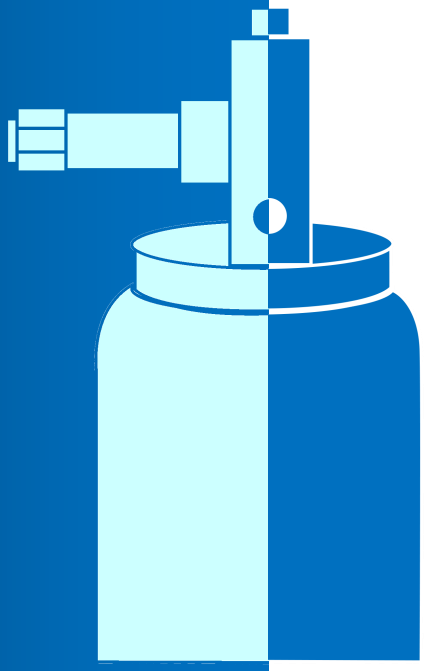
BRISTOL



Engineered Clean Agent Fire Extinguishing System

Content Index

Typical Manifold System

HFC227ea Fire Suppression System
UL Listed

HFC-227ea gas fire extinguishing system includes the cylinder kit, manual release device, discharge hose, check valve, manifold, and relief device of distributor manifold, pressure operating switch, pipe ware and nozzle. HFC-227ea gas fire extinguishing system is linked with automatic alarm system for automatic control.

BRISTOL typical manifold systems are only for single area protection.

For single area system, the solenoid actuator will act to open the master cylinder after getting the instruction from control panel, and then the gas from the master cylinder will open the slave cylinders.

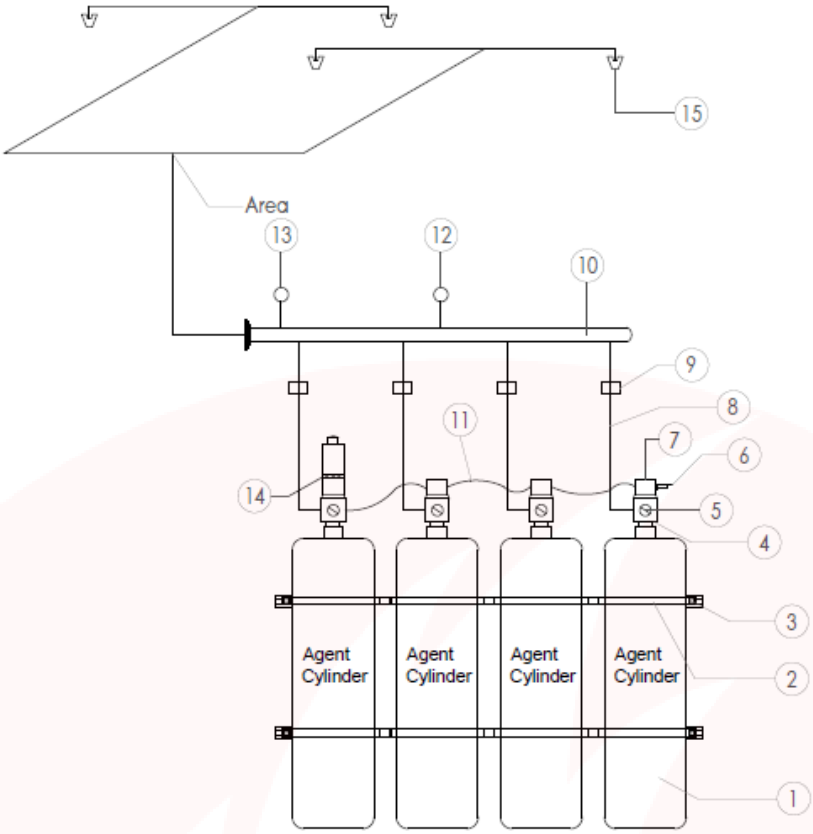


Figure 2.1 *- BRISTOL Manifold System for Single Area System*

PART NO.	PART NAME
1	Cylinder
2	Mounting Bracket
3	Fix Steel Channel
4	Container Valve
5	Agent Pressure Gauge
6	Bleed Valve
7	Pneumatic Actuator
8	Discharge Hose

PART NO.	PART NAME
9	Manifold Check Valve
10	Manifold
11	Pilot Hose
12	Manifold Safety Valve
13	Discharge Pressure Switch
14	Solenoid Actuator
15	Nozzle

HFC-227ea Clean Agent

UL Listed

DESCRIPTION

HFC-227ea is a clean, gaseous agent containing no particles or oily residues. It is produced under ISO 9002 guidelines to strict manufacturing specifications ensuring product purity. HFC-227ea leaves no residue or oily deposits on delicate electronic equipment, and can be removed from the protected space by ventilation.

HFC-227ea is thermally and chemically stable, but without the extremely long atmospheric lifetimes associated with other proposed halon replacements. The atmospheric lifetime of HFC-227ea has been determined to be 36.5 years. The US EPA SNAP does not consider HFC-227ea to be a long lived substance when discharged, and as such has placed no restrictions on its use (Environmental Protection Agency's Significant New Alternatives Program).

