



OSHPD (Optional)

DESCRIPTION

This **TOTALPAC®3** integrated fire protection system by FireFlex Systems Inc. consists of a **Firecycle®III** system trim totally pre-assembled, pre-wired and factory tested. All electrical and mechanical components of the system are contained in one single unit

TOTALPAC®3 Firecycle®III systems are built around the Viking trim using flow control valves model J-1.

Firecycle®III Wet preaction system uses closed automatic sprinklers in the sprinkler piping. A detection network is used in parallel with the automatic sprinkler system and is designed to operate before a sprinkler head fuses. This network is electric and may be actuated by normally closed rate compensated heat detectors, or normally open manual pull station. The detection system operates before the sprinkler fuses and gives an alarm. When the detection system operates it gives an alarm and activates the flow control valve.

In addition to automatically detecting a fire and turning the system on, **Firecycle®III** has the added ability to sense when the fire has been controlled, and automatically turn off the water flow once a preprogrammed "Soak Timer" has been satisfied. Should the fire rekindle, the releasing control panel will initiate the sequence again. This unique **Firecycle®III** feature will repeat as long as power is available to the panel, helping to minimize water usage, water damage, and the danger of pollution to surrounding areas.

A special features offer perfect fail-safe modes, **Firecycle®III** preaction systems provide protection with or without electrical power. If a condition occurs that removes both the primary and secondary power supplies, the pneumatic actuator becomes the release mechanism and the system will operate as a dry pipe system.

The **Firecycle®III** preaction system includes a VIKING VFR-400 releasing control panel

All the valves are rated up to a maximum of 250 psi WWP (1724 kPa) max. and are available in the following diameters:

- 1½" (40 mm) 2" (100 mm) 3" (80 mm)
- 4" (100 mm) 6" (150 mm) 8" (200 mm)

Standard features

- cULus Listed & FM Approved as an assembled unit
- Factory assembled, programmed and tested under ISO-9001 standards
- Prewired to a terminal block
- Easy and compact installation
- Viking conventional trim rated at 250 psi (1724 kPa)
- Galvanized trim piping
- Serial number for easy reference
- Corrosion resistant cabinet with flush type handle and lock
- No open drain cup inside the unit
- numerous modular options to meet the most demanding jobsite requirements
- Four styles of modular air supply options
- Inlet & outlet hydrostatic test ports
- User-friendly standardized operation & installation manual
- Free interactive simulator

Cabinet

The TOTALPAC®3 cabinets are made of sturdy 14 gauge steel, they are available in four (4) sizes;

23" x 25" x 77" (58.4 x 63.5 x 195.6 cm) for 1½", and 2" systems,

36" x 25" x 77" (91.4 x 63.5 x 195.6 cm) for 3" and 4" system,

46" x 25" x 77" (116.8 x 63.5 x 195.6 cm) for 6" system

54" x 31" x 81" (137.2 x 78.7 x 205.7 cm) for 8" system

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.

A field wiring electrical junction boxes is integrated with the cabinet for connection of all electrical components in the trim. Pressure switches, supervisory switches, etc. are all factory wired to a terminal strip (TBA) for contractor's field wiring.

Gauges to indicate air, water supply pressure and priming water pressure are all visible through clear Lexan windows.

IMPORTANT: TOTALPAC®3 units are NOT designed to be installed where they will be subjected to outdoors and/or freezing conditions. Refer to environmental data for additional details. Subjecting the unit to conditions outside these limitations might tamper the normal operation of the system.

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

Multiple unit installations are easily achieved by manifolding units together at their water inlets but drains shall remain separate and open.

Sequence of operation (see trim diagram)

In a fire condition, when the detection condition is satisfied, system releasing control panel activates an alarm and energizes normally closed solenoid valve (F2) open and normally open solenoid valve (F1) closed.

Pressure continues to be released from the priming chamber of the flow control valve (A1) to the open drain manifold faster than it is supplied through the restricted orifice (B3). The flow control valve clapper remains open to allow water to flow into the system piping and alarm devices, causing the alarm pressure switch (C1) and optional water motor alarm (C2) to activate. When a sprinkler head opens, water will flow from the system.

Water discharges until all Firecycle®III detectors have reset (cooled below their set point). After all detectors have reset, the Firecycle®III releasing control panel activates the soak timer, allowing the system to continue discharging water for a preset time period. When the soak timer has elapsed, the releasing control panel de-energizes the normally closed solenoid valve (F2), allowing the flow control valve to re-primed and closes, stopping the flow of water through the piping system. Should a Firecycle®III detector go into alarm, the releasing control panel reenergizes the normally closed solenoid valve (F2) open, and the entire cycle repeats.

If the system piping is damaged sufficiently to activate the alarm flow switch (C3), the VFR-400 Control Panel will energize normally open release solenoid valve (F1) closed. If a detector has NOT gone into alarm mode, release solenoid valve (F2) will remain closed. The flow control valve will re-prime and close after a short delay. If a sprinkler or the system piping is damaged, this feature ensures that the amount of discharging water is limited by the system pressure and the location of the system damage. If a Firecycle® detector detects a fire during this condition, normally closed release solenoid valve (F2) will be energized open, allowing the flow control valve to open, and water will be discharged from any sprinklers that may have operated as a result of the fire, as well as from the damaged portion of the system. The cycling function of the Firecycle®III wet system and all alarms will operate normally in this condition.

