



FireFlex[®] DUAL description

The FireFlex[®] DUAL integrated system consists of an integrated double interlock Electric/Pneumatic release preaction automatic sprinkler system combined with a clean agent fire extinguishing system, factory-assembled in a single cabinet. All the components necessary for both extinguishing systems are integrated. The FireFlex[®] DUAL is fully tested at factory.

The FireFlex[®] DUAL 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[®] DUAL 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[®] DUAL system utilizes Novec 1230 extinguishing agent which is highly efficient for total flooding applications and a Preaction automatic sprinkler system.
- cULus Listed & FM Approved as an assembled unit
- OSHPD certification pre-approval: OSP-0342-10 is OPTIONAL
- ISO-9001 manufacturing and quality control procedures.
- 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. SNAP: approved for flooding (12/20/02) and streaming (1/23/03)
- Canada CDSL: product complies with chemical notification requirements
- Uses the Viking F1 Deluge Valves
- All trim piping is galvanized steel, Listed and Approved for 250 psi (1724 kPa) service maximum.
- Quick connections to water supply and drain on left side, and sprinkler riser on top of unit, available with grooved end or flanged fittings
- No open drain cups inside unit
- Separate unlocked access hatch to emergency manual release



Double interlock Engineered system with Notifier NFS-320

System configurations

- 2" Double Interlock Preaction combined with single NOVEC cylinder, electric release
- 3" Double Interlock Preaction combined with single NOVEC cylinder, electric release

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

Sequence of operation

Automatic release

1. Actuation of a detector from one detection zone:
 - a) "ZONE 1" (or "ZONE 2") message appears on the display.
 - b) "FIRE ALARM" lamp flashes until acknowledged.
 - c) "ALARM" audible devices activate.
 - d) "ALARM" contacts activate.
 - e) Preaction solenoid valve (F1) activates.

Note: Preaction piping network will not yet be filled with water.

2. Actuation of a detector from the other detection zone for crossed zones configuration):
 - a) "ZONE 2" (or "ZONE 1") message appears on the display.
3. Discharge sequence occurs:
 - a) "PRE-DISCHARGE" and "DISCHARGE" lamps illuminate steady.
 - b) "PRE-DISCHARGE NOVEC 1230" contacts activate.
 - c) Pre-discharge delay starts (not exceeding 60 sec).
 - d) "SECOND STAGE ALARM" audible devices activate.

Note: The abort station will prevent the **NOVEC 1230** discharge as long as being maintained if activated during the pre-discharge delay.

4. After pre-discharge delay is completed:
 - a) "PRE-DISCHARGE" lamp turns off.
 - b) **NOVEC 1230** electric actuator (C) activates.
 - c) "DISCHARGE NOVEC 1230" contact activates.
- If **NOVEC 1230** discharge switch option is selected:
 - d) "DISCHARGE NOVEC" message appears on the display.
5. After a preaction sprinkler head fuses:
 - a) Deluge valve (A1) opens; water will flow into sprinkler piping network and out of sprinklers and any openings on the system.
 - b) "WATERFLOW PREACTION" message appears on the display.
 - c) "WATERFLOW PREACTION" contact activates.

4.4.2 Manual release

1. Actuation of a manual release pull station within the system:
 - a) "MANUAL RELEASE" message appears on the display.
 - b) "FIRE ALARM" light flashes until acknowledged.
 - c) "ALARM" audible devices activate.
 - d) "ALARM" contacts activate.
 - e) "PRE-DISCHARGE" and "DISCHARGE" lamps illuminate steady.
 - f) Preaction solenoid valve (F1) activates.

Note: Preaction piping network will not yet be filled with water.

- g) "PRE-DISCHARGE NOVEC 1230" contacts activate.
- h) Pre-discharge delay starts (not exceeding 30 sec).
- i) "SECOND STAGE ALARM" audible devices activate.
2. After pre-discharge delay is completed:
 - a) "PRE-DISCHARGE" lamp turns off.
 - b) **NOVEC 1230** electric actuator (C) activates.
 - c) "DISCHARGE NOVEC 1230" contact activates.
- If **NOVEC 1230** discharge switch option is selected:
 - d) "DISCHARGE NOVEC" message appears on the display.
3. After a preaction sprinkler head fuses:
 - a) Deluge valve (A1) opens; water will flow into sprinkler piping network and out of sprinklers and any openings on the system.
 - b) "WATERFLOW PREACTION" message appears on the display.
 - c) "WATERFLOW PREACTION" contact activates.

