STAINLESS STEEL PRESSURE REDUCING VALVE PRV ELITE

FEATURES

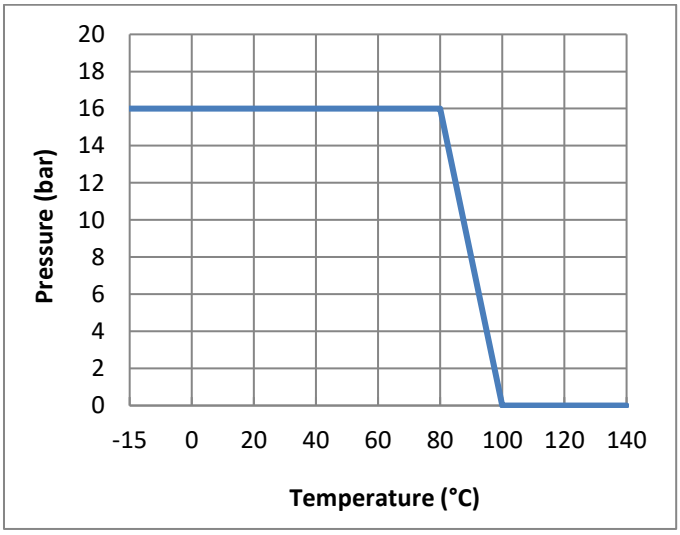
The stainless steel PRV elite valve is intended for the function of pressure reduction of the fluids such as water, air, liquids and compatible gases. It construction of the valve is in stainless steel with tightness in FPM. The setting of the downstream pressure is made by means of the screw. The pressure gauge allows the direct reading of the reduced pressure. The flow is one-away indicated by an arrow on the body. The PRV valve suits with compatible fluids free of particles. It must be necessarily protected by a streamer installed upstream.

AVAILABLE MODELS

Stainless steel PRV : G 1/2'' to 2'' and NPT 1/2" to 1" (1"1/2 to 2" on request)
Stainless steel PRV flange : PN 16 DN 15 to DN 100 (Option : ANSI 150 and NPT)
BSP screwed end connections.
Downstream pressure range : 1-6 bar, 4-10 bar, 8-13 bar

LIMITS OF USE

Max allowed fluid pressure : PS	16 bar
ΔP mini :	1 bar
ΔP maxi :	13 bar
Max allowed fluid temperature : TS	-15°C / +100°C



Flange type

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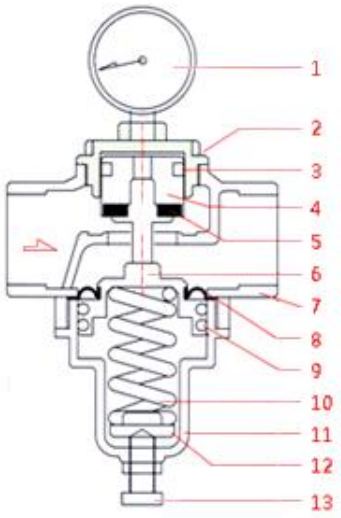
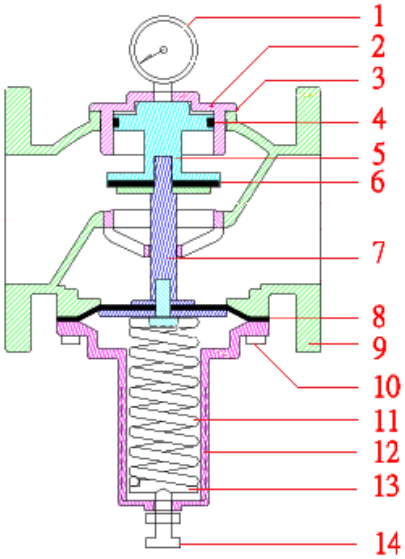
REGULATIONS AND STANDARDS OF CONSTRUCTIONS

Item	Standard	ON	Item	Standard
Pressure equipment directive 2014/68	DN 15 to 25 : A4 § 3 excluded		Conception	ANSI B16.34
	DN 32 to 100 : catégorie II	0035	Test final	API 598
BSP theard	ISO 228		Flanges	EN 1092-1

