Fire Suppression System Checklist

Pre-Engineered System	
Current service inspection (annual)	O Yes O No O N/A
Gauge indicates proper charge (green)	O Yes O No O N/A
Pins in place with proper tamper seals	O Yes O No O N/A
Manual pull cable properly attached at cylinder head	O Yes O No O N/A
Manual pull cable properly mounted at pull station with handle	O Yes O No O N/A
Charged/Discharged indicator operating	O Yes O No O N/A
Shutdown (engine(s), ventilation) / Alarm system installed/operational	O Yes O No O N/A
Crew familiar with system operation	O Yes O No O N/A

Fixed System	
Current service inspection (annual)	O Yes O No O N/A
Gauge indicates proper charge (green)	O Yes O No O N/A
Pins in place with proper tamper seals	O Yes O No O N/A
Heat actuated detector (HAD) properly connected	O Yes O No O N/A
Pressure actuated switchbox for shutdown (engine(s), ventilation) / alarm system wired/operational	O Yes O No O N/A
Manual pull cable properly attached at cylinder head	O Yes O No O N/A
Manual pull cable properly mounted at pull station with handle	O Yes O No O N/A
Pressure trip(s) installed and properly set	O Yes O No O N/A
Crew familiar with system operation	O Yes O No O N/A

CO_2 Fixed System (in addition to Fixed System)	
Pressure operated siren(s) installed in protected space(s)	O Yes O No O N/A
Discharge time delay cylinder in proper piping position	O Yes O No O N/A
Warning signs posted in/out of protected space	O Yes O No O N/A
Odorizer (wintergreen) installed	O Yes O No O N/A

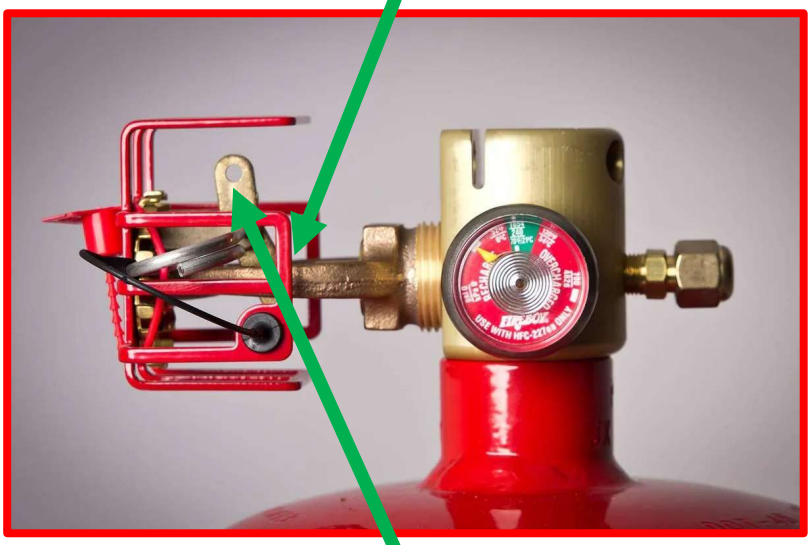
Fire Suppression Systems

This CO2 system has a significant safety issue that, hopefully, will make more sense after reviewing this reference. The service technician installed the cylinders in the incorrect order, which bypassed the time delay, alarm, and pressure switch. The cylinders with the actuation heads should be on the right side of the time delay cylinder. This "simple" mistake could have had deadly consequences if not discovered by Mike Rudolph during an exam.

The information contained within this document is general in nature and is not all-inclusive in details or descriptions, as all systems are unique. Use caution around suppression systems, especially CO2.

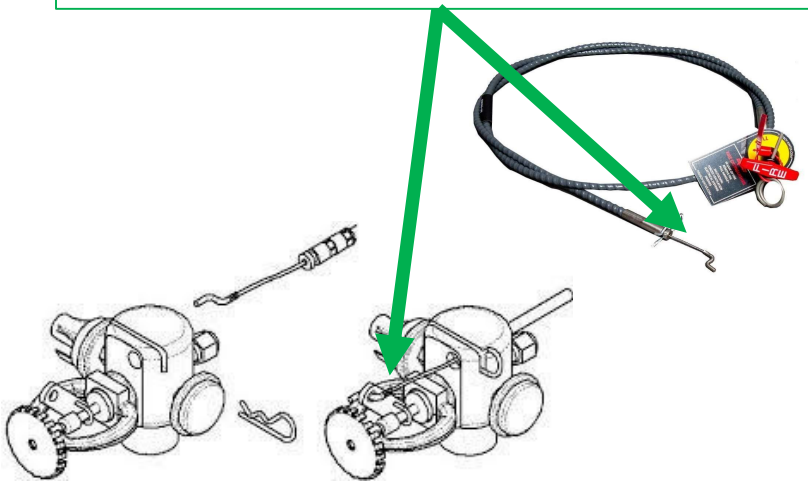
Typical Pre-Engineered System

- These are automatically actuated by heat expansion of the ampule at the discharge outlet. When heated, the ampule breaks causing the agent to discharge.



