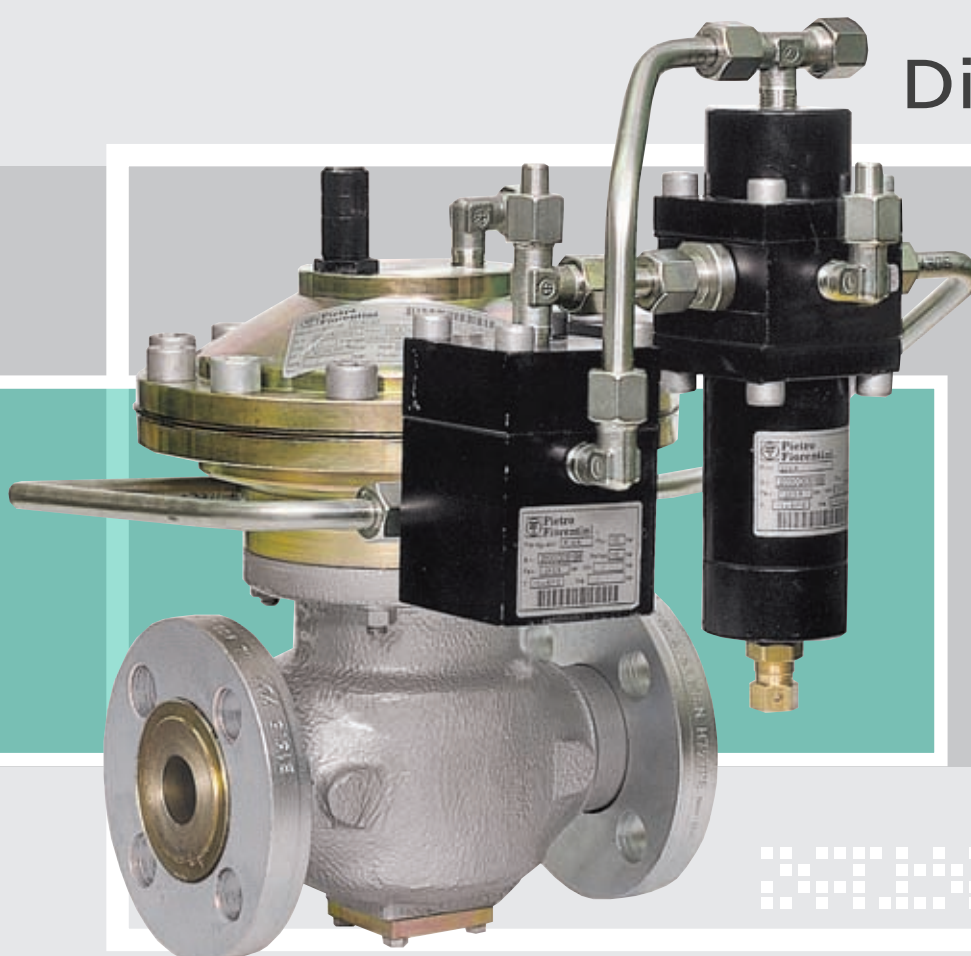




Pressure  
Regulators

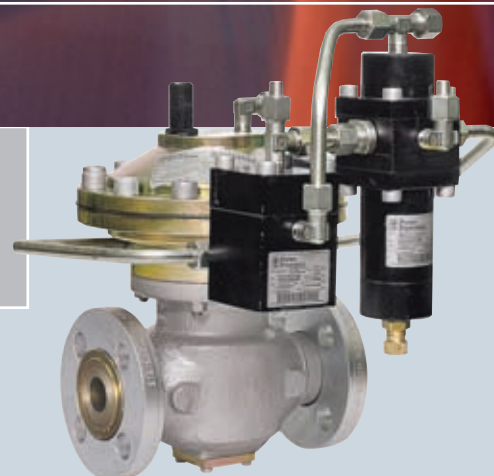


Dixi AP



# Dixi AP

> Pressure regulators

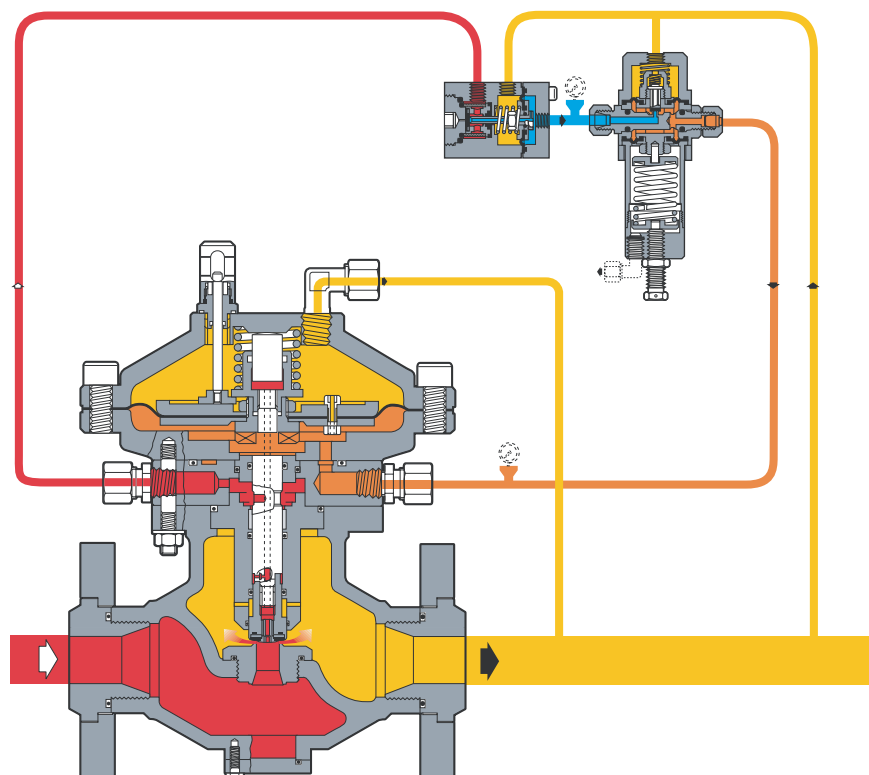


## Introduction

**Dixi AP** is a pilot-controlled pressure regulator for medium and high pressure applications.

**Dixi AP** is a normally a fail close regulator and specifically will close under the following circumstances:

- breakage of main diaphragm;
- lack of feeding to the pilot loop. These regulators are suitable for use with previously filtered, non-corrosive gases.



Dixi AP

## Main Features

The "top entry" design of the **Dixi AP** allows an easy periodical maintenance without removing the regulator body from the line.

Regulator is available with integral slam shut valve.



Dixi AP



Dixi AP +SB/87

Designed  
With Your  
Needs In Mind

- Compact Design
- Easy Maintenance
- Top Entry
- High Accuracy

- Wide Down Ratio
- High  $\Delta p$  Handling



## Main Features

- Design pressure: up to 85 bar (1232 Psi)
- Design temperature: -20 °C to +60 °C (-4 to + 140°F)
- Ambient temperature: -20 °C to +60°C (-4 to + 140°F)
- Range of inlet pressure bpe: 1,5 to 85 bar (21,75 to 841 Psi)
- Range of outlet pressure Wh: 0,5 to 25 bar (7,25 to 362 Psig) (depending on installed pilot)
- Minimum working differential pressure: 1 bar (14.5 Psig)
- Accuracy class Ac: up to 1
- Closing pressure class SG: from 5 to 1 depending on outlet pressure
- Available size DN: 1"
- Flanging: class 300-600 RF or RTJ according to ANSI B16.5 according to ISO 7005.

