

# P133 Pressure Regulator

- Suitable for Monitoring
- Balanced Supply Valve
- Wide Pressure Range Offering

The P133 is a direct operated pressure reducing regulator with external pressure registration used in commercial and industrial applications such as furnace and burners where accuracy and sensitivity is critical. The regulator utilizes a balanced diaphragm design that provides for the sensitivity and accuracy. This minimizes the effects of supply pressure variation on output pressure. The P133 is available in low pressure or high pressure models and a broad range of outlet spring ranges. The P133 is also suitable in pressure monitoring applications.

## Applications

- Industrial and Commercial Gas Regulation
- Compressors
- Gas Engines
- Natural Gas and Propane Applications



## Materials of Construction

Adjusting Screw	Aluminum or Brass
Body	Ductile Cast Iron or WCB Steel
Bonnet	Aluminum
Cage	Aluminum
Diaphragm	Nitrile or Fluorocarbon
Lower Casing	Aluminum
Molded Seat Assembly	Nitrile or Fluorocarbon
Orifice	Aluminum

## P133 Wide Open Flow Coefficients

Capacity	Wide Open $C_g$ for Relief Valve Sizing	Representative $C_1$
25% <sup>(1)</sup>	490	28.2
40% <sup>(1)</sup>	760	29.1
60% <sup>(1)</sup>	1150	31.8
100%	1800	35.0

1. Using optional restriction collar.  
2.  $C_1 = C_g / C_v$

## Specifications

	133L	133H
Maximum Operating Inlet	60 PSIG	60 PSIG
Maximum Emergency Inlet	125 PSIG	125 PSIG
Maximum Operating Outlet	2 PSIG	10 PSIG
Maximum Emergency Outlet	15 PSIG	15 PSIG
Pressure Ranges	See Table 2	
Port Sizes	2 NPT	
Restrictor Collars	25%	
	40%	
	60%	
	2" NPT (Standard)	
End Connections	125 FF Flange (Iron Only)	
	150 RF Flange (Steel Only)	
Temperature Range	-40°F to 200°F	
	-40°C to 93°C	
Approx Weight	35 lbs. (15.9 kg)	

