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FireFlex® 1230 description

The **FireFlex® 1230** integrated system consists of a clean agent fire extinguishing system, factory-assembled in a cabinet and integrating all the components necessary for a complete extinguishing system. The **FireFlex® 1230** is fully tested at factory.

The **FireFlex® 1230** System uses Engineered **SEVO™ 1230 FORCE500™** Clean Agent Fire Suppression System for Class A, B and C fires. This clean extinguishing agent is based on sustainable technology and meets the most stringent actual and future environmental standards.

Novec 1230 extinguishing agent description

Designed as per NFPA 2001, the extinguishing agent used in **FireFlex® 1230** system is Dodecafluoro-2-methylpentan-3-one known as **Novec 1230** Fire Protection Fluid (also known as **FK-5-1-12**, 3M™ NOVEC™ 1230 Fire Protection Fluid, C₆-F-ketone) produced by 3M. Volumetric concentration varies from 4 - 6 % (not to exceed 10%)

Novec 1230 Fire Protection Fluid is a colorless fluid. It is stored as a pressurized liquid and injected into a room, area, or compartment that has the structural integrity to retain the agent that has been discharged.

Novec 1230 is dispensed as an odorless, electrically non-conductive vapor. It leaves no residue.

Features

- **FireFlex® 1230** system utilizes Novec 1230 extinguishing agent which is highly efficient for total flooding applications.
- **FireFlex® 1230** system is FM Approved under the heading: "FIXED EXTINGUISHING SYSTEMS, CLEAN AGENT FIRE EXTINGUISHING SYSTEMS".
- **FIREFLEX® 1230** System is UL Listed under "Clean Agent Extinguishing System Unit" Category # GAQF-EX6174 and Category # GAQFC-EX6174 (ULC).
- Seismic type construction.
- ISO-9001 manufacturing and quality control procedures.
- Meet NFPA 2001, Sec. 4.3.4.1
- Novec 1230 extinguishing agent has zero ozone depletion potential, an atmospheric lifetime of 0.014 year and a global warming potential of 1.
- No Observed Adverse Effect Level (NOAEL) of 10%.
- USA TSCA: product complies with chemical notification requirements.
- Canada CDSL: product complies with chemical notification requirements

System configurations

- Single cylinder system** with electric release
- Main/Reserve system**, double cylinder with electric release. Where uninterrupted protection is required, both the primary and the reserve agent supplies shall be permanently connected to the distribution piping and arranged for easy changeover.
- Main/Slave system**. double cylinder with electric release on Main cylinder **and** Pneumatic actuator on slave cylinder

Cabinet width	Size of cylinder (lbs)					
	40	76	164	322	601	850
24"	1	1	1	1	1	n/a
36"	2	2	2	n/a	n/a	n/a
46"	n/a	n/a	n/a	2	2	n/a
54"	n/a	n/a	n/a	n/a	n/a	1 - 2

Sequence of operation

Automatic release

1. Actuation of a detector from one detection zone:
 - a) "COMMON ALARM" lamp flashes.
 - b) "ZONE 1" (or "ZONE 2") lamp flashes.
 - c) "DETECTION ZONE 1" (or "DETECTION ZONE 2") message appears on the display.
 - d) "OUTPUT 1" (1ST ALARM) activates.
 - e) "ALARM" contact activates.
2. Actuation of a detector from the other detection zone for crossed zones configuration):
 - a) "ZONE 2" (or "ZONE 1") lamp flashes.
 - b) "DETECTION ZONE 2" (or "DETECTION ZONE 1") message appears on the display.
3. Pre-discharge sequence occurs:
 - a) "PRE-DISCHARGE" lamp flashes.
 - b) "OUTPUT 2" (2ND ALARM) activates.
 - c) Pre-discharge delay starts (not exceeding 60 sec).
4. After pre-discharge delay is completed:
 - a) DISCHARGING" lamp illuminates steady.
 - b) "OUTPUT 4" lamp flashes.
 - c) "OUTPUT 4" (RELEASING) message appears on the display.
 - d) **NOVEC 1230** electric actuator (C) activates.

Note: The abort station will prevent the **NOVEC 1230** discharge as long as being maintained if activated during the pre-discharge delay (refer to chapter 3.4.3).

If **NOVEC 1230** discharge switch option is selected:

- e) "ZONE 3" lamp flashes.
- f) "DETECTION ZONE 3" (RELEASING) message appears on the display.
- g) "RELEASING" contact activates.

Manual release

1. Actuation of a manual release pull station within the system:
 - a) "COMMON ALARM" lamp flashes.
 - b) "ZONE 4" lamp flashes.
 - c) "PRE-DISCHARGE" lamp flashes.
 - d) "DETECTION ZONE 4" (MANUAL RELEASE) message appears on the display.
 - e) "OUTPUT 2" (2ND ALARM) activates.
 - f) "ALARM" contact activates.
 - g) Pre-discharge delay starts (not exceeding 30 sec).
 2. After pre-discharge delay is completed:
 - a) "DISCHARGING" lamp illuminates steady.
 - b) "OUTPUT 4" lamp flashes.
 - c) "OUTPUT 4" (RELEASING) message appears on the display.
 - d) **NOVEC 1230** electric actuator (C) activates.
- If **NOVEC 1230** discharge switch option is selected:
- e) "ZONE 3" lamp flashes.
 - f) "DETECTION ZONE 3" (RELEASING) message appears on the display.
 - g) "RELEASING" contact activates.

