Protec

Protec Fire Detection plc

Fixed Fire Suppression Solutions

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FIXED FIRE SUPPRERSSION SOLUTIONS

Protec Fire Detection plc, a major independent British company, is amongst the leaders in the design of Fire Safety Systems.

The company's success is built upon a total commitment to quality and customer service with an unrivalled range of quality products.

The selection of appropriate fire protection measures requires an experienced approach. Protec design systems taking into account specific risk, client and insurers' needs. The range of possible solutions to any given risk includes the choice of chemical or inert suppression agent, pressure relief, extraction, suppression release control and early warning detection systems. The design must be verified through approved calculations based on type testing in accordance with the international standards and the requirements of LPC, FM or UL.

Supply & Installation

Protec can provide solutions to these requirements. The services provided are based on a technical, cost effective and impartial approach and include:

- Design, Supply, Installation, Commissioning & Maintenance of Fixed Suppression Equipment
- Specialist Suppression Systems
- Chemical & Inert Suppression Agents
- Carbon Dioxide Fire Suppression Systems
- Water Mist Fire Suppression Systems
- Dry Chemical and Particulate Aerosol
- Wet Chemical Fire Suppression Systems
- Foam Suppression Systems
- Incipient Fire and High Sensitivity Smoke Detection Systems
- Halon Removal and Disposal
- Room Integrity Testing, Pressure Relief & Extraction
- Refilling Carbon Dioxide, Chemical & Inert Gases
- Service & Maintenance of mechanical systems, including stretch testing and optional discharge testing

The schematic diagram below shows a typical fixed gas suppression system.

The system consists of cylinders containing the gas agent, distributed pipe-work, and discharge nozzles. The nozzles are located to provide optimum coverage in the application of suppression in the voids and room space. Detection is provided by a point detection system and supplemented by an incipient fire detection system. The incipient fire detection system provides the earliest warning of the fire by detecting the smallest particles emitted when cable or equipment components overheat. This permits immediate action to locate the seat of the incipient fire and permit local power shutdown or use of portable extinguishers.

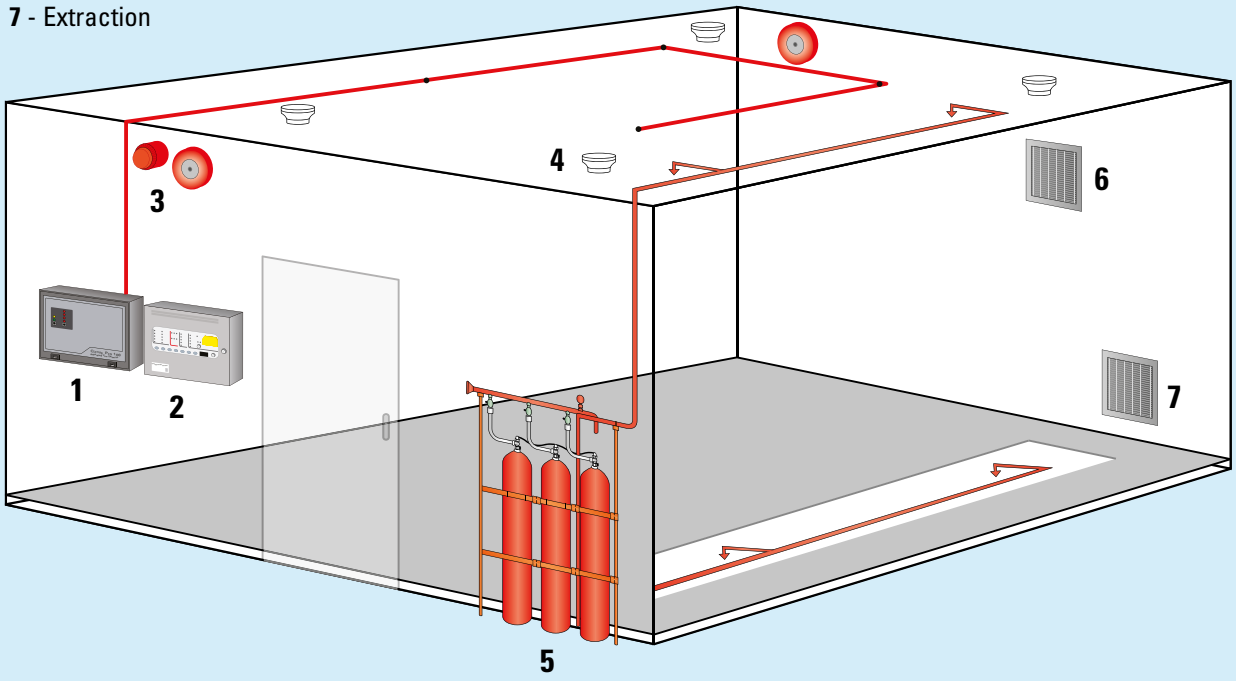
Should a fire grow very rapidly the point detection system will detect the fire. In accordance with the standards BS 6266, and to prevent unwanted discharge, the control panel will require two independent detection signals before suppression release is activated.

