

# KUNKLE

**Models 910, 911, 916 and 917 – ASME Section VIII, Air/Gas/Steam/Liquid, “UV” National Board certified. Models 920, 921 and 927 – ASME Section I Special use or application, “V” National Board certified. Also available for vacuum service. PED certified for non-hazardous gas. Not for use with oxidizing fluids.**

## Features

- Available with soft seats.
- Threaded cap standard (back pressure tight). Maximum back pressure 50 psig [3.4 barg].<sup>1</sup>
- Hex on valve nozzle provides for easy installation.
- Warn ring offers easy adjustability.
- Pivoting disc design offers exceptional seat alignment.
- Guide to nozzle ratio reduces friction.
- Valve bodies are heavy duty casting.
- Full nozzle design for optimum flow performance.
- Threaded side outlet for piped off discharge to eliminate fugitive emissions.
- Each Kunkle valve is tested and inspected for pressure setting and leakage.

## Model Descriptions

**Model 910:** Carbon Steel (CS) body and bonnet with Stainless Steel (SS) trim.

**Model 911:** All SS construction.

**Model 916:** Same as model 910 resilient seat/seals. Superior “leak-free” performance.

**Model 917:** Same as model 911 except resilient seat/seals. Superior “leak-free” performance.

**Model 920:** Steel body and bonnet with screwed cap and stainless steel spring for organic fluid vaporizers (ASME Section I - “V” Special Use or application).

**Model 921:** Steel body and bonnet with plain lift lever and stainless steel spring for forced flow steam generators (ASME Section I - “V” Special Use or application).

**Model 927:** Steel body and bonnet with packed lift lever and SS spring for high temperature/pressure hot water boilers (ASME Section I - “V” Special Use or application).



## Applications

- Air/gas compressors, intercoolers, aftercoolers.
- Liquid filled pressure vessels/systems, ASME Section VIII (UV).
- Vacuum systems including pumps, tanks and equipment.
- Pressure vessels - containing gas, air, liquid or steam, including tanks and receivers.
- Oil/gas separators.

- Overpressure relief and protection of pumps, tanks, lines and hydraulic systems.
- Bypass relief or pressure regulation.
- All SS Model 911 may be suitable for sanitary/edible applications.
- Process and industrial corrosive applications.

### Note:

1. Back pressure increases set pressure on a one to one basis, and reduces capacity. Back pressure in excess of 10% of set pressure is not recommended.

### Specifications - Models 910, 911, 916, 917, 920, 921 and 927

#### Options

- Threaded cap. (variation 01)
- Threaded cap with gag. (variation 02)
- Plain lever. (variation 03)
- Plain lever with gag. (variation 04)
- Plain lever with vibration dampener. (variation 05)
- Packed lever. (variation 06)
- Packed lever with gag. (variation 07)
- Models 910 and 911 available with 150#, 300# and 600# inlet flanges and 150# outlet flange per ANSI B16.5.
- Model 911 available with Tri-Clover Adapter Inlet.

Model	Inlet	Orifice	Outlet
911 ZDE	1"	D	1"
911 ZEE	1"	E	1 1/4"
911 ZFG	1 1/2"	F	1 1/2"
911 ZGG	1 1/2"	G	2"
911 ZGH	2"	G	2"
911 ZHH	2"	H	2 1/2"
911 ZJJ	2 1/2"	J	3"

#### Pressure Limits

See Specification Table

#### Temperature Limits

##### Model 910:

-20°/800°F [-28.9°/427°C]

##### Model 911:

-320°/800°F [-195°/427°C]

##### Models 916 and 917:

Temperatures limited by Elastomer seat material.

