

Vacuum / Pressure Controller Model FLX-PC®

FIREFLEX

Operation Manual



FLX-PC[®] Vacuum / Pressure Controller

Operation Manual

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FLX-PC[®] Vacuum / Pressure Controller***Operation Manual***

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FLX-PC® Vacuum / Pressure Controller

Operation Manual

General Description

The **FLX-PC**® control unit is equipped with a microcontroller based circuit that uses a piezoelectric type pressure sensor to analyze the pressure in real time in a piping network and perform various control operations. It includes a LCD type display with 2 lines of 16 characters that displays the status of the system. A single push-button on the side is used to perform the various commands.

The **FLX-PC**® unit is powered by the release control panel and consumes very little energy. Various pre-established parameters allow to conduct supervisory and fire protection system release via connections to the release control panel.

The **FLX-PC**® unit allows the control of the start-stop cycle of the vacuum pump according to pre-established parameters.

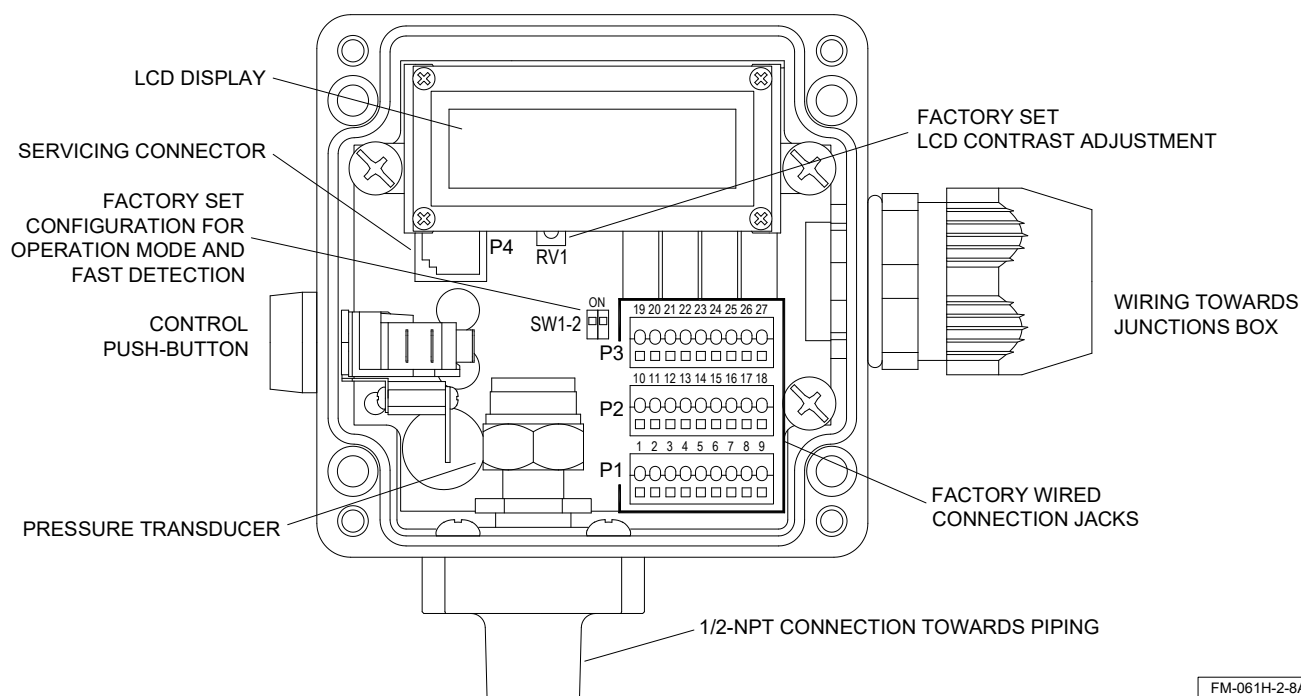


Figure 1 - Internal arrangement of the FLX-PC unit

Display in Normal Condition

The system pressure is displayed in real time on the first line (see PRESSURE UNITS CONVERSION section for a list of other units of pressure).

