



## BACK PRESSURE REGULATOR LPS® I

in-line design  
DN 25

### Application

The self contained low pressure reducing regulators and back pressure regulators controls pressure in mbar range. Applications are for inert gas tank blanketing, reactors, centrifuges and agitating tubs with inert gas such as nitrogen. The regulators are designed to meet requirements in the chemical, pharmaceutical and biotechnology industries and are particularly corrosion resistant and reliable.

### Design

The large proportioned, spring-loaded diaphragm actuator with directly-controlled valve seat ensures precise control with low hysteresis. The regulators function without auxiliary power supply. High overpressure strength and safe regulator function is achieved by means of the supported diaphragm with long spindle guide. The regulator has a low degree of clearance volume and is self-emptying.

### Description

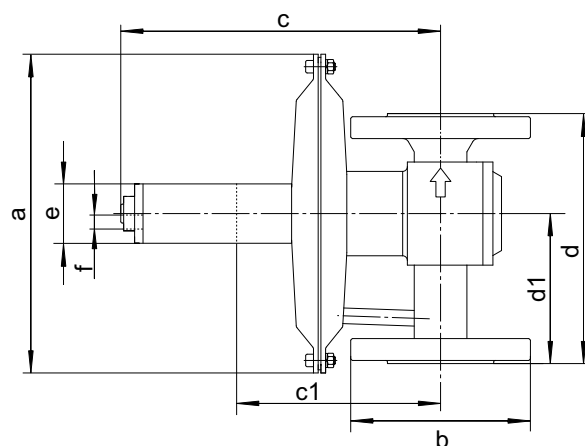
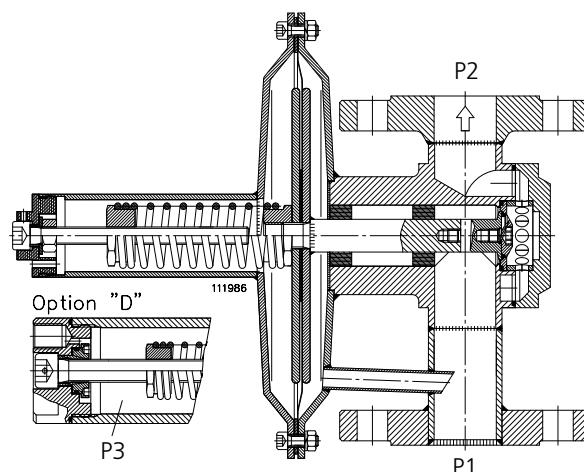
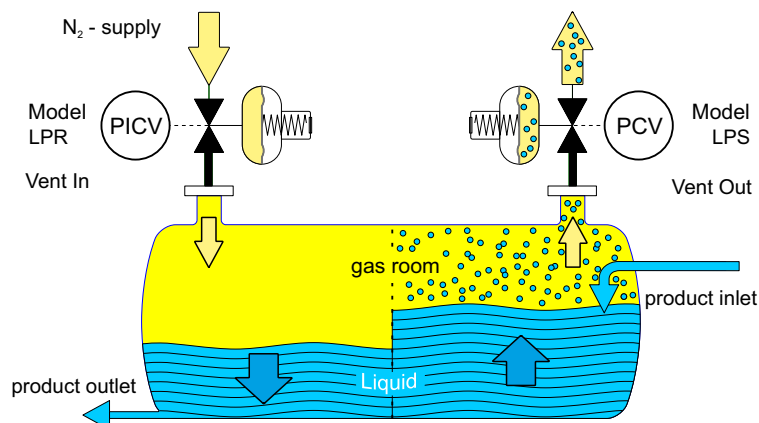
The components coming in contact with the product are manufactured from CrNiMo steel 1.4435 / 1.4404. The diaphragm and seals are made of PTFE and the regulator seat is made of perfluoroelastomer (FFKM – Isolast®, Chemraz®, Kalrez®) as standard, or fluoroelastomer (FKM: Viton®). These materials guarantee high corrosion resistance and excellent sealing, even at zero flow. The design has a low degree of clearance volume and is self-draining (suitable for CIP). On request, we can supply regulators in Hastelloy, Tantal or plastic etc. with the appropriate certification.

The surface finish for the stainless-steel version is better than Ra 1.6 for housing parts in contact with the medium, better than Ra 0.8 for internal functional parts and better than Ra 3.2 for the outer housing.

