

pressure regulator piloted



CE 97/23/CE

Notified Body number 1370

The **APR** series regulators are a new line of piloted action type pressure regulators for high pressure, developed to guarantee a high regulating accuracy and utmost easiness in use.

These devices are normally used in high pressure civil installations so as to be assembled in regulating stations of canalized networks for natural and manufactured gas, Lpg or other non corrosive, preliminarily treated stable gases.

The mod. **APR** pressure regulators are high pressure equipments and normally fail-to-close action.

The “trivalent” function is a peculiar characteristic of **APR** regulators where at the same body there’s a union between the regulator and safety devices operations, as well between monitor and shut-off device.

Moreover, it’s possible to add or to substitute any other device without pull off the body from piping as the variation from **FTC** (fail to close) operation to **FTO** (fail to open).

The devices use solves any problem of interchangeability for the conversion of existing units out of norms and brings a significant saving about the units overall dimensions of the regulating stations.

Technical features

- **body** steel ASTM A350 LF2
- **covers** steel ASTM A350 LF2
- **diaphragms** synthetic rubber with cloth reinforcement
- **seats** stainless steel
- **springs** stainless steel
- **available versions** FTC/FTO & FTO/FTC
- **wide range of regulating pressure**
- “top entry” design
- **anti-pumping device**
- **built-in silencer (on request)**
- **quick operation time**

		APR 25	APR 50	APR 80
Diameters	DN	25	50	80
Connections		ANSI 300 RF (B 16.5) ANSI 600 RF (B 16.5)		
Design pressure	P zul [bar]	100		
Inlet pressure range	Bpe [bar]	1 ÷ 100		
Outlet pressure range	Wh [bar]	0,5 ÷ 40		
Regulating class	RG [%]	up to 1		
Closing pressure class	SG [%]	up to 5		
Min. differential pressure	Δp min [bar]	0,5		
Operating temperature	T [°C]	-20 ÷ 60		
Valve coefficient	Cg	500	2200	4800

Versions available	Dimensioning
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APR -B

pressure regulator with

- built-in shut-off valve

APR -M

pressure regulator with

- built-in emergency regulator (monitor)

APR -X

pressure regulator with

- built-in shut-off valve
- built-in emergency regulator (monitor)

The choice of the regulator is made using the **Cg** valve coefficient .

Cg coefficient is numerically equivalent to the value of air flow in Scfh in critical conditions with full open regulator operating with an upstream pressure of 1 psia and a temperature of 15 °C.

Flow rates with maximum opening at different operating conditions can be calculated as follows:

a. in non critical conditions (when $Pe < 2 Pa$)

$$Q = 0,526 * Cg * Pe * \sin \left(106,79 * \sqrt{\frac{(Pe - Pa)}{Pe}} \right)^{Deg}$$

b. in critical conditions (when $Pe \geq 2 Pa$)

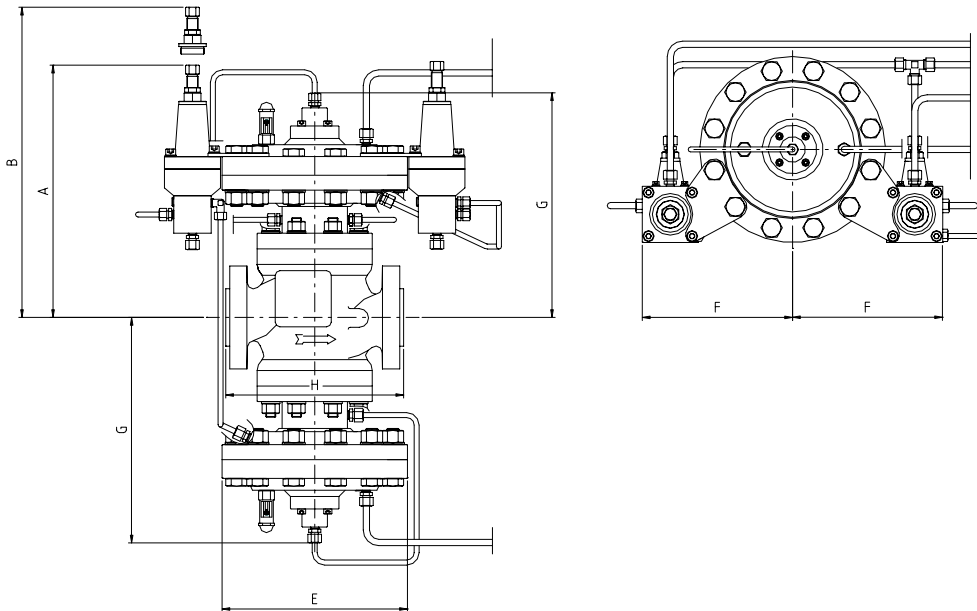
$$Q = 0,526 * Cg * Pe$$

where :

Q = capacity [Stm³/h]

Pe = absolute upstream pressure [bar]

Pa = absolute downstream pressure [bar]



Mod.	H			A	B	C	D	E	F	G	weight
	DN 25	DN 50	DN 80								
APR 25	210			350	364	180	110	Ø 230	220	280	
APR 50		286		410	424	228	147	Ø 298	245	365	
APR 80			337	460	474	270	169	Ø 400	280	410	

Control system

The control system in **APR** regulators is carried out by a piloted pneumatic system which is mechanically independent with individual set-point.

The pilot function is to send to the regulator the motorization pressure and to set the stopper so as to maintain the regulating pressure in the prefixed value, independently by the upstream pressure variation or by the capacity request.

Moreover, there's an adjustable flow regulator built-in pilot which its function is to power the pilot with a constant pressure so as to maintain the pressure distribution independent by the upstream pressure variation.

Main regulator

The regulator is controlled by pilot **EPC 2000** series consists of pilot, recorder flow regulator and filter unit.

The choice of pilot model is based on the set-point range, in other words:

- Pilot **EPC 2000/1** = range **0.3 – 43** [bar]
- Pilot **EPC 2000/2** = range **20 – 60** [bar]
- Pilot **EPC 2000/3** = range **41 – 74** [bar]

Emergency regulator (monitor)

The monitor is controlled by the pilot **EPC 2000** series consists of pilot, equipped with accelerator, adjustable flow regulator and filter unit. The drain accelerator device permits a rapid variation at monitor motorization chamber, following by the pressure discharge, so as in case of regulator malfunction makes more rapid the intervention of the equipment.

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Safety device

The safety device assembled on **APR** regulators is spring self-operated type (mod. **OS 10**) in order to protect the equipment and downstream section by pressure anomalies due to network or to malfunction equipment.

Regarding its operation is a mechanical and independent device separated from the main regulator.

In direct way the safety device acts to the housing valve by cutting off the upstream gas flow of the regulator.

Following the device characteristics:

- Rearming exclusively manual
- Intervention for max. and/or min. pressure (OPSO/UPSO)
- Possible push - button control
- Possible remote control devices
- Possible intervention signaling application