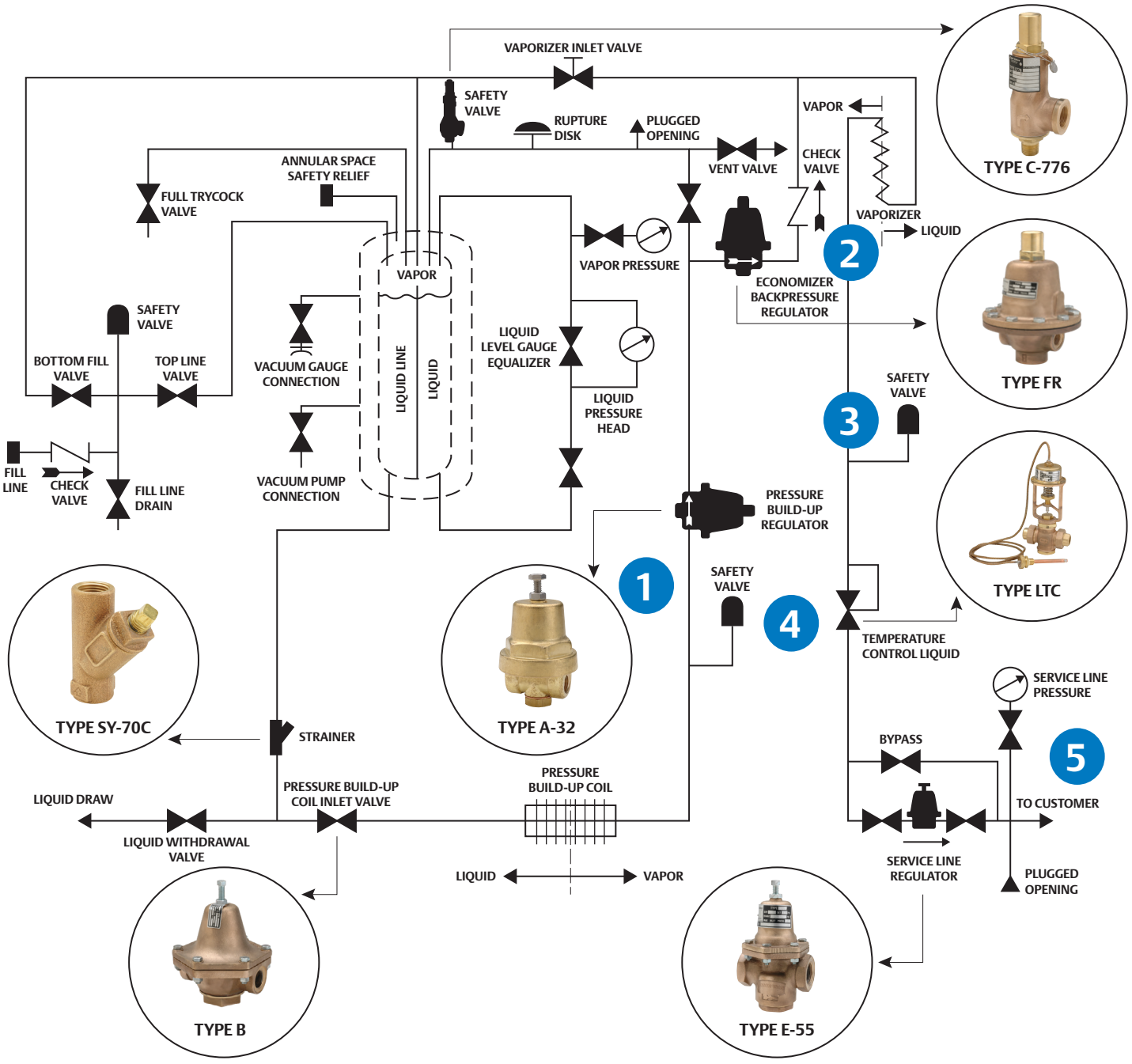
Cash Valve Cryogenic Products

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

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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

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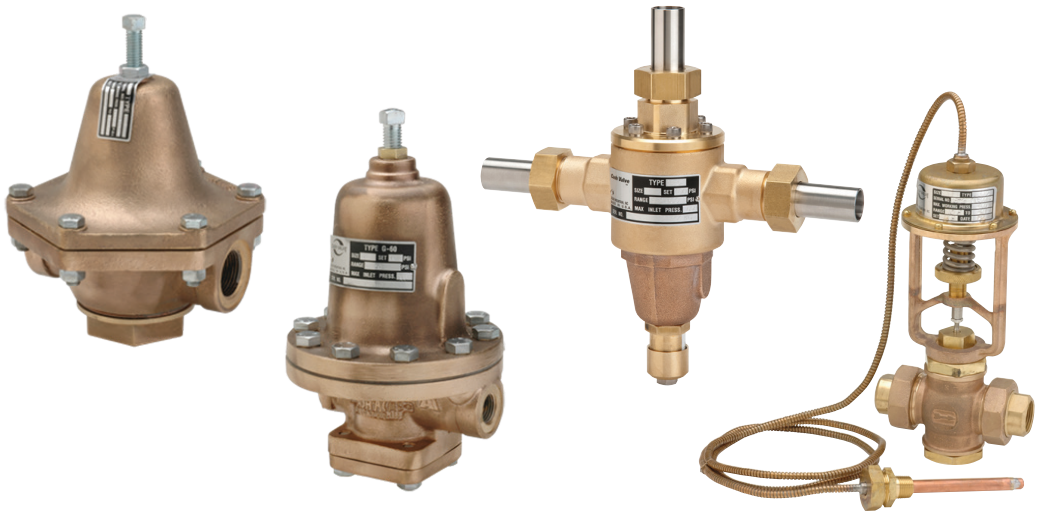

Cash Valve

Americas
T +1 800 558 5853
T +1 972 548 3574

Europe
T +39 051 419 0611

Asia Pacific
T +65 6777 8211

Middle East / Africa
T +971 4811 8100

webadmin.regulators@emerson.com
CashValve.com