

490 L SYSTEM ASSEMBLY • 500 PSI [34.5 BAR]

High Efficiency Delivery System (HEDS™) Assemblies 500 PSI [34.5 Bar] Designed for use with 3M™ Novec™ 1230 Fire Protection Fluid

PRODUCT OVERVIEW

The High Efficiency Delivery System (HEDS™) 490 L System Assembly is factory filled with 3M™ Novec™ 1230 Fire Protection Fluid in half-kilogram (0.5 kg) increments from a minimum of 118 kg to a maximum of 588 kg to achieve the calculated agent mass required. The cylinder is then pressurized with dry nitrogen to 500 psi at 70°F [35 bar at 21.1°C].

FEATURES

- High-flow-rate valve
- 4.0" [100 mm] grooved valve outlet connection
- Calibrated Pressure Gauge
- Over-pressure safety device (PRD)
- 4-way "lift-base" for ease of shipping and installation
- Manual, Electric or Pressure operated (Pneumatic) Actuation
- Optional Equipment
 - Liquid-level indicator
 - Pressure Supervisory Switch
 - Discharge Pressure Switch
 - Cylinder Floorstrap

The System Assembly is equipped with a 4.0" [100 mm] stainless steel, differential pressure-type valve with a 4.0" [100 mm] grooved male outlet. A piston in the valve

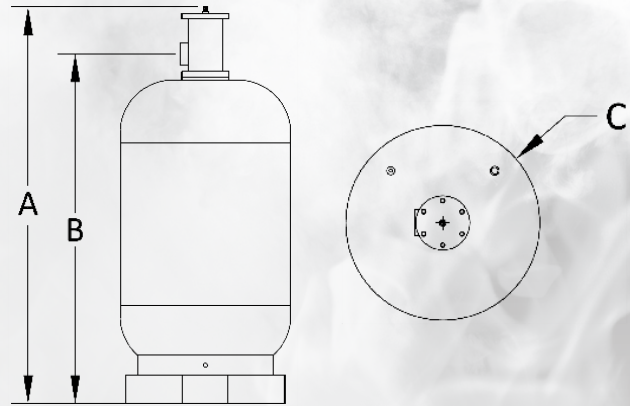


bore is equipped with a rubber seal to contain the extinguishing agent under pressure within the cylinder. An orifice in the axis of the piston allows cylinder pressure to equalize on the top and bottom of the piston. The pressurized area at the top of the piston is greater than the area at the bottom of the piston. The net force seals the piston against the valve seat. When the cylinder pressure on the top of the piston is relieved (by means of automatic or manual activation) there is only pressure acting against the bottom of the piston and the piston slides to its full open position. This allows the agent to discharge through the distribution piping network connected to the valve outlet. A siphon tube is built into the cylinder assembly. The siphon tube is straight, allowing the cylinder to be installed in a vertically upright orientation (valve on top).

PART NUMBER	CYLINDER SIZE	MAXIMUM FILL	MINIMUM FILL	VALVE SIZE (NOMINAL)	EMPTY WEIGHT (LB.)/(KG)
SHG 000490	490 L	588 kg	118 kg	4.0" (100 mm)	345.9 kg

DIMENSIONS

ASSEMBLY P/N	CYLINDER SIZE (NOMINAL)
SHG 000490	490 L



DIMENSION A		DIMENSION B		DIMENSION C	
IN.	MM	IN.	MM	IN.	MM
69.875	1775	61.625	1565.5	30	762

ENVIRONMENT LIMITATIONS

- Operating Temperature:
32°F [0°C] to 130°F [54.4°C]
- System Operating Pressure: 500 psi
at 70°F [35 bar at 21.1°C]

ENGINEERING CONSIDERATIONS

Proper System Assembly size and agent fill shall be determined using only genuine "HEDS" Flow Calculation Software (P/N: SHG 901001).

Floor loading varies as a function of the quantity of extinguishing agent fill required in each System Assembly and the optional accessories included on the system. Contact Manufacturer for additional guidance on installed weights and dimensions.

The System Cylinder is manufactured, tested and stamped in accordance with DOT and TC regulations, it is UL Component recognized and FM Approved.

SYSTEM ASSEMBLY	FM APPROVALS KIT
SHG000490	

SERVICE NOTE: System Assemblies shall be designed, filled, pressurized and maintained by trained personnel in accordance with SHTG Design, Installation, Operation and Maintenance Manuals and related prescriptive documents.

Listings and Approvals:

Complies with UL requirements when used with UL listed cylinder assemblies.

Complies with FM requirements when used with FM listed system assemblies.



All information and specifications herein subject to change without notice.

SYSTEM ASSEMBLIES • 500 PSI [34.5 BAR]

High Efficiency Delivery System (HEDS™)
Assemblies 500 PSI [34.5 Bar] Designed for
use with 3M™ Novec™ 1230 Fire Protection
Fluid

DESCRIPTION

The High Efficiency Delivery System (HEDS™) Clean Agent cylinders are manufactured, tested and stamped in accordance with DOT 4BW500 and TC 4BWM34. Refer to dimensional details. All cylinders are equipped with back pressure type valves. A piston in the valve bore is equipped with a rubber seal that keeps the Agent under pressure within the cylinder. A small hole in the piston allows cylinder pressure to equalize on both sides of the piston. Since the area at the top of the piston is greater than the area at the bottom of the piston, the net force seals the piston against the valve discharge outlet. When the cylinder pressure on the top assembly is relieved by means of automatic or manual activation, the internal piston slides to its full open position, allowing cylinder discharge.

Attached to the bottom of the cylinder valve is a siphon tube. The siphon tubes are straight, allowing for cylinder installation to be vertically upright only (valve on top). On the cylinder valve is a 1/8 inch NPT outlet stamped

Novec 1230 system assemblies are:

PART NUMBER	CYLINDER SIZE	MAXIMUM FILL	MINIMUM FILL	VALVE SIZE (NOMINAL)	EMPTY WEIGHT
SHG 000015	15 L	17 kg	4 kg	1" (25 mm)	17.1 k
SHG 000029	29 L	34.5 kg	7.5 kg	1" (25 mm)	24.5 kg
SHG 000062	62 L	74 kg	15 kg	1½" (40 mm)	48.2 kg
SHG 000103	103 L	122.5 kg	25 kg	1½" (40 mm)	70.3 kg
SHG 000153	153 L	184 kg	37.5 kg	2½" (65 mm)	113.4 kg
SHG 000227	227 L	272.5 kg	55 kg	2½" (65 mm)	154.3 kg
SHG 000368	368 L	437 kg	88 kg	2½" (65 mm)	211.2 kg



"P". This outlet transmits cylinder pressure to an optional low pressure supervisory switch, which when used, supervises the internal cylinder pressure.