Upon receiving these signals the control panel will sound alarms and time-out to initiate a gas discharge. Dependent on the suppressionagent applied, pressure relief and/or extraction units may be required.

The protected risk must also be sealed to provide maximum integrity to retain the suppression design concentration for at least 10 minutes post-discharge. This can be checked through the use of a room integrity or fan test.

Typical Fixed Gas Extinguishing Systems

1 - High Sensitivity Aspirating Fire Detection
2 - Suppression Control Panel
3 - 1st & 2nd Stage Alarm Sounders
4 - Smoke Detection
5 - Extinguishing Agent Storage Cylinders
6 - Pressure Relief
7 - Extraction



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OBSOLETE, INERT, CHEMICAL & CARBON DIOXIDE FIRE SUPPRESSING AGENTS

Inert Suppression Agents

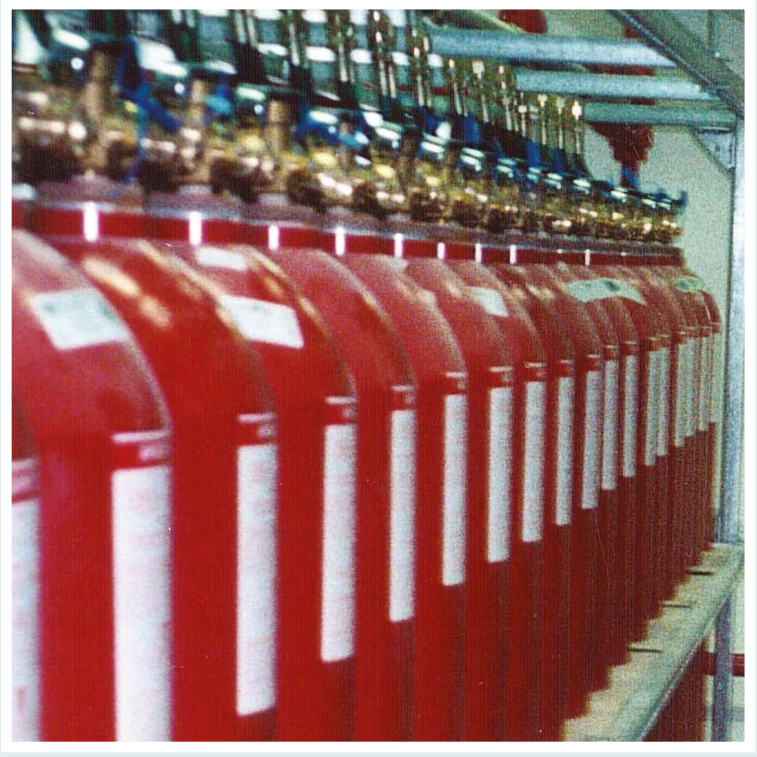
These agents are the most environmentally friendly gas extinguishing agents available. Inert gases extinguish a fire by removing the oxygen concentration below 14% such that the fire cannot be sustained. All inert gases are stored as a gas in cylinders at between 150 bar and 300 bar. The cylinders can be stored at distance from the application. Multiarea protection systems can also be used with inert gases. If more than one area within a building needs to be protected, a single inert gas system designed to extinguish a fire in the largest room can be used, with automatic valves directing the agent into the required area. Provided there is a low risk of more than one fire within the facility at any one time, this can provide cost and storage space. Most inert gas installations will require the provision of pressure relief. All inert agents supplied by Protec are suitable for use in occupied areas, subject to fire type and application.

