

LIFECO-541 Suppression Agent

LIFECO-541 Engineered Fire Suppression systems consist of inert gas extinguishing agent: IG-541 (52% Nitrogen, 40% Argon and 8% Carbon Dioxide).

Inert gas is a colorless, odorless, electrically non-conductive gas. The gases do not support combustion, do not deplete the ozone layer and as well as no global warming potential. Inert gas is pressurized and stored in seamless cylinders assembly which hold at 200bar or 300 bar @ 15°C (2900 psi or 4351psi @ 59°F). LIFECO541 systems are ideal for total flooding applications to suppress Class A, B and C hazards. The main extinguishing mechanism of inert gas is by lowering the oxygen content below the level that supports combustion.

IG-541 is listed under:

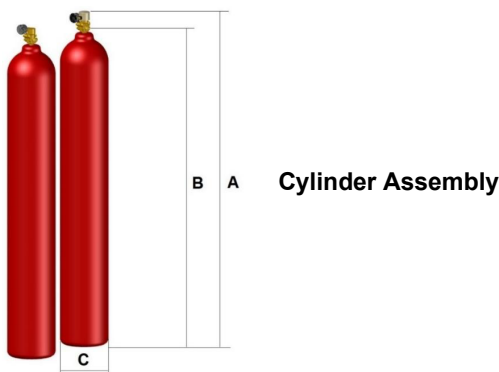
- ▶ National Fire Protection Agency (NFPA®) 2001, Standard on Clean Agent Fire Extinguishing Systems.
- ▶ Underwriters Laboratories (UL)
- ▶ FM (Factory Mutual) Approved
- ▶ U.S. Environmental Protection Agency

LIFECO-541 IG CYLINDER ASSEMBLY

The cylinder assembly comprises of a cylinder factory fitted with a valve, filled with IG-541 and pressurized to 200 Bar or 300 Bar @ 15°C (2900 psi or 4351 psi @ 59°F). Cylinders are available in 80L or 140L. Cylinder color is RAL3001.

ISO Cylinder Details

Agent	Size	Working Pressure	Part Number	Valve Type	Agent Quantity		Gross Weight (kg)
					(m3)	(kg)	
IG-541	80	200 Bar	LF -IG54180200S	Solenoid Valve	16.59	23.43	118
			LF -IG54180200	Discharge Valve			
	140		LF -IG541140200S	Solenoid Valve	29.02	41.01	189
			LF -IG541140200	Discharge Valve			
	80	300 Bar	LF -IG54180300S	Solenoid Valve	23.57	33.31	144
			LF -IG54180300	Discharge Valve			
	140		LF -IG541140300S	Solenoid Valve	41.26	58.29	283
			LF -IG541140300	Discharge Valve			



Pilot Assembly

The cylinder assembly comprises of a cylinder factory fitted with a solenoid discharge valve (PN: LFIGEASV200), filled with nitrogen and pressurized to 200 Bar @ 15oC (2900 psi @ 59oF). Cylinders are available in 4L and 10L. Pilot assembly is to actuate cylinders pneumatically in a system and selector valve if system available. Pilot valve adaptor (PN: LF-PVA) is available to adapt the pilot cylinder to the pilot line.
 (*4L is not FM approved)

Description	Specification	
Working Pressure	200 Bar @ 15°C	
Size	4L	10 L
Part Number (ISO 9809)	LF-IGPC4	LF-IGPC10
Outlet	W21.8 x 1/14"	
Test Pressure	300 Bar	
Safety Disc Pressure	270 Bar (3916psi)	
Gauge Port	M12 x 1.0	
Equivalent Length	25.84m	
Weight	10kg	19kg
Voltage	24 VDC	
Max Current	0.4 A	
Power consumption	9.3 W	
Protection class	IP65	
Overall height	500mm	950mm
Cylinder diameter	140mm	



Pilot Cylinder Assembly

Valve Assembly

Valve operates by means of pressure differential piston. The valves incorporated with the features to enable it to be connected with manual and pneumatic actuator for actuation purpose. Each valve is provided with an antirecoil cap. Only removed when connecting cylinder to pipework and refit when disconnecting the cylinder from pipework. There are 2 types of valves:

