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# **Project Technical Specification**



# QCS 2014

Section 23: Fire Fighting and Fire Alarm Systems Part 03: Analogue Addressable Fire Alarm System







Section 23: Fire Fighting and Fire Alarm Systems

# 1 **GENERAL**

### 1.1 INTRODUCTION

#### 1.1.1 Scope

1 This Section specifies the requirements for fire fighting systems, fire alarm systems and fire protection systems.

#### 1.1.2 General

- 1 The Clauses in this Specification and all other information provided in the Project Documentation shall be considered to be a minimum requirement for performance and quality.
- 2 All electrical and electronic equipment shall be designed, manufactured, erected and tested to the International Electrotechnical Commission (IEC) standards.

### 1.2 REGULATIONS

#### 1.2.1 Electrical Installations

- 1 All electrical installations shall comply with all the relevant provisions of the regulations of the following:
- 2 Qatar General Electricity & Water Corporation
- 3 Institution of Electrical Engineers.

#### 1.2.2 Civil Defence Department

- 1 The entire fire alarm system, fire protection system and fire fighting system including all materials, components, equipment and accessories and their installation shall conform to the requirements of the Civil Defence Department of the Ministry of Interior, State of Qatar. Particular attention should be made with respect to the time required by the Civil Defence Department for approval of schematic and wiring diagrams, layout diagrams etc.
- 2 The fire alarm system contractor shall be registered with, and on the approved list of, the Civil Defence Department.







Section 23: Fire Fighting and Fire Alarm Systems

# 2 FIRE ALARM AND DETECTION SYSTEMS

### 2.1 GENERAL

#### 2.1.1 Scope

1 This part specifies the requirements for the material, installation, testing and commissioning of fire alarm and detection systems for use within buildings. It covers all the system components for efficient operation.

#### 2.1.2 References

1 The following standards and references are referred to in this Part:

BS 5445	Components of automatic fire detection systems
BS 5839	Fire detection and alarm systems for building
BS 5306	Fire extinguishing installations and equipment on premises
BS 6360	Conductors in insulated cables and cords

#### 2.1.3 Contractor's Responsibility

1 The Contractor shall arrange for an approved sub-contractor, to supply, install, wire and commission the complete manual/automatic fire alarm system comprising manual fire alarm call points, alarm bells and sounders, smoke and heat detectors optical smoke detectors, combined smoke and heat detectors, duct mounted smoke detectors, flame detectors, alarm heights (xenon beacon), remote indicating lights" and control panels as indicated on the drawings. The system shall be designed, installed and maintained in accordance with the recommendations of BS 5839.

#### 2.1.4 System Description

- 1 The Contractor shall provide and install the system in accordance with the Project Documentation, applicable codes and manufacturer<sup>s</sup> recommendations.
- 2 Fire alarm panels, repeater panels, detection components, alarm components, cables, other materials and their installation shall be approved by the Civil Defence Department, Ministry of Interior, State of Qatar.
- 3 The fire alarm system subcontractor shall be registered with, and on the approved contractors list of the Civil Defence Department.
- 4 The fire alarm and automatic detection systems shall meet the requirements and comply with the relevant British Standards and shall meet the requirements of National Fire Protection Association.
- 5 The system shall be suitable for 240 V, 1 phase, 50 Hz power supply and be complete with standby sealed lead acid gas-recombination type long life batteries and charger to provide a 24 V DC for detection and alarm system.
- 6 Where the installation extends beyond more than one building the system in each building shall be self-contained with visual and audible alarms. A common fire alarm and common fault signal from each system shall be displayed on the control room repeater panel.







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#### 2.1.5 Quality Assurance

1 Items and equipment specified in this part shall be provided by experienced and approved manufacturers and contractors as designated in the Project Documentation or to the written approval of the Engineer. All equipment shall be UL listed and shall be supplied from the same manufacturer who has a minimum of 10 years experience in the active manufacturing of fire alarm systems.

#### 2.2 CABLING

#### 2.2.1 General

- 1 The wiring size shall be not less than 1.5 mm<sup>2</sup> for call/detector circuits and 2.5 mm<sup>2</sup> for bell and battery circuits. The system shall be of the two wire type.
- 2 Cabling in fire alarm detection systems shall comply with the relevant provisions of BS 6883 and BS 5839.
- 3 In enclosed work areas and accommodation areas, zero halogen type cables shall be used.
- 1 Cables shall be able to withstand the IEC 331 gas flame test, enhanced to 3 hours at 950 °C.
- 4 Conductors shall be circular tinned wires complying with the relevant provisions of BS 6360, Class 2.
- 5 The Contractor shall provide and install the system in accordance with Project Documentation, applicable standards and manufacturer's recommendations. All wiring shall be in a conduit system which is separate from other building wiring. Junction boxes shall be sprayed red and levelled "Fire Alarm".

#### 2.2.2 Cables

1 Fire alarm cables shall be rated for 600/1000 V grade unless otherwise stated in the Project Documentation.

#### 2.2.3 Insulation

- 1 Fire alarm system cables shall have the following type of insulation as specified in the Project Documentation:
  - (a) pressure packed magnesium oxide insulation
  - (b) a composite insulation of mica impregnated glass tape beneath an extruded layer of ethylene propylene rubber (EPR)
  - (c) silicone rubber insulation.







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### 2.3 CONTROL PANEL

#### 2.3.1 General

- 1 The main fire alarm control panel shall be located in the main control room and shall be wall mounted. The fire alarm system shall protect all risk areas within the premises by giving warning of a fire condition when detected by an automatic detector or by the manual operation of a break glass call point. The risk area shall be divided into zones and each zone shall have its own fire indicator on the control unit. The control and indicating equipment, power supply unit and repeater panels shall comply with the electro-magnetic compatibility (EMC) test requirements described in BS 5839 and the Electronic Engineers Commission (EEC) requirements for the EMC directive 89/336/EU and the subsequent amendment 92/31/EU.
- 2 A diagram shall be provided adjacent to the control panel showing the general layout of the building and the fire zones. The diagram shall be engraved with black paint filling on a white ebonite sheet of thickness not less than 2 mm. The letter height shall be 5 mm. The diagram shall be coloured to show the extent of the area covered by each fire zone. A different colour shall be used for each zone.
- 3 Upon receipt of an alarm, the control units shall perform the following actions:
  - (a) illuminate fire zone detector
  - (b) activate alarm warning devices within the building
  - (c) operate internal fire sounder
  - (d) operate ancillary devices as appropriate
- Alarm warning devices shall be deactivated by operation of the "Silence Alarms" switch. The internal sounder will continue to operate and the fire indicators remain lit until the key switch controlled push switch is operated. This should only be achieved if the alarm initiating device is no longer in alarm.
- 5 Reset of the controller, after the fire incident has been investigated, will be achieved by operation of the "Reset" switch.
- 6 The fire alarm panel shall comply with BS 5839 Part 4 and requirements herein and be suitable for installation of fire detection and alarm systems to BS 5839 Part 1.

#### 2.3.2 Fabrication

- 1 The panel shall be of the multi-zone, modular type and capable of extension. The number of zones shall be related to the requirements of the individual buildings and shall be agreed with the Engineer. As a minimum, the fire alarm panel is to be wall mounted and suitable for 6 zones with all modules installed.
- 2 A lockable smoked glass door shall protect the face of the panel from access by unauthorised personnel.
- 3 The enclosures of panels shall be fabricated from sheet steel, minimum thickness 1.5 mm and shall be provided with a hinged lockable door. Protection to at least IP54 shall be provided.







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- 4 Control panels shall as a minimum requirement be equipped with the following:
  - (a) mains supply on indicator
  - (b) DC supply faulty indicator
  - (c) alarm indicator for each zone
  - (d) alarm accept push-button to acknowledge fire alarm signals, silence external audible alarms and energise an internal bleeper unit or sounder
  - (e) reset push-button to restore monitoring systems to the inactive condition
  - (f) integral sealed battery and trickle battery charger where appropriate
  - (g) alarm transmission facilities via the telephone alarm system (this facility shall be provided for future use if not utilised under this Contract)
  - (h) termination for incoming and outgoing wiring systems
  - (i) voltage free normally closed circuits which shall open in the event of an alarm to shutdown ventilation and air conditioning equipment in the immediate vicinity of the alarm
  - (j) suitable fault indication (both visual and audible)
  - (k) interfacing facility to connect to Civil Defence Department system
  - (I) interfacing facility to control elevator system
  - (m) interfacing facility to control air handling units (AHU) of the HVAC systems
  - (n) interfacing facility to control fire doors/dampers.
- 5 Alarm indicators shall be of the light emitting diode type. Indicators shall be provided in pairs for each function.
- 6 Control panels shall continuously monitor all alarm circuits, including wiring and control devices. When a fault monitoring circuit has been energised it shall not rest until the fault condition is cleared.
- 7 The control panel shall include the following:
  - (a) power supply normal light (green LED)
  - (b) power supply fault light (amber LED)
  - (c) battery charger fault light (amber LED)
  - (d) general evacuate push button
  - (e) silence alarm push button
  - (f) reset push button
  - (g) common fire light (twin red LED)
- 8 Repeat facilities shall be available for common fire and fault conditions. In addition, two normally open/normally closed (NO/NC) volt free auxiliary contacts each rated at 2.5 amps (inductive) for 24 V DC and 240 V AC shall be available
- 9 Cable entries are to be made from knock-outs located on top and bottom of the fire alarm panel.







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- 10 The removal of any detector(s) shall not effect the performance of other detectors in the system.
- 11 The sensitivity of any of the sensors shall be adjustable from the control panel.

### 2.4 BATTERIES AND CHARGING EQUIPMENT

#### 2.4.1 General

1 The system shall be of the 24 V DC, monitored, open circuit type utilising transformed and rectified mains voltage supply under all normal circumstances but with stand-by provision in the form of rechargeable sealed lead-acid batteries.

#### 2.4.2 Batteries

1 Batteries shall have a capacity capable of maintaining the system in normal working condition for at least 24 hours and in the alarm state for at least 30 minutes without recharging unless otherwise stated in the Project Documentation.

#### 2.4.3 Battery Chargers

1 Battery chargers are to be of sufficient capacity to power the system whilst recharging a fully discharged battery. The battery shall be fully charged within 8 hours.

#### 2.5 DETECTORS

#### 2.5.1 General

- 1 Detectors shall conform to the relevant provisions of BS 5445 and be fully compatible with the system offered and shall comprise a fixed base which can be used with other types of detector head.
- 2 The base shall have fixed non-corroding terminals and contain no electronic components.
- 3 The head shall comprise the sensing elements which shall be housed in a corrosion proof enclosure which can be fixed to the base by a bayonet or plug-in twist-lock mechanism.
- 4 The sensing elements shall be exposed to the atmosphere through a protective cover which will allow free movement of air but provide a high degree a resistance to dust and insects. A small drain hole shall be included to allow any condensation to drain.
- 5 Integral LED"s shall be provided which will confirm operation and also permit detector testing.
- 6 The removal of a detector from its base shall cause a fault signal to be indicated.
- 7 It shall be clearly stated on the head of the detector the type of element it contains or the principle on which the detector operates.
- 8 All detectors shall operate at a nominal voltage of 24 V DC and shall exhibit long-term stability and reliability under the prevailing conditions at the installation location.







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#### 2.5.2 Optical Smoke Detectors

- 1 The sensors shall utilise the light scattering principle. They shall employ a photoelectric cell and light source so arranged that only light scattered by smoke particles falls on the photoelectric cell.
- 2 The Optical smoke detector shall respond to the visible smoke produced by smouldering or burning materials.
- 3 The detector shall be fully operational after initiation of an alarm without any maintenance.

#### 2.5.3 Combined Smoke and Heat Detectors

- 1 Combine smoke and heat detector shall comprise of two chambers. One chamber containing the photoelectric smoke detector and the other chamber shall contain the heat detector.
- 2 The smoke detector shall utilise a horizontal optical bench construction which houses the detector and the optical sensor. The detector shall be arranged for radial detection of forward scattered light.
- 3 The heat detector shall operate at fixed temperatures set at 57 °C, 71 °C or 99 °C to trigger the alarm. The setting shall depend on the application and as specified in the Project Documentation.
- 4 The detector shall be fully operational after initiation of an alarm without any maintenance.

#### 2.5.4 Heat Detectors

- 1 The detector shall be a combined unit including both fixed temperature element and rate of rise temperature element.
- 2 Each heat detector shall incorporate a dual thermal element which responds to either an excessively high temperature or a rate of rise of temperature which is unacceptable.
- 3 The heat detector shall operate on the principle that one element is exposed to the atmosphere whilst the other is contained in such a way that it is not so readily affected by increasing temperature. At a certain rate of rise of temperature or at a pre-set fixed temperature, the imbalance between the two elements shall cause the detector to trigger.
- 4 The fixed element of the heat detector shall be the type that can be reset for renewed detection. The detector shall be fully operational after initiation of an alarm without any maintenance

#### 2.5.5 Duct Mounted Smoke Detectors

- 1 Duct smoke detectors shall be provided in the main return air duct adjacent to each air handling unit (AHU).
- 2 They shall be of the duct mounted type and initiate alarm in case of a developing fire. These shall be provided with two sampling tubes. The first, an inlet tube for intake of air from the duct to the sensor assembly. The second, an exhaust tube to allow air to leave the assembly.







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3 Duct smoke detectors shall be interlocked with the air handling unit motor and volt free contact shall also be provided to raise an alarm on the main fire alarm panel. Installation of duct mounted detectors shall be approved by the Air Conditioning Section of QGEWC.

#### 2.5.6 Infra-Red Flame Detectors

- 1 The infra-red flame detectors shall be capable of detecting infra-red radiation produced by flaming fires involving carbonaceous materials.
- 2 The infra-red flame detectors shall be approved and listed by the Loss Prevention Council Board (LPCB) and manufactured under the appropriate category by the Underwriters Laboratories, Inc. (UL), and shall bear the "UL" mark.
- 3 The infra-red flame shall be able to detect a fuel fire of 0.1 m<sup>2</sup> area from a distance of 30 m for the following fuels:
  - (a) petrol
  - (b) N-heptane
  - (c) kerosene
  - (d) diesel oil
  - (e) alcohol
  - (f) ethylene glycol
- 4 The infra-red flame detectors shall employ narrow band optical filters that block unwanted radiation such as that emanating from the sun or tungsten filament lamps.
- 5 The infra-red flame detectors shall be designed to be sensitive to modulation of the received radiation in a small range of frequencies corresponding to the flicker of flames.
- 6 The infra-red flame detectors shall be designed to have high resistance to contamination and corrosion.
- 7 The electronic assembly of the infra-red flame detectors shall be encapsulated in high resistivity epoxy resin.
- 8 The infra-red flame smoke detectors shall include radio frequency interference (RFI) screening and feed through connecting components to minimise the effect of radiated and conducted electrical interference.
- 9 The infra-red flame detector shall incorporate an LED, clearly visible from the outside, to provide indication of alarm actuation.

