.5	102	110	650
10	128	110	820
60	320	110	2650
100	448	110	4070

Reduction emission 1st stage failure* **88,99%**

Reduction emission 2nd stage failure* **97,29%**

(*) DISCLAIMER — EVALUATION ONLY: The venting values of the other brand regulator are preliminary engineering estimates based on stated assumptions and are provided for evaluation purposes only. They are not a substitute for site-specific design, verification, or code compliance. No warranty is expressed or implied; the user assumes all responsibility for use.

Nylon filter

The NeoR is equipped with a nylon mesh 100 microns | 140 mesh (NeoR standard version) and 300 microns | 50 mesh (NeoR arctic version) to prevent foreign particles, such as weld slag or PE shavings, to get stuck between the orifice and seat/disk thus preventing lockup for new installations.
The purpose of the nylon mesh is to provide protection to the NeoR and its accessories thus protecting the customers downstream piping system.

Figure 5 Nylon filter

Thermal safety valve

The thermal valve is a safety device that shuts the inlet gas flow in case of excessive temperature, e.g., due to fire.

The valve is rated to stop the gas flow for up to 90 minutes at 1472 °F | 800 °C. The valve mechanism is composed of a seat, plug, spring, and a block of thermoplastic material. The block holds the valve open under normal conditions, and when the temperature exceeds a certain limit, it softens releasing the plug and stopping the flow. The model used for NeoR is TVD1.

Temperature limits:
320 °F +/- 18 °F | 160°C +/- 10 °C

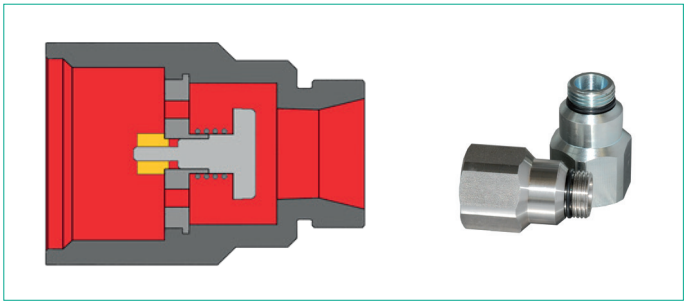


Figure 4 Thermal safety valve

Fire protection valve TVD1 (NeoR) pressure drop

Inlet pressure		Flow rate											
		1 m^3/h 35 scfh		5 m^3/h 175 scfh		9.9 m^3/h 350 scfh		14.9 m^3/h 525 scfh		24.8 m^3/h 875 scfh		42.8 m^3/h 1500 scfh	
kPa	psig	kPa	" w.c.	kPa	" w.c.	kPa	" w.c.	kPa	" w.c.	kPa	" w.c.	kPa	" w.c.
6.9	1	0	0	0.3	1.2	1	4	3.73	15	5.5	22	-	-
13.8	2	0	0	0.25	1	0.87	3.5	3.48	14	5	20	-	-
34.5	5	0	0	0.2	0.8	0.75	3	3.23	13	4.5	18	12	50
69	10	0	0	0.15	0.6	0.62	2.5	2.49	10	3.5	14	8	32
≥ 276	≥ 40	0	0	0.1	0.4	0.5	2	1.49	6	2	8	4	16

Table 8 Fire protection valve TVD1 (NeoR) pressure drop table

Weights and Dimensions

NeoR

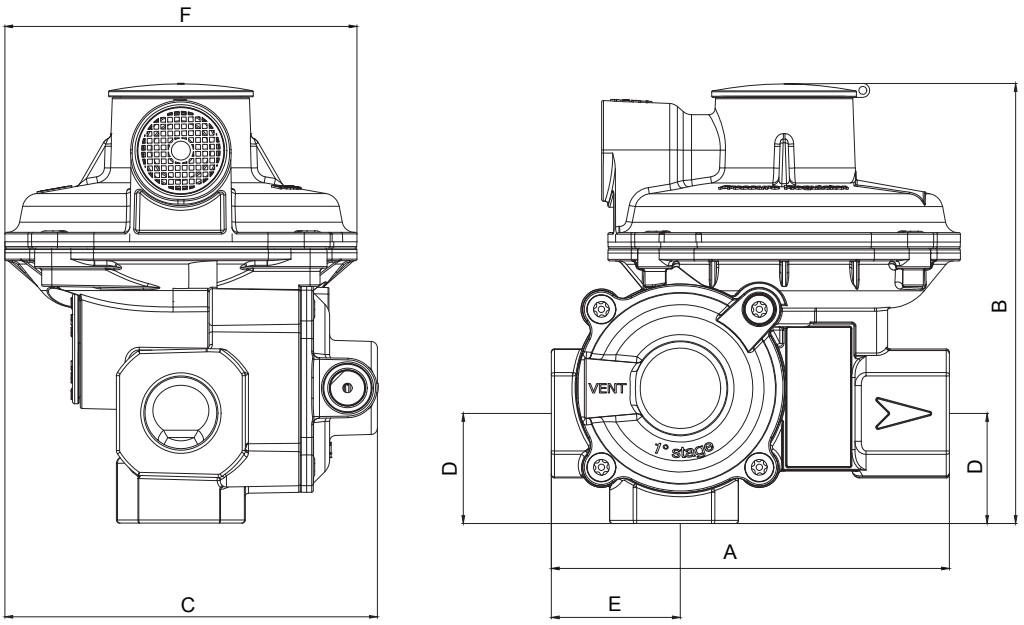


Figure 6 NeoR Dimensions

Weights and Dimensions (for other connections, please contact your closest Pietro Fiorentini representative)		
	[mm]	inches
A	126.5	5”
B	140	5.5”
C	119	4.7”
D	35	1.4”
E	41	1.6”
F	122	4.4”
Weight	Kg	pounds
Body	1.0	2.20

Table 9 Weights and dimensions

Pietro Fiorentini

TB0228USA

The data is not binding. We reserve the right
to make changes without prior notice.

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