Protec can provide inert gas systems based on an argon/nitrogen mix (IG-55), or on pure argon (IG-01). These systems require a nominal design concentration of 38% for a Class A surface fire, and 40% for fires within a computer room application. The No Observed Adverse Effect Level is 43% and Lowest Observed Adverse Effect Level is 52%, equivalent to residual oxygen concentrations of 12% and 10% respectively.

Chemical Suppression Agents

These agents are electrically non-conductive, colourless and odourless and leave no residue after discharge. They are stored as liquid, thus requiring minimal storage space and discharge as a gas at room temperature. Once discharged, chemical agents extinguish the fire rapidly (typically within 10 seconds) thus minimising damage to property and valuable equipment, and also providing personnel with immediate protection from risk. Chemical agents are effective on risks containing live electrical equipment such as computer rooms. They are suitable for use on both Class A fires that involve combustibles such as wood, paper and plastics, and Class B fires where liquids or liquefiable solids are present.

One of the most effective chemical agents is HFC-227ea this is known as hydrofluorocarbons, or HFCs. HFCs are similar to halon 1301 in their properties but do not deplete the ozone layer and are thus exempt from the restrictions imposed by the Montreal Protocol.



HFCs utilise a different mechanism to extinguish a fire. Halon 1301 extinguishes fires by both physically absorbing heat and chemically removing free radicals. HFCs act primarily by absorbing heat from a fire at the molecular level.

Protec can provide Novec 1230™ Fire Protection fluid systems. Novec 1230 fluid is a fluorinated ketone that is stored as a liquid and discharges as a gas. Novec 1230 distributes throughout the hazard zone and suppresses fire by a combination of heat absorption and chemical interface with the fire. Novec 1230 has a zero ozone depletion (ODP) and a global warming potential (GWP) of just one. Novec 1230™ has an atmospheric lifetime of just 5 days.

The properties of chemical and inert suppression agents used in total flood applications