#### 2.5.7 Remote Indicating Lights

1 All fire detectors shall be provided with remote indicator facility. The remote indicator output shall diode gated for protection against electrical interference generated along the remote indicator wiring and to enable one remote indicator to be connected to a number of detectors. The remote indicator shall be polarity independent and operate at constant brightness over the range of 8-28 V.







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### 2.6 ALARMS

#### 2.6.1 Manual Fire Alarm Call Points

- 1 Manual fire alarm call points shall consist of a die cast plastic enclosure with a die cast plastic cover locked in position with screws. The enclosure shall house a micro switch. The micro switch plunger shall bear onto an inset break glass panel fixed into the cover. The call point shall be arranged for surface or flush mounting as appropriate. The cover and the enclosure shall be self coloured red. The words "BREAK GLASS FOR ALARM" shall be printed on the frangible glass. A testing facility using a special key shall be provided to enable the call point to be tested without breaking the glass and the frangible glass shall be covered with plastic film to prevent injury when the glass is broken. The mounting height shall be 1400 mm above finished floor level.
- 2 The switching unit contacts shall be gold or silver plated or on alloyed metal which will not corrode when left unattended in a highly polluted environment. Contact blades and other metal parts of the switching unit shall also be constructed form plated or alloyed metal which will not corrode when left unattended. Contacts shall be normally open or normally closed to suit the alarm monitoring system. The voltage and current rating of the contacts shall be marked within the enclosure. The items shall have approval and listing by the LPCB (Loss Prevention Council Board).
- 3 The call point shall be suitable for direct connection into the wiring system, and shall comply with the relevant provisions of BS 5839: Part 2.
- 4 The call point shall be resistant to the ingress of dust and water to IP55.

#### 2.6.2 Alarm Bell

- 1 Red underdome indoor fire alarm bells shall be installed in locations complying with the relevant provisions of BS 5839 and in locations as indicated in the Project Documentation. Each bell shall be suitable for 24 V DC operation and shall be polarised. The output shall not be less than 90 dBA at 1 m distance. 150 mm diameter underdome bells shall be used indoors and 225 mm diameter underdome bells shall be used outdoors. Outdoor underdome bell shall be to IP44.
- 2 Alarm bells shall be of the gong type. They shall be continuously rated and mounted 2200 mm above finished floor level.
- 3 Bells shall be painted red and marked with the words "FIRE ALARM".
- 4 Each bell or sounder circuit shall have a separate fuse at the fire alarm control unit.

#### 2.6.3 Electronic Sounders

- 1 Electronic Sounders shall comply with the relevant provisions of BS 5389 and BS 5306 and shall be suitable for 24 V DC use. These sounders shall be coloured red and be polarised, suppressed and suitable for line monitoring. Electronic sounders are to have a low current consumption of approximately 30 mA but have a minimum output of 100 dBA at 1 m.
- 2 The electronic sounder shall be capable of providing at least two distinct and different sounds and be suitable for "on site" adjustments.







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#### 2.6.4 Alarm Lights

1 Visual flashing alarm lights shall be located above doors and openings as indicated in the Project Documentation. They shall be of the xenon flashing type and suitable for 24 V DC. The wording "Fire" shall be prominently displayed when this alarm is activated.

END OF PART







# **QCS 2014** Section 23: Fire Fighting and Fire Alarm Systems

# 3 ANALOGUE ADDRESSABLE FIRE ALARM SYSTEM

#### 3.1 INTRODUCTION

#### 3.1.1 Scope

- 1 This part specifies the requirements for the material, installation, testing and commissioning of services for analogue addressable fire alarm systems for use within buildings.
- 2 Fire alarm panels, repeater panels, detection components, alarm components, cables, other materials and their installation shall be approved by Civil Defence Department.
- 3 The fire alarm system contractor shall be registered with, and on the approved contractors list of, the Civil Defence Department.

#### 3.1.2 References and Compliance

1 The following standards are referred to in this Part:

- BS 5839 Fire detection and alarm systems for buildings:
- BS 5445 Components of automatic fire detection systems: detectors
- BS 5501 Electrical apparatus for potentially explosive atmospheres
- BS 7671 IEE Wiring regulations
- 2 Where applicable, the fire detection and alarm system and its installation shall comply with the relevant standards, regulations, rules and recommendations of the following:

British Standards	BS
National Fire Prevention Association	NFPA
Underwriters Laboratory, Inc.	UL
Loss Prevention Council Board	LPCB

3 Where applicable, the fire detection and alarm system and its installation shall comply with the relevant standards, regulations, rules and recommendations of the Civil Defence Department, Ministry of the Interior, State of Qatar.

#### 3.1.3 General

- 1 The control and indicating equipment shall form the central processing unit of the system. It shall receive and analyse signals from fire sensors, providing audible and visual information to the user. It shall also initiate automatic alarm response sequences and providing the means by which the user interacts with the system. The housing enclosure shall be constructed to IP22 unless otherwise stated elsewhere in the Project Documentation.
- 2 The control and indicating equipment shall be modular in construction to allow for future extension of the system.
- 3 The control and indicating equipment shall be easily configurable so as to meet the exact detection zone and output mapping requirements of the building.
- 4 The control and indicating equipment shall be microprocessor based and operate under multitasking software program. Operating programs and configuration data must be contained in easily up-datable non-volatile memory (EPROM).
- 5 The control and indicating equipment shall incorporate a real-time clock to enable events to be referenced against item and date. This clock shall be accurate to within 1 minute per year under normal operating conditions.







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- 6 It shall be possible for an engineer to perform configuration updates on site by plugging a portable personal computer into the control and indicating equipment. Configuration data shall be retained in an electronic (disk) format.
- 7 The company responsible for the installation shall operate an approved document control system for the retention of configuration data.
- 8 The control and indicating equipment shall meet the requirements of BS 5839 Part 4 and shall be approved, together with associated ancillary equipment, by the Loss Prevention Council Board (LPCB).
- 9 The control and indicating equipment shall comprise separate processors, cross-monitoring each other"s correct operation, for the major functions of the system. In particular, different processors must be used for the main control function, the detection input and alarm output functions, and the display and control function.
- 10 No more than 200 addressable input or output points shall be controlled by a single processor.
- 10 To ensure continuous stability of the system, the setting of the address code in each addressable device shall be by either a DIL switch in the detector base or small card technology in addition to the adjustment provision in the central control panel.
- 12 In the case of plug-in analogue addressable detectors, the address code shall be set in the base to prevent unauthorised and potentially dangerous reconfiguration of the system.
- 13 The control and indicating equipment shall incorporate a key-switch with three positions "Normal", "Trapped Normal" and "Enable" to prevent unauthorised use of the manual controls.
- 14 The control and indicating equipment shall be capable of operating with any of the following types of automatic detection equipment:
  - (a) conventional detectors
  - (b) two-state addressable detectors
  - (c) analogue addressable detectors
- 15 The control and indicating equipment shall be capable of operating with intrinsically safe conventional detectors and intrinsically safe analogue addressable detectors suitable for installation in hazardous areas.
- 16 Addressable input and output devices shall be connected to addressable loops capable of accepting up to 99 devices for cable lengths not exceeding 1 km.
- 17 The control and indicating equipment shall have a minimum capacity for operating 1 fully loaded addressable loop. This shall be extendable up to a maximum capacity of 10 addressable loops.
- 18 Provision shall be made for each addressable loop to be subdivided into different geographical zones. The section of wiring corresponding to each zone circuit shall be protected from faults in other sections by line isolator modules. It shall be possible to allocate all 99 addressable devices on the loop to a single zone.
- 19 In order to facilitate re-configuration and system extension, the allocation of addresses to devices shall be independent of their physical arrangement on the loops.







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- 20 The control and indicating equipment shall have provision to drive and monitor up to 20 repeater panels providing a repeat of the indications on the control and indicating equipment display and up to a further three (3) repeater panels also incorporating the full set of system manual user controls.
- 21 The control and indicating equipment shall have provision to house the main power supply unit and the batteries required to power a systems of up to sixteen (16) zones.
- 22 The control and indicating equipment shall have provision for the connection of external power supplies, either local to the control and indicating equipment or distributed throughout the system, to supply power in excess of that stated as above.
- 23 The control and indicating equipment shall have provision for the connection of an 80 character line printer, either locally via a parallel port or remotely via a serial port. The fire alarm control panel shall be provided with a built-in printer, if specified in the Project Documentation.
- 24 The control and indicating equipment shall be capable of interfacing directly to an electronic radio paging system.
- 25 The control and indicating equipment shall be capable of being interfaced with the similar control and indicating equipment without locking up or being affected by feedback signals.
- 26 It shall be possible to connect a VDU monitor to the control and indicating equipment to display the information that would otherwise appear on the printer referred to in Clause 3.1.3- 24.
- 27 The control and indicating equipment shall have the facility to enable an on board communications module to be added to allow local area networking to other controllers.

#### 3.1.4 Quality Assurance

1 Items and equipment specified in this part shall be provided by experienced and approved manufacturers and contractors as designated in the Project Documentation or to the written approval of the Engineer.

#### 3.2 AUTOMATIC FIRE DETECTORS

#### 3.2.1 General

- 1 The system may include, but not be limited to, the following types of automatic detectors, manual call points and line modules for direct connection to the system addressable loops:
  - (a) ionisation smoke detectors
  - (b) optical smoke detectors
  - (c) high performance optical smoke detectors
  - (d) infra-red flame detectors
  - (e) heat detectors
  - (f) manual call points for indoor use
  - (g) (manual call points for outdoor use
  - (h) ionisation smoke detectors for hazardous areas
  - (i) optical smoke detector for hazardous areas
  - (j) infra-red flame detectors for hazardous areas
  - (k) conventional detector interface module





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- (I) addressable relay interface module
- (m) addressable contact monitoring module
- (n) addressable sounder driver module
- (o) addressable voice alarm module
- (p) addressable power supply module
- (q) line isolator module
- (r) special detector interface module
- 2 The system may include, but not be limited to, both an analogue addressable and a two state addressable version of the following type of automatic fire detectors:
  - (a) ionisation smoke detectors
  - (b) optical smoke detectors
  - (c) high performance optical smoke detectors
  - (d) infrared flame detectors
  - (e) manual call points for indoor use
  - (f) manual call point for outdoor use
  - (g) sounder booster module
  - (h) remote indicator module
- 3 The automatic fire detectors shall be fixed to the installation by means of plug-in detector bases.
- 4 The addressable base must incorporate all the circuitry required for communicating detector status to the control and indicating equipment, including the address setting switch.
- 5 Addressable detectors and modules must be able to transmit to the control and indicating equipment a pre-set and unique identifier to detect unauthorised changes in the system configuration.
- 6 It shall be possible to program and adjust the sensitivity of any of the detectors in the system from the central panel in addition to the local setting facilities. Removal of any detector shall not affect the performance of other detectors in the system
- 7 It shall be possible to program for automatic adjustment of sensitivity settings of the detectors on time-zone features, if required, for different hours of the day, for different days of the week, or for different months of the year.
- 8 The Contractor shall provide standard accessories for installing detectors in air ducts. This equipment shall be designed to accommodate the manufacturer"s standard smoke detectors and bases, both conventional and addressable. All such detectors to be installed in the air duct system shall be approved by the Air Conditioning Section of QGEWC, Qatar.
- 9 It must be possible to connect and mix automatic detectors, manual call points and addressable modules within the same zone sub-division of an addressable loop.
- 10 All types of automatic detectors, the plug-in bases and the line isolator shall be intrinsically safe
- 11 The addressable contact monitoring module for connection of "simple apparatus" such as conventional manual call points shall be intrinsically safe.







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- 12 The intrinsically safe devices shall be designed to comply with the relevant provisions of BS 5501: Pt 7 and be certified by BASEEFA (British Approval Service for Electrical Equipment in Flammable Atmosphere) to EEx i IIC T5.
- 13 It shall be possible to connect several circuits of intrinsically safe addressable devices to a standard addressable loop via standard BASEEFA approved safety barriers from the loop as spurs.
- All equipment connected to the system addressable loops, either directly or via interfaces, shall be proofed against electrical noise, high frequency pulses and electromagnetic influences from other equipment.
- 15 Both the conventional and addressable detector base shall be capable of driving a separate alarm LED indicator module.

#### 3.2.2 Optical Smoke Detectors

- 1 The optical smoke detectors shall be capable of detecting visible combustion gases emanating from fires.
- 2 The optical smoke detectors shall comply with the relevant provisions of BS 5445: Pt.7 (EN 54: Pt.7).
- 3 The optical smoke detector shall have a sensitivity sufficient to be classified as "A" in BS 5445: Pt.9 (EN 54: Pt.9) test fires for TF2 and TF3.
- 4 The optical smoke detectors shall be approved and listed by the Loss Prevention Council Board (LPCB).
- 5 The optical smoke detectors shall employ the forward light scatter principle, using optical components operating at a wavelength of approximately 4.35 nm.
- 6 The design of the optical smoke detector sensing chamber shall be optimised to minimise the effect of dust deposits during a long period of operation.
- 7 The optical smoke detectors shall incorporate screens designed to prevent insects from entering the sensing chamber.
- 8 The optical smoke detectors shall incorporate a fin structure designed to totally eliminate the effect of very small insects such as thunder flies.
- 9 The optical smoke detectors shall be designed to have high resistance to contamination and corrosion.
- 10 The optical smoke detectors shall include RF1 screening and feed through connecting components to minimise the effect of radiated and conducted electrical interference.
- 11 The system may include, but not be limited to, the following versions of optical smoke detectors as required to meet different applications:
  - (a) analogue addressable
  - (b) analogue addressable intrinsically safe
  - (c) two state addressable normal sensitivity
  - (d) conventional high sensitivity
  - (e) conventional normal sensitivity
  - (f) conventional normal sensitivity delayed response





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- (g) conventional low sensitivity
- (h) conventional normal sensitivity intrinsically safe
- 12 The optical smoke detector shall incorporate an LED, clearly visible from the outside, to provide indication of alarm actuation.

#### 3.2.3 High Performance Optical Smoke Detectors

- 1 In addition to the above :
- 2 The high performance optical smoke detectors shall have a sensitivity sufficient to be classified as "B" or better in accordance with BS 5445: Part 9 (EN 54: Part 9) test fires TF2 to TF5 inclusive and as "C" in test fire TF1.
- 3 The high performance optical detectors shall monitor and use rapid changes in temperature to increase the normal sensitivity of the light scatter optical sensor to obtain an improved response to fast burning fires.
- 4 The high performance optical detectors shall not generate an alarm condition from a rate of rise of temperature or absolute temperature alone.