- 0.180 BAR
168:30:25 5:20

The second line shows information on the operation of the vacuum pump. The hour meter on the left represents the time (in hours: minutes: seconds) between the last two starts of the pump; this gives an idea of the frequency of the pump. The hour meter on the right represents the operation time of the pump (in minutes: seconds) during its last start.

The limit of the time meter on the left is 9999:59:59. The one on the right is 99:59. Each counter restarts at zero when the limit is reached.

In the attached example, we can see that the pump starts approximately once a week (the last two cycles of the pump having been separated from 168 hours, 30 minutes and 25 seconds) and that the last startup time was 5 minutes, 20 seconds.

This information is useful for identifying a change of state in the pipe network or a change in the performance of the pump. In a normal state of supervision, the frequency and duration of operation should be constant with time.

LCD Display Intensity

The brightness of the LCD display is kept at a low level. By pressing the push-button momentarily, the display reaches its full brightness; the full brightness will be kept for a period of one minute.

The contrast of the LCD display is calibrated at the factory, but can be changed via the RV1 adjustment potentiometer located inside the case.

FLX-PC® Vacuum / Pressure Controller**Operation Manual****Vacuum Pump Control**

The system is designed to maintain a level of vacuum in the piping network between -0.150 BAR and -0.180 BAR. These values are fixed and cannot be changed.

Supervisory pressure

The pump starts at -0.150 BAR and stops at -0.180 BAR.

- 0 . 1 5 0 BAR +

When the pump is in operation, the sign [+] appears to the right of the first line.

Note: The vacuum pump will not operate if a trouble condition is present on the **FLX-PC®** unit.

Forced Shutdown

The forced shutdown of the vacuum pump takes place when the deluge valve is operated, an automatic sprinkler has been activated or that the vacuum pump has worked for a period of more than 35 minutes.

- 0 . 1 8 0 BAR *

When the pump is shutdown, the sign [*] is displayed to the right of the first line.

To allow the vacuum pump to start, you must first correct the situation and put the system in normal condition of operation. Refer to the section **B** MECHANICAL SECTION of the Operation and Maintenance Manual of the **FIREFLEX®VACTEC®** system.

Once the system is back in operating condition, press and hold the push-button for 5 seconds to restart the vacuum pump. Release the push-button as soon as the pump starts or until the sign [*] disappears.

Note: The history display appears after 3 seconds; do not release the push-button before the end of 5 seconds.

Low and High Pressure

A supervisory signal is transmitted to the release control panel in the following situations:

- 0 . 1 4 0 BAR
LOW PRESS .

When the vacuum level reaches -0.140 BAR. This can happen if the vacuum pump does not work. Refer to the section **D** VACUUM SUPPLY of the Operation and Maintenance Manual of the **FIREFLEX®VACTEC®** system to correct the situation.

If the vacuum level reached -0.220 BAR, this indicates a high level of vacuum and this situation is abnormal. Refer to the section **D** VACUUM SUPPLY of the Operation and Maintenance Manual of the system **FIREFLEX®VACTEC®** to correct the situation.

- 0 . 2 2 0 BAR
HIGH PRESS .

Note: Supervisory signals are kept latched for a period of 5 seconds.

Alarm Pressure

Note: This section do not applies to vacuum single interlock pre-action systems.

An alarm pressure signal is transmitted to release control panel when the vacuum level reaches -0.130 BAR.

- 0 . 1 3 0 BAR
ALARM PRESS .

Note: Alarm signal is kept latched for a period of 5 seconds.

Operation Mode

The **FLX-PC®** unit can be configured to match the different types of interlock for a pre-action system, via switch SW1 located inside the case. This switch is configured at the factory and should not be changed.

Quick Detection of Sprinkler Opening

The **FLX-PC®** unit can be configured so that it can quickly detect an automatic sprinkler opening; this configuration is done via the switch SW2 located inside the case. When this mode is enabled, the letter [D] is displayed to the right of the first line. This allows for a time of operation less than 5 seconds between the automatic sprinkler opening and the opening of the deluge valve.