- 1) Discharge valve
- 2) Solenoid discharge valve



Discharge Valve

Discharge Valve Technical Information

Description	Valve Size	
Working Pressure	200 Bar	300 Bar
Part Number	LF-IGDV200	LF-IGDV300
Outlet	W21.8 x 1/14"	
Material	Brass	
Test Pressure	360 Bar	
Safety Disc Pressure	270Bar (3916psi)	405 Bar (5874 psi)
Gauge Port	M12 x 1.0	
Equivalent Length	25.84m	
Weight	1.16kg	

Solenoid Valve



Solenoid Valve

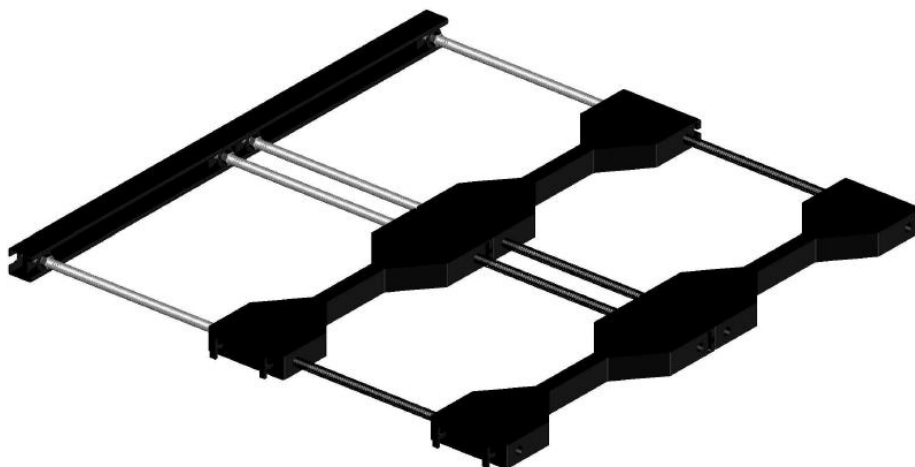
Solenoid Valve Technical Information

Description	Valve Size	
	200 Bar	300 Bar
Working Pressure	200 Bar	300 Bar
Part Number	LF-IGEASV200	LF-IGEASV300
Outlet	W21.8 x 1/14"	
Material	Brass	
Test Pressure	360 Bar	
Safety Disc Pressure	270 Bar (3916psi)	405 Bar (5874 psi)
Gauge Port	M12 x 1.0	
Equivalent Length	25.84m	
Weight	1.55kg	
Voltage	24 VDC	
Max Current	0.4 A	
Power consumption	9.3 W	
Protection class	IP65	



Cylinder Bracket

Cylinder brackets are available for 80L(200bar/300bar) and 140L(200bar/300bar) cylinders. It comes with an unistrut channel designed to securely fix the cylinders to a supporting structure or wall. Cylinder to be floor mounted only.



Cylinder Bracket

Cylinder Bracket Technical Information

Description	Specification
Material	Mild Steel
Paint	Epoxy Powder Coating (Black)
Mounting	Unistrut Channel

Part Number	Cylinder Size	Unistrut Channel Length	Row	Set comes with
LF - CB-80	80L (200bar & 300bar)	360 mm (14.2 inch)	1 st Row	1x Strap, 2x M12 stud with c channel stopper, 2x washer, 2x Nut, 1x Unistrut channel
LF - CB-140	140L (200bar & 300bar)	450 mm (17.7 inch)		
LF - CBX-80	80L (200bar & 300bar)	N/A	2 nd Row and above	1x Strap, 2x M12 stud
LF - CBX-140	140L (200bar & 300bar)	N/A		

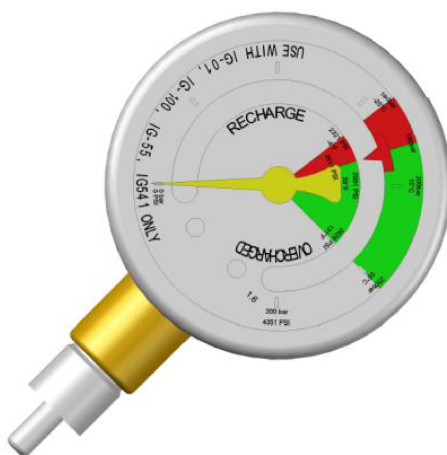


Pressure Gauge

There are two types of pressure gauge;

- 1) Pressure gauge with switch 200 Bar
- 2) Pressure gauge with switch 300 Bar

Pressure gauge comes with electrical contact to monitor cylinder pressure and to report losses of cylinder contents. Cylinder assembly can be supply with pressure gauge with Normally Open switch or Normally Close switch. Both pressure gauge can be assembled and disassembled under pressure.



