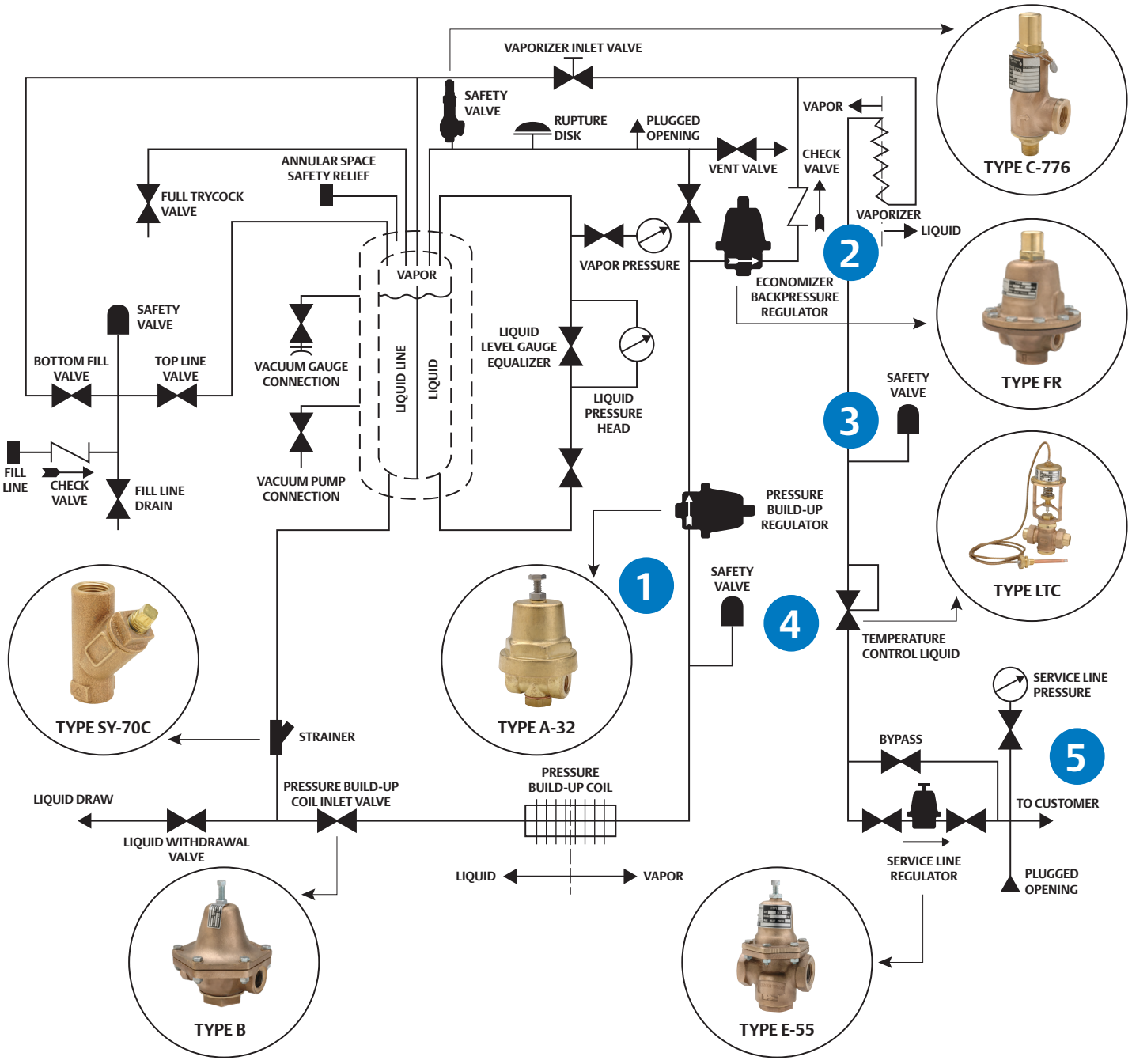
Cash Valve Cryogenic Products

Cash Valve Portfolio of Products

Provides solutions for cryogenic tanks and systems.

CASH VALVE™

Liquid-Gas Distribution System Schematic Diagram



Cryogenic System Segments

1. Pressure Build Circuit

- Head pressure not sufficient to supply final line so pressure maintained about 25 psi above the service line
- When pressure reaches setpoint, the regulator shuts off, stopping vaporization and pressure build-up. Regulator reopens when demand initiated at the final line
- Takes liquid from base of Dewar, passes through valve and heat exchanger and is vaporized after being warmed by ambient air
- Typically between 125 and 175 psig
- Regulator may be located before or after heat exchanger but makes big difference in valve size

2. Economizer Circuit

- Usually set 10 to 25 psig above the set pressure of build-up regulator
- When no gas being used, heat leakage into the tank causes gas pressure to rise
- Excess pressure bypassed into final vaporizer circuit to prevent losing gas to atmosphere through safety valve

3. Combination Valves

- Combines pressure building and economizer functions
- Economizer function can start just before or when the pressure building pressure is reached

4. Low Pressure Cut-Off Circuit

- Temperature control valve designed to trip when gas temperature reaches a predetermined level (usually -20°F)
- Most common cause is rapid gas draw
- Temperature control valve trips to prevent excessively cold gas from being delivered to service end of system when setpoint reached
- Valve automatically opens when gas temperature rises above setpoint

5. Final Line (House Line)

- Demand causes flow from system first
- Liquid flow passes through heat exchanger and is warmed by ambient air or steam
- Phase change occurs in the vaporizer to convert back to gas
- Pressure controlled using regulator
- Standard elastomers can be used for service line regulator since gas at or near ambient temperature