Note: At any time, if the optional mechanical activator (J) is activated, the **NOVEC** Automatic release

Abort Station

1. Actuation of an abort station within the system:
 - a) "SYSTEM TBL" lamp flashes.
 - b) "SUP 1 / ABORT" lamp flashes.
 - c) "TROUBLE ABORT" message appears on the display.
 - d) "TROUBLE" contact activates.

When abort release switch is activated, pre-discharge timer will continue to count down until it reaches

10 seconds and then wait. Releasing the abort release switch will allow the pre-discharge to continue its count down from 10 seconds. If the abort release switch is again activated before the pre-discharge timer reaches zero, the timer will reset to 10 seconds and wait.

CAUTION ! Abort does not function and has no effect on panel operation from zones programmed as Manual RELEASE.

Standard equipment Cabinet

The **FireFlex® 1230** unit cabinet is made of sturdy 14 gauge steel. All surfaces are rust proof coated, inside and outside, with fire red, oven baked polyester powder on phosphate base. Cabinet is provided with one or two doors, all provided with a neoprene gasket to absorb vibrations.

Electrical junction boxes are integrated inside the cabinet for connection of AC power, detection system, auxiliary contacts and signaling devices. Knockouts can be drilled by the installing contractor on-site. Cabinet doors are provided with hinges that can easily be disassembled on site to remove the door assemblies for servicing.

Control panel

- 120 VAC / 60 Hz, 165VA.
- 220 VAC / 50 Hz, 185VA.
- 12VDC / 7Ah batteries. (factory installed)
- 12VDC / 12Ah batteries. (optional)
- Single Zone detection (Activated by Zone 1 **or** Zone 2)
- Cross-Zone detection (Activated by Zone 1 **and** Zone 2)

The release control panel integrated into the **FireFlex® 1230** cabinet is Potter's Model **PFC-4410 RC**. This panel includes four Class B, programmable detection zones (optional Class A); two Class B supervisory zones and four Class B, programmable output circuits (optional Class A). It is also provided with menu driven programming, including a specific program assigned at the factory.

The panel is compatible with many types of fire alarm & supervisory devices such as linear heat detectors, spot-type heat and smoke detectors, water flow and release indicators, low and high air pressure switches, manual pull stations.

The control panel also includes an alphanumeric display with 2 lines of 16 characters describing all the system conditions, as well as a set of red and yellow LED lamps individually indicating each of the alarm and trouble conditions of the system

Easy to operate control buttons are also provided to activate and operate the system's various functions.

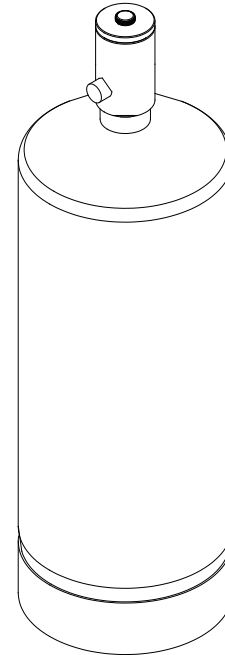
Standard SEVO SYSTEMS equipment

Agent storage cylinder

The agent storage cylinder by SEVO Systems is a steel pressure vessel manufactured, tested and stamped in accordance with DOT 4BW500 or DOT 4BA500, TC (Transport Canada).

The agent storage cylinder is designed to hold the clean agent at a normal operating pressure of 500 psi (34.5 bar) at 70°F (21.1°C). The agent storage cylinders are suitable use at temperatures of 0°F (-17.8°C) to 130°F (54.4°C).

A rupture disc is connected to the cylinder body to serve as a pressure relief device to protect the cylinder against excessive internal pressure. The disc rupture point is in the range of 864 psi (59.5 bar) to 950 psi (65.5 bar) at 70°F (21.1°C).



Cylinder filling range

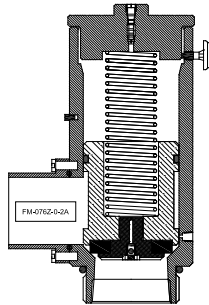
FireFlex® 1230 Cylinders	
Size	Fill Capacity (lbs)
40	16 - 40
76	31 - 76
164	66 - 164
322	129 - 322
601	241 - 601
850	366 - 854

Standard SEVO SYSTEMS equipment (cont'd)

Discharge valve

The discharge valve is a Brass construction backpressure type valve. The piston in the valve bore is equipped with copolymer seal that keeps the **Novac 1230** under pressure within the cylinder. A small hole in the axis of the piston allows the 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 of the piston is released by means of automatic or manual actuation, the cylinder pressure acting against the piston causes it to slide to its fully open position allowing agent discharge.

The 40 lb and 76 lb cylinders are equipped with a 1" valve. The 164 lb cylinders are equipped with a 1 1/4" valve. The 322 lb. and 601 lb. cylinders are equipped with 2 1/2" valves and the 850 lb cylinders are equipped with a 3" valve.



Pressure gauge integrated low pressure switch

The pressure gauge integrated switch is a means for both visual and electronic monitoring of the pressure condition within the cylinder. Furthermore, the pressure gauge integrated switch eliminates the need for a separate pressure switch.



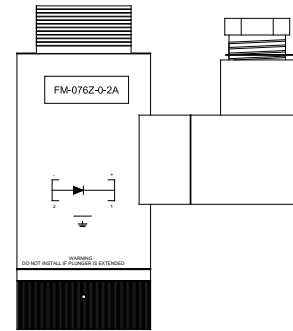
Electric actuator

The SEVO electrical actuator is mounted on the top plug of the cylinder valve. The 24 VDC electric actuator is required to discharge the system electrically from a releasing control panel.