Another 1/8" N.P.T. outlet on the cylinder valve stamped "M" is available for use as a pressure source to drive the piston actuator slave control heads on a multiple cylinder system or to actuate a pressure operated switch.

PRODUCT OVERVIEW

The High Efficiency Delivery System (HEDS™) System Assembly is factory filled with 3M™ Novec™ 1230 Fire Protection Fluid in half-kilogram (0.5 kg) increments to achieve the calculated agent mass required. The cylinder is then pressurized with dry nitrogen to 500psi at 70°F [34.5 bar at 21.1°C].

FEATURES

- High-flow-rate valve
- Calibrated Pressure Gauge
- Pressure Relief Device (PRD)
- Manual, Electric or Pneumatic Actuation
- Optional Equipment
 - Liquid-level indicator
 - Pressure Supervisory Switch
 - Pressure Operated Switch

ENVIRONMENTAL LIMITATIONS

- Operating Temperature: 32°F [0°C] to 130°F [54.4°C]
- System Operating Pressure: 500 psi at 70°F [34.5 bar at 21.1°C]

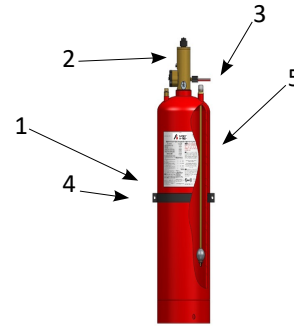
ENGINEERING CONSIDERATIONS

Proper System Assembly size and agent fill shall be determined using only genuine "HEDS" Flow Calculation Software (P/N: SHG 901001).

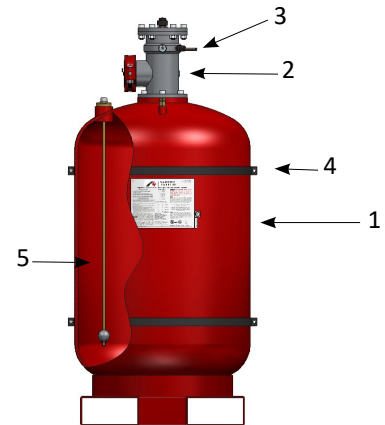
Floor loading varies as a function of the quantity of extinguishing agent fill required in each System Assembly and the optional accessories included on the system. Contact Manufacturer for additional guidance on installed weights and dimensions.

The System Cylinder is manufactured, tested and stamped in accordance with DOT and TC regulations, it is UL Component recognized and FM Approved.

Suppression Unit Component



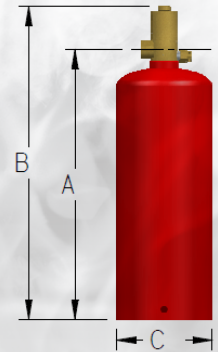
ITEM	DESCRIPTION
1	Cylinder
2	Valve
3	Pressure Supervising Switch
4	Cylinder Strap
5	Liquid Level Indicator Optional



SYSTEM ASSEMBLY
SHG000015
SHG000029
SHG000062
SHG000103
SHG000153
SHG000227
SHG000368
SHG000490

DIMENSIONS

SYSTEM ASSEMBLY PART NUMBER	CYLINDER SIZE (NOMINAL)	DIMENSION "A"		DIMENSION "B"		DIMENSION "C"	
		IN.	MM	IN.	MM	IN.	MM
SHG 000015	15 L	16.75	425.5	27.75	704.9	10.00	254.0
SHG 000029	29 L	28.75	730.3	33.90	861.1	10.00	254.0
SHG 000062	62 L	37.70	957.6	43.60	1107.4	12.75	323.9
SHG 000103	103 L	38.70	983.0	44.60	1132.8	16.00	406.4
SHG 000153	153 L	55.30	1404.6	63.60	1615.4	16.00	406.4
SHG 000227	227 L	54.00	1371.6	62.60	1590.0	20.00	508.0
SHG 000368	368 L	58.50	1485.9	66.10	1678.9	24.00	609.6



ORDERING INFORMATION

Cylinder Wall Straps (P/N: SHG 400XXX) are required for installing the System Assembly. One cylinder strap is to be used for the 15 L, 29 L, 62 L and 103 L cylinders. Two cylinder straps must be used for 153 L, 227 L, and 368 L cylinders. In order to fill and pressurize the System Assembly, a Top Plug must be specified and purchased when ordering the system.

Listings and Approvals:

Complies with UL requirements when used with UL listed cylinder assemblies.

Complies with FM requirements when used with FM listed system assemblies.



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DISCHARGE NOZZLES 500 PSI [34.5 BAR]

DESCRIPTION

The function of the Discharge Nozzle, in a fire extinguishing system, is to distribute the Clean Agent in a uniform, pre-determined pattern and concentration. The nozzles are designed to complete the discharge of Clean Agent in 10 seconds, or less, when installed within the design limitations of the "HEDS" Design, Installation, Operation, & Maintenance Manual.

Discharge Nozzles are available in sizes of 1/2" [13 mm], 1" [25 mm], 1½" [40 mm], 2" [50 mm], and 2½" [63.5 mm]. Each discharge nozzle comes in two configurations: 180 and 360 degree distribution patterns. Discharge Nozzles are made of aluminum, brass, or stainless steel with female pipe threads. Discharge Nozzle orifice sizes are determined by hydraulic flow calculations. All nozzles are rated for a maximum hazard height of 14 feet. If hazards exceed 14 feet in height, a second tier of nozzles must be used.

DISCHARGE NOZZLE SELECTION – SIDEWALL 180°

Typically installed adjacent to the center of the wall in the enclosure. Its discharge path will be across the enclosure. At no time shall the area coverage be exceeded.

DISCHARGE NOZZLE SELECTION – CENTRAL TYPE 360°

Typically installed at the center of the ceiling in an enclosure. Its discharge path will be across the enclosure. At no time shall the area coverage be exceeded.



INSTALLATION

Refer to "HEDS" Design, Installation, Operation, & Maintenance Manual for Discharge Nozzle Area Coverage and Application Selection.

