



## LOW PRESSURE REDUCER LPR<sup>®</sup>T angle 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. Vacuum Regulators can be realised also. 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.

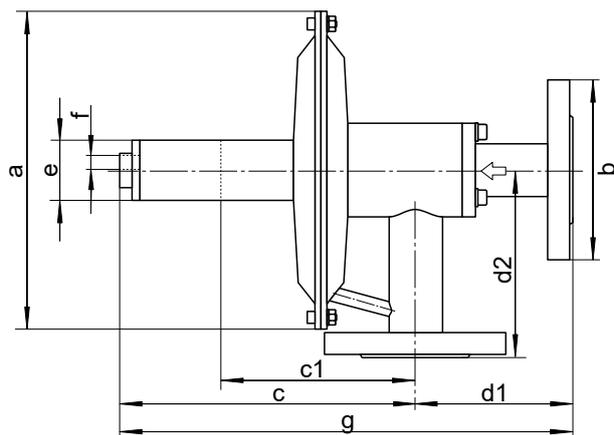
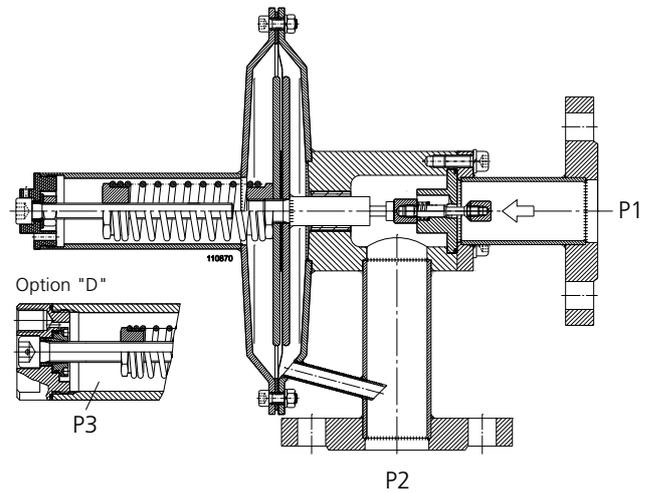
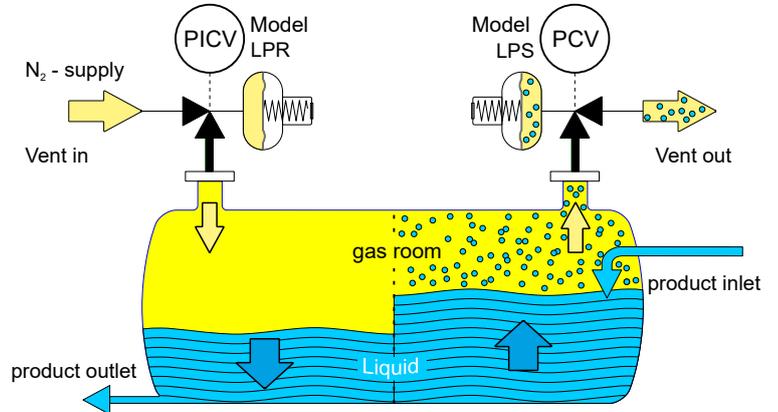
### Description

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 25 / 1"
<b>Regulating range P2:</b>	L.. to 500 mbar M.. to 1 bar D (pressure difference) to 4 bar = P3
<b>Inlet pressure P1:</b>	max. 10 bar
<b>Vakuum proof</b>	
<b>Pressure connections:</b>	Flange / thread (Special version available on request)
<b>Weight:</b>	6,0 kg to 8,3 kg
<b>Temperature:</b>	-20 ° to +120 °C for EPDM (Dependent on pressure conditions) -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	g	d1 x d2	e	f Option "D"	c1 factory setting P2
LPRT-025-...-L-...-...	DIN DN25 PN16 ANSI 1" 150 lbs	Ø 204	Ø115 (DIN)	190	290	Standard 100 x 120	Ø38 (M36)	G 1/4" female thread (dimen- sion "e" is always Ø54 (M48) with Option "D"	132
LPRT-025-...-M-...-...	BSP 1" female thread NPTF 1" female thread		Ø108 (ANSI)	208	308	If desired 100 x 100	Ø54 (M48)		---



angle design  
DN 25

## MODEL CODE LPR<sup>®</sup>T

1			2			3			4			5			6			7		
Design			Nominal diameter DN/ pressure connection			Flow capacity			Regulating pressure range			Material			Options			Specials		
LP	R	T	-	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