Note: At any time, if the optional mechanical activator (J) is activated, the **NOVEC 1230** will be released.

At any time, if the emergency release valve (B10) is activated, the preaction piping network will be filled with water.

Double interlock Engineered system with Notifier NFS-320

Standard equipment

Cabinet

The FireFlex® DUAL 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 (Self-contained system only)

- 120 VAC / 60 Hz, 165VA.
- 220 VAC / 50 Hz, 185VA.
- 12VDC / 18Ah batteries. (factory installed)
- Single Zone detection
(Activated by Zone 1 **or** Zone 2)
- Crossed-Zone detection
(Activated by Zone 1 **and** Zone 2)

The release control panel integrated into the FireFlex® DUAL cabinet is Notifier's Model NFS-320. This panel includes two Class A or B, programmable detection zones; four Class B supervisory zones and four Class A or B, programmable output circuits.

Programming of the control panel made by Fireflex System Inc and password protected. 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 40 characters describing all the system conditions, as well as a set of red and yellow LED lamps individually indicating 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.

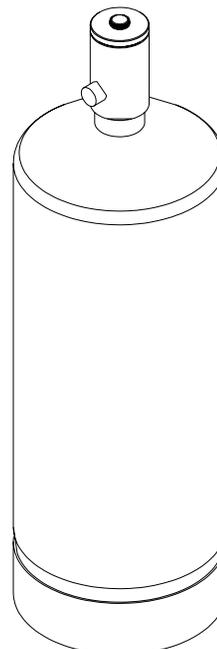
Standard SEVO SYSTEMS equipment

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

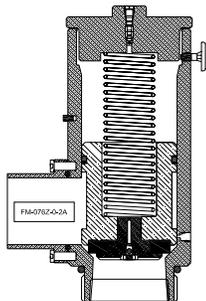
Double interlock Engineered system with Notifier NFS-320

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 a copolymer seal that keeps the **Novec 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.

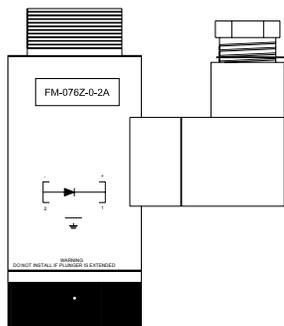


Electric actuator

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.

Power Requirements 24 Volts d.c.

Current 0.2A at 24 Volt d.c.

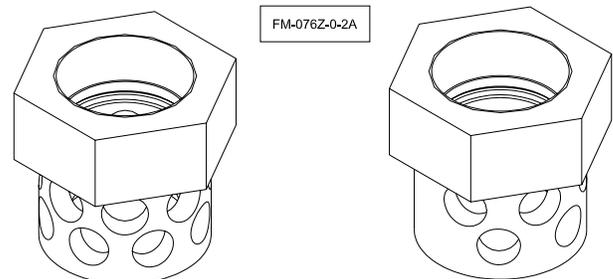


Nozzles

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". Both 180° and 360° nozzles were tested for a maximum area coverage using a 32' wide by 32' long enclosure.

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.



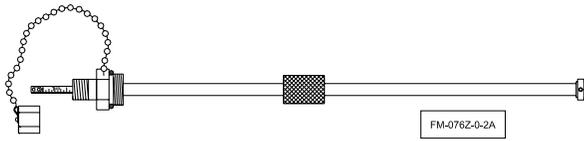
Double interlock Engineered system with Notifier NFS-320

Standard SEVO SYSTEMS equipment (cont'd)

Liquid Level Indicator

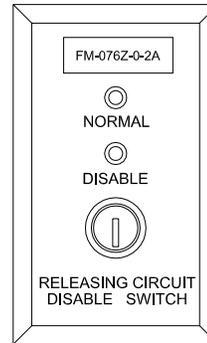
The SEVO Liquid Level Indicator is a simple, manually operated device, which provides means to determine the fluid level in a vertically mounted cylinder. Use of this device allows for the content of fluid to be determined without removing cylinder from its bracketing and piping for weighing.

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



Releasing circuit disable switch

The releasing circuit disable switch is used to disable the clean agent electrical actuator. When the key is set to "Disable", the SEVO electrical actuator will be disconnected from the control panel's releasing circuit, causing a trouble signal and preventing accidental discharge during maintenance or inspection.

