



# Consultant Specification

**Scope of work:**

To design, supply, install and commission a Gas Extinguishing Control System in accordance with the details specified herein and in accordance with supplied drawings

## Introduction

The system shall include all materials, equipment and wiring required to install the complete Extinguishing Control System. The system shall include but not be limited to a single area conventional extinguishing control panel (hereafter known as FACP) with integral power supply, manual release devices and remote status indicators as required, sensors, solenoid/actuator release devices, hold/abort switches, audible and visual indication and all accessories to provide a complete system.

The system components shall be freely available from a number of sources, (i.e. not a closed protocol system), and shall support conventional devices from various manufacturers. A selection of supported manufacturers can be found below:

- 1) Apollo
- 2) Argus Vega
- 3) Hochiki
- 4) Nittan

The installation shall include the laying of all cables required for connectivity of the Detection, Releasing Mechanisms, Alarm Indicating Equipment, and Power Supplies appropriate to the design. All cabling shall conform to the requirements and recommendations of the control equipment manufacturer. Any openings / chasings in walls, ceilings or floors shall be made good.

The system shall be designed in such a manner, that no more than 90% of the available detection circuit capacity is employed in order to allow for future expansion.

Normative references:

EN54-1:2011	Introduction
EN54-2:1997 +A1:2006	Control and Indicating Equipment
EN54-3:2001 +A1:2002 +A2:2006	Audible Alarm Devices
EN54-4:1997 +A1:2002 +A2:2006	Power Supply Equipment
EN54-5:2000 +A1:2002	Heat Detectors – Point Detectors
EN54-7:2000 +A1:2002 +A2:2006	Smoke Detectors – Point Detectors
EN54-11:2001 +A1:2005	Manual Call Points
EN54-13:2005	Compatibility Assessment of System Components
EN54-17:2005	Short Circuit Isolators
EN54-18:2005	Input / Output Devices
EN54-23:2010	Visual Alarm Devices
EN54-25:2008	Components using Radio Links
EN12094-1:2003	Electrical automatic control and delay devices
EN12094-2:2003	Manual triggering devices
BS5839-1:2013	Code of practice

## Standards

The Extinguishing Control system shall be installed and commissioned in accordance with, and all elements shall meet the requirements of, BS5839-1 (Code of Practice for fire detection and fire alarm systems), BS7273-1 (Code of Practice for the operation of fire protection measures) and EN15004-1 (Fixed firefighting systems - Gas extinguishing systems - Design, installation and maintenance).

The responsible company should be able to demonstrate their competence to design, install and commission the system, e.g. by certification to BAFE SP203, LPS1014 or other relevant standard.

The equipment manufacturer shall operate a quality management system in accordance with ISO 9001. In addition, the equipment shall be manufactured under a recognised factory control procedure such as BSI Kitemark or the Vertrauen durch Sicherheit (VDS) scheme.

All detection devices shall be independently certified as complying with the relevant EN54 standard.

The Fire Alarm Control Panel shall be independently certified as complying with the requirements of EN12094-1, EN54-2, EN54-4 and EN54-13. The Independent approvals body shall be the British Standards Institute (BSI) or Vertrauen durch Sicherheit (VdS).

In addition to the basic requirements of EN54, the Fire Alarm Control Panel shall offer the following EN54 optional features with requirements:

Optional Functions:	EN54-2 Clause
Outputs -Outputs to fire alarm devices	7.8
Alarm Counter	7.13
Test condition	10
Power Supply Equipment Functions:	EN54-4 Clause
Operation from a main power supply	5.1
Operation from a standby battery	5.2
Monitor and charge the standby battery	5.3
Recognise and notify supply faults	5.4
Compatibility of system components	EN54-13 Clause
Basic System Requirements	4.2
Components	4.4
Transmission Path	4.5
Input and Output Devices linked to fire protection systems	4.6