#### 3.2.4 Beam Smoke Detectors

- 1 The beam smoke detectors shall be capable of detecting the presence of smoke in large open type interiors.
- 2 The beam smoke detectors shall project a modulated infrared light beam from a transmitter unit to a receiver unit. The received signal shall be analysed and, in the event of smoke being present for a predetermined period an alarm condition be activated.
- 3 The detectors shall be capable of providing cover in open areas up to 100 m in length and up to 14 m wide, giving an effective protection area of up to 1400  $m^2$ .
- 4 The fire alarm output of the detectors shall be activated in the event of smoke reducing the signal strength between 40% and 90% for a period of approximately 5 seconds.
- 5 In the event of a power failure at the transmitter unit or if the transmitted signal is reduced by more than 90% for a period in excess of 1 second, then a fault alarm condition shall be indicated. This condition shall inhibit the fire alarm until the signal is restored.
- 6 The receiver unit of the detectors shall be capable of performing an automatic reset, approximately 5 seconds after a fault is indicated, if the fault is no longer present.
- 7 The detectors shall include Automatic Gain Control (AGC) circuitry capable of providing compensation for long-term degradation of signal strength caused by component ageing or build-up of dirt on the optical surfaces of the transmitter and receiver unit lenses.
- 8 The beam smoke detectors shall comply with the relevant provisions of either BS 5445: Part 5 (EN 54: Part 5) for detectors suitable for use in normal environments or BS 5445: Part 8 (EN 54: Part 8) for detectors designed for use in high ambient temperatures.
- 9 The beam smoke detectors shall be approved and listed by the Loss Presentation Council Board (LPCB).
- 10 The receiver unit of the detectors shall incorporate an alarm/fault lamp, clearly visible from the outside, to provide indication of both alarm and fault conditions.







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#### 3.2.5 Aspirating Smoke Detectors

- 1 The aspirating smoke detectors shall be capable of detecting the presence of smoke particles in air samples drawn from several different locations.
- 2 The aspirating smoke detectors shall provide a continuous analogue profile of ambient air conditions.
- 3 The detectors shall be capable of responding to a developing fire situation with multiple staged alarms.
- 4 The fire alarm output of the detectors shall be programmable to allow sufficient time for action to be taken, from a detailed investigation of the cause of the alarm to a full scale evacuation.
- 5 The design of the detectors shall be such that they can be integrated with a fire alarm system and guard against specific pieces of equipment, such as computers, equipment racks, power boards and telecommunications switching racks, as well as entire rooms or floors.
- 6 The detectors shall include a facility to allow sensitivity threshold adjustments to suit the needs of particular environments.
- 7 Each detector system shall be capable of monitoring an area up to 2,000 m<sup>2</sup> using easy to install PVC conduit.
- 8 The beam smoke detectors shall comply with the relevant provisions of either BS 5445: Part 5 (EN 54: Part 5) for detectors suitable for use in normal environments or BS 5445: Part 8 (EN 54: Part 8) for detectors designed for use in high ambient temperatures.
- 9 The aspirating smoke detectors shall be approved and listed by the Loss Prevention Council Board.
- 10 The detectors shall incorporate an LED indicator, clearly visible from the outside, to provide indication of alarm or fault condition.

#### 3.2.6 Heat Detectors

- 1 The heat detectors shall be capable of detecting both rapid rise in temperature and fixed absolute temperatures.
- 2 The beam smoke detectors shall comply with the relevant provisions of either BS 5445: Part 5 (EN 54: Part 5) for detectors suitable for use in normal environments or BS 5445: Part 8 (EN54: Part 8) for detectors designed for use in high ambient temperatures.
- 3 The heat detectors shall be approved and listed by the Loss Prevention Council Board (LPCB).
- 4 The heat detector shall employ two heat sensing elements with different thermal characteristics to provide a rate of rise dependent response.
- 5 The temperature sensing elements and circuitry of the heat detectors shall be coated with epoxy resin to provide environmental protection.
- 6 The heat detectors shall include RF1 screening and feed through connecting components to minimise the effect of radiated and conducted electrical interference.
- 7 The system may include, but not be limited to, the following versions of the heat detector as required to meet different applications:







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- (a) analogue addressable
- (b) analogue addressable intrinsically safe
- (c) two state addressable grade 1
- (d) conventional grade 1
- (e) conventional grade 1 intrinsically safe
- (f) conventional grade 3
- (g) conventional grade 3 intrinsically safe
- (h) conventional range 2 (98oC)
- (i) conventional range 2 intrinsically safe
- (j) conventional static 60oC (grade 2)
- (k) conventional static 90oC
- 8 The heat detectors shall incorporate an LED, clearly visible from the outside, to provide indication of alarm actuation.

#### 3.2.7 Linear heat detectors

- 1 The linear heat detectors shall be capable of detecting fire (or overheat) conditions in confined or polluted areas.
- 2 The sensor capable of the linear heat detectors shall be unaffected by dust, moisture or vibration and require little maintenance.
- 3 The detectors shall have a calibration switch mounted internally to set the alarm sensitivity threshold.
- 4 The detectors shall generate an alarm condition if the predetermined alarm threshold is exceeded.
- 5 The detectors shall initiate a fault condition if the sensor cable has an open or short circuit condition present.
- 6 The detectors, upon detecting a cable open or short circuit or fault, shall be capable of signalling the condition to the main fire controller.
- 7 The linear heat detectors shall meet the requirements of either BS 5445: Part 5 (EN 54: Part 5) for detectors suitable for normal environments or BS 5445: Part 8 (EN 54: Part 8) for detectors designed for high ambient temperatures.
- 8 The linear heat detectors shall be approved and listed by the Loss Prevention Council Board (LPCB).
- 9 The detectors shall be suitable for use in hazardous areas and have mechanical protection for cables in areas where damage may occur.
- 10 The detectors shall incorporate red (fire) LED and yellow (fault) LED, clearly visible from the outside, to provide indication of alarm and fault condition.

#### 3.2.8 Infra-Red flame detectors

1 The infra-red flame detectors shall be capable of detecting infra-red radiation produced by flaming fires involving carbonaceous materials.







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- 2 The infra-red flame detectors shall be approved and listed by the Loss Prevention Council Board (LPCB) and manufactured under the appropriate category by the Underwriters Laboratories, Inc. (UL), and shall bear the "UL." label.
- 3 The infra-red flame shall be able to detect a fuel fire of 0.1 m<sup>2</sup> area from a distance of 30 m for the following fuels:
  - (a) petrol
  - (b) N-heptane
  - (c) kerosene
  - (d) diesel Oil
  - (e) alcohol
  - (f) ethylene glycol
- 4 The infra-red flame detectors shall employ narrow band optical filters that block unwanted radiation such as that emanating from the sun or tungsten filament lamps.
- 5 The infra-red flame detectors shall be designed to be sensitive to modulation of the received radiation in a small range of frequencies corresponding to the flicker of flames.
- 6 The infra-red flame detectors shall be designed to have high resistance to contamination and corrosion.
- 7 The electronic assembly of the infra-red flame detectors shall be encapsulated in high resistivity epoxy resin.
- 8 The infra-red flame smoke detectors shall include RFI screening and feed through connecting components to minimise the effect of radiated and conducted electrical interference.
- 9 The system may include, but not be limited to, the following version of infra-red flame detectors to meet different applications:
  - (a) analogue addressable -intrinsically safe
  - (b) conventional -intrinsically safe
- 10 The intrinsically safe versions of the infra-red flame detectors shall be suitable for use with safe area circuits.
- 11 The infra-red flame detector shall incorporate an LED, clearly visible from the outside, to provide indication of alarm actuation.

#### 3.3 ENGINEERING

#### 3.3.1 System Management Facilities

- 1 The control and indicating equipment shall incorporate the following system management facilities:
  - (a) isolate/reconnect a particular addressable point
  - (b) isolate/reconnect a particular detector zone
  - (c) isolate/re-connect a particular sounder zone
  - (d) walk test of a selected zone to verify detectors and sounders
  - (e) view the number of alarms since power up
  - (f) view the number of software initialisation since power up







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- (g) view common alarm status
- view common fault status (h)
- (i) view common disabled status
- (j) view zonal alarm status
- (k) view zonal fault status
- (I) view zonal isolated status
- view point address status (m)
- (n) print event log
- (0) print points isolated
- print points in detector condition monitoring fault (p)
- print point statuses (q)
- 2 Access to the facilities described in clause above shall be restricted to authorised personnel using coded password.
- 3 The control and indicating equipment shall have an event log capable of storing up to the last 500 events that have occurred. It shall be possible to view the content of the log via an alphanumeric display. Events shall be displayed in chronological order in any of the following three options:
  - newest event first (a)
  - (b) oldest event first
  - (C) highest priority event first
- 4 The control and indicating equipment shall be capable of isolating a group of selected detectors in areas of the building where maintenance work is carried out via a suitable timer unit. The detectors shall be automatically reinstated after a predetermined time.
- 5 The control and indicating equipment shall have a facility to enable the user to easily change the time and date settings of the system real-time clock.

#### 3.3.2 **Technical specification**

1 The enclosure used to house the control and indicating equipment, standard system power supply and standard repeater panel shall not exceed the following overall dimensions unless otherwise stated in the Project Documentation:

Height:	400 mm
Width:	550 mm
Depth:	200 mm

- 2 The control and indicating equipment shall be light in weight. The complete unit including standard power supply unit and standard repeater unit shall not exceed 7 kg excluding the weight of batteries unless otherwise stated in the Project Documentation.
- 3 The control and indicating equipment shall operate on a mains power supply rated for 240 V AC ±10% @ 50Hz ±4%
- 4 The control and indicating equipment, standard power supply unit and standard repeater unit shall comply with the following environmental conditions unless otherwise stated elsewhere in the Project Documentation:
  - 00 C to 550C operating temperature range (a) 00 C to 650C
  - (b) storage temperature







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- (c) relative humidity up to 95% (non-condensing)
- (d) IEC protection category IP22 minimum
- 5 The control and indicating equipment, standard power supply unit and standard repeater unit shall comply with the EMC test requirements described in BS 5839 Pt.4 and the EEC requirements of the EMC Directive 89/336/EU and subsequent amendment 92/31/EU.
- 6 All equipment, including the fire alarm components and the control panel, shall be UL listed and shall be supplied from the same manufacturer. The manufacturer shall have a minimum of 10 (ten) years active experience in the manufacturing of fire alarm systems.

#### 3.3.3 Cabling

- 1 Unless specified elsewhere in the Project Documentation, the cabling and wiring used in the fire alarm system shall comply with the provisions this Clause.
- 2 The cabling and wiring to be used in the system shall be fire resistant and approved to British Standard and LPCB specifications for use in fire detection and alarm systems.
- 3 Wiring used for driving devices requiring high currents (e.g. bells) shall limit the voltage drop to less than 10% of the nominal operating voltage.
- 4 Cables used for the transmission of system data and alarm signals shall be in accordance with the types recommended by the manufacturer of the fire alarm system.
- 5 The ends of all cables shall be sealed by means of proprietary seals and associated glands. No heat shall be applied to any seal or termination. Cable tails shall be insulated by means of gland PVC sleeving anchored and sealed into the seal.
- 6 Where protection of the cable glands is required or terminations are on display, the glands shall be enclosed in red coloured shrouds of the appropriate British Standard colour.
- 7 All cables to brick/concrete shall be securely fixed by means of copper saddles sheathed with red PVC. These saddles shall be provided near bends and on strength runs at intervals no greater than recommended in the British Standards or by the manufacturer.
- 8 Where multiple cables are to be attached to a wall or soffit, copper saddles shall enclose all cables and shall be secured by means of suitable masonry plugs and two round head plated wood screws.
- 9 Where multiple cables are to be attached to the top of horizontal trays they shall be neatly run and securely fixed at suitable intervals. Copper or plastic cable fixings shall be used.

#### 3.3.4 Addressable Manual Call Points

- 1 The addressable manual call points shall monitor and signal to the control and indicating equipment the status of a switch operated by a "break glass" assembly.
- 2 The addressable call points shall comply with the relevant provisions of BS 5839: Part 2.
- 3 The addressable call points shall be capable of operating by means of thumb pressure and not require a hammer.
- 4 The addressable call points shall be capable of being mounted in weather-proof affording protection to IP65.
- 5 The addressable call points shall incorporate a mechanism to interrupt the normal addressable loop scan to provide an alarm response within less than 1 second.







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- 6 The addressable call points shall be field programmable to trigger either an alert or an evacuate response from the control and indicating equipment.
- 7 The addressable call points shall be capable of being tested using a special "key" without the need for shattering the glass.
- 8 The addressable call points shall provide an integral red LED to indicate activation.

#### 3.3.5 Manual Pull Stations

- 1 The manual fire alarm pull stations shall monitor and signal to the control and indicating equipment the status of a switch operated by manual pulling down of a handle or lever.
- 2 The stations shall be capable of operating by hand pull and does not require special instrument.
- 3 The stations shall be capable of being mounted in weather-proof affording protection to IP65.
- 4 The pull station shall incorporate a mechanism to interrupt the normal addressable loop scan to provide an alarm response within less than 1 second.
- 5 The points shall be capable of being tested using a special "key" without actually initiating the alarm signal.
- 6 A glass cover shall be provided to deter the accidental or malicious activation of the manual call stations. After actuation, the cover can be replaced, and the system reset by use of a key only.

#### 3.4 MODULES

#### 3.4.1 Remote Indicator Module

- 1 The remote indicator module shall provide a remote indication for any conventional or analogue addressable detector that may be located in an enclosed or locked compartment.
- 2 The remote indicator module shall be driven directly from its associated local detector.
- 3 The connection to the remote indicator module shall be monitored for open and short-circuit.

#### 3.4.2 Conventional Detector Interface Module

- 1 The conventional detector interface module shall monitor and signal to the control and indicating equipment the status of up to 20 conventional detectors and manual call points.
- 2 The conventional detector interface module shall be capable of monitoring automatic detector and manual call points from existing conventional systems.
- 3 The conventional detector interface module shall operate from a monitored 24 V AC power supply.
- 4 The conventional detector interface module shall operate integral red LED indication when in the alarm state.

#### 3.4.3 Addressable Relay Output Module

1 The addressable relay output module shall provide a volt free changeover relay contact operated by command from the control and indicating equipment.