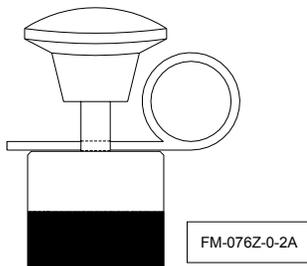


Optional SEVO SYSTEMS equipment

Manual actuator (optional)

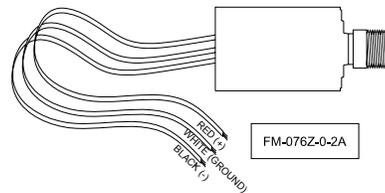
The manual actuator features a push lever that vents pressure through the top of the valve causing the piston to rise and allow for Novec 1230 to discharge through the valve outlet. The manual actuator also has the option to mount on top of the stackable electric actuator allowing electrical or manual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

As per NFPA 2001 (2008 Edition), **4.3.3.5.1**. A discharge pressure switch shall be required where mechanical system actuation is possible.



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.



Double interlock Engineered system with Notifier NFS-320

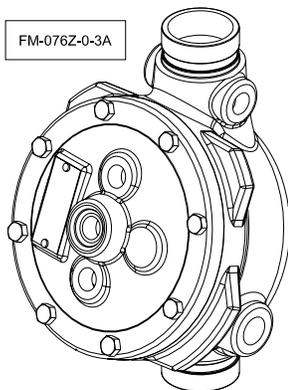
Standard Preaction equipment

Preaction valve

The Viking Model F-1 Deluge Valve is a quick-opening, differential diaphragm flood valve with one moving mechanism. The deluge valve is used to control water flow in preaction sprinkler systems. The valve is held closed by system water pressure trapped in the priming chamber, keeping the outlet chamber and system piping dry. In fire conditions, when the releasing system operates, pressure is released from the priming chamber. The deluge valve clapper opens to allow water to flow into the system

□ 2"

□ 3"



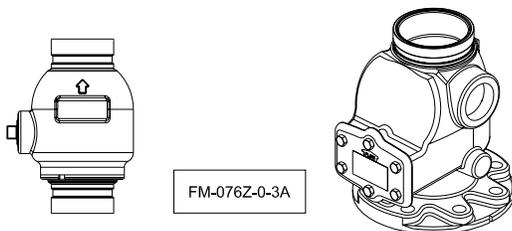
Preaction riser check valve

The Viking 2" spring loaded In-Line check valve is a general purpose rubber-faced check valve approved for use in fire-service systems. The Spring Loaded In-Line check valve is manufactured with a brass body, brass seat, and a rubber-faced clapper assembly.

The Viking 3" Easy Riser[®] Swing check valve is a general purpose rubber-faced check valve approved for use in fire service systems. The valve is for use in preaction system risers.

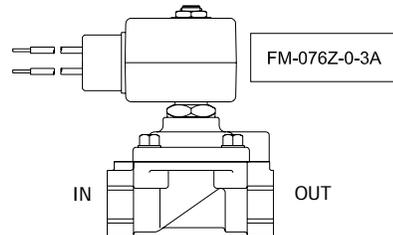
□ 2"

□ 3"



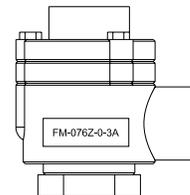
Solenoid valve

The high pressure solenoid valve is a two-way type with one inlet and one outlet. It is a packless, internal pilot operated valve, suitable for use in releasing water pressure from the priming chamber of Viking Deluge Valves. The solenoid valve has floating diaphragm construction, which requires a minimum pressure drop across the valve to operate properly.



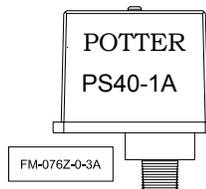
Pneumatic actuator

Used in conjunction with the solenoid valve, the Viking Pneumatic Actuator is a spring loaded, rolling diaphragm and piston operated valve. It is used wherever a combination is required between the detection and system's loss of air.



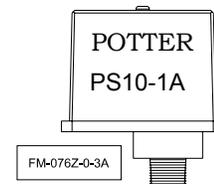
Low air supervisory switch

The low pressure switch monitors the pressure within the sprinkler piping should a loss of the air below 25 Psi occur. The pressure switch contacts transfer indicating supervisory signal.



