



## MODEL KPRL LOW PRESSURE REGULATOR

The model KPRL is a direct-acting pressure reducing regulator for use with natural gas, air, and a variety of other gases. The regulator outlet pressure is controlled by a diaphragm and an adjustable spring. As the downstream demand for flow changes, the downstream pressure changes. These pressure changes are registered by the diaphragm and will open or close the valve as needed to maintain the downstream pressure and flow requirements. There are five orifice sizes and five springs available to cover a wide range of application conditions. With the correct orifice and spring combination, the Kenco model KPRL Low Pressure Regulator will maintain a constant pressure downstream while meeting downstream flow requirements.

### FEATURES

- 1" or 2" NPT, 1" or 2" 150 / 300 / 600 lb. raised face flanged process connections.
- 3/4" NPT vent connection with removable screened plug.
- Five different orifice sizes to accommodate a wide range of flow requirements.
- Orifice, seal holder, and valve stem all come standard in 316 Stainless Steel.
- Wear items can be replaced without removing the body from the piping setup.
- Carbon steel body rated for 2000 psi of inlet pressure.
- Diaphragm housing and spring housing constructed of sturdy die cast aluminum.
- Diaphragm housing and spring housing can be rotated in multiple orientations.
- Protective cap with UV inhibitor allows for tamper resistant pressure settings.
- 10 to 95 psi utility spring available.
- Wetted pressure retaining components on NPT models comply with NACE MR0175.



### APPLICATIONS

- Fuel Gas Scrubbers/Filters
- Separators
- Dehydration Systems
- Gas Gathering
- Farm Taps
- Flare and Burner Systems