- Bank Vaults
- Rare Book Stores
- Telephone Exchanges
- Communication Centre
- Control Rooms
- Flammable Liquid Stores
- Libraries
- Electronic Data Processing
- Studios
- Transformer and Switch Rooms
- Test Laboratories
- Auxiliary Power Room

Typical areas that can be protected by an HFC-227ea system are detailed below; the list is by no means exhaustive:

The present understanding of the functioning of HFC-227ea is that 80% of its fire fighting effectiveness is achieved through heat absorption and 20% through direct chemical means (action of the fluorine radical on the chain reaction of a flame). Complete suppression using HFC-227ea has the following advantages:

- The low concentration of HFC-227ea required means less visual obscurity and minimal risk to personnel.
- The small quantity of agent discharged minimizes overpressurization of the protected area.
- Maximum safety for personnel due to low toxicity.
- Most effective when used with automatic detection to introduce HFC-227ea rapidly .
- The ability to prevent re-ignition as long as concentration levels are maintained.

HFC-227ea is stored as a liquified compressed gas and is discharged into the protected area as a vapour. It is stored in approved TPED/GB/DOT containers and is super-pressurised with dry nitrogen to 25 Bar @ 21°C (360 PSI @ 70°F) and 42 Bar @ 21°C (600 PSI @ 70°F).

WARNING

HFC-227ea shall not be used on fires involving the following materials unless they have been tested to the satisfaction of the authority having jurisdiction:

- Certain chemicals or mixtures of chemicals, such as cellulose nitrate and gunpowder, those are capable of rapid oxidation in the absence of air.
- Reactive metals such as lithium, sodium, potassium, magnesium, titanium, zirconium, uranium and plutonium.
- Metal hydrides.
- Chemicals capable of undergoing autothermal decomposition, such as certain organic peroxidase and hydrazine.

HFC-227ea Clean Agent

UL Listed

Agent Physical Properties

Table 1.1 HFC-227ea Agent Physical Properties

Chemical structure	CF_3CHFCF_3
Chemical name	Heptafluoropropane
Molecular weight	170
Boiling point	-16.4°C (1.9°F)
Freezing point	-131.1°C (-204°F)
Critical temperature	101.7°C (214°F)
Critical pressure	2912 kPa (422 psi)
Critical volume	274 cc/mole (.0258cuft./ lb.)
Critical density	621 kg/m³ (38.76lb./ft³)
Saturated vapour density@20°C (68°F)	31.18 kg/m³ (1.95lb./ft³)
(Reference: NFPA2001)	

Table 1.2 Nitrogen Physical Properties

Chemical structure	N2
Chemical name	Nitrogen
Molecular weight	28
Boiling point	-195.8°C (-320.4°F)
Freezing point	-210.0°C (-346°F)
Critical temperature	-146.9°C (-232.4°F)
Critical pressure	3399 kPa (492.9 psi)

(Reference: NFPA2001)

Table 1.2 Nitrogen Physical Properties

Environmental	
Ozone Depletion(ODP)	0
Atmospheric Life time (yrs)	36.5
Toxicology	
Acute Exposure LC50 (%)	>80
Cardiac Sensitization	
No Observed Adverse Effect Level (NOAEL)	9.00%
Lowest Observed Adverse Effect Level (LOAEL)	10.50%
(Reference: NFPA2001)	

WARNING

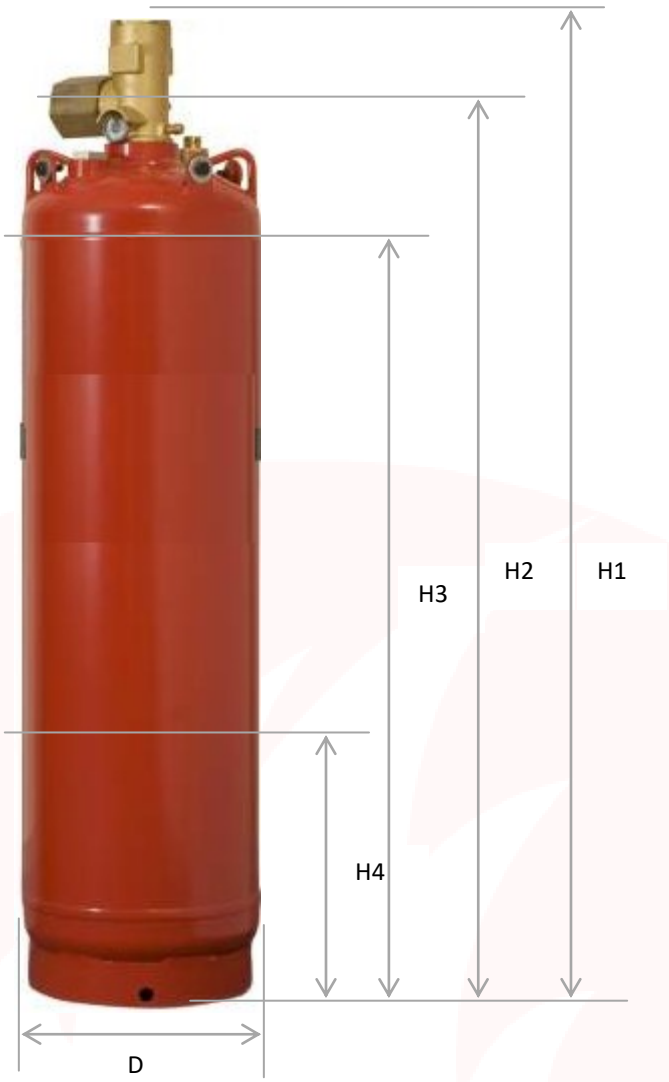
The BRISTOL HFC-227EA system periodically be inspected by trained personnel.

BRISTOL HFC-227EA system is the systems tested within limitations contained in the detailed installation manual. The system designer must be consulted whenever changes are planned for the system or area of protection. An authorized installer or system designer must be consulted after the system has discharged.