Systems hydraulic limitations

WARNING The information contained herewith is for estimation and evaluation purposes only. Its use remains the responsibility of the designer.

Designers should refer to the appropriate NFPA Standards and any other applicable codes for their final design.

System size (in.)	Usage Range (gpm)	Piping Equivalent Lengths w/o shut off valve		Piping Equivalent Lengths c/w shut off valve	
		(m.)	(ft.)	(m.)	(ft.)
1½	0 – 210	8.3	27.2	8.5	27.9
2	0 – 360	11.65	38.2	11.85	38.9
3	100 - 700	16.8	55.1	20.33	66.7
4	200 – 1400	21.89	71.8	25.33	83.1
6	400 - 3500	33.28	109.15	37.28	122.3
8	750 - 5250	41.15	135	44.71	146.7

System drain flow:

System size	USGPM Formula
1½" & 2"	0.5 x (water pressure Psi) + 65 = USGPM
3"	1.2 x (water pressure Psi) + 130 = USGPM
4", 6" & 8"	2.7 x (water pressure Psi) + 215 = USGPM

System size	LPM Formula
1½" & 2"	2 x (water pressure Psi) + 235 = LPM
3"	4 x (water pressure Psi) + 490 = LPM
4", 6" & 8"	10 x (water pressure Psi) + 800 = LPM

Standard equipment

Control panel

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

The release control panel integrated into the **TOTALPAC®3** cabinet is Viking's Model **VFR-400**. 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.

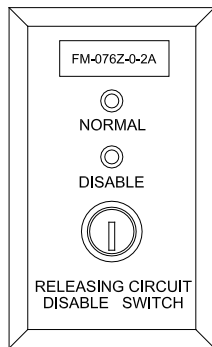
The panel is compatible with many types of fire alarm & supervisory devices such as linear heat detectors, spot-type heat and smoke detectors, water flow and release indicators, low and high air pressure switches, manual pull stations.

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.

Releasing circuit disable switch

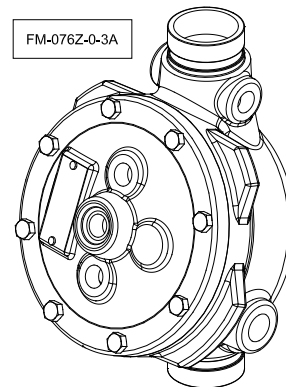
The releasing circuit disable switch is used to disable the releasing solenoid. When the key is set to "Disable", the releasing solenoid will be disconnected from the control panel's releasing circuit, causing a trouble signal and preventing accidental discharge during maintenance or inspection.



Flow control valve

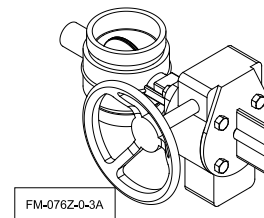
The Viking flow control valve is a quick opening, differential type flood valve with a spring loaded rolling diaphragm clapper. The flow control valve can be used to facilitate manual or automatic on/off control. The Viking flow control valve is an integral part of the Viking Firecycle® System.

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 flow control valve clapper opens to allow water to flow into the system piping.



Water supply control valve

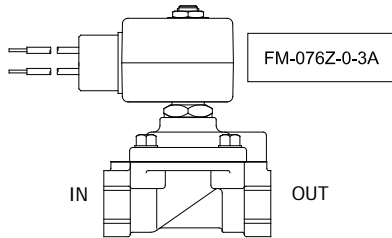
The water inlet control valve is a supervised, indicating butterfly valve. Purpose of this valve is to manually shutoff the preaction system.



Standard equipment (continued)

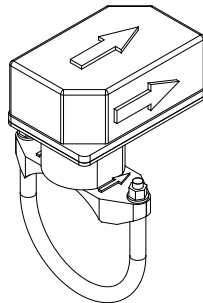
Solenoid valve

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 flow control valves. The solenoid valve has floating diaphragm construction, which requires a minimum pressure drop across the valve to operate properly.



Alarm water flow switch

The alarm water flow switch monitors the water flow within the sprinkler piping. Should an automatic sprinkler open to allow water to flow into the sprinkler piping. The alarm water flow switch will activate, indicating a water flow signal.



Optional mechanical equipment

❑ **Shut-off valve & sight glass option**

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. Examples of such applications are freezers, ovens, museums, data processing and other hazards where the possibility of water leaking from the piping system is to be avoided at all costs.