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- 2 The contacts of the addressable relay output module shall be rated for minimum of 1 Amp at 24 V DC.
- 3 The addressable relay output module shall monitor the relay coil open-circuit and transmit the fault signal to the control and indicating equipment.
- 4 The addressable relay output module shall derive its operating power from the addressable loop.
- 5 The addressable relay output module shall provide a red LED indication that the relay has operated.

#### 3.4.4 Addressable Contact Monitoring Module

- 1 The addressable contact monitoring module shall provide monitoring of the status of switched input signals from either normally open or normally closed contacts.
- 2 The addressable contact monitoring module shall provide a red LED indication when the contact has operated.
- 3 The addressable contact monitor module shall derive its power directly from the addressable loop.

#### 3.4.5 Addressable Sounder Driver Module

- 1 The addressable sounder driver module shall be capable of monitoring and driving a circuit of alarm sounders.
- 2 The output of the addressable sounder driver module shall be rated at 500 mA.
- 3 The addressable sounder driver module shall be capable of operating the sounders in a pulsing or continuous mode as determined by the control and indicating equipment.
- 4 The addressable sounder driver module shall provide the facility to monitor for failure of the power supply for the sounders and transmit the necessary fault signal to the control and indicating equipment.
- 5 The addressable sounder driver module shall provide a red LED indication that the sounder circuit has been actuated.

#### 3.4.6 Sounder Booster Module

- 1 The sounder booster module shall be capable of monitoring and driving a heavy duty circuit of sounders up to 15 Amps.
- 2 The sounder booster module shall be capable of interfacing either to the common sounder outputs of the control and indicating equipment or to the output of the addressable sounder driver module.
- 3 The sounder booster module shall be designed to maintain the monitoring of the sounder circuit and transmit a fault signal either via the addressable sounder driver module or directly to the control and indicating equipment.

#### 3.4.7 Addressable Power Supply Module

1 The addressable power supply module shall be capable of supplying up to 24 V DC. 3 Amps of power to local sounder circuits and ancillary equipment.







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- 2 The addressable power supply module shall derive its power from the 240 V AC mains supply.
- 3 The addressable power supply module shall be able to contain and maintain in a charged state a 24 V battery set of up to 15 Ah capacity.
- 4 The addressable module shall monitor the mains power supply and the battery and transmit a fault signal as appropriate to the control and indicating equipment.

#### 3.4.8 Smoke Damper Module

- 1 The smoke damper module shall provide the inputs and outputs required to monitor and control a smoke damper.
- 2 The smoke damper module shall be fully addressable and provide one volt-free changeover relay contact rated for 240 V AC @ 5 Amps.
- 3 A separate 24V DC supply shall be provided to operate the changeover relay.
- 4 The changeover relay contact of the smoke damper module shall be monitored and controlled by commands signalled from the fire alarm system control panel via the addressable loop.
- 5 The smoke damper module shall be capable of monitoring up to two external relay contacts.
- 6 The module shall derive its power directly from the addressable loop.
- 7 The outputs of the smoke damper module shall be capable of being controlled using a keypad via the addressable loop.
- 8 The keypad shall be capable of forcing the relay outputs LOW, HIGH or AUTO. It shall also be capable of reading the status of the relay outputs.
- 9 The smoke damper module shall have a red LED, clearly visible on the fascia panel of the unit, to provide an indication of relay operation.

#### 3.4.9 Plant Interface Module

- 1 The plant interface module shall provide inputs and outputs required to monitor and control any plant and machinery.
- 2 The plant interface module shall be fully addressable and provide multiple volt-free DPDT changeover relay contacts rated for 240 V AC @ 5 Amps.
- 3 A separate 24 V dc supply shall be provided to operate the changeover relays.
- 4 The changeover relay contacts of the plant interface module shall be monitored and controlled by commands signalled from the fire alarm system control panel via the addressable loop.
- 5 The module shall be capable of monitoring multiple external relay contacts.
- 6 The plant interface module shall derive its power directly from the addressable loop
- 7 The plant interface module shall be capable of being link-configured to provide 2 inputs/2 outputs, 4 inputs/4 outputs or 6 inputs/6 outputs as required and specified in the Project Documentation.
- 8 The plant interface module shall have six consecutive addresses provided for configuration.



**NION** FIRE PROTECTION





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#### 3.5.1 Fire monitoring

- 1 The control and indicating equipment shall monitor the status of all devices on the addressable loops for fire, short-circuit fault, open-circuit fault, incorrect addressing, unauthorised device removal or exchange, pre-alarm condition and contaminated detector condition.
- 2 The control and indicating equipment shall monitor the status of all internal connection and interfaces, including charger, battery and remote signalling functions.
- 3 The control and indicating equipment shall provide the following discrete visual indications:
  - (a) power on green LED indicator
  - (b) fire alarm dual red LED indicator
  - (c) fault yellow LED indicator
  - (d) disabled/isolated yellow LED indicator
  - (e) fire zones red LED indicator per zone
- In addition to the indications provided in Clause 3.5.1-3, the control and indicating equipment shall also have an integral LCD alphanumeric back-lit display unit. In order that an easy identification of different information is provided, the LCD display shall be arranged in the following categories:
  - (a) event type
  - (b) zone message
  - (c) addressable point message
  - (d) circuit identifier point number/zone number of events in the system
- 5 The control and indicating equipment shall provide a set of push button controls to enable an authorised operator to perform the following:
  - (a) evacuate actuates ALL alarm sounders in the system
  - (b) silence stop all currently actuated alarm sounders
  - (c) reset return and control and indicating equipment to quiescent condition

Access Level 2

- 6 The control and indicating equipment shall provide a facility to manually check all the discrete LED indicators. This shall be clearly marked LAMP TEST and be accessible at all time.
- 7 The control and indicating equipment shall provide a simple to operate keypad to enable the user to access the various built-in functions, and interact with the information displayed on the LCD. For security reasons, the control and indicating equipment shall provide a customer configurable password code facility in accordance with the relevant provisions of BS 5839 for the following levels of access:
  - (a) user operator Access Level 3
  - (b) user engineer Access Level 1
  - (c) user manager
  - (d) civil defence engineer Access Level 3
  - (e) alarm company engineer Access Level 3





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- 8 The control and indicating equipment shall provide facilities to drive visual indication LED mimic displays for each of the following zonal status:
  - (a) alarm
  - (b) fault
  - (c) isolated
- 9 The control and indicating equipment shall provide facilities for signalling the following system conditions to a remote (Central Station) and/or an on-site monitoring centre:
  - (a) alarm
  - (b) pre-alarm
  - (c) fault
  - (d) zone isolated
- 10 The control and indicating equipment shall be capable of monitoring and controlling remote site devices, such as door release unit and relays for the control of plants and dampers, directly from the addressable loops.
- 11 The control and indicating equipment shall be capable of monitoring fire doors such that, in the event of a fire alarm condition, an event is generated to warn of the failure of fire door to close.

#### 3.5.2 Fault and Warning Monitoring

- 1 The control and indicating equipment shall interrogate each addressable device at least once every 5 seconds.
- 2 The control and indicating equipment shall incorporate fire decision algorithms specifically adapted to the response characteristics of the analogue addressable detectors employed.
- 3 The algorithms shall perform a trend analysis of the signal received from the analogue addressable detectors in order that non-fire events may be differentiated.
- 4 The control and indicating equipment shall be designed so that, each type of analogue addressable detector, the overall responses time, including that for the sensor, the signal transmission system and the fire decision algorithm, meets the requirement of the relevant provisions of BS 5445 (EN 54).
- 5 The response time of the control and indicating equipment to two-state addressable detectors and conventional detectors shall not exceed 10 seconds.
- 6 The control and indicating equipment shall have a special scanning sequence so that designated manual call points provide alarm indication and warning within 1 second of operation.
- 7 The control and indicating equipment shall have a facility to automatically adjust the sensitivity of analogue detectors to a higher level for periods of time when the building is unoccupied.
- 8 The control and indicating equipment shall have, as an optional software enhancement, the ability to automatically adjust the alarm and pre-alarm threshold levels to compensate for changes in detector sensitivity due to contamination over a period of time.
- 9 The control and indicating equipment shall have, as an optional software enhancement, the ability to provide automatic warning that a detector has reached a level of contamination which requires that it be replaced or serviced.









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#### 3.5.3 Supervision and Fault Reporting

- 1 The control and indicating equipment shall monitor all critical system components and interconnections (internal and external). In the event of a failure occurring which prevents correct operation of the alarm functions, a FAULT indicator will light and message shall be given on the alphanumeric display within 100 seconds of occurrence.
- 2 The following faults shall be reported.
  - (a) loop short circuit
  - (b) loop open circuit
  - (c) un-configured device
  - (d) addressable device failure
  - (e) device not responding
  - (f) incorrectly configured device
  - (g) detector condition monitoring warning
  - (h) conventional call point wiring open circuit
  - (i) conventional call point wiring short circuit
  - (j) conventional detector circuit wiring fault
  - (k) repeater/repeater LCD, remote printer failure
  - (I) power supply unit (PSU) fault
  - (m) charger fault
  - (n) battery fault
  - (o) battery critical
  - (p) mains failure
  - (q) auxiliary power supply unit (PSU) failure
  - (r) relay output stuck
  - (s) signalling fault
  - (t) sounder wiring open circuit
  - (u) sounder wiring short circuit
- 3 To help rapid fault finding and repair, the control and indicating equipment shall provide text messages to indicate the precise location of where a fault has occurred in the system.
- 4 The control and indicating equipment shall be capable of monitoring and indicating the status of auxiliary units, such as a remote signalling transmitter. This shall be achieved using a suitable addressable contact monitor module.
- 5 The control and indicating equipment shall have the facility to delay the generation of an event to confirm operation of the monitored device. This shall be either 6 seconds for normal non-fluctuating contacts, or 40 seconds for fluctuating contacts, e.g. sprinkler flow valve switches.

#### 3.5.4 Alarm Output Functions

1 The control and indicating equipment shall provide the necessary outputs to separately operate two monitored circuits of common system sounders. Each output shall be capable of driving a sounder load of up to 1 Amp.







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- 2 The control and indicating equipment shall be able to monitor and control the integrity of zonal sounder circuits via a suitable addressable module.
  - (a) The control and indicating equipment shall be capable of providing a two stage alarm sounder facility that can be programmed, either on a zonal basis or common system basis, to meet the requirements of the fire authority. Three possible sound output signals shall be available as follows:
  - (b) alert pulsed tone (1 second ON, 1 second OFF)
  - (c) evacuate continuous tone
  - (d) user definable tone for specialised events (e.g. boom alert).
- 3 The control and indicating equipment shall have the facility to change, on a per sounder zone basis, the sound output dependent upon whether the source of alarm is:
  - (a) an automatic detector (e.g. smoke or heat)
  - (b) a manual call point
  - (c) an evacuate command
  - (d) a non-fire event (e.g. plant alarm)
- 4 The control and indicating equipment shall be capable of generating customer definable time delay sequences to upgrade alarm sounder responses, without the need for external timers, as follows:
  - (a) silent to alert
  - (b) alert to evacuate
  - (c) silent to user defined tone
- 5 The control and indicating equipment shall have the ability to delay the transmission to the Civil Defence Department of fire alarm signals from automatic detectors in predetermined detection zones. The time delay shall be configurable up to a maximum time of 2 minutes.
- 6 The control and indicating equipment shall provide the facility to automatically inhibit the delay function described in clause above when the building is unoccupied.

#### 3.5.5 Voice Evacuation Systems

- 1 The control and indicating equipment shall be capable of operating addressable voice alarm units and monitoring the integrity of the wiring connection to individual loudspeakers.
- 2 The system shall include power supply unit, amplifier, tone generator, synthesisers, message player, loudspeakers, cable and wiring system and other accessories required for independent operation.
- 3 The control and indicating equipment shall provide, additionally when specified in the Project Documentation, an interface to drive the public address system of the building in accordance with the relevant provisions of BS 5839: Pt.1. The system shall be arranged such that, in the event of a failure of the public address system, back-up sounders are available to alert or evacuate the relevant areas of the protected premises.
- 4 The fire alarm signal shall automatically activate the voice evacuation system and shall broadcast a suitable evacuation call (either pre-recorded or synthesised) over the loudspeaker system, independent of operator"s action. At least one fire microphone should normally be sited near to the control panel for manual call for evacuation. To avoid confusion, the system should be so designed that both automatic call and operators call can not be broadcast simultaneously.







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### 3.6 INSTALLATION

#### 3.6.1 General

- 1 Correct installation, combined with the use of high quality equipment, components and cabling ensures that the fire detection and alarm system shall operate as designed and provide many years of trouble free service.
- 2 The Contractor shall install the alarm system in accordance with the manufacturer"s documented installation instructions.
- 3 The Contractor shall provide all relevant installation documentation required for each component of the system.
- 4 Installation of the system shall be in accordance with the relevant provisions of BS 5839: Part 1 and BS 7671.
- 5 The Contractor shall be responsible for the correct sitting of all equipment and components of the system in accordance with the Project Documentation.
- 6 All cabling and wiring shall be tested before they are connected to the fire controller and its associated devices. The Contractor shall note that if the tests are carried out after the cables and wires have been connected to the controller and its devices, components within the controller and devices will be damaged by high voltages used during testing.
- 7 At detector and sounder locations, cables shall be terminated in approved black enamelled/galvanized junction boxes. All other devices forming part of the system shall utilise dedicated/custom back boxes.

#### 3.6.2 Installation of Detectors

- 1 All detectors (and bases) shall be installed in accordance with the relevant provisions of BS 5839: Part 1, BS 7671 and the installation instructions provided by the manufacturer.
- 2 The number and type of detectors required to be installed shall be as detailed on the Project Drawing. The location of each type of detector installed shall generally be as shown on the Project Drawings but their final position shall be determined on site.
- 3 All detector bases shall be securely fixed to boxes and allow for easy fitting and removal of detectors.
- 4 Cable and wire entries to detector bases shall be fitted with grommets to prevent possible damage to the insulation.
- 5 Cable and wire strain relief clamps shall be provided at all entries to detector bases.
- 6 Cable entries of detector bases used in environments with abnormal atmospheric or operating conditions shall be appropriately sealed to prevent ingress of dust, water moisture or other such contaminants.

#### 3.6.3 Installation of Control Devices

- 1 All control devices (e.g. call points, sounders, interface modules, etc.) shall be installed in accordance with the relevant provisions of BS 5839: Part, BS 7671 and the installation instructions provided by the manufacturer.
- 2 The location of control devices and associated modules to be installed shall generally be as shown on the Project Drawings but their final position shall be determined on site.







