



MODEL C-PRV

PRESSURE REDUCING REGULATOR

The Model C-PRV* is a 316L SST self-contained pressure reducing regulator designed for liquid or gaseous fluids utilized in sanitary biotechnological process piping systems. The unit is capable of controlling outlet pressure between 10-75 psig (.69-5.17 Barg) with a maximum inlet pressure of 150 psig (10.3 Barg).



**1" MODEL C-PRV
with Investment Cast Body**

FEATURES

Clean-in-Place (CIP): Patented lock-open feature on the spring chamber area allows the regulator to be cleaned with 50 psig (3.45 Barg) cleaning solution.

Steam-in-Place (SIP): The combination of materials allows for steam-in-place up to 20 psig (1.38 Barg) of saturated steam.

Self-Draining: Angle style body with bottom inlet and side outlet.

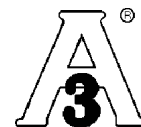
Readily Accessible: Unit can be easily and quickly disassembled in line for inspection and manual cleaning without the use of tools.

Polished Interior: Interior of body surface polished to 10 micro-inch R_a finish with electro-polished exterior.

Wetted Materials Construction: All metallic wetted parts of 316LSST. All diaphragms and some plug/stem selections are of non-metallic materials. Unit is cleaned to Cashco Spec. #S-1576.

Contained Guiding: All guiding for the plug is contained in the spring chamber area to eliminate particle generation.

3A Construction: Selection of the metallic plug/stem constructions meets 3A Sanitary Standards, Authorization No. 782.



! CAUTION
DO NOT APPLY IN CONTINUOUS STEAM SERVICE!

APPLICATIONS

Used in pharmaceutical industry in production of many health care products for both human and animal consumption. Widely applied for processed food production — candy, beverages, nutritional supplements and artificial sweeteners. May also be used in cosmetics production and specialty chemicals.

Would be found supporting fermenters, batching tanks, cookers, dryers and other similar equipment.



SPECIFICATIONS

Body Connections: Sanitary "Tri-Clamp®" designed to seal against weld-type clamp liners per ISO 2852. (Lower inlet, side outlet connection.)

Body Size and Material: **1" and 1-1/2" (25 and 40 mm) size.** ASTM A182, Gr. F316L; Forged 316L SST for superior quality and finish. Interior and exterior of body material is electro-polished.

1" (25 mm) size only. ASTM A351, Gr. CF3M; Investment Cast 316L SST. Interior of standard body material is mechanically polished to 10 micro-inch R_a finish with electro-polished exterior.

See Table 4 for dimensions.

Spring Chamber: ASTM A351, Gr. CF8M; Cast 316 SST. Electro-polished.

Body Design Pressure Rating: 150 psig (10.3 Barg); inlet & outlet.

Range Springs: SST.

| | psig | (Barg) |
|--|-------|--------------|
| | 10-30 | (.69 - 2.07) |
| | 10-75 | (.69-5.17) |

NOTE: Contact the factory for settings below 10 psig (.69 Barg).

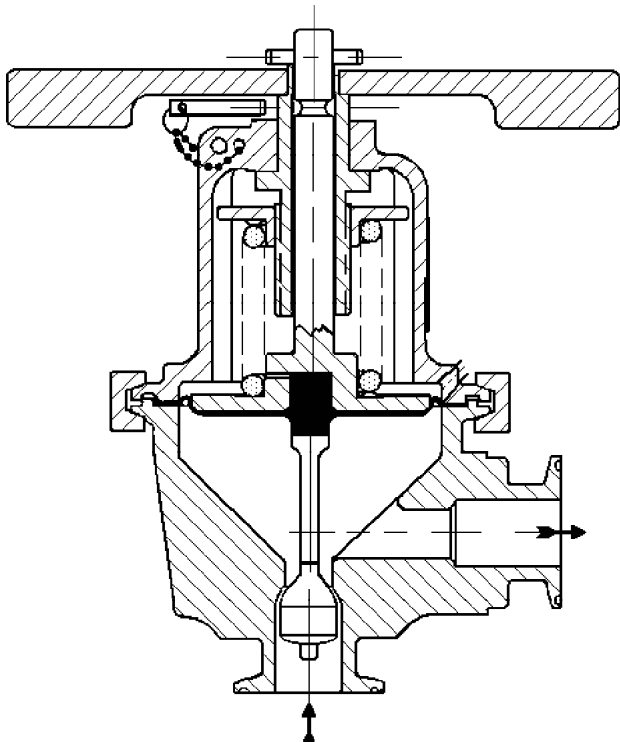


Figure 1: Forged Body, Model C-PRV

Operating Temperature: 40° to 300°F (4° to 149°C)

Maximum Pressure Drop: Function of range spring and set-point pressure utilized; see Table 1.

Maximum CIP Conditions: Maximum Cleaning Fluid: Pressure = 50 psig (3.45 Barg); Temperature = 300°F (149°C).

Maximum SIP Conditions: Maximum Steaming Fluid: Saturated; Recommended Pressure at 20 psig (1.38 Barg); Acceptable Pressure to 30 psig (2.07 Barg), but with reduced elastomer life.

Capacity: Up to 5.0 Cv. See Table 1.

Max C_v with Plug Locked Wide Open (Use for Relief Valve Sizing)

| Body Size | | Cv |
|-----------|------|-----|
| Inch | (mm) | |
| 1" | (25) | 5.0 |
| 1-1/2" | (40) | 9.5 |

Wetted Trim Materials:

| Trim Material Combinations (Non-3A) | | |
|-------------------------------------|-----------------------|-----------|
| Part | Trim Designation Nos. | |
| | R1 | R3 |
| Diaphragm * | EPDM | Silicone |
| Stem & Plug | Ryton® ** | Ryton® ** |

* Diaphragms are molded to stem. These materials conform with FDA Code of Federal Regulations Title 21, Part 177.2600.

