



## Norval

Pressure Regulators

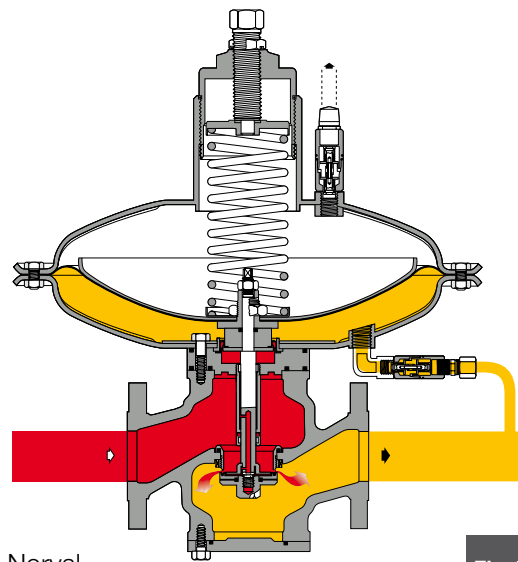
## Pressure regulators

### Norval

NORVAL pressure regulators are direct acting devices for low and medium pressure applications controlled by a diaphragm and counter spring. These regulators are suitable for use with previously filtered, non corrosive gases.

### Modular Design

The modular design of pressure regulator Norval allows application of slam shut or device for use as “in line monitor” on the same body without changing the face-to-face dimension. Furthermore the truly “top entry design” allows an easy periodical maintenance without removing body from the line. The features of Norval regulators make of it a product suitable for any application, the regulator can be mounted upside down. The fast response time makes it ideal for burner or industrial applications or whenever sudden changes of flowrate are part of the process. The high accuracy against any inlet pressure variation makes of Norval an optimum product also for gas district systems, an application generally not suitable for direct acting regulators. An extremely easy maintenance and a reduced number of parts are the background of low cost operation.



**DESIGNED  
WITH YOUR  
NEEDS IN MIND**

- COMPACT DESIGN
- EASY MAINTENANCE
- TOP ENTRY
- FAST RESPONSE TIME
- HIGH TURN DOWN RATIO
- HIGH ACCURACY
- LOW OPERATION COST
- WIDE RANGE OF APPLICATIONS

**SLAM SHUT**
**Norval**

This is a device stopping immediately gas flow (SAV) when, whatsoever downstream pressure exceeds given set-point. The device can be actuated also manually.

SN Slam shut (see figure 2) can be incorporated on the standard regulator and on the in-line monitor.

The regulator with the incorporated slam-shut has Cg coefficients equal to 93% of those of the basic regulator.

A further advantage of the incorporated slam-shut valve is that it can be retro fitted at any time on a previously installed Norval (size up to 3" only) without modifying the regulating unit.

Main features of SN slam-shut device are:

- design pressure 16 bar for all the components;
- accuracy (AG): up to  $\pm 1\%$  of the pressure set-point for pressure increase; up to  $\pm 5\%$  for pressure decreasing;
- internal by-pass for resetting;
- intervention for over pressure and/or under pressure;
- manual push-button control;
- possibility of pneumatic or electromagnetic remote control;
- compact overall dimensions;
- easy maintenance;
- possibility of application of devices for remote signal (contact or inductive microswitches).

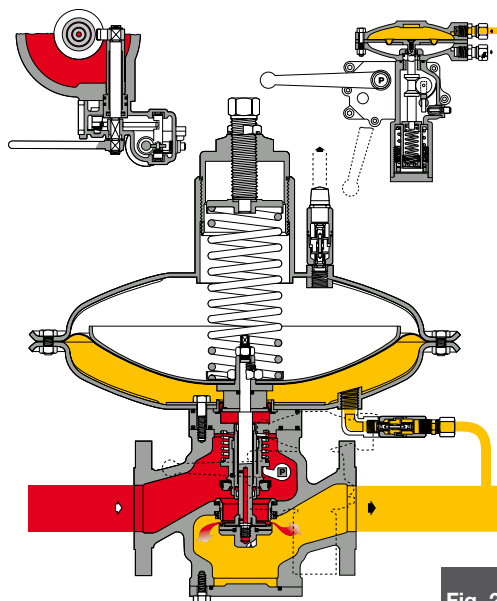
**NORVAL + SLAM SHUT SN**
**Norval**


Fig. 2

## IN-LINE MONITOR

Norval

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.