## Materials

<b>Body</b>	Cast steel ASTM A352 LCB
<b>Head covers</b>	ASTM A350 LF2 Forged steel
<b>Steam</b>	AISI 416 Stainless steel
<b>Plug</b>	AISI 416 + Vulcanized rubber
<b>Valve seat</b>	ST. Steel
<b>Seals</b>	Nitrile rubber
<b>Compression fittings</b>	According to DIN 2353 in zinc-plated carbon steel

The characteristics listed above are referred to standard products. Special characteristics and materials for particular applications may be supplied upon request.



## Dixi AP

### Choosing the pressure regulator

Sizing of regulators is usually made on the basis of Cg valve and KG sizing coefficients (table 1). Flow rates at fully open position and various operating conditions are related by the following formulae where:

Q = flow rate in  $\text{Stm}^3/\text{h}$   
 Pu = inlet pressure in bar (abs)  
 Pd = outlet pressure in bar (abs).

**A >** When the Cg and KG values of the regulator are known, as well as Pu and Pd, the flow rate can be calculated as follows:

**A-1** in sub critical conditions: ( $P_u < 2 \times P_d$ )

$$Q = KG \times \sqrt{P_d \times (P_u - P_d)} \quad Q = 0.526 \times C_g \times P_u \times \sin \left( K1 \times \sqrt{\frac{P_u - P_d}{P_u}} \right)$$

**A-2** in critical conditions: ( $P_u \geq 2 \times P_d$ )

$$Q = \frac{KG}{2} \times P_u \quad Q = 0.526 \times C_g \times P_u$$

**B >** Vice versa, when the values of Pu, Pd and Q are known, the Cg or KG values, and hence the regulator size, may be calculated using:

**B-1** in sub-critical conditions: ( $P_u < 2 \times P_d$ )

$$KG = \frac{Q}{\sqrt{P_d \times (P_u - P_d)}} \quad C_g = \frac{Q}{0.526 \times P_u \times \sin \left( K1 \times \sqrt{\frac{P_u - P_d}{P_u}} \right)}$$

**B-2** in critical conditions ( $P_u \geq 2 \times P_d$ )

$$KG = \frac{2 \times Q}{P_u} \quad C_g = \frac{Q}{0.526 \times C_g \times P_u}$$

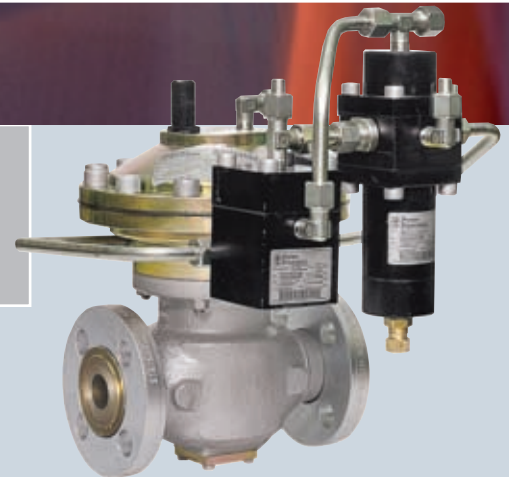
NOTE: The sin val is understood to be DEG.

**Table 1: Cg and Kg valve coefficient**

Nominal diameter (DN)	25
Size (DN)	1"
Cg coefficient	159
KG coefficient	167
K1 coefficient	99,5

# Dixi AP

> Pressure regulators



The formulae are applicable to natural gas having a relative density of 0.61 w.r.t. air and a regulator inlet temperature of 15 °C. For gases having a different relative density  $S$  and temperature  $t$  in °C, the value of the flow rate, calculated as above, must be multiplied by a correction factor, as follows:

$$F_c = \sqrt{\frac{175.8}{S \times (273.16 + t)}}$$

Table 2 lists the correction factors  $F_c$  for a number of gases at 15 °C.

**Table 2: Correction factors  $F_c$**

Type of gas	Relative density	$F_c$ Factor
Air	1.0	0.78
Propane	1.53	0.63
Butane	2.0	0.55
Nitrogen	0.97	0.79
Oxygen	1.14	0.73
Carbon dioxide	1.52	0.63

## Caution:

in order to get optimal performance, to avoid premature erosion phenomena and limit noise emissions, it is recommended to check gas speed at the outlet flange does not exceed 150 m/sec.