- 0 . 1 6 0 BAR D
ALARM SPK

This operation is valid under the following conditions:

Sprinkler K Factor	Network Capacity
K5.6(80) to K<11.2(161)	2000 US gal (7.57m³)
K11.2(161) to K<25.2(363)	3000 US gal (11.4m³)
K25.2(363) and bigger	4000 US gal (15.1m³)

An alarm pressure signal is transmitted to the release control panel when a variation of the vacuum corresponding to the opening of a vacuum sprinkler is detected.

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Events History Log

The last 50 events are kept inside the **FLX-PC®** unit for consultation.

To access this information, press and hold the push-button for 3 seconds then release the push-button.

```
***VER: 1.0.0***
1000:45:33 HRS
```

The first line indicates the version of the software of the **FLX-PC®** unit.

The second line shows the total operating time of the vacuum pump. When the hour counter reaches the value of 9999:59:59, the counter returns to 0:00:00.

Note: When the 24VDC supply is removed from the **FLX-PC®** unit, the hour counter returns to 0:00:00.

Press the push-button momentarily to scroll through each of the events in history up to a maximum of 50 events. The list will go back to the first event at the end of the last event.

```
***VER: 1.0.0***
1 PUMP STOP
```

The display will automatically return to its normal condition after 10 seconds of inactivity of the push-button.

Note: When the 24VDC supply is removed from the **FLX-PC®** unit, all events are cleared from the history.

Pressure Units

The pressure is initially displayed in BAR. It can also be displayed in KPA, PSI or BAR/PSI. This last unit will display the BAR when in a vacuum and the PSI under positive pressure.

To change the unit, press and hold the push-button for 10 seconds then release the push-button.

```
BAR
```

The current unit will be displayed. Press the push-button momentarily to scroll through the various units.

```
KPA
```

```
PSI
```

```
BAR / PSI
```

Once the unit has been selected, the display will automatically return to its normal condition after 10 seconds of inactivity of the push-button; the change of units will be completed.

Note: When a unit is changed, the hour counter returns to 0:00:00 and all events are cleared from the history.

Trouble Condition

A trouble signal is transmitted to the release control panel when the **FLX-PC®** unit is not powered or a defect of the microcontroller is present.

Note: The vacuum pump will not operate if a trouble condition is present on the **FLX-PC®** unit.

Note: When the 24VDC supply is removed from the **FLX-PC®** unit, the hour counter returns to 0:00:00 and all events are cleared from the history.

The opening of the **FLX-PC®** unit must only be performed by a qualified technician. No operation requires to remove the front cover.

Specifications

Voltage supply range: 20 to 28VDC

Maximum current consumption: 40mA under normal supervisory condition; 75mA under alarm condition

Contacts rating: 30VDC, 1A (resistive)

Pump control rating: 30VDC, 45mA

Inputs rating: 30VDC, 2mA

Pressure range: -14.7 to 175PSI (-1 to 12.1BAR)