### Technical data

<b>Nominal diameter:</b>	DN 25 / 1 "		
<b>Regulating range P1:</b>	L..	to 500 mbar	
	M..	to 5 bar	
	D (pressure difference)	to 4 bar = <b>P3</b>	
<b>Inlet pressure P1:</b>	max. 5 bar		
<b>Vakuum proof</b>			
<b>Pressure connections:</b>	Flange / thread (Special version available on request)		
<b>Weight:</b>	5,3 kg to 7,9 kg		
<b>Temperature:</b> (Dependent on pressure conditions)	-20 ° to +120 °C for EPDM		
	-20 ° to +130 °C for FKM		
	-20 ° to +160 °C for PTFE		
<b>Testing and inspection:</b>	According to IEC 60534-4		
<b>Pressure tightness:</b>	Bubble tight sealing category VI		

Section drawing for Hastelloy model and regulating pressure range "M" available on request.



Model dimensions	pressure connection	a	b	c	d	d1	e	f Option "D"	c1 factory setting P1
LPSI-025.-.-L.-.-.-.	DIN DN25 PN16 ANSI 1" 150 lbs	Ø 204	Ø115 (DIN)	207	160	96	Ø38 (M36)	G 1/4" female thread (dimension "e" is always Ø54 (M48) with Option "D")	149
LPSI-025.-.-M.-.-.-.	BSP 1" female thread NPTF 1" female thread	Ø 115	Ø108 (ANSI)	230			Ø54 (M48)		---



## MODEL CODE LPS® I

in-line design  
DN 25

1				2			3		4			5		6		7	
Design				Nominal diameter DN/ pressure connection			Flow capacity		Regulating pressure range			Material		Options		Specials	
LP	S	I	-	025			..		...			...		.		Xn	

### 2 Nominal diameter DN/ Pressure connection

D	Flange:	DIN EN 1092-1, B1 DN 25 PN 16
A	Flange:	ANSI B 16.5, 1" 150 lbs
B	Thread:	1" BSP female thread
N	Thread:	1" NPTF female thread

### 3 Flow capacity

20	Seat	ø20 mm	kv = 5,6
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### 4 Regulating pressure range P1 (mbar)

L01	2 - 10	L50	80 - 500
L02	4 - 20	M01	200 - 1000
L05	8 - 50	M03	500 - 3000
L10	16 - 100	M05	800 - 5000
L20	30 - 200		

### 5 Material (only the same colours can be combined)

Housing/ internal components		Seat seal		Diaphragm/ Regulating range	
S	1.4435 (1.4404)/ 1.4435 (1.4404)	K	FFKM	P	PTFE / L..
G	1.4435 (1.4404)/ HC 22 (2.4602)	V	FKM	E	EPDM / L.. M..
H	HC 22 (2.4602)/ HC 22 (2.4602)	E	EPDM	G	PTFE-glass fibre reinforced / L..
		C	FFKM con- forms to FDA	V	FKM / M..
				H <sup>1</sup>	HC 276 / M..

<sup>1</sup> Cannot be combined with seat seal "V" or "E".

**Example:** Housing/internal components with material code "G" or "H" (red) are only combined with seat of type "K" or "C" and with diaphragm type "P" or "G".

Housing/internal components with material code "S" can be combined with all seat and diaphragm materials (yellow). Notice footnote <sup>1</sup>.

### 6 Optionen

D	Differential pressure connection
E*	External impulse connection (standard 5/8"-20 UNS)

\*The welded nipple is provided for connecting a pipe with ø 10. Included are a Swagelok nut and a front and rear clamping ring. (Specials on request).

### 7 Specials

X0	If you require, for example, ATEX, PED, special connections, external control, rain hood, a fixed setting for P2 ..., please enter an X in this field with the number of desired Specials. Each of the specials must be described in writing.
X1	
X2	
Xn	
	For special versions and certifications, please contact the manufacturer or the appropriate sales representative.