#### Note

1. ASME standard valves for air, steam and hot water above 140°F [60°C] must have lift lever.

### Specifications - Models 910, 911, 916, 917, 920, 921 and 927

#### Service Recommendations for Resilient Seat/Seal Materials

Seat/Seal Materials	Service Recommendation
BUNA-N (-40° to 275°F) [-40° to 135°C]	Air, Anhydrous Ammonia, Butane, Carbon Dioxide, Diesel Oil, Ethyl Chloride, Ethyl Ether, Freons #11 and 12, Fuel Oil, Gasoline, Helium, Hydrogen Sulphide, Kerosene, Lube Oil, Natural Gas, Nitrogen, Oxygen (Gas), Propane, Propylene, Sulphur Dioxide, Vinyl Chloride
Viton® A (-10° to 406°F) [-23° to 208°C]	Acetone, Air, Amyl Alcohol, Aniline, Benzene, Butane, Carbon Disulphide, Carbon Tetrachloride, Dowtherm "A" and "J," Ethyl Chloride, Ethylene, Ethylene Glycol, Ethyl Alcohol, Gasoline, Hexane, Hydrogen Sulphide, Isobutyl Alcohol, JP - 4 Fuel, JP - 5 Fuel, Kerosene, Lube Oil, Natural Gas, Naphtha, Nitrogen, Propane, Propylene, Propyl Alcohol, Sulphur Dioxide, Toluene, Trichloroethylene, Turpentine, Water, Xylene
Silicone (-100° to 406°F) [-73° to 208°C]	Air, Helium, Nitrogen, Oxygen (Gas)
Ethylene Propylene (-70° to 400°F) [-57° to 205°C]	Steam, Hot Water
Neoprene (-45° to 300°F) [-43° to 149°C]	Air, Anhydrous Ammonia, Butane, Butyl Alcohol, Castor Oil, Denatured Alcohol, Ethanol, Ethyl Alcohol, Freons (12, 13, 14 and 22), Glycols, Natural Gas and Silicate Esters

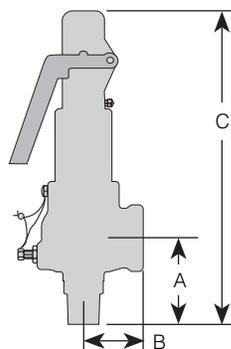
#### Specifications

Model Number <sup>1</sup>	Orifice	Connections		Min/Max Set Pressure <sup>7</sup> psig [barg]	Min/Max Temp. <sup>2</sup> (°F) <sup>2</sup> [°C]	Dimensions, in [mm]					Approx. Weight lb [kg]
		ANSI Standard Inlet	Outlet			A	B	C Threaded Cap	C Plain Lever	C Packed Lever	
9*BDC#	D	1/2" [12.7]	1" [25.4]	3/1400 <sup>4</sup> [0.2/96.5]	-320/800 [-195/427]	2 <sup>3</sup> / <sub>8</sub> [60.3]	1 <sup>5</sup> / <sub>8</sub> [41.3]	7 <sup>1</sup> / <sub>4</sub> [184.2]	8 <sup>3</sup> / <sub>8</sub> [212.7]	9 [228.6]	3 [1.4]
9*BDD#	D	3/4" [19.0]	1" [25.4]	3/1400 <sup>4</sup> [0.2/96.5]	-320/800 [-195/427]	2 <sup>3</sup> / <sub>8</sub> [60.3]	1 <sup>5</sup> / <sub>8</sub> [41.3]	7 <sup>1</sup> / <sub>4</sub> [184.2]	8 <sup>3</sup> / <sub>8</sub> [212.7]	9 [228.6]	3 [1.4]
9*BDE#	D	1" [25.4]	1" [25.4]	3/1400 <sup>4</sup> [0.2/96.5]	-320/800 [-195/427]	2 <sup>5</sup> / <sub>8</sub> [66.7]	1 <sup>5</sup> / <sub>8</sub> [41.3]	7 <sup>1</sup> / <sub>2</sub> [191.0]	8 <sup>5</sup> / <sub>8</sub> [219.0]	9 <sup>1</sup> / <sub>8</sub> [232.0]	3 [1.4]
9*BED#	E	3/4" [19.0]	1 1/4" [31.8]	3/1000 <sup>5</sup> [0.2/68.9]	-320/800 [-195/427]	2 <sup>5</sup> / <sub>8</sub> [66.7]	2 [50.8]	7 <sup>5</sup> / <sub>8</sub> [193.7]	8 <sup>3</sup> / <sub>4</sub> [222.3]	9 <sup>3</sup> / <sub>8</sub> [238.1]	4 [1.8]
9*BFE#	F	1" [25.4]	1 1/2" [38.1]	3/700 <sup>6</sup> [0.2/48.3]	-320/800 [-195/427]	2 <sup>7</sup> / <sub>8</sub> [73.0]	2 <sup>3</sup> / <sub>8</sub> [60.3]	8 <sup>3</sup> / <sub>4</sub> [222.3]	9 <sup>7</sup> / <sub>8</sub> [250.8]	10 <sup>1</sup> / <sub>2</sub> [266.7]	6 [2.7]
9*BGF#	G	1 1/4" [31.8]	2" [50.8]	3/600 [0.2/41.4]	-320/800 [-195/427]	3 <sup>1</sup> / <sub>4</sub> [82.6]	2 <sup>5</sup> / <sub>8</sub> [66.7]	10 <sup>1</sup> / <sub>8</sub> [257.2]	11 <sup>1</sup> / <sub>4</sub> [285.8]	11 <sup>3</sup> / <sub>4</sub> [298.5]	8 [3.6]
9*BHG#	H	1 1/2" [38.1]	2 1/2" [63.5]	3/500 [0.2/34.5]	-320/800 [-195/427]	3 <sup>1</sup> / <sub>2</sub> [88.9]	2 <sup>3</sup> / <sub>4</sub> [69.9]	11 <sup>1</sup> / <sub>8</sub> [282.6]	13 [330.2]	12 <sup>1</sup> / <sub>2</sub> [317.5]	11 [5.0]
9*BJH#	J <sup>3</sup>	2" [50.8]	3" [76.2]	3/500 <sup>8</sup> [0.2/34.5]	-320/800 [-195/427]	4 [101.6]	3 <sup>1</sup> / <sub>4</sub> [82.6]	12 <sup>1</sup> / <sub>2</sub> [317.5]	14 <sup>1</sup> / <sub>2</sub> [368.3]	15 <sup>1</sup> / <sub>8</sub> [384.2]	15 [6.8]