Meets NFPA 2001, Sec. 4.3.4.1 with active installation supervision switch.

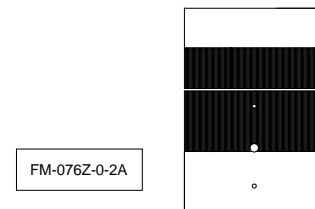
Power Requirements 24 Volts d.c.

Current 0.5A at 24 Volt d.c.



Pneumatic actuator

The Pneumatic Actuator Control Head, used on **Main/Slave system**, features a pneumatically driven piston that depresses a check valve, releasing the pressure from the top of the piston, allowing the cylinder discharge. The pneumatic pressure required to operate the Pneumatic Actuator Control Head is obtained from the "M" port of a main cylinder that is either mechanically and/or electrically actuated. Multiple cylinders (max.10) equipped with Pneumatic Actuator Control Heads can be activated from one main cylinder using 1/4" copper tubing, 1/4"metal flex hose or 1/8" pipe. The Pneumatic Actuator Control Head mounts directly to a top plug adapter directly on top of the cylinder valve.

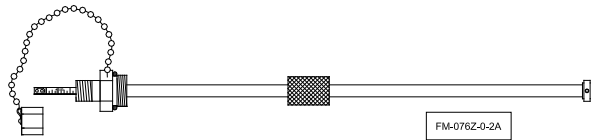


Standard SEVO SYSTEMS equipment (cont'd)

Liquid Level Indicator

The SEVO 1230 LL-30020-1 Series Liquid Level Indicator is a simple, manually operated device, which provides means to determine the fluid level in a vertically mounted cylinder. Use of this device allows for the content of fluid to be determined without removing cylinder from its bracketing and piping for weighing.

Provided and available only on 322, 601 and 850 Cyl.



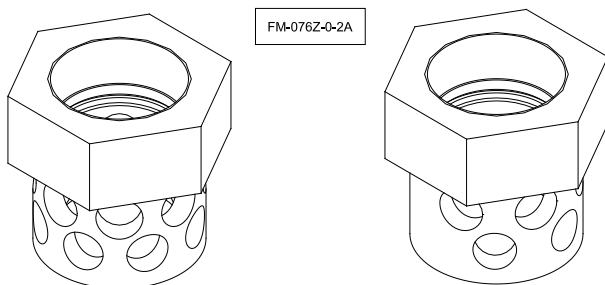
Nozzles

The Sevo® nozzles are designed to provide rapid and thorough vaporization and distribution of agent with the air in the protected space. Standard nozzles are made of aluminum.

Engineered system nozzles are available in five pipe sizes, 1/2", 1", 1-1/2", 2" and 2-1/2", 180° and 360° discharge pattern.

Each nozzle has a standard female pipe thread for attachment to discharge piping. Nozzle shall be spaced in accordance with the instructions in the "Engineered system design manual". Each nozzle shall be marked with the Sevo® Systems part number.

- | | |
|--|--|
| <input type="checkbox"/> 1/2" @ 180° | <input type="checkbox"/> 1/2" @ 360° |
| <input type="checkbox"/> 1" @ 180° | <input type="checkbox"/> 1" @ 360° |
| <input type="checkbox"/> 1-1/2" @ 180° | <input type="checkbox"/> 1-1/2" @ 360° |
| <input type="checkbox"/> 2" @ 180° | <input type="checkbox"/> 2" @ 360° |
| <input type="checkbox"/> 2-1/2" @ 180° | <input type="checkbox"/> 2-1/2" @ 360° |

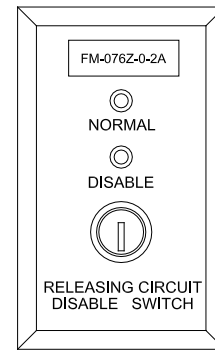


The maximum nozzle height per layer of coverage is 16'-4" (4.97 meters). Nozzles should be placed at least 1" below the ceiling surfaces. Both 180° and 360° nozzles were tested for a maximum area coverage using a 32' wide by 32' long enclosure.

Maintenance key switch

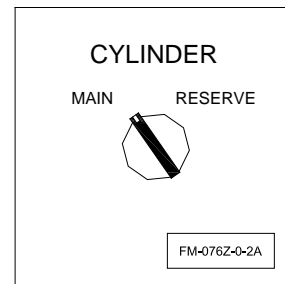
The releasing circuit disable key is used to disable the SEVO electrical actuator, preventing accidental discharge during maintenance / inspection.

Meet NFPA 72, Sec. 23.11.5.2



Main / Reserve switch

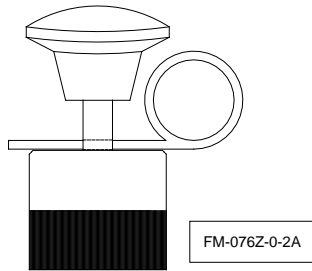
The Main / Reserve switch is used only on **Main/Reserve system** configuration. The Main / Reserve switch allows selecting of electric release on either Main or Reserve cylinder.



Optional SEVO SYSTEMS equipment

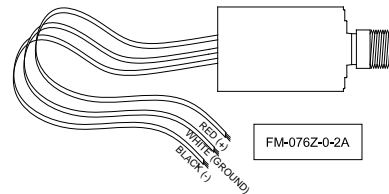
Manual actuator (optional)

The manual actuator features a push lever that vents pressure through the top of the valve causing the piston to rise and allow for Novec 1230 to discharge through the valve outlet. The manual actuator also has the option to mount on top of the stackable electric actuator allowing electrical or manual system activation.



