Pressure & Flame Protection

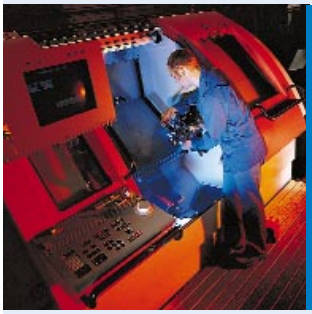
Cash

Cryogenic Products

Bailey and Cash

Bailey and Cash have been sister companies since the early 1990's. These two product lines have been integrated and now offer existing and new Cash cryogenic customers the benefits of the well established Bailey distribution network and international sales offices. In doing so, we are able to provide local knowledge and expertise on a global scale.

Utilising our established and extensive commercial and manufacturing systems to control order routing, we can now offer a wider range of products from our Bailey factory in the UK. These products can be supplied drop shipped from the USA or directly from our complementary UK stock.





Bailey

Bailey is located in Manchester, United Kingdom and we have been developing and manufacturing valves for more than 160 years. By employing modern techniques and "cutting edge" equipment, we continue to pioneer new developments in valve technology, while delivering the high standards of quality and service expected from our growing customer base.

At Bailey we design and manufacture safety relief valves, pressure reducing valves and associated products that are used extensively throughout the process industry. The performance of Bailey products has been proven time and time again in demanding environments such as chemical, food and drink, heating and pharmaceutical industries. These industries demand accurate in-process regulation and require the highest level of over-pressure protection to ensure the safety of plant and personnel.

Bailey possesses one of the best Research and Development Laboratories in Europe. With continual investments in high specification machinery and a state of the art clean room facility, Bailey has provided a wide range of products for many years. Our products are available for any application, including cryogenic and oxygen clean duties.

Cash

Cash is located in North Carolina, USA and they have been developing and manufacturing cryogenic valves for decades. They are renowned world wide for their quality and expertise in the field of cryogenic gas applications. Cash continue to pioneer new and innovative developments in this field, which are continually delivered to the high standards of quality expected from the demanding industrial gas producers of the world.

Also available:

- **Birkett** - API/ASME Spring loaded and pilot operated safety relief valves and thermal relief valves.
- **Amal** - Flame arresters.
- **Marston** - Bursting discs and explosion vent panels.
- **Marvac** - Tank protection valves.

Safety Systems UK Ltd.

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Cryogenic Products

The Cash range of cryogenic products are used predominantly on cryogenic gas systems. Many industrial gas supply companies now supply their gas in its liquefied state. In this context the term "cryogenics" is the liquefaction of gases. Typically the liquid is then turned back to a gas on site, whenever demand is generated.

Many different gases can be supplied in a liquefied state, from fine industrial gases such as nitrogen, to medical gases such as oxygen.

Industrial gas companies still supply these gases to small gas users, such as small oxyacetylene welding shops, doctors, etc., in the high pressure, compressed gas state. However, when the usage is substantial, there are valid commercial reasons to supply the gas in the liquid state.

Liquefied gas occupies only a quarter of the space of a compressed gas. For example a welding shop can replace 17 oxyacetylene cylinders with just one 1,250 litre cryogenic vessel. This saves storage space and saves time in changing bottles.

The liquefied gas is stored in a "dewar". A dewar can range from the size of a man to the size of a building and is designed like a highly specified Thermos flask - keeping heat out of the vessel whilst maintaining the cryogenic temperature inside.

There are various elements to a typical dewar; the pressure build circuit, the safety relief system, the economiser circuit and the final "house" supply line.

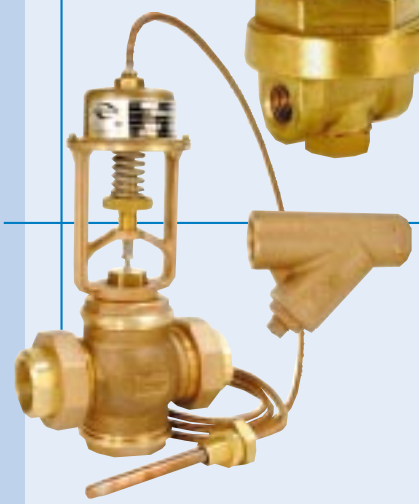
The Cash range has products which are used in all of the above areas.