ALUMINUM NOZZLES

PART NUMBER	DESCRIPTION	PART NUMBER	DESCRIPTION
SHG 661200	½" [15 mm] (180°) Sidewall	SHG 661100	½" [15 mm] (360°) Central
SHG 662200	1" [25 mm] (180°) Sidewall	SHG 662100	1" [25 mm] (360°) Central
SHG 663200	1½" [40 mm] (180°) Sidewall	SHG 663100	1½" [40 mm] (360°) Central
SHG 664200	2" [50 mm] (180°) Sidewall	SHG 664100	2" [50 mm] (360°) Central
SHG 665200	2½" [63.5 mm] (180°) Sidewall	SHG 665100	2½" [63.5 mm] (360°) Central

BRASS NOZZLES

PART NUMBER	DESCRIPTION	PART NUMBER	DESCRIPTION
SHG 661400	½" [15 mm] (180°) Sidewall	SHG 661300	½" [15 mm] (360°) Central
SHG 662400	1" [25 mm] (180°) Sidewall	SHG 662300	1" [25 mm] (360°) Central
SHG 663400	1½" [40 mm] (180°) Sidewall	SHG 663300	1½" [40 mm] (360°) Central
SHG 664400	2" [50 mm] (180°) Sidewall	SHG 664300	2" [50 mm] (360°) Central
SHG 665400	2½" [63.5 mm] (180°) Sidewall	SHG 665300	2½" [63.5 mm] (360°) Central

STAINLESS STEEL NOZZLES

PART NUMBER	DESCRIPTION	PART NUMBER	DESCRIPTION
SHG 661600	½" [15 mm] (180°) Sidewall	SHG 661500	½" [15 mm] (360°) Central
SHG 662600	1" [25 mm] (180°) Sidewall	SHG 662500	1" [25 mm] (360°) Central
SHG 663600	1½" [40 mm] (180°) Sidewall	SHG 663500	1½" [40 mm] (360°) Central
SHG 664600	2" [50 mm] (180°) Sidewall	SHG 664500	2" [50 mm] (360°) Central
SHG 665600	2½" [63.5 mm] (180°) Sidewall	SHG 665500	2½" [63.5 mm] (360°) Central

Listings and Approvals:

Complies with UL requirements when used with UL listed cylinder assemblies.

Complies with FM requirements when used with FM listed system assemblies.



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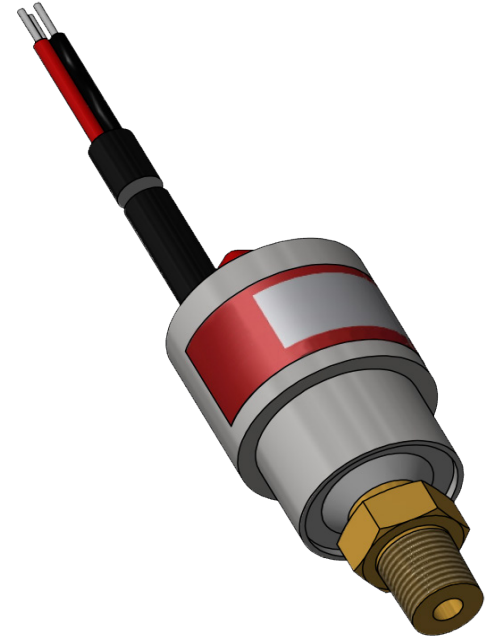
PRESSURE OPERATED SWITCHES 500 PSI [34.5 BAR]

DESCRIPTION

The switch is used as a Discharge Confirmation. If the cylinder to which the switch is attached detects pressure, above the pressure set point, the switch contacts will activate, providing a signal to the Release Control Panel to indicate that the Clean Agent Cylinder has been activated. The pressure switch is wired into a circuit to give a fault signal upon activation.

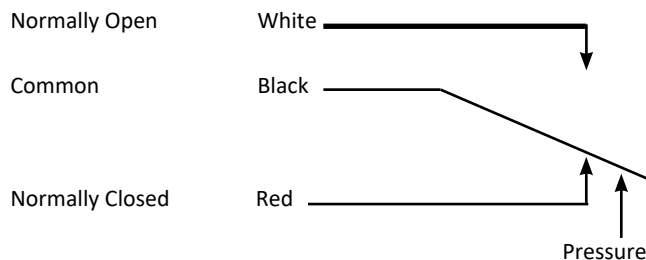
ELECTRICAL RATING

Electrical Rating	240 VAC- 3 A, 24 VDC - 3 A,
Switch	SPDT snap action
Contacts	NO, NC and Common
Set Points	Activation: 20 + 5 psig [1.4 + 0.3 bar]
	Manual Reset: 10 + 6 psig [0.7 + 0.4 bar]
Operation Temperatures	-5°F to + 175°F [-29°C to + 66°C]
	-40°F to + 260°F [-54°C to + 127°C]



*Per NFPA 2001, you must use a pressure operated switch if mechanical operation is possible.

Shown at Atmosphere



Listings and Approvals:

Complies with UL requirements when used with UL listed cylinder assemblies.

Complies with FM requirements when used with FM listed system assemblies.

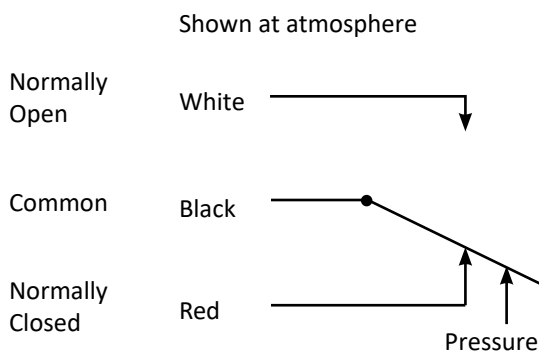
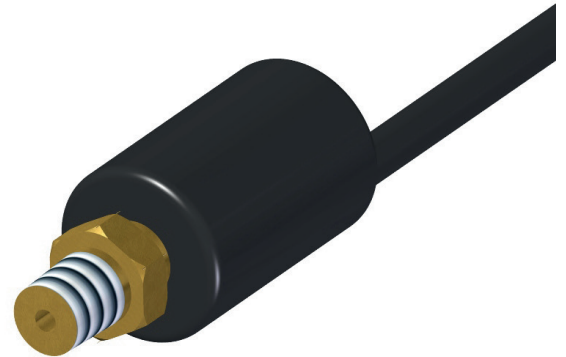


PRESSURE SUPERVISORY SWITCHES 500 PSI [34.5 BAR]

DESCRIPTION

The switch is used to monitor the pressure within the Clean Agent Cylinder. If the cylinder to which the switch is attached leaks, and its pressure drops below 414 psi, the switch contacts will activate, providing a signal to the Release Control Panel to indicate Clean Agent Cylinder's loss of pressure and or leakages. Part Number SHG 503006, Single Pole Double Throw.