Alarm pressure switch

The alarm pressure switch monitors the water flow within the sprinkler piping. Should the Deluge Valve clapper opens to allow water to flow into the sprinkler piping. The alarm pressure switch will activate, indicating a water flow signal



Double interlock Engineered system with Notifier NFS-320

Preaction system - Air supply

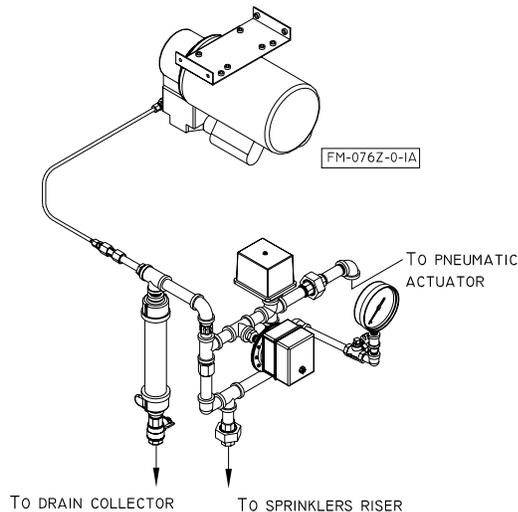
Direct air compressor (Style "A")

Used only for the sprinkler piping network of the preaction system. Air supply Style "A" includes the air compressor mounted inside the **FIREFLEX® DUAL** cabinet with its supervisory trim and options. Compressor is factory piped to the sprinkler piping system riser. It is available in three (3) sizes:

- 1/6HP 1/3HP 1/2HP

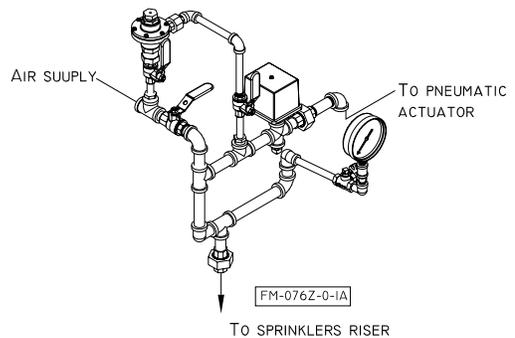
All the above air compressors are oilless piston type without reservoir and have open, single phase motor with internal thermal protection and supply voltage of

- 120Vca, 60Hz 220Vca, 50Hz.



Air Pressure Maintenance Device (Style "B")

Used only for the sprinkler piping network of preaction system, when an external air supply is provided by others (tank mounted compressor, plant air or dry nitrogen cylinders) and piped to the air inlet port of the unit. Air supply style "B" provides an Air Pressure Maintenance Device (APMD) trim, factory mounted in the **FireFlex® DUAL** cabinet.



Note: The external air supply must be restricted to insure that it cannot replace air as fast as it escapes when a releasing device or sprinkler operates.

Compressor selection Table:

Compressor size	CFM @ 40 psi	120VAC System capacity to pump 40 psi in 30 minutes	220VAC System capacity to pump 40 psi in 30 minutes
1/6 HP	1.33 CFM	110 gallons	90 gallons
1/3 HP	2.61 CFM	215 gallons	170 gallons
1/2 HP	4.06 CFM	335 gallons	270 gallons

Compressor Amp rating

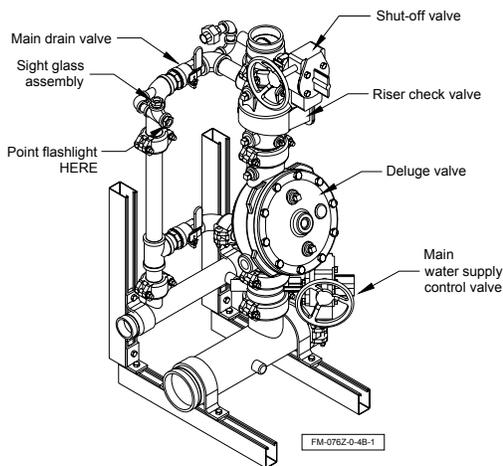
Compressor size	Amp rating @ 120VAC, 60Hz	Amp rating @ 220VAC, 50/60Hz
1/6 HP	6.6 A	3.3 A
1/3 HP	6.6 A	3.3 A
1/2 HP	8 A	4 A

Double interlock Engineered system with Notifier NFS-320

Optional PREACTION equipment

❑ Shut-off valve & sight glass (optional)