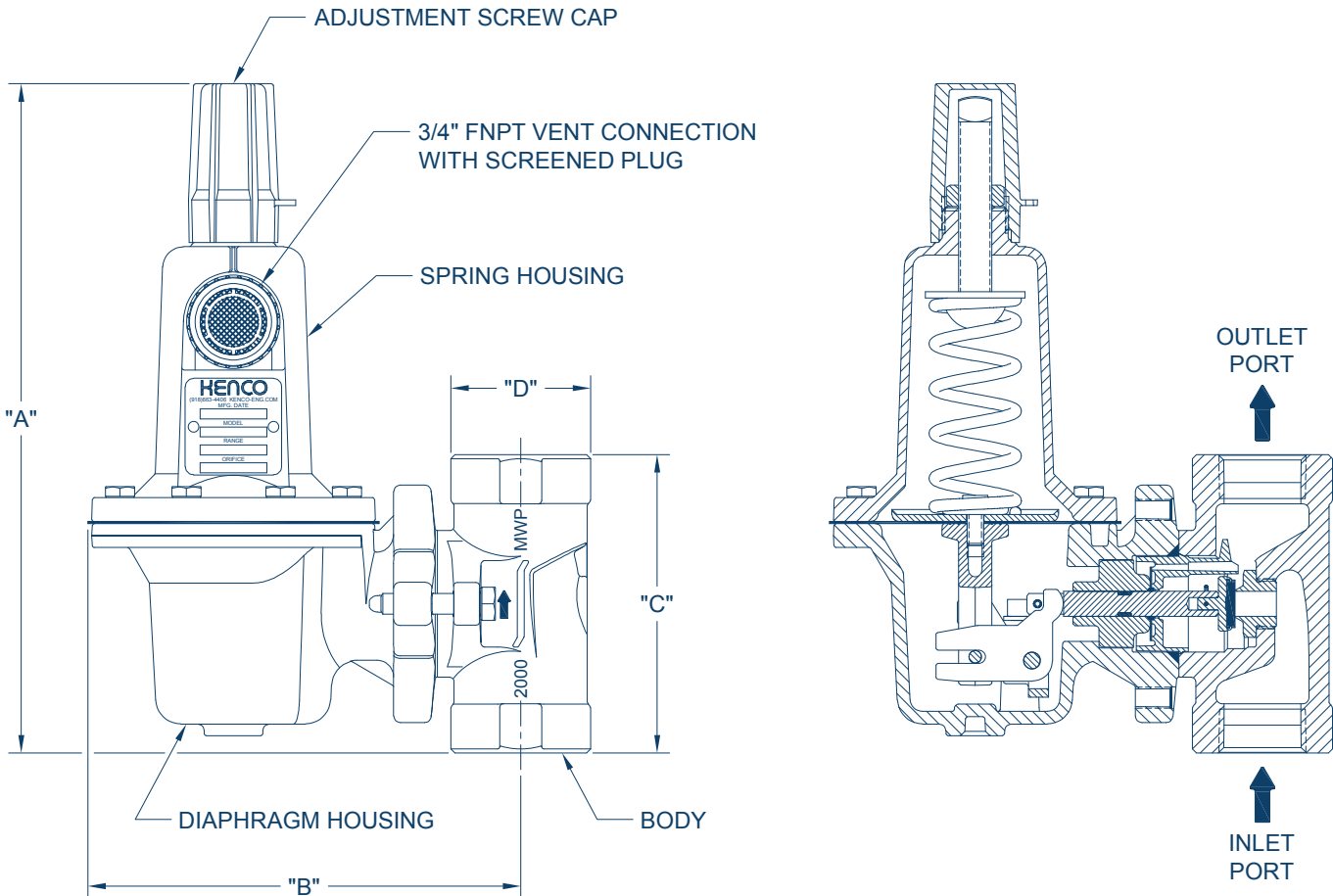
OPERATING PARAMETERS	
Maximum Inlet Pressure	Based on Spring Selection & Orifice Size / Seal Material
Body Pressure Rating	2000 psi
150 Lb. Flange Rating	285 psi at 100° F
300 Lb. Flange Rating	740 psi at 100° F
600 Lb. Flange Rating	1480 psi at 100° F
Maximum Outlet Pressure	Based on Spring Selection
Maximum Diaphragm Housing Overpressure to Prevent Damage to Internal Components	60 psi Above Set Point
Maximum Diaphragm Housing Pressure to Prevent Leakage to the Atmosphere	250 psi
Maximum Diaphragm Housing Pressure to Prevent Burst	375 psi
Operating Temperature Ranges	-20° F to 180° F (0° F to 180° F if FKM is present)

PRODUCT SPECIFICATIONS		
Process Connection Sizes and Types	1" or 2" NPT, 1" or 2" 150 / 300 / 600 Lb. R.F. Flanges	
*Outlet Pressure Ranges and Spring Color	5-20 psi	Yellow
	15-40 psi	Green
	35-80 psi	Blue
	10-95 psi	Black
	70-150 psi	Red
Orifice Sizes	1/8", 3/16", 1/4", 3/8" or 1/2"	

MATERIALS OF CONSTRUCTION	
Orifice Seal	Nitrile, Nylon or FKM
Diaphragm and O-Rings	Nitrile or FKM
Body	ASTM A216 WCC Carbon Steel
Flanges	ASTM A105 Carbon Steel
Diaphragm and Spring Housing	A380 Die Cast Aluminum
Orifice and Seal Holder	316 Stainless Steel

\* Outlet pressure is factory set at the lower end of the specified outlet range.  
 Since inlet pressures are application specific, the startup outlet pressure may differ from the factory setting.

DIMENSIONAL INFORMATION								
Process Connection Sizes and Types	1" NPT	1" 150 Lb. R.F. Flange	1" 300 Lb. R.F. Flange	1" 600 Lb. R.F. Flange	2" NPT	2" 150 Lb. R.F. Flange	2" 300 Lb. R.F. Flange	2" 600 Lb. R.F. Flange
A	10-1/16"	12-3/8"	12-3/8"	12-3/8"	10-11/32"	13-1/2"	13-1/2"	13-1/2"
B	6-1/2"	6-1/2"	6-1/2"	6-1/2"	6-31/32"	6-31/32"	6-31/32"	6-31/32"
C	4-15/32"	9-1/8"	9-1/8"	9-1/8"	5-1/16"	11-3/8"	11-3/8"	11-3/8"
D	2-1/8"	4-1/4"	4-7/8"	4-7/8"	3-1/4"	6"	6-1/2"	6-1/2"



**Note:**  
 Diaphragm Housing and Spring Housing can be rotated as required for your application.  
 Refer to Installation Instructions on Kenco website for reorientation instructions.