### Operation of the Norval functioning as Monitor

NORVAL functioning as an in-line monitor is a regulator which, in addition to the standard version, has a further mobile assembly balancing device (ER) guaranteeing greater accuracy of regulated pressure and therefore an equally precise value for the intervention pressure without risk of interference with main regulator (see figure 3). This device can be retro fitted on a standard existing regulator.

## MONITOR DEVICE ER

Norval

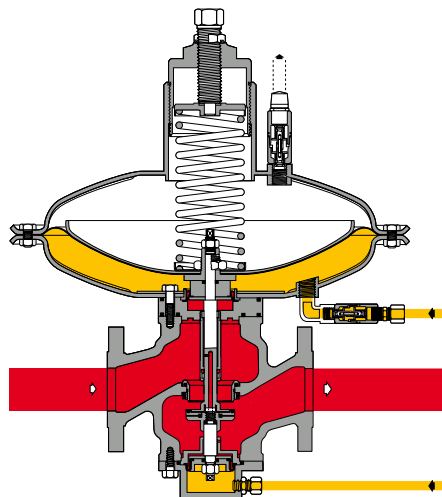


Fig. 3

## MAIN FEATURES

Norval

- > Design pressure: up to 19 bar (275 Psig)
- > Design temperature: -20 °C to +60 °C (-4 to + 140 °F)
- > Ambient temperature: -20 °C to +60 °C (-4 to + 140 °F)
- > Max inlet pressure  $P_{umax}$ : Size 1" to 3" 16 bar (232 Psig) Size 4" to 8" 8 bar (116 Psig)
- > Outlet pressure range of Wh: Size 1" to 4" 8 to 4400 mbar (3" w.c. to 63,8 Psig)  
Size 6" to 8" 12 to 1800 mbar (5" w.c. to 26,1 Psig)
- > Accuracy class AC: up to 5
- > Closing pressure class SG: up to 10
- > Available size DN: 1" - 1"1/2 - 2" - 2"1/2 - 3" - 4"- 6"- 8"
- > Flanging: class 150 RF according to ANSI B16.5 and PN16 according to ISO 7005.

**MATERIALS**
**Norval**

<b>Body</b>	Spheroidal ductile iron GS 400-18 ISO 1083 for Size ≤ 6" Cast steel ASTM A216 WCB for all sizes
<b>Head covers</b>	Drop-forged carbon steel
<b>Diaphragm</b>	Rubberized canvas
<b>Valve seat</b>	Stainless steel
<b>Seals</b>	Nitril 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 specific applications may be supplied upon request.