The gas speed at the outlet flange may be calculated by means of the following formula:

$$V = 345.92 \times \frac{Q}{DN^2} \times \frac{1 - 0.002 \times P_d}{1 + P_d}$$

where:

$V$  = gas speed in m/sec

$Q$  = gas flow rate in Scm/h

$DN$  = nominal size of regulator in mm

$P_d$  = outlet pressure in bar g.

## Pilots System

### Pilots

**Dixi AP** regulators are equipped with pilot 204/...

Pilots may be adjusted manually or remotely as shown in table 3:

**Table 3: Pilot adjusting instructions**

<b>Pilot type .../A</b>	Manual setting
<b>Pilot type .../D</b>	Electric remote setting control
<b>Pilot type .../CS</b>	Setting increased by pneumatic signal remote point

### Pre regulator

The pilot loop is completed with a device, called preregulator, external to the pilot.

The preregulators listed below are available:

- **R14/A**: self adjusting preregulator that automatically regulates the feeding pressure to the pilot; with integral filter at the inlet.

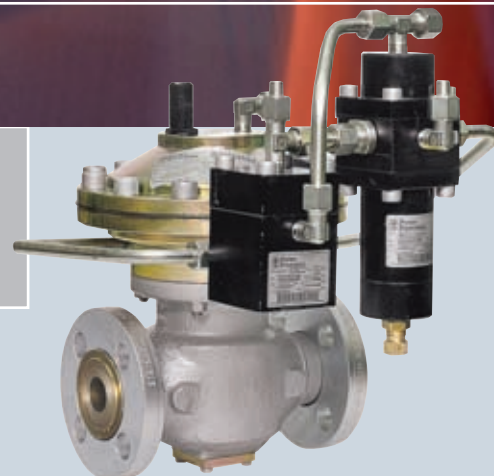
### Accessories

The pilot loop may be completed with the accessories listed below:

- supplementary filter **CF 14**;
- dehydrating filter;
- flow-limiting devices.
- limit switches
- stainless steel fittings, single or dual sealing

# Dixi AP

> Pressure regulators



## Dixi AP functioning as Monitor

The monitor is an emergency regulator which comes into operation in place of the main regulator if, in the event of failure, the latter allows the downstream pressure to reach the monitor set-point.

## In-Line Monitor

In this solution, the monitor is installed upstream from the main regulator and it is identical to the main regulator (Fig. 3).