07	Seat	ø7 mm	kv = 0.70
12	Seat	ø12 mm	kv = 2.60
16	Seat	ø16 mm	kv = 5.20

### 4 Regulating pressure range P2 (mbar)

L01	2..10	N01	-10..+10	M01	200..1000
L02	4..20	N02	-20..-4		
L05	8..50	N05	-80..-10		
L10	16..100	N20	-200..-30		
L20	30..200	N50	-500..-80		
L50	80..500	N80	-850..-90, on request		
L00	Dome, max. 4,0 bar				

### 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	A FKM-PA PTFE productside
	C FFKM FDA- konform	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 "A".

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)
G	Pressure gauge connection G <sup>1</sup> / <sub>4</sub>

\*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 [flow quantities in Nm<sup>3</sup>/h]

P1 [bar rel.]	0.15	0.25	0.40	0.65	1.0	1.5	2	4	6	10	Seat size
10	10	14	18	22	26	34	42	72	100	-	ø7 mm
	23	31	42	54	65	85	100	168	232	-	ø12 mm
	53	70	85	115	145	180	220	370	-	-	ø16 mm
100	10	14	18	22	26	34	42	72	100	-	ø7 mm
	23	31	42	54	65	85	100	168	232	-	ø12 mm
	53	70	85	115	145	180	220	370	-	-	ø16 mm
200	10	14	18	22	26	34	42	72	-	-	ø7 mm

The flow capacity is the same in the supercritical operating range (guide value: P2 < 0.5 x P1).

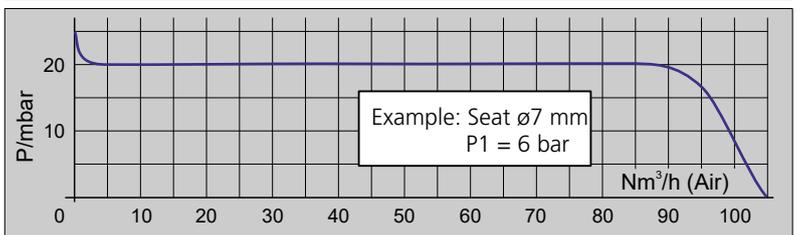
It is recommended to design for operation at a maximum of 70% of the flow values.

P1 = supply pressure P2 = regulating pressure

### Dependency on inlet pressure (per -1 bar / +1 bar change in P1)

Seat ø7 mm	- 3 mbar / + 3 mbar	Seat ø12 mm	- 8 mbar / + 8 mbar
Seat ø16 mm	- 13 mbar / + 13 mbar		

### Pressure / flow characteristic

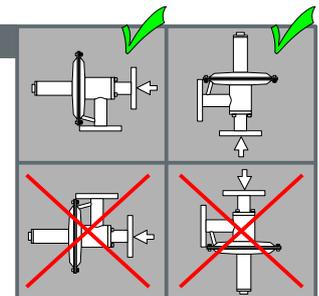


### Installation

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
- LPRT adjust reduced pressure: (Relative pressure)
- 1.1 to compare the plant data with the name plate.
- 1.2 the values marked on the name plate are the values measured during our functional inspection
- 1.3 to check the corrosion resistance of the material
- 1.4 to blow out impurities in the pipes
- 1.5 to note the flow direction – it is marked with an arrow on the housing.
- 1.6 to open inlet pipes slowly.
- 2.1 set a light flow (1Nm<sup>3</sup>/h). Set the pressure +/- as required using a hexagonal wrench.
- 2.2 the setting can be secured with a seal.
- 3 Adjust the LPRT differential pressure (-D) with the servo-regulator
- 3.1 if the D-connection is pressurised with the servo-pressure, the working pressure is displaced by the servo-pressure.