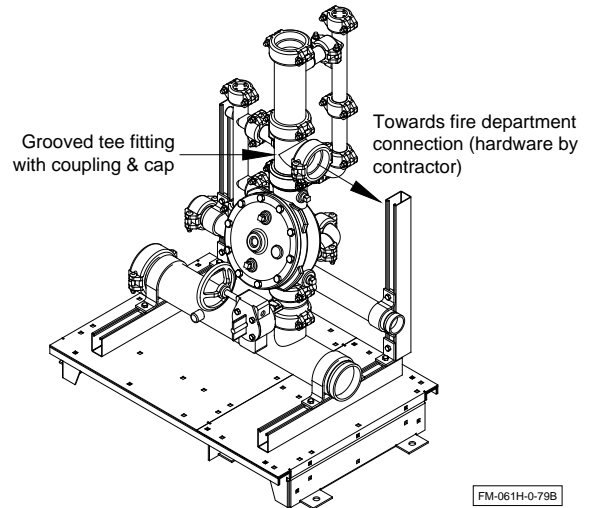
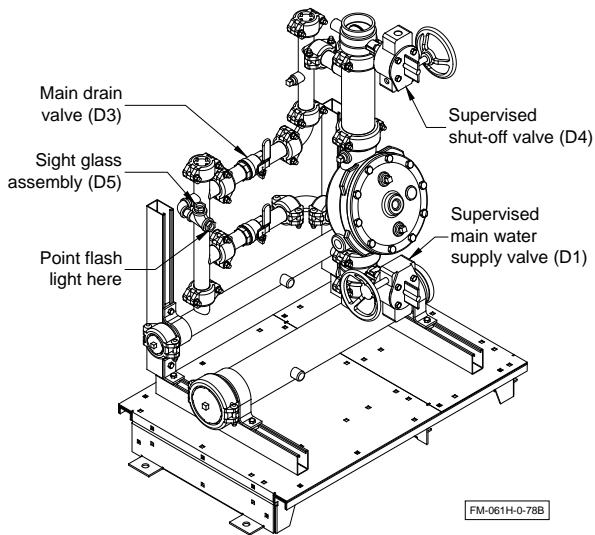
Warning: Shut-off valve & sight glass option is **not available** on 8" systems.

❑ **Fire department connection**

The fire department connection option consists of a grooved tee fitting installed in lieu of the 90 degree elbow at the outlet of the deluge valve (A1). An access hole of the proper diameter is factory pre-drilled on the side of the **TOTALPAC®3** enclosures for connection of the piping going to the fire department connection.

Note: The fire department connection hardware itself (drain, Siamese, etc.) is NOT provided with this option and shall be provided by the installing contractor. Refer to NFPA-13 Standard for additional information about the equipment layout and installation.

Warning: Fire department connection is **not available** on 8" systems.



Optional mechanical equipment (continued)

❑ **Semi and full flange option**

When required by the user, TOTALPAC®3 units can be provided in either a semi-flanged or full flanged configuration.

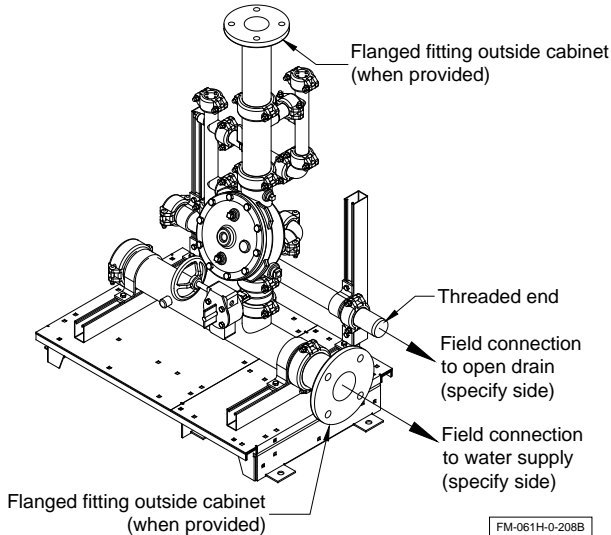
The semi flanged option provides flanged fittings only on the water inlet pipe (side needs to be specified at the time of order) and on the system riser outlet. The drain manifold is then provided with a threaded end that also needs to have its side specified (left or right). The rest of the fittings are the same as usual with the main components being provided in the standard grooved-grooved configuration.

The full flanged option is the same as above but goes a step further with the main components being also provided with a flanged-flanged configuration.

When provided, the face of the flanges will always be situated 6 inches from the outside face of the mounting base or cabinet surface.