** Ryton® -polyphenylene sulfide - a thermoplastic, conforms with FDA Code of Federal Regulations Title 21, Part 177.2490. Both the Ryton® Stem, Plug and adhesive were submitted and approved as meeting the standards of USP XXII, Class V Biological Test for Plastics, Case Study #T91M0152 and #T91M0158, respectively, and are on file.

| Trim Material Combinations (3A Approved) | | |
|------------------------------------------|-----------------------|----------|
| Part | Trim Designation Nos. | |
| | LE | LC |
| Diaphragm * | EPDM | Silicone |
| Stem & Plug | 316LSST | 316LSST |

* Diaphragms are molded to stem. These materials conform with FDA Code of Federal Regulations Title 21, Part 177.2600.



The adhesive was submitted and approved as meeting the standards of USP XXII, Class V Biological Test for Plastics, Case Study #T91M0158 is on file.

Non-Wetted Trim Materials: Castings - CF8M (316SST) Barstock - 18-8 SST All cast parts electro-polished.

Special Cleaning: All units are cleaned per Cashco Spec. #S-1576.

APPLICATION AND SELECTION

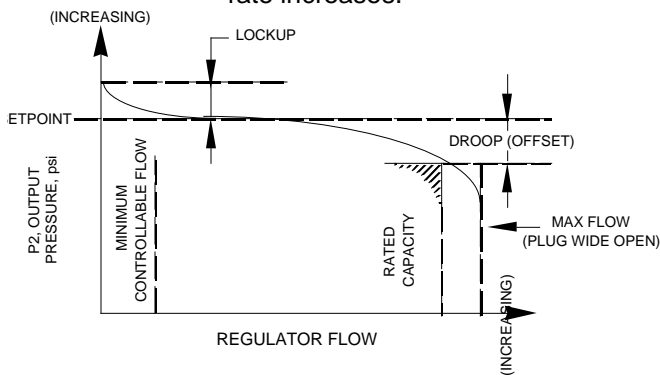
Pressure reducing regulators are control devices intended for continuous duty in throttling service. These regulators are not designed for shutoff service. The following procedure will help determine the minimum suitable selection for an application.

- STEP 1.** FIVE KNOWNs. The following minimal parameters / information must be available before a selection procedure can begin:
- Service Fluid - What is it? Liquid or gas? SG (std. cond.).
 - Inlet Pressure - P_1 (upstream pressure).
 - Outlet Pressure - P_2 (downstream pressure). How much can P_2 vary as flow varies?
 - Desired capacity - C_v , GPM, SCFH; minimum & maximum.
 - Fluid temperature - T_1 , SG (actual).

STEP 2. INLET PRESSURE. Assure that the actual design inlet pressure and temperature limits do not exceed the limits indicated in the Specifications section.

STEP 3. PRESSURE DROP. Check the maximum pressure drop ($P_1 - P_2$) in Table 1.

STEP 4. OUTLET PRESSURE. All self-contained pressure reducing regulators “droop” or “falloff” from a setpoint pressure level at a given flow as the flow rate increases.



This deviation in setpoint is described as “% droop”. Droop is expressed on increasing flow, starting from a minimum flow level.

The “% droop” must be known to enter the capacity tables. The acceptable level of setpoint deviation should be known for the min-to-max flow variation.

A regulator may have a setpoint up to 15% below the lower stated range spring level. (Tags will show the standard ranges.) A setpoint above the higher range spring level is not recommended. Setpoint at the upper limit of a range spring is acceptable.

If final setpoint is questionable and expected near the upper limit, the next higher range spring should be utilized. Best performance will be obtained when the lowest range spring is utilized.

STEP 5. CAPACITY. Using the five knowns of Step 1, calculate the required C_v . If a liquid, determine the flow description – non-, partial, excess partial, or full cavitation. **DO NOT APPLY MODEL C-PRV IN “EXCESSIVE PARTIAL CAVITATION” OR “FULL CAVITATION” CONDITIONS!!**

For liquids that are cavitating, consideration should be given to use multiple units in series to state the pressure and prevent excessive partial or full cavitation from occurring.

For Example:

Fluid = Water
 GPM = 10.0 Max., 4.0 Min.
 $P_1 = 120$ psig
 $P_2 = 25$ psig
 $T_1 = 180^\circ\text{F}$

Preliminary Calc. $C_v = 1.09$
 Flow Description = FULL CAVITATION
 .. Must Stage

1st Stage

$P_1 = 120$ psig
 $P_2 = 55$ psig
 Calc. $C_v = 1.22$
 Flow Descript = Non-Cavitating
 % Droop (deviation of setpoint) = 11%
 10-75 psig range spring
 Set 55 psig

2nd Stage

$P_1 = 55$ psig
 $P_2 = 25$ psig
 Calc. $C_v = 1.8$
 Flow Descript = Non-Cavitating
 % Droop (deviation of setpoint) = 15%
 10-30 psig range spring
 Set 25 psig

Spacing between in-series units must be a minimum of 2 feet (0.6 meters).

STEP 6. TRIM MATERIAL. Select the desired trim material with 3A Approval applying to LE and LC trims.

Refer to IOM-C-PRV for complete cleaning procedures and maintenance instructions.