Discharge pressure switch (optional)

The discharge pressure switch is used to provide a means of detecting system activation. Upon activation of the cylinder valve, the discharge pressure switch contacts transfer to indicate discharge and/or to perform auxiliary functions required during system operation.

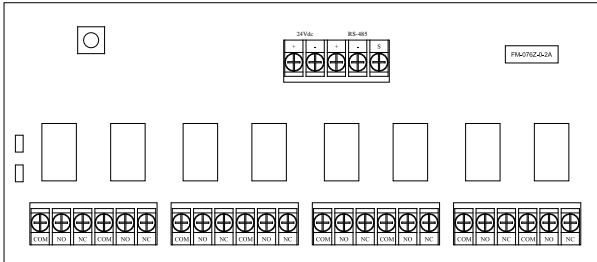


As per NFPA 2001, Sec. 4.3.3.5.1. A discharge pressure switch shall be required where mechanical system actuation is possible.

Optional control panel equipment

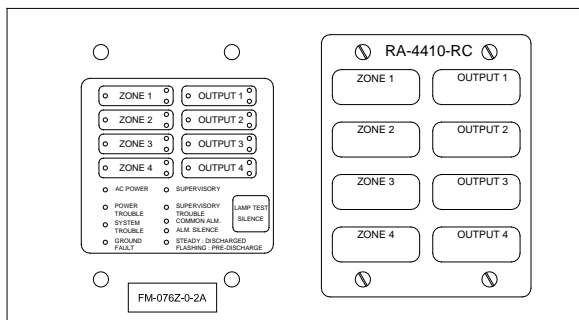
❑ **Relay module ARM-44**

The ARM-44 is an auxiliary relay module designed to operate with the FireFlex® 1230 control panel to provide 4 independent form C relay outputs. The 4 output circuits each have a dedicated relay. Each relay is rated for 3 amps at 24 volts DC resistive load. The relay module mounts directly to the back of the cabinet and is connected to the main board. All of the relay terminals are wired back to the field wiring junction box. A disable switch is available for disabling the relays when the system is being tested or serviced.



❑ **Remote Annunciator RA-4410-RC**

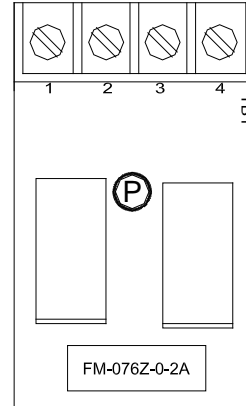
The RA-4410-RC remote annunciator is designed to operate with the PCF-4410RC releasing control panel. There are 34 LED's to indicate a change in panel status. There is a buzzer on the annunciator that sounds for any trouble or supervisory condition. The release control panel supervises and communicates with the annunciator via separate connections for the RS-485 communication and the 24VDC power requirement of the RA-4410-RC. Separate cables should be used for power and communication. Shielded cable MUST be used for the RS-485 communication line.



❑ **Class A initiating device module CA2Z**

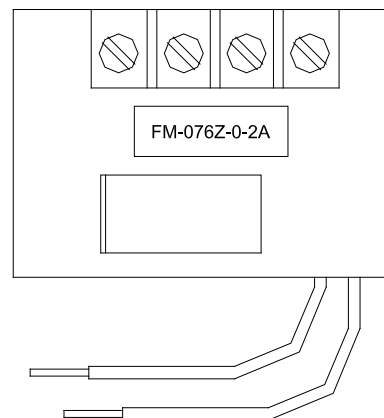
The Model CA2Z Class A Module is designed to be used with the PFC-4410RC Fire Control Releasing Panel to convert from two (Class B) initiating device circuits to two (Class A) circuits.

The module is to be mounted in the upper right hand corner of the panel. All the connections are wired back to the field wiring junction box.