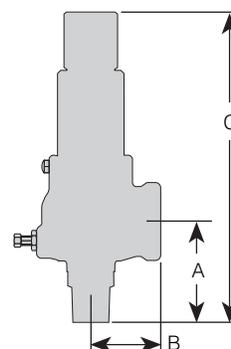
Dimensions are for reference only.

#### Notes

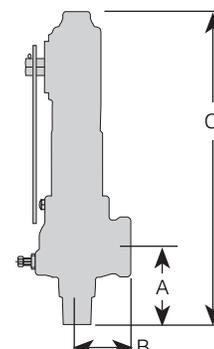
1. Replace asterisk with desired Model Number. Replace # with seat material designation. Data applicable to all models.
2. Temperature limits for Model 910 = -20°/800°F [-28.9°/427°C]; for Model 911 = -320°/800°F [-195°/427°C]. Temperature limits for elastomer seats per above table.
3. For C dimensions: pressures above 200 psig [14 barg] add 1.25" [31.8 mm] to the overall height.
4. 1044 psig [72 barg] for steam service with standard stainless steel spring.
5. 900 psig [62 barg] for liquid service, or with high-temperature alloy steel spring.
6. 600 psig [41.4 barg] for liquid service, or with high-temperature alloy steel spring.
7. Subject to pressure and temperature limits of flanged or tri-clover connections.
8. 367 psig [25.3 barg] for plain lever with gag.