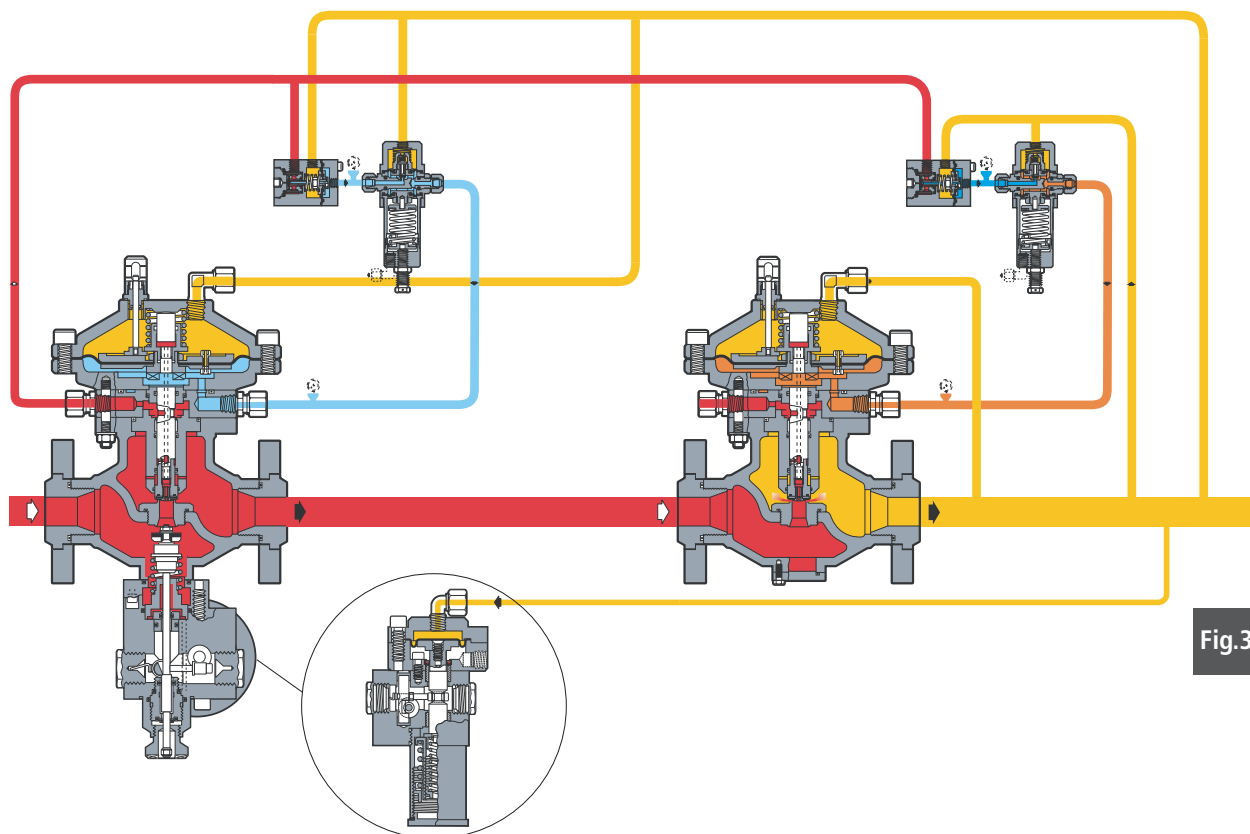
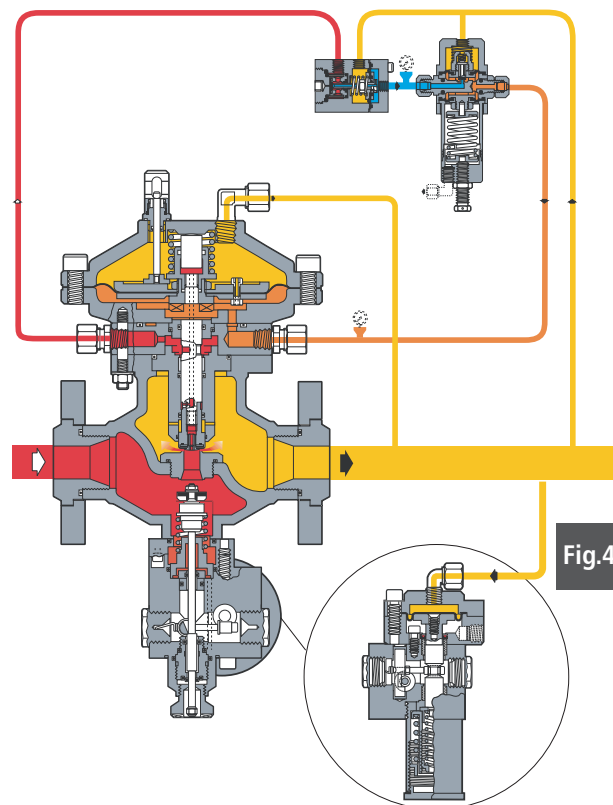


Fig.3



## Slam-Shut valve

This device immediately stops gas flow (SAV) whenever some downstream pressure exceed the set point value.