MAXIMUM INLET PRESSURES (PSI)									
Outlet Pressure Range (Spring Color)	Orifice Size	Nitrile Orifice Seal	Nylon Orifice Seal	FKM Orifice Seal	Outlet Pressure Range (Spring Color)	Orifice Size	Nitrile Orifice Seal	Nylon Orifice Seal	FKM Orifice Seal
*5-20 psi (Yellow)	1/8"	1000	1000	300	35-80 psi (Blue)	1/8"	1000	2000	300
	3/16"	750	750	300		3/16"	1000	1750	300
	1/4"	500	500	300		1/4"	1000	1500	300
	3/8"	300	300	300		3/8"	1000	1000	300
	1/2"	250	250	250		1/2"	750	750	300
15-40 psi (Green)	1/8"	1000	1500	300	70-150 psi (Red)	1/8"	1000	2000	300
	3/16"	1000	1000	300		3/16"	1000	2000	300
	1/4"	750	750	300		1/4"	1000	1750	300
	3/8"	500	500	300		3/8"	1000	1250	300
	1/2"	300	300	300		1/2"	750	750	300
10-95 psi (Black)	When using the 10-95 psi (Black) spring, select the orifice size that falls within the application parameters described in this table.								

\*For outlet pressure settings under 10 psi, the inlet pressure should not exceed 100 psi.

### ORIFICE SELECTION INSTRUCTIONS:

Select the correct orifice size by comparing the wide open flow capacity at the application conditions to the desired flow rate. Calculate the flow rate ("Q") through each orifice size using the Universal Gas Sizing Equation and Wide Open Flow Coefficients table below. Select the smallest orifice size that will meet the required flow rate needs. After selecting the orifice, make sure the application inlet pressure does not exceed the pressure rating listed in the Maximum Inlet Pressures table above.

### UNIVERSAL GAS SIZING EQUATION:

#### Variables:

- Q = Flow Rate (SCFH)
- T = Gas Temperature @ Regulator Inlet (°Rankine)
- G = Gas Specific Gravity
- P1 = Pressure @ Regulator Inlet (psia)
- ΔP = Pressure Drop Across Regulator (psia)
- Cg = Gas Sizing Coefficient
- Cv = Liquid Sizing Coefficient
- C1 = Flow Coefficient

#### Equation to determine Critical Flow:

$$\text{IF } \left[ \left( \frac{3417}{C1} \right) \sqrt{\frac{\Delta P}{P1}} \right] \geq 90^\circ, \text{ Critical Flow will occur.}$$

#### Flow Rate Equation for Non-Critical Flow Applications:

$$Q = \sqrt{\frac{520}{GT}} Cg P1 \text{ SIN } \left[ \left( \frac{3417}{C1} \right) \sqrt{\frac{\Delta P}{P1}} \right] \text{ DEG}$$

#### Flow Rate Equation for Critical Flow Applications:

$$Q = \sqrt{\frac{520}{GT}} Cg P1$$

WIDE OPEN FLOW COEFFICIENTS				
Variables	Orifice	Cg	Cv	C1
1" NPT and 1" Flanged Models	1/8"	12	0.47	25.5
	3/16"	35	1.07	32.7
	1/4"	55	1.96	28.1
	3/8"	110	3.20	34.4
	1/2"	165	4.97	33.2
2" NPT and 2" Flanged Models	1/8"	11	0.50	22.0
	3/16"	37	1.11	33.3
	1/4"	54	2.06	26.2
	3/8"	113	3.50	32.3
	1/2"	174	5.21	33.4

#### Note:

All flow coefficients were determined using lab tested data.

