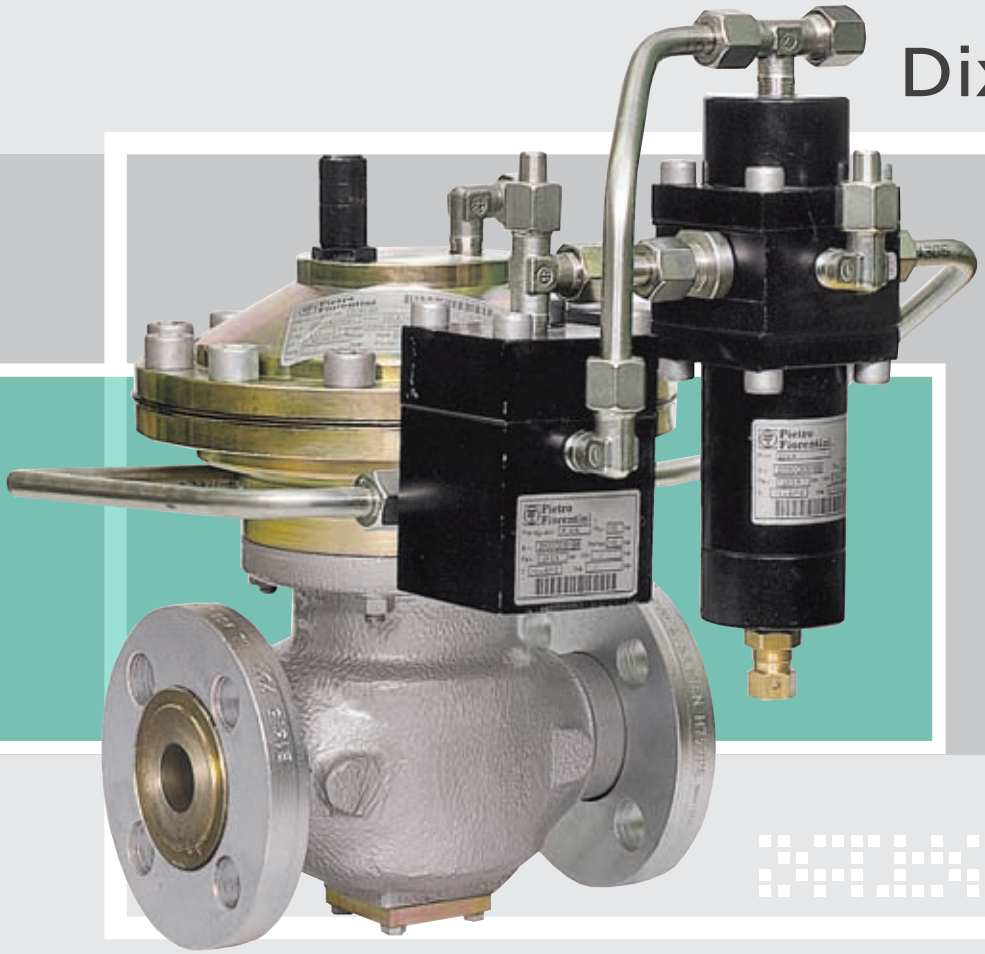
Dixi AP

Pressure
Regulators



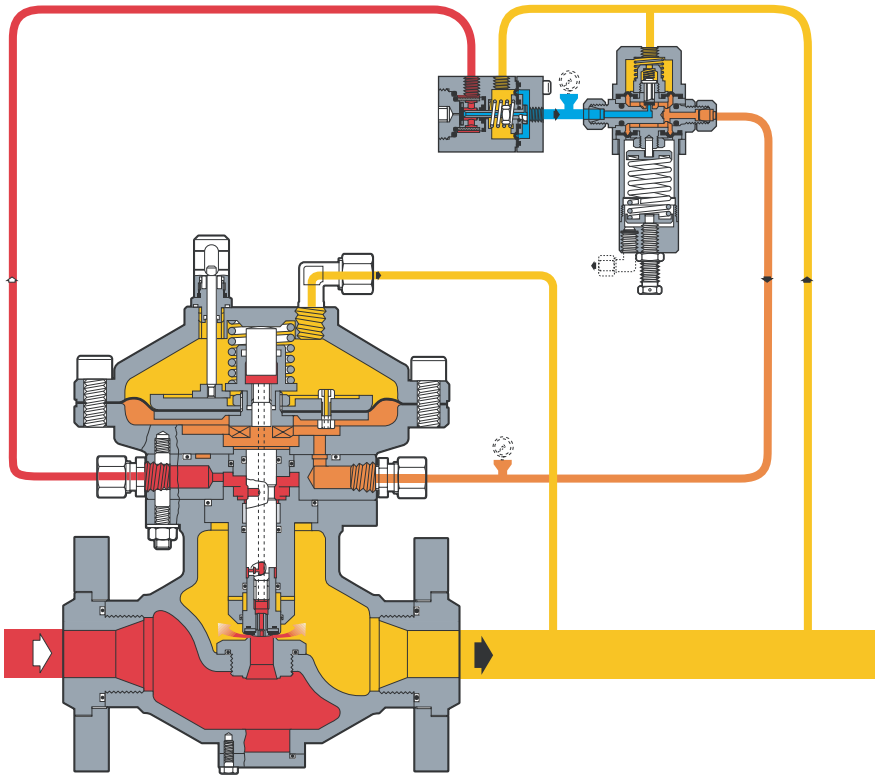
Pietro Fiorentini®

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

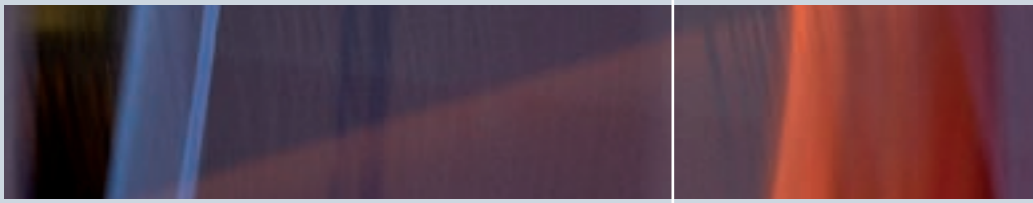
The "top entry" design of the **Dixi AP** allows an easy periodical maintenance without removing the regulator body from the line.
Regulator is available with integral slam shut valve.

Dixi AP

Dixi AP +SB/87

Designed With Your Needs In Mind

- Compact Design
- Easy Maintenance
- Top Entry
- High Accuracy
- Wide Down Ratio
- High Δp 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

Body	Cast steel ASTM A352 LCB
Head covers	ASTM A350 LF2 Forged steel
Steam	AISI 416 Stainless steel
Plug	AISI 416 + Vulcanized rubber
Valve seat	ST. Steel
Seals	Nitrile rubber
Compression fittings	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 Stm^3/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: (Pu<2xPd)

$$Q = KG \times \sqrt{Pd \times (Pu - Pd)} \qquad Q = 0.526 \times Cg \times Pu \times \text{sen}\left(K1 \times \sqrt{\frac{Pu - Pd}{Pu}}\right)$$

A-2 in critical conditions: (Pu≥2xPd)

$$Q = \frac{KG}{2} \times Pu \qquad Q = 0.526 \times Cg \times Pu$$

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: (Pu<2xPd)

$$KG = \frac{Q}{\sqrt{Pd \times (Pu - Pd)}} \qquad Cg = \frac{Q}{0.526 \times Pu \times \text{sen} \times \left(K1 \times \sqrt{\frac{Pu - Pd}{Pu}}\right)}$$

B-2 in critical conditions (Pu≥2xPd)

$$KG = \frac{2 \times Q}{Pu} \qquad Cg = \frac{Q}{0{,}526 \times Cg \times Pu}$$

NOTE: The sin val is understood to be DEG.