❑ **Class A Indicating Appliance Circuit module**

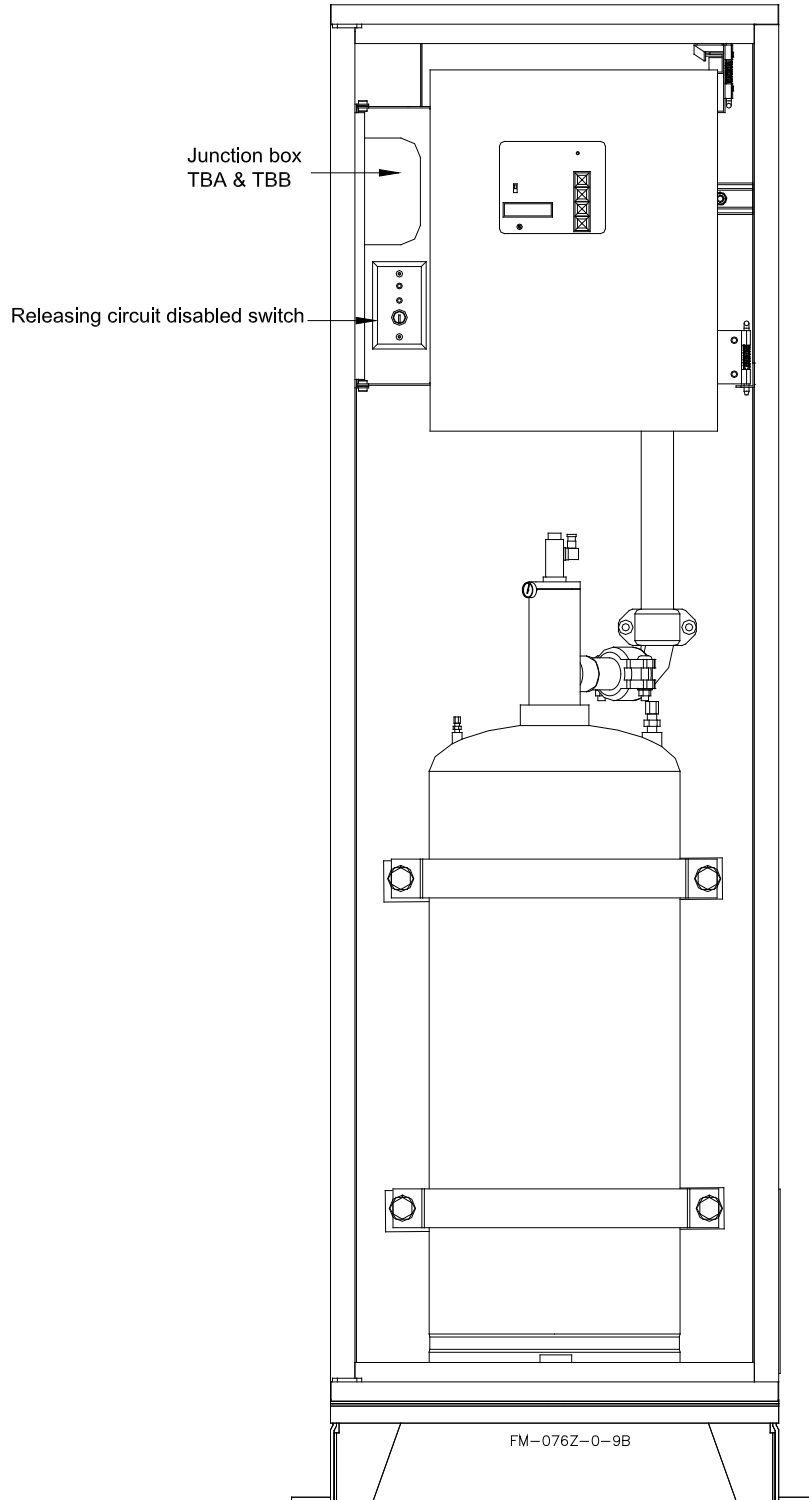
The Model CAM Class A Module is designed to be used with the PFC-4410RC Fire Control Releasing Panel to convert a single (Class B) indicating appliance circuit to a (Class A) circuit (one module is required for each indicating appliance circuit). After installing the CAM, the indicating circuit should be activated to ensure proper operation and connections. The module is provided with double-sided foam tape and should be mounted in the field wiring junction box so that the terminals are accessible.



Field wiring diagrams & details

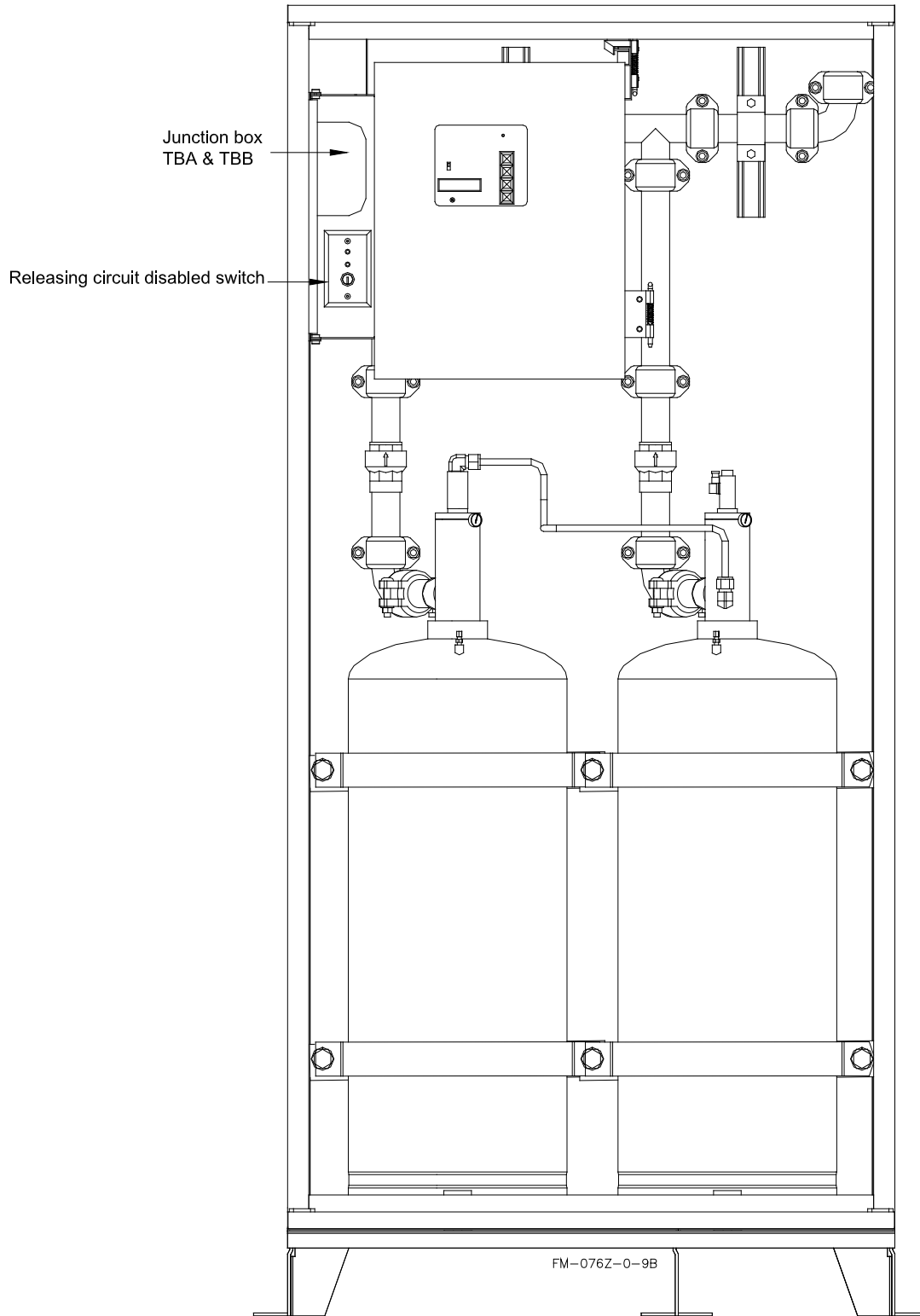
Cabinet with main components, shown without door