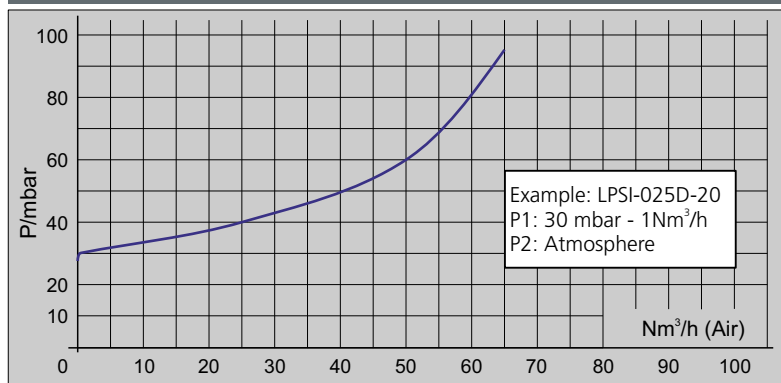
### Flow table for seat 20 [flow quantities in Nm³/h]

P1 [mbar rel.]	2	5	10	16	25	40	50	80	100	160	250	400
Atm.	8	12	18	22	28	35	39	50	55	70	88	110
-2	11	15	19	23	29	36	40	50	55	70	88	110
-5	15	17	21	25	30	37	41	51	56	71	88	110
-10	19	21	25	28	32	39	43	52	58	72	89	111

It is recommended to design for operation at a maximum of 70% of the flow values.  
If the diaphragm is designed in M / HC, the flow is reduced by 50 %.

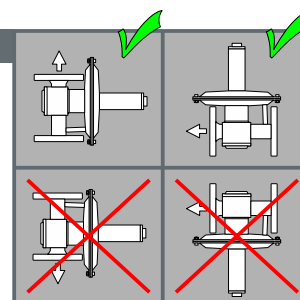
P1 = regulating pressure

### Pressure / flow characteristic



### Installation

The preferred installation position is with vertical diaphragm housing and horizontal input. Pressure fixed unit is adjusted in this position. The output pressure increases by approximately 4 mbar for installation with horizontal diaphragm housing. The installation position must be specified.



### Mounting and start up

- Before connecting the pressure regulator please make sure
  - to compare the plant data with the name plate.
  - The values marked on the name plate are the values measured during our functional inspection.
  - to check the corrosion resistance of the material.
  - to blow out impurities in the pipes.
  - to note the flow direction – it is marked with an arrow on the housing.
  - to open inlet pipes slowly.
- LPSI adjust reduced pressure: (Relative pressure)
  - Set a light flow (1Nm³/h). Set the pressure +/- as required using a hexagonal wrench.
  - The setting can be secured with a seal.
- adjust the LPSI differential pressure (-D) with the servo-regulator.
  - If the D-connection is pressurised with the servo-pressure, the working pressure is added by the servo-pressure.



## BACK PRESSURE REGULATOR LPS® I

in-line design  
DN 50

### Application

The self contained low pressure reducing regulators and back pressure regulators controls pressure in mbar range. Applications are for inert gas tank blanketing, reactors, centrifuges and agitating tubs with inert gas such as nitrogen. The regulators are designed to meet requirements in the chemical, pharmaceutical and biotechnology industries and are particularly corrosion resistant and reliable.

### Design

The large proportioned, spring-loaded diaphragm actuator with directly-controlled valve seat ensures precise control with low hysteresis. The regulators function without auxiliary power supply. High overpressure strength and safe regulator function is achieved by means of the supported diaphragm with long spindle guide. The regulator has a low degree of clearance volume and is self-draining.