TECHNICAL SPECIFICATIONS

TABLE 1
CAPACITY - Cv (F_L = .8)

| Max. Inlet | | Set Pressure | | 1" (25mm) SIZE | | 1-1/2" (40mm) SIZE | | | Max. Pressure Drop | |
|------------|-------|--------------|--------|-------------------------|------|-------------------------|------|------|--------------------|--------|
| | | | | Range Spring 10-30 psig | | Range Spring 10-30 psig | | | | |
| | | | | Droop | | Droop | | | | |
| psig | Barg | psig | Barg | 10% | 20% | 10% | 20% | 30% | psid | (Bard) |
| 60 | (4.1) | 10 | (.69) | .56 | .94 | .94 | 1.52 | 2.04 | 52 | (3.59) |
| 65 | (4.4) | 15 | (1.03) | .75 | 1.35 | 1.16 | 2.02 | 2.66 | 53 | (3.65) |
| 70 | (4.8) | 20 | (1.38) | 1.24 | 1.99 | 1.41 | 2.31 | 3.16 | 54 | (3.72) |
| 75 | (5.1) | 25 | (1.72) | 1.36 | 2.18 | 1.72 | 2.69 | 3.56 | 55 | (3.79) |
| 80 | (5.5) | 30 | (2.07) | 2.07 | 2.33 | 1.85 | 3.05 | 3.92 | 56 | (3.86) |

| Max. Inlet | | Set Pressure | | Range Spring 10-75 psig | | Range Spring 10-75 psig | | | Max. Pressure Drop | |
|------------|--------|--------------|--------|-------------------------|------|-------------------------|------|------|--------------------|--------|
| | | | | Droop | | Droop | | | | |
| | | | | 10% | 20% | 10% | 20% | 30% | | |
| psig | Barg | psig | Barg | 10% | 20% | 10% | 20% | 30% | psid | (Bard) |
| 110 | (7.5) | 10 | (.69) | .35 | .59 | .41 | .68 | .99 | 102 | (7.03) |
| 115 | (7.9) | 15 | (1.03) | .48 | .75 | .65 | 1.05 | 1.35 | 103 | (7.10) |
| 120 | (8.2) | 20 | (1.38) | .59 | .92 | .76 | 1.28 | 1.70 | 104 | (7.17) |
| 125 | (8.6) | 25 | (1.72) | .65 | 1.14 | .91 | 1.47 | 1.99 | 105 | (7.24) |
| 130 | (8.9) | 30 | (2.07) | .75 | 1.38 | 1.00 | 1.71 | 2.26 | 106 | (7.31) |
| 135 | (9.3) | 35 | (2.41) | .86 | 1.55 | 1.10 | 1.86 | 2.51 | 107 | (7.38) |
| 140 | (9.6) | 40 | (2.75) | .92 | 1.70 | 1.33 | 2.00 | 2.68 | 108 | (7.45) |
| 145 | (10.0) | 45 | (3.10) | 1.00 | 1.90 | 1.48 | 2.19 | 2.97 | 109 | (7.51) |
| 150 | (10.3) | 50 | (3.45) | 1.14 | 2.05 | 1.63 | 2.81 | 3.32 | 110 | (7.59) |
| 150 | (10.3) | 55 | (3.79) | 1.15 | 2.10 | 1.84 | 3.07 | 3.69 | 106 | (7.31) |
| 150 | (10.3) | 60 | (4.14) | 1.21 | 2.15 | 1.88 | 3.15 | 3.98 | 102 | (7.03) |
| 150 | (10.3) | 65 | (4.48) | 1.31 | 2.25 | 1.94 | 3.23 | 4.30 | 98 | (6.76) |
| 150 | (10.3) | 70 | (4.83) | 1.39 | 2.39 | 2.00 | 3.38 | 4.62 | 94 | (6.48) |
| 150 | (10.3) | 75 | (5.17) | 1.44 | 2.49 | 2.44 | 3.69 | 4.94 | 90 | (6.20) |

TABLE 2
WATER CAPACITY — GPM
S.G = 1.0 T = 60° F_L = 0.8

| 10-30 psig RANGE SPRING | | | | | | | | |
|--------------------------|-------------------------|----------------|-------|----------|--------------------|-------|-------|----------|
| Outlet Pressure P2, psig | Inlet Pressure P1, psig | 1" (25mm) SIZE | | | 1-1/2" (40mm) SIZE | | | |
| | | Droop | | Max. GPM | Droop | | | Max. GPM |
| | | 10% | 20% | | 10% | 20% | 30% | |
| 10 | 25 | 2.2 | 3.9 | 22.4 | 3.8 | 6.3 | 9.1 | 42.5 |
| | 30 | 2.6 | 4.4 | 25.0 | 4.3 | 7.1 | 10.2 | 47.5 |
| | 35 | 2.9 | 4.9 | 27.4 | 4.8 | 7.9 | 11.2 | 52.0 |
| | 40 | 3.1 | 5.3 | 29.5 | 5.2 | 8.6 | 12.0 | 56.1 |
| | 50 | 3.6 | 6.0 | 32.1 | 6.0 | 9.8 | 13.1 | 61.0 |
| | 60 | 3.9 | 6.5 | HI DP | 6.5 | 10.5 | HI DP | HI DP |
| | 70 | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP |
| 15 | 25 | 2.5 | 4.9 | 20.9 | 3.9 | 7.3 | 11.1 | 39.7 |
| | 30 | 3.0 | 5.7 | 23.7 | 4.7 | 8.6 | 12.6 | 45.1 |
| | 35 | 3.5 | 6.5 | 26.2 | 5.4 | 9.7 | 13.9 | 49.8 |
| | 40 | 3.9 | 7.1 | 28.5 | 6.0 | 10.7 | 15.2 | 54.2 |
| | 50 | 4.5 | 8.3 | 32.1 | 7.0 | 12.5 | 17.1 | 61.0 |
| | 60 | 5.1 | 9.3 | 34.5 | 7.9 | 13.9 | 18.4 | 65.6 |
| | 70 | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP |
| 20 | 25 | 3.3 | 6.0 | 19.4 | 3.7 | 6.9 | 12.2 | 36.8 |
| | 30 | 4.3 | 7.4 | 22.4 | 4.9 | 8.6 | 14.1 | 42.5 |
| | 35 | 5.1 | 8.7 | 25.0 | 5.8 | 10.1 | 15.8 | 47.5 |
| | 40 | 5.8 | 9.7 | 27.4 | 6.6 | 11.3 | 17.3 | 52.0 |
| | 50 | 7.0 | 11.6 | 31.6 | 8.0 | 13.5 | 20.0 | 60.1 |
| | 60 | 8.0 | 13.2 | 34.5 | 9.1 | 15.3 | 21.8 | 65.6 |
| | 70 | 8.9 | 14.6 | HI DP | 10.2 | 17.0 | HI DP | HI DP |
| | 80 | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP |
| 25 | 30 | 3.7 | 6.9 | 20.9 | 4.7 | 8.5 | 14.9 | 39.7 |
| | 35 | 4.8 | 8.4 | 23.7 | 6.1 | 10.4 | 16.9 | 45.1 |
| | 40 | 5.7 | 9.7 | 26.2 | 7.2 | 12.0 | 18.7 | 49.8 |
| | 50 | 7.1 | 11.9 | 30.6 | 9.0 | 14.7 | 21.8 | 58.2 |
| | 60 | 8.3 | 13.8 | 34.5 | 10.5 | 17.0 | 24.5 | 65.5 |
| | 70 | 9.4 | 15.4 | HI DP | 11.9 | 19.0 | HI DP | HI DP |
| | 80 | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP |
| 30 | 35 | 5.9 | 7.7 | 22.4 | 5.2 | 10.1 | 17.5 | 42.5 |
| | 40 | 7.5 | 9.3 | 25.0 | 6.7 | 12.2 | 19.6 | 47.5 |
| | 50 | 9.9 | 11.9 | 29.6 | 8.9 | 15.6 | 23.2 | 56.2 |
| | 60 | 11.9 | 14.0 | 33.5 | 10.6 | 18.3 | 26.3 | 63.7 |
| | 70 | 13.6 | 15.8 | 36.8 | 12.1 | 20.7 | 28.8 | 69.8 |
| | 80 | 15.1 | 17.4 | HI DP | 13.5 | 22.8 | HI DP | HI DP |