Multiple series of containers are available, including: The 16.6, 28.3, 40, 50, 60, 70, 80, 90, 100, 120, 150, 160& 170 L containers are manufactured.

Technical Information

Material	HP345 Carbon: ≤0.20% Manganese: ≤1.50% Silicon: ≤0.35% Phosphorus: ≤0.025% Sulphur: ≤0.015% Aluminium acid-soluble: ≥0.015
Nominal Working Pressure	53 bar
Hydrostatic Test Pressure	80 bar
Work Temperature	0 °C ~ 50 °C
Paint Specification	Red Polyester Powder Coated



HFC-227ea Container Assembly

The agent storage vessel consists of a container fitted with a valve and internal syphon tube, factory filled with HFC-227ea, and super-pressurized with dry nitrogen to 25 bar @ 21℃(360 psi @ 70℉) and 42 bar @ 21℃ (600 psi @ 70℉).

Containers sharing the same manifold shall be equal in size and fill density. Containers are finished in red and are available in various sizes (Figure 2.3).

A nameplate is adhered to the container displaying the agent weight, tare weight, gross weight, fill density and charge date.

Table 2.3.5 HFC-227ea Container Assembly Dimension

Cylinder with Valve Assembly Part No.	Container Assembly Type	Nominal Working Pressure (bar)	Nominal Cylinder Volume (L)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	D (mm)
811.101.0135	BF227SP-25-16.6C	25	16.6	668	566	400	200	Ø228.6
811.101.0145	BF227SP-25-28.3C	25	28.3	975	873	600	330	Ø228.6
811.101.0455	BF227SP-25-40K	25	40	1068	966	750	300	Ø260
811.101.0465	BF227SP-25-50K	25	50	1055	953	750	300	Ø312
811.101.0475	BF227SP-25-60K	25	60	1197	1095	750	300	Ø312
811.101.0486	BF227SP-25-70M	25	70	1403	1257	1050	300	Ø312
811.101.0496	BF227SP-25-80M	25	80	1545	1399	1050	300	Ø312
811.101.0506	BF227SP-25-90M	25	90	1126	980	750	300	Ø416
811.101.0516	BF227SP-25-100M	25	100	1200	1055	750	300	Ø416
811.101.0526	BF227SP-25-120M	25	120	1360	1214	900	300	Ø416
811.101.0546	BF227SP-25-150M	25	150	1599	1453	1050	300	Ø416
811.101.0246	BF227SP-25-160D	25	160	1346	1200	900	450	Ø462
811.101.0137	BF227SP-42-16.6C	42	16.6	668	566	400	200	Ø228.6
811.101.0147	BF227SP-42-28.3C	42	28.3	975	873	600	330	Ø228.6
811.101.0457	BF227SP-42-40K	42	40	1068	966	750	300	Ø260
811.101.0467	BF227SP-42-50K	42	50	1055	953	750	300	Ø312
811.101.0477	BF227SP-42-60K	42	60	1197	1095	750	300	Ø312
811.101.0488	BF227SP-42-70M	42	70	1403	1257	1050	300	Ø312
811.101.0498	BF227SP-42-80M	42	80	1545	1399	1050	300	Ø312
811.101.0508	BF227SP-42-90M	42	90	1126	980	750	300	Ø416
811.101.0518	BF227SP-42-100M	42	100	1200	1055	750	300	Ø416
811.101.0528	BF227SP-42-120M	42	120	1360	1214	900	300	Ø416
811.101.0548	BF227SP-42-150M	42	150	1599	1453	1050	300	Ø416
811.101.0248	BF227SP-42-160D	42	160	1346	1200	900	450	Ø462
811.101.0568	BF227SP-42-170M	42	170	1758	1612	1200	300	Ø416

Table 2.3.5 HFC-227ea Filling Capacity Details

Cylinder with Valve Assembly	Container Assembly	Nominal Working Pressure	Nominal Cylinder Volume	Fill Capacity (kg)		Outlet Size	Empty Wt.
Part No.	Type	(bar)	(L)	Min.	Max.	(mm)	(kg)
811.101.0135	BF227SP-25-16.6C	25	16.6	8	18.6	33	21
811.101.0145	BF227SP-25-28.3C	25	28.3	13.6	31.7	33	29
811.101.0455	BF227SP-25-40K	25	40	19.2	44.8	33	41
811.101.0465	BF227SP-25-50K	25	50	24	56	33	52
811.101.0475	BF227SP-25-60K	25	60	28.8	67.2	33	59
811.101.0486	BF227SP-25-70M	25	70	33.6	78.4	49	72
811.101.0496	BF227SP-25-80M	25	80	38.4	89.6	49	80
811.101.0506	BF227SP-25-90M	25	90	43.2	100.8	49	94
811.101.0516	BF227SP-25-100M	25	100	48	112	49	100
811.101.0526	BF227SP-25-120M	25	120	57.6	134.4	49	113
811.101.0546	BF227SP-25-150M	25	150	72	168	49	134
811.101.0246	BF227SP-25-160D	25	160	76.8	179.2	49	104
811.101.0137	BF227SP-42-16.6C	42	16.6	8.0	18.6	33	21
811.101.0147	BF227SP-42-28.3C	42	28.3	13.6	31.7	33	29
811.101.0457	BF227SP-42-40K	42	40	19.2	44.8	33	41
811.101.0467	BF227SP-42-50K	42	50	24	56	33	52
811.101.0477	BF227SP-42-60K	42	60	28.8	67.2	33	59
811.101.0488	BF227SP-42-70M	42	70	33.6	78.4	49	72
811.101.0498	BF227SP-42-80M	42	80	38.4	89.6	49	80
811.101.0508	BF227SP-42-90M	42	90	43.2	100.8	49	94
811.101.0518	BF227SP-42-100M	42	100	48	112	49	100
811.101.0528	BF227SP-42-120M	42	120	57.6	134.4	49	113
811.101.0548	BF227SP-42-150M	42	150	72	168	49	134
811.101.0248	BF227SP-25-160D	42	160	76.8	179.2	49	104
811.101.0568	BF227SP-42-170M	42	170	81.6	190.4	49	149

The bracket assembly consists of a nut and bolt, two bracket straps and one back channel. To securely hold the container in position during the system discharge, two bracket assemblies are required per container.