Electrical Rating	240 VAC - 3 A, 24 VDS - 3 A
Switch	SPDT snap action
Contacts	NO, NC, and Common
Set Points	486 ± 14 psi [33.5 ± 1.0 bar] Actuation
	414 ± 14 psi [28.5 ± 1.0 bar] Release Pressure
Operational Temperatures	-5F to +175F [-21C to +65C]
	-40F to +260F [-40C to +135C]



Listings and Approvals:

Complies with UL requirements when used with UL listed cylinder assemblies.

Complies with FM requirements when used with FM listed system assemblies.



SYSTEM ACTUATORS

Monitored System Actuators

Electric Actuator

The Electric Actuator (SHG500125) is a removable device with an internal monitoring switch. The internal monitoring switch complies with NFPA requirements for actuation apparatus monitoring.

The Electric Actuator mounts to the threads on the actuation adapter, located on the top of the cylinder valve. It is permanently installed while the system is in service, but the threaded attachment allows for ease of removal for inspection and maintenance purposes.

The Electric Actuator houses a pin magnetically held in place while the systems remain in an idle state. Once powered, the pin moves downward, depressing the actuation adapter valve core and releasing pressure from the cylinder valve.

Cylinder valves equipped with the Electric Actuator must be actuated from a listed control panel for releasing device service that is compatible with Firetrace equipment.

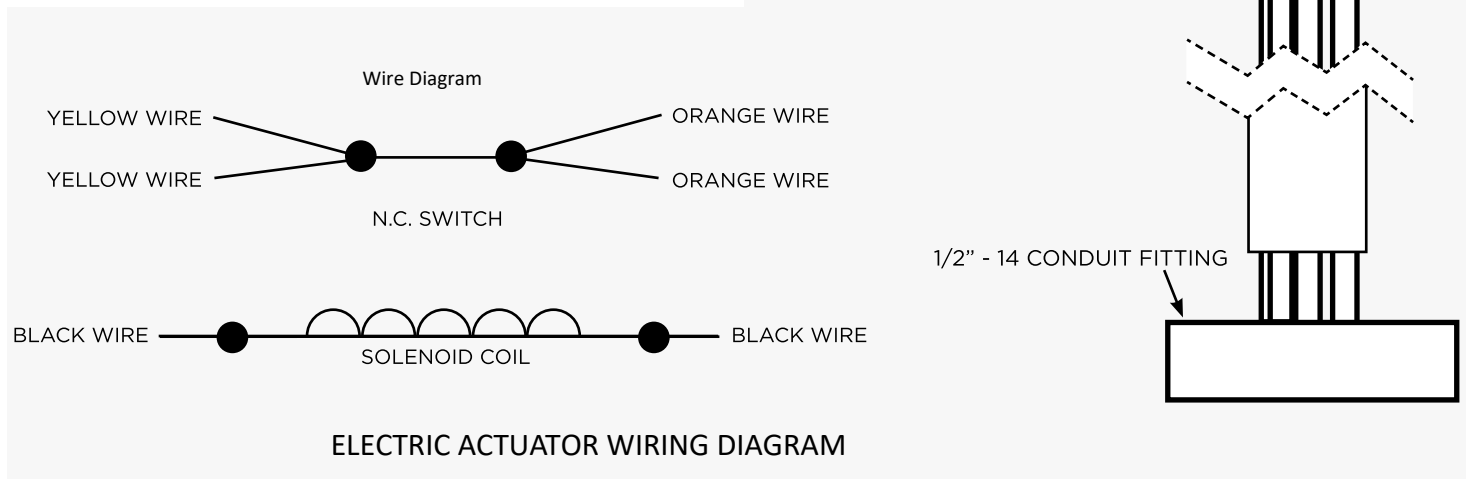
Prior to the installation of the Electric Actuator to the actuation circuit, confirm that the electrical ratings of the solenoid are compatible with the electrical ratings of the actuation circuit. NOTE: The actuation circuit is rated at 24 VDC, 0.5 Amps. The maximum supervisory current should not exceed 30 mA.



Wiring of the Electric Actuator to the actuation circuit shall comply with wiring methods in accordance with NFPA requirements and the installation instructions provided with the listed control panel for releasing device service. A diagram for proper wiring has been provided below. For more information, refer to the wiring methods found in NFPA 72, Chapter 17.

The Electric Actuator shall be installed with listed conduit connectors.

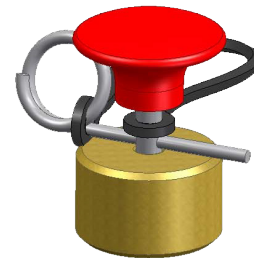
By utilizing flexible metal conduit connectors or liquid-tight conduit connectors, the solenoid coil wires and dual leads for the internal monitoring switch are mechanically protected from damage.



Manual Actuator

The Manual Actuator (SHG500126) features a push-button that moves the internal pin downward and manually actuates the Electric Actuator.

The Manual Actuator mounts to the threads located on the top of the Electric Actuator. The threaded attachment allows for ease of removal for inspection and maintenance purposes.



Listings and Approvals:

Complies with UL requirements when used with UL listed cylinder assemblies.

Complies with FM requirements when used with FM listed system assemblies.



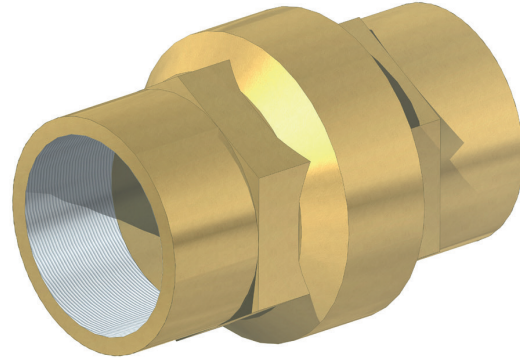
MANIFOLD CHECK VALVES 500 PSI [34.5 BAR]

DESCRIPTION

The Manifold Check Valve is required when a manifold is used to enable two or more agent storage cylinders to share one common discharge piping configuration. Their purpose is to prevent loss of agent in the event that any of the agent storage cylinders are not connected to the manifold at time of system discharge.