Safety Relief

A full range of safety relief valves and bursting discs are available to protect the dewar from over pressurisation.

Pressure Regulation

Several ranges of back pressure and pressure reducing valves are available to regulate pressure in the various parts of the dewar system.



Associated Products

Strainers, low temperature cut off valves and isolating valves are also available to complement the above items.

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The Cryogenic System

While each gas company will have their own very different and individual designs, the example below illustrates the key elements of the system and the types of products available from Bailey-Cash.

Pressure Build Circuit

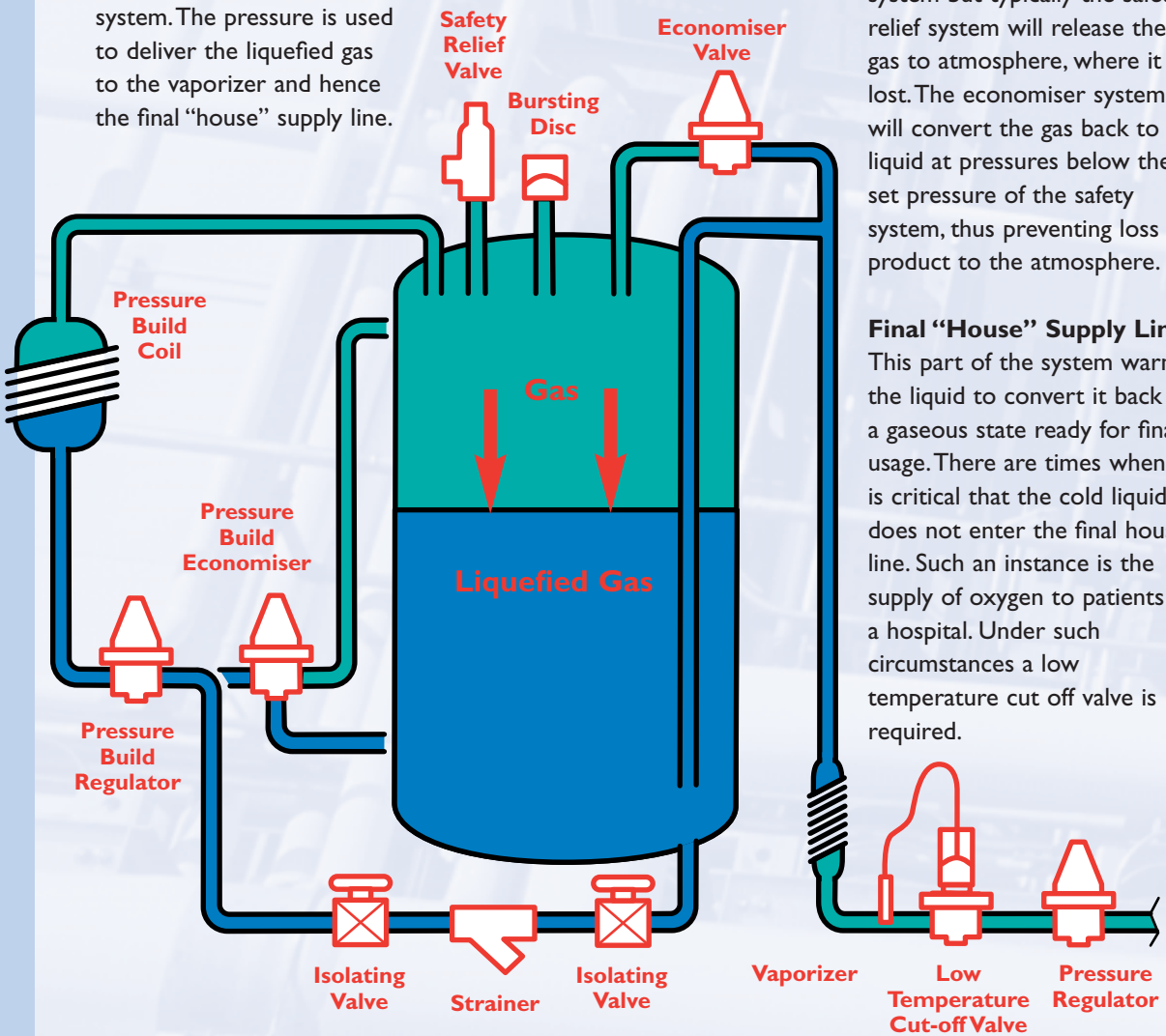
A dewar stores liquefied gas at cryogenic temperatures. Heating this liquid in the pressure build coil changes its state to gas; this gas is fed to the top of the dewar, which pressurises the system. The pressure is used to deliver the liquefied gas to the vaporizer and hence the final "house" supply line.