Single cylinder system



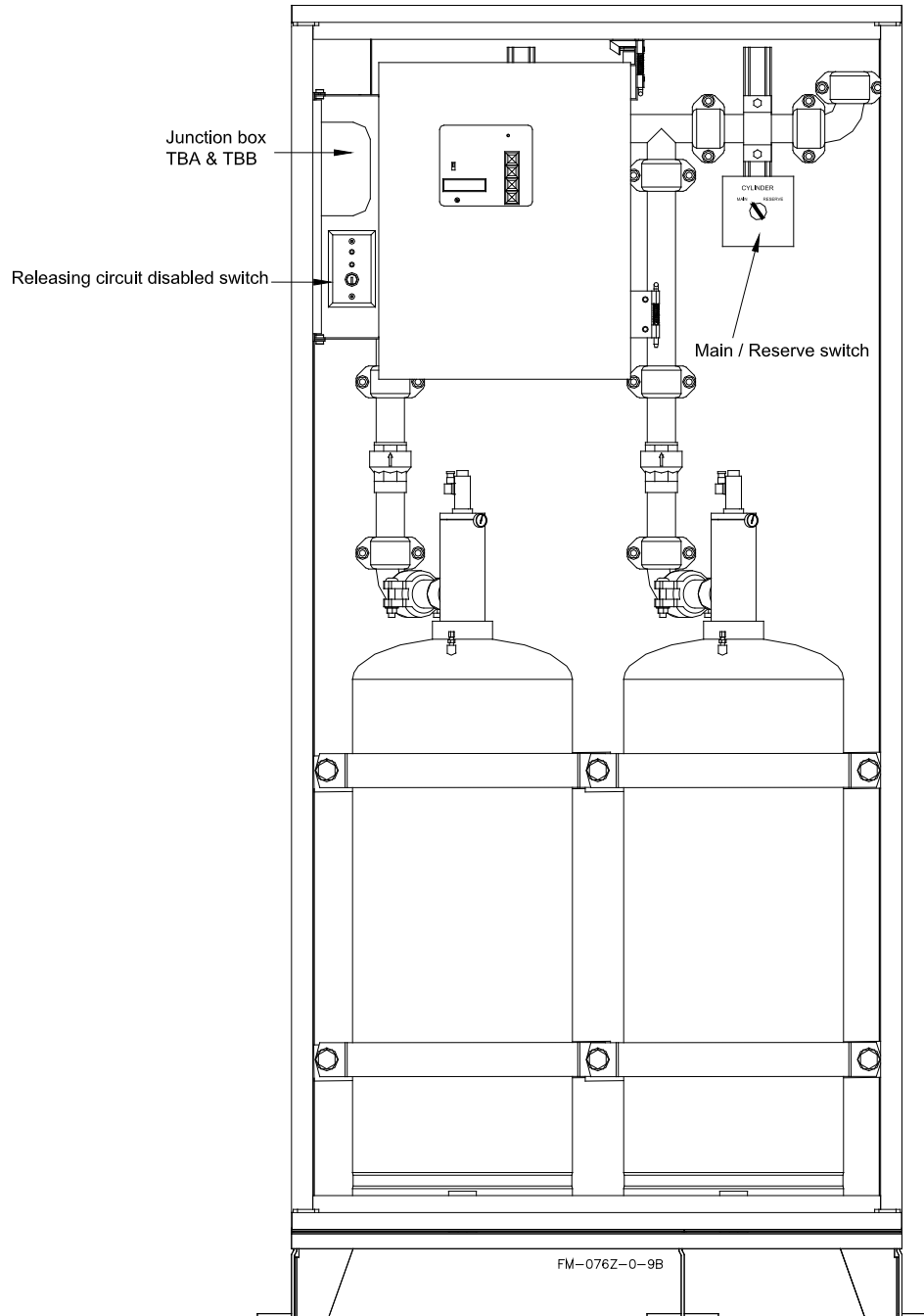
Cabinet with main components, shown without doors