in-line design  
DN 50

## back pressure regulator LPS®

### 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.

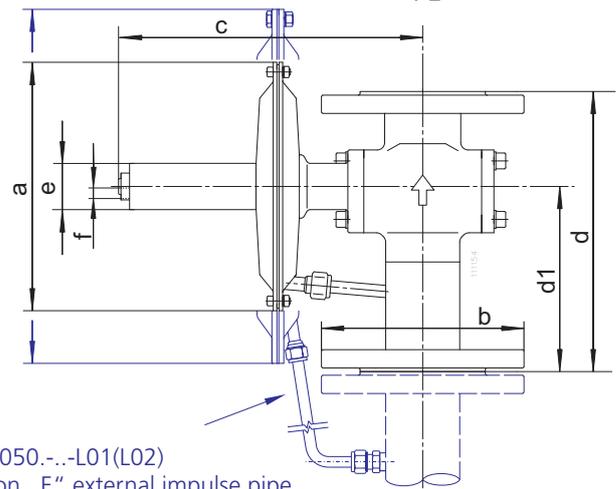
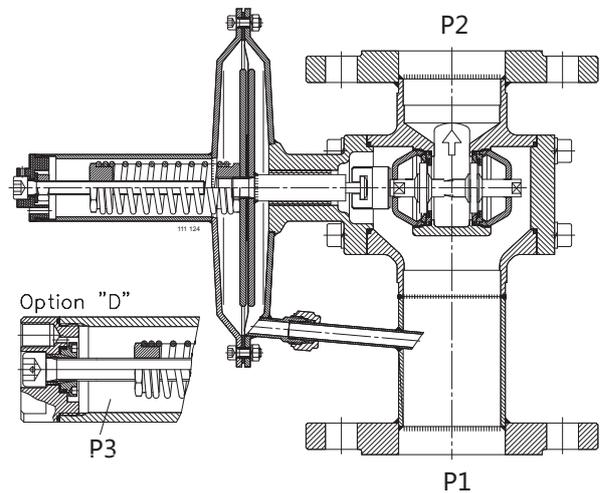
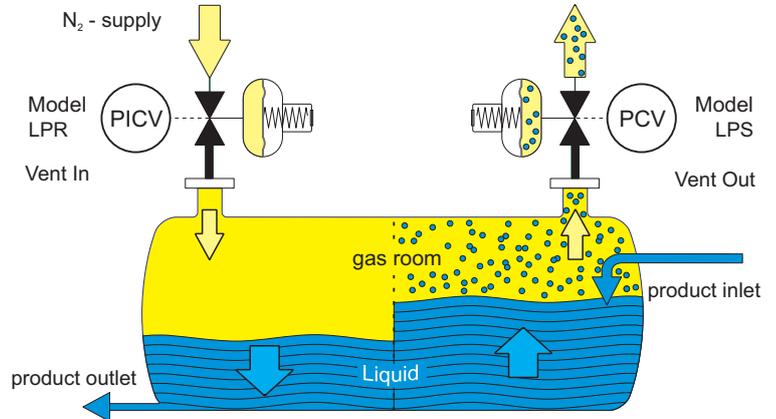
### Design

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 0.8 for internal functional parts and better than Ra 3.2 for the outer housing in contact with the medium. Surfaces of casted parts are without treatment.



LPRI-050.-...-L01(L02)  
Option „E” external impulse pipe

### 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 = P3
<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>	-20 ° to +120 °C for EPDM	
(Dependent on pressure conditions)	-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.