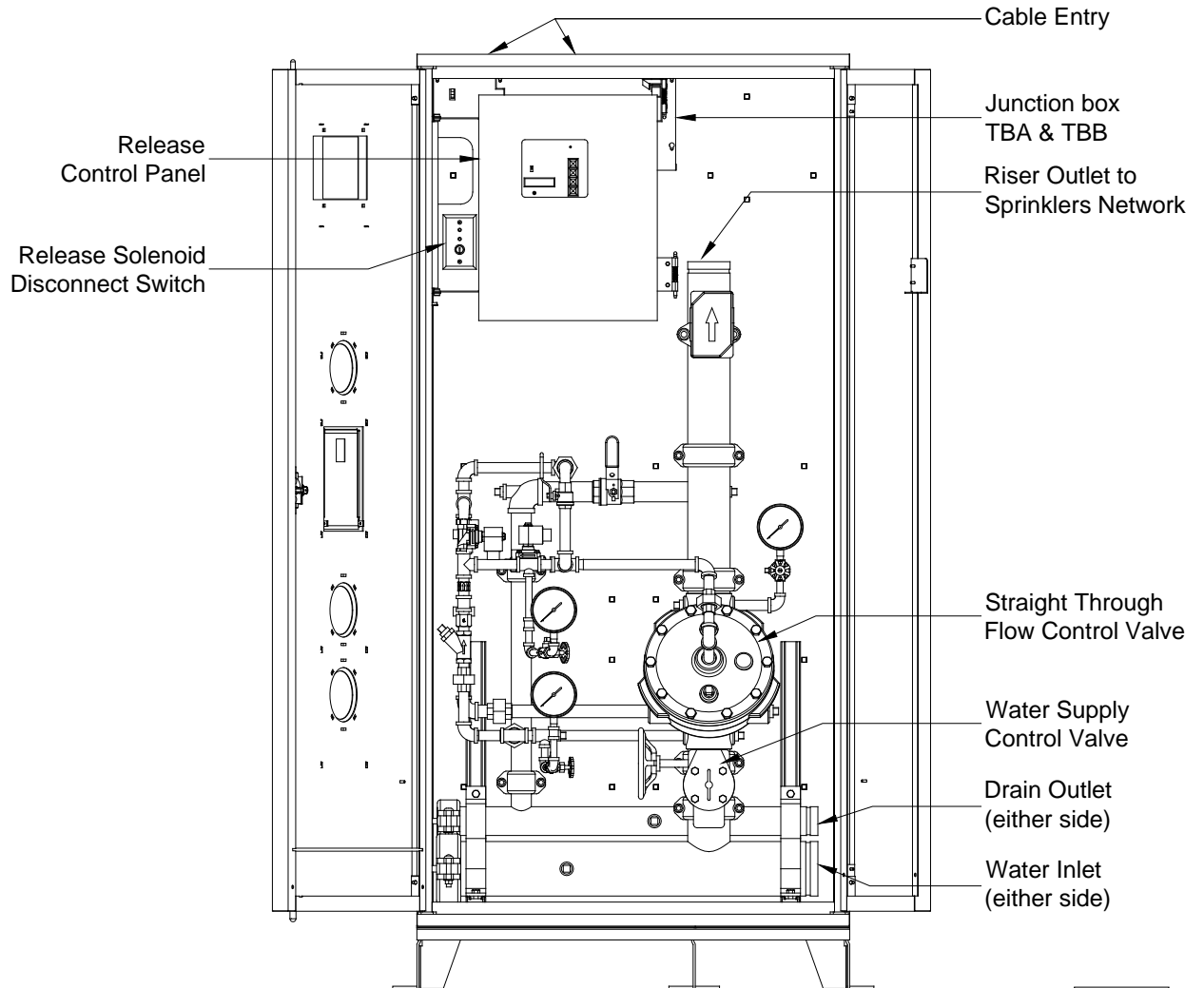
❑ **OSHPD option**

Pre-approved construction, under OSP-0341-10, using specific components.



