

GAS PRESSURE REGULATORS WITH RELIEF VALVE

Serie IR5 ... DN 32 ÷ 100



DESCRIPTION

Direct-operated gas pressure regulator with compensated obturator.

Pmax = 5 bar

This devices are equipped with the following safety devices and accessories:

- **relief valve:**
it vents outside small quantity of gas in case there are downstream regulator overpressure. That exhaust it is conveyed outside in case of installation in environment with bad ventilation
- **outlet over pressure shut-off device (OPSO):** it stops the gas flow when the regulator outlet pressure goes up the device setting value
- **outlet under pressure shut-off device (UPSO):** it stops the gas flow when the regulator outlet pressure goes down the device setting value. It closes even if there is no inlet pressure.
- **outlet pressure test point.**

- EC certified according to EN 88-2 and EN 334
- In conformity with the 2009/142/EC Directive (Gas Directive)
- In conformity with the 2014/68/EU Directive (PED Directive)
- In conformity with the 2014/34/EU Directive (ATEX Directive)

IDENTIFICATION

IR N 5 02N 610 A B

Single stage gas pressure regulator with relief valve **series IR...**

Types

N = STANDARD version

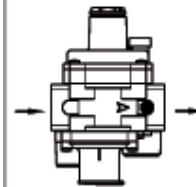
Pmax

5 = Pmax 0,5 ÷ 5 bar

B = biogas

Versions

- = without relief valve
- 610** = with relief valve
- 802** = with OPSO, UPSO and relief valve



Settings: see next page

- 610** = setting spring (mbar)
(P2+diff. relief valve range)
- 805** = setting spring (mbar)
(P2+OPSO+UPS0+diff. relief valve range)
-

Connections

Threaded				Flanged			
Code	GAS	Code NPT	NPT	Code	PN 16	Code ANSI	ANSI PN 16
05	DN 32 (G 1"1/4)	05N	DN 32 (NPT 1"1/4)	32	DN 32	32A	DN 32 ANSI
06	DN 40 (G 1"1/2)	06N	DN 40 (NPT 1"1/2)	40	DN 40	40A	DN 40 ANSI
07	DN 50 (G 2")	07N	DN 50 (NPT 2")	50	DN 50	50A	DN 50 ANSI
				08	DN 65	08A	DN 65 ANSI
				09	DN 80	09A	DN 80 ANSI
				10	DN 100	10A	DN 100 ANSI

**NOTE: not all combinations are possible
Please contact the technical department.**

SETTINGS

Connections	P2 (mbar)	OPSO (mbar)	UPSO (mbar)	Differential relief valve range (mbar)	Code P. max 0,5 ÷ 5 bar	
DN 32 - 40 - 50	10 ÷ 22	30 ÷ 90	7 ÷ 20	10 ÷ 20	805	
	15 ÷ 33	30 ÷ 90	7 ÷ 20	15 ÷ 40	806	
	32 ÷ 60	30 ÷ 90	10 ÷ 30	15 ÷ 40	801	
	50 ÷ 95	70 ÷ 140	10 ÷ 30	40 ÷ 80	807	
	85 ÷ 180	90 ÷ 260	30 ÷ 50	40 ÷ 80	808	
	150 ÷ 350*	200 ÷ 550	50 ÷ 110	50 ÷ 120	809	
	300 ÷ 500*	500 ÷ 1000	50 ÷ 110	50 ÷ 120	827	
	500 ÷ 800*	500 ÷ 1000	50 ÷ 110	50 ÷ 120	828	
	10 ÷ 22	-	-	10 ÷ 20	610	
	15 ÷ 33	-	-	15 ÷ 40	611	
	32 ÷ 60	-	-	15 ÷ 40	601	
	50 ÷ 95	-	-	40 ÷ 80	613	
	85 ÷ 180	-	-	40 ÷ 80	614	
	150 ÷ 350*	-	-	50 ÷ 120	615	
	300 ÷ 500*	-	-	50 ÷ 120	616	
	500 ÷ 800*	-	-	50 ÷ 120	826	
DN 65 - 80	13 ÷ 27	40 ÷ 110	7 ÷ 15	15 ÷ 50	813	
	22 ÷ 58	40 ÷ 110	15 ÷ 25	15 ÷ 50	814	
	50 ÷ 130	90 ÷ 210	25 ÷ 70	15 ÷ 50	815	
	110 ÷ 200	180 ÷ 350	70 ÷ 110	20 ÷ 100	829	
	13 ÷ 27	-	-	15 ÷ 50	617	
	22 ÷ 58	-	-	15 ÷ 50	618	
	50 ÷ 130	-	-	15 ÷ 50	619	
	110 ÷ 200	-	-	20 ÷ 100	620	
	PILOTED REGULATOR					
	170 ÷ 400	-	-	40 ÷ 200	607	
	300 ÷ 530	-	-	40 ÷ 200	608	
	530 ÷ 1300	-	-	40 ÷ 200	609	
	800 ÷ 1500	-	-	40 ÷ 200	621	
DN 100	15 ÷ 27	40 ÷ 110	7 ÷ 15	15 ÷ 50	813	
	27 ÷ 55	40 ÷ 110	15 ÷ 25	15 ÷ 50	814	
	55 ÷ 130	90 ÷ 210	25 ÷ 70	15 ÷ 50	815	
	130 ÷ 200	180 ÷ 350	70 ÷ 110	20 ÷ 100	829	
	15 ÷ 27	-	-	15 ÷ 50	617	
	27 ÷ 55	-	-	15 ÷ 50	618	
	55 ÷ 130	-	-	15 ÷ 50	619	
	130 ÷ 200	-	-	20 ÷ 100	620	
	PILOTED REGULATOR					
	170 ÷ 400	-	-	40 ÷ 200	607	
	300 ÷ 530	-	-	40 ÷ 200	608	
	530 ÷ 1300	-	-	40 ÷ 200	609	
	800 ÷ 1500	-	-	40 ÷ 200	621	