In addition to the basic requirements of EN12094-1, the Extinguishing Control Device shall offer, as a minimum, the following optional features with requirements:

Optional Functions:	EN12094-1 Clause
Delay of extinguishing signal	4.17
Monitor Flow of Extinguishing Agent	4.18
Monitoring of status of components	4.19
Emergency Hold Device	4.20
Control of flooding time: 0 – 1800s	4.21
Manual Only Mode	4.23
Triggering Signals to Equipment within the System	4.24
Triggering Signals to Equipment outside the System	4.26

Emergency Abort Device	4.27
Activation of Alarm Devices with Different Signals	4.30

## Functional Description

### Panel Features

The Fire Alarm and Extinguishing Control Panel (FACP) shall be the central controller of the complete system. It shall receive and process information from the detection and/or manual release devices and provide audible and visual indication of alarm and other conditions to the user. It shall automatically or manually initiate alarm response sequences and provide an on-board user interface for interrogation and user programming of the system.

The FACP shall provide a user interface from which; controls can be operated, manual operations can be carried out, indications are audible and/or visible, and system information can be obtained. It shall also be capable of unambiguously indicating the following functional conditions: Quiescent condition, Fire Alarm condition, Fault warning condition, and Disablement condition. Furthermore, the Fire Alarm and Extinguishing release condition shall always be capable of clearly being indicated without any prior manual intervention at the FACP.

The FACP shall be easy to configure and all basic operating characteristics should be programmable through the user interface on the FACP in order to satisfy the detection zone and output mapping of the premises.

Updates to the FACP operating software shall be simple to undertake and should not require the use of replaceable components. The operating program and configuration memory shall be stored in non-volatile memory, and shall not rely on batteries for retention. The FACP shall incorporate a single microprocessor to control the operation of the detection, signalling, releasing and central processing functionality.

A PC tool operating under the Windows™ operating system shall be available to retrieve configuration settings and logs from the control equipment.

The FACP shall support up to 32 conventional devices per zone input.

The FACP shall provide a facility to enable a simple configuration of the actuator circuit (auto-learn) for either solenoid type or metron type actuators for the controlled release of the extinguishing agent. The circuit shall not require any special configuration or adjustment set-up.

For solenoid type actuator circuits, the FACP shall support solenoids with coil resistances of between 25-200Ω.

The FACP shall provide 3 outputs to fire alarm devices each rated at 1A. An auxiliary supply output shall also be available to provide power for internal option modules.

The FACP shall incorporate a real-time clock and an event log capable of recording the history, and time stamping of the last 500 events.

All fault conditions (except CPU System Fault) shall be non-latching.

It shall be possible to configure cause and effect operation for evacuation, and output control operations at the panel. It shall be possible to assign outputs on a 1<sup>st</sup>, or 2<sup>nd</sup> stage basis.

Other key features that shall be provided are:

- Menu driven programming
- Status Change from Automatic to Manual (or optional key switch operation)
- Pass-code for level 2 access (or optional key switch operation)
- Company Logo/Contact Information displayed during normal conditions
- Configurable duty cycle for pulsing alarm-device outputs – these must be independently configurable for two types of 'Alert' pulsing modes and one 'Hold' pulsing mode.

## Panel Construction

The Fire Alarm Control Panel shall be of metal construction. It shall be capable of surface or semi-flush mounting. Sufficient 20mm knockouts shall be provided to accommodate all likely wiring requirements.

The housing shall meet IP30 minimum ingress protection classification. It shall not be possible to open the enclosure without a key or special tool.

## Panel Indications

The Fire Alarm Control Panel shall be equipped with a graphics liquid crystal display (124 x 64 pixels) as the primary indicator giving at least 6-lines of information. The display shall incorporate an LED backlight that will illuminate upon any event (excluding mains failure) or button press.

The primary display shall incorporate a large on-screen countdown timer for clear visibility of the remaining time before the release of the extinguishing agent. It will also be capable of simultaneously indicating the presence of Fire Alarms, Faults, Disablements and Tests conditions.