Plain Lever



Threaded Cap

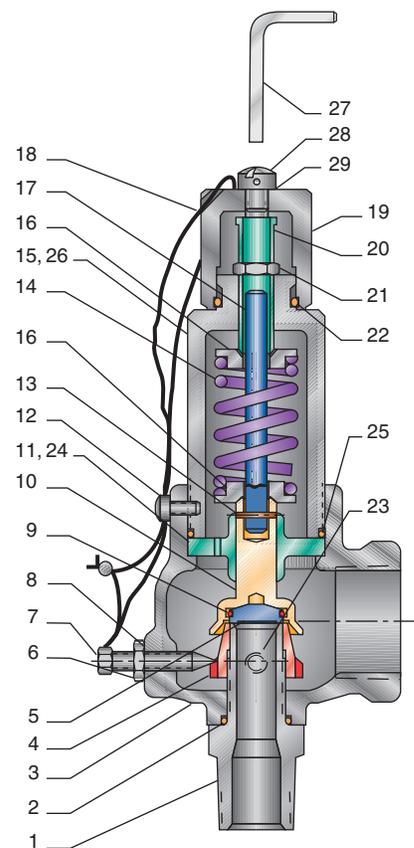


Packed Lever

### Specifications - Models 910, 911, 916, 917, 920, 921 and 927

#### Parts and Materials - Models 910 and 911 Threaded Cap

No.	Part Name	910, 916, 920, 921, 927	911, 917
1	Nozzle	SS, SA351-CF8M <sup>3</sup>	SS, SA351-CF8M <sup>3</sup>
2	Body O-ring <sup>1</sup>	Teflon®	Teflon®
3	Body	Steel, SA216 Gr. WCB	SS, SA351-CF8M
4	Warn Ring	SS, A743-CF8M	SS, A743-CF8M
5	Disc	SS, A479-316	SS, A479-316
6	Set Screw Nut	SS 18-8	SS 18-8
7	Set Screw	SS, Commercial Gr. 18-8	SS, A479-316
8	Set Screw Seal	Teflon®	Teflon®
9	Retainer Ring	SS, A303-316	SS, A313-316
10	Disc Holder	SS, A351-CF8M	SS, A351-CF8M
11	Guide	SS, A743-CF8M	SS, A743-CF8M
12	Screw	SS, Commercial Gr. 18-8	SS, Commercial Gr. 18-8
13	Coiled Spring Pin	SS, A313-302	SS, A313-302
14	Spring	SS: A313-316 or A313-T631 Alloy steel: A681-H12 or B637-X750	
15	Bonnet	Steel, A108 Gr. 1117	SS, SA479-316
16	Spring Step	SS, A479-316	SS, A479-316
17	Stem	SS, A479-316	SS, A479-316
18	Wire and Seal	SS wire and lead seal, Commercial	SS wire and lead seal, Commercial
19	Cap	Steel, A108 Gr. C1018	SS, A479-316
20	Compression Screw	SS, A479-316	SS, A479-316
21	Jam Nut	SS 18-8 or SS A479-316	SS 18-8 or SS A479-316
22	Cap O-ring	BUNA-N	BUNA-N
23	Body Plug	Steel, A108 Gr. C1018	SS, Commercial Gr. 18-8
	Guide <sup>2</sup>	SS, A479-316	SS, A479-316
24	Guide Locknut <sup>2</sup>	SS, A479-316	SS, A479-316
	Shield <sup>2</sup>	SS, A167-316	SS, A167-316
25	Bonnet Gasket <sup>1</sup>	Teflon®	Teflon®
	Bonnet Cap <sup>4</sup>	Steel, A108 Gr. 1117	SS, A479-316
26	Cap O-ring <sup>4</sup>	BUNA-N	BUNA-N
	Bonnet <sup>4</sup>	Steel, A108-1018	SS, A312-316
27 <sup>5</sup>	Gag Screw	Steel A108-1018/Zinc Plated	
28 <sup>6</sup>	Gag Screw Plug	SS 18-8	
29 <sup>6</sup>	Gag Screw Gasket	Teflon®	

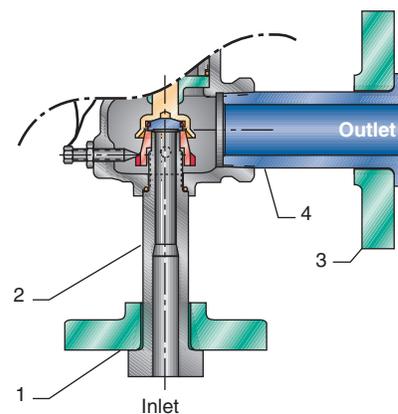


**Threaded Cap Option  
(shown with Gag Option)**

No.	Part Name	Flanged Option	Flanged Option
1	Inlet Flange	CS, A105	SS, A182-F316
2	Inlet Stub End	SS, A479-316	SS, A479-316
3	Outlet Flange	CS, A105	SS, A182-F316
4	Outlet Stub End	SS, A479-316	SS, A479-316

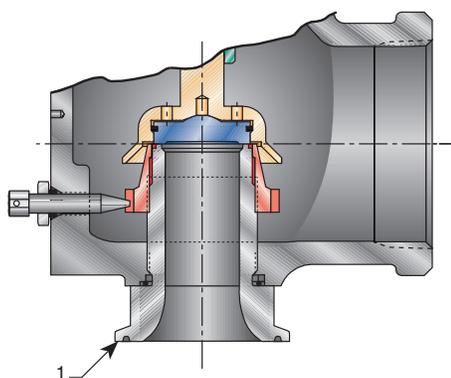
#### Notes

1. For threaded cap and packed lever only.
2. 3-piece design for "J" orifice only.
3. "D" and "E" orifice nozzle material is SS, SA479-316.
4. 3-piece design (not shown) for "H" and "J" orifices only.
5. Gag screw ships with valve, not installed.
6. For threaded cap and packed lever gag options only.