* = strengthen diaphragm

GENERAL DATA

TECHNICAL DATA

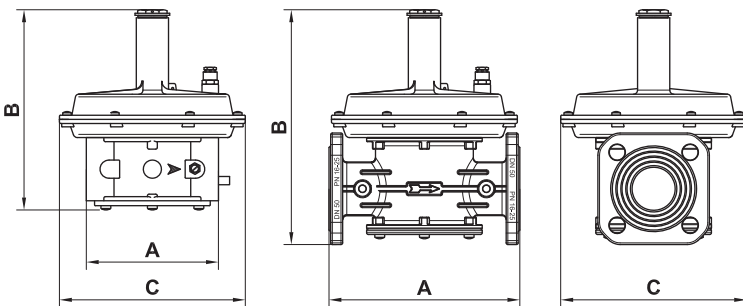
- Use: not aggressive gases of the 3 families (dry gases)
- Threaded connections Rp: (DN 32 ÷ DN 50) according to EN 10226
- Flanged connections PN 16: (DN 32 ÷ DN 100) according to ISO 7005
- On request ANSI 150 flanged connections
- Max. working pressure: 5 bar
- Environment temperature: -20 ÷ +60 °C
- Max superficial temperature: 60 °C
- P2 accuracy class (AC): 10
- Overpressure lockout accuracy group (AG): 10
- Closing pressure class (SG): 30
- Trip pressure range: see springs table
- Shut-off closure time: < 1 s
- Relief valve: tested according to EN 334
- Vent connection: G 1/4"
- Mechanical strength: Group 2 (according to EN 13611:2007)
- Safety factor: $f=4$ ($5 \times 4 = 20$ bar) according to EN 88-2 point 7.2

MATERIALS

- Die-cast aluminium (UNI EN 1706)
- OT-58 brass (UNI EN 12164)
- 11S aluminium (UNI 9002-5)
- Stainless steel (UNI EN 10088)
- NBR rubber (UNI 7702)
- Nylon 30% glass fibre (UNI EN ISO 11667)

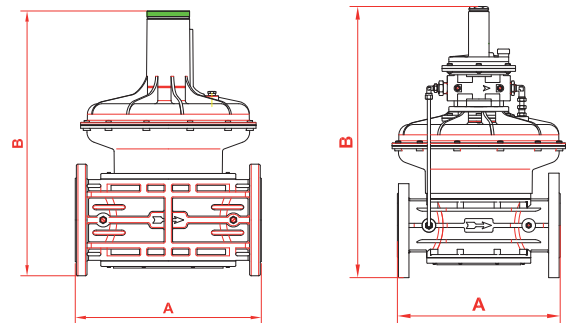
DIMENSIONS

DN 32 - DN 40 - DN 50

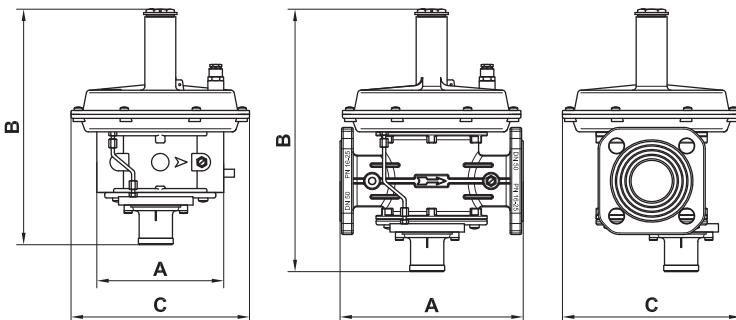


Connections	A	B	C
DN 32 ÷ 50 threaded	160	245	225
DN 32 ÷ 50 flanged	230	285	225

DN 65 - DN 80 - DN 100



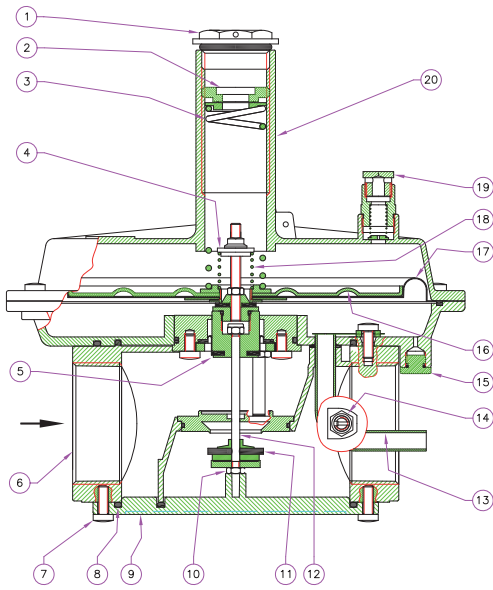
Connections	A	B
DN 65	290	471
DN 80	310	478
DN 100	350	504
IR ... O		
DN 65	290	528
DN 80	310	535
DN 100	350	561
PILOTED REGULATOR		
DN 65	290	518
DN 80	310	525
DN 100	350	551



Connections	A	B	C
DN 32 ÷ 50 threaded	160	297	225
DN 32 ÷ 50 flanged	230	330	225

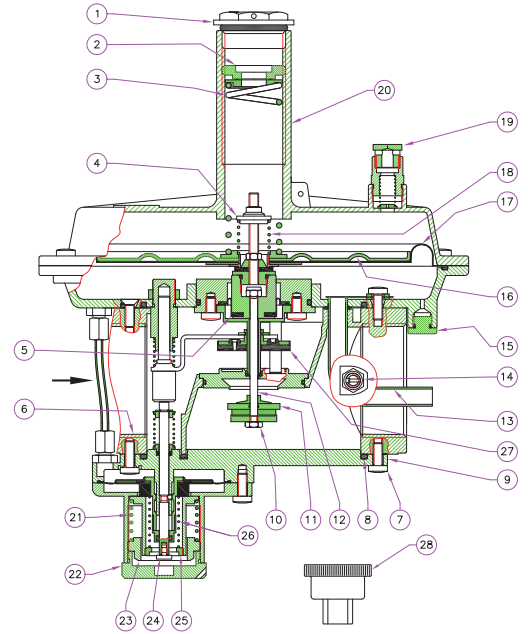
COMPONENTS

DN 32 - DN 40 - DN 50

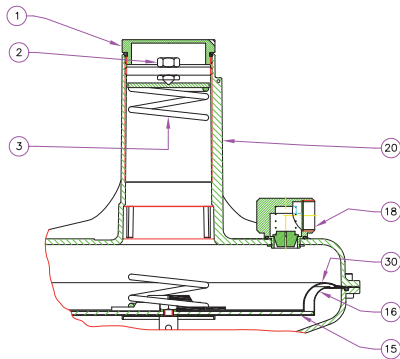


LEGEND

1. Closing cap
2. Outlet pressure calibration
3. P2 regulation spring
4. Relief valve calibration
5. Compensation diaphragm
6. Body
7. Bottom fixing screws
8. Seal O-Ring
9. Bottom
10. Fixing nut
11. Closure member
12. Central pin
13. Sensor tube
14. Outlet pressure test nipple
15. G 1/8" connection
16. Diaphragm disc
17. Working diaphragm
18. Relief valve spring
19. Antidust cap
20. Funnel
21. Maximum shut-off spring
22. Closing cap (shut-off)
23. Calibration of maximum pressure shut-off
24. Reset of shut-off device
25. Calibration of minimum pressure shut-off
26. Minimum shut-off spring
27. Closure member of shut-off
28. Special Key