Each strap is notched for insertion into the back channel allowing the container to be properly aligned. The bracket assembly is designed to be mounted to a rigid vertical surface with the container assembly resting fully on the floor.

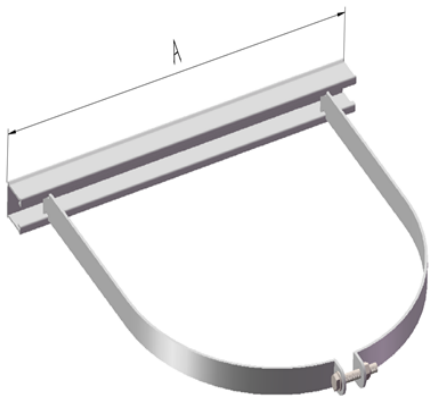


Figure 2.5 - Fixing Bracket

Part No.	Container Volume (L)	Container Dia. (mm)
811.106.601	16.6, 16.7, 28.3	Φ228.6
811.106.602	40	Φ260
811.106.603	50, 60, 70, 80	Φ312
811.106.604	40, 49, 50, 60, 62, 70, 80	Φ324
811.106.605	90, 100, 103, 106, 120, 147, 150, 153, 170	Φ406, Φ416
811.106.606	160, 170	Φ462
Fastening Bolt	M10X60	

Table 2.5.1 Container Mounting Strap

Part No.	Container Diameter (mm)	Dimension A (mm) Container Quantity									
		1	2	3	4	5	6	7	8	9	10
811.106.731-811.106.740	Φ228.6 Φ260	500	800	1100	1400	1700	2000	2300	2600	2900	3200
811.106.701-811.106.710	Φ312 Φ324	600	1000	1400	1800	2200	2600	3000	3400	3800	4200
811.106.711-811.106.720	Φ406 Φ416	700	1200	1700	2200	2700	3200	3700	4200	4700	5200
811.106.721-811.106.730	Φ462	700	1200	1700	2200	2700	3200	3700	4200	4700	5200

Table 2.5.2 Fixing Back Channel Dimensions

Installed in the gas cylinder is used to control the release of agent. Build up the container valve extinguishing kit together with cylinders started by Solenoid Actuator, Manual Actuator or Pneumatic Actuator. Container valve has long service life, low leakage rate, can automatically reset after use, re-filling agent needn't change any accessories (such as burst disc, etc.). The pressure gauge port of the container valve are available with connection thread of M10X1 or NPT1/8.

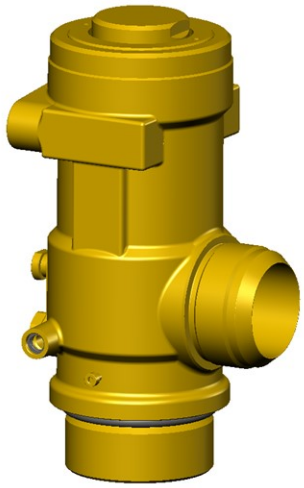


Figure 2.6 - Container Valve

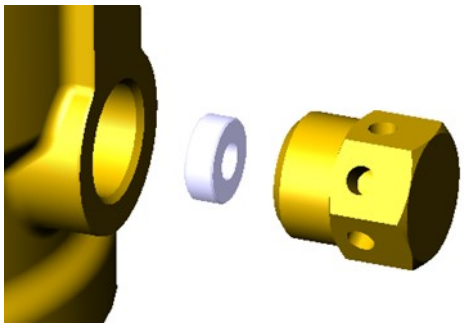
Technical Information

Table 2.6 Container Valve

Type	33 mm 25 bar		33 mm 42 bar		49 mm 25 bar		49 mm 42 bar	
Part No.	811.101.0013	811.101.0017	811.101.0014	811.101.0018	811.101.0023	811.101.0027	811.101.0024	811.101.0028
Body Material	Brass		Brass		Brass		Brass	
Nominal Working Pressure	25 bar @21°C		42 bar @21°C		25 bar @21°C		42 bar @21°C	
Safety Relief pressure (Burst Disc Rating)	60±6 bar		100±10 bar		60±6 bar		100±10 bar	
Work Temperature	-20 °C ~60 °C							
Inlet	2.5"-12UN				3"-12UN			
Outlet	1.875"-12UN				2.5"-12UN			
Actuator Port	M42X1.5							
Pilot Pipe Connection	G1/8							
Pressure Gauge Port	M10X1	NPT1/8	M10X1	NPT1/8	M10X1	NPT1/8	M10X1	NPT1/8
Overall Size (mm)	124 (L) ×102 (W) ×184 (H)	124 (L) ×121 (W) ×184 (H)	124 (L) ×102 (W) ×184 (H)	124 (L) ×121 (W) ×184 (H)	149 (L) ×110 (W) ×238 (H)	149 (L) ×129 (W) ×238 (H)	149 (L) ×110 (W) ×238 (H)	149 (L) ×129 (W) ×238 (H)
Weight	4.9 kg				9.5 kg			

Safety Relief Device

A burst disc is factory fitted to every container valve assembly. It is designed to rupture when the container becomes over pressurized when subjected to temperatures above the designed storage temperature of the container.