Moderate level of cavitation.
 Full cavitation.

NOTE: Where "HI DP" is indicated, the actual pressure drop has exceeded the recommended limits in Table 1.

S.G = 1.0 T = 60° F_L = 0.8

10-75 psig RANGE SPRING

| Outlet Pressure P2, psig | Inlet Pressure P1, psig | 1" (25mm) SIZE | | | | 1-1/2" (40mm) SIZE | | | |
|-----------------------------|----------------------------|----------------|-------|----------|-------|--------------------|----------|-------|-------|
| | | Droop | | Max. GPM | Droop | | Max. GPM | | |
| | | 10% | 20% | | 10% | 20% | | 30% | |
| 10 | 25 | 1.4 | 2.4 | 22.4 | 1.6 | 2.8 | 4.4 | 42.5 | |
| | 30 | 1.6 | 2.8 | 25.0 | 1.9 | 3.2 | 5.0 | 47.5 | |
| | 35 | 1.8 | 3.1 | 27.4 | 2.1 | 3.5 | 5.4 | 52.0 | |
| | 40 | 1.9 | 3.3 | 29.5 | 2.3 | 3.8 | 5.8 | 56.1 | |
| | 50 | 2.2 | 3.8 | 32.1 | 2.6 | 4.4 | 6.4 | 61.0 | |
| | 60 | 2.4 | 4.1 | 34.5 | 2.8 | 4.7 | 6.8 | 65.6 | |
| | 70 | 2.6 | 4.3 | 36.8 | 3.0 | 5.0 | 7.3 | 69.8 | |
| | 80 | 2.7 | 4.6 | 38.9 | 3.2 | 5.3 | 7.7 | 73.9 | |
| | 90 | 2.9 | 4.8 | 40.9 | 3.4 | 5.6 | 8.1 | 77.7 | |
| | 100 | 3.0 | 5.0 | 42.8 | 3.5 | 5.8 | 8.5 | 81.3 | |
| | 125 | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | |
| 15 | 25 | 1.6 | 2.7 | 20.9 | 2.2 | 3.8 | 5.6 | 39.7 | |
| | 30 | 1.9 | 3.2 | 23.7 | 2.6 | 4.5 | 6.4 | 45.1 | |
| | 35 | 2.2 | 3.6 | 26.2 | 3.0 | 5.0 | 7.1 | 49.8 | |
| | 40 | 2.5 | 4.0 | 28.5 | 3.3 | 5.6 | 7.7 | 54.2 | |
| | 50 | 2.9 | 4.6 | 32.1 | 3.9 | 6.5 | 8.7 | 61.0 | |
| | 60 | 3.3 | 5.2 | 34.5 | 4.4 | 7.2 | 9.3 | 65.6 | |
| | 70 | 3.5 | 5.5 | 36.8 | 4.8 | 7.7 | 9.9 | 69.8 | |
| | 80 | 3.7 | 5.8 | 38.9 | 5.1 | 8.2 | 10.5 | 73.9 | |
| | 90 | 3.9 | 6.1 | 40.9 | 5.3 | 8.6 | 11.0 | 77.7 | |
| | 100 | 4.1 | 6.4 | 42.8 | 5.6 | 9.0 | 11.6 | 81.3 | |
| | 125 | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | |
| 20 | 25 | 1.6 | 2.8 | 19.4 | 2.0 | 3.8 | 6.6 | 36.8 | |
| | 30 | 2.0 | 3.4 | 22.4 | 2.6 | 4.8 | 7.6 | 42.5 | |
| | 35 | 2.4 | 4.0 | 25.0 | 3.1 | 5.6 | 8.5 | 47.5 | |
| | 40 | 2.8 | 4.5 | 27.4 | 3.6 | 6.3 | 9.3 | 52.0 | |
| | 50 | 3.3 | 5.4 | 31.6 | 4.3 | 7.5 | 10.8 | 60.1 | |
| | 60 | 3.8 | 6.1 | 34.5 | 4.9 | 8.5 | 11.7 | 65.6 | |
| | 70 | 4.3 | 6.8 | 36.8 | 5.5 | 9.4 | 12.5 | 69.8 | |
| | 80 | 4.6 | 7.2 | 38.9 | 5.9 | 10.0 | 13.2 | 73.9 | |
| | 90 | 4.8 | 7.5 | 40.9 | 6.2 | 10.5 | 13.9 | 77.7 | |
| | 100 | 5.0 | 7.9 | 42.8 | 6.5 | 11.0 | 14.5 | 81.3 | |
| | 125 | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | |
| 25 | 30 | 1.8 | 3.6 | 20.9 | 2.5 | 4.6 | 8.3 | 39.7 | |
| | 35 | 2.3 | 4.4 | 23.7 | 3.2 | 5.7 | 9.4 | 45.1 | |
| | 40 | 2.7 | 5.1 | 26.2 | 3.8 | 6.6 | 10.4 | 49.8 | |
| | 50 | 3.4 | 6.2 | 30.6 | 4.8 | 8.1 | 12.2 | 58.2 | |
| | 60 | 4.0 | 7.2 | 34.5 | 5.6 | 9.3 | 13.7 | 65.5 | |
| | 70 | 4.5 | 8.1 | 36.8 | 6.3 | 10.4 | 14.6 | 69.8 | |
| | 80 | 4.9 | 8.8 | 38.9 | 6.9 | 11.4 | 15.5 | 73.9 | |
| | 90 | 5.3 | 9.3 | 40.9 | 7.4 | 12.0 | 16.3 | 77.7 | |
| | 100 | 5.6 | 9.8 | 42.8 | 7.8 | 12.6 | 17.0 | 81.3 | |
| | 125 | 6.1 | 10.8 | HI DP | 8.6 | 13.9 | HI DP | HI DP | |
| | 150 | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | |
| 30 | 35 | 2.1 | 4.6 | 22.4 | 2.8 | 5.7 | 10.1 | 42.5 | |
