



**FirePro.**

# Guideline

## Fire Extinguishing System Design and Operation

12 March 2013



Reinventing  
**Fire Suppression**

12 March 2013

Dear Distributor/Master Dealer,

## RE: Fire Extinguishing System Solutions Guidelines

When designing a fire extinguishing system, you must always ask yourself:

*Is this fire extinguishing system, certified as a complete integrated UL listed system?*

Like our FirePro system, where the aerosol generators, extinguishing panel, and sequential activator are UL listed independently and certified as an integrated system.

Please find below some information expanding your knowledge on fire extinguishing systems:

- B) Information why Kentec-FirePro SigmaXT panel is suitable for activating aerosol generators compared with other extinguishing panels.

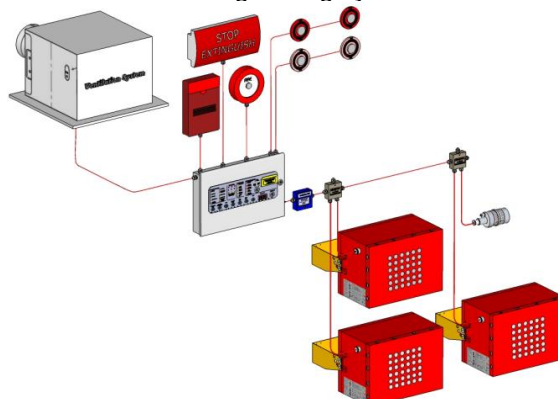
### A) General information when designing an extinguishing system:

I cannot judge the design and the capability of other electronic systems manufacturers to actuate the aerosol generators, since I have not tested such electronic system, but I would like to inform you the following issues when designing simple/complex extinguishing system:

- 1) When designing an extinguishing system for the protection of an area, you should follow the international standards. In this case the Authority having jurisdiction will accept the system design proposed, since you will provide them with the relevant certificate/listing.
- 2) The electronic management system should be certified by an accredited body.
- 3) Further to the electronic management system, any other electronic system interfaced to it for the extinguishing protection in separate rooms should also be certified according to the International standards such as UL864/ EN12094 related to conventional extinguishing systems.
- 4) The equipment's that shall be used, in order to comply with the standards' requirements, (such as Extinguishing Panel, Aerosol Generators and any other module), should be certified as an integrated system by an international accredited laboratory, to ensure the compatibility of all its components. Please find attached our certification from UL. The aerosol generators, panel, and sequential activator are UL listed, independently and certified as an integrated system as well.

If your installed system is not certified as an integrated system then you are not complying with the standards. This may lead to system functionality problems and non-acceptance by the local authorities. As a result this may lead to an unsuccessful extinguishing.

- 5) The correct design of the conventional fire extinguishing system should be as follow.



### Extinguishing System Operation

-The extinguishing panel will reach **Stage1 (ALARM)** when one of the two detection zones (1 or 2) is activated. The bell is in alarm mode.

*Note: The extinguishing panel informs about the possibility of the presence of a fire. The auto-dialer is activated.*

The extinguishing panel will reach **Stage2 (ALARM)** when the second detection zone (1 or 2) is activated. The second siren with flashing light is in alarm mode.

*Note: The system confirms the presence of the fire and informs the personnel:*

*(1) Evacuate the protected area.*

*(2) The system will proceed to the extinguishing mode after a preset period (time delay).*

*(3) Nobody is allowed to enter the protected area during the activation.*

-After the preset time expires the extinguishing panel activates the aerosol generators.