CONSTRUCTION

N°	Item	Material	Thread type
1	Gauge Ø 63	All stainless steel - 1/4 ''	
2	Upper cover	Stainless steel 1.4408	
3	U-ring	FPM	
4	Shaft	Stainless steel 1.4408	
5	Sealing spacer	FPM	
6	Seat	Stainless steel 1.4408	
7	Body	Stainless steel 1.4408	
8	Diaphragm	FPM	
9	U-H-ring	FPM	
10	Spring	Spring steel	
11	Spring box	Stainless steel 1.4408	
12	Spring washer	Brass	
13	Adjusting screw	Stainless steel 1.4301	

N°	Item	Material	Flange type
1	Gauge Ø 63	All stainless steel - 1/4 ''	
2	Cover	Stainless steel 1.4408	
3	Sealing cover	FPM	
4	U-ring	FPM	
5	Upper seat	Stainless steel 1.4408	
6	Sealing spacer	FPM	
7	Lower seat	Stainless steel 1.4408	
8	Diaphragm	FPM	
9	Body	Stainless steel 1.4408	
10	Screw	Stainless steel 1.4301	
11	Spring	Spring steel	
12	Spring box	Stainless steel 1.4408	
13	Spring washer	Brass	
14	Adjusting screw	Stainless steel 1.4301	

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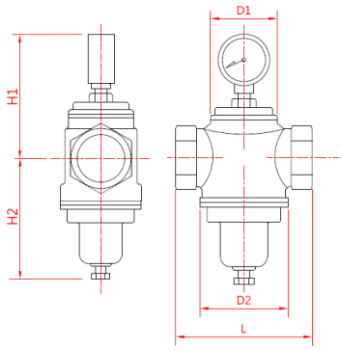
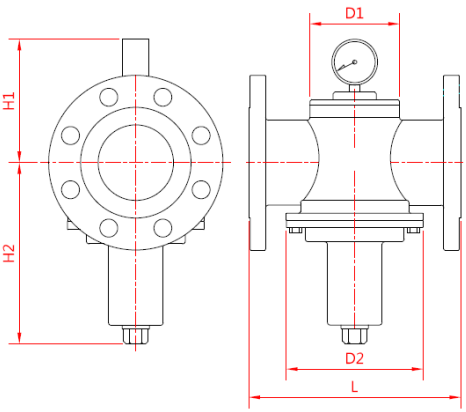
DIMENSIONS (mm)

DN	L	H1	H2*	D1	D2	Gauge connection	Weight (kg)	Thread type
15	70	120	80	30	60	1/4'' G	1,0	
20	85	125	105	35	60		1,2	
25	90	130	105	42	60		1,4	
40	115	140	130	60	73		2,6	
50	120	140	130	65	85		2,8	

* Completely unscrewed reticule adjusting screw

DN	L	H1	H2*	D1	D2	Gauge connection	Weight (kg)	Flange type
15	155	120	80	30	60	1/4'' G	2,6	
20	155	125	105	35	60		3	
25	155	130	105	42	60		3,7	
40	190	140	130	60	73		6,5	
50	195	140	130	65	85		7,8	
65	210	145	195	95	145		14,5	
80	225	145	195	95	145		15,4	
100	250	160	235	115	160		20,7	

* Completely unscrewed reticule adjusting screw

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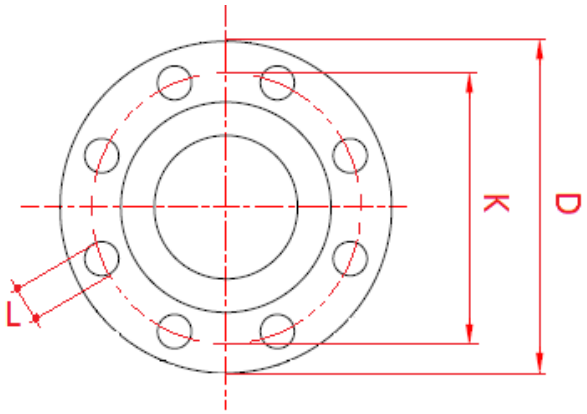
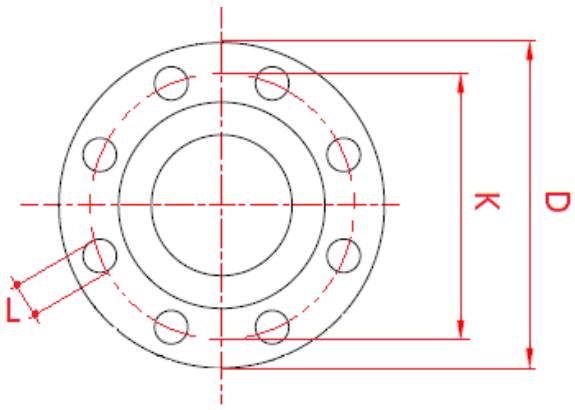
DN	D	K	L	Qty	ø	Flanges EN 1092-1 PN16 Dimensions
15	95	65	14	4	M12	
20	105	75	14	4	M12	
25	115	85	14	4	M12	
40	150	110	19	4	M16	
50	165	125	19	4	M16	
65	185	145	19	4	M16	
80	200	160	19	8	M16	
100	220	180	19	8	M16	