### Description

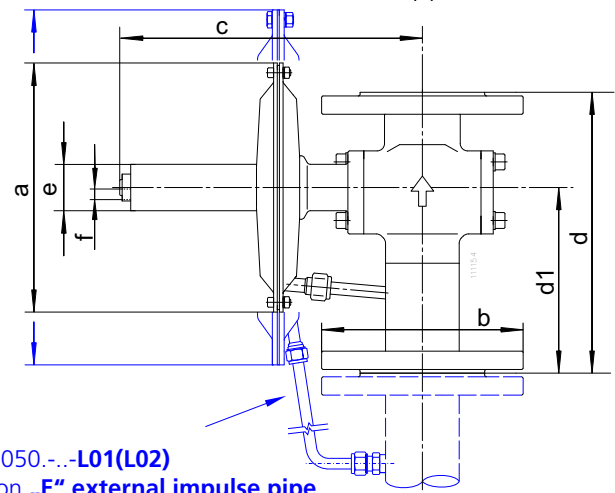
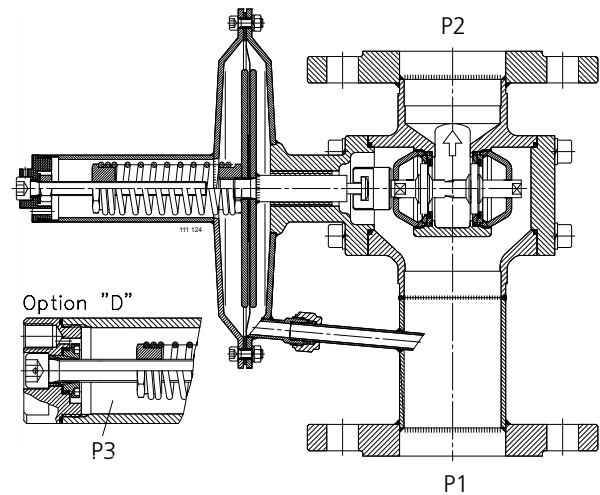
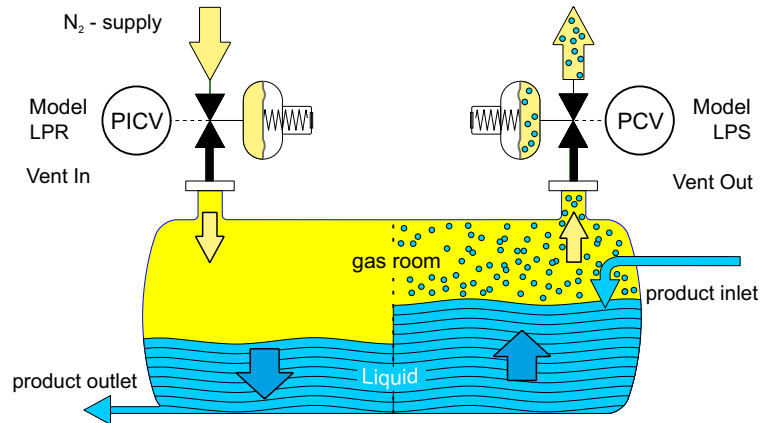
The components coming in contact with the product are manufactured from CrNiMo steel 1.4435 / 1.4404. The diaphragm and seals are made of PTFE and the regulator seat is made of perfluoroelastomer (FFKM – Isolast®, Chemraz®, Kalrez®) as standard, or fluoroelastomer (FKM: Viton®). These materials guarantee high corrosion resistance and excellent sealing, even at zero flow. The design has a low degree of clearance volume and is self-draining (suitable for CIP). On request, we can supply regulators in Hastelloy, Tantal or plastic etc. with the appropriate certification.

The surface finish for the stainless-steel version is better than Ra 1.6 for housing parts in contact with the medium, better than Ra 0.8 for internal functional parts and better than Ra 3.2 for the outer housing.

### Technical data

<b>Nominal diameter:</b>	DN 50 / 2"	
<b>Regulating range P1:</b>	L..	to 500 mbar
	M..	to 5 bar
	D (pressure difference)	to 4 bar = <b>P3</b>
<b>Inlet pressure P1:</b>	max. 10 bar	
<b>Vakuum proof</b>		
<b>Pressure connections:</b>	Flange (Special version available on request)	
<b>Weight:</b>	11,3 kg to 12,2 kg	
<b>Temperature:</b> (Dependent on pressure conditions)	-20 ° to +120 °C for EPDM	
	-20 ° to +130 °C for FKM	
	-20 ° to +160 °C for PTFE	
<b>Testing and inspection:</b>	According to IEC 60534-4	
<b>Pressure tightness:</b>	Sealing category V	

Section drawing for Hastelloy model and regulating pressure range "M" available on request.



LPSI-050-...-L01(L02)  
Option „E“ external impulse pipe

Model dimensions	pressure connection	a	b	c	d	d1	e	e	f Option "D"
LPSI-050-...-L01(L02)	DIN DN50 PN16 ANSI 2" 150#	Ø360	Ø165 (DIN) Ø152 (ANSI)	272	230 (DIN)  254 (ANSI)	154 (DIN)  175 (ANSI)	Ø54 (M48)	always Ø54 (M48) with Option "D"	G 1/4" female thread
LPSI-050-...-L...-...		Ø204		249			Ø38 (M36)		
LPSI-050-...-M01-...				267			Ø54 (M48)		



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DN 50

1				2			3		4			5		6		7	
Design				Nominal diameter DN/ pressure connection			Flow capacity		Regulating pressure range			Material		Options		Specials	
LP	S	I	-	050	.	-	..	-	...	-	-	...	-	.	-	Xn	