Technical Information

Table 2.7 Safety Relief Device

Part No.	811.101.090	811.101.091
Applicable System	25 bar system	42 bar system
Body Material	Brass	
Burst Disc Material	Nickel	
Burst Pressure	60 ± 6 bar	100 ± 10 bar
Work Temperature	-20 °C ~ 55 °C	
Installation Torque	35 Nm	

Pressure Gauge

A burst disc is factory fitted to every container valve assembly. It is designed to rupture when the container becomes over pressurized when subjected to temperatures above the designed storage temperature of the container.

Technical Information

Part No.	811.101.080	811.101.082	811.101.081	811.101.083
Applicable System	25 bar system		42 bar system	
Gauge Diameter	φ41 mm			
Body Material	Stainless steel			
Range	0-25-48 bar		0-42-70 bar	
Precision Grade	1.6 Grade			
Work Temperature	-20 °C ~ 60 °C			
Connection Thread	Axial M10X1	Axial NPT1/8	Axial M10X1	Axial NPT1/8
Weight	0.05 kg			
Certification	UL			

Figure 2.8 - Pressure Gauge

Feedback the information generated by the agent release pressure to tell the extinguishing control panel that system is opened, to indicate extinguishing agent released.

Wiring: Remove the two screws retaining the cover and cover gasket. A 1/2" NPT conduit connection is provided on the left hand side of the enclosure. Two cast-in knockouts for the 1/2" conduit are located on the side and back of the enclosure. These can easily be knocked out by placing the blade of a screwdriver in the groove and tapping sharply with a hammer. The three switch terminals are clearly labeled "common", "normally open" and "normally closed". For switches supplied with lead wires, the following color coding applies: Common-Yellow, Normally Closed-Orange, Normally Open-Brown.

Technical Specification

Table 2.9 Discharge Pressure Switch

Part No.	811.108.008
Model	SYK101
Material	Die cast aluminum, epoxy powder coated internally and externally
Work Temperature	-40°C ~ 70°C
Over Range Pressure	103.4 bar/ 1500 psi
Proof Pressure	172.4 bar/ 2500 psi
Bursting Pressure	⩾200 bar
Action Pressure	3.5 bar
Switch Output	One SPDT snap action switch; switch may be wired "normally open"
Electrical Rating	15A 125/250/480 VAC, 2A 24VDC
Protection Grade	IP65
Connection Thread	NPT1/4 Female
Electrical Entry	NPT1/2 Female
Overall Size	102mm W × 178mm H × 60mm T
Weight	1.0 kg
Life	6,000 Times
Certification	UL

Figure 2.9.1 - Discharge Pressure Switch

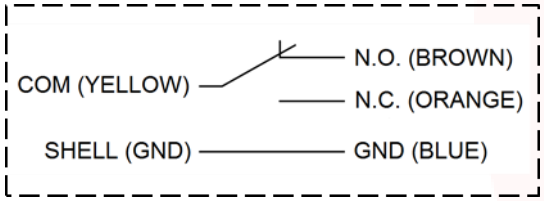


Figure 2.9.2 – Discharge Pressure Switch Wire Diagram

The Safety Valve is installed in the Manifold; a burst disc is fitted to this valve. When the internal pressure of the manifold exceeds the expected pressure, the safety disc will be broken quickly, then release the inside pressure. The burst disc is designed to rupture when the manifold becomes over pressurized.

Figure 2.10 – Safety Valve

Technical Specification

Table 2.10 Safety Valve

Part No.	811.108.004	811.108.005
Applicable System	25 bar system	42 bar system
Body Material	Brass	
Burst Disc Material	Stainless Steel	
Burst Disc Color Code	Blue (Atmospheric Side)	Red (Atmospheric Side)
Burst Pressure	46 ± 4.6 bar	72 ± 7.2 bar
Work Temperature	-20°C ~ 55°C	
Installation Torque	35 Nm	
Connection Thread	NPT3/4 or R3/4	
Overall Size	72 mm (L)× φ47mm (D)	
Weight	0.15 kg	

The removable Electrical Actuator locates to the top of the container valve. 24 VDC is required for electrical operation. Provision is made for the connection of a manual actuator to the top of the actuator assembly. Due to the design of the bridge rectifier it will operate regardless of how it is wired up; the positive supply from control panel can be connected to either terminal 1 or 2 with the reverse for the negative supply.