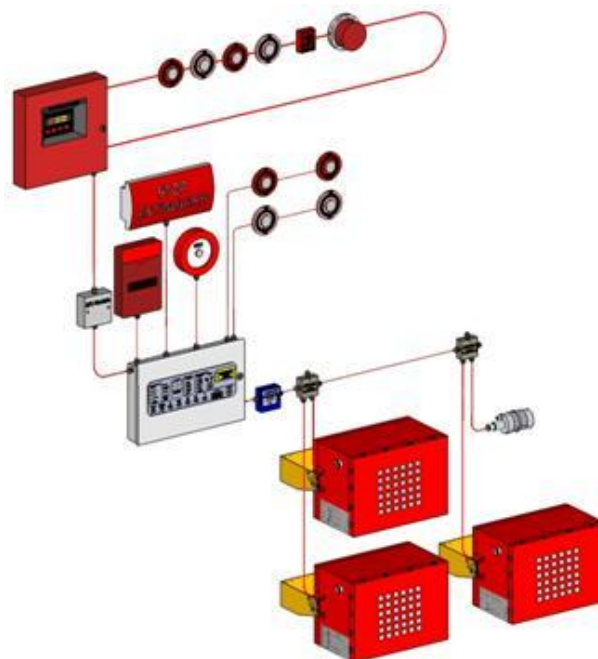
The system can be manually activated by pressing the **Yellow Manual Activation Switch**. This is applicable when the fire is present or at early stage but the system is not automatically activated yet. The extinguishing mode can be manually disabled by pressing the **Blue System Isolation Switch**. This can be used to stop the activation of the system in case of false detection or during events such as system maintenance, visiting the extinguishing area etc.

- 6) In case that you have multiple rooms to protect from fire then you have to install one certified conventional extinguishing system in each protected area. If you want to interface all conventional systems under an existing or new addressable management system, then you can achieve that by interfacing all conventional systems with the addressable system (by the use of input / output modules).

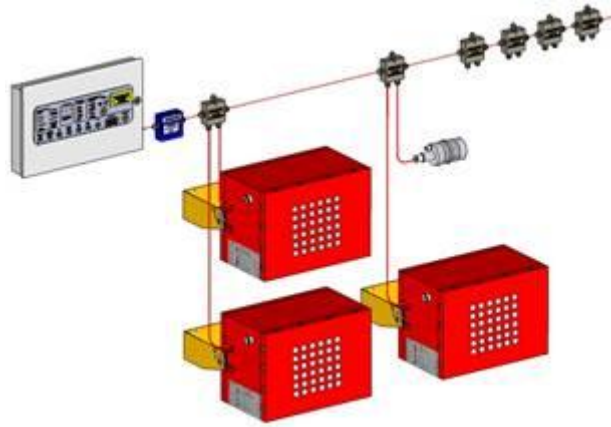
In this way the conventional extinguishing systems (certified) and the addressable management system (certified) are complying with the international standards.

Additionally in case of a fault at the addressable management system, the conventional extinguishing systems are still providing protection to each protected area, since they are independent.

Below you can find a schematic drawing how to interface the conventional extinguishing systems with the addressable management system.







Additionally you must be able to continuously monitor the extinguishing line and aerosol generators line to know if they are faulty or in good working order. By the use of Sequential Activators you can do both.

### How do Sequential Activators operate?

When the extinguishing panel wants to activate the aerosol generators, it sends a power signal to the extinguishing zone.

The first sequential activator will activate the first two aerosol generators.

After 2 seconds, power will pass to the second sequential activator in order to activate its own aerosol generators.