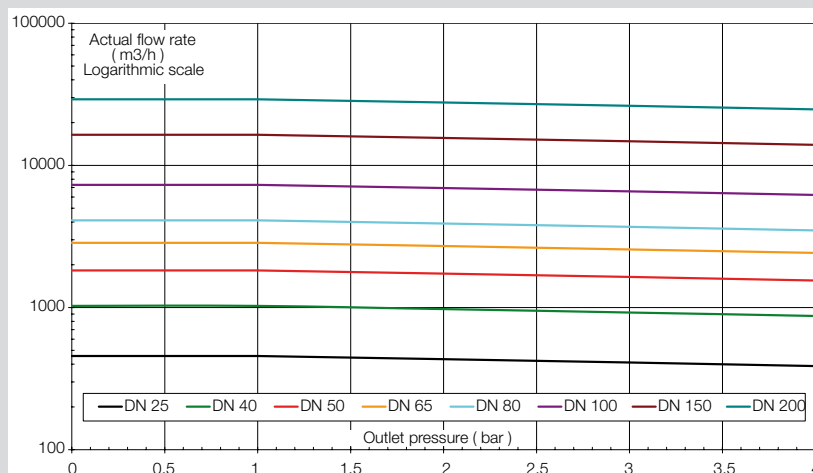
**Coefficient**
**Norval**

<b>Nominal diameter (mm)</b>	25	40	50	65	80	100	150	200
<b>Size (inches)</b>	1"	1 1/2"	2"	2 1/2"	3"	4"	6"	8"
<b>Cg coefficient</b>	331	848	1360	2240	3395	5100	10600	16600
<b>KG coefficient</b>	348	892	1430	2356	3571	5365	11151	17463
<b>K1 coefficient</b>	106,78	106,78	106,78	106,78	106,78	106,78	106,78	106,78

For sizing formula refer to [www.fiorentini.com/sizing](http://www.fiorentini.com/sizing)

**CAUTION:**

The graph gives a quick reference of maximum recommended regulator capacity depending on selected size. Values are expressed in actual m<sup>3</sup>/h of Natural gas (s.g. 0,6): to have the data directly in Nm<sup>3</sup>/h it is necessary to multiply the value by the outlet pressure value in bar – absolute.



## Control heads

Norval

Outlet pressure range is determined by the control head installed. The table below sums up the heads available for every size and the ranges of outlet pressure expressed in mbar.

Size (mm)	25	40	50	65	80	100	150	200
Inches	1"	1"1/2	2"	2"1/2	3"	4"	6"	8"
ø 817							12 ÷ 79	12 ÷ 79
ø 658							75 ÷ 405	75 ÷ 405
ø 630				10 ÷ 80	10 ÷ 80	12 ÷ 80	220 ÷ 650	220 ÷ 650
ø 495	16 ÷ 83	16 ÷ 83	16 ÷ 83	81 ÷ 530	81 ÷ 530	81 ÷ 530	405 ÷ 1800	405 ÷ 1800
ø 375	81 ÷ 1100	81 ÷ 1100	81 ÷ 1100	470 ÷ 2800	470 ÷ 2800	470 ÷ 2800		
ø 375TR	920 ÷ 4400	920 ÷ 4400	920 ÷ 4400	920 ÷ 4400	920 ÷ 4400	920 ÷ 4400		

## Slam-shuth pressure switches

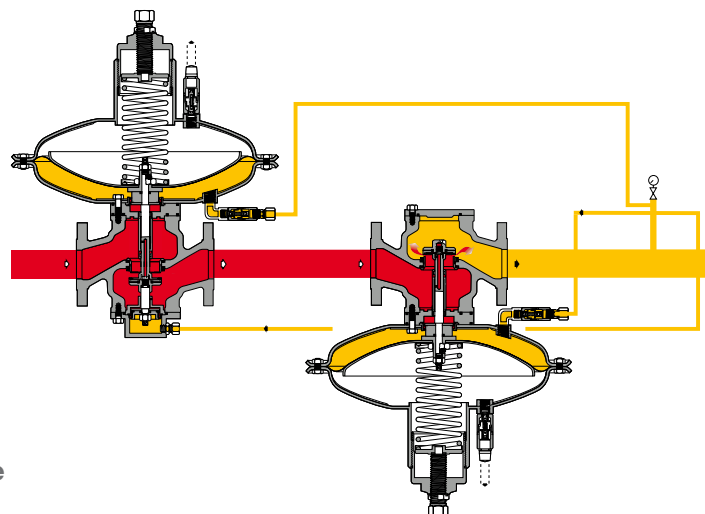
Norval

Pressure switch	SN 91	SN 92
Set point range for Overpressure (OPSO)	0,025 ÷ 1,20	0,75 ÷ 5,5
Set point range for Underpressure (UPSO)	0,01 ÷ 0,9	0,25 ÷ 2,7