Piping connection size/material: 1/2-NPT, C836 Brass

Useful Conversions

BAR	KPA	PSI
-0.220	-22	-3.19
-0.180	-18	-2.61
-0.150	-15	-2.18
-0.140	-14	-2.03
-0.130	-13	-1.89
0	0	0
12.07	1207	175

FLX-PC® Vacuum / Pressure Controller**Operation Manual****Electrical Wiring**

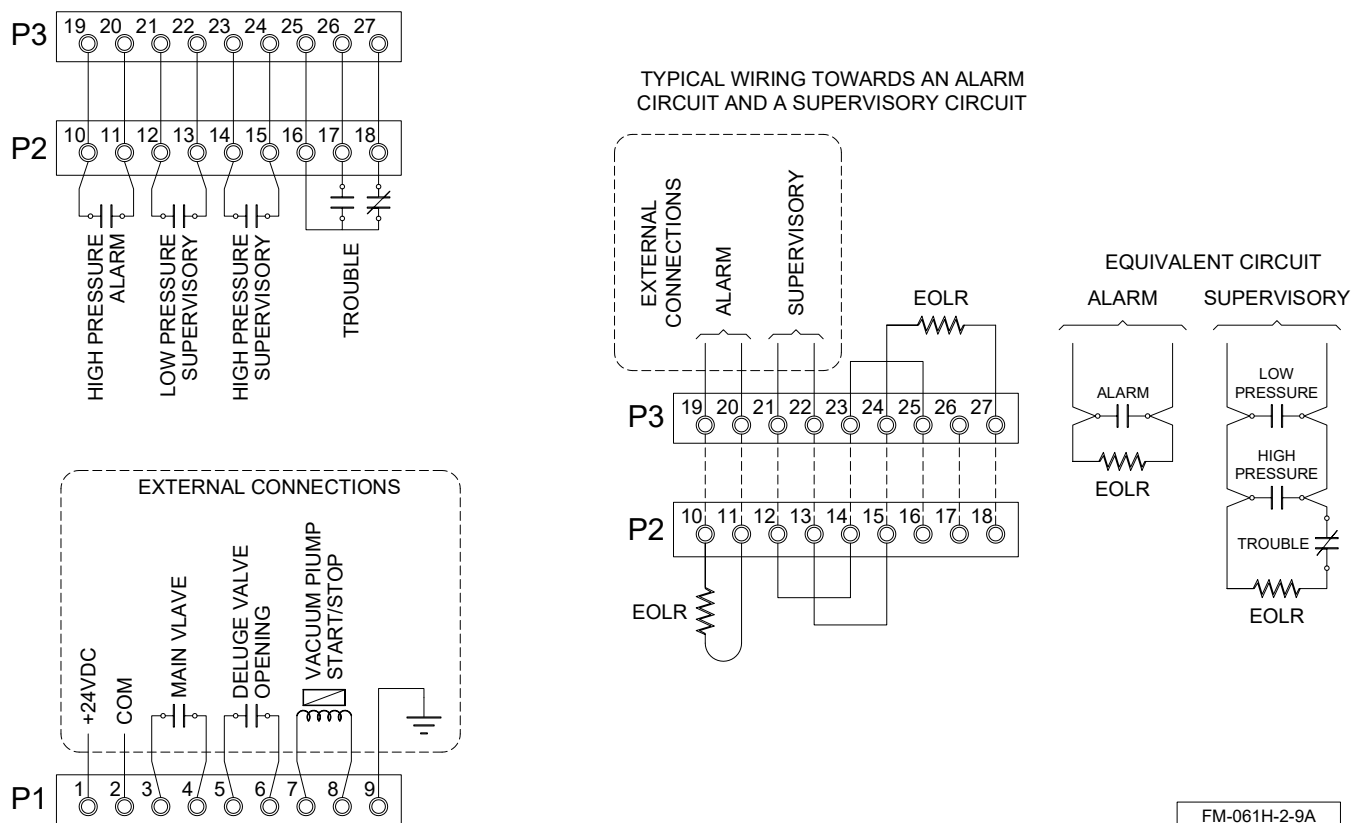
The electrical connections to the **FLX-PC®** unit are rooted to the release control panel via a built-in junction box and connected at the factory.

Connections to the **FLX-PC®** unit allow powering the unit, the connection among other devices of the system, the transmission of alarm, supervisory and trouble control signals towards the release control panel and ultimately control of the vacuum pump.

The **FLX-PC®** unit is powered via a non-resettable power source from the release control panel. Alarm, supervisory and trouble signals are connected to the release control

panel through dry contacts of the **FLX-PC®** unit. Control contacts of the system come from the devices of the fire protection system. The vacuum pump control is made via a 24VDC isolation relay whose contacts activate the contactor that controls the vacuum pump.

The connections are all done via the connections of terminals P1, P2 and P3 jacks. These jacks are spring-loaded and can accept only a single wire. Terminals P2 and P3 are thus redundant in order to not allow connection of more than one wire in the same jack.



FM-061H-2-9A

Figure 2 - Wiring diagrams