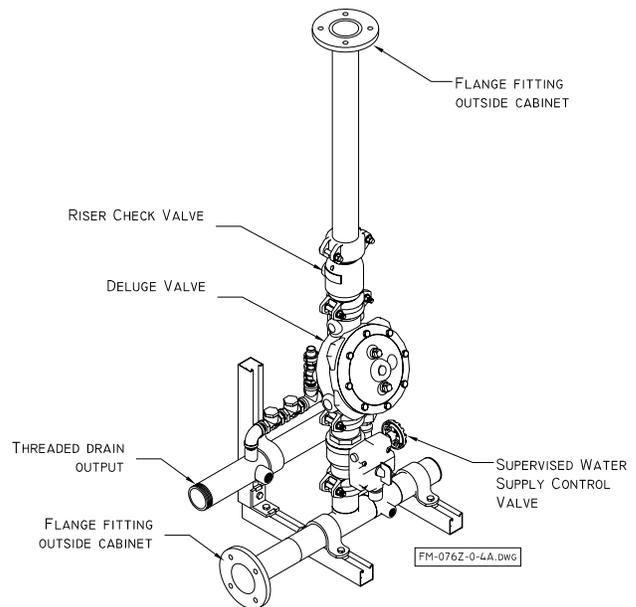
The Shut-off Valve & Sight Glass Option is intended to be used for applications where testing of the system operation without filling the sprinkler piping network is desirable and where it is critical that all functions of the preaction system be tested under actual discharge conditions.



❑ Semi-flanged inlet / outlet (optional)

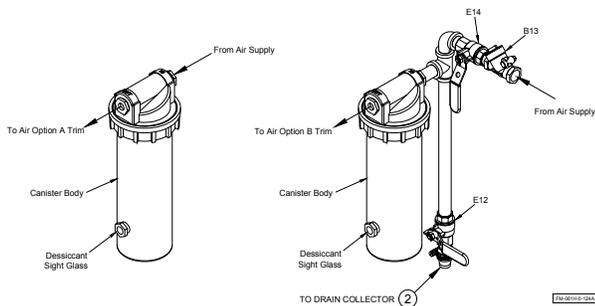
When required by the user, FireFlex[®] DUAL units can be provided in a semi-flanged configuration.

The semi flanged option provides flanged fittings only on the water inlet pipe (left side) and on the system riser outlet. The drain manifold is provided with a threaded connection (left side). The rest of the fittings are the same as usual with the main components being provided in the standard flanged / grooved configuration.



❑ Dehydrator (optional)

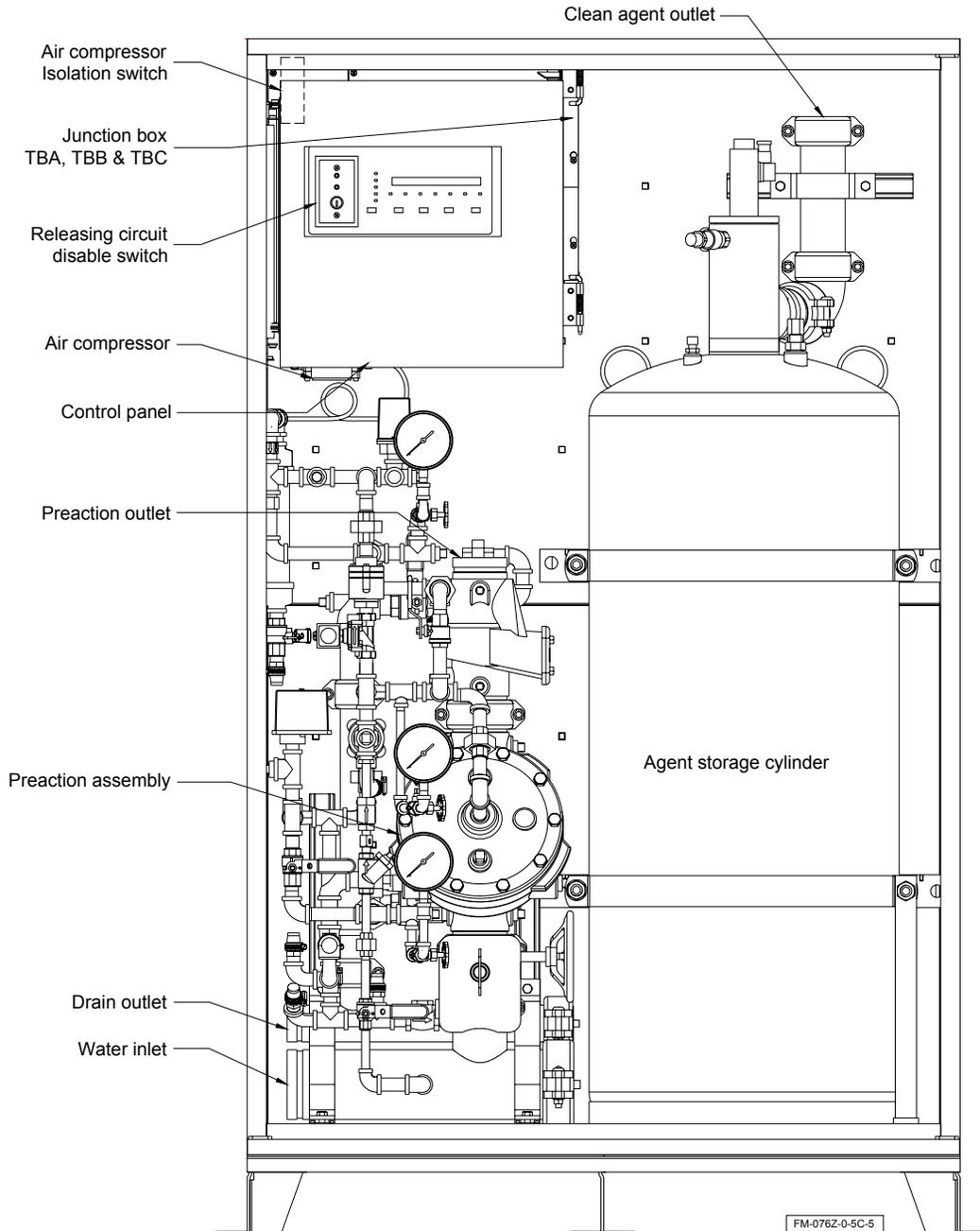
The Viking Dehydrator is a manually regenerated desiccant-type air dryer. The desiccant acts as a moisture indicator by changing color, and is visible through the required bowl guard and transparent plastic bowl.