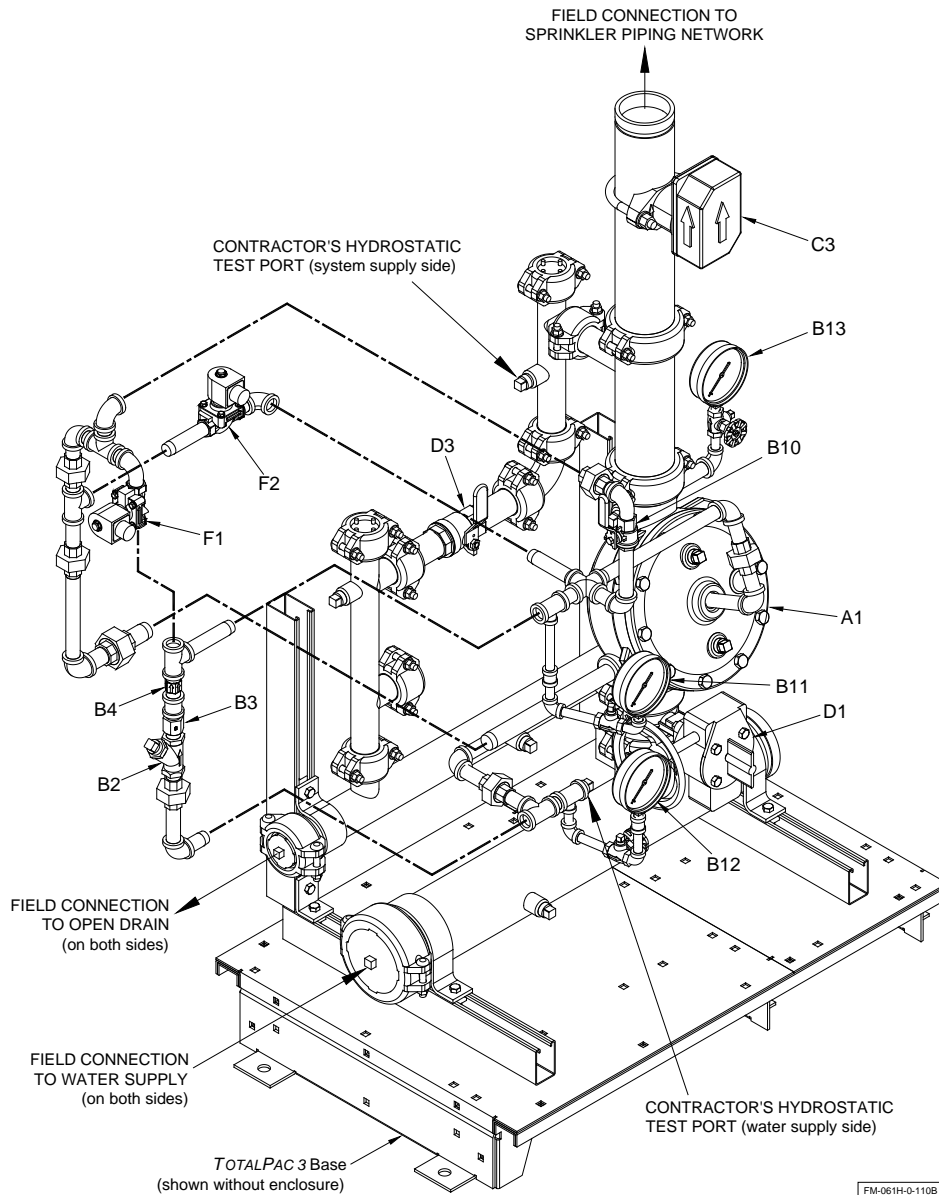
Details & field wiring diagrams

Cabinet with main components - Configuration without releasing control panel, shown with air style "A"



FM-061H-0-194A

Trim diagram

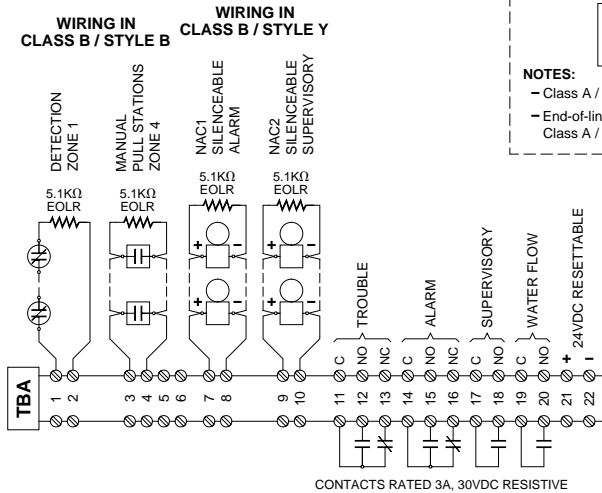
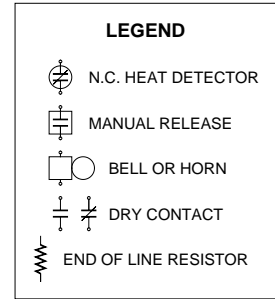
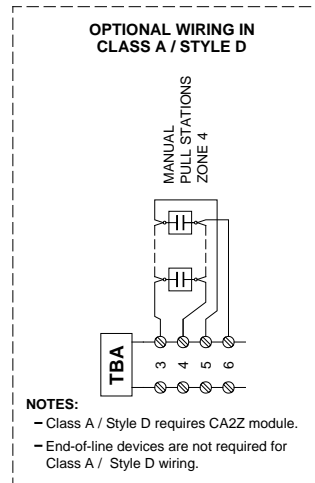
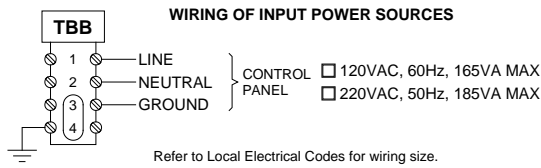


FM-061H-0-110B

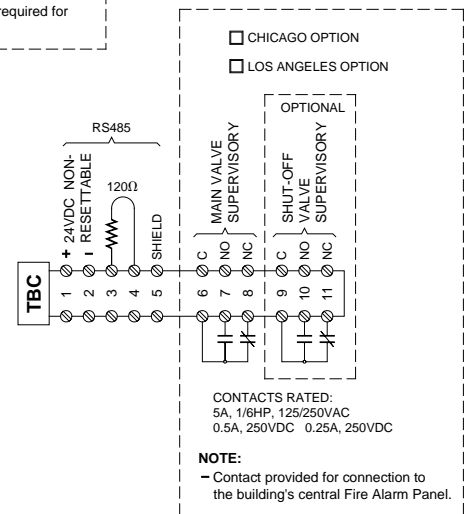
Trim Components:

A2	Flow control valve	C3	Alarm water flow switch
B2	Strainer	D1	Water supply control valve
B3	1/8" Restricted orifice	D3	Main drain valve
B4	Spring loaded check valve	F1	N.O. solenoid valve – 24Vdc
B6	Flow test valve	F2	N.C. solenoid valve – 24Vdc
B10	Emergency release valve		
B11	Priming pressure water gauge & valve		
B12	Water supply pressure gauge & valve		
B13	System water pressure gauge & valve		

Field wiring diagram:



- NOTES:**
- Control panel AC power source is supervised and non-power limited.
 - All devices are shown in their normal supervisory state.
 - Use dry contacts with power limited circuits only.



FM-061H-0-87A

Power limited (supervised) initiating device circuits

Zones 1 (detection) and 4 (manual release):

Max. loop resistance: 100Ω

End of line: 5.1KΩ, 1/4W

Leave ELR (provided) on all unused circuits.

Refer to the VFR-400 release control panel manual for device compatibility.

Auxiliary power 24Vdc regulated source

Total current available: 0.2A

Resettable for 4 wires smoke detectors

Power limited (supervised) notification appliance circuits

Output circuits 1 and 2:

Maximum operating voltage: 27Vdc (ripple: 0.3Vdc)

Maximum usable current per circuit: 1.0A

Total current available (all circuits): 2.5A

End of line: 5.1KΩ, 1/4W

Leave ELR (provided) on all unused circuits.