Double cylinder system **Main/Slave**



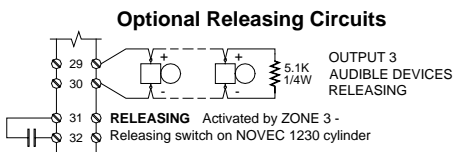
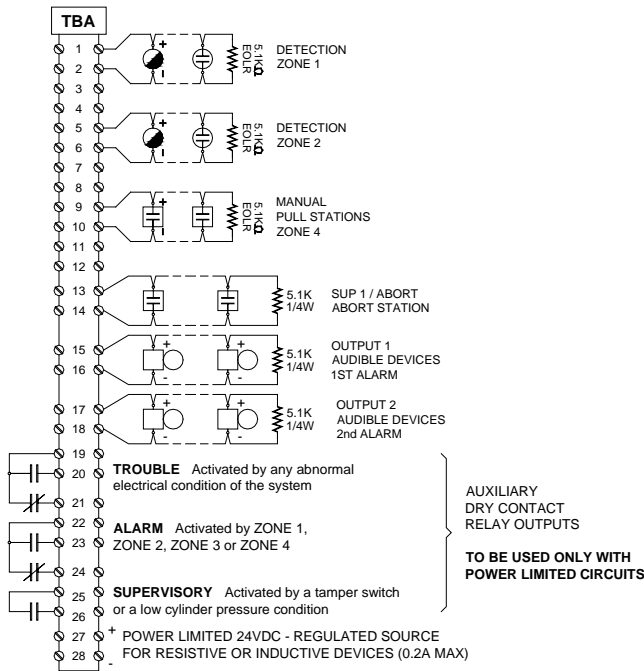
Cabinet with main components, shown without doors

Double cylinder system **Main/Reserve**

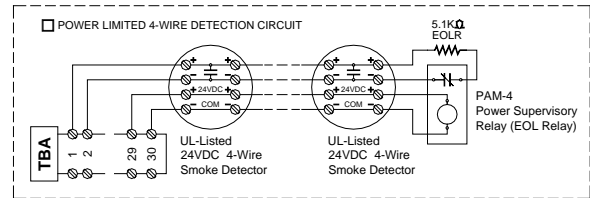
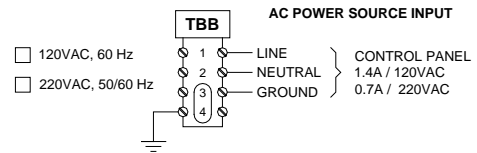
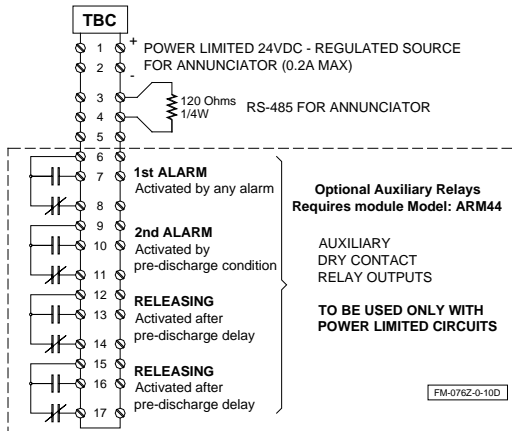
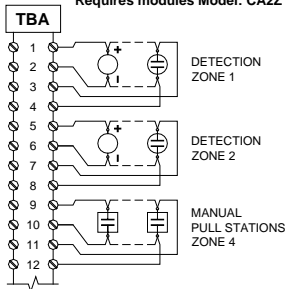


Wiring diagram

Figure 5.1 - Field wiring diagrams



Optional Class A (Style D) Wiring
Requires modules Model: CA2Z



Power limited (supervised) initiating device circuits

ZONE 1, 2, 3 and 4
End of line resistor: 5.1KΩ, 1/4W
Leave EOL device (provided) on all unused circuits.
Loop resistance: 100Ω max.
Refer to the PFS-4410RC control panel manual for smoke detector compatibility.

Power limited (supervised) initiating device circuits

SUP 1 / ABORT and SUPERVISORY 2
End of line: 5.1KΩ, 1/4W
Leave EOL (provided) on all unused circuits.
Max. Loop resistance: 100Ω
For dry contact supervisory devices only (Class B only)

Power limited (supervised) notification appliance circuits

OUTPUT 1, 2 and 3
End of line resistor: 5.1KΩ, 1/2W
Leave EOL device (provided) on all unused circuits.
Maximum operating voltage: 27VDC (ripple: 0.3V)
Maximum usable current per circuit: 1A
Maximum total current (all circuits): 2.5A
Polarity is reversed in supervisory condition.
Refer to the PFC-4410RC control panel manual for device compatibility.

Auxiliary Power 24VDC Regulated Source

Maximum available current: 0.2A for resettable 4 wires smoke detectors

Auxiliary relay contacts

Rated 3A, 30VDC resistive

Cabinet

The **FIREFLEX® 1230** cabinet is made of sturdy 14 gauge steel.

All surfaces are rust proof coated, inside and outside, with fire red, oven baked polyester powder on phosphate base. Cabinet is provided with one, or two doors (depending on size), all provided with a neoprene gasket to avoid vibrations, giving the access to the pressure gauges reading and the manual emergency release.

The cabinet assembly is pre-assembled, pre-wired, and factory tested under ISO-9001 conditions.

Electrical junction box is integrated inside the cabinet for connection of detection system, auxiliary contacts and signaling devices. Knockouts can be drilled by the installing contractor on-site but must adhere to the restrictions indicated on figure 1.