Double interlock Engineered system with Notifier NFS-320

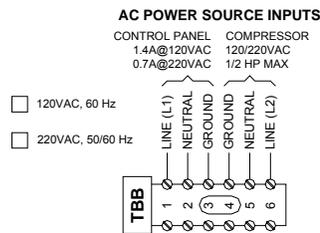
Details & field wiring diagrams

Cabinet with main components, shown without door(s)



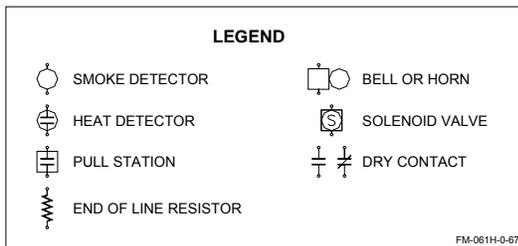
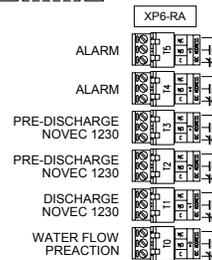
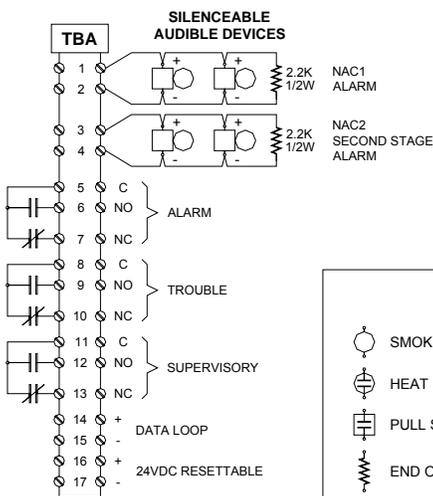
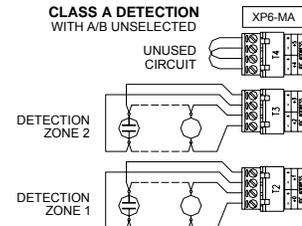
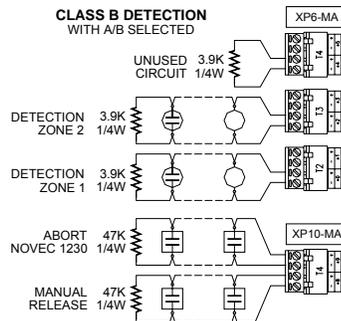
Double interlock Engineered system with Notifier NFS-320

Wiring diagram



Cable size: 14AWG min with 600V isolation

⚠ Two (2) circuits are required.
Control panel shall have a dedicated circuit breaker.