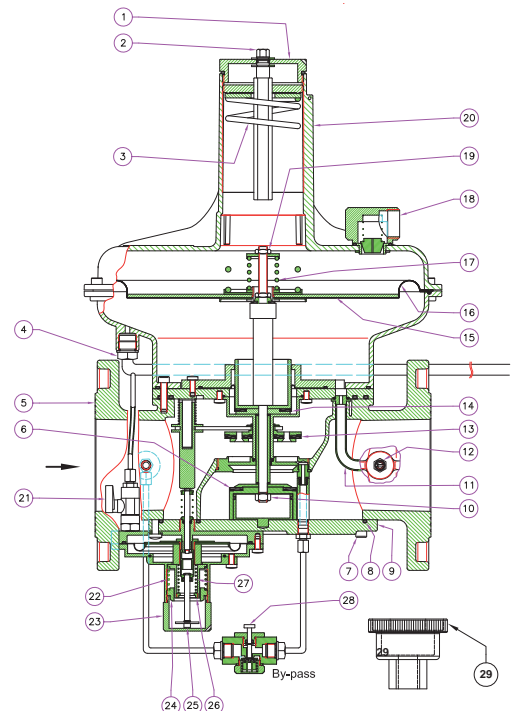
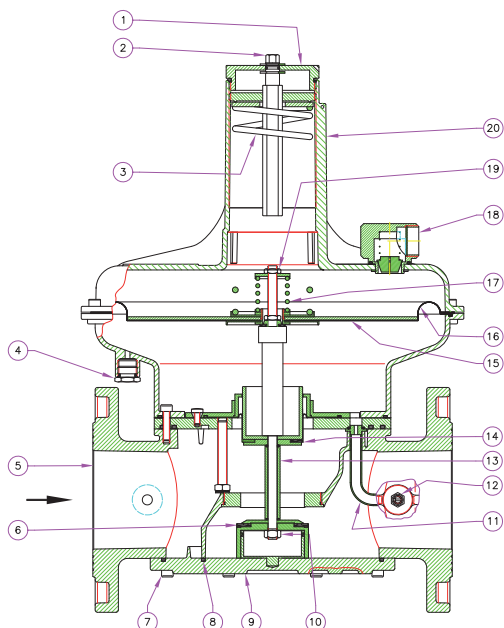
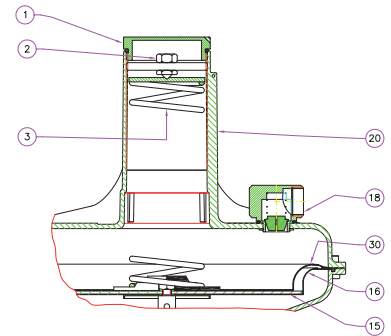


DN 65 - DN 80 - DN 100



LEGEND

1. Closing cap
2. Outlet pressure calibration
3. P2 regulation spring
4. External sensing line connection
5. Body
6. Closure member
7. Bottom fixing screws
8. Seal O-Ring
9. Bottom
10. Fixing nut
11. Seal seat
12. Outlet pressure test nipple
13. Central pin/Closure member
14. Compensation diaphragm
15. Diaphragm disc
16. Working diaphragm
17. Relief valve spring
18. Antidust cap/relief valve discharge
19. Relief valve calibration
20. Funnel
21. Tap
22. OPSO spring
23. Closing cap (shut-off)
24. OPSO calibration
25. Reset of shut-off device
26. UPSO calibration
27. UPSO spring
28. By-pass button
29. Special key
30. Safety diaphragm (no on piloted version)