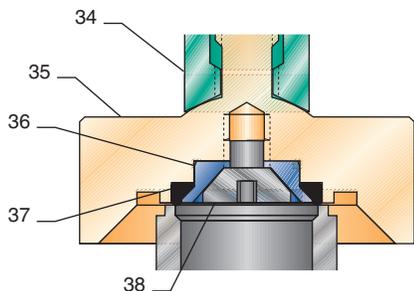


**Flanged Option**

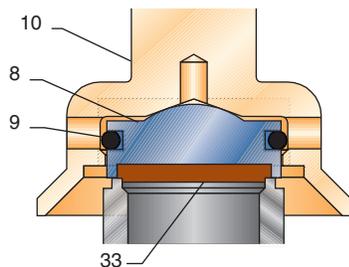
### Specifications - Models 910, 911, 916, 917, 920, 921 and 927



**Tri-Clover (Inlet only)**



**Soft Seat D and E Orifice**



**Soft Seat F to J Orifice**

#### Parts and Materials - Tri-Clover Inlet Option

No.	Part Name	910, 911, 916, 917, 920, 921 and 927
1	Nozzle	SS A479-316

#### Parts and Materials - Models 916 and 917 Soft Seat, D and E Orifice

No.	Part Name	916	917
34	Spindle	SS A479-316	SS A479-316
35	Disc Holder	SS A479-316	SS A479-316
36	Retainer	SS A479-316	SS A479-316
37	O-ring Seat <sup>1</sup>		
38	Seat Retainer Screw	SS 18-8	SS 18-8

#### Parts and Materials - Models 916 and 917 Soft Seat, F to J Orifice

No.	Part Name	916	917
8	Disc	SS A479-316	SS A479-316
9	Ring, Retainer	SS A313-316	SS A313-316
10	Disc Holder	SS A351-CF8M	SS A351-CF8M
33	Molded Seat <sup>1</sup>		

#### Note

1. Material	Letter Designation
BUNA-N	- B
Ethylene Propylene (EPR/EPDM)	- E
Neoprene	- N
Silicone	- S
Viton®	- V

### Specifications - Models 910, 911, 916, 917, 920, 921 and 927

#### Parts and Materials - Models 910, 911, 916, 917 and 927 Packed Lever

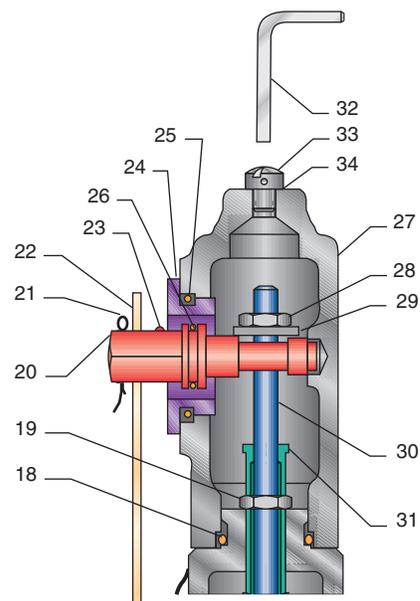
No.	Part Name	Materials
18	Cap O-ring	BUNA-N 70
19	Jam Nut	SS, A479-316
20	Lift Cam	SS, A743-CF8M
21	Cotter Pin	CS, Commercial
22	Lever	Steel, Zinc Plated A108-GR. 1018
23	Drive Screw	SS, Commercial
24	Retainer Nut	SS, A479-316
25	Retainer O-ring	BUNA-N
26	Lift Cam O-ring	BUNA-N
27	Cap	(Model 910) Steel, A216 GR. WCB, (Model 911) SS, A743-CF8M
28	Lift Nut	SS, A479-316
29	Lift Washer	SS, A479-316
30	Stem	SS, A479-316
31	Compression Screw	SS, A479-316
32 <sup>1</sup>	Gag Screw	Steel A108-1018/Zinc Plated
33 <sup>2</sup>	Gag Screw Plug	SS 18-8
34 <sup>2</sup>	Gag Screw Gasket	Teflon®

#### Notes

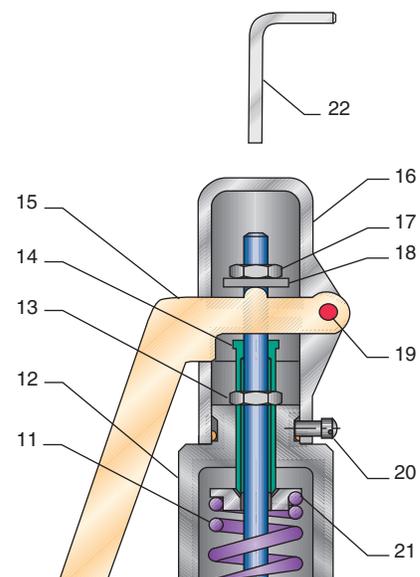
1. Gag screw ships with valve, not installed.
2. For threaded cap and packed lever gag option only.