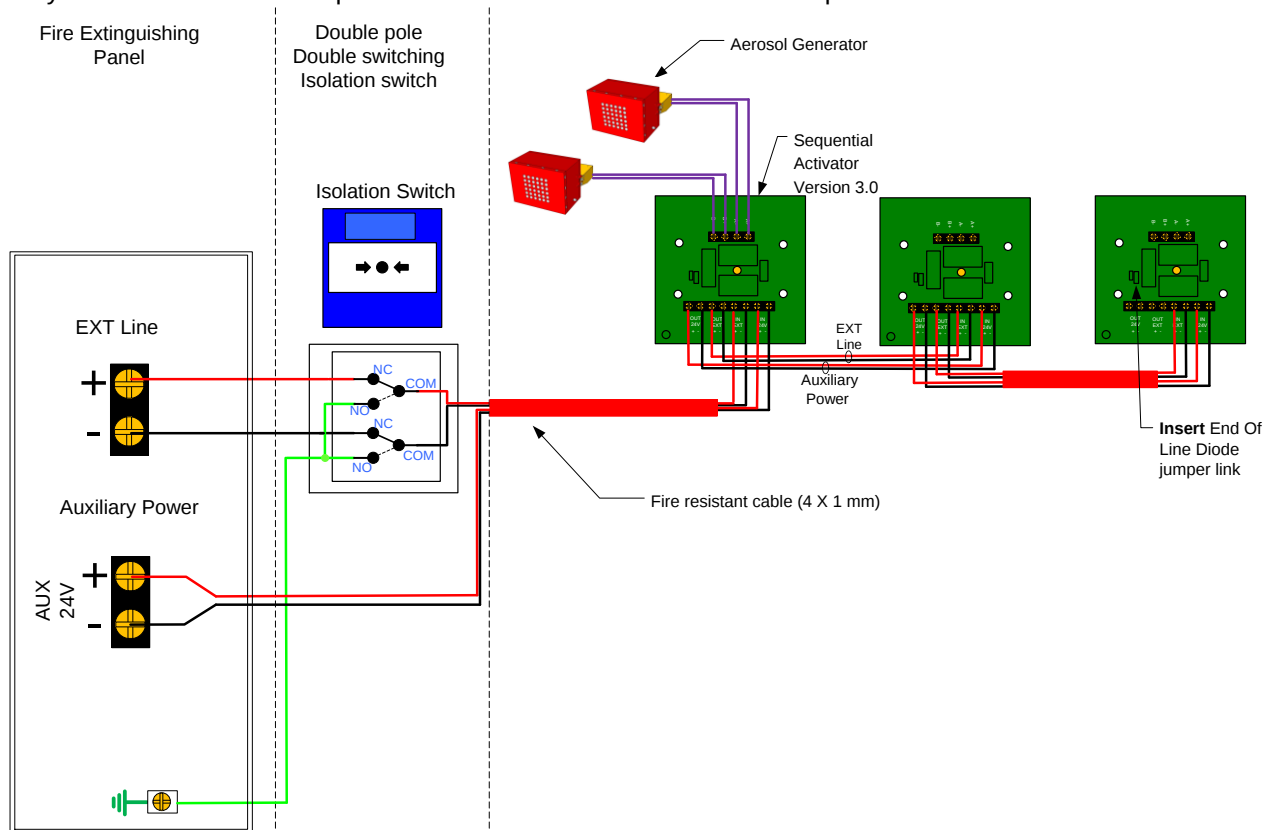
After 2 seconds, power will pass to the third sequential activator in order to activate its own aerosol generators etc.....

As a result, the amperes (A) needed to be drawn from the extinguishing zone is always 0.8 (A) either if you use 1 or 20 sequential activators.

According to the NFPA 2010 standard the discharge time allowed for aerosol extinguishing systems is one minute max. This enables us to connect up to 20 Sequential Activators.

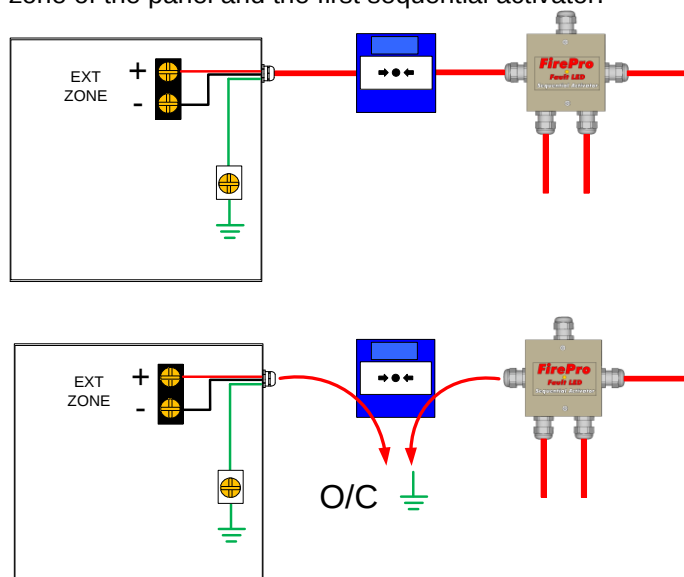
In each sequential activator you can connect 2 aerosol generators. If you use 20 sequential activators (maximum allowed) then 40 aerosol generators in total can be used in a system.