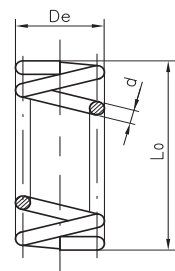


SETTINGS SPRINGS

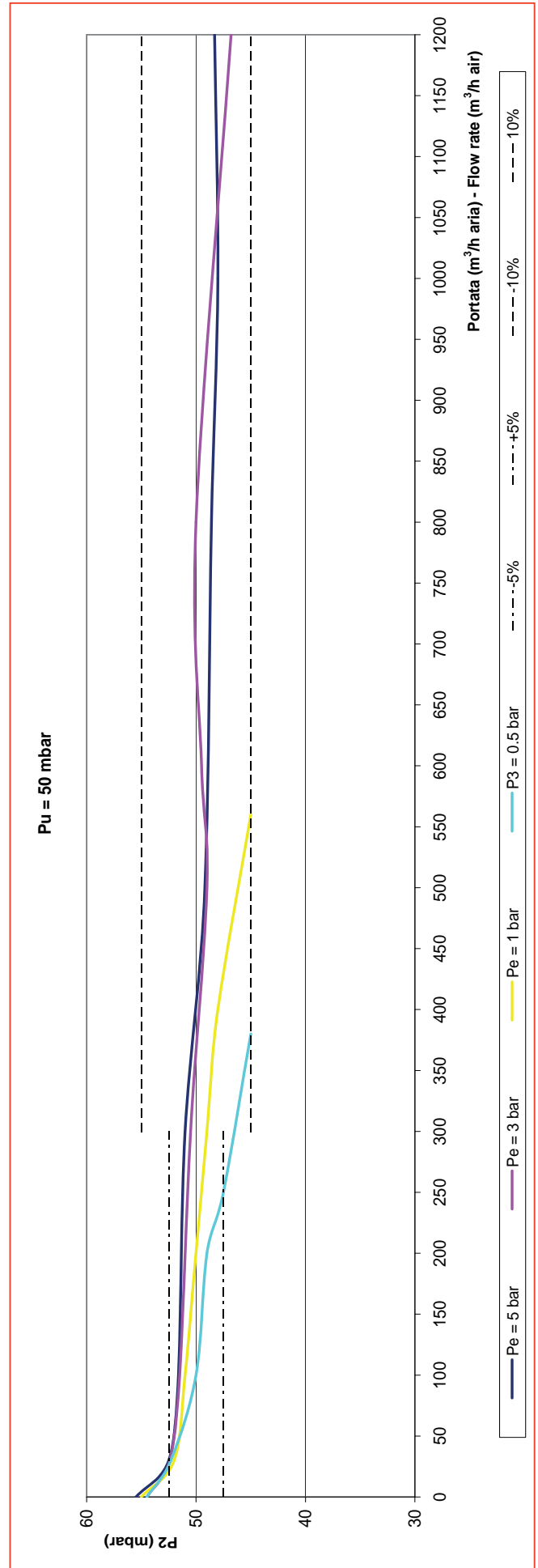
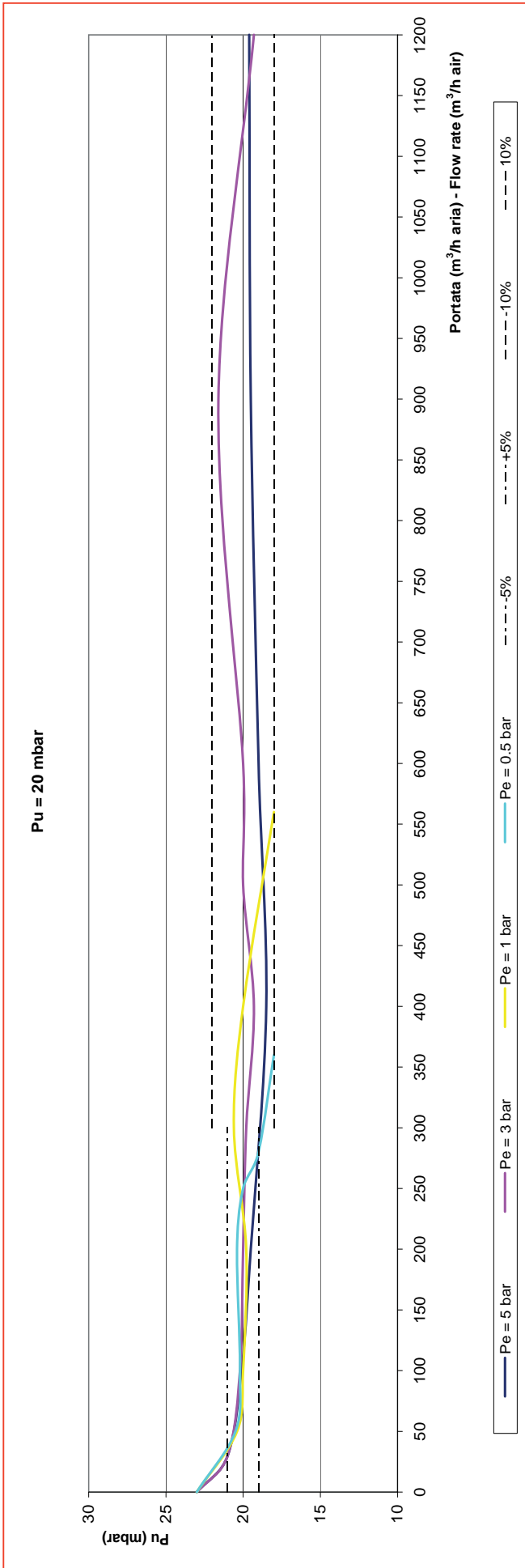
Connections	P2 (mbar) <small>* = strengthened diaphragm</small>	Code and dimensions (d x De x Lo x it) (mm)	OPSO (mbar)	Code and dimensions (d x De x Lo x it) (mm)	UPSO (mbar)	Code and dimensions (d x De x Lo x it) (mm)	Differential relief valve range (mbar)	Code and dimensions (d x De x Lo x it) (mm)
DN 32 - DN 40 - DN 50	10 ÷ 22	031 (2x29x140x16)	30 ÷ 90	028 (2x35x20x4)	7 ÷ 20	003 (0,8x17x40x6)	10 ÷ 20	011 (1,3x17x40x6)
	15 ÷ 33	033 (2,2x29x140x18)	30 ÷ 90	028 (2x35x20x4)	7 ÷ 20	003 (0,8x17x40x6)	15 ÷ 40	012 (1,8x18,4x45x8,5)
	32 ÷ 60	037 (2,5x29x155x16)	70 ÷ 140	030 (2x35x37x4)	10 ÷ 30	004 (0,9x17x45x7)	15 ÷ 40	012 (1,8x18,4x45x8,5)
	50 ÷ 95	041 (3x29x140x18)	70 ÷ 140	030 (2x35x37x4)	10 ÷ 30	004 (0,9x17x45x7)	40 ÷ 80	055 (2x17x54x9)
	85 ÷ 180	048 (3,5x29x125x14)	90 ÷ 260	034 2x35,5x27x3	30 ÷ 50	006 (1x17x52x7)	40 ÷ 80	055 (2x17x54x9)
	150 ÷ 350*	058 (4x29x98x8)	200 ÷ 550	035 (2,5x35x27x2,25)	50 ÷ 110	008 (1,2x15x36x5)	50 ÷ 120	061 (18x2,5x50x8)
	300 ÷ 500*	059 (4,6x29,4x95x9)	500 ÷ 1000	038 (3x35x33,5x3,5)	50 ÷ 110	008 (1,2x15x36x5)	50 ÷ 120	061 (18x2,5x50x8)
	500 ÷ 800*	059 (4,6x29,4x95x9)	500 ÷ 1000	038 (3x35x33,5x3,5)	50 ÷ 110	008 (1,2x15x36x5)	50 ÷ 120	061 (18x2,5x50x8)
DN 65 - DN 80	13 ÷ 27	043 (4,5x70x200x14,5)	40 ÷ 110	034 (2x35,5x27x3)	7 ÷ 15	004 (0,9x17x45x7)	15 ÷ 50	047 (3,5x29,8x64x9)
	22 ÷ 58	044 (5x70x200x13,5)	40 ÷ 110	034 (2x35,5x27x3)	15 ÷ 25	007 (1x17x40x6)	15 ÷ 50	047 (3,5x29,8x64x9)
	50 ÷ 130	049 (6x70x200x10,5)	90 ÷ 210	035 (2,5x35x27x2,25)	25 ÷ 70	007 (1,3x17x40x6)	15 ÷ 50	047 (3,5x29,8x64x9)
	110 ÷ 200	602 (049+050) (6x70x200x10,5 + 5,5x54,5x195x12,5)	180 ÷ 350	039 (3x35x30x3,5)	70 ÷ 110	013 (1,8x18,4x45x8,5)	20 ÷ 100	058 (4X29X98X8)
DN 100	15 ÷ 27	043 (4,5x70x200x14,5)	40 ÷ 110	034 (2X35,5X27X3)	7 ÷ 15	004 (0,9x17x45x7)	15 ÷ 50	047 (3,5x29,8x64x9)
	27 ÷ 55	044 (5x70x200x13,5)	40 ÷ 110	034 (2X35,5X27X3)	15 ÷ 25	007 (1x17x40x6)	15 ÷ 50	047 (3,5x29,8x64x9)
	55 ÷ 130	049 (6x70x200x10,5)	90 ÷ 210	035 (2,5x35x27x2,25)	25 ÷ 70	007 (1,3x17x40x6)	15 ÷ 50	047 (3,5x29,8x64x9)
	130 ÷ 200	602 (049+050) (6x70x200x10,5 + 5,5x54,5x195x12,5)	180 ÷ 350	039 (3x35x30x3,5)	70 ÷ 110	013 (1,8x18,4x45x8,5)	20 ÷ 100	058 (4X29X98X8)
PILOTED REGULATOR								
DN 65 - 80 - 100	170 ÷ 400	M22 (3,5X29,8X64X9)	-	-	-	-	40 ÷ 200	M32 (2x17x29x6)
	300 ÷ 530	M07 (3,5x29,8x98x11,5)	-	-	-	-	40 ÷ 200	M32 (2x17x29x6)
	530 ÷ 1300	M12 (4X29X98X8)	-	-	-	-	40 ÷ 200	M32 (2x17x29x6)
	800 ÷ 1500	M29 (4,6x29,4x95x9)	-	-	-	-	40 ÷ 200	M32 (2x17x29x6)