| | 40 | 2.7 | 5.5 | 25.0 | 3.6 | 6.8 | 11.3 | 47.5 | |
| | 50 | 3.6 | 7.0 | 29.6 | 4.8 | 8.7 | 13.4 | 56.2 | |
| | 60 | 4.3 | 8.3 | 33.5 | 5.7 | 10.3 | 15.2 | 63.7 | |
| | 70 | 4.9 | 9.4 | 36.8 | 6.6 | 11.6 | 16.6 | 69.8 | |
| | 80 | 5.5 | 10.3 | 38.9 | 7.3 | 12.8 | 17.6 | 73.9 | |
| | 90 | 6.0 | 11.2 | 40.9 | 7.9 | 13.9 | 18.5 | 77.7 | |
| | 100 | 6.4 | 11.8 | 42.8 | 8.5 | 14.6 | 19.3 | 81.3 | |
| | 125 | 7.1 | 13.0 | HI DP | 9.4 | 16.2 | HI DP | HI DP | |
| | 150 | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | |
| | 35 | 40 | 2.5 | 5.4 | 23.7 | 3.2 | 6.4 | 11.9 | 45.1 |
| 50 | | 3.7 | 7.3 | 28.5 | 4.7 | 8.7 | 14.3 | 54.2 | |
| 60 | | 4.6 | 8.8 | 32.6 | 5.9 | 10.5 | 16.4 | 61.9 | |
| 70 | | 5.3 | 10.0 | 36.2 | 6.8 | 12.1 | 18.2 | 68.8 | |
| 80 | | 6.0 | 11.2 | 38.9 | 7.7 | 13.4 | 19.5 | 73.9 | |
| 90 | | 6.6 | 12.2 | 40.9 | 8.4 | 14.6 | 20.5 | 77.7 | |
| 100 | | 7.1 | 13.2 | 42.8 | 9.1 | 15.8 | 21.5 | 81.3 | |
| 125 | | 8.1 | 14.6 | HI DP | 10.4 | 17.6 | HI DP | HI DP | |
| 150 | | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | |
| 40 | | 50 | 3.4 | 7.2 | 27.4 | 5.0 | 8.5 | 14.7 | 52.0 |
| | | 60 | 4.5 | 9.0 | 31.6 | 6.5 | 10.6 | 16.9 | 60.1 |
| | 70 | 5.4 | 10.5 | 35.4 | 7.8 | 12.3 | 19.0 | 67.2 | |
| | 80 | 6.1 | 11.8 | 38.7 | 8.8 | 13.9 | 20.8 | 73.6 | |
| | 90 | 6.8 | 12.9 | 40.9 | 9.8 | 15.2 | 21.9 | 77.7 | |
| | 100 | 7.4 | 14.0 | 42.8 | 10.6 | 16.5 | 22.9 | 81.3 | |
| | 125 | 8.7 | 16.1 | 47.2 | 12.5 | 18.9 | 25.3 | 89.7 | |
| | 150 | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | |
| | 45 | 50 | 3.1 | 7.1 | 26.2 | 4.6 | 8.2 | 15.6 | 49.8 |
| | | 60 | 4.4 | 9.3 | 30.6 | 6.5 | 10.7 | 18.2 | 58.2 |
| | | 70 | 5.4 | 11.1 | 34.5 | 8.0 | 12.8 | 20.5 | 65.5 |
| 80 | | 6.3 | 12.6 | 37.9 | 9.3 | 14.5 | 22.5 | 72.0 | |
| 90 | | 7.0 | 14.0 | 40.9 | 10.4 | 16.1 | 24.3 | 77.7 | |
| 100 | | 7.7 | 15.2 | 42.8 | 11.4 | 17.5 | 25.4 | 81.3 | |
| 125 | | 9.2 | 17.9 | 47.2 | 13.6 | 20.7 | 28.1 | 89.7 | |
| 150 | | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | |
| 50 | | 60 | 4.4 | 9.2 | 29.6 | 6.3 | 12.6 | 19.6 | 56.2 |
| | | 70 | 5.7 | 11.2 | 33.5 | 8.2 | 15.4 | 22.3 | 63.7 |
| | | 80 | 6.7 | 13.0 | 37.1 | 9.6 | 17.8 | 24.6 | 70.5 |
| | 90 | 7.6 | 14.5 | 40.3 | 10.9 | 19.9 | 26.8 | 76.6 | |
| | 100 | 8.5 | 15.9 | 42.8 | 12.1 | 21.8 | 28.4 | 81.3 | |
| | 125 | 10.2 | 18.9 | 47.2 | 14.6 | 25.9 | 31.4 | 89.7 | |
| | 150 | 11.7 | 21.0 | HI DP | 16.7 | 28.8 | HI DP | HI DP | |
| | 60 | 70 | 4.8 | 10.1 | 31.6 | 7.5 | 14.8 | 25.2 | 60.1 |
| | | 80 | 6.2 | 12.2 | 35.4 | 9.6 | 17.8 | 28.1 | 67.2 |
| | | 90 | 7.3 | 13.9 | 38.7 | 11.3 | 20.4 | 30.8 | 73.6 |
| | | 100 | 8.2 | 15.5 | 41.8 | 12.8 | 22.7 | 33.3 | 79.5 |
| 125 | | 10.2 | 18.9 | 47.2 | 15.8 | 27.6 | 37.6 | 89.7 | |
| 150 | | 11.9 | 21.7 | HI DP | 18.4 | 31.8 | HI DP | HI DP | |
| 75 | | 80 | 5.1 | 11.1 | 32.6 | 8.6 | 16.5 | 32.2 | 61.9 |
| | | 90 | 6.8 | 13.6 | 36.2 | 11.6 | 20.2 | 35.8 | 68.8 |
| | | 100 | 8.2 | 15.7 | 39.5 | 13.9 | 23.3 | 39.1 | 75.1 |
| | | 125 | 10.9 | 20.1 | 46.8 | 18.5 | 29.7 | 46.2 | 88.9 |
| | | 150 | 13.1 | 23.6 | HI DP | 22.2 | 35.0 | HI DP | HI DP |

