STAINLESS STEEL LOW PRESSURE REDUCING VALVE LPRV ELITE

FEATURES

The stainless steel LPRV elite low-pressure reducer is intended for the pressure reduction of the fluids such as water, air, clear liquids not in charge of and the compatible gases until 200 mbar. The 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 LPRV valve suits with compatible fluids free of particles. It must be necessarily protected by a streamer installed upstream.

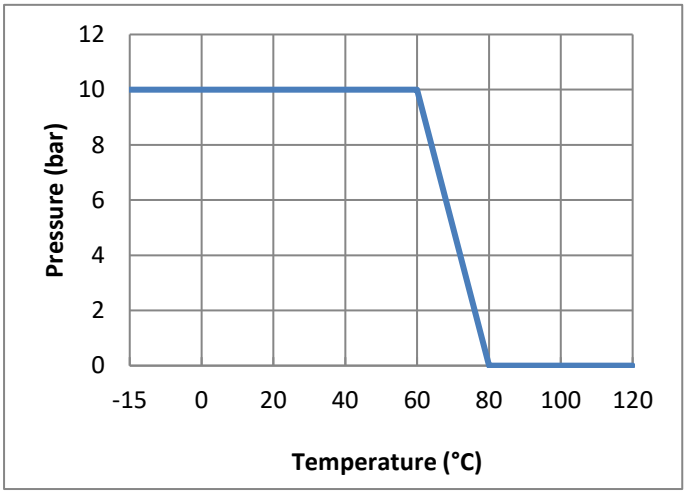


AVAILABLE MODELS

Stainless steel LPRV : G 1/2'' to 2''
Stainless steel LPRV flanges : PN 16 DN 15 to DN 50 (Option: ANSI 150 and NPT)
BSP screwed end connections.
Downstream pressure range : 0,2 - 1,5 bar

LIMITS OF USE

Max allowed fluid pressure : PS	10 bar
P downstream mini :	0,2 bar
P downstream maxi :	1,5 bar
Max allowed fluid temperature : TS	-15°C / +80°C





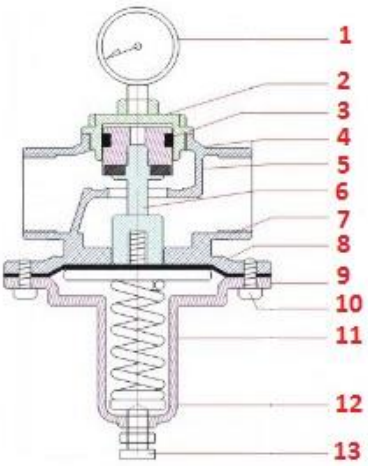
Flange type

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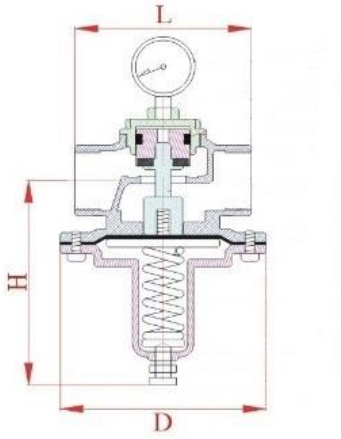
REGULATIONS AND STANDARD OF CONSTRUCTIONS

Item	Standard	ON	Item	Standard
Pressure equipment directive 2014/68	**DN 15 to 25** : A4 § 3 excluded		Conception	ANSI B16.34
	DN 32 to 50 : category 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	Body	Stainless steel 1.4408	
10	screw	Stainless steel 1.4301	
11	Spring	Spring steel	
12	Spring washer	Brass	
13	Adjusting screw	Stainless steel 1.4301	

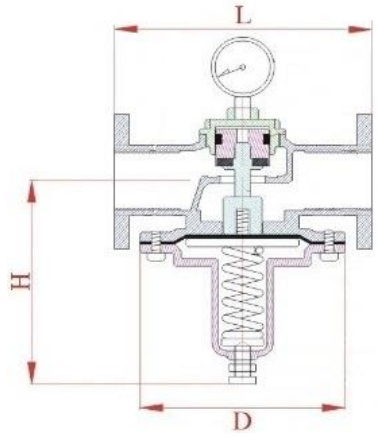
DIMENSIONS (mm)

DN	L	H	D	Gauge connection	Weight (kg)	Thread type
15	70	110	105	G 1/4''	0,8	
20	85	125	105		1	
25	90	125	105		1,05	
40	115	155	145		2,3	
50	120	155	145		2,5	

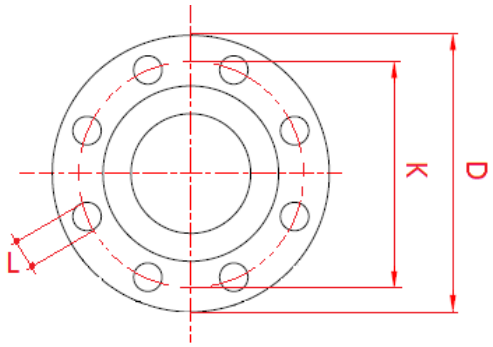
* Completely unscrewed reticule adjusting screw