#### Important:

The KPRL Low Pressure Regulator must always be used with overpressure protection. Use the Universal Gas Sizing Equation to select the appropriate relief valve.

## ORDERING GUIDE

REQUESTED BY: \_\_\_\_\_ COMPANY: \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_ CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_  
 PHONE: \_\_\_\_\_ FAX: \_\_\_\_\_ EMAIL: \_\_\_\_\_

<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"><b>KPRL</b></div> <p><b>Model:</b>                  KPRL = Kenco Low Pressure Regulator</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"></div> <p><b>Process Connections:</b>                  1 = 1" NPT                  2 = 2" NPT                  1FL150 = 1" 150 Lb. R.F. Flanges                  2FL150 = 2" 150 Lb. R.F. Flanges                  1FL300 = 1" 300 Lb. R.F. Flanges                  2FL300 = 2" 300 Lb. R.F. Flanges                  1FL600 = 1" 600 Lb. R.F. Flanges                  2FL600 = 2" 600 Lb. R.F. Flanges</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"></div> <p><b>Outlet Pressure Range (Spring Color):</b>                  20 = 5-20 psi (Yellow)                  40 = 15-40 psi (Green)                  80 = 35-80 psi (Blue)                  95 = 10-95 psi (Black)                  15 = 70-150 psi (Red)</p>
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"></div> <p><b>Orifice Size:</b>                  125 = 1/8"                  188 = 3/16"                  250 = 1/4"                  375 = 3/8"                  500 = 1/2"</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"></div> <p><b>Orifice Seal Material:</b>                  B = Nitrile                  N = Nylon                  V = FKM (Fluorocarbon)</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"></div> <p><b>Diaphragm / O-ring Material:</b>                  B = Nitrile                  V = FKM (Fluorocarbon)</p>

**Example Order Designation:**

KPRL-1-40-188-B-B is a Kenco Low Pressure Regulator with 1" NPT Process Connections, 15-40 psi Outlet Pressure Range, 3/16" Orifice, Nitrile Orifice Seal and Nitrile Diaphragm/O-ring seals.

### SEAL REPAIR KIT PART NUMBERS

Part Number	Contents
<b>KPRL-B-B-RK</b>	Nitrile Orifice Seal, Nitrile Diaphragm and O-rings, and other Associated Hardware
<b>KPRL-N-B-RK</b>	Nylon Orifice Seal, Nitrile Diaphragm and O-rings, and other Associated Hardware
<b>KPRL-V-V-RK</b>	FKM Orifice Seal, FKM Diaphragm and O-rings, and other Associated Hardware
<b>KPRL-N-V-RK</b>	Nylon Orifice Seal, FKM Diaphragm and O-rings, and other Associated Hardware

### ORIFICE / SPRING REPAIR KIT PART NUMBERS

Part Number	Contents
<b>KPRL-ORIFICE-125-RK</b>	1/8" Orifice
<b>KPRL-ORIFICE-188-RK</b>	3/16" Orifice
<b>KPRL-ORIFICE-250-RK</b>	1/4" Orifice
<b>KPRL-ORIFICE-375-RK</b>	3/8" Orifice
<b>KPRL-ORIFICE-500-RK</b>	1/2" Orifice
<b>KPRL-SPRING-20-RK</b>	5-20 psi Spring (Yellow)
<b>KPRL-SPRING-40-RK</b>	15-40 psi Spring (Green)
<b>KPRL-SPRING-80-RK</b>	35-80 psi Spring (Blue)
<b>KPRL-SPRING-95-RK</b>	10-95 psi Spring (Black)
<b>KPRL-SPRING-15-RK</b>	70-150 psi Spring (Red)

**Note:** Refer to Kenco website for complete parts list and installation instructions.

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