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- 3 The type of control device installed in each particular location shall be the type specified in the Project Documents.
- 4 All control devices and associated modules shall be securely fixed, and if required, marked with appropriate notices, warnings, signs as applicable.
- 5 Cable and wire entries to all control devices and associated modules shall be fitted with grommets or glands so as to prevent possible damage to the insulation.
- 6 Cable entries of control devices and associated modules used in environments with abnormal atmospheric or operating conditions shall be appropriately sealed to prevent ingress of dust, water, moisture or other such contaminants.

#### 3.6.4 Installation of Fire Controller Equipment

- 1 The fire controller equipment shall be installed in accordance with the relevant provisions of BS 5839: Part 1, BS 7671 and the installation instructions provided by the manufacturer.
- 2 The installation location of the fire controller and its associated component parts shall generally be as shown on the Project Drawings but their final position shall be determined on site.
- 3 The type of fire controller and its associated component parts installed shall be the type specified in the Project Documentation.
- 4 The fire controller equipment shall be securely fixed, and if required, marked with appropriate notices, warnings, signs as applicable.
- 5 Cable and wire entries to the fire controller and associated devices shall be fitted with grommets or glands to prevent possible damage to the insulation.
- 6 The fire alarm system mains power connections to the fire controller equipment shall be accordance with the guidelines set out in the relevant British Standards and the installation instructions provided by the manufacturer.
- 7 The fire alarm system mains power isolating switch shall be coloured red and clearly labelled "FIRE ALARM: DO NOT SWITCH OFF".
- 8 Each circuit of the system shall be connected to the fire controller via associated fuse or circuit breaker devices located within the fire controller unit.
- 9 All cables from the fire controller equipment to the detection and alarm devices shall be clearly labelled as part of the fire detection and alarm system.

END OF PART







Section 23: Fire Fighting and Fire Alarm Systems

# 4 FIRE FIGHTING SYSTEM

### 4.1 GENERAL

- 4.1.1 Scope
- 1 This Part specifies the requirements for fire fighting systems.
- 2 Related Sections are as follows: Section 21 Electrical Works

#### 4.1.2 Codes and Standards

1 The following standards are referred to in this Part:

ANSI B16.1	Cast iron pipe flanges and flanged fittings
ANSI B16.5	Pipe flanges and flanged fittings
ASTM A 47	Specification for Ferritic Malleable Iron Castings
ASTM A 106	Specification for Seamless Carbon Steel Pipe for High-Temperature Service
ASTM A 135	Specification for Electric-Resistant-Welded Steel pipe
ASTM A 183	Specification for Carbon Steel track Bolts and Nuts
ASTM A 197	Specification for Cupola Malleable Iron
ASTM A 234	Specification for Pipe Fittings of Wrought Carbon Steel and Alloy for Moderate and Elevated temperatures
ASTM A 395	Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures
ASTM A 536	Ductile Iron Castings
BS 750	Underground fire hydrants and surface box frames and covers
BS EN 1561	Specification for grey iron castings
BS EN 1563	Iron castings with spheroidal or nodular graphite
BS 5163	Double flanged cast iron wedge gate valves for waterworks purposes
BS 5423	Portable fire extinguishers
BS 6575	Fire blankets
BS EN 671	Fixed fire fighting systems – Hose systems

- NFPA 13 Installation of Sprinkler Systems
- 2
- In addition to the above, all aspects of the fire fighting system shall comply with applicable national and international codes and standards including, but not limited to, those issued by the following organisations:
  - (a) Civil Defence Department
  - (b) National Fire Prevention Association (NFPA)
  - (c) British Standards (BS)
  - (d) Loss prevention Council Board (LPCB)







### Section 23: Fire Fighting and Fire Alarm Systems

### 4.2 SPRINKLER SYSTEMS

#### 4.2.1 System Description

- 1 Wet pipe sprinkler systems shall employ automatic sprinklers attached to a piping system containing water and connected to a water supply. Each pipeline in the system shall be fully pressurised, so that water discharges immediately from sprinklers opened by a fire.
- 2 The system shall be designed that only those sprinklers that have been activated by heat will discharge water.
- 3 The design of the sprinkler system indicated on the Project Drawings is indicative only and is to be taken as general guide and not as final design unless specifically noted otherwise. The final detail design (including manufacturer components) shall be fully developed by the Contractor strictly in accordance with the requirements of the Civil Defence Department and the rules for automatic sprinkler installations in accordance with the relevant provisions of NFPA 13. The Contractor shall allow in his rates for components of sprinkler systems that are required to meet requirements but are not shown on the Project Drawings.
- 4 The fire fighting system shall be fed from a centralised fire water storage tank located inside the building or the basement of the building unless otherwise indicated in the Project Documentation.
- 5 The sprinkler system for each building shall be complete with an automatic packaged fire pumping station and valves, water motor alarm and gong, pressurised water main with distribution pipework, range pipes, hangers and supports, sprinkler heads and a piped drain system.
- 6 The sprinkler system shall be interconnected with the central fire alarm panel in order that the alarm bells and zone valves in various locations can be actuated.
- 7 The water motor alarm and gong should consist of a simple water turbine having the shaft connected to a rotary ball clapper mounted within a domed gong. The alarm system shall be self-winding, adjustable recycling non-thermal type and equipped with signal retarding device to prevent false alarms due to surges in the water system. Auxiliary pressure and flow sensing devices shall be incorporated in the feed to the alarm gong to actuate the central fire alarm panel.
- 8 A test valve shall be incorporated on a branch pipe from the alarm valve to allow operational conditions to be simulated for test purposes. Water from the test valve shall be properly drained.
- 9 The distance between sprinklers shall not exceed 3.5 m. The maximum floor area to be covered by a single sprinkler for different hazard class are as follows:
  - (a) ordinary hazard =  $12 \text{ m}^2$
  - (b) extra light hazard =  $21 \text{ m}^2$
  - (c) extra high hazard =  $9 \text{ m}^2$
- 10 The distance from the walls to the end sprinklers on the branch lines shall not exceed half of the allowable distance between sprinklers on the branch lines. The distance from the walls to the end branch lines shall not exceed half the allowable distance between the branch lines.
- 11 The allowable distance between sprinklers on the branch lines is determined by the actual distance between the branch lines and the permissible protection area per sprinkler.







### Section 23: Fire Fighting and Fire Alarm Systems

- 12 The Contractor shall install an adequate quantity of additional sprinkler heads of the correct temperature rating. The number will depend on the size of the installation and number of sprinkler heads likely to be opened. The following figures are the minimum number of additional sprinkler heads that should be installed:
  - (a) for systems not exceeding 300 sprinklers, 6 spare heads shall be installed
  - (b) for systems exceeding 300 sprinklers but not exceeding 1000, 12 spare heads shall be installed
  - (c) for systems exceeding 1000 sprinklers, 24 spare heads shall be installed.
- 13 All components for sprinkler system packages should be from one single manufacturer with an approved local agent. The Contractor shall maintain a technical representative from the manufacturer or the local agent on site for the duration of the Contract in order to supervise the installation. This representative shall issue a certificate upon completion of the Project stating that the complete system has been installed, tested and commissioned in accordance with the Project Documentation, the requirements of the NFPA and the Civil Defence Department.

#### 4.2.2 Sprinkler Heads

- 1 The glass bulb sprinkler heads should be of the upright pendant type and rated for 68°C. They shall be arranged such that there is not interference with the discharge pattern and they shall be positioned between 75 and 150 mm below ceilings.
- 2 The sprinklers and pipelines shall not be spaced too close together in order to prevent an operating sprinkler from wetting, and thereby delaying the operation of, adjacent sprinklers.
- 3 In locations where sprinkler heads are liable to be operated or damaged by accidental blow, they should be protected by stout metal guards. Care shall be taken to ensure that the normal operation of the sprinkler head in the event of a fire is not impeded by such guards.
- 4 Sprinklers in false ceilings areas shall be the concealed or recessed type. They shall be the two-piece design with closure and mounting plate which allows for easy installation and removal.
- 5 Sprinklers in parking and hardware areas shall be the pendant or upright bulb type with a 12 mm diameter orifice and temperature rated to 68°C with a natural brass finishes and sprinkler guard.

#### 4.2.3 Sprinkler System Alarm Devices

1 The system shall be provided with alarm devices consisting of, but not limited to, the items described in the following clauses.

#### 4.2.4 Alarm Valve

1 Alarm valves shall be UL listed and FM approved. They shall be check type, with a rubber faced clapper, designed for use in wet pipe systems for automatic actuation. The alarm valve may be installed vertically or horizontally with inlet and outlet connection in accordance with the relevant provisions of ANSI B 16.1.

#### 4.2.5 Basic Trip and Retarding Chamber

Basic trip and retarding chamber shall be UL listed and FM approved. It shall be used in order to prevent any false alarm that may be caused by small variation in pressure. The chamber should consist of a by-pass check valve to permit slow as well as small transient increases in water supply pressure to be passed through to the system and held at their highest value, without opening of the water way clapper.








#### Section 23: Fire Fighting and Fire Alarm Systems

#### 4.2.6 Pressure Alarm Switches

1 Pressure alarm switches shall be UL listed and FM approved. They shall be designed to indicate a water discharge from automatic sprinkler and the start-up or shut down of auxiliary fire protection system equipment. The one single pole double throw snap-action switch's components shall be enclosed in an oil resistant IP 22 rated enclosure.

#### 4.2.7 Water Motor Alarms

1 Water motor alarms shall be UL listed and FM approved. They shall be hydraulically operated outdoor alarms, designed for use with fire protection system water flow detection devices. They shall be suitable for mounting to any type of rigid wall and to consist of an approved "Y" strainer for use in the alarm line utilising a high energy efficient, light weight, impeller design which can produce a very high sound pressure level. The gong, gong mount, and water motor casing shall be made with corrosion resistant aluminium alloy. The drive shall be of the type that does not require lubrication.

#### 4.2.8 Stop Valves

1 Stop valves shall be UL listed and FM approved. They should be the gate valve type, designed specifically for fire line applications, where a positive indication of the open or closed position is necessary. The valve shall have flanged ends, an iron body and a working pressure of 12 bar.

#### 4.2.9 Zoning Valve

2 Zoning valves shall be UL listed and FM approved. They shall be gear operated butterfly valves with internal or external monitor switch. They shall have a wafer or lug style body for mounting between ANSI 125/150 flanges. They shall be rated for a 12 bar operating pressure and have a cast iron body and an EPDM seat with bronze disc.

#### 4.2.10 Water Flow Detectors

Water flow detectors shall be UL listed and FM approved and shall be designed for use with wet pipe, automatic sprinkler systems. They shall utilise a vane type sensor to actuate two (2) single pole double throw snap-action switches when water flows at a sustained rate of 17.5 litres or more. They shall be used where sectional water flow signals are required.

#### 4.2.11 Drain and Test Orifice

1 The system shall incorporate a 30 mm drain and a 13 mm test orifice for flow control inspection testing and drainage of feed mains.

#### 4.3 WATER SUPPLY

#### 4.3.1 General

- 1 Unless otherwise stated elsewhere in the Project Documentation, the water supply shall consist of:
  - (a) electric motor driven fire pump with back-up
  - (b) diesel motor driven fire pump with back-up
- 2 The capacity of the reservoirs from which fire fighting systems draw water shall be as stated in the Project Documentation.









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#### 4.4 HOSE REELS AND HOSES

#### 4.4.1 General

- 1 Hose reels and hoses shall be installed in locations as stated in the Project Documentation unless otherwise directed by the Civil Defence Department.
- 2 Fire hose reel assemblies shall be provided with full operational instructions for display on or adjacent to the hose reel.
- 3 The supplier shall make available an installation and maintenance manual for the hose reel.
- 4 All hose systems shall be such that they can be operated efficiently by one person and that such system shall have a long service life and will not need excessive maintenance.
- 5 Hose reels shall be marked with the following information:
  - (a) suppliers name or trademark, or both
  - (b) year of manufacture
  - (c) maximum working pressure
  - (d) length and bore of hose
  - (e) nozzle diameter (marked on the nozzle)

#### 4.4.2 Cabinets

- 1 Cabinets shall be fitted with a door. The door shall open approximately 180° to allow the hose to run at freely in any direction.
- 2 Cabinets shall have suitable ventilation openings.
- 3 Cabinets shall be fitted with a lock if required by the Project Documentation. Lockable cabinets shall be fitted with an emergency opening device.
- 4 To provide access for inspection and maintenance, the cabinet shall be unlockable with a key or a special opening device. Lockable cabinets shall have provision for a security seal to be fitted.

#### 4.4.3 Hose Reels with Semi-Rigid Hose

- 1 Hose reels with semi-rigid hose shall generally comply with BS EN 671-1.
- 2 The nominal bore of the hose shall be 19 mm or 25 mm or 33 mm.
- 3 The maximum length of the hose shall not exceed 30 m.
- 4 The reel shall rotate around a spindle. The reel shall consist of two wheel discs with a maximum diameter not more than 800 mm, and inside segments or drum with a minimum diameter not less than 200 mm for 19 mm and 25 mm hose and minimum diameter not less than 280 mm for 33 mm hose. The discs shall be red in colour.
- 5 The hose shall terminate in a shut-off nozzle which shall give the following control settings:
  - (a) shut
  - (b) spray (sheet or conical) and/or jet.







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- 6 Rotary operated nozzles shall be marked to show the direction of closing and opening. Lever operated nozzles shall be marked to show the setting for:
  - (a) shut
  - (b) spray and/or jet.
- 7 A manual or automatic inlet stop valve shall be fitted to each hose reel.
- 8 Working, test and minimum burst pressure for hose reels shall be as given in Table 4.1, unless otherwise stated in the Project Documentation or agreed with the Engineer.

Table 4.1 Pressure for Hose Reels

Nominal Diameter (mm)	Working Pressure (bar)	Test Pressure (bar)	Minimum Burst Pressure (bar)
19	12	18	30
25	12	18	30
33	7	10.5	17.5

9 Testing, performance and materials of hose reels with semi-rigid hose shall comply with the relevant provisions of BS EN 671-1.

#### 4.4.4 Hose Systems with Lay-flat Hose

- 1 Hose systems with lay-flat hose shall generally comply with BS EN 671-2.
- 2 The hose system shall be designed for mounting in one of the following forms:
  - (a) in a wall recess with cover
  - (b) in a cabinet in a wall recess
  - (c) in a cabinet for surface mounting
- 3 The hose support shall be one of the following types:
  - (a) Type 1: rotating reel
  - (b) Type 2: cradle with the hose double coiled
  - (c) Type 3: hose basket with the hose flaked
- 4 With Type 1 hose supports, the reel shall rotate around a spindle so that the hose can be withdrawn freely. The inside drum shall have a minimum diameter of not less than 70 mm and shall have a slit not less than 20 mm wide across the full diameter of the drum into which the folded house is located.
- 5 Type 1 and 3 supports, if fixed to the cabinet, shall allow a swing to a position at 90° to the plane of the back of the cabinet. The turning axis shall be vertical.
- 6 The hose shall be lay-flat, with a nominal bore of 52 mm, and shall not exceed 20 m in length.
- 7 A coupling shall be used to connect the hose to the valve and to the shut-off nozzle. The coupling shall be bound to the hose by means of an even pressure over the complete perimeter of the hose against the coupling shank.