Pressure Gauge with switch

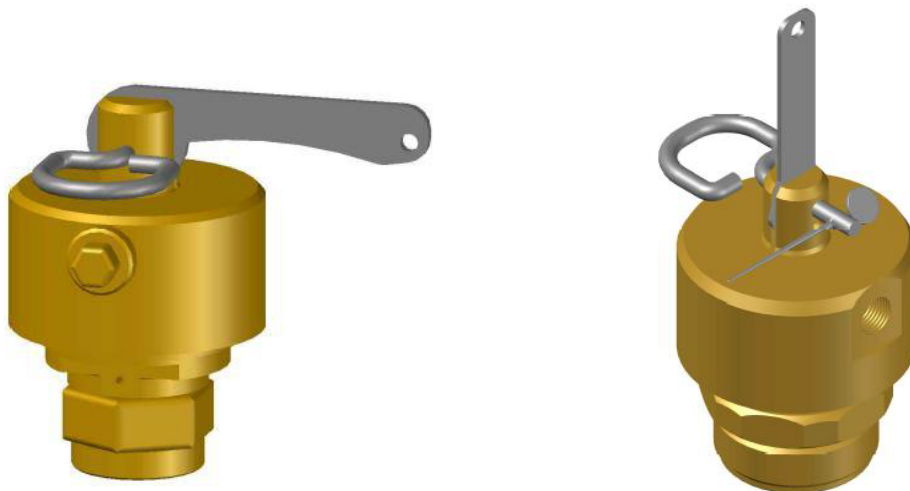
Pressure Gauge Technical Information

Description	Specification			
Working Pressure	200 Bar	300 Bar	200 Bar	300 Bar
Part Number	LF -PGLPS4	LF -PGLPS3	LF -PGLPS6	LF -PGLPS5
Body	Stainless Steel Case			
Type	Bourdon Tube			
Gauge Size	50mm			
Pressure Range	0 – 300 Bar (0 – 4351 psi)	0 – 450 Bar (0 – 6527 psi)	0 – 300 Bar (0 – 4351 psi)	0 – 450 Bar (0 – 6527 psi)
Std. Connection	M12 x 1.0			
Set Point	180 Bar (2611 psi)	270 Bar (3916 psi)	180 Bar (2611 psi)	270 Bar (3916 psi)
Switching Type	Normally Open (NO)		Normally Close (NC)	
Switching voltage	4.5 – 24 VDC/VAC			
Switching current	5 – 100mA			
Contact Load	Max 2.4W			



Pneumatic Manual Actuator

Pneumatic Manual actuator is designed to be used and installed on valve for mechanically or pneumatically actuation.



Pneumatic Manual Actuator

Pneumatic Manual Actuator Technical Information

Description	Specification	
Part Number	LF-COMPA	LF-COMPA/1
Used with Valve	Discharge valve LF-IGDV200 & LF-IGDV300	Solenoid valve LF-IGEASV200 & LF-IGEASV300
Body	Brass C3604BD	
Actuation Pin	Brass C3604BD	
Valve Connection	M36 x 1.5	M20 x 1.5
Pneumatic Connection	2 x 1/8" BSP	
Overall Size	83mm (L) x 40mm (Diameter)	
Pilot Pressure	Min 8 Bar (116 psi), Max 300 Bar (4351 psi)	
Mounting Torque	15 Nm $\pm$ 1	

Manual Actuator

The manual actuator is designed to be used and installed with solenoid valve (PN: LF-IGEASV200 & LFIGEASV300) for mechanically actuation. Safety pin is provided with every actuator to prevent accidental discharge. Actuation by removing safety pin and moving lever to 90°. Manual actuator features retractable pin which reset when level back to original position.