The 1, 1.5, and 2.5 inch Manifold Check Valves are constructed of a brass body, featuring Female NPT threads, wrench flats on the outer surface for tightening, and a rubber internal sealing mechanism. The check is spring assisted to ensure the valve closes before flow reversal. This feature helps prevent the phenomenon known as “hammer” and its associated damage to the piping systems.

The 4 inch Manifold Check Valve is constructed of a ductile iron body, featuring Victaulic Coupling ends and a Nitrile rubber internal sealing surface. The Stainless Steel twin disc check valves are spring assisted to ensure the valve closes before flow reversal.



PART NUMBER	CHECK VALVE SIZE	FITTING STYLE
SHG 701001	1" [25 mm]	NPT
SHG 701501	1½" [40 mm]	NPT
SHG 702501	2½" [65 mm]	NPT
SHG 704003	4" [100 mm]	Grooved

Listings and Approvals:

Complies with UL requirements when used with UL listed cylinder assemblies.

Complies with FM requirements when used with FM listed system assemblies.



All information and specifications herein subject to change without notice.

LIQUID LEVEL INDICATOR 500 PSI [34.5 BAR]

DESCRIPTION

The Liquid Level Indicator (Optional) is a simple, compact, manually operated device which provides a means to determine the Clean Agent liquid level in vertically mounted agent storage containers. Once the liquid level is determined, it can then be converted into the amount of Clean Agent present in the agent storage container.

OPERATION

A magnet equipped float moves with the liquid level along the unit stem. Level readout is obtained by simply removing the protective cap and pulling out a calibrated tape until magnetic interlock with the float is felt. With the tape in this position, the reading is obtained at the point where the tape emerges from the unit housing. When the liquid level is determined, reference the tape reading to the chart provided in the system manual to determine the corresponding Clean Agent amount. Accurate readings can be obtained over a +40°F to +90°F [4.4°C to 32.2°C] temperature range.

FEATURES

All Liquid Level Indicators come equipped with a flexible tape design. This allows measurements to be taken and the agent amount determined without ever moving the system, thus reducing maintenance time. These measurements can be taken while the system is charged and does not require the Clean Agent System to be shut down, thus avoiding the need to disable the fire protection system. These Liquid Level Indicators are installed directly into the boss on the cylinder without use of Epoxy, making field installs easy if the system is uncharged/filled.



PART NUMBER	DESCRIPTION
SHG 720150	Liquid Level Indicator for 160 lb [62 L] & 270 lb [103 L] Cylinders
SHG 720375	Liquid Level Indicator for 400 lb [153 L] through 950 lb [368 L]
SHG 721200	Liquid Level Indicator for 1300 lb [490 L] Cylinders

Listings and Approvals:

Complies with UL requirements when used with UL listed cylinder assemblies.

Complies with FM requirements when used with FM listed system assemblies.

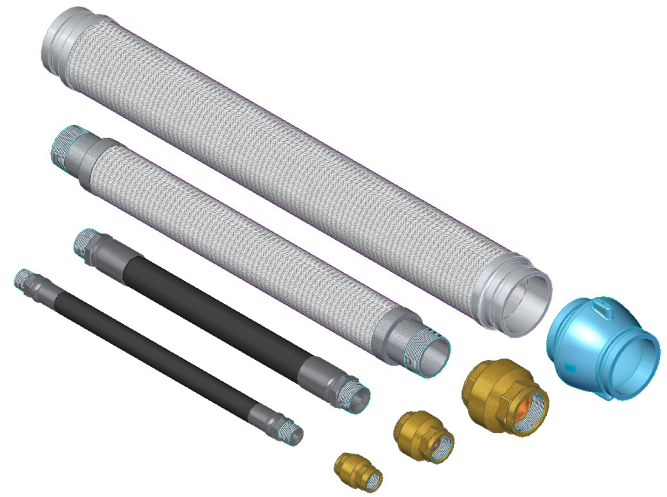


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FLEXIBLE CYLINDER HOSE 500 PSI [34.5 BAR]

DESCRIPTION

Flexible cylinder hoses can be used to connect the agent storage containers to the manifold in multiple cylinder arrangements or for ease of installation to discharge piping networks in single cylinder applications. Flexible cylinder hoses vary in length and are constructed of high pressure hydraulic rubber in the 1.0" [25 mm] and 1.5" [40 mm] sizes and stainless steel with braid in the 2.5" [65 mm] and 4" [100 mm] sizes. The 4.0" flexible cylinder hoses come with grooved Victaulic connections on both ends while the 1.0", 1.5", and 2.5" are fitted with male NPT threads on both ends.



PART NUMBER	SIZE	LENGTH	MATERIAL
SHG 701005	1" [25 mm]	24" [610 mm]	Rubber
SHG 701505	1½" [40 mm]	24" [610 mm]	Rubber
SHG 702504	2½" [65 mm]	32" [813 mm]	S.S. Braided
SHG 704005	4" [100 mm]	40" [1016 mm]	S.S. Braided

Listings and Approvals:

Complies with UL requirements when used with UL listed cylinder assemblies.

Complies with FM requirements when used with FM listed system assemblies.



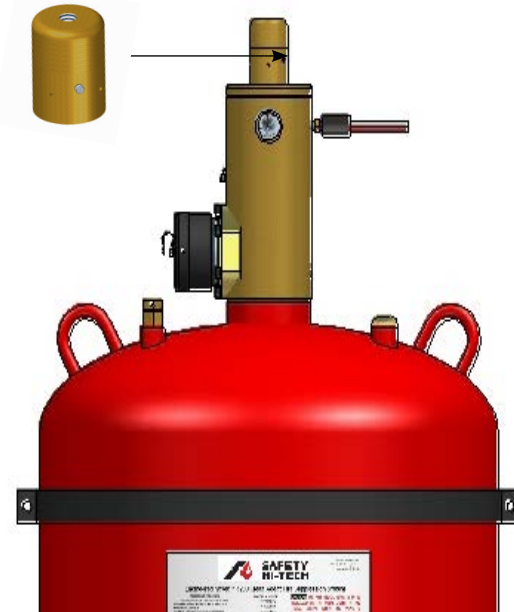
PNEUMATIC ACTUATOR

PRODUCT OVERVIEW

A pneumatic actuator is used in a multiple cylinder configuration. It features a pneumatically driven piston that slides downward, depressing the actuation adapter valve core allowing the cylinder valve to activate.