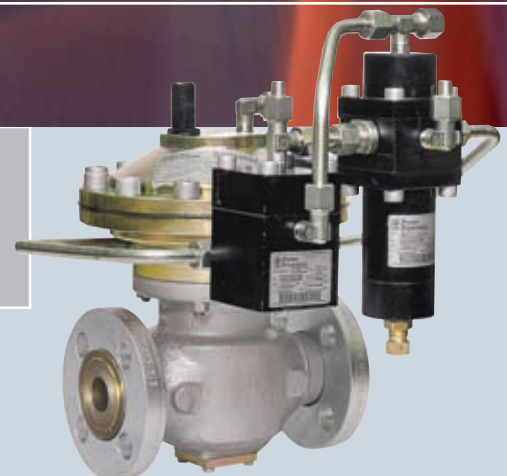
Dixi AP + SB/87

- Inlet pressure
- Outlet pressure
- Motorization monitor
- Feed pilot
- Motorization regulator

# Dixi AP



Pressure regulators



## Incorporated SB/87...Slam-Shut

**DIXI AP** pressure regulator may have a incorporated slam-shut valve (see fig. 4) on the main regulator or on the in-line monitor regulator. Both the regulator with a incorporated slam shut valve has the  $C_g/KG$  coefficient equal to about 95% of the standard regulator.

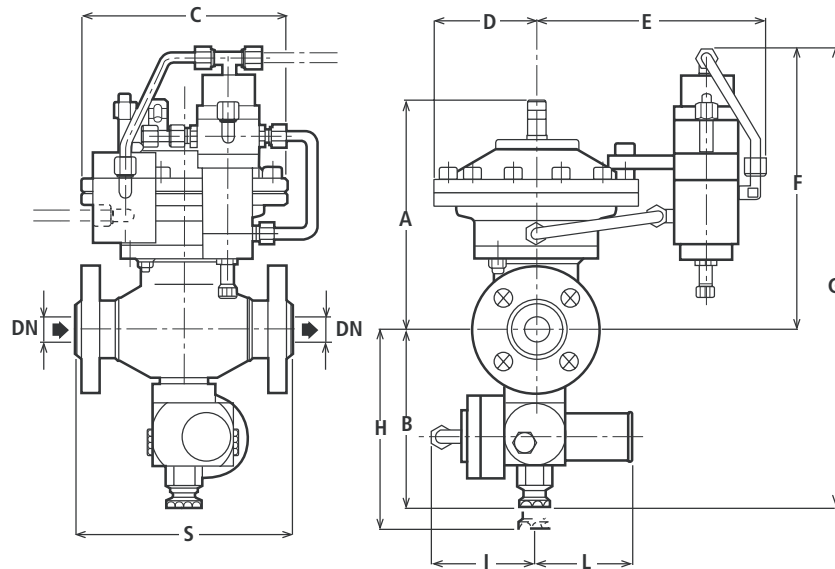
The main characteristics of this device are:

- design pressure 85 bar;
- operating temperature:
  - 20 °C to +60 °C;-ambient temperature:
  - 20 °C to +60 °C;-accuracy (AG):  $\pm 1$  % on the value of the set point pressure for pressure increase;  $\pm 5$  % for pressure drop;
- internal by-pass;
- intervention for over pressure and/or under pressure
- possibility of pneumatic or electromagnetic remote control;
- possibility to install intervention signalling devices (contact microswitches or inductive microswitches);
- easy maintenance.

### Slam Shut pressure switches

Pressure switch	102	103	104
Set point range for Overpressure (OPSO)	0,15 to 1,5	1 to 6,8	10 to 31,5
Set point range for Underpressure (UPSO)	0,07 to 1	0,4 to 5	4,7 to 20,6

Working pressure in bar

**Dixi AP + SB/87**

**Overall dimensions in mm**

Size (mm)	25
Inches	1"
S - Ansi 300	197
S - Ansi 600	210
A	222
B	173
C	199
D	99,5
E	225
F	275
G	450
H	193
I	100
L	94
Tubing Connections	øe10 x øi 8

**Weights in Kgf**

Regulator	24
Slam Shut Valve	30

Face to face dimensions S according to IEC 534-3 and EN 334



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