Manual Actuator

Manual Actuator Technical Information

Description	Specification
Part Number	LF-COMA
Body	Brass C3604BD
Level	Stainless Steel
Safety Pin	Stainless Steel
Piston Rod	Brass C3604BD
Connection	M20 x 1.5
Overall Size	48mm (H) x 28mm (W)
Mounting Torque	15 Nm ± 1

Pneumatic Actuator

Pneumatic actuator is designed to be used and installed with valve (PN: LF-IGDV200 & LF-IGDV300) for pneumatically actuation. The pneumatic actuator features a pneumatically driven piston that used to depress the valve core and opening the valve. The pressure from the master cylinder is used to actuate the cylinder discharge valve of slave cylinder via flexible hose.



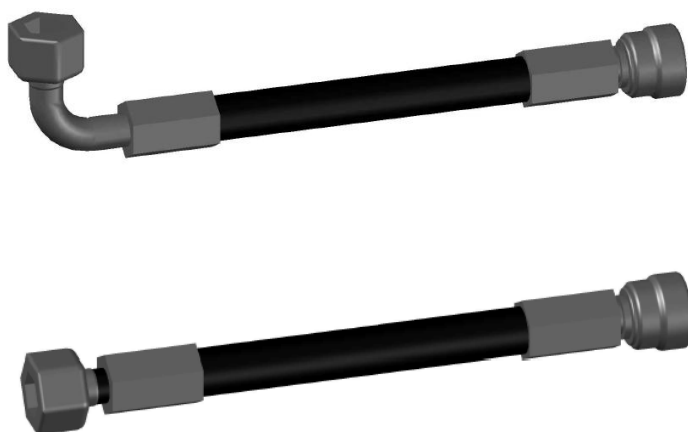
Pneumatic Actuator

Pneumatic Actuator Technical Information

Description	Specification
Part Number	LF-COPA
Body	Brass C3604BD
Actuation Pin	Brass C3604BD
Valve Connection	M36 x 1.5
Pneumatic Connection	2 x 1/8" BSP
Overall Size	56.5mm (L) x 40mm (Diameter)
Pilot Pressure	Min 20 Bar (290 psi), Max 360 Bar (5221 psi)
Mounting Torque	25 Nm ± 2

Discharge Hose

The discharge hose is equipped with a female swivel fitting at the inlet and enable to connect the cylinders to the manifold in multiple cylinder arrangements. This feature has enables cylinder to be disconnected during maintenance without any effort to remove other manifold connection and pipework.



Discharge Hose

Discharge Hose Technical Information

Description	Specification	
Part Number	LF -DH500E	LF -DH500S
Type	90° Elbow	Straight
Hose Material	Synthetic rubber	
Connection Material	Coated Steel	
Inlet Connection	W21.8 x 1/14"	
Outlet Connection	¾" BSP	
Min Bend Radius	250mm	
Max Working Pressure	360 Bar (5221 psi)	
Temperature Range	-20°C to + 50°C (-4° F to 122° F)	
Overall Length	500mm	
Size	DN12	

*Various length is available upon request .



Constant Pressure Regulator

Constant Pressure Regulator provided constant flow throughout the discharge. It regulates the pressure to ≤ 60 Bar for 200 Bar and 300 bar system which enable a lower pressure rating piping can be used. It gives higher flow rates and achieve 95% of the discharge within 60 seconds.

Description	Specification
Part Number	LF-PR
Material	Brass
Inlet Connection	3/4" BSP Female
Outlet Connection	3/4" BSP Male
Inlet Pressure	Max 360 Bar (5221 psi)
Outlet Pressure	Static: 60 Bar (+2, -6 Bar), 870 psi (-29, +87 psi) Dynamic: Max 60 Bar (870 psi)
Overall Size	145mm (L) x 64mm (Diameter)
Mounting Torque	55 Nm $\pm$ 5



Constant Pressure Regulator

Check Valves

Check valve is connected between discharge hose and constant pressure regulator before the manifold to prevent backflow of the agent during a discharge.

Description	Specification
Part Number	LF-CV
Nominal Size	12mm
Material	Stainless Steel
Connection	3/4" BSP Male
Working Pressure	360 Bar (5221 psi)
Overall Size	65mm (L) x 38mm (W)
Equivalent Length	0.48 m



Check Valve

Bleed Valve

Bleed valve is used and installed in pneumatic pilot lines to prevent and release unintended pressure developed in the pilot line.