Multiple cylinders equipped with a Pneumatic Actuator can be activated from one master cylinder using the flex hoses.

The Pneumatic Actuator mounts on the top of the cylinder valve.



PART NUMBER	DESCRIPTION
SGH 700041	Pneumatic Actuator

Listings and Approvals:

Complies with UL requirements when used with UL listed cylinder assemblies.

Complies with FM requirements when used with FM listed system assemblies.



MAIN/RESERVE SWITCHES

PRODUCT OVERVIEW

The High Efficiency Delivery System (HEDS) Main/Reserve Switch is designed to allow the user to quickly switch the electrical connection between a main and reserve system. The switch allows for easy and worry free system servicing and shorter downtimes in the event of a discharge.



PART NUMBER	DESCRIPTION
SHG 502001	Main/Reserve Switch

Listings and Approvals:

Complies with UL requirements when used with UL listed cylinder assemblies.

Complies with FM requirements when used with FM listed system assemblies.



HAZARD SIGNS

PRODUCT OVERVIEW

The High Efficiency Delivery System (HEDS) offers three different hazard signs which can be placed near the doors of a hazard to inform the occupants of the installed "HEDS" Clean Agent Fire Suppression System. The signs feature a red face with white lettering. The signs measure 7.5"W x 3.5"H x 0.25" T

LISTINGS AND APPROVALS:

Complies with UL requirements when used with UL or ULC listed cylinder assemblies.



PART NUMBER	SIGN WORDING
SHG 710001	"Caution: When Alarm Sounds Vacate Room, Fire Suppression System Being Discharged"
SHG 710002	"Caution: Do Not Enter Room When Alarm Sounds. Fire Suppression System Being Discharged"
SHG 710003	"Caution: Operation of Manual Station Will Result in Immediate Discharge of Fire Suppression System"

All information and specifications herein subject to change without notice.

PNEUMATIC ELBOWS, TEES, AND FLEX HOSES

PRODUCT OVERVIEW

"HEDS" provides pneumatic elbows, tees, and flex hoses to insure that proper connections are made between master and slave cylinders. There are two sizes of pneumatic elbow depending on the placement within the bank of cylinders. SHG 700021 attaches to the master cylinder valve located at the beginning of the cylinder bank. SHG 700033 attaches to the slave cylinder pneumatic actuator located at the end of the cylinder bank. The pneumatic tee, SHG 700032, attaches to the slave cylinder pneumatic actuator of all remaining slave cylinders located within the cylinder bank. Finally, the pneumatic flex hoses provide the connections between the tees and elbows of the cylinder bank. Refer to DIOM manual for more information on the proper design of master and slave cylinder banks.



PART NUMBER	DESCRIPTION
SHG 700021	Pneumatic Elbow (Used at Valve)
SHG 700033	Pneumatic Elbow (Used at Actuator)
SHG 700032	Pneumatic Tee
SHG 700024	Flex Hose – Actuation (24" Length)
SHG 700025	Flex Hose – Actuation (36" Length)
SHG 700004	Flex Hose – Actuation (48" Length)

Listings and Approvals:

Complies with UL requirements when used with UL listed cylinder assemblies.

Complies with FM requirements when used with FM listed system assemblies.



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VDS FLOW CALCULATION SOFTWARE

PRODUCT OVERVIEW

The High Efficiency Delivery System (HEDS) systems use a customized version of VdS's FK-5-1-12 Flow Calculation Software. This software has been designed to accurately represent "HEDS" Systems and Components during the flow calculation. Licenses and software can be purchased directly through "HEDS" to enable distributors to perform flow calculations.



PART NUMBER	DESCRIPTION
SHG 901001	HEDS Flow Calculation Software and Key (1 Year)

Listings and Approvals:

Complies with UL requirements when used with UL listed cylinder assemblies.

Complies with FM requirements when used with FM listed system assemblies.



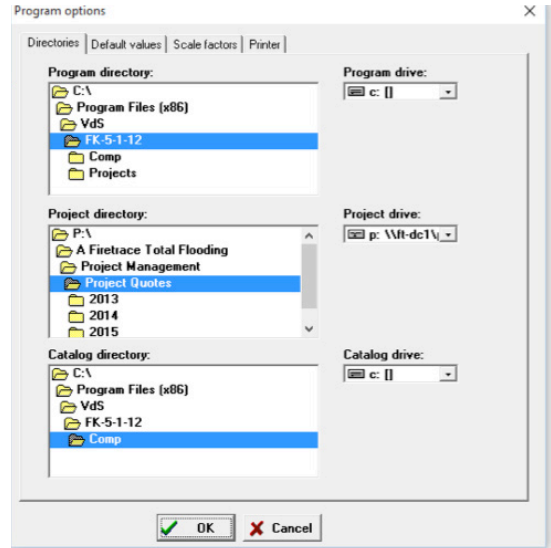
VdS Software Installation:

Installing the VdS Software is a multiple step procedure that includes copying the program files to your desktop, installing the VdS and Codemeter programs, and then establishing your default settings. To accomplish these task you must:

1. Copy the VDS.zip File onto the installation com-puter's desktop.
2. Right Click on the VDS.zip file and choose "Ex-tract All..." from the drop down menu.
3. You will now see a regular folder titled "VdS", open it.
4. Contained within this file you will now see an additional folder titled "FK-5-1-12Normal", open this folder.
5. You should now see a file titled "Setup_FK-5-1-12_7.5.exe", click on this file and then follow the instructions on the screen.
6. Now that the VdS program is installed you will need to upload the Safety HI-Tech Global Licensing informa-tion to the program files. To do this you will need to:
 - a. copy the lst_.chk file
 - i. go to the VdS folder on your desktop and open it
 - ii. click on the FK-5-1-12Normal folder and open it
 - iii. Highlight the lst_.chk file and copy it