Dimension Legend

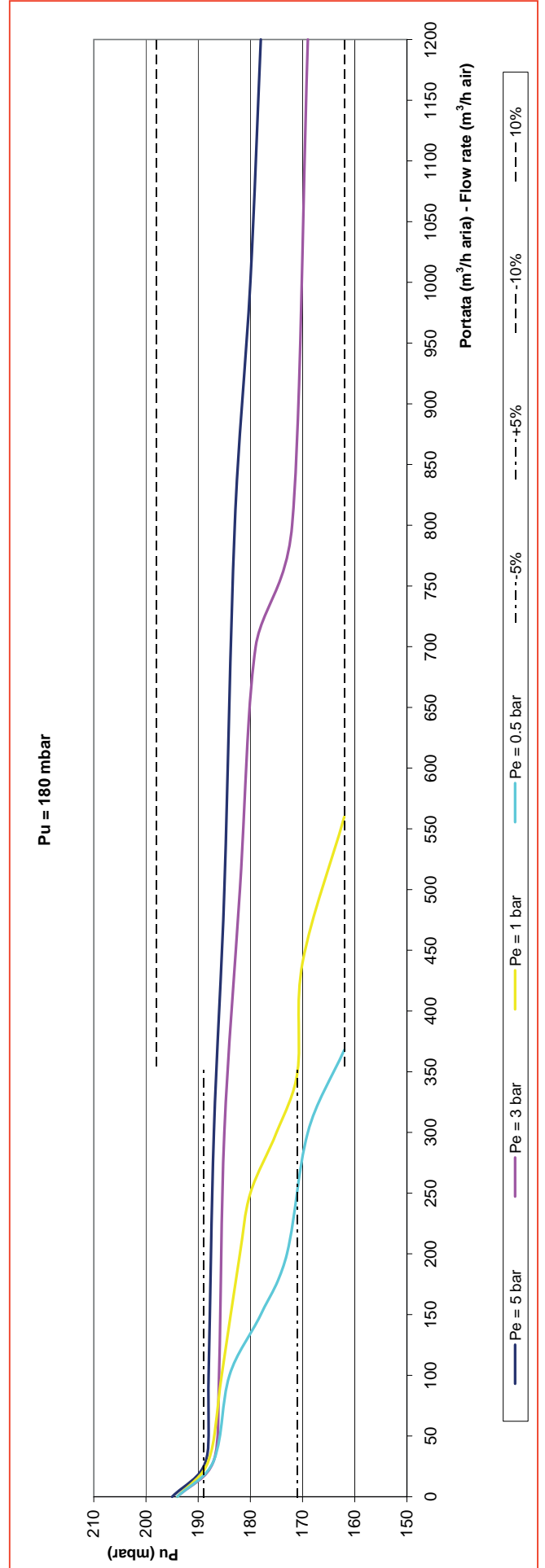
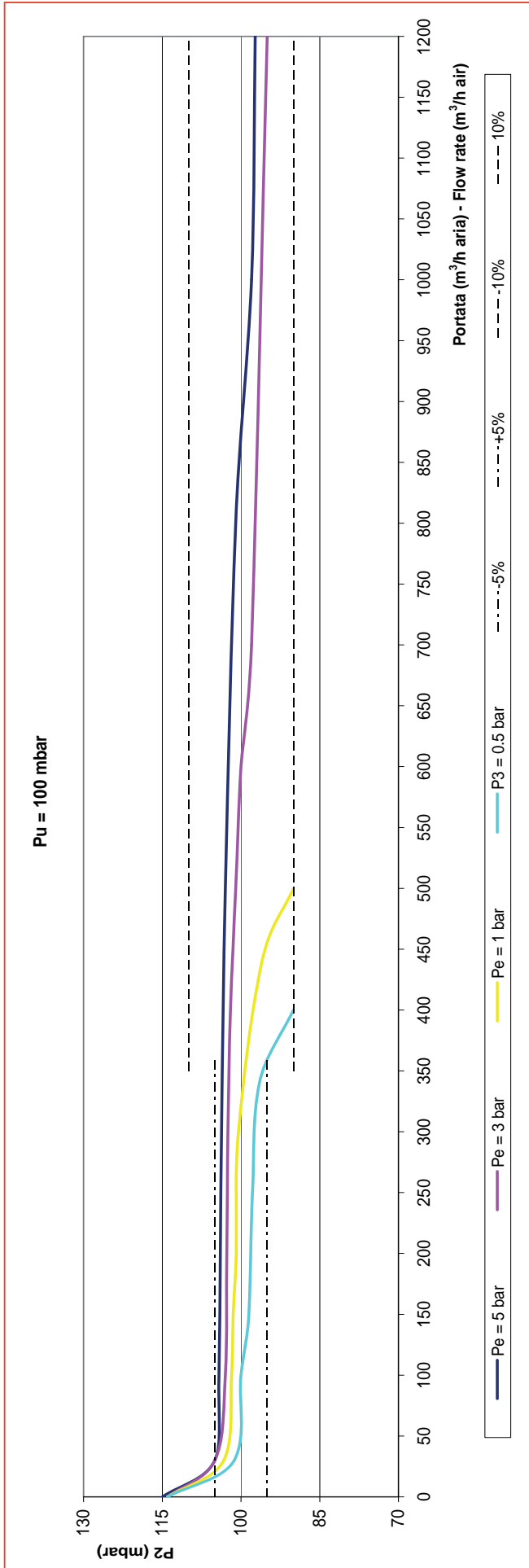
d=diameter
 De = external diameter
 Lo= length
 it = total number of turns