Figure 2.11.1 - Electrical Actuator

Technical Specification

Table 2.11 Electrical Actuator

Part No.	811.101.060
Manufacturer	TLX Technologies
Model	PA0421
Material	Body: Mild Steel Swivel Nut: Brass Manual Button: ABS Limit Pin: Stainless Steel
Electrical/ Electronic Configurations	Voltage Supply: 24 VDC Current Supply: 0.50 A Monitoring Current: <30 mA Reverse Polarity Compatible Via Bridge Rectifier Circuit. Supervisory Switch (N.C.) internal to Actuator.
Mechanical Configurations	Nominal Pin Movement: 6.35 mm Connection: M42x1.5 Female Overall Size: 175 mm x Ø 53 mm Min Force Provided: 240 N Max Manual Actuation Force: 150 N
Actuation Type	Latching
Reset Method	Manually Via Reset Tool Supplied
Working Temperature	-20 °C to 55 °C
Weight	0.9 kg
Factory Test	100% Check on Start/ Finish Position
Approvals	UL

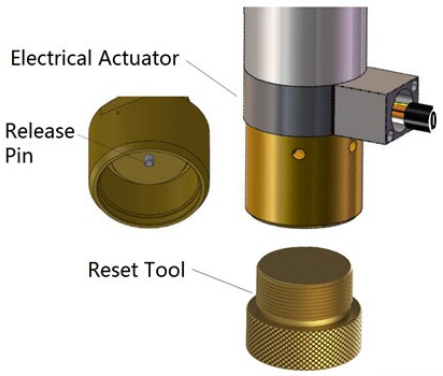


Figure 2.11.2 - Actuator Reset Tool

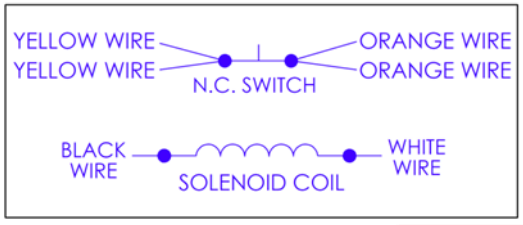


Figure 2.11.3 - Electrical Actuator Wire Diagram

The Electrical Actuator will operate after receiving a 24 VDC nominal voltage signal from the panel. The actuator will latch in the fire position after the signal terminates. It will require to be manually reset by removing the unit from the valve and inserting (screwing in) the Reset Tool (Part No.811.101.066, see Figure 2.11.2)

A Manual Button is installed on the top of the actuator. In addition to the electrically actuate, the actuator can be activated directly by pressing the Manual Button. Before pressing the Button manually, the limit pin at the bottom of the button should be pulled out.

Pneumatic/Manual Actuator

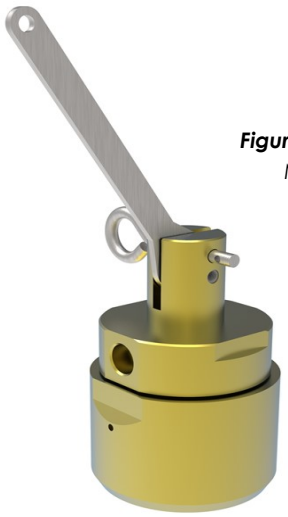


Figure 2.12 - Pneumatic & Manual Actuator

The actuator is installed on the container valve, is used to manually or pneumatically operate container valve.

The Pneumatic and Manual Actuator is used to manual mechanically or pneumatically operate the system at the container position and is fitted to the top of the valve assembly. Pressure from a 'Master' container or manual force is used to actuate the valve.

Technical Specification

Table 2.11 Electrical Actuator

Part No.	811.101.065
Material	Body / Piston Rod: Brass Handle / Safety Pin: SS304
Max. Working Pressure	60 bar
Min Actuation Pressure	4 bar
Manual Operating Force	30 N
Install Thread	M42×1.5 Female
Pneumatic Port	G1/8 Female
Work Temperature	-20 °C ~ 60 °C
Overall Size	150 mm (H) × φ50mm (D)
Weight	0.6 kg
Install Torque	~15 Nm

Pneumatic Actuator

Figure 2.13 - Pneumatic Actuator

The Pneumatic Actuator is used to pneumatically operate the system at the container position and is fitted to the top of the valve assembly. Pressure from a 'Master' Container is used to actuate the valve, via small bore piping or a flexible hose.

Technical Specification

Table 2.13 Pneumatic Actuator

Part No.	811.101.064
Material	Body: Brass Piston Rod: Brass
Max. Working Pressure	60 bar
Min Actuation Pressure	4 bar
Install Thread	M42×1.5 Female
Pneumatic Port	G1/8 Female
Work Temperature	-20 °C ~ 60 °C
Overall Size	50 mm (H) × φ50mm (D)
Weight	0.5 kg
Install Torque	~15 Nm

Manual Actuator

Figure 2.14 - Manual Release Device

The Manual Actuator is used to mechanically operate the system at the container position and is fitted to the top of the valve assembly. Inadvertent operation is prevented by a safety pin which has to be removed before releasing.

Technical Specification

Table 2.14 Manual Actuator

Part No.	811.101.063
Material	Body / Piston Rod: Brass Handle / Safety Pin: SS304
Manual Operating Force	30 N
Install Thread	M42×1.5 Female
Work Temperature	-20 °C ~ 60 °C
Overall Size	110mm (L) × 50mm (W)_x 60mm (H)
Weight	0.5 kg
Install Torque	~15 Nm

Discharge Hose

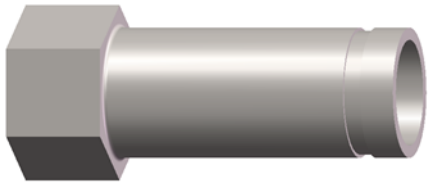
Figure 2.15 - Discharge Hose

Container installations may be connected to the system by means of a flexible discharge hose. This enables containers to be disconnected for maintenance or recharge without dismantling other container mountings, manifold connections and pipework, etc. The flexible discharge hose is provided with a swivel fitting at the inlet. Discharge hose is installed between container valve and check valve used to connect agent cylinder in a system, convenient installation and maintenance of them.