Moderate level of cavitation. Full cavitation.

NOTE: Where "HI DP" is indicated, the actual pressure drop has exceeded the recommended limits in Table 1.

TABLE 3
NITROGEN CAPACITY — SCFH
S.G = 0.987 T = 60° (F_L = 0.8)

| 10-30 psig RANGE SPRING | | | | | | | | |
|-----------------------------|----------------------------|------------------------|-------|-----------|----------------------------|-------|-------|-----------|
| Outlet Pressure P2, psig | Inlet Pressure P1, psig | SCFH @ 1" (25 mm) SIZE | | | SCFH @ 1-1/2" (40 mm) SIZE | | | |
| | | Droop | | Max. SCFH | Droop | | | Max. SCFH |
| | | 10% | 20% | | 10% | 20% | 30% | |
| 10 | 25 | 660 | 1,110 | 5,880 | 1,110 | 1,790 | 2,400 | 11,180 |
| | 30 | 740 | 1,250 | 6,620 | 1,250 | 2,010 | 2,700 | 12,590 |
| | 35 | 820 | 1,380 | 7,370 | 1,380 | 2,240 | 3,010 | 14,000 |
| | 40 | 910 | 1,520 | 8,110 | 1,520 | 2,460 | 3,310 | 15,400 |
| | 50 | 1,070 | 1,800 | 9,590 | 1,800 | 2,920 | 3,910 | 18,220 |
| | 60 | 1,240 | 2,080 | HI DP | 2,080 | 3,370 | HI DP | HI DP |
| | 70 | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP |
| 15 | 25 | 860 | 1,550 | 5,720 | 1,330 | 2,310 | 3,050 | 10,880 |
| | 30 | 990 | 1,790 | 6,610 | 1,530 | 2,670 | 3,520 | 12,560 |
| | 35 | 1,100 | 1,990 | 7,370 | 1,710 | 2,980 | 3,920 | 14,000 |
| | 40 | 1,220 | 2,190 | 8,110 | 1,880 | 3,280 | 4,310 | 15,400 |
| | 50 | 1,440 | 2,590 | 9,590 | 2,220 | 3,870 | 5,100 | 18,220 |
| | 60 | 1,660 | 2,990 | 11,070 | 2,570 | 4,470 | 5,890 | 21,030 |
| | 70 | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP |
| 20 | 25 | 1,170 | 1,880 | 4,720 | 1,330 | 2,180 | 2,980 | 8,960 |
| | 30 | 1,540 | 2,470 | 6,210 | 1,750 | 2,870 | 3,920 | 11,790 |
| | 35 | 1,800 | 2,880 | 7,240 | 2,040 | 3,350 | 4,580 | 13,760 |
| | 40 | 2,010 | 3,220 | 8,090 | 2,280 | 3,740 | 5,110 | 15,370 |
| | 50 | 2,380 | 3,820 | 9,590 | 2,700 | 4,430 | 6,060 | 18,220 |
| | 60 | 2,750 | 4,410 | 11,070 | 3,120 | 5,110 | 7,000 | 21,030 |
| | 70 | 3,110 | 5,000 | HI DP | 3,540 | 5,800 | HI DP | HI DP |
| | 80 | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP |
| 25 | 30 | 1,350 | 2,160 | 4,960 | 1,710 | 2,670 | 3,530 | 9,430 |
| | 35 | 1,800 | 2,890 | 6,630 | 2,280 | 3,570 | 4,720 | 12,590 |
| | 40 | 2,120 | 3,400 | 7,790 | 2,680 | 4,190 | 5,550 | 14,810 |
| | 50 | 2,600 | 4,170 | 9,570 | 3,290 | 5,150 | 6,810 | 18,180 |
| | 60 | 3,010 | 4,830 | 11,070 | 3,810 | 5,960 | 7,880 | 21,030 |
| | 70 | 3,410 | 5,470 | HI DP | 4,320 | 6,750 | 8,940 | HI DP |
| | 80 | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP |
| 30 | 35 | 2,150 | 2,420 | 5,190 | 1,920 | 3,170 | 4,070 | 9,860 |
| | 40 | 2,900 | 3,270 | 7,010 | 2,590 | 4,270 | 5,490 | 13,310 |
| | 50 | 3,860 | 4,350 | 9,330 | 3,450 | 5,690 | 7,310 | 17,730 |
| | 60 | 4,570 | 5,150 | 11,050 | 4,090 | 6,740 | 8,660 | 21,000 |
| | 70 | 5,200 | 5,850 | 12,550 | 4,640 | 7,660 | 9,840 | 23,850 |
| | 80 | 5,810 | 6,540 | HI DP | 5,190 | 8,560 | HI DP | HI DP |

NOTE: Where "HI DP" is indicated, the actual pressure drop has exceeded the recommended limits in Table 1.