Figure 1 - Drilling details

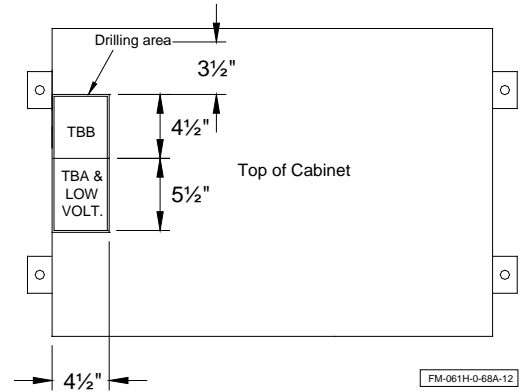
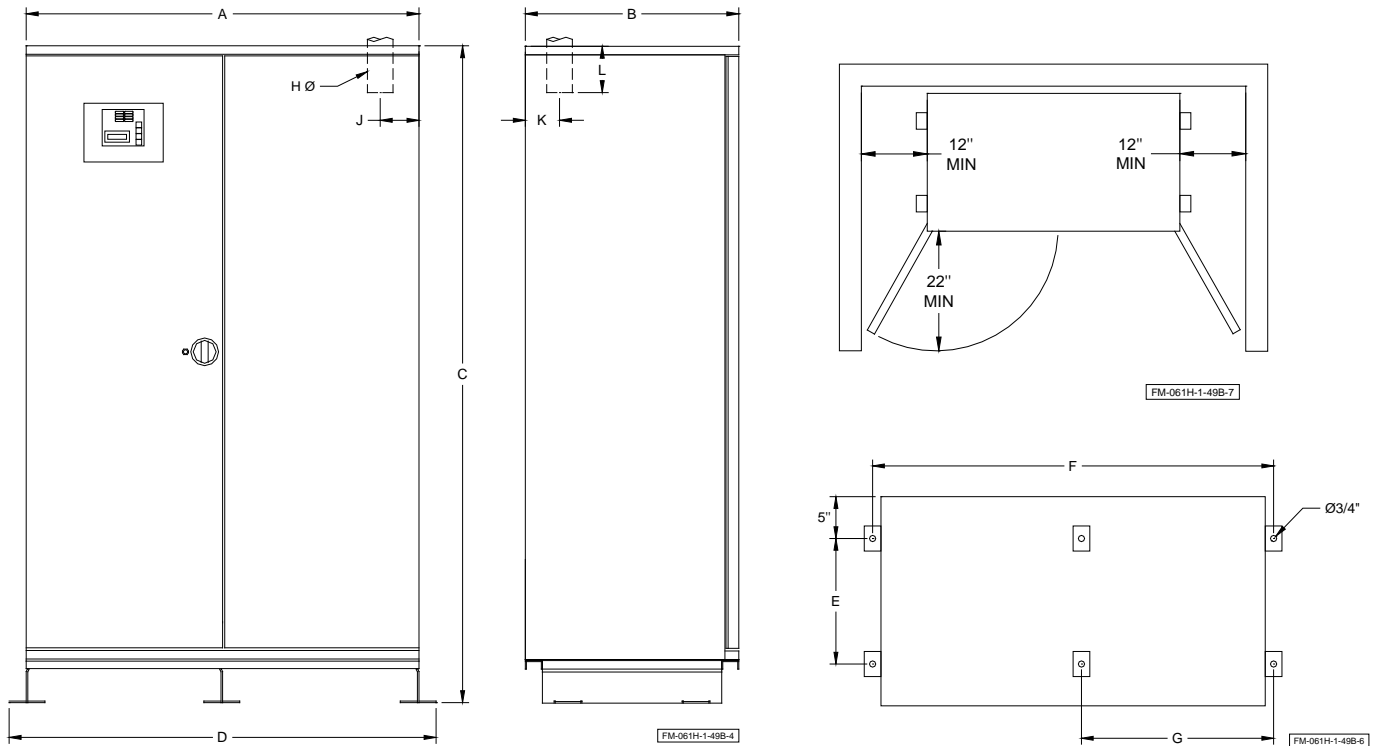


Figure 2 - Cabinet dimensions



Dimensions are nominal and may vary $\pm 1/4$ ".

Table 1 - Cabinet dimensions

Size	A	B	C	D	E	F	G
24"	23"	25"	77 $\frac{1}{8}$ "	29"	15"	27"	n/a
36"	35 $\frac{3}{4}$ "	25"	77 $\frac{1}{8}$ "	39 $\frac{3}{4}$ "	15"	37 $\frac{3}{4}$ "	12 $\frac{3}{4}$ "
46"	46"	25"	77 $\frac{1}{8}$ "	50"	15"	48"	23"
54"	54"	31"	81"	58"	21"	56"	26"

Table 2 - NOVEC 1230 piping installation

Lbs	H	J	K	L
40	1"	2 $\frac{3}{4}$ "	6"	3 $\frac{1}{4}$ "
76	1 $\frac{1}{4}$ "	2 $\frac{3}{4}$ "	6"	3 $\frac{1}{4}$ "
164	1 $\frac{1}{2}$ "	2 $\frac{3}{4}$ "	6"	1 $\frac{3}{4}$ "
322	2"	6 $\frac{3}{4}$ "	6"	4 $\frac{3}{4}$ "
601	2 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "	6"	3 $\frac{3}{4}$ "
850	3"	9"	7"	5"



1935, Lionel-Bertrand Blvd.

Boisbriand QC Canada J7H 1N8

Tel.: 450-437-3473 • Fax: 450-437-1930

Toll Free: 866-347-3353

Email: info@fireflex.com • Web: www.fireflex.com