Description	Specification
Part Number	LF -BVPL
Material	Stainless Steel
Connection	1/8" BSP
Max Working Pressure	360 Bar (5221 psi)
Temperature Range	-20°C to + 65°C (-4° F to 149° F)
Overall Size	64mm (L) x 22mm (W)
Pressure	Closing : 0.4 Bar Increasing Pressure Opening: 0.5 Bar Falling Pressure

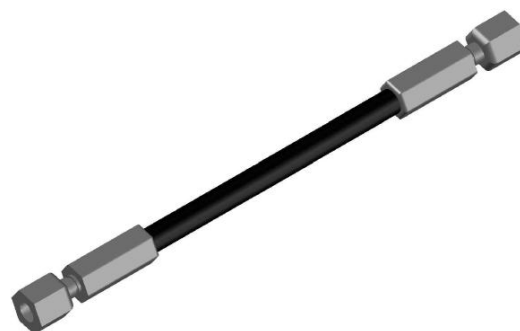


Bleed Valve

Flexible Hose

The flexible hose is used to connect between the master cylinder valve port and slave cylinder pneumatic actuator and slave to slave cylinder pneumatic actuator. This flexible hose is act as a pressure connector.

Description	Specification	
Part Number	LF -PH350	LF -PH450
Hose Material	Synthetic rubber	
Connection Material	Coated Steel	
Connection	M12 x 1.5	
Min Bend Radius	30mm	
Max Working Pressure	360 Bar (5221 psi)	
Temperature Range	-20°C to + 65°C (-4° F to 149° F)	
Overall Length	350mm (L)	450mm(L)
Size	DN5	

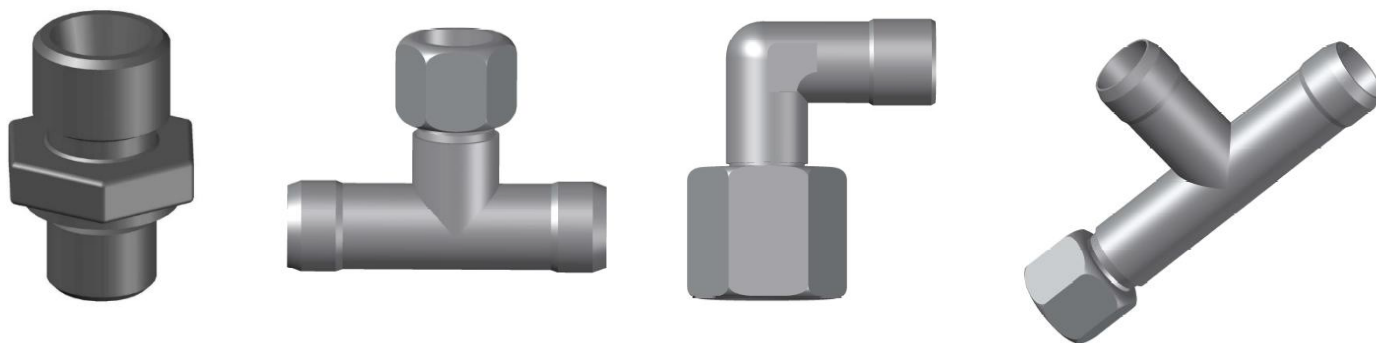


Flexible Hose

*Various length is available upon request.

Pilot Hose Fitting Adaptor

Connection adaptor and fitting for pilot line.



Connection adaptor and fitting

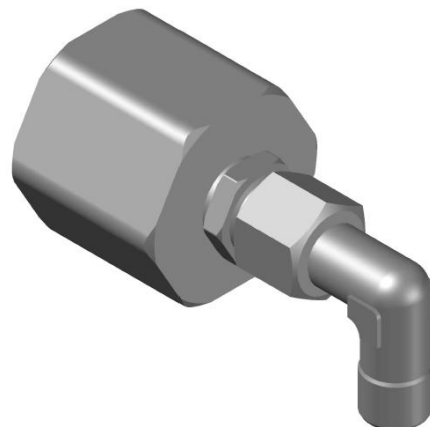
Description	Specification			
Part Number	LF-PHA	LF-SORS	LF-PVE	LF-SORT
Type	Straight	Tee (swivel on side)	Elbow	Tee (swivel on run)
Material	Steel (Zinc plated)			
Connection	1/8" BSP x M12 x 1.5	M12 x 1.5	M12 x 1.5	M12 x 1.5
Working Pressure	360Bar (5221psi)			



Pilot Valve Adaptor

Connection adaptor for pilot cylinder to pilot line.