Cryogenic

Relief Valves

Maximum Inlet Pressure	Outlet Pressure Range	Size	Maximum Capacity		Type Number
600 psig / 41.4 bar	15 to 600 psig / 1 to 41.4 bar	1/2 to 3/4 in.	4800 to 99,060 SCFH / 128.6 to 2654.8 Nm^3h		**C-776** Bronze
500 psig / 34.5 bar	15 to 500 psig / 1 to 34.5 bar	1 to 2 in.	9660 to 817,920 SCFH / 258.9 to 21,920 Nm^3h		**C-776** Bronze
600 psig / 41.4 bar	15 to 600 psig / 1 to 41.4 bar	1/4 to 1/2 in.	1560 to 32,040 SCFH / 41.8 to 859 Nm^3h		**C600** Brass

Isolation Valves and Strainers

Maximum Inlet Pressure	Outlet Pressure Range	Size	Maximum Capacity		Type Number
700 psig / 48.3 bar	----	1/4 to 1/2 in.	----		**2300** Brass
400 psig / 27.6 bar	----	1/2 to 2 in.	----		**SY-70C** Bronze

Pressure Build

Maximum Inlet Pressure	Outlet Pressure Range	Size	Maximum Capacity		Type Number
600 psig / 41.4 bar	2 to 600 psig / 0.1 to 41.4 bar	1/4 to 3/8 in.	2027 SCFH / 54 Nm^3h		**A-32** Bronze
600 psig / 41.4 bar	10 to 400 psig / 0.7 to 27.6 bar	3/8 in.	2027 SCFH / 54 Nm^3h		**A-36** Brass
600 psig / 41.4 bar	20 to 600 psig / 1.4 to 41.4 bar	1/2 in.	----		**A-401** Bronze
720 psig / 49.6 bar	5 to 250 psig / 0.3 to 17.2 bar	1/4 to 2 in.	282 to 341,940 SCFH / 8 to 9164 Nm^3h		**B** Bronze
720 psig / 49.6 bar	10 to 600 psig / 0.7 to 41.4 bar	1/2 to 1 in.	240 to 57,600 SCFH / 6 to 1544 Nm^3h		**B-95** SST
600 psig / 41.4 bar	5 to 600 psig / 0.3 to 41.4 bar	1/4 to 1 1/2 in.	132 to 7260 SCFH / 4 to 195 Nm^3h		**G-60** Bronze, SST
400 psig / 27.6 bar	25 to 300 psig / 1.7 to 20.7 bar	1/2 to 2 in.	240 to 8400 SCFH / 6 to 225 Nm^3h		**E-55** Bronze
2400 psig / 165.5 bar	1 to 250 psig / 0.1 to 17.2 bar	3/8 to 3/4 in.	7500 to 42,000 SCFH / 201 to 1126 Nm^3h		**LS** Bronze

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Backpressure Regulators (Economizers)

Maximum Inlet Pressure	Outlet Pressure Range	Size	Maximum Capacity		Type Number
520 psi / 35.9 bar	0 to 400 psig / 0 to 27.6 bar	1/2 to 2 in.	**Gas:** 420 to 90,000 SCFH / 11.3 to 2412 Nm^3h **Liquid:** 1.5 to 162 gpm		**FR** Cast Iron, Bronze
780 psi / 53.8 bar	200 to 600 psig / 14 to 41.4 bar	1/2 to 2 in.	**Gas:** 3600 to 126,000 SCFH / 96.5 to 3376 Nm^3h **Liquid:** 10 to 162 gpm		**FR-6** Cast Iron, Bronze
325 psi / 22.4 bar	0 to 250 psig / 0 to 17.2 bar	1/2 to 2 in.	**Gas:** 420 to 45,000 SCFH / 11.3 to 1206 Nm^3h **Liquid:** 1.5 to 82 gpm		**FR-10** Cast Iron, Bronze
720 psi / 49.6 bar	0 to 250 psig / 0 to 17.2 bar	1/8 to 3/8 in.	**Gas:** 18 to 2100 SCFH / 0.5 to 56 Nm^3h **Liquid:** 0.2 to 1.5 gpm		**FRM** Brass, SST

Pressure Build Economizers

Maximum Inlet Pressure	Outlet Pressure Range	Size	Maximum Capacity		Type Number
600 psig / 41.4 bar	50 to 300 psig / 3.4 to 24.1 bar	1/4 in.	----		**PBE-1A** Brass
400 psig / 27.6 bar	10 to 250 psig / 0.7 to 17.2 bar	1/2 in.	----		**PBE-2** Bronze
650 psig / 44.8 bar	0 to 650 psig / 0 to 44.8 bar	1/2 in.	----		**PBE-5** Brass

Low Temperature Cutoff

Maximum Inlet Pressure	Outlet Pressure Range	Size	Maximum Capacity		Type Number
400 psi / 27.6 bar	----	1/2 to 2 in.	147,268 SCFH / 3947 Nm^3/h		**LTC** Bronze

Final Line

Maximum Inlet Pressure	Outlet Pressure Range	Size	Maximum Capacity		Type Number
400 psig / 27.6 bar	25 to 300 psig / 1.7 to20.7 bar	1/2 to 2 in.	240 to 8400 SCFH / 6 to 225 Nm^3/h		**E-55** Bronze
400 psig / 27.6 bar	2 to 175 psig / 0.1 to 12.1 bar	1/4 in.	480 to 3240 SCFH / 13 to 87 Nm^3/h		**A-31** Brass
600 psig / 41.4 bar	20 to 600 psig / 1.4 to 41.4 bar	1/2 in.	----		**A-401** Bronze