Polarity is reversed in supervisory condition.

Refer to the VFR-400 release control panel manual for device compatibility

Dimensions and weights

Figure 1 – Cabinet dimensions:

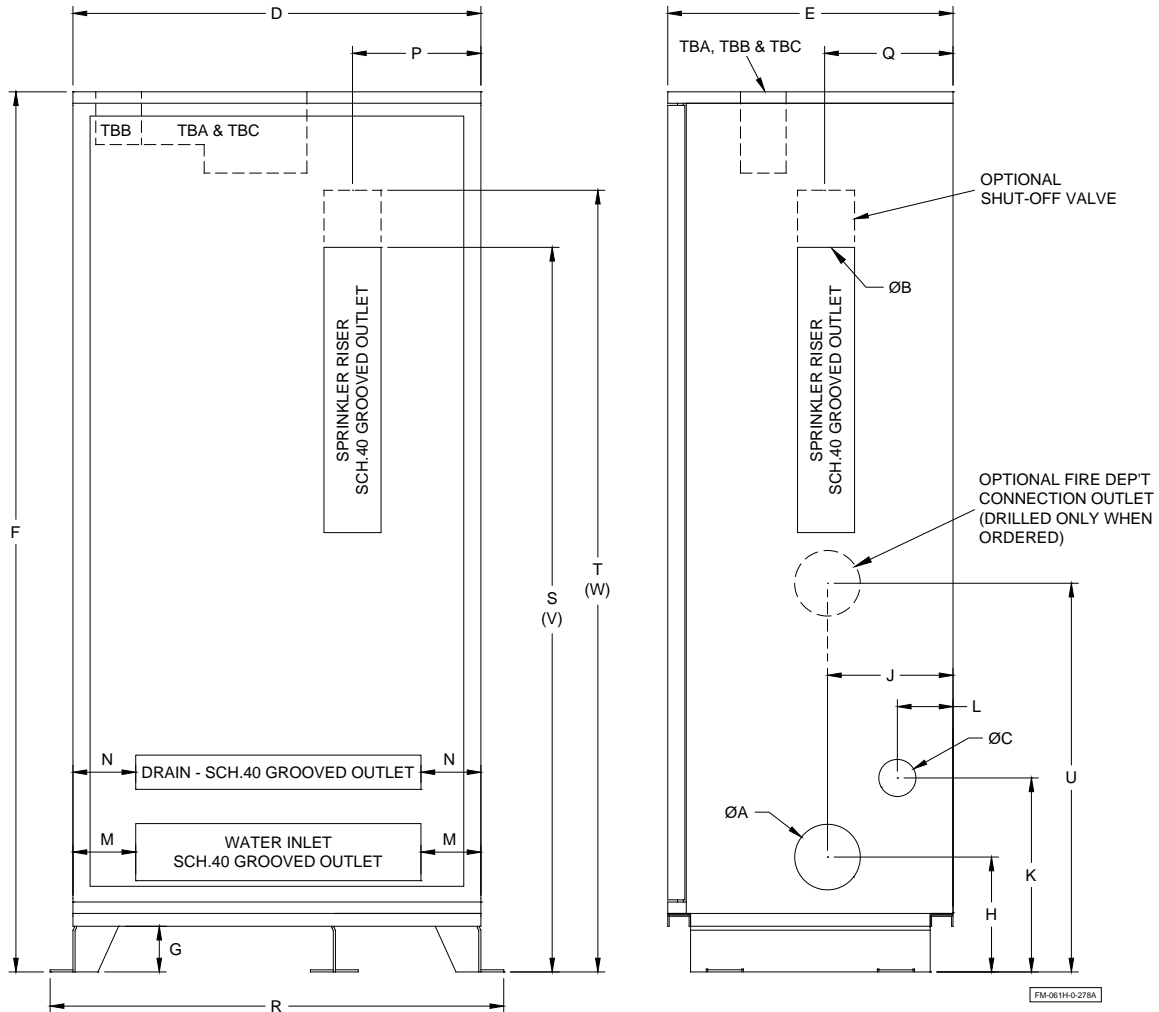


Table 1 - Cabinet dimensions - dimensions are in inches (mm)

Unit size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W
1½" (40)	2" (51)	1½" (38)	2" (51)	23" (584)	25" (635)	77" (1956)	4" (102)	8¾" (222)	11½" (292)	13¾" (349)	3¾" (95)	2¾" (70)	2¾" (70)	8" (203)	11½" (292)	27" (686)	55½" (1410)	59¾" (1518)	34¼" (870)	61¼" (1556)	65¼" (1657)
2" (50)	2" (51)	2" (51)	2" (51)	23" (584)	25" (635)	77" (1956)	4" (102)	8¾" (222)	11½" (292)	13¾" (349)	3¾" (95)	2¾" (70)	2¾" (70)	8" (203)	11½" (292)	27" (686)	58½" (1486)	62½" (1588)	34¾" (883)	65" (1651)	69" (1753)
3" (80)	4" (102)	3" (76)	2" (51)	35¾" (908)	25" (635)	77" (1956)	4" (102)	10" (254)	11½" (292)	13¾" (349)	3¾" (95)	2¾" (70)	2¾" (70)	11¾" (298)	11½" (292)	39¾" (1010)	60" (1524)	64" (1626)	37" (940)	66½" (1689)	70½" (1791)
4" (100)	4" (102)	4" (102)	2" (51)	35¾" (908)	25" (635)	77" (1956)	4" (102)	10" (254)	11½" (292)	13¾" (349)	3¾" (95)	2½" (64)	2½" (64)	12" (305)	11½" (292)	39¾" (1010)	62¾" (1594)	67¾" (1708)	42" (1499)	70¾" (1797)	75¼" (1911)
6" (150)	6" (152)	6" (152)	2" (51)	46" (1168)	25" (635)	77" (1956)	4" (102)	11" (279)	11½" (292)	13¾" (349)	3¾" (95)	5¼" (133)	5¼" (133)	17¾" (451)	11½" (292)	50" (1270)	65½" (1664)	71¼" (1810)	N/A	N/A	N/A
8" (200)	8" (203)	8" (203)	2" (51)	54" (1372)	31" (787)	81" (2057)	4" (102)	12" (305)	13¾" (337)	17" (432)	3¾" (95)	9" (229)	6¾" (171)	27" (686)	13¾" (337)	58" (1473)	76" (1778)	N/A	N/A	N/A	N/A