Description	Specification
Part Number	LF-PVA
Material	Brass
Connection (Pilot Hose)	M12 x 1.5
Connection (Valve)	M21.8 x 1/14"
Working Pressure	360Bar (5221psi)



Valve Adaptor

Pilot Line Check Valve

The pilot line check valve is used to maintain pressure in a particular section of the pilot line or to ensure that nitrogen pressure from the pilot cylinder is operating the correct bank of cylinders.

A system using selector valve which consist of different numbers of cylinders for each hazard enclosure, can use the pilot line check valve to ensure the pilot pressure opens only the correct cylinder from the bank.



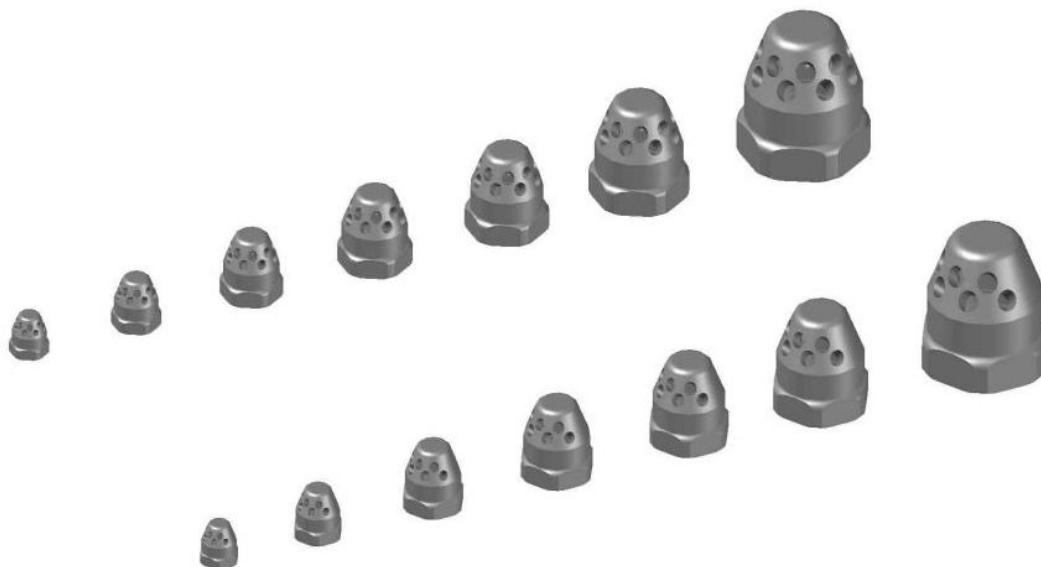
Pilot Line Check Valve

Description	Specification
Part Number	LF-CVPL
Material	Stainless steel
Connection	1/8" BSP Female
Working Pressure	360Bar (5221psi)



Discharge Nozzles

Nozzles are devices through which the agent is discharged within the protected enclosure. Nozzles are available in 180° or 360° and available in size 3/8 inch, 1/2 inch, 3/4 inch, 1 inch, 1 1/4 inch, 1 1/2 inch and 2 inch. Orifices size determine by design software calculation.



180° and 360° Discharge Nozzle

Description	Specification
Material	Brass (Nickel Plate)
Insert	Brass
Connection	BSPFemale/ NPT Female
Working Pressure	90 Bar(1305 psi)