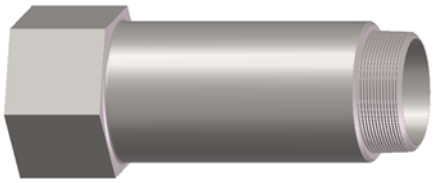
Technical Specification

Table 2.15 Discharge Hose

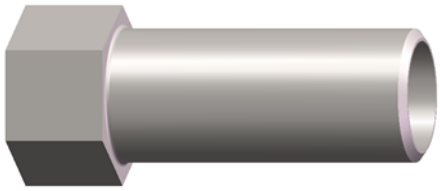
Part No.	811.102.001	811.102.002
Hose Material	Teflon hose with stainless steel braid overlay	
Type	1¼" (33 mm)	2" (49 mm)
Length	550 mm	700 mm
Inlet Thread	1.875"-12UN	2.5"-12 UN
Outlet Thread	1.875"-12UN	2.5"-12 UN
Minimum Bending Radius	400 mm	500 mm
Working Temperature	-20°C ~60°C	-20°C ~60°C
Working Pressure	42 bar	42 bar
Burst Pressure	>200 bar	>200 bar
Weight	2.8 kg	4.6 kg



Grooved Type



Threaded Type



Welded Type

Figure 2.16 – Valve Outlet Adaptor

When a single container is being used without a manifold, three type adaptors are available for connection to the container valve outlet, either grooved, threaded or welded.

Technical Specification

Table 2.16.1 Valve Outlet Adaptor- Grooved Type

Part No.	811.102.010	811.102.011
Material	Stainless Steel	
Type	VOA-33G	VOA-49G
Nominal Diameter	1¼" (33 mm)	2" (49 mm)
Length	150 mm	184 mm
Inlet Thread	1.875"-12UN	2.5"-12 UN
Working Temperature	-20°C ~60°C	-20°C ~60°C
Working Pressure	42 bar	42 bar
Weight	0.9 kg	1.7 kg

Table 2.16.2 Valve Outlet Adaptor- Threaded Type

Part No.	811.102.014	811.102.015
Material	Stainless Steel	
Type	VOA-33T	VOA-49T
Nominal Diameter	1¼" (33 mm)	2" (49 mm)
Length	150 mm	184 mm
Inlet Thread	1.875"-12UN	2.5"-12 UN
Outlet Thread	NPT or R 1¼	NPT or R 2
Working Temperature	-20°C ~60°C	-20°C ~60°C
Working Pressure	42 bar	42 bar
Weight	1.0 kg	2.0 kg

Table 2.16.2 Valve Outlet Adaptor- Threaded Type

Part No.	811.102.012	811.102.013
Material	Stainless Steel	
Type	VOA-33W	VOA-49W
Nominal Diameter	1¼" (33 mm)	2" (49 mm)
Length	150 mm	184 mm
Inlet Thread	1.875"-12UN	2.5"-12 UN
Working Temperature	-20°C ~60°C	-20°C ~60°C
Working Pressure	42 bar	42 bar
Weight	0.9 kg	1.7 kg

Pilot Hose

Figure 2.17 - Pilot Hose

The pilot hose is used to connect pressure activated devices to the system, e.g. the master cylinder to the slave container to the pressure switch.

Technical Specification

Table 2.17 Pilot Hose

Part No.	811.102.003	811.102.004	811.102.005
Hose Material	Steel wire braided rubber hose		
Nominal Diameter	Φ6 mm		
Length	400 mm	500 mm	700 mm
Connection Thread	M12×1.5		
Install Torque	22.5±2.5 N·m		
Min. Bending Radius	60 mm		
Working Temperature	-20℃~60℃		
Working Pressure	42 bar		
Burst Pressure	>200 bar		

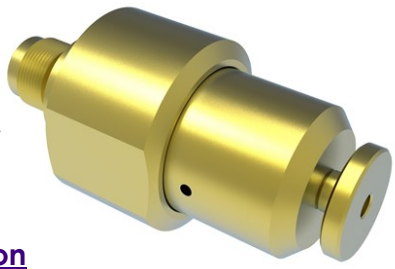
Bleed Valve

On manifold systems with connected reserves it is necessary to fit bleed valves at the location of the pneumatic actuator of the last slave container of both duty and reserve actuation lines. Also a bleed valve is required to be fitted into the pilot line.

The bleed valve acts to relieve a gradual pressure build-up occurring perhaps as a result of a leaking container valve or check valve. It also provides a means by which pressure trapped in the actuation line may be manually relieved. The bleed valve relieves automatically up to a pressure of approximately 1.5 bar and seals at pressures above this.

Bleed valve is installed in the end of a closed pipeline, normal opened. It is used to eliminate leakage gas due to accumulate in the pipeline, to prevent the system false starts, it will be closed, while inlet pressure up to setting point. After activation press the valve button, release the gas in the pipeline, then valve is reset.

Figure 2.18 - Bleed Valve



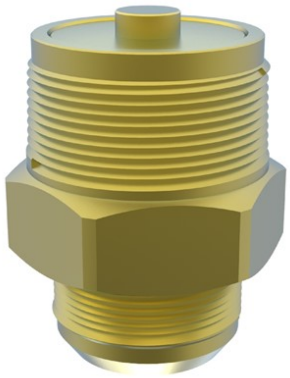
Technical Specification

Table 2.18 Bleed Valve

Part No.	811.101.006
Material	Brass
Max. Working Pressure	64 bar
Flow Rate	≥ 6 L/min @ 0.6 bar
Closed Pressure	0.7 ~ 1.5 bar
Install Thread	G1/8
Work Temperature	-20 °C ~ 60 °C
Overall Size	50 mm H × φ24 mm Dia
Weight	0.1 kg
Install Torque	8 Nm

Manifold Check Valve

Manifold check valves are of mushroom pattern type and lift into the manifold as discharge occurs. The function of the check valve is to prevent loss of extinguishing agent during discharge from an outlet, should a container have been removed. All check valves are ordered separately to the manifold assembly.