	Inert Extinguishing Agents			Chemical Extinguishing Agents	
DESIGNATED NAME	IG-55	IG-01	IG-541	HFC-227ea	HFC-23
Trade name	Argonite	Argon	Inergen	FM-200/FE-227	FE-13
Type	Inert Gas	Inert Gas	Inert Gas	Halocarbon	Halocarbon
Ozone Depleting Substance	No	No	No	No	No
Greenhouse Effect	No	No	Yes	Yes	Yes
Design Concentration	38% - 41%	38% - 41%	38% - 41%	7.5%	16.5% - 18%
Extinguishing Mechanism	Reduction of Oxygen	Reduction of Oxygen	Reduction of Oxygen	Cooling at Molecular Level	Cooling at Molecular Level
Residual Oxygen Concentration	10% - 12%	10% - 12%	10% - 12%	20%	18%
No Observed Adverse Effect Level	43%	43%	43%	9%	50%
Lowest Observed Adverse Effect Level	52%	52%	52%	10.5%	>50%
Storage Pressure	Up to 300 bar	Up to 300 bar	Up to 300 bar	25 and 42 bar	42 bar
Cylinder Size (litres)	80	140	80	5 to 243	5 to 120
Discharge Time	60 Seconds	60 Seconds	60 Seconds	10 Seconds	10 Seconds
Pressure Relief Required	Yes	Yes	Yes	No	No
Location from Risk*	Up to 50m	Up to 50m	Up to 50m	Up to 10m	Up to 20m
Risk Volume:	**No. of Cylinders (footprint)**				
50m³	2 (0.23m²)	1 (0.17m²)	1 (0.23m²)	1 (0.12m²)	1 (0.16m²)
100m³	3 (0.36m²)	2 (0.4m²)	3 (0.34m²)	1 (0.12m²)	1 (0.16m²)
250m³	8 (0.98m²)	5 (0.89m²)	8 (0.91m²)	1 (0.16m²)	2 (0.44m²)
400m³	13 (1.51m²)	7 (1.22m²)	12 (1.27m²)	1 (0.32m²)	4 (0.78m²)
550m³	18 (1.95m²)	10 (1.71m²)	17 (1.9m²)	2 (0.65m²)	5 (0.94m²)
1,000m³	33 (4m²)	18 (3.09m²)	30 (3.7m²)	3 (0.97m²)	8 (1.43m²)

* Dependant on design configuration. Values are in accordance with the standard BS EN 15004 (2008).
All agents supplied by Protec Fire Detection plc are suitable for use in occupied areas.

Obsolete Fire Suppression Agents

Under European Regulation there are a number of obsolete fire suppression agents that cannot be refilled. These agents include Halon, NAF SIII and PFC's. The majority of Industrial and commercial users must comply with the legislation (critical use is largely restricted to military and aviation applications). The movement and disposal is strictly controlled and only suitably qualified engineers must undertake the removal and specialist care must be taken in the transportation and processing.

Protec has the experience and expertise to remove any of the absolete agents and to process it.

Carbon Dioxide

This is a cost-effective extinguishing agent used for a variety of total flood applications that are normally unoccupied. Carbon dioxide is stored as a liquefied gas at 58 bar and extinguishes a fire by reducing the oxygen level below that required for combustion.

Carbon dioxide may be used also in the local application of fire extinguishant used as a means for protecting machinery, printing presses and similar equipment within open spaces that are normally occupied.

Protec can provide complete extinguishing solutions for both total flood and local application carbon dioxide systems.

Foam Systems

Foam Systems are used for a variety of applications in the protection of liquid fuel Class B fires. Foam is mixed with a flow of water in 3% or 6% solution via a proportioner. Air is added to the foam/water solution to produce the foam extinguishing agent as low, medium or high expansion.

Low expansion foam is used for the application of 2-dimensional fires and is applied using long-throw devices (such as monitors on fire-fighting vehicles and ships) in applications where distance and spread are more important. Medium expansion foam is applied where depth coverage is required, for example in the protection of bunds around tank farms. High expansion foam is used for the rapid filling of large volumes such as warehouses and hangers.

Protec can provide the most suitable foam equipment for the application, and a variety of foam compounds including AFFF, fluoroprotein and alcohol-resistant foam-types.

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ANCILLARY EQUIPMENT

WET AND DRY CHEMICAL

WATER MIST

High Sensitivity Aspirating Fire Detection Panel

Pressure Relief

Extinguishing Release Panel

Protec are able to provide a complete fire suppression system that includes pressure relief, extraction, room integrity testing and if required extinguishing release, detection and control

Pressure Relief

Pressure relief is required so that no overpressures develop within the protected enclosure that could damage the structure. Pressure relief is also required to ensure that the correct design concentration of inert gases is achieved.

Extraction

Gas extinguishing systems should be provided with means of suitable extraction to remove any toxic by-products of decombustion, and traces of discharged chemical agent or carbon dioxide.