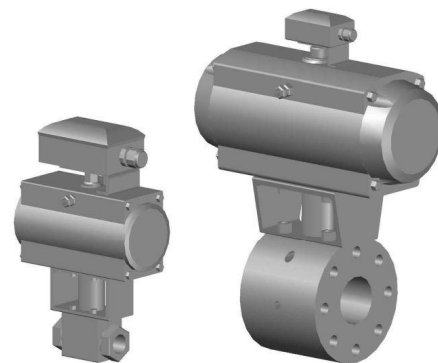


Nozzle Size	Part Number	Nozzle Type	Port	Port Size	Height	Wrench Size	Orifice Size Range
10 mm (3/8 inch)	LF-180IG-10	180	5	4.5 mm	29 mm	24 mm	4.9 mm – 9.6 mm
15 mm (1/2 inch)	LF-180IG-15	180 ⁰	5	6.7 mm	36 mm	30 mm	6.2 mm – 12.2 mm
20 mm (3/4 inch)	LF-180IG-20	180 ⁰	9	6.7 mm	46 mm	38 mm	8.2 mm – 16.2 mm
25 mm (1 inch)	LF-180IG-25	180 ⁰	9	8.4 mm	55 mm	45 mm	10.4 mm – 20.6 mm
32 mm (1 1/4 inch)	LF-180IG-32	180 ⁰	9	10.7 mm	64 mm	50 mm	14.0 mm – 27.0 mm
40 mm (1 1/2 inch)	LF-180IG-40	180 ⁰	14	10.7 mm	77 mm	60 mm	16.0 mm – 31.5 mm
50 mm (2 inch)	LF-180IG-50	180 ⁰	14	13.4 mm	94 mm	80 mm	20.5 mm – 40.5 mm
10 mm (3/8 inch)	LF-360IG-10	360 ⁰	8	3.6 mm	29 mm	24 mm	4.9 mm – 9.6 mm
15 mm (1/2 inch)	LF-360IG-15	360 ⁰	8	5.4 mm	36 mm	30 mm	6.2 mm – 12.2 mm
20 mm (3/4 inch)	LF-360IG-20	360 ⁰	16	5.0 mm	46 mm	38 mm	8.2 mm – 16.2 mm
25 mm (1 inch)	LF-360IG-25	360 ⁰	16	6.3 mm	55 mm	45 mm	10.4 mm – 20.6 mm
32 mm (1 1/4 inch)	LF-360IG-32	360 ⁰	16	8.0 mm	64 mm	50 mm	14.0 mm – 27.0 mm
40 mm (1 1/2 inch)	LF-360IG-40	360 ⁰	24	8.2 mm	77 mm	60 mm	16.0 mm – 31.5 mm
50 mm (2 inch)	LF-360IG-50	360 ⁰	24	10.2 mm	94 mm	80 mm	20.5 mm – 40.5 mm

Selector Valve

Selector valves are flow control valves with open and closed condition. Selector valve used in application where multiple enclosure or areas require to be protected from a single bank cylinder system. All selector valves are equipped with pneumatic actuators and limit switches

Description	Specification
Material	Stainless Steel
Connection	BSP
Working Pressure	140 Bar (2030 psi)
Nominal Control Pressure	6 Bar
Control Pressure zone	6 – 10 Bar
Complete Switching Time	≤ 3 s
Opening Angle	90°C
Voltage	12 – 250 V AC/DC
Operating Current	0.1 – 10 A
Limit switch	2 change over contacts

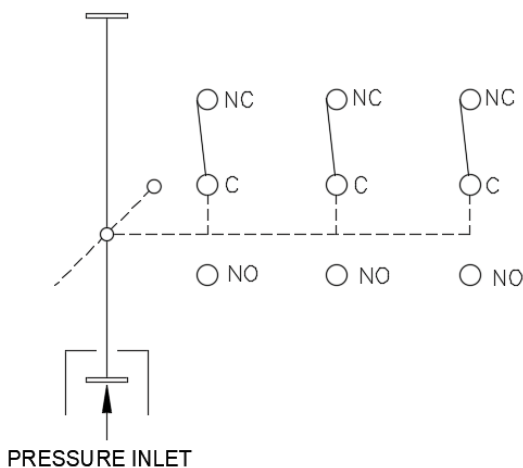


Selector Valve



Discharge Pressure Switch

The discharge pressure switch function by sending signal to a control panel during a system discharged. It activates by the agent pressure during discharged and can be reset manually by pushing the top stem after activation.



Discharge Pressure Switch & Wiring Diagram

Discharge Pressure Switch Technical Information

Description	Specification
Part Number	LF -DPS
Body Material	Brass
Cover Plate	Mild Steel
Connection	1/2" NPT
Switch Configuration	3PDT, Three Pole Double Throw
Minimum Actuation Pressure	4 bar (58psi)
Maximum Operating Pressure	60 bar (870psi)
Electrical Rating	10A 250VAC 15A 125VAC 3/4HP, 250VAC 1,2, or 3 phase
Overall Size	100 mm (L) x 92mm (W) x 123mm(H) 3.94 inch(L) x 3.62 inch(W) x 4.84 inch(H)

Cylinder Label

The cylinder label consists of cylinder part number, cylinder serial number, filling date, tare weight, charge weight, gross weight, fill density and fill location.