Notes:

- Dimensions are nominal and may vary ±¼" (±5mm).
- Dimensions U, V & W are for optional fire department connection.

Figure 2 - Floor anchoring dimensions

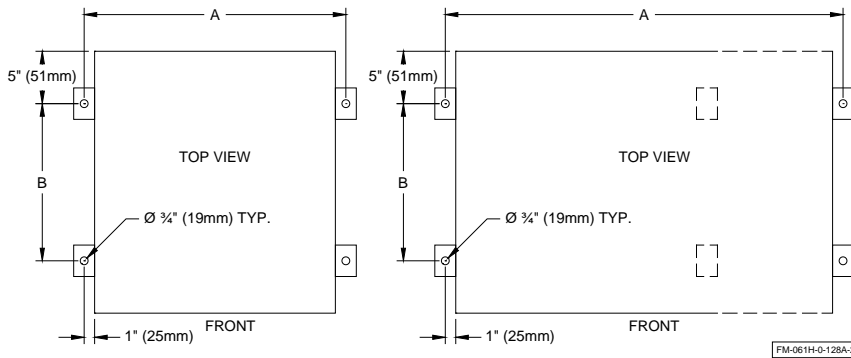


Table 2 - Floor anchoring dimensions

Unit size	A	B
1½" (40mm)	25" (635mm)	15" (380mm)
2" (50mm)	25" (635mm)	15" (380mm)
3" (80mm)	37¾" (959mm)	15" (380mm)
4" (100mm)	37¾" (959mm)	15" (380mm)
6" (150mm)	48" (1220mm)	15" (380mm)
8" (200mm)	56" (1422mm)	21" (530mm)

Figure 3 - Cabinet & doors clearance detail

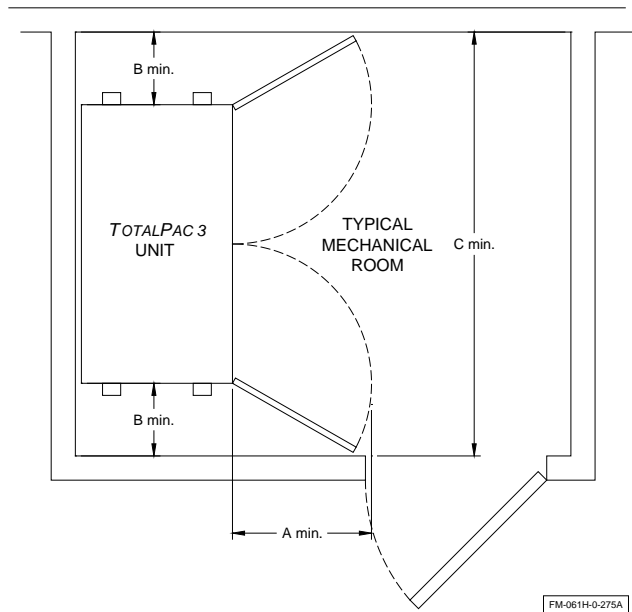


Table 3 - Cabinet clearance dimensions

Unit size	A	B	C
1½" (40mm)	24" (610mm)	12" (305mm)	48" (1219mm)
2" (50mm)	24" (610mm)	12" (305mm)	48" (1219mm)
3" (80mm)	24" (610mm)	12" (305mm)	60" (1524mm)
4" (100mm)	24" (610mm)	12" (305mm)	60" (1524mm)
6" (150mm)	24" (610mm)	12" (305mm)	70" (1778mm)
8" (200mm)	32" (813mm)	12" (305mm)	78" (1981mm)

Note : Minimum dimensions are according to door clearance and external piping requirements.