Below you can see how the sequential activators are connected with the panel.



## Why we need System Isolation Switch?

According to the standards we must install a System Isolation Switch (abort button - Blue color). It is connected between the Extinguishing zone of the panel and the first sequential activator.



By pressing the abort button the extinguish zone from the panel is opened. The extinguishing zone from the sequential activators is connected down to earth. The extinguishing panel detects it as a fault. An audible and visible fault indication is initiated over the extinguishing panel (Flooding zone Fault).

Notifier has an equivalent extinguishing panel the Notifier-RP1R.

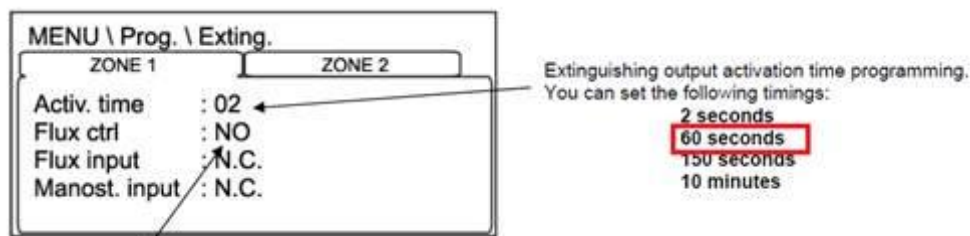
### 3) Notifier conventional extinguishing panel “RP1R” as a comparing example

In each room where FirePro extinguishing system is required, a Notifier extinguishing panel “RP1R” shall be installed together with the FirePro aerosol generators fitted with the sequential activator modules. The newly developed sequential activator module is now designed with LED indications status, therefore any fault can be easily identified.

Three parameters are important connecting sequential activators over the Notifier extinguishing panel “RP1R”:

#### A. Extinguishant output “Activation Time”.

A minimum of 1 minute activation time is necessary. The Notifier panel “RP1R” is capable to do that according to page 10 of the manual.



#### B. Extinguishant output “reverse polarity”

Reverse polarity is necessary for the sequential activators in order to activate. According to the manual, pages 10,27 reverse polarity is applicable.

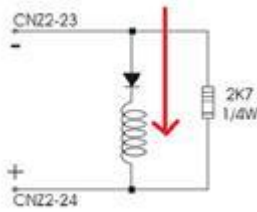
#### Page 10

##### EXTINGUISHING OUTPUT

This output is controlled by and “End-Of-Line” 2,7KΩ-1/4W resistor.  
This output is managed in “release condition”.  
Furthermore, this output can be excluded from programming.

**N.B. When sounder output is active, polarity is inverted on the corresponding terminals.**

The coil is activated only in the direction indicated in red color below. The diode allowing only positive power to pass through in the direction of the arrow (red color) below. This can be achieved only by reverse polarity.



**C. Extinguishant release output “ampers.”**

The output must be capable to handle 1 (A) load.

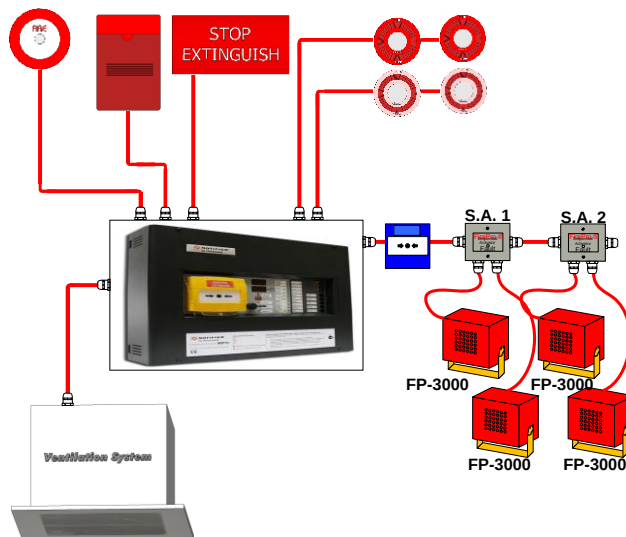
This is not clear in the manual.