TABLE 3 (cont.): NITROGEN CAPACITY — SCFH
S.G = 0.987 T = 60° (F_L = 0.8)

| 10-75 psig RANGE SPRING | | | | | | | | | |
|-----------------------------|----------------------------|------------------------|--------|-----------|----------------------------|--------|--------|-----------|--------|
| Outlet Pressure P2, psig | Inlet Pressure P1, psig | SCFH @ 1" (25 mm) SIZE | | | SCFH @ 1-1/2" (40 mm) SIZE | | | | |
| | | Droop | | Max. SCFH | Droop | | | Max. SCFH | |
| | | 10% | 20% | | 10% | 20% | 30% | | |
| 10 | 25 | 410 | 690 | 5,880 | 480 | 800 | 1,160 | 11,180 | |
| | 30 | 460 | 780 | 6,620 | 540 | 900 | 1,310 | 12,590 | |
| | 35 | 520 | 870 | 7,370 | 600 | 1,000 | 1,460 | 14,000 | |
| | 40 | 570 | 960 | 8,110 | 660 | 1,100 | 1,610 | 15,400 | |
| | 50 | 670 | 1,130 | 9,590 | 790 | 1,300 | 1,900 | 18,220 | |
| | 60 | 770 | 1,310 | 11,070 | 910 | 1,510 | 2,190 | 21,030 | |
| | 70 | 880 | 1,480 | 12,550 | 1,030 | 1,710 | 2,490 | 23,850 | |
| | 80 | 980 | 1,660 | 14,040 | 1,150 | 1,910 | 2,780 | 26,670 | |
| | 90 | 1,090 | 1,830 | 15,520 | 1,270 | 2,110 | 3,070 | 29,480 | |
| | 100 | 1,190 | 2,010 | 17,000 | 1,390 | 2,310 | 3,370 | 32,300 | |
| | 125 | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | |
| | 15 | 25 | 550 | 860 | 5,720 | 740 | 1,200 | 1,550 | 10,880 |
| 30 | | 630 | 990 | 6,610 | 860 | 1,390 | 1,790 | 12,560 | |
| 35 | | 710 | 1,100 | 7,370 | 960 | 1,550 | 1,990 | 14,000 | |
| 40 | | 780 | 1,220 | 8,110 | 1,050 | 1,700 | 2,190 | 15,400 | |
| 50 | | 920 | 1,440 | 9,590 | 1,250 | 2,010 | 2,590 | 18,220 | |
| 60 | | 1,060 | 1,660 | 11,070 | 1,440 | 2,320 | 2,990 | 21,030 | |
| 70 | | 1,210 | 1,880 | 12,550 | 1,630 | 2,640 | 3,390 | 23,850 | |
| 80 | | 1,350 | 2,110 | 14,040 | 1,820 | 2,950 | 3,790 | 26,670 | |
| 90 | | 1,490 | 2,330 | 15,520 | 2,020 | 3,260 | 4,190 | 29,480 | |
| 100 | | 1,630 | 2,550 | 17,000 | 2,210 | 3,570 | 4,590 | 32,300 | |
| 125 | | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | |
| 20 | | 25 | 560 | 870 | 4,720 | 720 | 1,210 | 1,600 | 8,960 |
| | 30 | 730 | 1,140 | 6,210 | 940 | 1,590 | 2,110 | 11,790 | |
| | 35 | 850 | 1,330 | 7,240 | 1,100 | 1,850 | 2,460 | 13,760 | |
| | 40 | 950 | 1,490 | 8,090 | 1,230 | 2,070 | 2,750 | 15,370 | |
| | 50 | 1,130 | 1,760 | 9,590 | 1,460 | 2,450 | 3,260 | 18,220 | |
| | 60 | 1,310 | 2,040 | 11,070 | 1,680 | 2,830 | 3,760 | 21,030 | |
| | 70 | 1,480 | 2,310 | 12,550 | 1,910 | 3,210 | 4,270 | 23,850 | |
| | 80 | 1,660 | 2,580 | 14,040 | 2,130 | 3,590 | 4,770 | 26,670 | |
| | 90 | 1,830 | 2,860 | 15,520 | 2,360 | 3,970 | 5,280 | 29,480 | |
| | 100 | 2,010 | 3,130 | 17,000 | 2,580 | 4,350 | 5,780 | 32,300 | |
| | 125 | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | |
| | 25 | 30 | 640 | 1,130 | 4,960 | 900 | 1,460 | 1,970 | 9,430 |
| 35 | | 860 | 1,510 | 6,630 | 1,210 | 1,950 | 2,640 | 12,590 | |
| 40 | | 1,010 | 1,780 | 7,790 | 1,420 | 2,290 | 3,100 | 14,810 | |
| 50 | | 1,240 | 2,180 | 9,570 | 1,740 | 2,810 | 3,810 | 18,180 | |
| 60 | | 1,440 | 2,520 | 11,070 | 2,010 | 3,250 | 4,410 | 21,030 | |
| 70 | | 1,630 | 2,860 | 12,550 | 2,280 | 3,690 | 5,000 | 23,850 | |
| 80 | | 1,820 | 3,200 | 14,040 | 2,550 | 4,130 | 5,590 | 26,670 | |
| 90 | | 2,020 | 3,540 | 15,520 | 2,820 | 4,560 | 6,180 | 29,480 | |
| 100 | | 2,210 | 3,880 | 17,000 | 3,090 | 5,000 | 6,770 | 32,300 | |