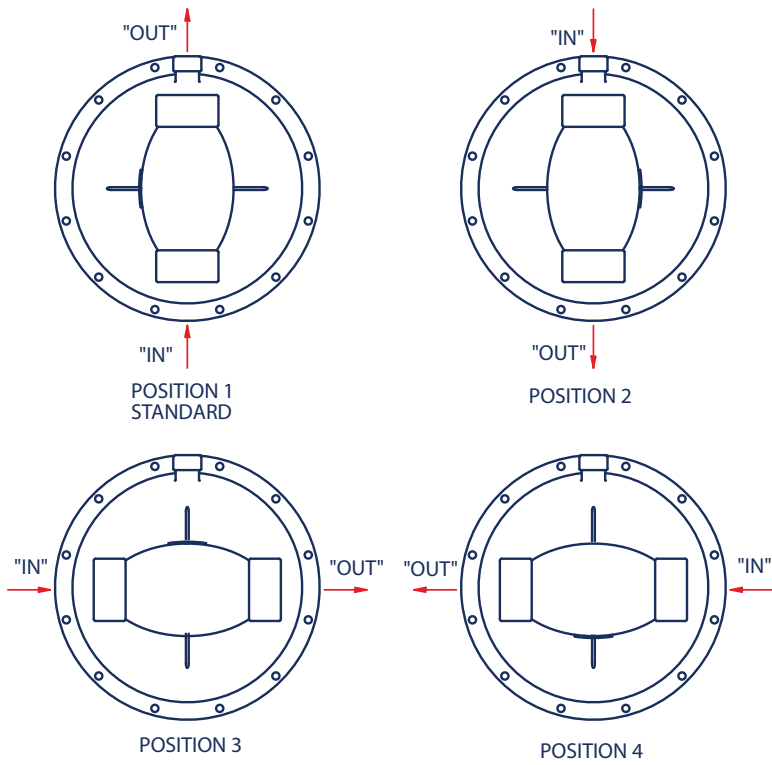
## P133 Series Range Springs

Model	Spring Ranges		Spring Color	Part Number
	W.C. or PSI	Bar		
P133 L & H	2" - 4" W.C.	0.005 - 0.01	Brown	655-697-002
	3.5" - 6" W.C.	0.009 - 0.015	Red	655-697-003
	5" - 9" W.C.	0.012 - 0.022	Black	655-697-004
	6" - 14" W.C.	0.015 - 0.035	Purple	655-697-011
	8.5" - 18" W.C.	0.021 - 0.045	White	655-697-005
	14" - 28" W.C.	0.035 - 0.07	Green	655-697-006
	0.75 - 2 PSI	0.005 - 0.138	Dark Blue	655-697-007
	1.5 - 3.25 PSI	0.103 - 0.224	Orange	655-697-008
P133 H Version Only	2 - 5 PSI	0.138 - 0.345	Yellow	655-730-000
	5 - 10 PSI	0.345 - 0.689	Grey	655-730-001



**P133 Port Orientation**

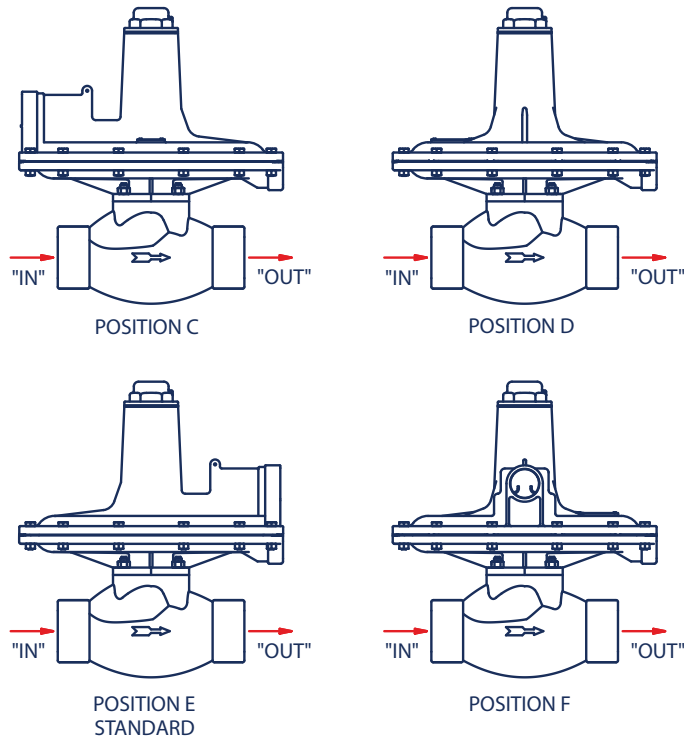
PORT ORIENTATION (ORDERING MATRIX DIGIT "12")



Port orientation is based on the body's 'Out' port location in relation to the control port of the housing.

**P133 Bonnet Vent Orientation**

BONNET VENT ORIENTATION (ORDERING MATRIX DIGIT "13")