Safety Relief System

If the pressure build circuit becomes uncontrolled, the pressure will continue to rise to unacceptable levels. Therefore the dewar needs protection from over pressurisation by either a safety relief valve, bursting disc or a combination of the two.

Economiser Circuit

There will be times when there is no demand on the dewar, and while it is very well insulated, it will still absorb some temperature from the atmosphere - particularly on hot days. This heat absorption will tend to convert the liquid to gas and thus pressurise the system. The system is protected by the safety relief system but typically the safety relief system will release the gas to atmosphere, where it is lost. The economiser system will convert the gas back to liquid at pressures below the set pressure of the safety system, thus preventing loss of product to the atmosphere.



Final "House" Supply Line

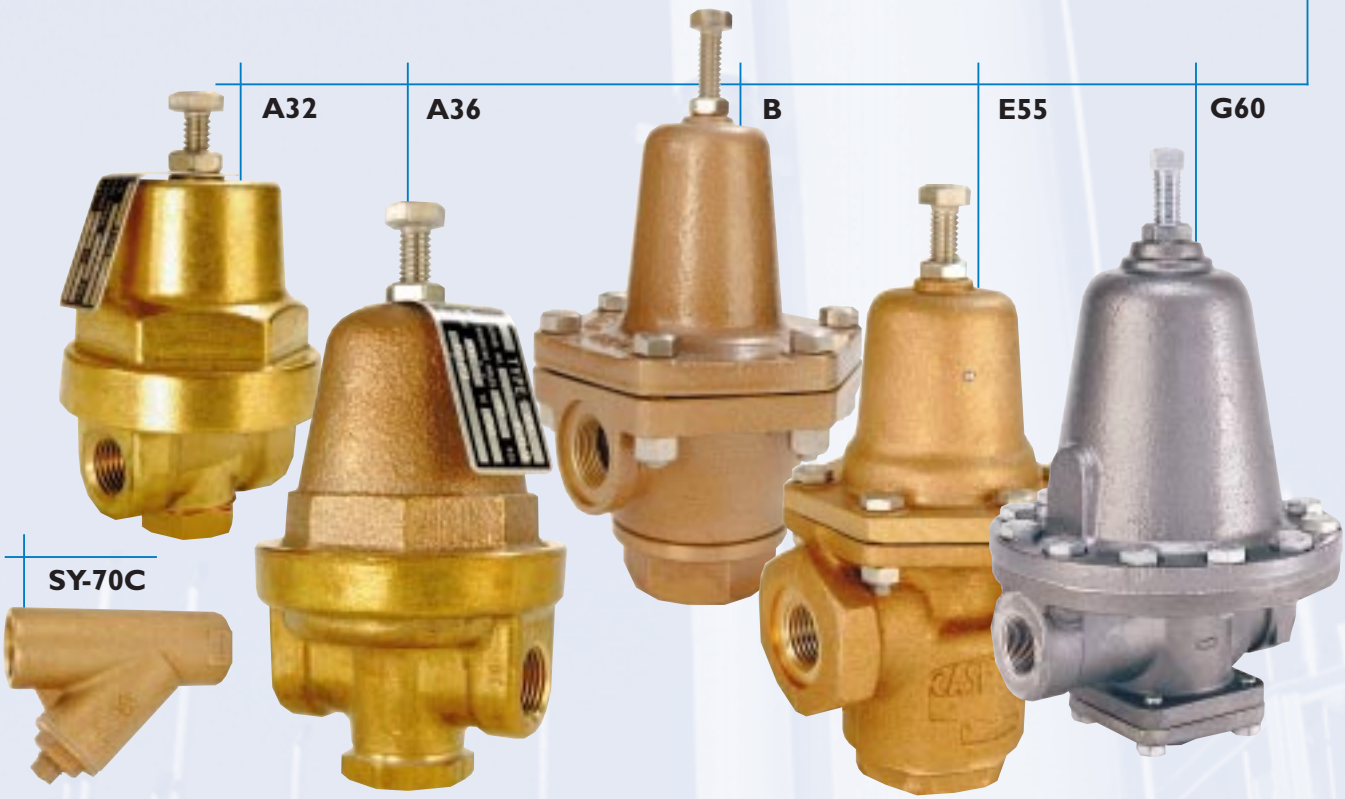
This part of the system warms the liquid to convert it back to a gaseous state ready for final usage. There are times when it is critical that the cold liquid does not enter the final house line. Such an instance is the supply of oxygen to patients in a hospital. Under such circumstances a low temperature cut off valve is required.