Detection

Often an incipient fire can be detected and controlled without the need for a full extinguishant discharge. High sensitivity smoke detection equipment provides this level of protection allowing equipment to be manually or automatically controlled and small fires to be contained with portable fire fighting equipment.

Protec can provide high sensitivity smoke detection and aspirating system.

Room Integrity Testing

For an extinguishing system to work it is vital that the protected space has passed a room integrity test. This test mimics a full system discharge and is required at installation, after any works that have bridged the integrity or yearly in accordance with the current standards.

System Maintenance

Fixed extinguishing systems need to be maintained din accordance with current standards to ensure that they will perform to specification. Protec are qualified to carry out full maintenance on all types of fixed Extinguishing systems. Services include liquid level indicating; stretch testing of cylinders; and refilling of discharged systems.

LPS 1014 - Certified Fire Detection and Alarm System Firm Certificate No. CFA-132

LPS 1204 Certificated Fixed System Installer Certificate Number CFSI-015

Specialist Applications

Dry Chemical

These systems are based on potassium or sodium-based powder. The powder provides a rapid knockdown of flames and is effective on all classes of fires.

Protec can supply dry chemical systems that consist of a cylinder, pipe work and nozzles, or alternatively modular systems based on a particulate aerosol generator. This is a new type of extinguishing system that contains the extinguishant in aerosol form, contained within a small canister generator. Discharge of the generator is achieved by thermal or electric activation to cause a pyrotechnic reaction within the canister. The aerosol is propelled forward through a coolant to form an aerosol cloud throughout the protected space. The fire is extinguished through a combination of chemical inhibition of the flame reaction, cooling and reduction in radiation transfer.

Particulate aerosols are particularly effective for the protection of engine compartments, machinery spaces, switchgear, and telecommunication equipment. The small modular nature of the system means that no interconnecting pipe work is required.

Wet Chemical

Wet Chemical Systems provide a fast knockdown of high temperature cooking-oil fires. On contact with cooking oil the wet chemical seals the fuel surface and provides rapid cooling to prevent re-ignition.

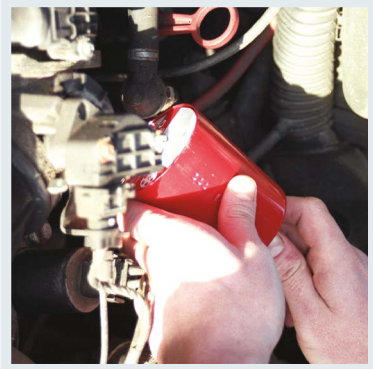
Protec supply kitchen hood protection systems that use a wet chemical extinguishant. These are used in restaurants, fast food outlets and other cooking oil processes. The system consists of a cylinder containing the wet chemical agent, pipe work, nozzles and a heat detection system. The nozzles are arranged to protect the main risk areas, including the surface area of the process beneath the hood and the extraction ductwork.

Water Mist Fire Suppression Systems

Water Mist Fire Suppression Systems discharge water in the form of small droplets. It is an extremely effective fire extinguisher particularly on flaming fires. Water Mist systems extinguish fire by using a number of different mechanisms, cooling or heat absorption from a flame, oxygen dilution, absorption of radiated heat and by chemical inhibition of the flame radicals. Water Mist is effective on Class A and Class B surface fires. Water Mist can be used as type approved systems for machinery spaces, engine test cells, turbine protection and prison cells.

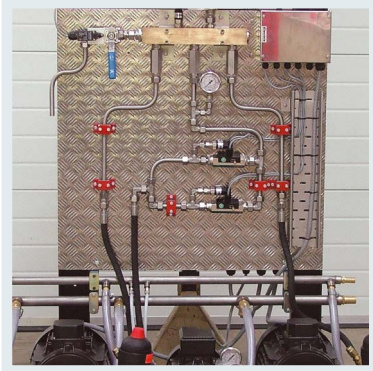
Protec can offer high pressure single fluid systems which can be configured as a cylinder or pump skid system.