STABILIZATION CURVES



STABILIZATION CURVES



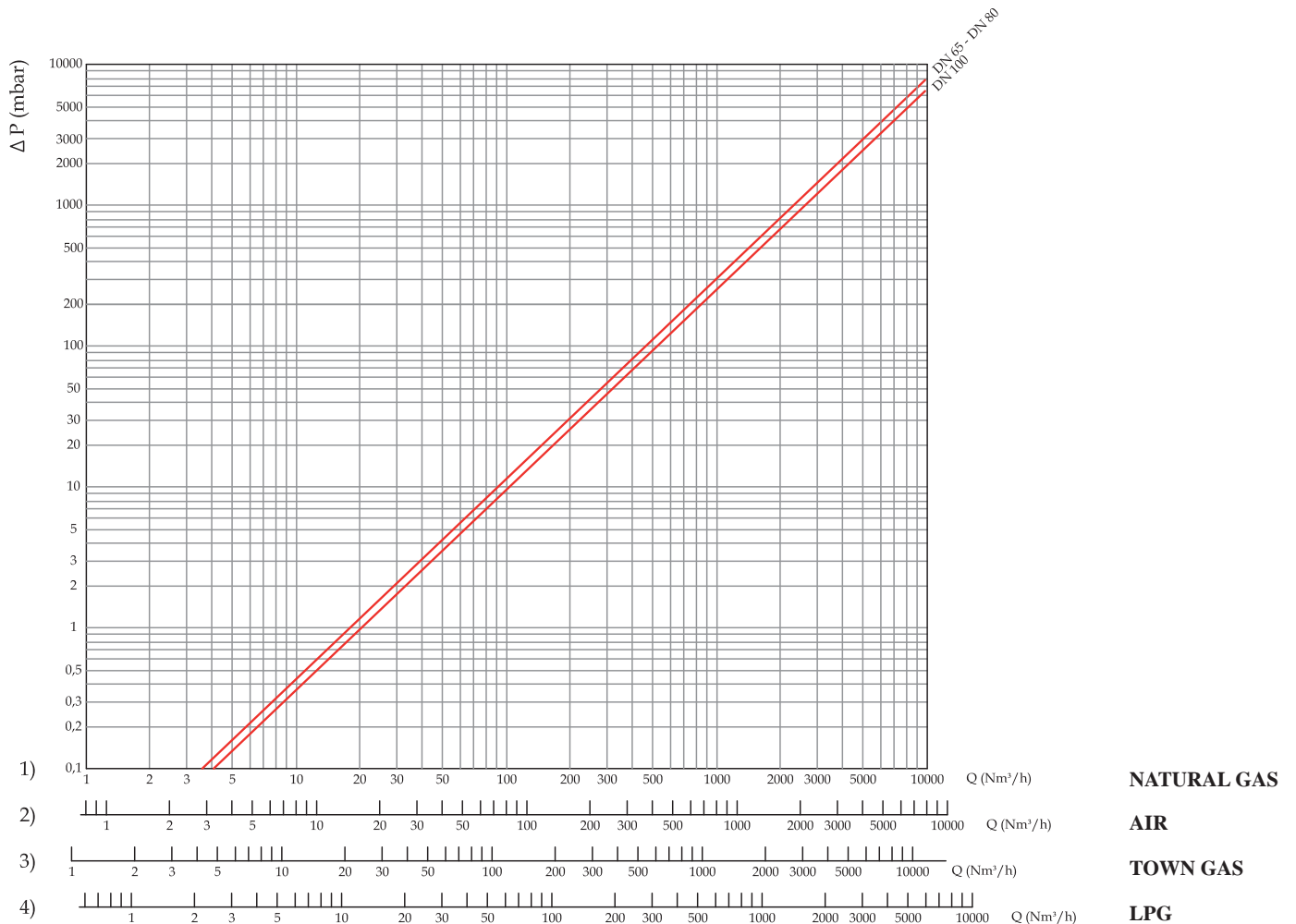
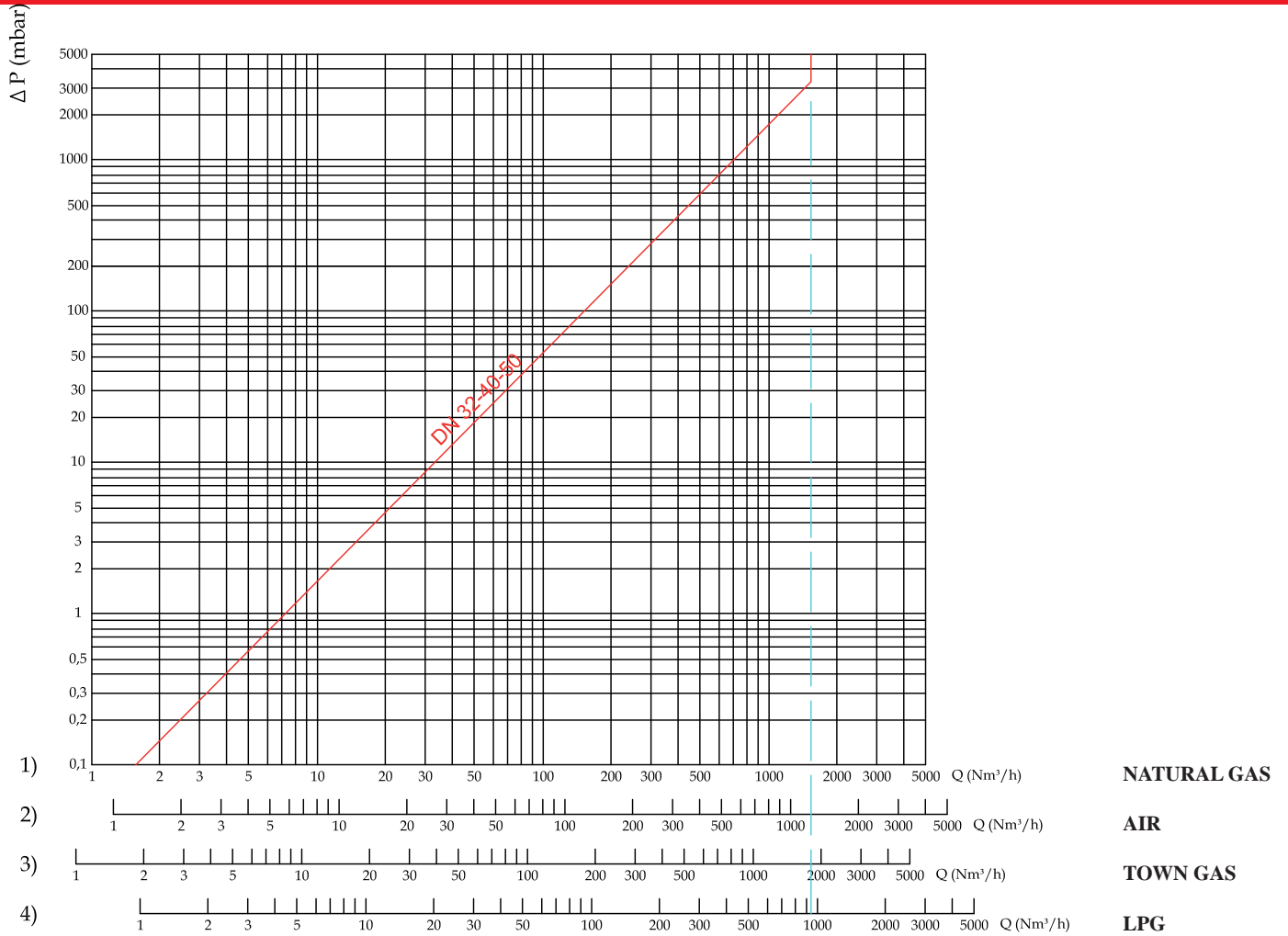
PRESSURE CAPACITIES