Pressure Build Economiser

At Cash we have developed a range of combination valves, which combine the functions of the back pressure regulator and the economiser valve.

These valves can simplify the layout of the system, reduce the amount of pipe work and the number of valves required.

Pressure Build Circuit



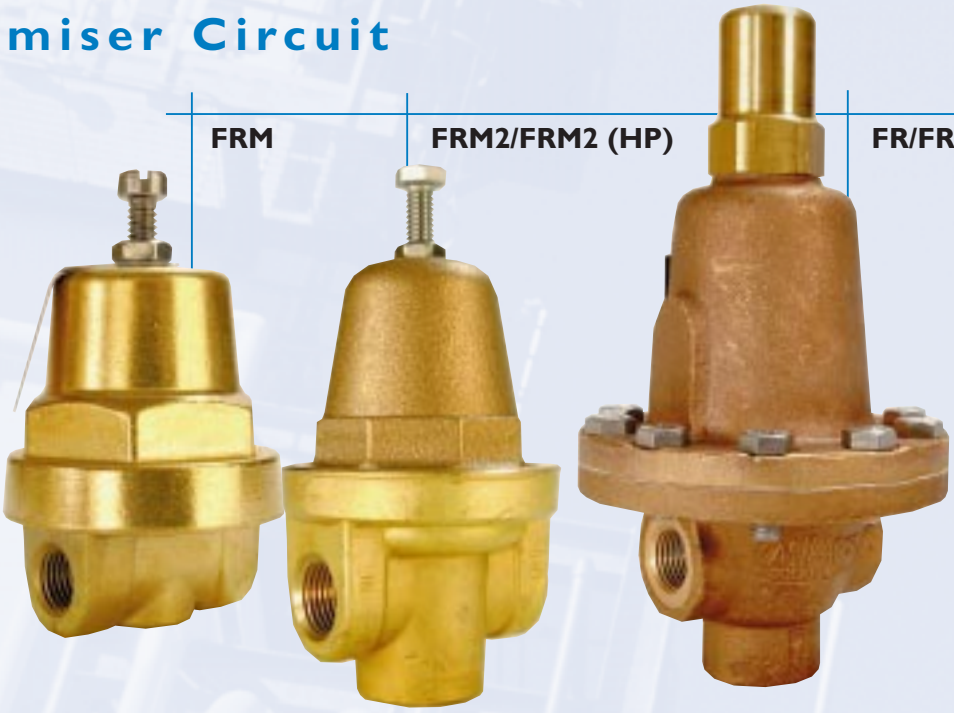
Final "House" Supply Line

Economiser Circuit

FRM

FRM2/FRM2 (HP)