## P133L Unrestricted Flow Capacities in Thousands of SCFH

(Nm<sup>3</sup>/h) of 0.6 Specific Gravity Natural Gas at 14.7 Psia and 60°F

Inlet Pressure		Outlet Pressure Setting <sup>(1)</sup> and Outlet Pressure Range											
		4 in. w.c. (10 mbar) 2 to 4 in. w.c. (5 to 10 mbar)	6 in. w.c. (15 mbar) 3.5 to 6 in. w.c. (8.7 to 15 mbar)	7 in. w.c. (17 mbar) 5 to 9 in. w.c. (12 to 22 mbar)	14 in. w.c. (35 mbar) 8.5 to 18 in. w.c. (21.2 to 44.8 mbar)		14 in. w.c. (35 mbar) 14 to 28 in. w.c. (35 to 70 mbar)		1 psig (0.07 bar) 14 to 28 in. w.c. (35 to 70 mbar)		2 psig (0.14 bar) 0.75 to 2 psig (0.05 to 0.14 bar)		
		1 in. w.c. (2.5 mbar) Droop	1 in. w.c. (2.5 mbar) Droop	1 in. w.c. (2.5 mbar) Droop	1 in. w.c. (2.5 mbar) Droop	2 in. w.c. (5 mbar) Droop	1 in. w.c. (2.5 mbar) Droop	2 in. w.c. (5 mbar) Droop	10% Droop	20% Droop	10% Droop	20% Droop	
PSIG	BAR												
1	0.07	14 (0.38)	13 (0.35)	12 (0.32)	5 (0.13)	8.4 (0.22)							
2	0.14	20.8 (0.56)	20 (0.54)	17 (0.46)	8.2 (0.22)	15.2 (0.41)			11.5 (0.31)	16 (0.43)			
3	0.21	26 (0.70)	24.5 (0.66)	21 (0.56)	12 (0.32)	19.5 (0.52)			15.5 (0.42)	21.5 (0.58)	12.5 (0.34)	18.5 (0.50)	
5	0.34	35 (0.94)	33 (0.88)	32 (0.86)	16 (0.43)	28 (0.75)	14 (0.38)	23 (0.62)	24 (0.64)	31.5 (0.84)	20.5 (0.55)	28 (0.75)	
10	0.69	52 (1.39)	52 (1.39)	48 (1.29)	34 (0.91)	45 (1.21)	26 (0.70)	38 (1.02)	37.5 (1.00)	44 (1.18)	38 (1.02)	46 (1.29)	
20	1.38	78 (2.09)	77 (2.06)	79 (2.12)	69 (1.85)	76 (2.04)	60 (1.61)	69 (1.85)	70 (1.88)	77 (2.06)	62 (1.66)	76 (2.04)	
30	2.07	101 (2.7)	100 (2.68)	100 (2.68)	91 (2.44)	97 (2.60)	87 (2.33)	93 (2.49)	90 (2.41)	101 (2.71)	87 (2.33)	101 (2.71)	
40	2.76	124 (3.32)	122 (3.27)	124 (3.32)	109 (2.92)	116 (3.11)	107 (2.87)	115 (3.08)	110 (2.95)	122 (3.27)	105 (2.81)	121 (3.24)	
50	3.45	146 (3.91)	144 (3.86)	145 (3.89)	130 (3.48)	136 (3.64)	132 (3.54)	137 (3.67)	127 (3.40)	145 (3.89)	124 (3.32)	145 (3.89)	
60	4.14	170 (4.56)	168 (4.50)	166 (4.45)	155 (4.15)	161 (4.32)	152 (4.07)	158 (4.23)	149 (3.99)	167 (4.48)	145 (3.89)	170 (4.56)	