(Nm³/h) Natural Gas

Air = 0,806
 Natural Gas = 1
 Town gas = 1.177
 LPG = 0.62

Connections	P2 (mbar)	Inlet Pressure					
		0,5 bar	1 bar	2 bar	3 bar	4 bar	5 bar
DN 32	20	270	430	450	450	450	450
	30	270	430	510	510	510	510
	50	270	410	600	620	620	620
	100	250	400	650	740	740	740
	200	190	320	550	740	860	860
	300	190	370	650	890	940	940
DN 40	20	270	430	690	700	700	700
	30	270	430	690	700	700	700
	50	270	430	700	860	870	890
	100	260	420	690	950	1050	1070
	200	200	340	600	850	1020	1170
	300	190	380	670	940	1160	1380
DN 50	20	300	460	750	990	1290	1500
	30	300	460	750	1000	1300	1500
	50	300	460	750	1000	1300	1500
	100	280	450	740	1000	1300	1500
	200	220	370	660	930	1160	1410
	300	210	390	700	960	1250	1500
DN 50 Outlet pipe DN 80	20	300	470	760	1000	1300	1500
	30	300	470	760	1000	1300	1500
	50	300	470	760	1000	1300	1500
	100	280	460	750	1010	1300	1500
	200	240	410	710	970	1100	1410
	300	220	420	730	990	1300	1500
DN 65	20	1000	1490	1800	1625	1670	1750
	30	1100	1240	2125	2230	1380	1480
	50	1090	1450	1850	2230	2400	1850
	100	1100	1670	2100	2250	2400	2700
	200	1050	1600	2400	2600	2700	2850
DN 80	20	1350	1950	2450	2450	2450	2600
	30	1450	2150	2650	2600	2700	2700
	50	1240	2100	3100	2850	3100	3200
	100	1350	2350	3450	3450	3700	3840
	200	1240	2200	3400	3900	3900	4000
DN 100	20	1670	2400	3100	3800	3800	3800
	30	1500	2400	3200	3800	3800	3800
	50	1500	2480	3700	4900	4900	4900
	100	1700	2400	3600	5000	5000	5000
	200	1270	2900	3700	5000	5000	5000

PRESSURE DROP DIAGRAM



INSTALLATION

The regulator is in conformity with the Directive 2014/34/EU as device of group II, category 2G and as device of group II, category 2D; for this reason it is suitable to be installed in the zones 1 and 21 (besides in the zones 2 and 22) as classified in the attachment I to the Directive 99/92/EC.

The regulator is not suitable to be used in zones 0 and 20 as classified in the already said Directive 99/92/EC.

To determine the qualification and the extension of the dangerous zones, see the norm CEI EN 60079-10-1.

The device, if installed and serviced respecting all the conditions and the technical instructions of this document, is not source of specific dangers: in particular, during the normal working, is forecast, by the regulator, the emission in the atmosphere of inflammable substance only occasionally.

The regulator can be dangerous as regards to the presence close to it of other devices when the integrated relief valve vents or in case of damage of the working diaphragm (16/17) and safety one (30). Only in this last case the regulator is a source of emission of the continue degree explosive atmosphere and, so, it can originate dangerous areas 0 as defined in the 99/92/EC Directive.

In conditions of particularly critic installation (places not protected, lack of servicing, lacking availability of ventilation) and, especially in presence, close to the regulator, of potential sources of primer and/or dangerous devices during the normal working because susceptible to origine electric arcs or sparks, it is necessary to value before the compatibility between the regulator and these devices.

In any case it is necessary to take any useful precaution to avoid that the regulator could be origin of areas 0: for example yearly periodical inspection of regular working, possibility to change the emission degree of the source or to attend on the exhaust outside the explosive material canalizing outside, for example, the relief valve discharge.