FR/FR6

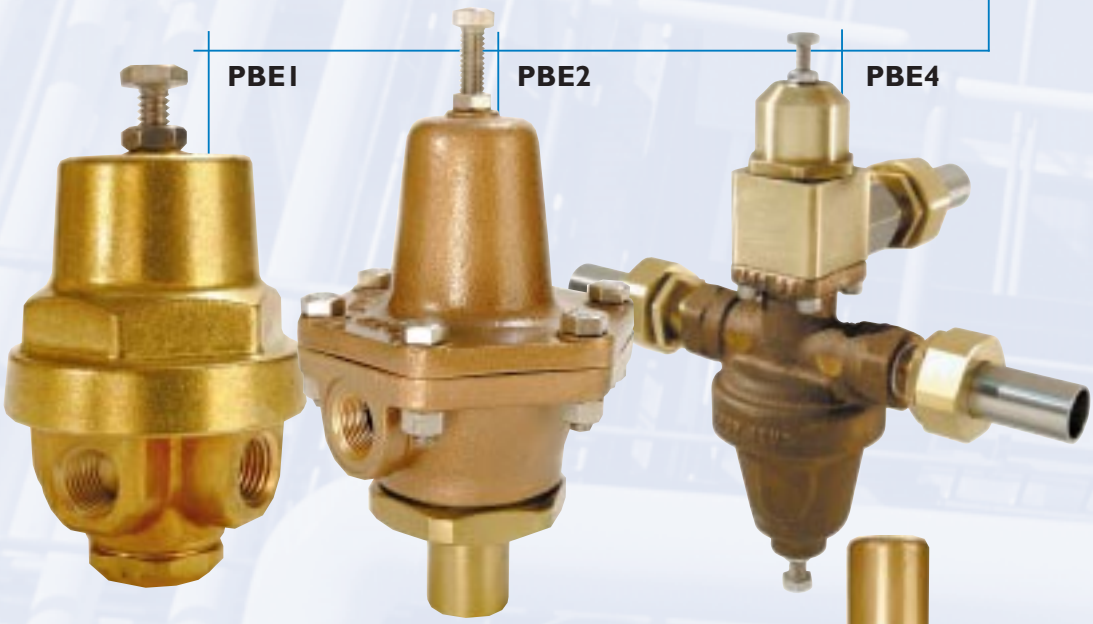


Pressure Build Economiser Circuit

PBE1

PBE2

PBE4



Safety Relief System

Bursting Discs

Safety Relief Valve 776

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Type	Model	Sizes	Connections	Body Materials	Temperature Range °C (°F)	Max. Inlet Pressure Barg (Psig)	Outlet Pressure Range Barg (Psig)
Pressure Build Regulator	A-32	¼" & ⅜"	Screwed	Brass or Stainless	-196 to 65 (-320 to +150)	41.4 (600)	0.14 to 41.4 (2 to 600)
	A-36	⅜"	Screwed	Brass or Stainless	-196 to 65 (-320 to +150)	27.6 (400)	0.7 to 17.2 (10 to 250)
	B	¼" to 1"	Screwed	Bronze	-196 to 65 (-320 to +150)	27.6 (400)	0.7 to 17.2 (10 to 250)
	B	1-¼" & 1-½"	Screwed	Bronze	-196 to 65 (-320 to +150)	27.6 (400)	0.7 to 10.3 (10 to 150)
	B	2"	Screwed	Bronze	-196 to 65 (-320 to +150)	27.6 (400)	0.35 to 6.9 (5 to 100)
	E-55	1-¼" to 2"	Screwed	Bronze	-196 to 65 (-320 to +150)	27.6 (400)	1.38 to 20.7 (20 to 300)
	G-60	¼" to 1"	Screwed	Bronze or Stainless	-196 to 65 (-320 to +150)	41.4 (600)	0.35 to 41.4 (5 to 600)
	G-60	1-¼" & 1-½"	Screwed	Bronze or Stainless	-196 to 65 (-320 to +150)	41.4 (600)	0.35 to 27.6 (5 to 400)
Strainer	SY-70C	½" to 1-½"	Screwed	Bronze	-196 to 65 (-320 to +150)	27.6 (400)	
	SY-70C	2"	Screwed	Stainless	-196 to 65 (-320 to +150)	27.6 (400)	
Low Temp. Cut-off	LTC	½" to 2"	Screwed	Bronze	-196 to 150 (-320 to + 300)	27.6 (400)	
Pressure Regulator	A-31	¼"	Screwed	Brass	-18 to 65 (0 to +150)	27.6 (400)	0.14 to 12.1 (2 to 175)
	G4	½" to 2"	Screwed	Brass or Stainless	-20 to 260 (-4 to +500)	41.4 (600)	0.7 to 21 (10 to 300)