DN	D	K	L	Qty	ø	Flanges ANSI 150 Dimensions
15	88,9	60,5	15,8	4	M14	
20	98,6	69,9	15,8	4	M14	
25	108	79,4	15,8	4	M14	
40	127	98,4	15,8	4	M14	
50	152	120,4	19	4	M16	
65	178	139,7	19	4	M16	
80	190	152,4	19	4	M16	
100	229	190,5	19	8	M16	

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SIZING

Selection of the size : You should not necessarily choose an overflow valve with a size equal to pipe's size. To set the PRV size, you must calculate it by using abacuses and formulae of calculation presented below.

Flow coefficients Kv (m^3/h) of PRV :

DN	15	20	25	40	50	65	80	100
Kv	2,1	3,4	5,5	11,1	14,5	26	36	64

Formula of calculation for a liquid:

$$Kv = Q \; x \sqrt{\frac{\rho}{\Delta P}}$$

Kv : flow coefficient in m^3/h. — *Q : flow in m^3/h* — *ΔP : Difference of pressure upstream-downstream in bar* — *ρ : Volumic weight kg/dm^3*

Formula of calculation for a gas :

Si $P2 > P1/2$ $\quad Kv = \frac{Q}{445} x \sqrt{\frac{d \; x \; T}{\Delta P \; x \; P2}}$

Si $P2 < P1/2$ $\quad Kv = \frac{Q}{240 \; x \; P1} \; x \sqrt{d \; x \; T}$

Kv	*Flow coefficient*	*m^3/h*
Q	*Flowrate in*	*Nm^3/h*
d	*Volumic weight*	*Kg / m^3*
T	*Absolute temperature*	*°K (°C +273)*
P1	*Upstream pressure (abs)*	*bar*
P2	*Downstream pressure (abs)*	*bar*
ΔP	*Pressure Différencial*	*bar*

Minimal gap from pressure : The reducer of pressure PRV has got is own pressure loss, that gives a minimal gap between upstream and downstream pressures. This gap valve is from 15 to 20 % of the upstream pressure.

Double pressure reduction : A pressure reduction of a very high pressure to a very low pressure is possible in theory. The PRV authorizes a maximum ΔP of 13 bar. However a noisy functioning is to be expected. It is advised to plan a pressure reduction in 2 steps by using two pressure reducers. The calculation of the intermediate pressure is made as follows:

$$P \; intermédiate = \sqrt{P \; upstream \; x \; P \; downstream}$$

Variation of upstream flowrate : When the upstream flowrate fluctuate in a too wide range, It is possible that the pressure downstream regarding to the setted pressure either that this it takes some time to recover the setted pressure.

Variation also fluctuate of the upstream pressure : When the upstream pressure fluctuates, the pressure downstream also fluctuates in the same way. If at the same time, the flowrate also comes to change, the stability of the downstream pressure becomes more difficult. If such variation is not acceptable for the intented use, it is necessary to prefer the choice of a control valve linked to in a transmitter of pressure settled downstream.

Phenomenon of pumping : When the pressure reducer is too big for the flow rateto be assured, an unstable operation of the device is to be expected (phenomenon says of "pumping"). Thus it is essential to size the pressure reducing valve neither too big, nor too small.

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TABLE OF FLOWRATE FOR WATER

Flowrate (m^3/h) for water at 20°C															
ΔP (bar)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
DN 15	2,1	2,9	3,4	3,8	4,1	4,4	4,5	4,8	5	5,1	5,2	5,3	5,4	5,5	5,6
DN 20	3,4	4,6	5,5	6,1	6,7	7	7,3	7,7	7,9	8,2	8,3	8,5	8,7	8,8	8,9
DN 25	5,6	7,5	9	10,1	10,9	11,5	12,1	12,5	13	13,3	13,6	13,9	14,1	14,3	14,6
DN 40	11,1	15,2	18	20,2	21,8	23,1	24,1	25,1	25,9	26,6	27,2	27,7	28,3	28,7	29,2
DN 50	14,5	19,9	23,5	26,4	28,6	30,2	31,5	32,8	34	34,9	35,6	36,2	36,8	37,5	38,2
DN 65	25,6	35,2	41,7	46,6	50,4	53,4	55,6	58	59,9	61,6	62,9	63,9	65	66,1	67,5
DN 80	35,9	49,2	58,4	65,3	70,6	74,6	77,9	81,2	84	86,2	88,1	89,6	90,8	92,6	94,6
DN 100	64,1	87,9	104	116	126	133	139	145	150	154	157	160	163	165	168