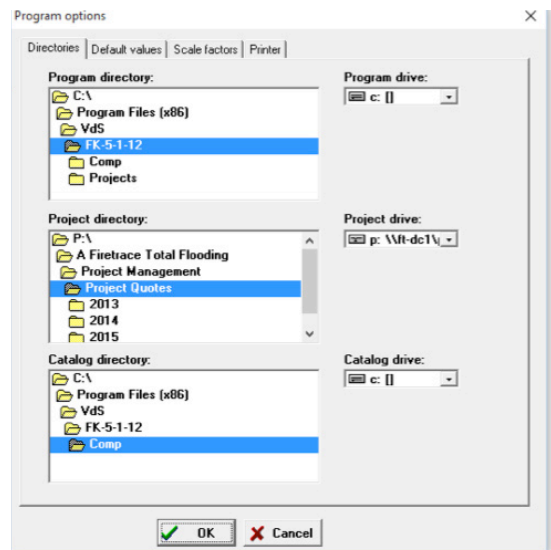
7. Next, to copy component files into your program directory you will need to:
 - a. Open the VdS folder on your desktop
 - b. Copy the following Firetrace Component files:
 - i. SHG Components 1.0.0.arm
 - ii. SHG Nozzles - 1.0.2.nox
 - iii. SHG Pipe - Schedule 40 - 1.0.0.rkl
 - c. Paste them into the program files in the catalogue folder by:
 - i. Go to your C drive
 - ii. Click on Program Files (x86)
 - iii. Click on VdS
 - iv. Click on FK-5-1-12
 - v. Open the Comp folder, and paste the three files here

13. At the bottom of this window you will see a dialogue box verify that the settings are all as shown in the illustration below:



8. Once these steps have been performed it is now time to install the Codemeter runtime software. To install this you will need to:
 - a. Open the VdS folder on your desktop
 - b. Find the Codemeter folder and open it
 - c. Select the file named "CodeMeterRuntime_5.0.exe"
 - d. Follow the prompts on the screen.

14. Now click on the "Default Values" tab and ensure your settings are as follows:



9. Now to verify that everything set up properly plug in the silver VdS USB dongle and open the program.
10. Once the program is open Select the "Files" Op-tion at the top of the screen
11. From the drop down menu choose the "Op-tions" selection.
12. A window will open up with several tabs, choose the "Directories" tab.

15. Once this final step is complete you are now ready to begin operating the program.

3M™ NOVEC™ 1230 FIRE PROTECTION FLUID

PRODUCT OVERVIEW

3M™ Novec™ 1230 Fire protection fluid, referenced as FK-5-1-12 in NFPA and ISO documents, is a fluorinated ketone (or “Fluoroketone”) depicted by the chemical formula $\text{CF}_3\text{CF}_2\text{C}(\text{O})\text{CF}(\text{CF}_3)_2$.

It is colorless, odorless and electrically nonconductive. It is a liquid at room temperature, pressurized with Nitrogen and stored in high-pressure cylinders as part of a "HEDS" Engineered Suppression System. Novec 1230 suppresses fire primarily by physical mechanisms due to its relatively high heat capacity with minimal impact on available oxygen. This allows hazard occupants to see and breathe, permitting them to safely exit the hazard area.

FEATURES

- UL/ULC listed
- FM approved
- Effective extinguishing performance on Class A, B and C fires
- People safe at concentration levels required to extinguish fire
- Zero ozone depletion potential
- Atmospheric lifetime of five days
- Colorless, odorless, no particulate or oily residue
- No cleanup and minimal business disruption after a discharge
- Electrically non-conductive
- Small quantity of agent required to extinguish fires
- Minimal claim of valuable floor space required in mission critical facilities

ENVIRONMENTAL IMPACT

Novec 1230 Fluid is approved under the US EPA’s Significant New Alternatives Policy (SNAP) and is approved for use as an alternative to Halons for clean agent suppression in occupied spaces. Additional environmental properties are noted in Table 1.1.

TABLE 1.1:

Ozone Depletion Potential (ODP) ¹	0
Global Warming Potential (GWP) ²	1
Atmospheric Lifetime (Days)	5

1 World Meteorological Organization (WMO) 1998, Model Derived Method. 2 intergovernmental Panel on Climate Change (IPCC) 2007 Method, 100 Year ITH.

PERFORMANCE

Due to its relatively high heat capacity, Novec 1230 Fluid suppresses fires via its cooling effect. At sufficient concentration it causes the combustion zone to cool, limiting heat buildup and extinguishing the fire. Concentration requirements vary based on applicable international code and compliance requirements. Specific design concentration shall be specified by the system manufacturer.

APPLICATIONS

As a clean agent, it leaves no residue behind and will not affect sensitive high-value electronics. Typical applications include:

- Telecommunication switch rooms
- Computer and electronic control rooms
- Hazards aboard ships
- Critical military applications

SAFETY

The NOAEL (No Observable Adverse Effect Level) is measured at 10% for Novec 1230 fluid. This provides the largest margin of safety in occupied spaces of any of the contemporary halocarbon clean agents. In accordance with NFPA 2001; unnecessary exposure to clean agents should be avoided (See: NFPA 2001, Sect. 1-6, Safety).

Novec 1230 fluid has been evaluated for cardiac sensitization in accordance with test protocols approved by the Novec 1230 fluid has been judged acceptable by the U.S. EPA for use in occupied spaces when used in accordance with the guidance of NFPA 2001.

Although Novec 1230 fluid has negligible toxicity in concentrations required to suppress most fires, sufficient safety considerations must be observed when applying and handling the agent. Consult "HEDS" Manuals and NFPA 2001 for additional guidance on safety.

Listings and Approvals:

Complies with UL requirements when used with UL listed cylinder assemblies.

Complies with FM requirements when used with FM listed system assemblies.



PHYSICAL PROPERTIES

Novec 1230 fluid is stored in liquid form. However, when discharged through the "HEDS" Discharge nozzles, Novec 1230 will transition to a gaseous state. These properties make it an effective suppression agent for a variety of hazards.

Table 1.2 features typical chemical properties of Novec™ 1230 Fire Protection Fluid.

TABLE 1.2:

Chemical Formula	$\text{CF}_3\text{CF}_2\text{C}(\text{O})\text{CF}(\text{CF}_3)_2$
Molecular Weight	316.04
Freezing Point	-162.4°F [-108°C]
Boiling Point at 1 Atm	20.6°F [9.2°C]
Critical Temperature	335.6°F [168.7°C]
Critical Density	39.91 lb./ft.3 [639.1 kg/m ³]
Critical Pressure	270.44 PSIA [1865 kPa]
Critical Volume	0.0251 ft.3/lbm [494.5 cc/mole]
Density, sat. liquid	99.9 lbm/ft ³ [1.60 g/ml]
Density, gas @ 1 atm	0.851 lbm/ft ³ [0.0136 g/ml]
Specific volume, gas @ 1 atm	1.175 ft ³ /lb [0.0733 m ³ /kg]
Liquid viscosity @ 32°F [0°C]/77°F [25°C]	0.56/0.39 centistokes
Heat of vaporization @ Boiling Point	37.9 BTU/lb [88.1 kJ/kg]
Solubility of H ₂ O in Novec 1230 liquid	<0.001% by wt.
Vapor pressure	5.85 psig [0.40 bar]
Dielectric strength relative to N ₂	2.3

All information and specifications herein subject to change without notice.