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- 8 The hose shall terminate in a shut-off nozzle which shall give the following control settings:
  - (a) shut
  - (b) spray (sheet or conical) and/or jet.
- 9 Rotary operated nozzles shall be marked to show the direction of closing and opening. Lever operated nozzles shall be marked to show the setting for:
  - (a) shut
  - (b) (spray and/or jet.
- 10 A manual inlet stop valve shall be fitted to the hose system. The valve shall be screw down or other slow-opening type. The inlet and outlet of the valve shall form an angle of not less than 90° and not more than 135°
- 11 Hose assemblies shall be designed for the following pressures unless otherwise stated in the project documentation or agreed with the Engineer:
  - (a) maximum working pressure shall be 12 bar
  - (b) test pressure shall be 24 bar
  - (c) minimum burst pressure shall be 42 bar
- 12 Testing, performance and materials of hose systems with lay-flat hose shall comply with the relevant provisions of BS EN 671-2.

#### 4.5 FIRE HYDRANTS

#### 4.5.1 General

- 1 Fire hydrants shall be installed in locations as stated in the Project Documentation unless otherwise directed by the Civil Defence Department.
- 2 A certificate shall be obtained from the manufacturer stating that the fire hydrants to be supplied are suitable for use in Qatar.
- 3 Fire hydrants shall be installed in accordance with the manufacturer"s instructions.

#### 4.5.2 High Pressure Dry Barrel Hydrant

- 1 High pressure dry barrel hydrants shall come complete with removable/replaceable nozzles and hydrant seat, top stop nut, easily repaired traffic section, nozzle section with 360° rotation, main valve opening and bronze drain plug.
- 2 Working pressure of the hydrant shall be 14 bar and the testing pressure shall be 28 bar unless otherwise stated in the Project Documentation or agreed with the Engineer.
- 3 The hydrant shall comply with ASNI/AWWA C502 and shall be UL listed and FM approved.
- 4 Materials for the hydrants shall be as follows:
  - (a) nozzle section, barrels, stand pipe flanges, breakable flange, base, main valve flange, weather-shield operating nut and bonnet all shall be ductile iron
  - (b) main valve disc shall be ductile iron core and fully encapsulated in EPDM rubber
  - (c) caps shall be cast iron
  - (d) coating above ground shall be fusion bonded epoxy inside and out
  - (e) coating below ground shall be bitumen or fusion bonded epoxy







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- (f) nozzles, valve seat ring, drain ring, drain bushings and plugs, stem nut, stem bushing and thrust nut shall be bronze
- (g) stop nut, cap chain, bolts and nuts shall be zinc plated steel
- (h) stem rod coupling, standpipe lock rings, nozzle lock screw, lock plate, lock plate screw and spider bolt shall be stainless steel
- (i) barrel gaskets and cap gaskets shall be nitrile rubber.
- 5 Each hydrant shall be clearly marked, either integrally with the stated components or on a plate of durable material securely fixed to that component, as follows:
  - (a) the number of the standard to which the hydrant conforms and the date of the standard
  - (b) the manufacturer"s name or trade mark
  - (c) the identification number (the reference used by the manufacturer allowing identification for the supply of spares, etc).

#### 4.5.3 Underground Fire Hydrants and Surface Box Frames and Covers

- 1 Underground fire hydrants and surface box frames and covers shall generally comply with the requirements of BS 750.
- 2 Underground fire hydrants with wedge gate type or screw down type valves shall be suitable for a maximum working pressure of 16 bar.
- 3 Fire hydrants shall be of the wedge gate type or screw-down type.
- 4 The wedge gate valve shall comply with the requirements of BS 5163 for PN 16 valves. The associated duck foot bends shall be grey cast iron (CI) to BS EN 1561 Grade 250 or spheroidal graphite cast iron (SG) to BS EN 1563.
- 5 Materials and testing of underground fire hydraulic shall be to BS 750. Provision shall be made for a certificate to be made available which certifies that the hydrant has complied with all testing requirements of BS 750.
- 6 Each screw-down type hydrant and each duck foot bend on a wedge gate type hydrant shall be provided with a drain boss on the outlet side. It shall be located at the lowest practicable point.
- 7 The hydrants shall have screwed outlets. The screwed outlet shall be provided with a cap to cover the outlet thread. It shall be securely attached to the hydrant by a chain or other flexible device.
- 8 When fitted with a standard round thread outlet, the hydrant shall deliver not less than 2000 litres/minute at a constant pressure of 1.7 bar at the inlet to the hydrant.
- 9 The hydrant operating spindle shall be provided with a cast iron cap complying with the requirements of BS 5163. The cap shall be securely fixed to the spindle so that it remains fixed in position during normal use.
- 10 Each hydrant valve, duckfoot bend and outlet shall be clearly marked, either integrally with the stated components or on a plate of durable material securely fixed to that component, as follows:
  - (a) on wedge gate type hydrant valves:
    - (i) in addition to the marking requirements of BS 5163, the direction of valve opening on the gland or upper part of the hydrant.







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- (b) on duckfoot bends:
  - (i) the number of the standard to which the hydrant conforms (i.e. BS 750) and the date of the standard
  - (ii) the material designation of the body, for grey cast iron "CI", or for spheroidal graphite cast iron "SG"
- (c) on screw–down type hydrants:
  - (i) the number of the standard to which the hydrant conforms (i.e. BS 750) and the date of the standard
  - (ii) the material designation of the body, for grey cast iron "CI", or for spheroidal graphite cast iron "SG"
  - (iii) the direction of valve opening on the gland or upper part of the hydrant
  - (iv) if loose valve mark "LV" or ""Loose"
  - (v) the manufacturer"s name or trade mark
  - (vi) the identification number (the reference used by the manufacturer allowing identification for the supply of spares, etc)
- (d) on screwed outlets:
  - (i) the number of the standard to which the hydrant conforms (i.e. BS 750) and the date of the standard.
- 11 Class, type, manufacture, workmanship, coating and design features of surface box covers and frames shall be in accordance with BS 750.
- 12 Surface box covers and frames shall be tested in accordance with the relevant provisions of BS 750. Provision shall be made for a certificate to be made available which certifies that samples from each production lot from which the delivery is made up comply with the requirements of BS 750.
- 13 Surface box covers shall be clearly marked by having the words "FIRE HYDRANT" in letters not less than 30 mm high, in English and Arabic, cast into the cover. The cover and frame shall have clearly cast thereon the following;
  - (a) the number of the standard to which the hydrant conforms (i.e. BS 750)
  - (b) the date of the standard
  - (c) the grade of the cover and frame.

#### 4.6 PIPES AND FITTINGS

#### 4.6.1 General

- 1 Pipes shall be UL listed and FM approved. They shall be exterior galvanized steel to ASTM A 135 with a working pressure of 14.5 bar. Couplings may be of the rolled groove type or the mechanical locking type (push-on). Pipe end preparation for the mechanical locking type couplings will be in accordance with the manufacturer's recommendations.
- 2 Fittings shall be UL listed and FM approved. Mechanical grooved pipe couplings and fittings as manufactured by specialised manufacturers shall be used for all stand pipe systems.
  - (a) couplings shall be ductile iron to ASTM A 536, or malleable iron to ASTM A 47, with chlorinated butyl gaskets suitable for an operating temperature of 95°C and heat treated carbon steel bolts and nuts to ASTM A 183
  - (b) fittings shall be malleable iron to ASTM A 47 or ductile iron to ASTM A 536 with grooved or shouldered ends







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- (c) flanges shall be malleable iron to ASTM A 47 or ductile iron to ASTM A 536, with a hinged, two-piece design, suitable for opening and engaging the groves, and shall be secured in position with a tight-fitting lock bolt. Cast iron flanges shall comply with ANSI B.16.1 and steel flanges steel shall comply with ANSI B 16.5
- (d) valves shall be grooved end design with encapsulated body and disc. Neck design shall readily accommodate insulation. Valves shall have pressure assisted double seal and be capable of 12 bar bubble tight shutoff. Butterfly valves shall be with gear actuator.

#### 4.6.2 Hangers Supports Anchors and Guide

- 1 The pipework shall be supported, anchored and guided in order to preclude failure or deformation. The Contractor shall construct and install hangers, supports, anchors, guides and accessories as necessary to the approval of the Engineer. Supports shall be designed to support the weight of the pipe, the weight of fluid and the weight of pipe insulation.
- 2 Piping shall be securely fastened to the structure without over-stressing any portion of the structure itself. Pipe supports, anchors and guides shall be secured to concrete by means of inserts or if greater load carrying capacity is required by means of steel fishplates embedded in the concrete.
- 3 Hanger shall be arrange so as to prevent transmission of vibration from piping to building and supports.
- 4 Pipe hangers and supports shall be furnished complete with rods, bolts, lock, nuts, swivels couplings, brackets and all other components and accessories to allow installation to freely expand and contract.
- 5 Hangers spacing shall be such that the piping is installed without undue strains and stresses and provision shall be made for expansion, contraction, structural settlement and waterhammer.
- 6 Supports, clamps and hangers shall be made of galvanized steel, fixed with drilled plugs.

#### 4.7 PUMPS

#### 4.7.1 General

- 1 Furnish and install where shown on the drawings one LPCB listed fire pump package composed of both electrical and compression ignition engine driven single stage or multistage centrifugal fire pump complete with motor, control, fittings, jockey pump and speciality accessories necessary to complete the installation in every respect. The complete installation shall be in accordance with the requirements of, and meet with the approval of, the Civil Defence Department and any other authorities having jurisdiction. Centrifugal fire pumps shall have a horizontal shaft with electric motor drive. Jockey fire pumps shall have electric motor drives.
- Pumps serving water supply to fire fighting system are normally driven electrically with backup by a compression ignition engine and should always be arranged to start automatically in the event of system operation. In addition, arrangement for starting manually should also be installed. It is important that the electricity supply should always be maintained to the pumping set. It is therefore essential that the electrical connections be such that a power supply is always available for the motor when the switches for the distribution of electrical power throughout the building are cut. Any switches on the power feed to the motor should be clearly labelled, "FIRE PUMP MOTOR SUPPLY -NOT TO BE SWITCHED OFF IN THE EVENT OF FIRE". Such switches should be of the locking type and should be kept locked on. An indicator lamp should be provided to show continuously that full power supply is available for the motor. Any fuses in the electricity sub-circuit should be of the high rupturing capacity (HRC) type.







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#### 4.7.2 Horizontal Fire Pumps

- 1 Pumps shall be horizontal fire pumps as indicated, factory assembled and tested. The capacity and electrical characteristics shall be as detailed elsewhere in the Project Documentation.
- 2 The pumps shall be capable of delivering not less than 150% of the rated flow at not less than 65% the rated head.
- 3 Pumps shall be hydrostatically tested at the factory and run tested pump prior to shipment. The hydrostatic test shall be at 150% of shut off head plus suction head but shall not less than 1725 kPa.
- 4 The pump shall meet or exceed 75% efficiency at design point.

#### 4.7.3 Construction

- 1 They shall have cast-iron pump casing with suction and discharge flanges machined to ANSI B16.1 dimensions, of size and pressure rating detailed in the Project Documentation with a red paint finish.
- 2 Each pump shall be capable of continuous operation without producing noise in excess of hydraulic institute and OSHA guidelines.
- 3 Pump casing shall be close grain cast iron with a replaceable bronze case wear ring. The pumps shall be of the back pull out design so that the rotating element can be removed from the casing without disconnecting the suction or discharge piping. Full flange connections shall be integrally cast with the volute. Pump impeller shall be of cast bronze material and shall be statically and dynamically balanced. Impeller diameter shall be trimmed for the specified design conditions.
- 4 The pump shall be mounted on a heavy duty CI bearing frame.
- 5 The shaft shall be of stainless steel Grade 316 S31 to BS 970 Part 1.
- 6 The pump bearing shall be of the permanently sealed type designed for an L10 life of at least 50,000 hours in accordance with BS 5512 and requiring no external lubrication.
- 7 The pump shall be connected to drive motor by a flexible coupling capable of withstanding all torsional, radial and axial loads.

#### 4.7.4 Fittings

- 1 The Contractor shall provide the following accessory fittings:
  - (a) eccentric tapered suction reducer
  - (b) concentric tapered discharge reducer
  - (c) hose valve test head
  - (d) hose valve with caps and chains.
  - (e) pumps casing relief valve
  - (f) ball drip valve
  - (g) suction and discharge pressure gauges
  - (h) mains relief valve
  - (i) strainer (waste cone)





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#### 4.7.5 Electric Motors

1 Electric motors for pumps shall be horizontal, foot mounted, ball bearing, induction motor with open drip-proof enclosure. The motor shall be mounted on the same steel base as the pump and connected to the pump with a flexible coupling. The coupling shall be protected by a coupling guard. The pump and motor shaft shall be aligned prior to shipment. The pump motor current will not exceed the full load ampere rating under any conditions of pump load. Pump motor shall be suitable for 415/3/50 and 2900 RPM, class "F" insulation, 50°C ambient temperature indoor.

#### 4.7.6 Compression Ignition Engine

1 Engine for fire pump shall be horizontal shaft, in-line, turbocharged, four stroke, liquid cooled, compression ignition type. The motor shall be mounted on the same steel base as the pump and connected to the pump with a flexible coupling. The coupling shall be protected with a coupling guard. The required pump horsepower shall not exceed the rated motor horsepower rating under any conditions of pump load. Accessories shall include 24V dc starting batteries, charging system, dual starting contactors, fuel filters, canister type air cleaner, fuel storage tank, cooling system heat exchangers, exhaust silencer and piping and engine control panel. Engine accessories shall be suitable for 240 V, single-phase, 50 Hz power supply.

#### 4.7.7 Controller and Transfer Switch

- 1 The controller and transfer switch shall be LPCB listed and shall be the combined manual and automatic, across the line type. Control equipment shall be furnished in a steel mounted, drip proof enclosure with front operated circuit breaker and disconnect switch.
- 2 The circuit breaker shall be rated as approved for continued use.
- 3 The pressure regulator shall have a range of 0 to 2070 kPa with pressure settings, established at time of testing at the Site. An instantaneous recycling running period timer to prevent to frequent automatic starting of fire pump motor, set to keep the motor in operation for 6 minutes on automatic start, shall be interwired with the pressure regulator.
- 4 The controller shall be capable of interrupting a short circuit current at least equal to the short circuit current in the controller supply circuit.