1. Outlet pressure setting was made at approximately 10% of the maximum capacity for the listed conditions.



### P133H Unrestricted Flow Capacities in Thousands of SCFH

(Nm<sup>3</sup>/h) of 0.6 Specific Gravity Natural Gas at 14.7 Psia and 60 °F

Inlet Pressure		Outlet Pressure Setting <sup>(1)</sup> and Outlet Pressure Range									
		3 psig (0.21 bar) 1.5 to 3 psig (0.10 to 0.21 mbar)		2 psig (0.14 bar) 2 to 5 psig (0.14 to 0.34 mbar)		5 psig (0.34 bar) 2 to 5 psig (0.14 to 0.34 mbar)		5 psig (0.34 bar) 5 to 10 psig (0.34 to 0.69 mbar)		10 psig (0.69 bar) 5 to 10 psig (0.34 to 0.69 mbar)	
		10% Droop	20% Droop	10% Droop	20% Droop	10% Droop	20% Droop	10% Droop	20% Droop	10% Droop	20% Droop
PSIG	BAR										
3	0.21			6.5 (0.17)	11.5 (0.31)						
5	0.34	14 (0.38)	22 (0.59)	11 (0.30)	18 (0.48)						
7	0.48	21.5 (0.58)	31 (0.83)	13 (0.35)	22 (0.59)	15.5 (0.42)	24 (0.64)	9 (0.24)	15 (0.40)		
10	0.69	28 (0.75)	42 (1.13)	15 (0.40)	27 (0.72)	24 (0.64)	35 (0.94)	14 (0.38)	22 (0.59)		
15	1.03	40 (1.07)	57 (1.53)	25.5 (0.68)	39 (1.04)	35 (0.94)	51 (1.37)	19 (0.51)	31.5 (0.84)	21 (0.56)	35 (0.94)
20	1.38	52 (1.39)	72 (1.93)	35 (0.94)	52 (1.39)	46 (1.23)	67 (1.80)	24 (0.64)	41 (1.10)	31 (0.83)	51 (1.37)
30	2.07	76 (2.04)	96 (2.57)	49 (1.31)	73 (1.96)	68 (1.82)	95 (2.55)	35 (0.94)	58 (1.55)	44 (1.18)	74 (1.98)
40	2.76	98 (2.63)	119 (3.19)	66 (1.77)	97 (2.60)	88 (2.36)	117 (3.14)	44 (1.18)	73 (1.96)	56 (1.50)	97 (2.60)
50	3.44	118 (3.16)	141 (3.78)	84 (2.25)	112 (3.00)	103 (2.76)	138 (3.70)	57 (1.53)	89 (2.38)	74 (1.98)	117 (3.14)
60	4.14	136 (3.64)	165 (4.42)	104 (2.79)	132 (3.54)	122 (3.27)	156 (4.18)	65 (1.74)	106 (2.84)	91 (2.44)	136 (3.64)