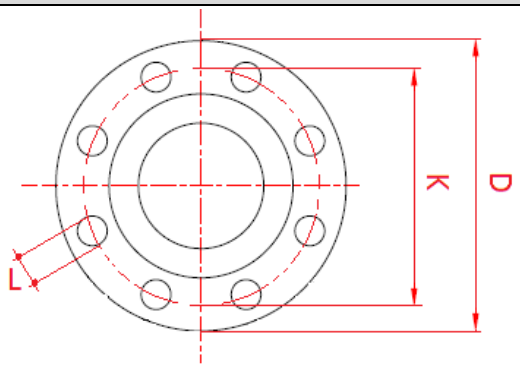
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DN	L	H	D	Gauge connection	Weight (kg)	Flange type
15	150	110	105	G 1/4''	2,5	
20	150	125	105		3,5	
25	150	125	105		5,6	
40	190	155	145		8,7	
50	190	155	145		13,5	

* Completely unscrewed reticule adjusting screw

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	

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	

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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 LPRV size, you must calculate it by using abacuses and formulae of calculation presented below.

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

DN	15	20	25	40	50
Kv	2,1	3,4	5,5	11,1	14,5

Formula of calculation for a liquid:

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

Kv : flow coefficent 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 coefficent*	*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 low pressure LPRV 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 LPRV authorizes a maximum ΔP of 10 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 low 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**
DN 15	2,1	2,9	3,4	3,8	4,1	4,4	4,5	4,8	5	5,1
DN 20	3,4	4,6	5,5	6,1	6,7	7	7,3	7,7	7,9	8,2
DN 25	5,6	7,5	9	10,1	10,9	11,5	12,1	12,5	13	13,3
DN 40	11,1	15,2	18	20,2	21,8	23,1	24,1	25,1	25,9	26,6
DN 50	14,5	19,9	23,5	26,4	28,6	30,2	31,5	32,8	34	34,9

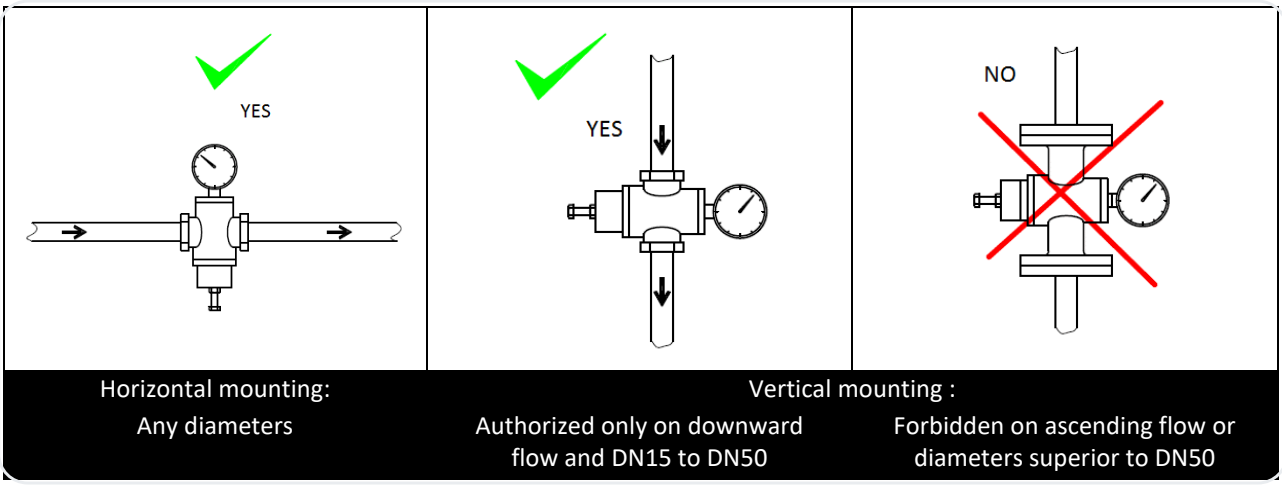
TABLE OF FLOWRATE FOR COMPRESSED AIR

Flowrate (Nm^3/h) for compressed air at 20°C										
P Upstream (bar)			**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Pressure downstream (bar)	**1**	DN 15	52	78	104	130	155	181	207	233	259
		DN 20	84	126	168	210	252	294	336	377	419
		DN 25	136	204	271	339	407	475	543	611	678
		DN 40	274	411	548	685	822	958	1095	1232	1369
		DN 50	358	537	715	894	1073	1252	1431	1610	1789
	2	DN 15		78	104	118	136	152	166	180	192
		DN 20		126	168	190	220	246	269	291	311
		DN 25		204	271	308	356	398	436	471	503
		DN 40		411	548	622	718	803	879	950	1015
		DN 50		537	715	812	938	1049	1149	1241	1327
	3	DN 15			104	130	155	166	186	204	220
		DN 20			168	210	252	269	301	330	356
		DN 25			271	339	407	436	487	534	576
		DN 40			548	685	822	879	983	1077	1163
		DN 50			715	894	1073	1149	1284	1407	1520
	4	DN 15				130	155	181	207	215	235
		DN 20				210	252	294	336	348	381
		DN 25				339	407	475	543	563	616
		DN 40				685	822	958	1095	1135	1244
		DN 50				894	1073	1252	1431	1483	1625
	5	DN 15					155	181	207	233	259
		DN 20					252	294	336	377	419
		DN 25					407	475	543	611	678
		DN 40					822	958	1095	1232	1369
		DN 50					1073	1252	1431	1610	1789
	6	DN 15						181	207	233	259
		DN 20						294	336	377	419
		DN 25						475	543	611	678
		DN 40						958	1095	1232	1369
		DN 50						1252	1431	1610	1789