Power limited (supervised) initiating device circuits

Detection Zone 1 and 2 (Class A or B)
End of line resistor: 3.9K Ω , 1/4W
Loop resistance: 25 Ω max.
Leave EOL device (provided) on all unused circuits.
Refer to the NFS-320 control panel manual for smoke detector compatibility.

Power limited (supervised) initiating device circuits

Abort and Manual release circuits (Class B)
End of line: 47K Ω , 1/4W
Max. loop resistance: 50 Ω
Leave EOL (provided) on all unused circuits.
For dry contact supervisory devices only

Auxiliary relay contacts

Rated 2A, 30VDC resistive
Rated 1A, 30VDC (0.6pF) inductive
Rated 0.5A, 125VCA (0.35pF) pilot duty

Power limited (supervised) notification appliance circuits

NAC Circuit 1 and 2 (Class B)
End of line resistor: 2.2K Ω , 1/2W
Nominal operating voltage: 24VDC regulated
Maximum wiring voltage drop into alarm: 1.2V
Maximum usable current per circuit: 1.5A
Maximum total current (including 24VDC): 3A
Polarity is reversed in supervisory condition.
Leave EOL device (provided) on all unused circuits.
Refer to the NFS-320 control panel manual for device compatibility.

Auxiliary Power 24Vdc Regulated Source

Nominal voltage: 24VDC, 176mVrms ripple
Maximum available current: 1.25A for resettable 4 wires smoke detectors

Cabinet

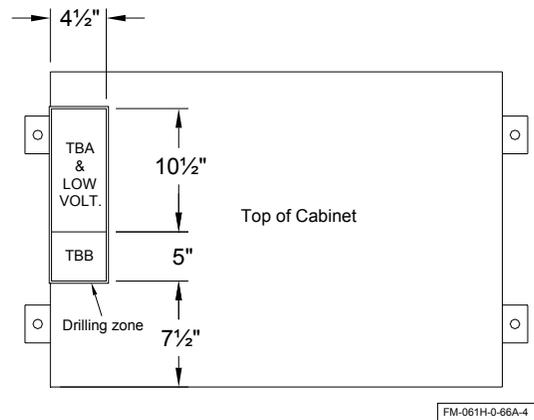
The **FIREFLEX[®] DUAL** cabinet is made of sturdy 14 gauge steel. Refer to table 8.1 and figure 8.2 for dimensions.

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

Cabinet doors are provided with hinges that can easily be disassembled on site to remove the door assemblies for installation and servicing. The cabinet assembly is pre-assembled, pre-wired, and factory tested under ISO-9001 conditions. Refer to tables 8.2 & 8.3 and figures 8.3 & 8.4 for installation and clearances details.

Electrical junction boxes are 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 8.1.

Figure 8.1 - Drilling details



Double interlock Engineered system with Notifier NFS-320**Table 8.1 - Cabinet dimensions**

Size	A	B	C	D	E	F	G
36"	35 ³ / ₄ "	25"	77 ¹ / ₈ "	39 ³ / ₄ "	15"	37 ³ / ₄ "	12 ³ / ₄ "
46"	46"	25"	77 ¹ / ₈ "	50"	15"	48"	23"
52"	52"	31"	81"	56"	21"	54"	26"

Table 8.2 - Preaction piping installation

H	J	K	L	M	N1	N2	O	P	Q
2"	11 ¹ / ₂ "	8"	5"	9 ³ / ₄ "	45"	48 ⁷ / ₈ "	4"	11 ¹ / ₂ "	3 ¹ / ₂ "
3"	11 ¹ / ₂ "	9"	4"	9 ¹ / ₂ "	45"	48 ⁷ / ₈ "	4"	12 ³ / ₄ "	3"

Notes:

1. N1 refers to 36" or 46" cabinet. N2 refers to 52" cabinet.
2. Dimensions may slightly differ from real unit.

Table 8.3 - NOVEC 1230 piping installation

Lbs	R	S	T	U
40	1"	2 ³ / ₄ "	6"	3 ¹ / ₄ "
76	1 ¹ / ₄ "	2 ³ / ₄ "	6"	3 ¹ / ₄ "
164	1 ¹ / ₂ "	2 ³ / ₄ "	6"	1 ¹ / ₄ "
322	2"	6 ³ / ₄ "	6"	4 ³ / ₄ "
601	2 ¹ / ₂ "	6 ¹ / ₂ "	6"	3 ³ / ₄ "
850	3"	9"	7"	5"

Note: Dimensions may slightly differ from real unit.