1. Outlet pressure setting was made at approximately 10% of the maximum capacity for the listed conditions.

### P133H Flow Capacities in Thousands of SCFH

(Nm<sup>3</sup>/h) of 0.6 Specific Gravity Natural Gas at 14.7 Psia and 60 °F

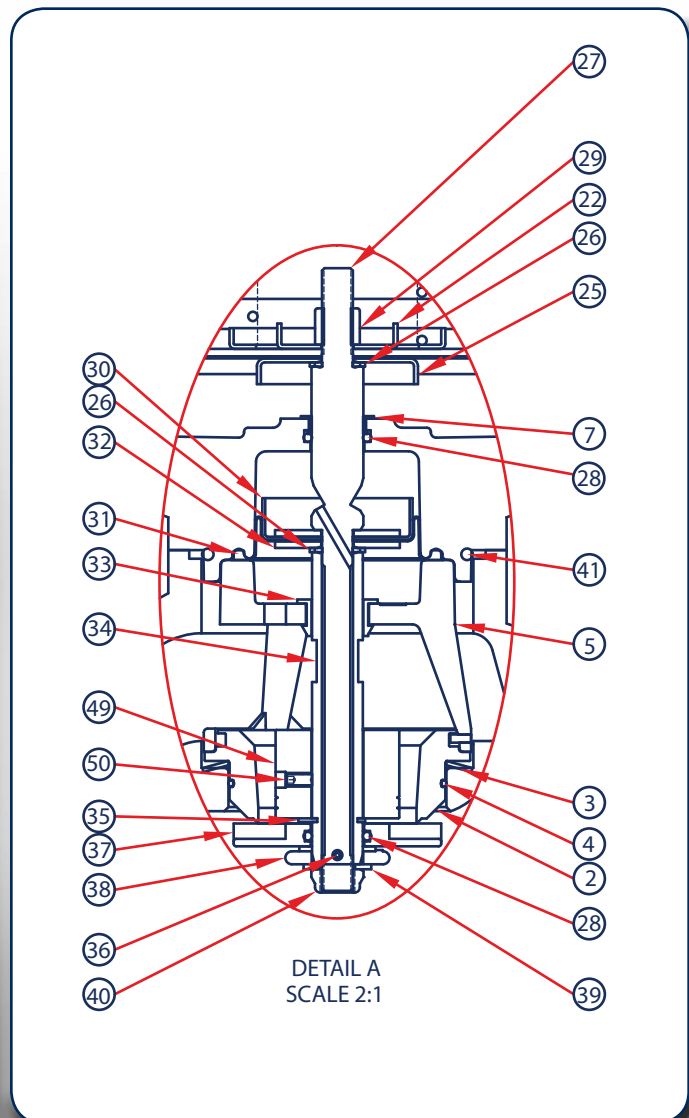
Inlet Pressure		Outlet Pressure Setting <sup>(1)</sup> and Outlet Pressure Range											
		25% Capacity				40% Capacity				60% Capacity			
		5 psig (0.34 bar) 2 to 5 psig (0.14 to 0.34 mbar)		10 psig (0.69 bar) 5 to 10 psig (0.34 to 0.69 mbar)		5 psig (0.34 bar) 2 to 5 psig (0.14 to 0.34 mbar)		10 psig (0.69 bar) 5 to 10 psig (0.34 to 0.69 mbar)		5 psig (0.34 bar) 2 to 5 psig (0.14 to 0.34 mbar)		10 psig (0.69 bar) 5 to 10 psig (0.34 to 0.69 mbar)	
PSIG	BAR	10% Droop	20% Droop	10% Droop	20% Droop	10% Droop	20% Droop	10% Droop	20% Droop	10% Droop	20% Droop	10% Droop	20% Droop
7	0.48	8.0 (0.21)	9.0 (0.24)			11.0 (0.0)	15.0 (0.40)			13.0 (0.35)	17.0 (0.46)		
10	0.69	12.3 (0.33)	13.0 (0.35)			16.5 (0.44)	20.0 (0.54)			20.0 (0.54)	25.0 (0.67)		
15	1.03			13.0 (0.35)	15.5 (0.42)			16.5 (0.44)	23.5 (0.63)			20.0 (0.54)	29.5 (0.79)
20	1.38	20.8 (0.56)	21.2 (0.57)	17.5 (0.47)	20.0 (0.54)	31.5 (0.84)	33.5 (0.90)	23.5 (0.63)	30.5 (0.82)	36.0 (0.96)	46.5 (1.25)	29.0 (0.78)	39.5 (1.06)
40	2.76	33.5 (0.90)	33.5 (0.90)	33.0 (0.88)	33.5 (0.90)	52.0 (1.39)	53.2 (1.43)	46.0 (1.23)	53.2 (1.43)	70.0 (1.88)	77.5 (2.08)	57.0 (1.53)	74.5 (2.00)
60	4.14	45.5 (1.22)	45.5 (1.22)	45.5 (1.22)	45.5 (1.22)	72.7 (1.95)	72.7 (1.95)	67.0 (1.80)	72.7 (1.95)	105.0 (2.81)	107.0 (2.87)	87.0 (2.33)	107 (2.87)