Table 1: Cg and Kg valve coefficient

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

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:

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

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

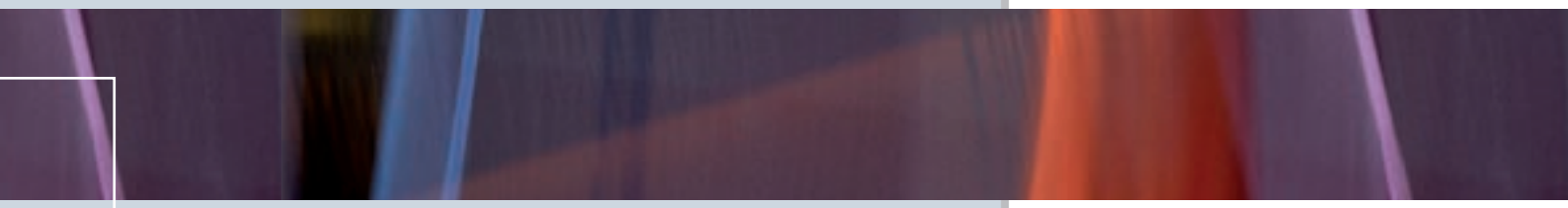
Table 2: Correction factors FC

Type of gas	Relative density	Fc 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:

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

where:
V = gas speed in m/sec
Q = gas flow rate in Scm/h
DN = nominal size of regulator in mm
Pd = 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

Pilot type .../A	Manual setting
Pilot type .../D	Electric remote setting control
Pilot type .../CS	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 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).