Model dimensions	pressure connection	a	b	c	d	d1	e	e	f
LPRI-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
LPRI-050.-...-L...-...-		Ø204		249			Ø38 (M36)		
LPRI-050.-...-M01-...-				267			Ø54 (M48)		





in-line design  
DN 50

## MODEL CODE LPS®I

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

### 2 Nominal diameter DN/ Pressure connection

- 040D** Flange: DIN EN 1092-1, B1 DN 40 PN 10-40
- 040A** Flange: ANSI B 16.5, 1 1/2" 150 lbs
- 050D** Flange: DIN EN 1092-1, B1 DN 50 PN 10-40
- 050A** Flange: ANSI B 16.5, 2" 150 lbs

### 3 Flow capacity

**26** Seat      ø26 mm      kv = 24

### 4 Regulating pressure range P1 (mbar)

Diaphragm M360		Diaphragm M200		Diaphragm M138	
L01	2..10	L05	8..50	N05	-50..-8
L02	4..20	L10	16..100	N20	-200..-30
N02	-20..-4	L20	30..200	N50	-500..-80
		L50	80 - 500	N80	-800..-90
		M01	200-1000		
		L00	Dome, max. 4,0bar		

M360 bei Setting <math>\leq 20\text{mbar}</math>

### 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	A FKM-PA PTFE productside
	C FFKM FDA-konform	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 "A". 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

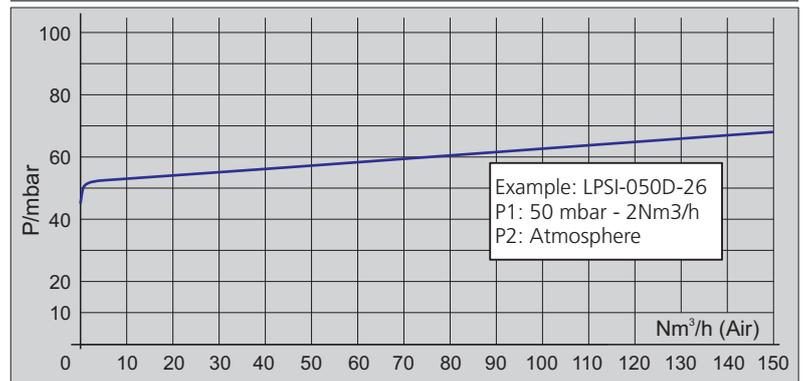
- X0** If you require, for example, ATEX, PED, special connections, external control, rain hood ..., please enter an X in this field with the number of desired Specials. Each of the specials must be described in writing.
- Xn** For special versions and certifications, please contact the manufacturer 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.	28	44	64	81	102	129	144	182	205	258	323	408
-2	40	54	70	88	105	133	147	184	206	259	322	408
-5	54	64	78	93	112	136	150	187	208	261	324	408
-10	70	78	91	104	120	144	157	192	212	264	326	410

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

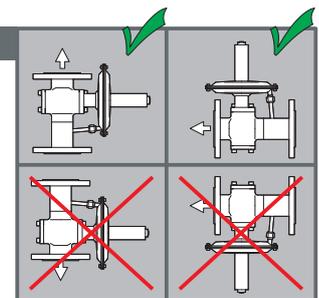
### Pressure / flow characteristic



### 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 15mbar (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
  - 1.1 to compare the plant data with the name plate
  - 1.2 the values marked on the name plate are the values measured during our functional inspection
  - 1.3 to check the corrosion resistance of the material
  - 1.4 to flow out impurities in the pipes
  - 1.5 to note the flow direction – it is marked with an arrow on the housing
  - 1.6 to open inlet pipes slowly.
- LPSI adjust reduced pressure: (Relative pressure)
  - 2.1 set a light flow (2 Nm³ /h). Set the pressure +/- as required using a hexagonal wrench
  - 2.2 the setting can be secured with a seal.
- Adjust the LPSI differential pressure (-D) with the servo-regulator
  - 3.1 if the D-connection is pressurised with the servo-pressure, the working pressure is added by the servo-pressure.