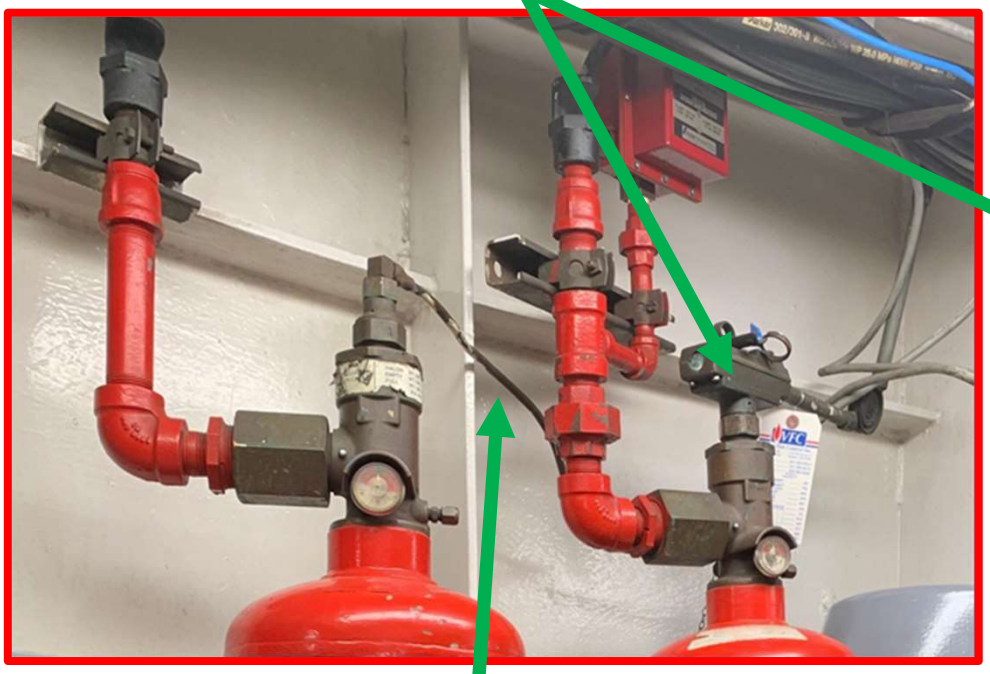
- A pressure switch is attached to the cylinder head to indicate cylinder discharge.
- It is recommended that these have an electrical monitor that indicates discharge, controls shutdowns, and allows overrides for vital systems such as propulsion.

- That ampule allows a manual actuation when a cable is connected to the lever on the ampule. Pulling the cable breaks the ampule causing a discharge.