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TABLE OF FLOWRATE FOR COMPRESSED AIR

Flowrate (Nm^3/h) for compressed air at 20°C													
P Upstream (bar)			2	3	4	5	6	7	8	9	10	11	12
Pressure downstream (bar)	1	DN 15	52	78	104	130	155	181	207	233	259	285	311
		DN 20	84	126	168	210	252	294	336	377	419	461	503
		DN 25	136	204	271	339	407	475	543	611	678	746	814
		DN 40	274	411	548	685	822	958	1095	1232	1369	1506	1643
		DN 50	358	537	715	894	1073	1252	1431	1610	1789	1967	2146
		DN 65	641	962	1283	1604	1924	2245	2566	2886	3207	3528	3849
		DN 80	888	1332	1776	2220	2664	3108	3553	3997	4441	4885	5329
		DN 100	1579	2368	3158	3947	4737	5526	6316	7105	7895	8684	9473
	2	DN 15		78	104	118	136	152	166	180	192	204	215
		DN 20		126	168	190	220	246	269	291	311	330	348
		DN 25		204	271	308	356	398	436	471	503	534	563
		DN 40		411	548	622	718	803	879	950	1015	1077	1135
		DN 50		537	715	812	938	1049	1149	1241	1327	1407	1483
		DN 65		962	1283	1457	1682	1880	2060	2225	2379	2523	2659
		DN 80		1332	1776	2017	2329	2604	2852	3081	3293	3493	3682
		DN 100		2368	3158	3586	4140	4629	5071	5477	5855	6210	6546
	3	DN 15			104	130	155	166	186	204	220	235	250
		DN 20			168	210	252	269	301	330	356	381	404
		DN 25			271	339	407	436	487	534	576	616	654
		DN 40			548	685	822	879	983	1077	1163	1244	1319
		DN 50			715	894	1073	1149	1284	1407	1520	1625	1723
		DN 65			1283	1604	1924	2060	2303	2523	2725	2913	3090
		DN 80			1776	2220	2664	2852	3189	3493	3773	4034	4278
		DN 100			3158	3947	4737	5071	5669	6210	6708	7171	7606
	4	DN 15				130	155	181	207	215	235	254	272
		DN 20				210	252	294	336	348	381	411	440
		DN 25				339	407	475	543	563	616	666	712
		DN 40				685	822	958	1095	1135	1244	1343	1436
		DN 50				894	1073	1252	1431	1483	1625	1755	1876
		DN 65				1604	1924	2245	2566	2659	2913	3147	3364
		DN 80				2220	2664	3108	3553	3682	4034	4357	4658
		DN 100				3947	4737	5526	6316	6546	7171	7746	8280
	5	DN 15					155	181	207	233	259	263	284
		DN 20					252	294	336	377	419	426	460
		DN 25					407	475	543	611	678	689	744
		DN 40					822	958	1095	1232	1369	1391	1502
		DN 50					1073	1252	1431	1610	1789	1816	1962
		DN 65					1924	2245	2566	2886	3207	3257	3518
		DN 80					2664	3108	3553	3997	4441	4510	4871
		DN 100					4737	5526	6316	7105	7895	8017	8660
	6	DN 15						181	207	233	259	285	311
		DN 20						294	336	377	419	461	503
		DN 25						475	543	611	678	746	814
		DN 40						958	1095	1232	1369	1506	1643
		DN 50						1252	1431	1610	1789	1967	2146
		DN 65						2245	2566	2886	3207	3528	3849
		DN 80						3108	3553	3997	4441	4885	5329
		DN 100						5526	6316	7105	7895	8684	9473