#### 4.7.8 Alarm Panel

1 An alarm panel with visible and audible signals for indication for FIRE PUMP CURRENT FAILURE and PUMP OPERATING shall be installed and connected to the fire pump controller.

#### 4.7.9 Jockey Fire Pumps

- 1 Jockey pumps shall be factory assembled and tested with capacities and electrical characteristics as detailed in the Project Documentation.
- 2 Jockey pumps shall be constructed from with cast iron diffusers and adapter with registered fits to maintain axial alignment. They shall have bronze enclosed impellers, bronze casing rings, bronze base bearing, steel clamp type shaft coupling and stainless steel shaft. The impellers shall be pinned to the shaft to prevent reverse rotation damage and to maintain proper inter-stage lateral setting. They shall incorporate threaded suction and discharge connections, mechanical seals and a cast-iron pump base with drain plug. They shall have a red paint finish.
- 3 The motor controller shall be LPCB listed and approved for fire pump service. Control shall include a combination type starter with fused disconnect switch, thermal over-current protection and a hand-off automatic selector switch in the enclosure. Control shall also include an adjustable pressure switch with gauge cock.
- 4 The installation shall come complete with a brass cased pressure gauge with a 100 mm dial on the discharge pipe near jockey pump.





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- 5 The installation shall come complete with a 20 mm relief valve on the discharge line of the jockey pump to relieve excess pressure to floor drains.
- 6 The installation shall come complete with a controller sensing pipes, not less than 15 mm in diameter with a 15 mm globe valve for testing mechanism of controller.
- 7 The installation shall come complete with a 85 mm diameter bronze check valves with 85 mm orifice in the clapper or ground-face unions with non-corrosive diaphragm with a 85 mm orifice.
- 8 The jockey pumps and pump drives shall be installed on vibration isolators in accordance with the manufacturer's recommendations.

#### 4.7.10 Field Quality Control

1 Upon completion of installation the Contractor shall perform field acceptance tests to demonstrate that the fire protection pumps comply with requirements of the Project Documentation.

#### 4.8 WET RISERS

#### 4.8.1 General

- 1 The wet riser installation shall incorporate an inlet box which shall be constructed from 1.5 mm thick galvanized sheet steel and shall be suitable for recessed mounting, with 3 mm thick x 40 mm wide architrave. The box shall be provided with a hinged, lockable door with a central panel glazed with wired glass and having the words "WET RISER INLET" in 50mm high red letters on the inside face. The box shall be finished in baked enamel inside with prime coat outside to the required colour, and shall be supplied by an approved manufacture of fire equipment.
- 2 The wet riser installation shall incorporate inlet breaching which shall be horizontal or vertical pattern with integral spring loaded non-return valve, drain valve and blank cap. Each inlet shall incorporate a 65 mm diameter instantaneous male couplings. The body of the breaching piece shall be fitted in 25 mm gunmetal gate valve for drain purposes, with a plug and chain.
- 3 The wet riser installation shall incorporate landing valves which shall be a spindle valve controlled breaching with a 50 mm diameter inlet and 65 mm diameter instantaneous female outlet with blank cap. The chain valves shall be straight or oblique pattern as required, and shall be fixed in the closed position. Each landing valve shall be provided with a 30 m long by 65 mm diameter fire hose lined with coated woven synthetic fire hose as well as a diffuser branch pipe nozzle. The valve, hose and nozzle shall be accommodated in a recessed box supported on purpose made hangers and ready for immediate use. The box shall be generally constructed as for the inlet breaching, but with the words "WET RISER OUTLET" in 50 mm high red letters on the inside face of the glazing.
- 4 The top of each dry riser shall be fitted with a 25 mm automatic air release valve, brass construction, with internal solid rubber ball.

#### 4.9 PORTABLE FIRE EXTINGUISHERS

#### 4.9.1 General

- 1 Fire extinguishers shall conform with the relevant provisions of BS 5423.
- 2 Fire extinguishers shall be colour coded according to their type. The colour shall be as follows:
  - (a) red water
  - (b) cream foam
  - (c) black carbon dioxide
  - (d) blue dry powder
  - (e) green halon







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## QCS 2014

#### Section 23: Fire Fighting and Fire Alarm Systems

- The types of extinguishers that can be used on a fire is dependent upon the class of the fire. The fire classes and the types of extinguishers that can be used on them is given in Table 4.1. Final selection of extinguisher type shall be in accordance with and to the approval of the Civil Defence Department.
- 4 The capacity of fire extinguishers shall be as detailed in the Project Documentation.

Class	Nature	Example	Extinguisher Type	
Α	Carbonaceous	Wood, paper, textiles	Water	
В	Flammable liquids	Adhesives	Dry powder	
		Flammable liquid stores	Dry powder or foam	
		Bitumen boilers, petrol or diesel powdered equipment	Dry powder, foam, carbon dioxide or halon	
		Cooking range fires	Dry powder, carbon, dioxide or fire blanket	
С	Flammable gases	Lpg, acetylene	Carbon dioxide, dry powder or halon	
D	Reactive metals	Magnesium, sodium etc.	Dry powder specially developed for particular metals	
E	Electrical	Any material where there is a danger of live electricity	Carbon dioxide, dry powder or halon	

#### Table 4.2 Fire Class and Extinguisher Type

#### 4.10 FIRE BLANKETS

#### 4.10.1 General

- 1 Fire blankets shall be manufactured from woven glass fabric coated on both sides with white silicon rubber, fully tested in accordance with BS 6575.
- 2 The blankets shall be supplied in white container suitable for wall mounting. Fire blankets shall be provided in the following standard sizes:
  - (a) 1000 x 1000 mm
  - (b) 1250 x 1250 mm
  - (c) 1500 x 1250 mm
  - (d) 1800 x 1250 mm
  - (e) 1800 x 1800 mm

4.11 FM 200 SYSTEM







#### Section 23: Fire Fighting and Fire Alarm Systems

#### 4.11.1 System description

- 1 The FM 200 system shall be sized to provide the required 5% concentration of agent in the space protected. A piping arrangement and nozzle shall convey the agent from the cylinders to the hazard and discharge the agent completely within 10 seconds. The piping and nozzles shall be engineered for the specific flow rates required and calculations shall be supplied with the system layout drawings for review and approval by the Engineer.
- 2 The system design shall incorporate the capability of fully testing all electrical detection, discharge control, abort, power shutdown, air conditioning shutoff, fire damper, and door closer circuits without discharge of the agent and without disconnecting the agent supply from the system.
- 3 Installed systems shall be complete with all control wiring for detectors, alarms, door releases, fire damper releases, abort stations, manual pull stations air conditioning and computer equipment shutdown devices, voltage trips and circuit breakers. All wiring, including control circuitry, shall consist of insulation copper conductors installed in metal conduit. The FM 200 alarm and detection system wiring and devices shall conform to QCS Section 23, Part 2, Fire Alarm and Detection Systems.

#### 4.11.2 Equipment Instruction -Plates

- 1 The Contractor shall provide engraved instruction plates detailing emergency procedures at each system control panel and at each hazard area manual discharge station/abort switch location. Permanent name plates shall be used in the control panel to identify control logic unit contacts and major circuits.
- 2 Etched aluminium warning signs shall be provided at all entrances and exits of the protected area. Entrance sign shall read: "WARNING - DO NOT ENTER ROOM WHEN ALARM SOUNDS, FM 200 BEING RELEASED." Exit sign shall read: "WHEN ALARM SOUNDS, VACATE AT ONCE, FM 200 BEING RELEASED."

#### 4.11.3 Basic Pipes and Pipe fittings

- 1 FM 200 manifold and piping shall conform to the relevant requirements of the latest codes and standards.
- 2 Pipes shall be black or galvanized steel, schedule 40 for 150mm diameter and smaller, complying with the relevant provisions of ASTM A 106.
- 3 Fittings shall be galvanized malleable iron 2070 kPa class complying with the relevant provisions of ASTM A 197; ductile iron 2070 class complying with the relevant provisions of ASTM A 395; or steel complying with the relevant provisions of ASTM A 234. For 20 mm diameter or smaller pipe sizes, 1035 kPa class fittings are acceptable.

#### 4.11.4 Control Panel

- 1 The detection and extinguishing components shall be one integrated panel. The power source, for the system shall be two separately fused standard voltage circuits which will be connected to the control panel., The panel out-put shall be 24 Volts DC with a battery operated stand-by which will automatically take over and operate the system for 24 hours in the event normal power is interrupted. When trouble of this kind or within the system occurs, an audible signal as well as the indicating lights shall warn operating personnel. The fire detection and control system shall be comprised of a solid state, low power information processor and associated supervisory and interface circuitry. The system shall provide adequate isolation from external wiring to assure against transient signals causing false alarms. The system shall be optimised for use with graphic annunciation displays.
- 2 The unit shall include the following functions and logic sequence:
  - (a) operation of all smoke detection circuits







#### Section 23: Fire Fighting and Fire Alarm Systems

- (b) operation of all agent discharge circuit
- (c) operation of all audible (and visual) pre-alarm and alarm signals
- (d) provide primary power (and control backup power) for entire system.
- (e) provide interconnection to fire alarm and detection system and SCADA control station.

3 The unit shall include supervision of the following circuitry:

- (a) input power status
- (b) manual pull station circuits
- (c) alarm circuits
- (d) abort switch circuits
- (e) detection circuits
- (f) agent discharge circuits
- (g) time delay circuits
- 4 A set of contacts for connection to pre-action valve shall be provided.
- 5 Activation of one detector shall activate the general alarm. The alarm shall be a combined horn and strobe (low pulse).
- 6 Remote annunciation to the buildings security system, and illuminate LED light on graphic annunciator
- 7 Activation of a cross-zoned detector in the same area shall:
  - (a) activation and annunciation of pre-discharge alarms. The alarm shall be combined horn and strobe (fast pulse).
  - (b) energise a time delay mechanism which shall delay release for 30 seconds; the agent shall be released at the end of this time interval unless a deadman - "Agent Hold" (abort switch) is depressed; time delay to reset to 0 seconds when abort switch is depressed, restarting the time delay when released
  - (c) Shut down the air-conditioning system and close its dampers.
  - (d) Discharge of the agent shall shut down power to equipment within the protected area.
- 8 If a manual pull station is energised, the actions detailed in Paragraphs 5, 6, 7 and 8 shall bypass the time delay and overriding abort switch.

#### 4.11.5 Storage Cylinders

1 The FM 200 cylinders shall be constructed of high strength steel alloy conforming to applicable specifications of the Civil Defence Department. All containers shall be mounted securely in an upright position. Cylinders manifolded together shall be of the same size and weight/capacity. Each cylinder in a multiple cylinder group connected to a manifold shall be fitted with a flexible discharge hose and a manifold check valve. The check valve shall prevent agent loss during discharge should a cylinder be disconnected from the manifold. A mechanical method of actuation shall be provided at the cylinder location for local emergency operation.

#### 4.11.6 Discharge Valve

1 Operation of the valve shall be by means of differential pressure using the container pressure at the source. The force differential and a metallic spring shall act to hold the valve closed prior to





#### Section 23: Fire Fighting and Fire Alarm Systems

discharge and the force shall reverse upon actuation to open the valve. This reversal shall be accomplished by means of venting the agent through an opening on the container valve. The container valve shall be equipped with a pressure gauge for continuous monitoring of the container pressure safety outlet to automatically relieve pressure build-up.

#### 4.11.7 Discharge Nozzles

1 Discharge nozzles shall be one piece cast aluminium, have either a 180° or 360° flat fanshaped discharge pattern and range in orifice sizes from 3 mm to 50 mm in 1 mm increments.

#### 4.11.8 Pressure Switch

- 1 This pneumatically actuated switch shall be used to give positive identification of release of the agent in the piping system.
- 2 The switch shall have one set of normally open and one set of normally closed contacts.

#### 4.11.9 Smoke Detectors

1 Devices shall be UL listed and FM approved. The minimum contacts rating shall be one ampere for both standard voltage, single phase, 50 hertz, ±10% fluctuation.

#### 4.11.10 Graphic Annunciator

- 1 An engraved multi-layer acrylic graphic display showing walls, doors, windows, location of control panel and location of all smoke detectors shall be provided. The number and location of the displays shall be as stated elsewhere in the Project Documentation. Silk screen graphics are not acceptable.
- 2 Panel colour shall be white with black lettering. Indicators shall be light emitting diodes (LED) in red, yellow or green. All points shall be wired to a labelled terminal strip which is plug compatible to the wiring harness for ease of installation. All graphics shall use a hide- away hinge system that eliminates the need for metal frames and visible screw heads. Back boxes shall be made of 1.5 mm thick steel.

#### 4.11.11 Battery Backup Power System

1 Battery backup of the entire FM 200 system, including detection, alarm, actuation and supervisory system is required. The backup system must be designed such that upon main power failure, backup power automatically services the system with no delay or interruption of any kind. The battery system must be capable of powering-the system for a period of-not less than 24 hours in a normal standby condition, at the end of which time it shall be capable of operating the entire system in a full alarm condition for period of not less than ten minutes. The trouble horn and light shall be activated to indicate that the system is operating on a battery power.

#### 4.11.12 Alarm Horn/strobe Combination

- 1 The alarm horn shall operate on 24 volt polarised DC power to allow supervision of the circuit wires.
- 2 The alarm horn shall have a minimum sound level of 98 decibels at 3 m.
- 3 A horn and strobe light shall operate simultaneously from one power supply with flash rate of 1-3 flashes per second with peak light intensity of 800 candlepower.

#### 4.11.13 Manual Pull Stations

1 The manual pull station shall be provided for the release of the FM 200 in case of an emergency.







#### Section 23: Fire Fighting and Fire Alarm Systems

2 The unit shall be contained within a metal body having a single pole switch. The unit shall require double action operation.

#### 4.11.14 Abort Switch

- 1 The abort switch shall be used where investigation delay is desired between detection and actuation of the system.
- 2 This switch shall be a momentary contact "dead-man" type switch requiring constant pressure to operate one set of normally open and one set of normally closed contacts on each contact block. Clear operating instructions shall be provided at the abort switch.

#### 4.11.15 Automatic Fire Dampers

1 Provide press sure trips for automatic fire dampers in air conditioning ductwork servicing hazard areas separated by fire walls. Activation of fire dampers shall occur upon activation of FM 200 discharge. In case of motorised or electro thermal link dampers, pressure trips are not required.