#### Parts and Materials - Models 910, 911, 916, 917 and 921 Plain Lever

No.	Part Name	Materials
11	Spring	Cadmium plated steel: A231/A231M SS: A313-302 SS: A313-316 Alloy steel: A681-H12
12	Bonnet	(Model 910) Steel, A108-1117, (Model 911) SS, A479-316
13	Jam Nut	SS, A479-316
14	Compression Screw	SS, A479-316
15	Lever	Steel, A109 Cadmium Plated
16	Cap	Aluminum, Anodized
17	Lift Nut	SS, A479-316
18	Lift Washer	SS, A479-316
19	Rivet	Steel, Commercial
20	Cap Screw	SS, Commercial 18-8
21	Spring Step	SS, A479-316
22 <sup>1</sup>	Gag Screw	Steel A108-1018/Zinc Plated



**Packed Lever**  
(shown with Gag Option)



**Plain Lever**  
(shown with Gag Option)

### Order Information - Models 910, 911, 916, 917, 920, 921 and 927

#### Model Number Position

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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#### Example

9	1	0	B	J	H	M	0	1	A	K	E	0	3	0	0
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#### Model

910, 911, 916, 917, 920, 921, 927

#### Connection Model

B - Male x Female NPT	M - 300# Flange x 300# Flange
E - 150# Flange x FNPT	N - 600# Flange x 150# Flange
G - 300# Flange x FNPT	P - 600# Flange x 300# Flange
J - 150# Flange x 150# Flange	X - 600# Flange x FNPT
L - 300# Flange x 150# Flange	Z - Tri-clover Inlet

#### Orifice

D, E, F, G, H, J

#### Inlet Size

C - 1/2" [12.7 mm]	F - 1/4" [31.8 mm]
D - 3/4" [19.1 mm]	G - 1/2" [38.1 mm]
E - 1" [25.4 mm]	H - 2" [50.8 mm]

#### Seat/Seal Material

M - Metal-to-metal – Models 910, 911, 920, 921, 927  
 B - BUNA-N – Models 916, 917 only  
 E - EPDM – Models 916, 917 only  
 S - Silicone – Models 916, 917 only  
 V - Viton® – Models 916, 917 only  
 N - Neoprene – Models 916, 917 only

#### Variation (01 to 99)

Number provided only by Kunkle to cover specific feature or option.  
 01 - Threaded cap                      05 - Plain lever with vibration dampner  
 02 - Threaded cap with gag        06 - Packed lever  
 03 - Plain lever                        07 - Packed lever with gag  
 04 - Plain lever with gag         60 - BSP Threads with threaded cap

#### Design Revision

Models	Orifice Size					
	D	E	F	G	H	J
910	A	A	A	A	A	A
911	A	A	A	A	A	A
916	B	B	A	A	A	A
917	B	B	A	A	A	A
920	A	A	A	A	A	A
921	A	A	A	A	A	A
927	A	A	A	A	A	A

#### Valve Service

B - High-temperature Hot Water ASME Sect. I (Model 927 only) - Packed lever only  
 C - Organic Fluid ASME Section I (Threaded Cap only) (Model 920 only)  
 J - Liquid ASME Section VIII (Threaded Cap/Packed Lever only)  
 K - Air/Gas ASME Section VIII (Plain Lever/Packed Lever required for air)  
 L - Steam ASME Section VIII (Plain Lever/Packed Lever required)  
 M - Non-code Liquid (Threaded Cap/Packed Lever only)  
 N - Non-code Air/Gas  
 P - Non-code Steam  
 Q - Vacuum (Threaded Cap/Packed Lever only)  
 R - Forced Flow Steam ASME Section I (Plain Lever only) (921 only)

#### Spring Material

E - SS (-60° to 550°F) [-51° to 288°C]  
 F - High-temperature Alloy Steel (-60° to 800°F) [-51° to 427°C]

#### Set Pressure

3 psig (0003) to 1400 psig (1400) [0.2 barg to 96.5 barg]  
 Vacuum 6" [200 mbarg] HG (inches of Mercury) (0006) to 29" [1000 mbarg]  
 HG (0029) Models 910, 911, 920, 921