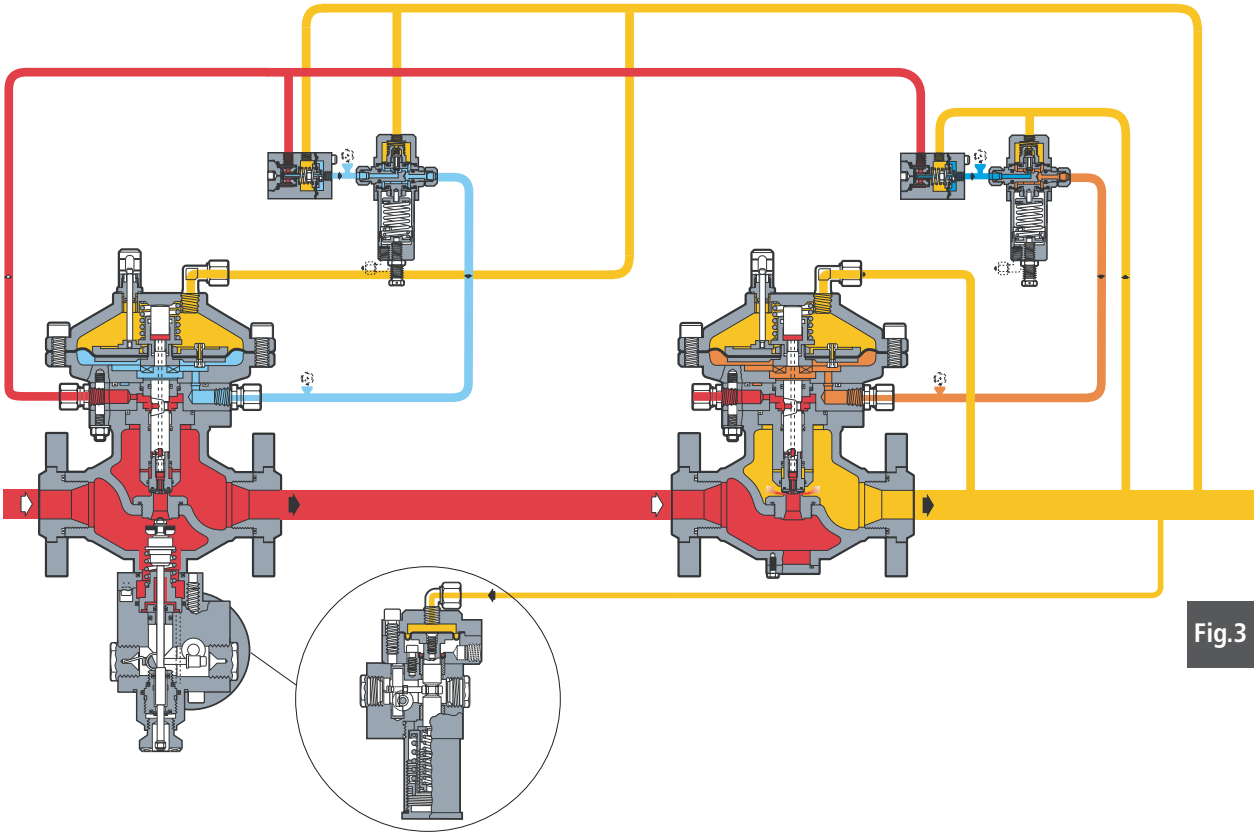


Fig.3

Slam-Shut valve

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

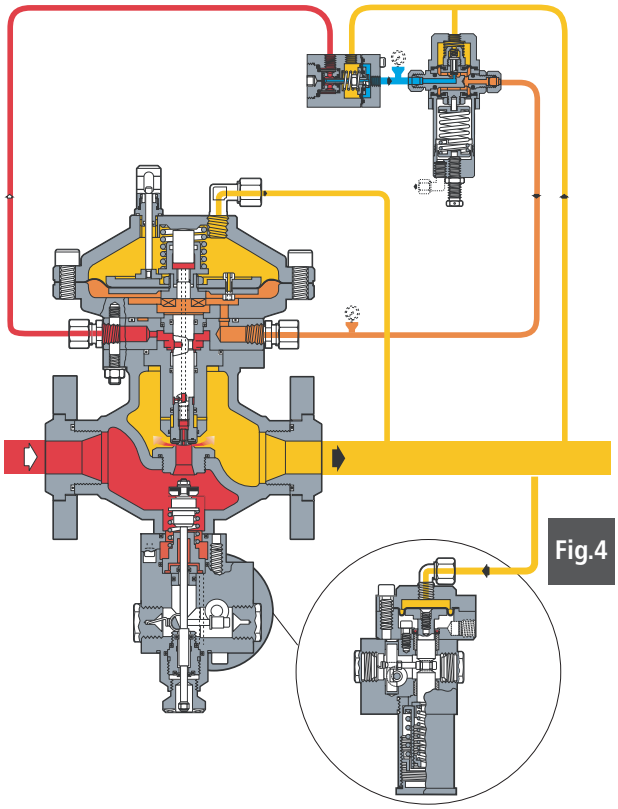


Fig.4

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 Cg/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): ±1 % on the value of the set point pressure for pressure increase; ±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 11	10 to 31,5
Set point range for Underpressure (UPSO)	0,07 to 1	0,4 to 6,8	4,5 to 20,6

Working pressure in bar

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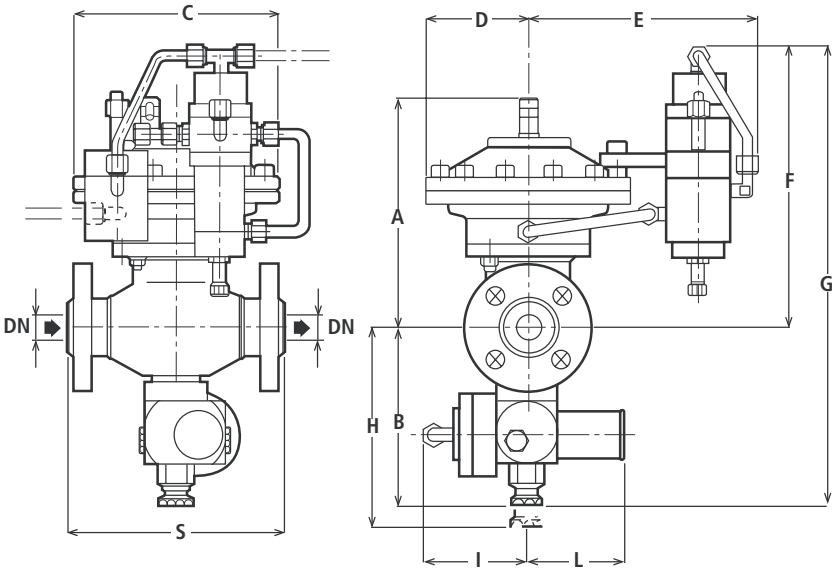

Overal dimensions in mm

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	⌀e10 x ⌀i 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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