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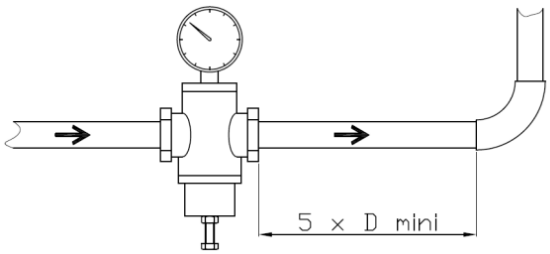
INSTALLATION

Position of mounting : The usual position of mounting of the LPRV 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.



Convergent and divergent : If the diameter of the LPRV 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 LPRV 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 LPRV, 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.



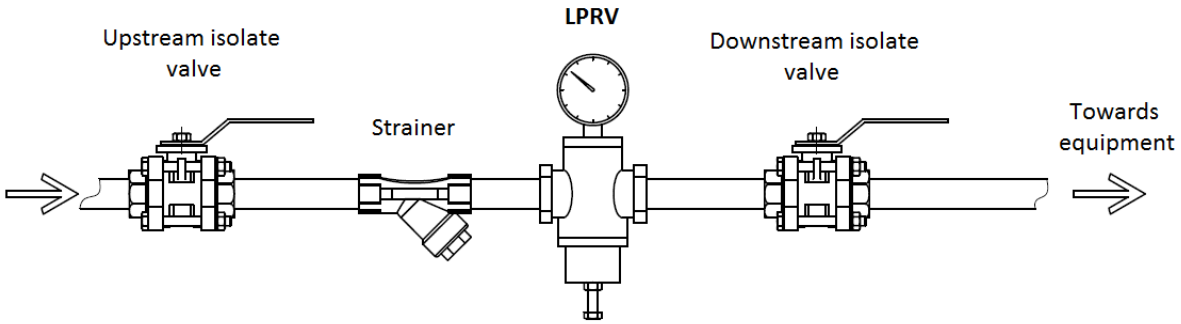
Upstream isolation : Plan a stop valve upstream to the LPRV. This one is not necessarily tight in zero flowrate and cannot be considered as an isolation valve.

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

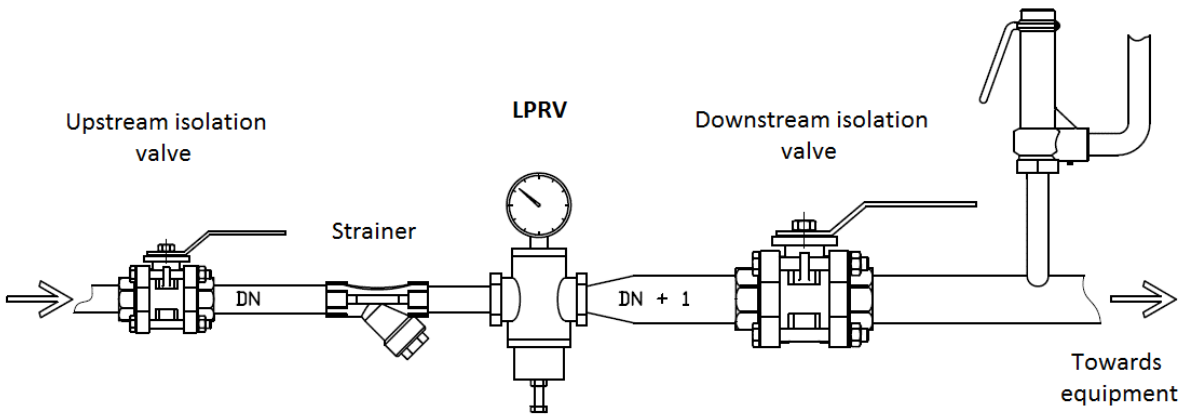
Safety valve : For the pressure reduction of on a gas : the low pressure reducer LPRV not being necessarily tight in zero flowrate, the upstream pressures and downstream could balance each other. Plan a safety valve to protect downstream equipments to the LPRV.

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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 an other 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 LPRV 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) 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). 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), (5) and (8). Replace them if needed. Verify also the state of the spring item (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 (13).

SPARE PARTS

DN	Kit of sealing FPM
Item	3, 5, 8
15	981800
20	981801
25	981802
40	981803
50	981804

Spare pressure gauge item 1
0,2 - 1,5 bar
F1616002

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