	G4	½" to 2"	Flanged	Brass or Stainless	-20 to 260 (-4 to +500)	41.4 (600)	0.7 to 21 (10 to 300)
	E-55	½" to 1"	Screwed	Bronze	-18 to 65 (0 to +150)	27.6 (400)	0.7 to 17.2 (10 to 250)
	E-55	1-¼" to 2"	Screwed	Bronze	-18 to 65 (0 to +150)	27.6 (400)	1.38 to 20.7 (20 to 300)
Back Pressure Regulator	FR	½" to 2"	Screwed	Bronze or Stainless	-196 to 65 (-320 to + 150)	17.2 (250)	0 to 17.2 (0 to 250)
	FR-6	½"	Screwed	Bronze or Stainless	-196 to 65 (-320 to +150)	41.4 (600)	0 to 41.4 (0 to 600)
	FR-6	¾" to 2"	Screwed	Bronze or Stainless	-196 to 65 (-320 to +150)	27.6 (400)	0 to 27.6 (0 to 400)
	FRM	¼" & ⅜"	Screwed	Bronze or Stainless	-196 to 65 (-320 to +150)	41.4 (600)	0.14 to 41.4 (2 to 600)
	FRM-2	¼" to ½"	Screwed	Bronze or Stainless	-196 to 65 (-320 to +150)	17.2 (250)	0 to 19 (0 to 275)
	FRM-2 (HP)	¼" to ½"	Screwed	Bronze or Stainless	-196 to 65 (-320 to +150)	27.6 (400)	13.8 to 27.6 (200 to 400)
Combination Regulator	PBE-1	¼"	Screwed	Brass	-196 to 65 (-320 to +150)	27.6 (400)	3.5 to 24.1 (50 to 350)
	PBE-2	½"	Screwed	Bronze	-196 to 65 (-320 to +150)	27.6 (400)	0.7 to 17.2 (10 to 250)
	PBE-4	½"	Screwed	Bronze	-196 to 65 (-320 to +150)	41.4 (600)	6.7 to 41.4 (100 to 600)
Safety Valve	776	½" to 1"	Screwed	Bronze or Stainless	-196 to 65 (-320 to +150)	41.4 (600)	
	776	1½" to 2"	Screwed	Bronze or Stainless	-196 to 65 (-320 to +150)	34.5 (500)	
Bursting (Rupture) Disc	Forward Acting	½" to 2"	Screwed or Flanged	Stainless	-196 to 65 (-320 to +150)	51 (740)	
	Reverse Buckling	½" to 2"	Screwed or Flanged	Stainless	-196 to 65 (-320 to +150)	51 (740)	

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