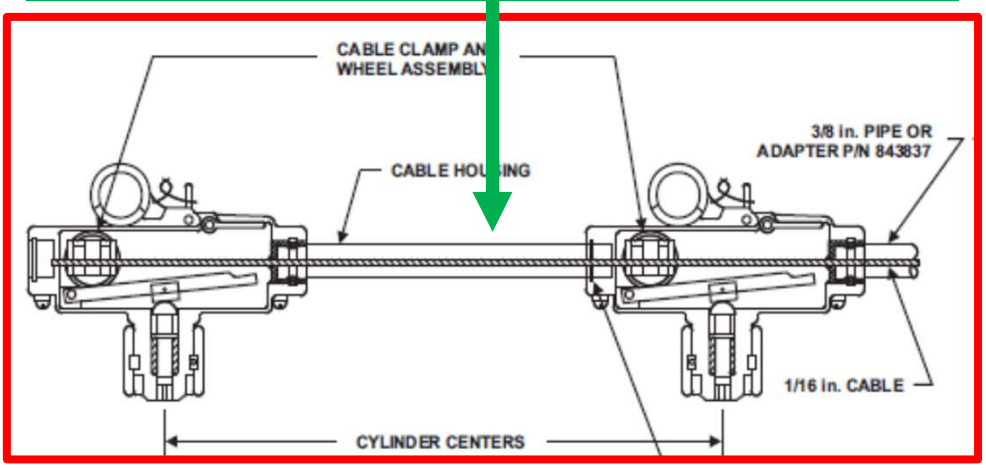
Manual Only System

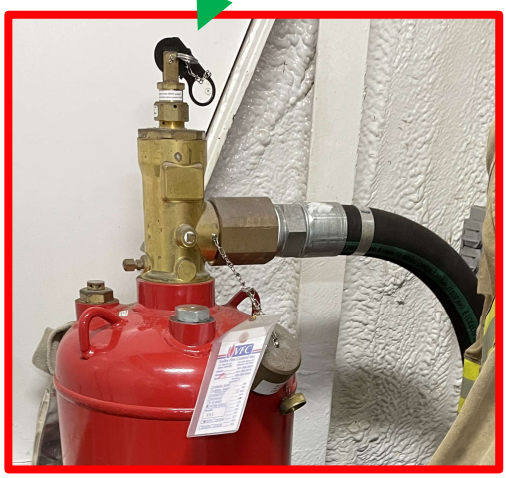
- Manual-only systems may be actuated with a cable pull from a remote location.
- The cylinder head connection will also have a manual actuation lever where the cable connects.



- This second cylinder is pressure actuated by the tubing connected to the first cylinder.
- An alternative option is running the pull cable through the first cylinder head into the second.

- A cable pull is not required when a local manual lever is installed.

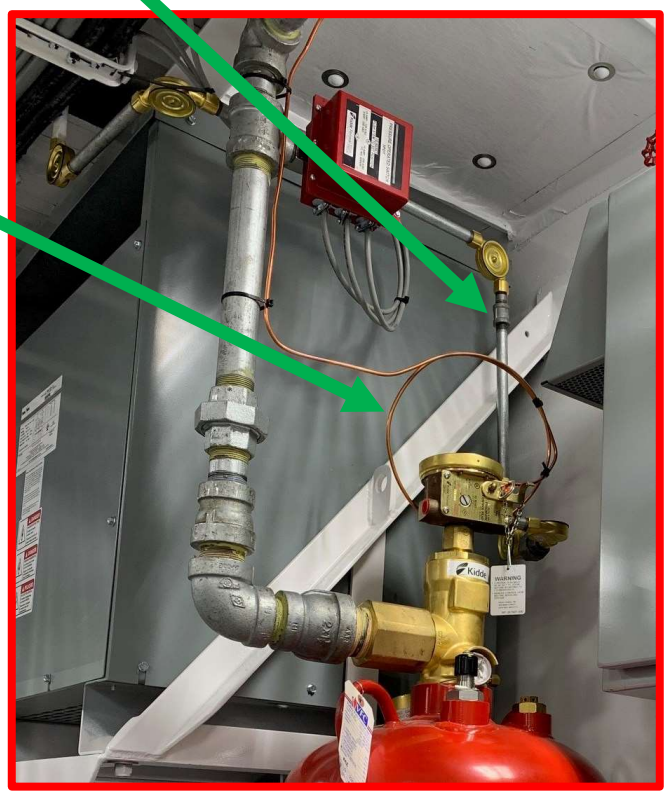




Automatic & Manual System

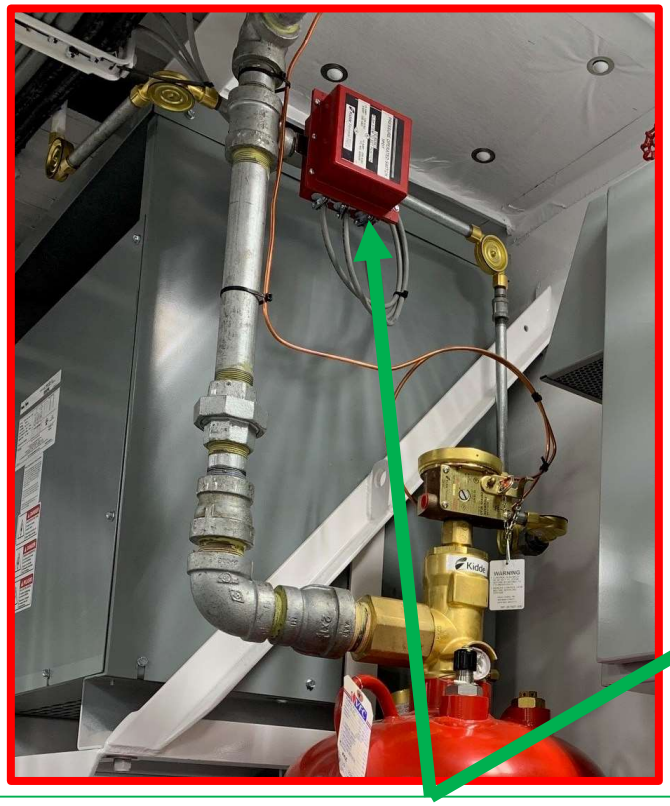
- "Automatic & Manual" systems may be actuated with a cable pull from a remote location.

- The automatic function is enabled through a heat actuated detector (HAD) that is connected to the cylinder head with a copper tube. When there is a rapid rise in temperature, the pressure in the HAD transfers through the tube and causes the cylinder to discharge.