1. Outlet pressure setting was made at approximately 10% of the maximum capacity for the listed conditions.

## P133 Parts List

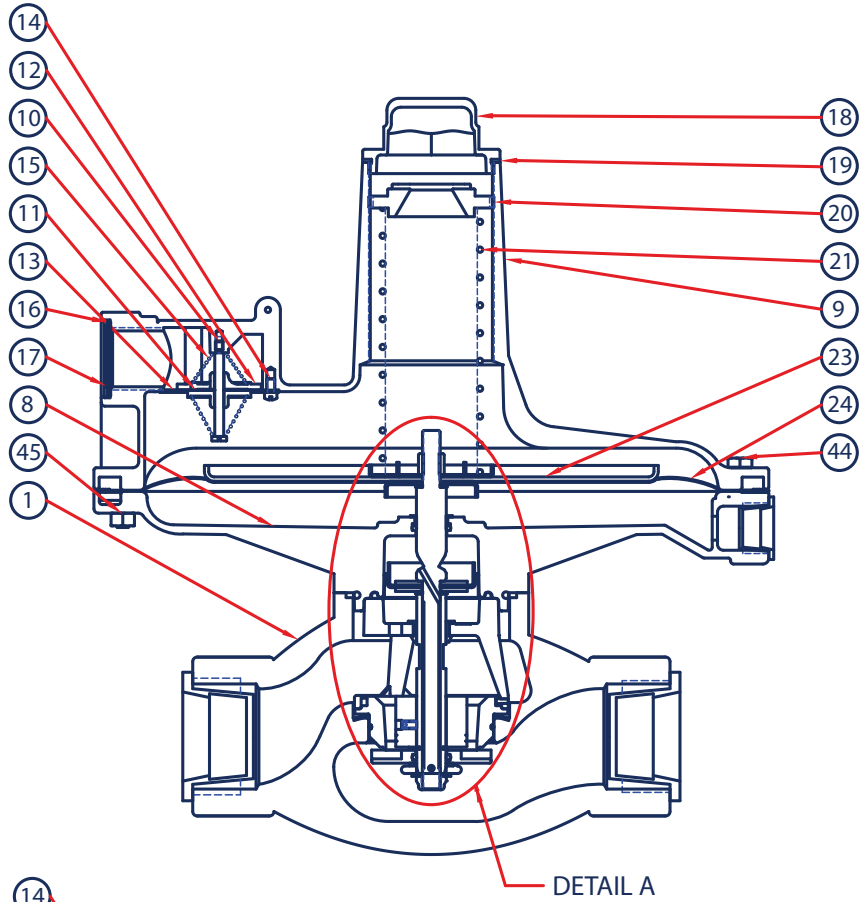
Item	Description	Qty.	Part Number
1	Bodies	1	
	Iron - 2" NPT		664-363-000
	Steel - 2" NPT		664-361-000
	Iron Body 125 FF		664-370-000
	Steel Body 150 RF		664-373-000
2	Orifice - Aluminum	1	688-054-001
3	Belleville Washer	1	662-235-000
4	O-ring - Nitrile	1	649-317-000
	O-ring - Fluorocarbon		649-317-001
5	Cage Assembly - Aluminum	1	839-002-000
7	Stem Bearing	1	602-126-000
8	Lower Casing	1	629-230-000
9	Bonnet	1	604-230-000
	Vent Assembly Parts		
10	Flapper Stem	1	661-008-000
11	Lower Flapper	1	661-009-000
12	Upper Flapper	1	661-010-000
13	Seat Ring	1	650-136-000
14	Self-tapping Screw	3	648-502-000
15	Vent Port Spring	2	655-697-000
16	Screen	1	647-018-000
17	Snap Ring	1	693-021-000
18	Closing Cap	1	610-058-000
19	Closing Cap Gasket	1	624-068-000
20	Adjustment Screw - Low Pressure	1	648-504-000
	Adjustment Screw - High Pressure		648-536-000
21	Range Springs - Low & High Pressure	1	
	2" to 4" WC, Brown, Plated Steel		655-697-002
	3.5" to 6" WC, Red, Plated Steel		655-697-003
	5" to 9" WC, Black, Plated Steel		655-697-004
	6" to 14" WC, Plated Steel		655-697-011
	8.5" to 18" WC, White, Plated Steel		655-697-005
	14" to 28" WC, Green, Plated Steel		655-697-006
	.75 to 2 psig, Blue, Plated Steel		655-697-007
	Range Springs - High Pressure Version Only		
	1.5 to 3.25 psig, Orange, Chrome Silicon		655-697-008
2 to 5 psig, Yellow, Chrome Silicon	655-730-000		
5 to 10 psig, Grey, Chrome Silicon	655-730-001		
22	Range Spring Seat	1	650-171-000
23	Upper Diaphragm Plates	1	
	Upper Diaphragm Plate - Low Pressure		638-071-000
	Upper Diaphragm Plate - High Pressure		638-070-000
24	Upper Diaphragms	1	
	Upper Diaphragm - Nitrile		618-094-000
	Upper Diaphragm - Fluorocarbon		618-094-001
25	Diaphragm Sealing Plate	1	638-072-000
26	Sealing Washer - Nitrile	2	662-231-000
	Sealing Washer - Fluorocarbon		662-231-001
27	Stem - 416 Stainless Steel	1	689-007-000
28	O-ring - Nitrile	2	649-000-197
	O-ring - Fluorocarbon		649-000-342
29	Upper Stem Hex Nut	1	634-196-000
30	Lower Diaphragm Plate	1	638-069-000
31	Lower Diaphragms	1	
	Nitrile Lower Diaphragm		600-511-000
	Fluorocarbon Lower Diaphragm		600-511-001
32	Washer	2	662-232-000
33	Stem Guide Bushing	1	608-082-000
34	Stem Sleeve	1	653-056-000
35	Stem E-ring	1	693-025-000