CYLINDER STRAPS

DESCRIPTION

The cylinder straps are manufactured of steel bands formed to the diameters of the cylinders with flanges for anchoring to solid surfaces or appropriately sized continuous slot metal framing channel. The channel is to be supplied by the installer. The cylinder bracket must be secured to a surface appropriate for retaining the weight of the cylinder in a discharge event. This precaution is intended to safely support the weight of the cylinder and the reaction force of the FK-5-1-12 discharge.

One cylinder bracket is required for the 15 L, 75 29 L, [62 L and 103 L cylinders. The 153 L, 227 L, 368 L and 490 L cylinders require two bracket straps per cylinder assembly. All cylinders must be mounted vertically only, with the valve up, resting firmly on the floor.

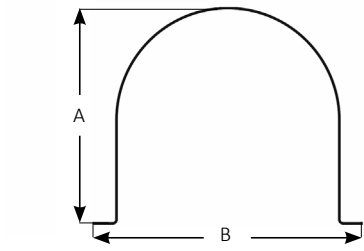


Cylinder Straps Dimensions

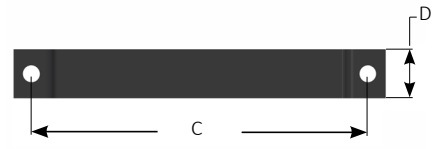
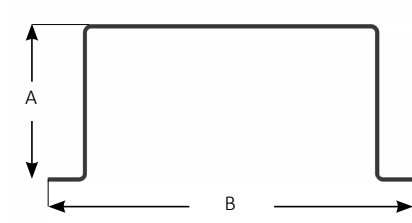
Cylinder Size (Nominal)	Qty Per Cylinder	Anchor Point	Dimension "A"		Dimension "B"		Dimension "C"		Dimension "D"	
			IN	MM	IN	MM	IN	MM	IN	MM
38 lb (15 L)	1	Wall	9.8	248	12.3	311	11.3	286	1.4	35
75 lb (29 L)	1	Wall	9.8	248	12.3	311	11.3	286	1.4	35
160 lb (62 L)	1	Wall	12.5	318	15.0	381	14.0	356	1.4	35
270 lb (103 L)	1	Wall	15.8	400	18.3	464	17.3	438	1.4	35
400 lb (153 L)	2	Wall	15.8	400	18.3	464	17.3	438	1.4	35
600 lb (227 L)	2	Wall	19.8	502	22.3	565	21.3	540	1.4	35
950 lb (368 L)	2	Wall	23.8	603	26.3	667	25.3	643	1.4	35
1,350 lb (490 L)	2	Wall	29.0	737	32.3	819	31.3	794	1.4	35
1,350 lb (490 L)	2	Floor	4.5	114	10.5	267	9.5	241	1.4	35

* Wall mount straps included in 1300 LB assembly. If floor mount is desired, floor mount straps (SHG401201) must be ordered separately.

Cylinder Wall Strap



Cylinder Floor Strap



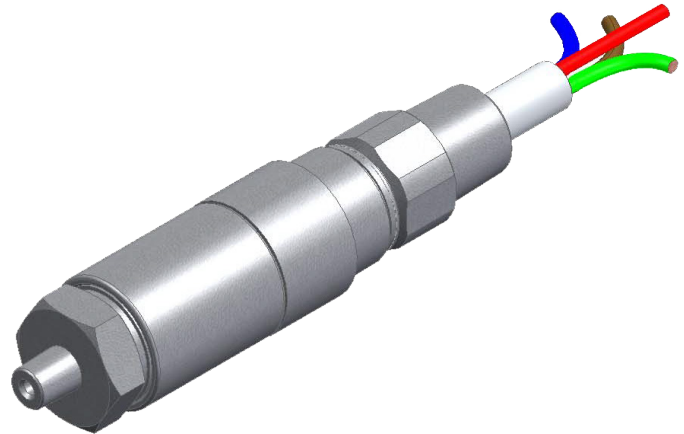
PRESSURE OPERATED SWITCH FOR HAZARDOUS ENVIRONMENTS • 500 PSI [34.5 BAR]

DESCRIPTION

The Pressure Operated Switch (SGH503012) is used as discharge confirmation. If the pressure operated switch detects pressure above the pressure set point, the switch contacts will activate and provide a signal to the control panel to indicate that the clean agent system assembly has been activated. The pressure operated switch is wired into the circuit to give a fault signal upon activation.

ELECTRICAL RATING

250 VAC	5 AMPS
28 VDC	3 AMPS

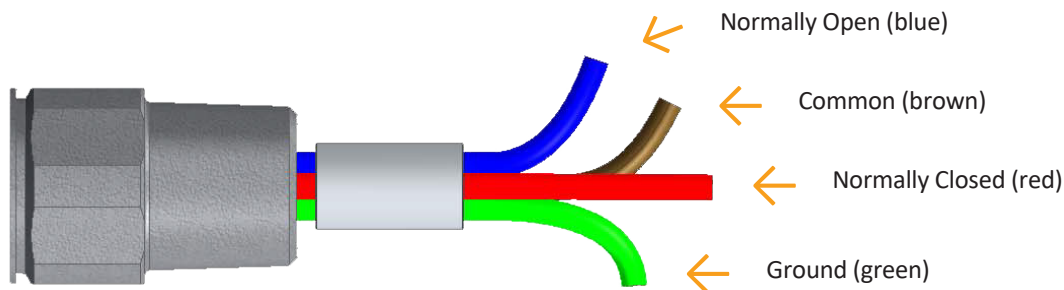


PRESSURE SETTINGS

Activation Point: 20 ± 5 psig [1.4 ± 0.3 bar]

TEMPERATURE RANGE

-58 °F to +203 °F [-50 °C to +95 °C]



Listings and Approvals:

Complies with UL requirements when used with UL listed cylinder assemblies.

Complies with FM requirements when used with FM listed system assemblies.