Value in bar

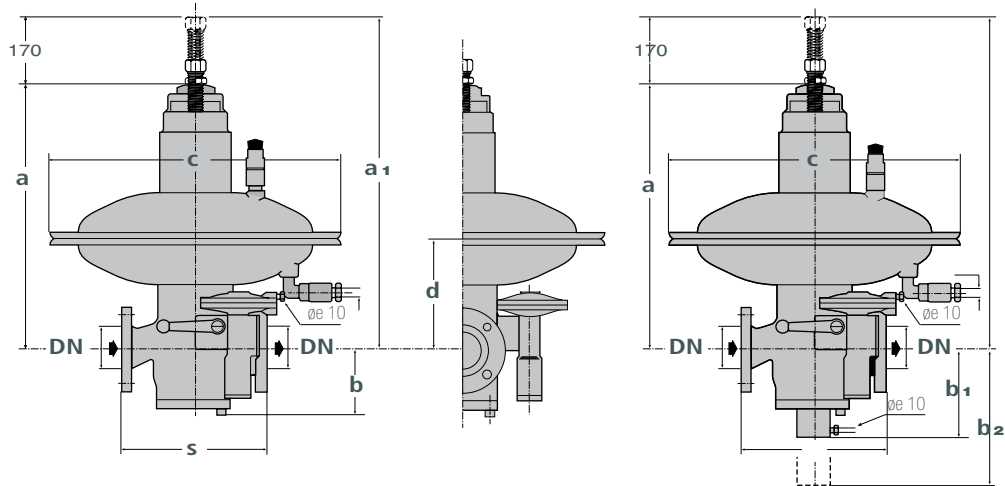
## INSTALLATION EXAMPLE

Norval



- Inlet pressure
- Outlet pressure

\* Refer to specific spring table for regulators installed upside down

**DIMENSIONS**
**Norval**

**Overall dimensions in mm**
**Norval**

		c				ø 817			ø 658			ø 630			ø 495			ø 375			ø 375TR		
Size (mm)	Inches	s*	b	b1	b2	a	a1	d	a	a1	d	a	a1	d	a	a1	d	a	a1	d	a	a1	d
25	1"	183	100	200	250										460	630	175	415	585	150	425	595	155
40	1 1/2"	223	120	220	270										475	645	190	435	605	165	445	615	170
50	2"	254	120	220	270										475	645	190	435	605	165	445	615	170
65	2 1/2"	277	140	240	290							540	710	220	500	670	210	455	625	190	465	635	195
80	3"	298	140	240	290							540	710	220	500	670	210	455	625	190	465	635	195
100	4"	352	180	280	330							640	810	310	600	770	300	555	725	275	565	735	280
150	6"	451	220	320	370	760	930	400	720	890	380	675	845	380	670	840	375						
200	8"	543	260	360	410	860	1030	500	820	990	480	775	945	480	770	940	475						

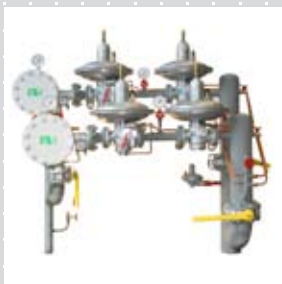
(\*) ANSI 150 - ISO PN16 - ISO PN 40 Flanges

**Weights in KGF**
**Norval**

Size (mm)	25	40	50	65	80	100	150	200
Inches	1"	1 1/2"	2"	2 1/2"	3"	4"	6"	8"
Norval	42	48	50	77	92	121	206	291
Norval with slam-shut/SN	47	53	55	82	97	126	211	296
Norval with monitor	48	55	58	85	100	129	216	302
Norval with slam-shut/SN and monitor	53	60	63	90	105	134	221	307

The Norval regulator conforms to ISA 4.1 standard

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



Reducing Stations



Metering



Butterfly Valves



**Pietro  
Fiorentini**

Pietro Fiorentini S.p.A.  
via E.Fermi 8/10  
I-36057 Arcugnano (VI) Italy

Tel. +39 0444 968.511  
Fax. +39 0444 960.468

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

CT-s 506-E August 10

[www.fiorentini.com](http://www.fiorentini.com)