Item	Description	Qty.	Part Number
36	Roll Pin	1	635-071-000
37	Valve Disk Assembly - Nitrile	1	822-039-000
	Valve Disk Assembly - Fluorocarbon		822-039-001
38	Registration Disk	1	619-064-000
39	Washer	1	662-233-000
40	Lower Stem Hex Nut	1	634-000-031
41	Body O-ring - Nitrile	1	649-000-257
	Body O-ring - Fluorocarbon		649-318-000
42	Body/Lower Casing Studs (not shown)	4	657-016-000
43	Body/Lower Casing Lock Nut (not shown)	4	634-184-000
44	Lower Casing/Upper Casing Screw	12	648-506-000
45	Lower Casing/Upper Casing Nut	12	634-174-000
47	Set Screw (not shown)	2	648-534-000
48	Thrust Washer - High Pressure only	1	662-234-000
49	Restrictor Collars	1	
	25% Capacity Restrictor		612-009-000
	40% Capacity Restrictor		612-010-000
	60% Capacity Restrictor		612-011-000
50	Restrictor Collar Set Screw	1	648-535-000

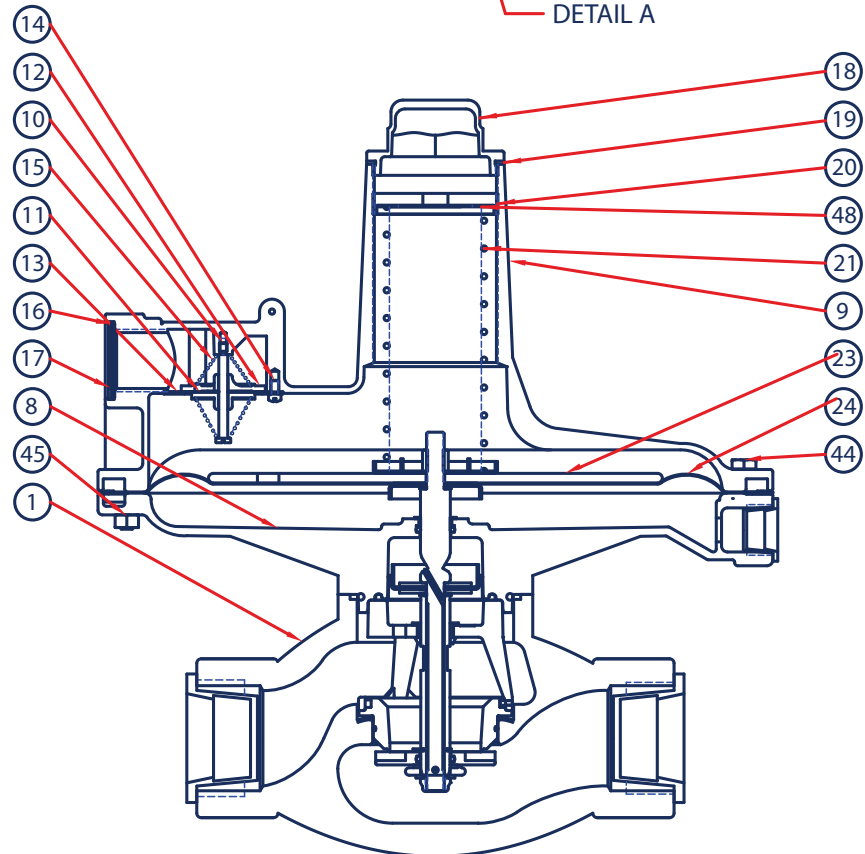


P133 Parts Drawing

P133 L



P133 H



**Notes:**