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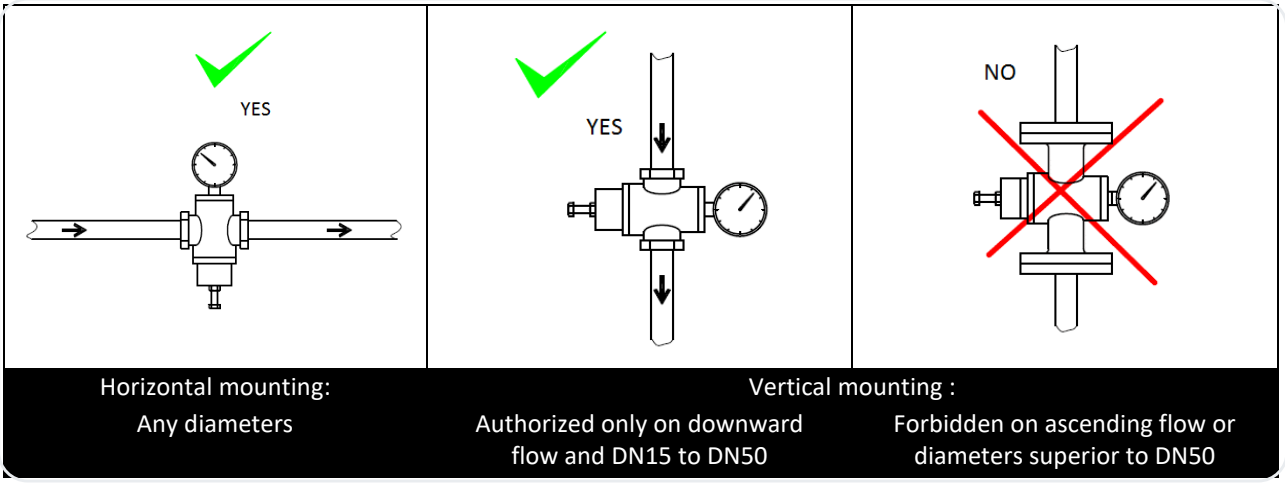
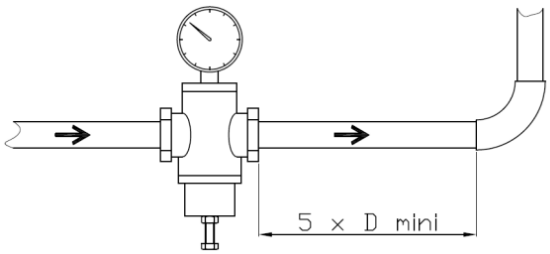
INSTALLATION

Position of mounting : The usual position of mounting of the PRV is vertical on horizontal piping, manometer upward. mounting on vertical piping : Although not recommended this mounting is possible for diameters DN 15 for DN 50, only on downward flow. For the BPV DN 65 to DN 100, this position of mounting is forbidden.



Convergent and divergent : If the diameter of the PRV is lower than the diameter of the piping (see § sizing), install upstream a convergent.
For a use on a gas, It is necessary to plan at the exit of the PRV a bigger sized pipe to that of the entrance and to link it by a divergent, The relaxed gas needing a bigger pipe's section.

Length of tranquillizing : To assure a good stability of the downstream pressure and reduce the turbulences at the exit of the PRV, plan before any of accident piping or device, A straight piping length at least equal to 5 x DN and 10 x DN if possible. In the case of a double pressure reduction, plan an identical lenght between both valves.



Upstream isolation : Plan a stop valve upstream to the PRV. This one is not necessarily tight in zero flowrate and cannot be considered as an isolation valve.

Upstream filtration : To protect the mechanism about 5/10 ° intern impurities, plan a filter of protection upstream to the PRV with a threshold of filtration.

Safety valve : For the pressure reduction of on a gas : the pressure reducer PRV not being necessarily tight in zero flowrate, the upstream pressures and downstream could balance each other. Plan a safety valve to protect downstream equipments to the PRV.