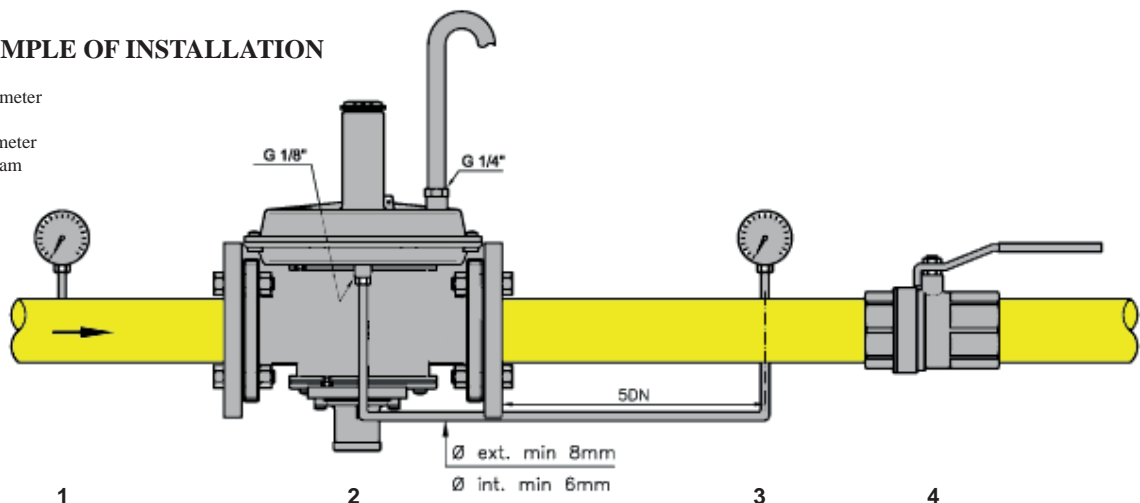
Installation must be in compliance with local law in force!

**WARNING: Read carefully the instruction sheet of each product before installing.
Installation and maintenance must be carried out by qualified personnel.**

- The gas supply must be shut-off before installation.
- Check that the line pressure **DOES NOT EXCEED** the maximum pressure stated on the product label.
- The regulator is normally installed before the user. It must be installed with the arrow on the body (6/5) towards the user.
- It can be installed in any position but it is preferable the installation with the spring in vertical position. Outside the regulator and downstream of it there is a checking pressure-tap (14) for the control of the regulation pressure.
- Connect the G1/8" connection pulse tap (15/4) to downstream regulator pipe. On versions IR..O connect together with the impulse grip the tap outlet (21).
- Canalize outside the relief valve discharge. Please see installation examples.
- If the device is threaded check that the pipeline thread is not too long; overlong threads may damage the body of the device when screwed into place.
- If the device is flanged check that the inlet and outlet counterflanges are perfectly parallel to avoid unnecessary mechanical stresses on the body of the device.
Also calculate the space needed to fit the seal. If the gap left after the seal is fitted is too wide, do not try to close it by over-tightening the device's bolts.
- During installation take care not to allow debris or scraps of metal to enter the device.
- Do not use the spring casing for leverage when screwing into place; use the appropriate tool.
- Always check that the system is gas-tight after installation.

EXAMPLE OF INSTALLATION

1. high pressure manometer
2. regulator IR
3. low pressure manometer
4. ball valve downstream



MANUAL RESET (versions IR...O)

DN 32-40-50

1. Close the tap or ball valve downstream the regulator.
2. Unscrew the tap (22)
3. Slowly push the reset pin (24), wait a few moments to get the pressure balanced and then push till the end the reset pin (24).
4. Keeping pushed the reset pin (24), slowly open the tap upstream the regulator.
5. Subsequently screw again the cap (22) on its original position.

DN 65-80-100

In order to reset the shut-off device, you need to follow the instructions:

1. Close ball valve downstream of the regulator.
2. Close the shut-off tap (21)
3. Push the by-pass button (28).
4. Reset pushing the pin (25).
 - a. If RESETEDED, slowly open the ball valve downstream the regulator and open the shut-off tap (21).
 - b. If NOT RESETEDED, open the shut-off tap (21) and reset pushing the pin (25).
 - b1. If RESETEDED, slowly open the ball valve downstream of regulator.
 - b2. If NOT RESETEDED: - open the ball valve downstream of regulator
 - close the shut-off tap (21)
 - close the ball valve downstream of regulator
 - push the by-pass button (28)
 - reset pushing the pin (25)
 - once rearmed, slowly open the ball valve downstream of regulator
 - open the shut-off tap (21)

When the reset operation is completed, to avoid any contact with the internal reset pin, slowly pull down the reset pin (25).

CALIBRATION P2

Before starting the system, pay attention that the standard regulation spring is suitable with the needed regulation pressure.

Get a proper pressure gauge to check the regulator pressure.

On versions with relief valve, you must act directly on the adjustment regulation screw (2), on versions without relief valve you have to unscrew the cap (1).

When the regulator is set, rescrew the cap (1) in the original position.

SETTING

DN 32-40-50

Normally the devices are presetted according to the customer specification, where it is needed to set it, with the plant giving flow, you need:

- Get a spanner (hex with a pipe of 8 mm and a max. external Ø not over 12 mm) and a proper pressure gauge to check the regulator pressure.
- Unscrew the caps (1) and (22)
- In order to change the setting value of the out let pressure P2, act on the regulation screw (2).
- Screw till the end the setting screws (4) and (23) and place at minimum, unscrewing it, the regulation screw (25).
- To modify the setting value of the minimum pressure shut-off tripping, act with the supplied key (28) on the regulation screw (25).
- To modify the setting value of overpressure shut-off tripping, act with the supplied screw (28) on the regulation screw (23).
- To modify the setting of the relief valve, act with a 8 mm spanner (not supplied) on the regulation screw (4).

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Where it is needed to set the devices, with the plant giving flow, you need:

- On versions with relief valve use an hex with a pipe type of 10 mm and a maximum external Ø not over than 15 mm.
- On versions of piloted regulator with relief valve use an hex with a pipe type of 8 mm and a maximum external Ø not over than 12 mm.
- Unscrew the cap (23).
- Unscrew and remove the final part of the pin (25).
- By the special key (29) screw completely the regulation screw (24) and put at minimum the regulation screw (26).
- In order to change the setting value of the out let pressure P2, act on the regulation screw (2).
- Screw till the end the setting screws (4) and (23) and place at minimum, unscrewing it, the regulation screw (25).
- To modify the setting value of the minimum pressure shut-off tripping, act with the supplied key (29) on the regulation screw (26).
- To modify the setting value of overpressure shut-off tripping, act with the supplied screw (29) on the regulation screw (24).
- To modify the setting of the relief valve, act with a commercial spanner (not supplied) on the regulation screw (19).

FOR FURTHER INFORMATION PLEASE CONTACT OUR TECHNICAL OFFICE.