IG-541 Label – UL / FM



LICHFIELD
FIRE & SAFETY
EQUIPMENT
CO. LTD.

LIFECO-541

IG - 541 CLEAN AGENT
Extinguishing System Unit

CONTENT

- THIS CYLINDER IS FILLED WITH 52% NITROGEN, 40% ARGON AND 8% CARBON DIOXIDE, LIFECO-541

CYLINDER PART NO:

CYLINDER SERIAL NO:

TARE WEIGHT:

AGENT WEIGHT:

GROSS WEIGHT:

FILLING PRESSURE/TEMP (°C):

CHARGE DATE:

WARNING:

AVOID EXPOSURE OF VAPOURS, FUME, AND PRODUCTS OF COMBUSTION.

CAUTION:

PRESSURIZED CYLINDER. CAPABLE OF VIOLENT DISCHARGE.

- EXTREMELY HAZARDOUS AND CAN CAUSE SEVERE INJURY OR DEATH.
- VALVE OUTLET SAFETY CAP MUST BE SECURELY ATTACHED DURING TRANSPORTATION AND ONLY REMOVE WHEN CYLINDER IS READY FOR CONNECTION TO SYSTEM'S DISCHARGE PIPE.
- DO NOT REMOVE VALVE FROM CYLINDER.
- DO NOT INCINERATE CYLINDER.

IF CONTAINER CONTENTS MUST BE REMOVED FOR SERVICE, MAINTENANCE OR DISMANTLING OF THE CLEAN AGENT SYSTEM - PRIOR TO REMOVAL, CONTACT YOUR LOCAL INSTALLER OR MANUFACTURER FOR INSTRUCTIONS ON HANDLING EQUIPMENT AND RECLAIMING OR RECYCLING CLEAN AGENT.

INFORMATION

- REFER TO DESIGN, INSTALLATION, OPERATION AND MAINTENANCE MANUAL, (P/N: LFIGMAL-0541) AND STANDARD ON CLEAN AGENT FIRE EXTINGUISHING SYSTEM, NFPA 2001 FOR DETAILED INSTRUCTIONS FOR CORRECT SYSTEM HANDLING USAGE AND MAINTENANCE.
- 80L & 140L CYLINDERS SHALL BE TRANSPORTED AND STORED IN HORIZONTAL OR VERTICAL POSITION.
- CYLINDER IS SUPERPRESSURIZED TO 200 BAR AT 15°C (2900 PSI AT 59°F) / 300 BAR AT 15°C (4351 PSI AT 59°F).
- CYLINDER FACTORY TESTED AT 300 BAR (4351 PSI) / 450 BAR (6526 PSI) IN ACCORDANCE TO ISO 9809 STANDARD.
- OPERATING TEMPERATURE CYLINDER/STORAGE RANGE -20°C TO 55°C (-4°F TO 131°F).




LISTED EX15998 5HC1

CLEAN AGENT EXTINGUISHING SYSTEM UNIT

LABEL PART NUMBER: LF-CLJ

INSPECTION AND MAINTENANCE

- CYLINDER SHALL BE INSPECTED AT LEAST SEMI ANNUALLY OR MORE FREQUENTLY WHEN CIRCUMSTANCE REQUIRED.
- CHECK CYLINDER PRESSURE.
- REFILL OR REPLACE THE CYLINDER WHEN LOSS OF PRESSURE MORE THAN 5 PERCENT, CONTACT SYSTEM SUPPLIER. REFER TO MANUAL FOR TEMPERATURE OTHER THAN 15°C / 59°F).

Hazardous Material Information System (HMIS)

Health : 0 Flammability : 0 Reactivity : 0

MSDS NO: LF-MSDS-40541

Consult : LICHFIELD FIRE & SAFETY EQUIPMENT CO LTD
EDMUND HOUSE, 12-22 NEWHALL STREET,
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UNITED KINGDOM.

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DO NOT COVER, REMOVE, OR DEFACE THIS LABEL

Cylinder Label