| 125 | | 2,690 | 4,720 | HI DP | 3,770 | 6,090 | HI DP | HI DP | |
| 150 | | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | |
| 30 | | 35 | 780 | 1,430 | 5,190 | 1,040 | 1,780 | 2,350 | 9,860 |
| | 40 | 1,050 | 1,930 | 7,010 | 1,400 | 2,400 | 3,170 | 13,310 | |
| | 50 | 1,400 | 2,580 | 9,330 | 1,870 | 3,190 | 4,220 | 17,730 | |
| | 60 | 1,660 | 3,050 | 11,050 | 2,210 | 3,780 | 4,990 | 21,000 | |
| | 70 | 1,880 | 3,460 | 12,550 | 2,510 | 4,290 | 5,670 | 23,850 | |
| | 80 | 2,110 | 3,870 | 14,040 | 2,810 | 4,800 | 6,340 | 26,670 | |
| | 90 | 2,330 | 4,280 | 15,520 | 3,100 | 5,310 | 7,010 | 29,480 | |
| | 100 | 2,550 | 4,690 | 17,000 | 3,400 | 5,810 | 7,680 | 32,300 | |
| | 125 | 3,110 | 5,710 | HI DP | 4,140 | 7,080 | 9,360 | HI DP | |
| | 150 | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | |
| | 35 | 40 | 930 | 1,680 | 5,410 | 1,190 | 2,010 | 2,720 | 10,280 |
| | | 50 | 1,500 | 2,710 | 8,750 | 1,920 | 3,250 | 4,390 | 16,620 |
| 60 | | 1,860 | 3,360 | 10,840 | 2,390 | 4,030 | 5,440 | 20,600 | |
| 70 | | 2,160 | 3,880 | 12,530 | 2,760 | 4,660 | 6,290 | 23,810 | |
| 80 | | 2,410 | 4,350 | 14,040 | 3,090 | 5,220 | 7,050 | 26,670 | |
| 90 | | 2,670 | 4,810 | 15,520 | 3,410 | 5,770 | 7,790 | 29,480 | |
| 100 | | 2,920 | 5,270 | 17,000 | 3,740 | 6,320 | 8,530 | 32,300 | |
| 125 | | 3,560 | 6,420 | HI DP | 4,550 | 7,700 | 10,390 | HI DP | |
| 150 | | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | |
| 45 | | 50 | 1,160 | 2,210 | 5,820 | 1,720 | 2,550 | 3,460 | 11,060 |
| | | 60 | 1,910 | 3,640 | 9,570 | 2,830 | 4,190 | 5,680 | 18,180 |
| | | 70 | 2,390 | 4,540 | 11,950 | 3,540 | 5,230 | 7,100 | 22,700 |
| | 80 | 2,770 | 5,260 | 13,840 | 4,100 | 6,060 | 8,220 | 26,300 | |
| | 90 | 3,100 | 5,890 | 15,490 | 4,580 | 6,780 | 9,200 | 29,430 | |
| | 100 | 3,400 | 6,460 | 17,000 | 5,030 | 7,450 | 10,100 | 32,300 | |
| | 125 | 4,140 | 7,870 | 20,700 | 6,130 | 9,070 | 12,300 | 39,340 | |
| | 150 | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | HI DP | |
| | 50 | 60 | 1,890 | 3,400 | 8,290 | 2,700 | 4,660 | 5,510 | 15,750 |
| | | 70 | 2,580 | 4,630 | 11,300 | 3,680 | 6,350 | 7,500 | 21,460 |
| | | 80 | 3,080 | 5,530 | 13,490 | 4,400 | 7,580 | 8,960 | 25,640 |
| | | 90 | 3,500 | 6,290 | 15,330 | 5,000 | 8,620 | 10,180 | 29,130 |
| 100 | | 3,870 | 6,960 | 16,970 | 5,530 | 9,540 | 11,270 | 32,240 | |
| 125 | | 4,720 | 8,490 | 20,700 | 6,750 | 11,640 | 13,750 | 39,340 | |
| 150 | | 5,570 | 10,010 | HI DP | 7,960 | 13,720 | HI DP | HI DP | |
| 60 | | 70 | 2,140 | 3,800 | 8,850 | 3,330 | 5,570 | 7,040 | 16,810 |
| | | 80 | 2,940 | 5,220 | 12,130 | 4,560 | 7,640 | 9,660 | 23,050 |
| | | 90 | 3,520 | 6,250 | 14,540 | 5,470 | 9,160 | 11,570 | 27,630 |
| | | 100 | 4,000 | 7,110 | 16,540 | 6,220 | 10,420 | 13,170 | 31,430 |
| | | 125 | 5,010 | 8,900 | 20,700 | 7,780 | 13,040 | 16,470 | 39,320 |
| | 150 | 5,910 | 10,500 | HI DP | 9,180 | 15,380 | HI DP | HI DP | |
| 75 | 80 | 1,990 | 3,440 | 6,900 | 3,370 | 5,090 | 6,820 | 13,110 | |
| | 90 | 3,350 | 5,790 | 11,620 | 5,670 | 8,580 | 11,480 | 22,080 | |
| | 100 | 4,230 | 7,320 | 14,690 | 7,170 | 10,840 | 14,520 | 27,920 | |
| | 125 | 5,800 | 10,030 | 20,140 | 9,830 | 14,870 | 19,900 | 38,280 | |
| | 150 | 7,020 | 12,130 | HI DP | 11,890 | 17,980 | HI DP | HI DP | |

NOTE: Where "HI DP" is indicated, the actual pressure drop has exceeded the recommended limits in Table 1.