Figure 2 - Cabinet dimensions

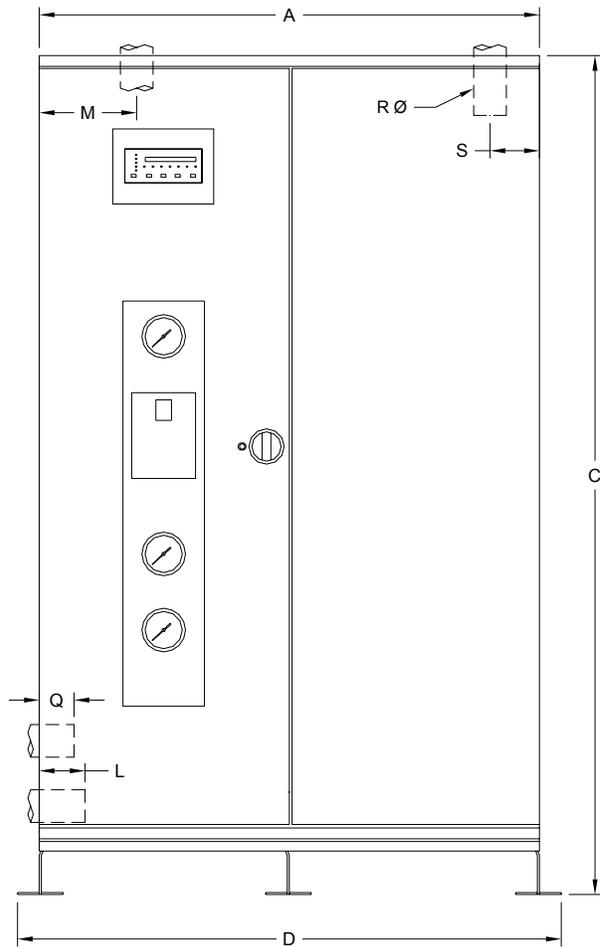


Figure 3 - Floor anchoring template

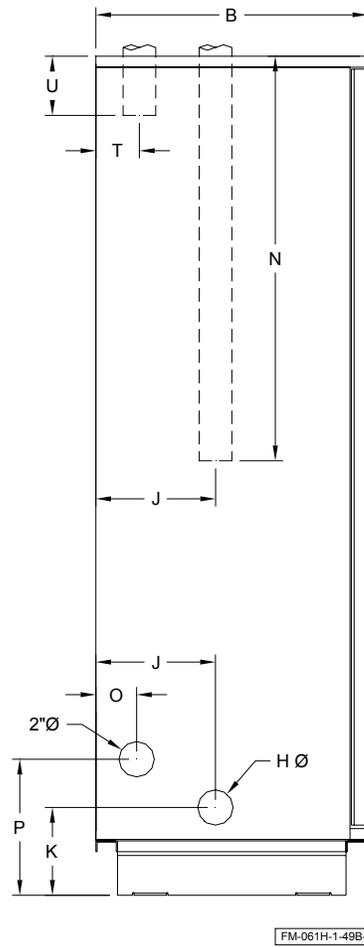
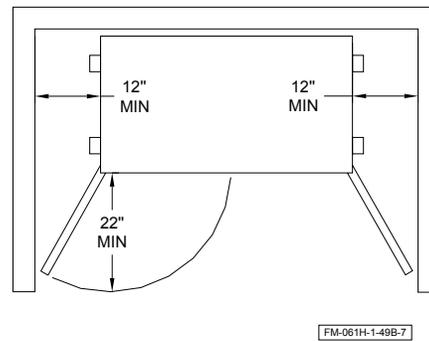
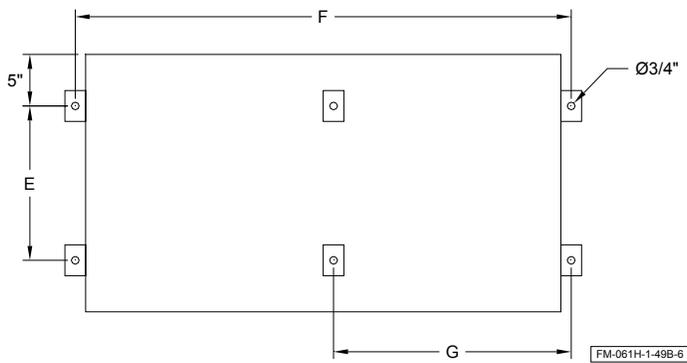


Figure 4 - Required clearance





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