Figure 4 - Knockouts details

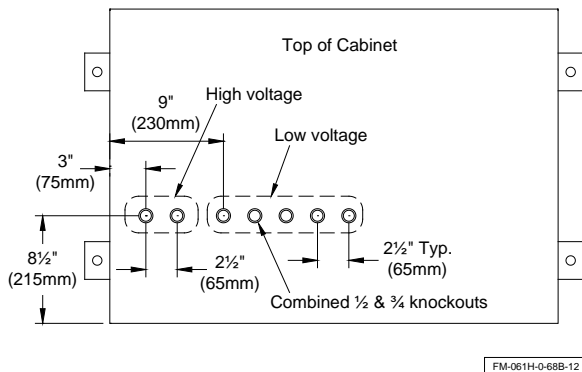


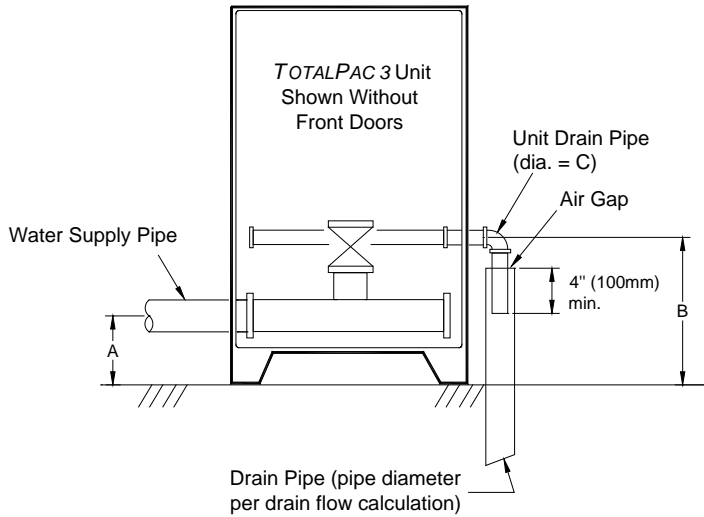
Table 4 - System weight in cabinet

System size	Weight ^{1,2}
1½" (40mm)	460 lb (209 kg)
2" (50mm)	465 lb (211 kg)
3" (80mm)	740 lb (336 kg)
4" (100mm)	755 lb (342 kg)
6" (150mm)	1035 lb (469 kg)
8" (200mm)	1485 lb (674 kg)

(1) Without release control panel. Add 34 lb (15 kg) for **TotalPac®3** unit with release control panel & batteries.

(2) Without air compressor.

Figure 5 - Open drain details for single unit



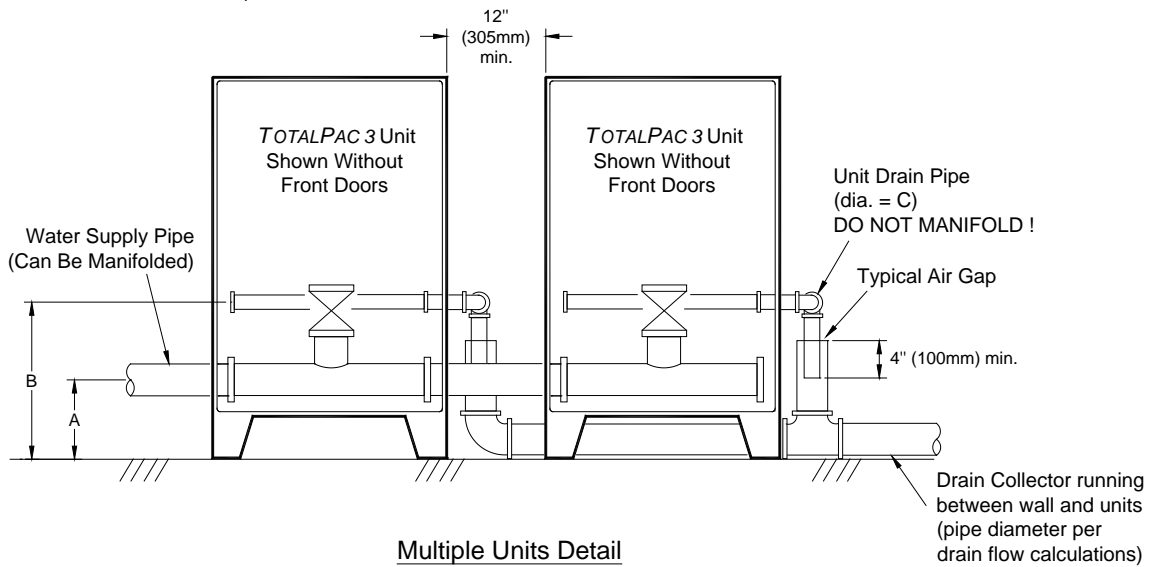
Single Unit Detail

FM-061H-0-139A

Table 5 - Manifold dimensions

Unit size	A	B	C
1½ (40mm)	8¾" (222mm)	13¾" (350mm)	2" (50mm)
2" (50mm)	8¾" (222mm)	13¾" (350mm)	2" (50mm)
3" (80mm)	10" (255mm)	13¾" (350mm)	2" (50mm)
4" (100mm)	10" (255mm)	13¾" (350mm)	2" (50mm)
6" (150mm)	11" (280mm)	13¾" (350mm)	2" (50mm)
8" (200mm)	12" (305mm)	17½" (445mm)	2" (50mm)

Figure 6 - Open drain details for multiple units
(refer to dimensions in table 5)



Multiple Units Detail

FM-061H-0-140A

Notes:

1. Water supply and drain pipes can be connected on either sides of cabinet.
2. All pipes and fittings should meet applicable codes.
3. Actual drain collector diameter shall be determined with detailed hydraulic calculations and is the responsibility of the system designer.



ADVANCED INTEGRATED FIRE PROTECTION SYSTEMS

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