In addition, the following minimum LED indicators shall be provided in accordance with the requirements of EN54-2 and EN12094-1:

**Indications:**

- Fire
- Fault
- Disable
- Test
- Power
- Silence
- Sounder Fault
- Sounder Disabled
- Sounder Delayed
- System Fault
- Detection Zones Fire (x3)
- Detection Zones Fault/Test/Disablement (x3)
- Release Imminent
- Released
- Timer Held
- Aborted
- Disabled
- Common Fault
- Manual Disabled
- Valve Closed
- Manual Only
- Auto/Manual Mode

## Panel Controls

The FACP shall be provided with the following minimum manual controls:

- Reset
- Mute Buzzer
- Silence
- Sound / Resound Alarms

In addition, the following controls shall be provided for menu operation and programming:

- Navigation keys, ←→↑↓
- A confirmation key, ✓
- A numeric keypad, 0-9, also providing the function for letter / character programming
- Escape key
- Menu select key

## Manual Release

An integral electrical triggering devices shall be incorporated that has been independently assessed as meeting the requirements of EN12094-3:2003.

## Software

A PC Configuration Tool shall be available for retrieval of the CIE configuration data, and Event Log contents.

The PC Configuration Tool shall be graphically based and operate under Windows™ operating systems XP, Vista, Windows7, and use USB technology as a means of communication.

## Configuration

It shall be possible to configure ALL configuration parameters, and settings, from the CIE panel.

## Remote Status Indicators

It should be possible to provide remote control and indication of panel functions via 'Remote Status Indicators'. Such devices should be strategically placed throughout the building to provide limited functionality and control of the FACP.

The Remote Status Indicators should communicate with the main FACP via an RS485 secure network, and the FACP should allow a minimum of seven devices to be connected. They should have the facility to replicate information from the FACP via a Graphical/Alphanumeric LCD display.

Remote Status Indicators should have the following LED indications and control functionality:

**Indications:**

- Release Imminent
- Released
- Timer Held
- Aborted
- Disabled
- Common Fault
- Fire Zones 1, 2, 3
- Manual Only Mode
- Auto/Manual Mode
- System Fault

**Controls:**

- Navigation keys, ↑↓
- A confirmation key, ✓

In addition, it should be possible to remotely select between Auto / Manual modes of operation for Extinguishing release purposes.

## Power Supplies

All power supplies (integral to the fire alarm control panel or remote) shall be independently certified to EN54-4: 1997 and shall be capable of supporting 24 hour standby requirements.

All power supplies shall be capable of operating from a main supply of 200-240VAC 50/60Hz.

## Additional System Components

The following additional system components shall be provided as optional equipment.

- RSI - Remote Status Indicators for remote control of FACP
- Hold Switch mechanism - Providing emergency HOLD operation of the Extinguishing release
- Abort Switch mechanism - Providing emergency ABORT operation of the Extinguishing release
- 8way Relay Card - Providing 8 additional programmable Relay outputs
- AEOL - Active End Of Line monitoring devices for detection circuits

## **Apollo Detectors and Devices**

The system shall be compatible with, and support Apollo's conventional detection device.

*(Complete or omit this section as required)*

## **Hochiki Detectors and Devices**

The system shall be compatible with, and support Hochiki's conventional detection device.

*(Complete or omit this section as required)*

## **Argus Vega Detectors and Devices**

The system shall be compatible with, and support the Argus Vega conventional detection devices.

*(Complete or omit this section as required)*

## **Nittan Detectors and Devices**

The system shall be compatible with, and support Nittan's conventional detection devices.

*(Complete or omit this section as required)*



**Email:** [enquiries@advancedco.com](mailto:enquiries@advancedco.com)  
**Web:** [www.advancedco.com](http://www.advancedco.com)

 @advancedlive

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