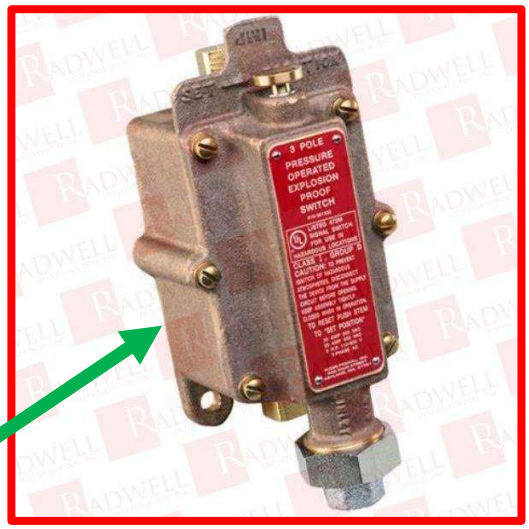
- A manual release lever on the cylinder head also allows local cylinder discharge.

Switches



- Pressure switches are on the discharge side of cylinders and are electrically connected to shutdowns (engines, ventilation fans, alarms, etc.).
- When pressurized by a discharge, the plunger extends from the “Set” position to the “Operated” position.
- This may be manually done with no cylinder discharge to test electrical functions.
- This MUST be manually reset following a cylinder discharge to reset connected electrical components.

- Intrinsically safe models are available for hazardous locations. Plunger functions are the same.



Accessories

Figure 14. Pressure Operated Siren

- Pressure operated sirens are on CO2 systems to warn personnel and to ensure evacuation.

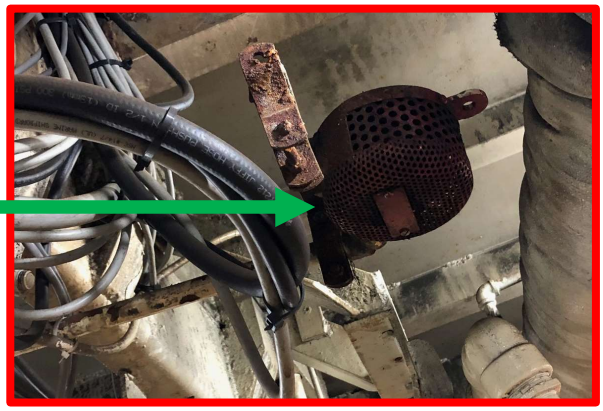


Figure 15. Discharge Delay

- Discharge time delay cylinders are in the cylinder piping as an additional safety factor to ensure evacuation.

PRESSURE TRIP

The pressure trip provides a pressure operated mechanical quick release to close dampers, shut spring loaded shutoff valves, and other similar applications

Figure 20. Pressure Trip

- Pressure trips are actuated by discharge pressure. They are not common on smaller commercial fishing vessels, but they are included for awareness and to present a talking point with vessel operators.

Figure 16. Odorizer

- Odorizers are required on certain newer CO2 installations as an additional safety precaution. The scent is wintergreen. They are installed in discharge piping.

Ventilation Covers

- ***All fire suppression systems require a means of securing ventilation for the agent to achieve the proper concentration, to prevent agent escaping the space, and to prevent the introduction of additional oxygen to feed the fire.***

- **Manual closures are the most common, but they may be controlled by pressure trips as shown on the previous slide.**

- **Although not a regulatory requirement for most commercial fishing vessels, the topic of ventilation should be included in discussion about fire suppression systems.**

Misc. Controls

Lever Operated Control Head • Allows for manual operation of the cylinder. • See datasheet K-85-6005	
Lever and Pressure Operated Control Head • Allows for either manual or pressure actuation of the cylinder. • See datasheet K-85-0535	
Pressure Operated Control Head • Allows for pressure actuation of the cylinder. • See datasheet K-85-0510	
Electric Control Head • Allows for electric actuation of the cylinder from a system control panel. Also offers manual operation at the cylinder. • See datasheet K-81-8010	

- Some controls look very similar. For example, the “Lever Operated Control Head” and the “Lever and Pressure Operated Control Head”.
- It is common for cylinders to be actuated by pressure from other cylinders, especially in multi-cylinder banks such as the CO2 photo below.

Electric and Cable Control Head • Allows for electric actuation of the cylinder from a system control panel or remote operation through a cable system. Also offers manual operation at the cylinder. • See datasheet K-81-8030	
Cable Operated Control Head • Allows remote operation of the cylinder through a cable system. Also offers manual operation at the cylinder. • See datasheets K-85-0509 and K-81-6021	
Pneumatic Control Head • Allows remote operation of the cylinder by means of pressure pulses transmitted from heat-actuated detectors (HADs) via copper tubing. Also offers manual operation at the cylinder. • See datasheet K-81-7010