The output fuse of the Notifier panel “RP1R” is only 0.65A.

This is a problem.

Must be tested.

If the panel can handle 1(A) load, then you can use the sequential activators with the Notifier panel “RP1R”.

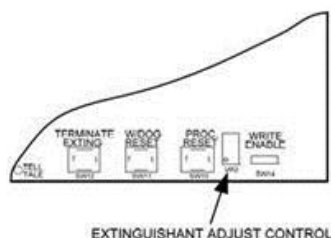


**D. Number of Sequential Activators that can be used.**

When the number of Sequential Activators connected to the extinguishing output line is close to 20 (the maximum) the threshold monitoring voltage of the extinguishing panel is unstable and it is detected as a fault by the panel. In order to overcome this a small circuit is added to the Kentec-FirePro SigmaXT panel in order to correct it.

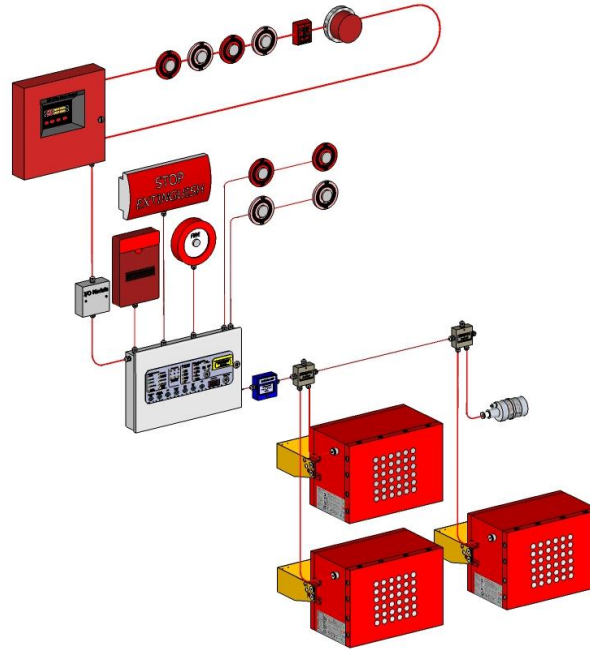
**Something that the Notifier panel “RP1R” and other panels do not support.**

Is good to connect some Sequential Activators with the **RP1R** panel in order to find the exact number of sequential activators / aerosol generators that can be used.



#### (4) How to use Addressable panel.

See below comments and schematic diagram, explaining how to install an addressable system with standalone conventional extinguishing panels.



- A. In each protected area where FirePro extinguishing system is required, extinguishing panel (Kentec-FirePro Sigma XT) shall be installed together with the FirePro generators fitted with the sequential activators modules.

The extinguishing panel in each protected area will provide the required power supply (and back-up power), which may not be enough by using only the addressable panel.

**Note:** External power supplies cannot be used according to the international Standards.

Furthermore the extinguishing panel can be used as a remote local indication panel for problems such as zones, extinguish line, power supply failure, battery status etc.

- B. Conventional Smoke and Heat detectors must be installed over the conventional extinguishing panel for each protected area.
- C. Addressable Input / Output modules must be installed such that, will report to the addressable panel.
- D. Isolation switch must be installed in each protected area such that by activation, all the extinguishing lines must be isolated and connected to earth due to the regulations.

Please consider the above points when you are designing fire extinguishing systems.

For more information or clarifications please do not hesitate to contact me.

Kindest regards  
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Technical Manager



**FirePro.**

**FirePro Systems**

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