### 2 Nominal diameter DN/ Pressure connection

D	Flange:	EN 1092-1, B1 DN 50 PN 10-40
A	Flange:	ANSI B 16.5, 2" 150 lbs

### 3 Flow capacity

26	Seat	ø26 mm	kv = 15
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### 4 Regulating pressure range P1 (mbar)

With diaphragm M360		With diaphragm M200	
L01	2 - 10	L05	8 - 50
L02	4 - 20	L10	16 - 100
		L20	30 - 200
		L50	80 - 500
		M01	200 - 1000

### 5 Material (only the same colours can be combined)

Housing/ internal components	Seat seal	Diaphragm/ Regulating range
S 1.4408/ 1.4435 (1.4404)	K FFKM	P PTFE/ L..
G 1.4408/ HC 22 (2.4602)	V FKM	E EPDM/ L.. M..
H HC 22 (2.4602)/ HC 22 (2.4602)	E EPDM	G PTFE-glass fibre reinforced / L..
	C FFKM con- forms to FDA	V FKM/ L.. M..

**Example:** Housing/internal components with material code "G" or "H" (red) are only combined with seat of type "K" or "C" and with diaphragm type "P" or "G".

Housing/internal components with material code "S" can be combined with all seat and diaphragm materials (yellow).

### 6 Options

D	Differential pressure connection
E*	External impulse connection (standard 5/8"-20 UNS)

\*The welded nipple is provided for connecting a pipe with ø 10. Included are a Swagelok nut and a front and rear clamping ring. (Specials on request).

### 7 Specials

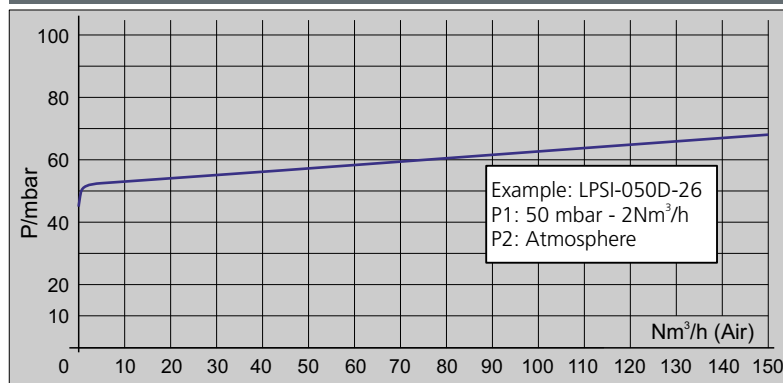
X0	If you require, for example, ATEX, PED, special connections, external control, rain hood ..., please enter an X in this field with the number of desired Specials. Each of the specials must be described in writing.
X1	
X2	
Xn	
Xn	For special versions and certifications, please contact the manufacturer or the appropriate sales representative.

### Flow table for seat 26 [flow quantities in Nm³/h]

P1 [mbar rel.]	2	5	10	16	25	40	50	80	100	160	250	400
Atm.	18	28	40	51	64	81	90	114	128	161	202	255
-2	25	34	44	55	66	83	92	115	129	162	202	255
-5	34	40	49	58	70	85	94	117	130	163	203	255
-10	44	49	57	65	75	90	98	120	133	165	204	256

It is recommended to design for operation at a maximum of 70% of the flow values.  
P1 = regulating pressure

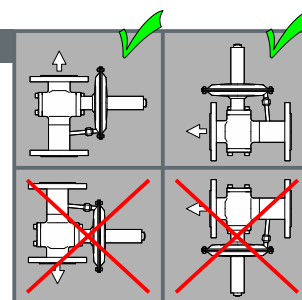
### Pressure / flow characteristic



### Installation

The preferred installation position is with vertical diaphragm housing and horizontal input. Pressure fixed unit is adjusted in this position. The output pressure increases by approximately 4mbar (M200) respectively circa 15 mbar (M360) for installation with horizontal diaphragm housing.

The installation position must be specified.



### Mounting and start up

- Before connecting the pressure regulator please make sure
  - to compare the plant data with the name plate
  - the values marked on the name plate are the values measured during our functional inspection
  - to check the corrosion resistance of the material
  - to blow out impurities in the pipes
  - to note the flow direction – it is marked with an arrow on the housing
  - to open inlet pipes slowly.
- LPSI adjust reduced pressure: (Relative pressure)
  - set a light flow (2 Nm³/h). Set the pressure +/- as required using a hexagonal wrench
  - the setting can be secured with a seal.
- Adjust the LPSI differential pressure (-D) with the servo-regulator
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