Wet Chemical System



Particulate Aerosol

Water Mist System



Water Mist System

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EXT301 CONTROL PANEL

Designed and manufactured to the highest standards in a quality controlled environment and with European EN12094-1 approvals, the extinguishant releasing panel offers outstanding value and perormance for all small to medium fixed firefighting installations.

With three detection zones as standard, extinguishant release can be configured to activate from any combination of detection zone inputs to allow (among other combinations) any two from three type activations such as would be required for detection in ceiling void, room and floor void applications.

The extensive configurtion options of the panel allow the functionality of the system to be extensively modified while still complying with the requirements of the controlling standard for the equipment (EN12094-01)

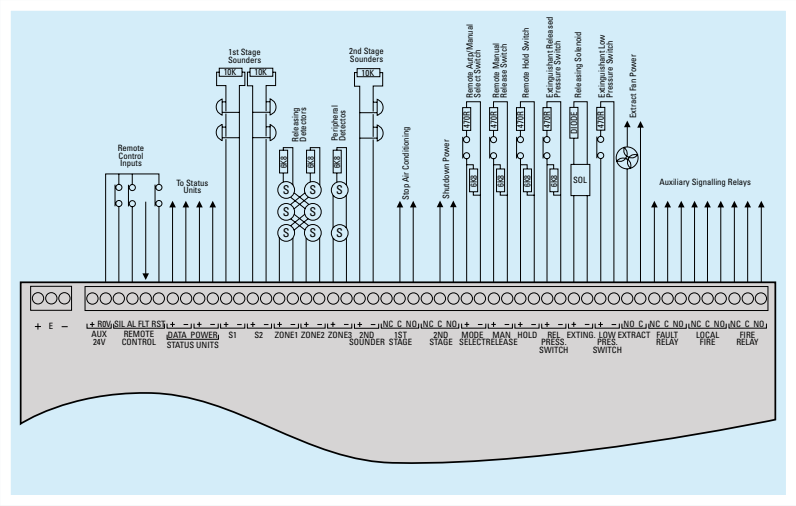
The panel contains a large LED display to enable easy configuration and control which also displays the time remaining until extinguishant relese for added user safety.

The countdown timer is duplicated on up to seven remote status units to provide local indication of the extinguishant system status.

With all of the electronics mounted on a single, easily removable, steel plate panels are both robust and easy to install.

Technical Specification

Size (surface)	385W x 310H x 90D (mm)
Size (flush)	415W x 315H x 90D (mm)
Mains supply	230V AC +10%/-15% (100 Watts maximum)
Mains supply fuse	1.6 Amp (F1.6A L250V)
Power supply rating	3 Amps total inc battery charge 28V +/- 2V
Panel in current mains fail	0.095A (Quiescent)
R0V output	Fused at 500mA with electronic fuse
Sounder outputs	24V Fused at 500mA with electronic fuse
Fault relay contact rating	30VDC 1A Amp max
Fire relay contact rating	30VDC 1A Amp max
Lcl fire relay contact rating	30VDC 1A Amp max
First stage contact rating	30VDC 1A Amp max
Second stage contact rating	30VDC 1A Amp max
Extract contact rating	30VDC 1A Amp max
Zone quiescent current	2mA maximum
Detection circuit EOL	6K8 5% 1/2 Watt resistor
Monitored input EOL	6K8 5%1/2 Watt resistor
Sounder circuit EOL	10K 5% 1/4 Watt resistor
Extinguishant output EOL	1N4004 Diode
No. of detection circuits	3
No. of sounder circuits	2 x 1st Stage, 1 2nd Stage
Ext release output	Fused at 1 Amp
Ext release delay	Adjustable 0 to 60 Secs
Ext release duration	Adjustable 60 to 300 Secs
Status unit	Two wire RS485 connection
Status unit power output	Fused at 500mA with Fuse



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