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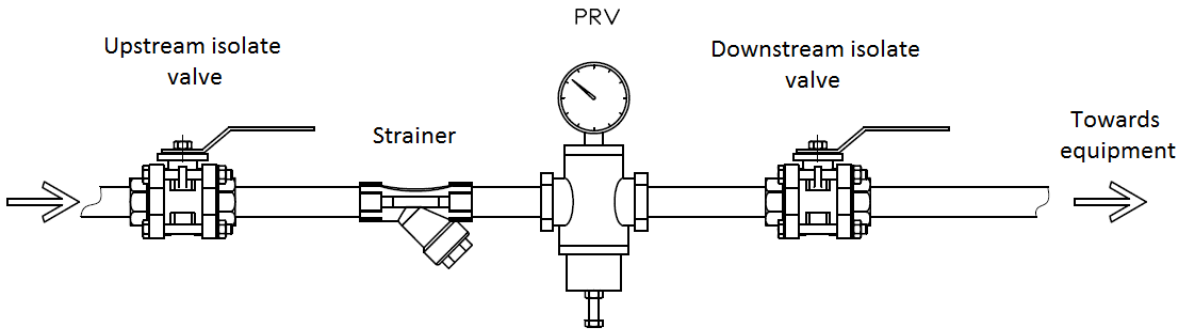
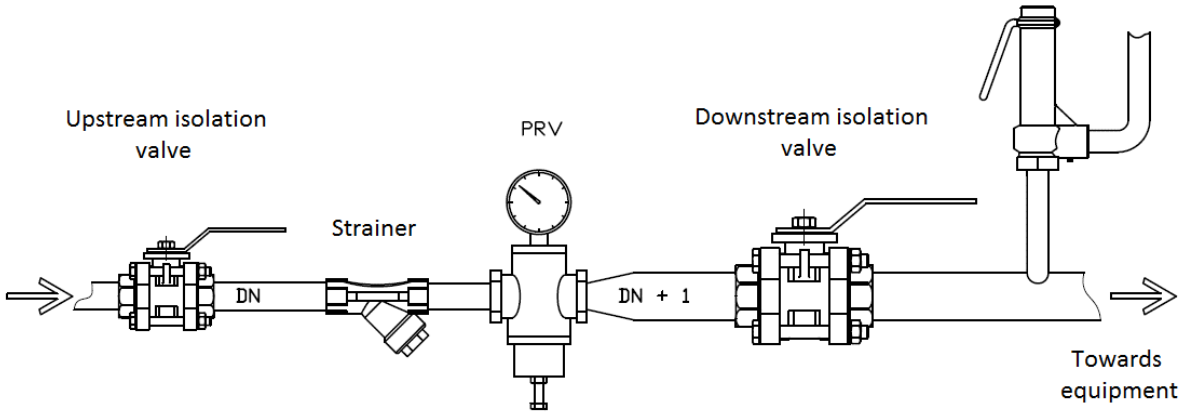
Example of a pressure reducing system for a liquid :



Example of a pressure reducing system for a gas :



OPTIONS

Thread NPT according to ANSI B1.20

ANSI 150 flanges according to ANSI B16.5

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INSTRUCTIONS OF MOUNTING AND MAINTENANCE

1 - Mounting

Verify that the range of pressure indicated on the body is adequate with regard to the use. Before any installation, isolate the upstream pipe and the downstream, depressurize the pipe and bring the installation at room temperature. Install a valve of isolation in the upstream and another one in the downstream. Install also a strainer upstream. Clean carefully the pipe of any particle by rinsing with water or a blowing with air. Install the reducer PRV by respecting the sense of the arrow indicated on the body and with the pressure gauge upward. Make the tightness of the grip of pressure gauge. Open slowly the upstream valve and the downstream. Use the adjusting screw item (13) or (14) and read the indication of the pressure on the manometer to adjust the pressure downstream looked for.

2 - Maintenance

Before any intervention, isolate the upstream pipings and the downstream by using valve intended for that purpose. Depressurize the pipe and bring the installation at room temperature. Unscrew completely the adjusting screw item (13) or (14). Remove screen the cork of the upstream strainer and clean or replace it. For a complete visit of the device, unscrew the parts (2) and (10). Verify the state of sealing parts (3), (4) and (6) or (3), (4), (6) and (8). Replace them if needed. Verify also the state of the spring item (10) or (11). Replace it if it is broken or strongly corroded. Clean all the internal parts. Reassemble all the internal parts, in the inverse order of the dismantling. Put back the device in service by opening slowly the upstream valve then the downstream valve. Adjust the upstream pressure by means of the screw item (14).

SPARE PARTS

DN	Kit of sealing FPM	Spring 1-6 bar	Spring 4-10 bar	Spring 8-13 bar
Thread type item	**3, 5, 8, 9**	**10**		
Flange type item	**3, 4, 6, 8**	**11**		
15	981784	981730	981731	981732
20	981785	981733	981734	981735
25	981786	981736	981737	981738
40	981787	981739	981740	981741
50	981788	981742	981743	981744
65	981789	981745	981746	981747
80	981790	981748	981749	981750
100	981791	981751	981752	981753

Spare pressure gauge item 1		
1-6 bar	4-10 bar	8-13 bar
F1616005	F1616006	F1616007

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