Manifold check valve is installed on the manifold behind the discharge hose to control the extinguishing agent.

Technical Specification

Table 2.21 Manifold Check Valve

Part No.	811.103.001	811.103.002
Size	33mm	49mm
Body Material	Brass	Brass
Stem Material	Stainless steel	Stainless steel
Work Pressure	80 bar	80 bar
Leakage Test Pressure	80 bar	80 bar
Hydraulic Strength Test Pressure	100 bar	100 bar
Inlet Thread	1.875"-12UN	2.5"-12UN
Outlet Thread	NPT2 or R2	NPT2½ or R2½
Weight:	0.9 Kg	1.82 Kg

Discharge Nozzle

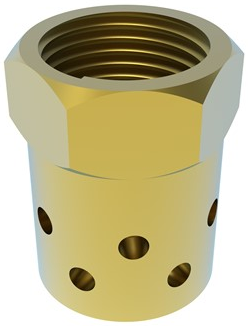
HFC-227ea is distributed within the protected area by the discharge nozzle which is sized to ensure the correct flow of agent for the risk. Nozzles are available with 8 ports to allow for 180° or 360° horizontal discharge patterns. Ports are drilled in special increments to the specified system design. Discharge nozzles are installed in the end of pipeline hole size is calculated, discharge the gas uniformly, and satisfies the requirement of discharge time.

Technical Specification

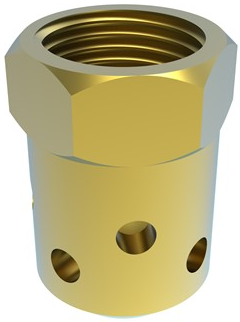
Table 2.22.1 Discharge Nozzle

Part No.	811.104.XXX	811.114.XXX
Nozzle Type	180° 8 Port	360° 8 Port
Material	Brass	
Distance From Ceiling	Max. 370 mm	
Connection Thread	NPT or Rc 3/8 to 2 Female	
Installation Mode	Side Wall	Center
Installation Orientation	Pendent or Upright	

Figure 2.22 - Discharge Nozzle



180° Nozzle



360° Nozzle

Pilot Pipe Connector G1/8

Pilot pipe connector G1/8 is used to connect the pilot hose and actuator, to introduce a pilot gas from the pilot hose for pneumatically actuating other valves.

Figure 2.23 - Pilot Pipe Connector G1/8

Technical Specification

Table 2.21 Manifold Check Valve

Part No.	811.111.001
Size	Ø4 mm
Material	Stainless Steel
Connection	M12*1.5× G1/8
Max. Working Pressure	150 bar
Overall Size	S14 mm* 25 mm
Weight:	0.025 kg

Pilot Hose Connector

Figure 2.24 - Pilot Hose Connector

Pilot Hose Connector is used to connect two pilot hoses together.

Technical Specification

Table 2.24 Pilot Hose Connector

Part No.	811.111.002
Size	Ø4 mm
Material	Brass
Connection	M12*1.5× M12*1.5
Max. Working Pressure	150 bar
Overall Size	S14 mm* 26 mm
Weight:	0.028 kg

Pilot Pipe Connector NPT¼

Pilot pipe connector NPT¼ connects the pilot hose to the discharge pressure switch.

Figure 2.25 - Pilot Pipe Connector NPT¼

Technical Specification

Table 2.25 Pilot Pipe Connector NPT¼

Part No.	811.111.003
Size	Ø4 mm
Material	Brass
Connection	M12*1.5× NPT¼
Max. Working Pressure	150 bar
Overall Size	S17 mm* 29 mm
Weight:	0.032 kg

Pressure Switch Connector

Figure 2.26 - Pressure Switch Connector

Pressure switch connector is used to connect the pressure switch and the manifold joint.

Technical Specification

Table 2.26 Pressure Switch Connector NPT¼

Part No.	811.111.004
Size	Ø6 mm
Material	Brass
Connection	NPT¼× NPT¼
Max. Working Pressure	150 bar
Overall Size	S17 mm* 36 mm
Weight:	0.035 kg

Inside Warning Sign

This Inside Warning Sign provides instructions to personnel who may work in an area protected with HFC-227ea fire system. The sign reminds the relevant personnel to leave the protected area immediately when the fire extinguishing system is activated. One sign is to be fixed to all export doors out of an HFC-227ea fire system protected area.

Technical Specification

Table 2.27 Inside Warning Sign

Part No.	811.108.104
Size	210 mm ×210 mm
Material	Aluminum

Figure 2.27 - Inside Warning Sign

Outside Warning Sign

Figure 2.28 - Outside Warning Sign

The Outside Warning Sign provides instructions to personnel who may enter an area protected with HFC-227ea fire system. This warning sign reminds the relevant personnel not to enter the protected area when the HFC-227ea firefighting system is activated. One plate is to be fixed to all entrance doors into an HFC-227ea fire system protected area.

Technical Specification

Table 2.26 Pressure Switch Connector NPT¼

Part No.	811.108.105
Size	210 mm ×210 mm
Material	Aluminum

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