#### 4.11.16 Basic Identification of Installation

- 1 Piping System Identification : Bare and insulated piping shall be labelled in accordance with a piping colour code. Lines above ceilings shall have utility name and directional flow arrows stencilled in designated colour. Exposed piping in mechanical equipment room shall be painted with their designated colour, flow arrow to be painted in contrasting colour. Spacing of description and arrow to be 10 m.
- 2 Underground Piping Identification : Provide continuous underground type plastic marker, located directly over buried line at 150 to 200 mm below finished grade.
- 3 Valve Identification : Provide valve tag on every valve in each piping system. Tag shall be brass, 50mm in diameter with utility service and valve number embossed or stamped on it. List each tagged valve in valve schedule for each piping system. Mount valve schedule frames and schedules in machine rooms.
- 4 Mechanical Equipment Identification : Provide engraved plastic laminate sign or plastic equipment marker on or near each major item of mechanical equipment and each operational device, including main control and operating valves and primary balancing dampers.
- 5 Install fire protection signs on piping in accordance with requirements of the Civil Defence Department.

#### 4.11.17 Installation of Pipes and Pipe Fittings

- 1 The Contractor shall comply with requirements of codes and standards for installation of fire protection piping materials. Install piping products where indicated, in accordance with manufacturer's written instructions, and in accordance with recognised industry practices to ensure that piping systems comply with requirements and serve intended purposes.
- 2 Co-ordinate with other work as necessary to interface components of fire protection piping properly with other work.

#### 4.11.18 Pressure Test

- 1 After portions of the FM 200 Systems work are completed, the work shall be hydrostatically tested in the presence be the Engineer. Five days advance notice of the tests shall be given to the Owner. Furnish all pumps, gauges, instruments, test equipment and personnel required for these tests and make all provisions for removal of test equipment.
- 2 Piping shall be tested individually by fire suppression zones, with plugs and/or caps in place of nozzles and agent storage containers as follows. A preliminary test of not more than 1500 kPa





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shall be applied to reveal possible major leaks. After this preliminary test, the pressure shall be raised to 2,000 kPa. If leaks are found, they shall be eliminated by tightening, repair or replacement. On completion of any remedial work, hydrostatic tests shall be repeated until no leakage occurs.

#### 4.11.19 Flow and Compliance Test

- 1 The Contractor shall co-ordinate and schedule flow tests at a times agreed with the Engineer. The Contractor shall notify the Engineer as to the time of flow and compliance tests a minimum of two weeks In advance of any such tests.
- 2 The Contractor shall provide all test equipment necessary to test and demonstrate that the FM 200 Systems satisfactory complies with the Project Documentation requirements. The flow and compliance test report shall include recordings of the following data:
  - (a) verification of status; for each item of equipment, alarm signalling, and zone barrier closure device prior to the test and at each stage of FM 200 Alarm, including abort and reset to the manual mode
  - (b) discharge time; time period to complete discharge by means of digital timing devices
  - (c) concentration; use thermal conductivity recording gas analysers with a minimum of three simultaneous recording points. Concentrations shall be recorded through entire holding time
- 3 Complete data shall be recorded for each fire suppression zone per the following scenario description:
  - (a) Conditions Normal; simulate an occupied facility, and verify status of device and equipment, using test lights on valves in lieu of pressurised agent storage containers
  - (b) Stage I FM 200 Alarm; activate a random smoke detector by canned smoke or similar agent and verify status of devices and equipment.
  - (c) Stage II FM 200 Alarm; activate another random smoke detector by canned smoke, or similar agent; after alarm, activate abort mode and verify status of devices and equipment
  - (d) Manual Mode; cancel the FM 200 timed release period logic by activated the key operated reset, and verify status of devices and equipment.
  - (e) Stage III FM 200 Alarm; activate a manual discharge station and verify status of devices and equipment.
  - (f) Conditions Normal; simulate an occupied facility and verify status of devices and equipment with pressurised agent storage containers replacing the test lights on valves.
  - (g) Stage IV FM 200 Alarm; activate random smoke detectors by canned smoke, or similar agent, and allow the FM 200 timed release period logic to discharge the test gas; record times and concentrations.
- If flow and compliance test indicates a fire suppression zone including related accessory devices and equipment failed to function, or concentrations during holding period were not satisfactory; reschedule another flow and compliance test to demonstrate satisfactory performance after making corrections.

#### 4.11.20 Painting

- 1 Priming: All shop-fabricated and factory-built equipment,: devices and apparatus not galvanized, or protected by plating, or a baked enamel finish, shall be cleaned and given one shop coat of paint primer. Any portions of shop coat damaged in delivery, during construction, or prior to finish painting, shall be re-coated.
- 2 Finish Painting: Do not paint name plates, labels, placards, tags, stainless steel or plated items, valve stems, motor shafts, levers, handles, trim strips, etc. Exposed and visible piping, equipment devices and apparatus in FM 200 Systems shall be ANSI standard colour.







#### Section 23: Fire Fighting and Fire Alarm Systems

3 Identification: Stencil 40 mm high white enamel block type characters on all items of equipment for identification purposes. Also, stencil a complete system of pipe identification adjacent to each valve and branch-take-off, and at not over 15 m intervals along runs of pipe, with flow arrows at each marking. Pipe identification shall be contrasting colour, either white or red, to the finish coating of the piping

### 4.11.21 CAPSULAR TYPE - FIRE EXTINGUISHING AND SUPPRESSION SYSTEM for the MCC/MV panels

- 1 Supply and install an automatic fixed type fire extinguishing and suppression system using clean agent (People safe gas FM200 or NOVEC -123 or similar QCD approved) for all the MCC/MV panels.
- 2 The automatic capsular type fire extinguishing system shall have the required UL (USA)/FM /CE (Europe)/ or LPCB or CSIRO (Austr) and Qatar Civil Defence approvals.
- 3 The system shall consist in individual capsules installed in each column compartments.
- 4 The system shall be direct release–low pressure using suitable polymer tubing as fire detection and fire extinguishing delivery system. The tubing shall rupture when exposed to the flame at 100 Degree C.
- 5 A local indication shall be provided by means of a pressure gauge for each system. A remote indication shall be provided for each system in the common alarm anunciator panel.
- 6 The system shall have a common anunciator panel installed in the same electrical room.
- 7 Common alarm from the capsular system common anunciator panel shall be transmitted to SCADA to indicate that the gas has been released.
- 8 A lock-off system shall be provided for use when maintenance is carried out and suitable warning notices shall be provided.
- 9 All control panels (such as but not limited to: MCC, MV panels, PFCC, synchronising DG panels, stand-alone VFD"s and Electronic Soft Starters panels) shall be provided with the above mentioned automatically operated Capsular type fire extinguishing and suppression system.
- 10 The system shall have successful operation installations in Qatar for a minimum 5 years in substantial number of operational installations in similar applications.
- 11 The manufacturer of the capsular type fire extinguishing system shall provide the design installation and warranty of the complete capsular type fire extinguishing system.
- 12 Spares cylinders and components shall be provided in a quantity no less that 10% installed.
- 13 The system shall include permanent notices to warn the personnel of the presence of the system and to provide instructions on its use and detailing the actions to be taken in an emergency and after the fire has been extinguished.
- 14 The gas discharged shall disconnect the MCC main incomer, disconnect the AC and shall initiate an alarm in SCADA control Room.
- 15 The Contractor shall provide written confirmation from the MCC manufacturer of his approval of the Extinguishing design and installation and confirmation that the installation does not contravene any of his MCC design requirements or certifications.
- 16 A discharge test shall be carried out on site and the Contractor shall provide all test equipment and clean agent as necessary to carry out the site test.







Section 23: Fire Fighting and Fire Alarm Systems

END OF PART







Section 23: Fire Fighting and Fire Alarm Systems

### 5 TESTING AND COMMISSIONING

#### 5.1 GENERAL

#### 5.1.1 Scope of Work

- 1 This Part specifies the requirement for the testing and commissioning of fire alarm systems, fire protection systems and fire fighting systems.
- 2 Related Sections are as follows:

Section 1 General

#### 5.1.2 References

 1
 The following standards are referred to in this Part:

 BS 5839
 Fire detection and alarm systems in buildings

#### 5.1.3 Definitions

- 1 Test: To determine quantitative performance of systems or components thereof.
- 2 Adjust: To regulate the specified rates, parameters at the terminal equipment.
- 3 Balance: To proportion flows within the distribution system.
- 4 Procedure: Standardised approach and execution of sequence of work operations to yield reproducible results.
- 5 Terminal: The point where the controlled fluid enters or leaves the distribution system.
- 6 Main: Pipe containing the system's major fluid flow.
- 7 Sub-main: Pipe containing part of the system's capacity and serving two or more branch mains.
- 8 Branch Main: Pipe serving two or more terminals.
- 9 Branch: Pipe serving a single terminal.

#### 5.1.4 System Description

- 1 The Contractor shall provide all necessary personnel and equipment required to commission the various items of plant and equipment comprising the various systems included in the Works.
- 2 Any specific requirements relating to the commissioning of each system shall be carried out as detailed in the Project Documentation. All costs associated with providing the requirements shall be included within the Contractor's rates.
- 3 Both the installation and the commissioning activities shall be undertaken as a single continuous operation. Upon completion of the installation activity, the Contractor shall test, start-up, commission and hand over the system.

#### 5.2 TESTING, START-UP AND COMMISSIONING







#### Section 23: Fire Fighting and Fire Alarm Systems

#### 5.2.1 General

- 1 The Engineer shall be present at the tests and be at liberty to participate in them. Such participation shall not relive the Contractor of his responsibilities for carrying out the tests satisfactorily.
- 2 The Contractor shall be responsible for inspecting and testing all the components of the system. Such components shall include, but not limited to, the following:
  - (a) detectors
  - (b) call points
  - (c) alarms
  - (d) ancillary devices
  - (e) fire controller equipment and associated devices
  - (f) auxiliary equipment
  - (g) operating and control software.
- 3 The fire controller and associated devices and modules shall be tested in accordance with the guidelines set out in BS 5839: Pt 1 and the testing instructions provided by the manufacturer.
- 4 The Contractor shall start up and operate the system for a trial period to ensure that it operates correctly. The duration of the trial period shall be as stated in the Project Documentation.
- 5 The Contractor shall test all performance of the completed system, including the software, to ensure that it operates in accordance with the requirements of the Specification, all relevant standards ad the manufacturer's recommendations.
- 6 The Contractor shall undertake an audibility test of the alarms. The duration and performance assessment criteria shall be determined on-site by the Engineer unless otherwise stated in the Project Documentation.
- 7 The Contractor shall start-up the system, or parts thereof, and make the necessary adjustments to ensure correct functioning.
- 8 The Contractor shall at his own expense carry out alterations to the system if the testing fails to demonstrate the satisfactory nature of the system, or parts thereof.
- 9 The Engineer shall call for further tests when such alterations have been made and his decision as to what constitutes a satisfactory test shall be final. The cost of all such further testing shall be at the Contractors own expense.







#### Section 23: Fire Fighting and Fire Alarm Systems

#### 5.3 MAINTENANCE

#### 5.3.1 General

1 The Contractor shall submit complete details of all materials and labour required to maintain the system in correct working order. The Contractor shall also include details of the testing procedures that need to be carried out and specify a maintenance schedule.

#### 5.3.2 System Spare Parts

- 1 The Contractor shall provide a detailed list of the system spare parts that should be kept onsite for maintenance of the system. The system spare parts which should be considered for inclusion in the list include the following:
  - (a) heat detectors
  - (b) smoke detectors
  - (c) flame detectors
  - (d) call points
  - (e) alarms
  - (f) beacons
  - (g) door retention units
  - (h) fuses
  - (i) circuit breakers.
- 2 The quantity of each spare part kept on-site shall be sufficient to last for the duration of the maintenance period and in addition, for a further period of two (2) years unless otherwise stated elsewhere in the Project Documentation.
- 3 Details of the system spare parts that are to be kept on-site for maintenance of the system shall be stated in the Operations and Maintenance Manual.
- 4 The Contractor shall guarantee the availability of all system spares for a period of not less than ten (10) years.

#### 5.3.3 System Test Equipment

- 1 The Contractor shall provide a detailed list of system test equipment and consumables that should be kept on-site for maintenance of the system. The system test equipment and consumables which should be considered for inclusion in the list include the following:
  - (a) detector head removal tool
  - (b) detector base skirt removal tool
  - (c) call point testing tool
  - (d) detector test smoke canister
  - (e) detector test adapter
  - (f) aerosol dispensing tube
  - (g) spare log book.







#### Section 23: Fire Fighting and Fire Alarm Systems

- 2 The quantity of each of spare part kept on-site
- 3 The quantity of each item of test equipment required and the quantity of each type of consumables required shall be sufficient to last for the duration of the maintenance period and in addition, for a further period of two (2) years unless otherwise stated elsewhere in the Project Documentation.
- 4 Details of the system test equipment and consumables that are to be kept on-site for maintenance of the system shall be stated in the Operations and Maintenance Manual
- 5 The Contractor shall guarantee the availability of all system test equipment and consumables for a period of not less than ten (10) years.

#### 5.4 TRAINING

#### 5.4.1 General

- 1 The Contractor shall provide details of the training required by personnel to operate and maintain the fire detection and alarm system.
- 2 The Contractor shall provide two levels of training:
  - (a) system supervision training
  - (b) other staff training.

#### 5.4.2 System Supervision Training

- 1 System supervision training shall include technical training sessions and on-site training given during installation and commissioning of the system.
- 2 An experienced and competent engineer familiar with the fire system being installed shall give system supervision training.
- 3 The scope of training provided shall depend on the type, size and complexity of the system.
- 4 The Contractor shall initially provided technical training in all aspects of the system. The trainee shall then be given full instructions in the use, operation and maintenance of the system. This shall include instruction in the procedures to be followed in the event of fire and false alarms, routine maintenance and testing procedures, and how to keep the Log Book.

#### 5.4.3 Other Staff Training

- 1 Other staff training shall include training sessions provided on-site after hand over of the system.
- 2 An experienced and competent engineer familiar with the fire system installed shall give the training sessions.
- 3 The scope of training provided shall include full operating instructions in the use of the fire system. This shall include instruction in the procedures to be followed in the event of fire and false alarms.







Section 23: Fire Fighting and Fire Alarm Systems

#### 5.5 SUBMITTALS

#### 5.5.1 Record Drawings

- 1 The Contractor shall submit record drawings of installed fire alarm systems, fire protection systems, fire fighting systems including equipment data in accordance with the relevant provisions of Section 1, General.
- 2 Notwithstanding the foregoing, the drawings shall include but not be limited to the following:
  - (a) arrangement drawings of each complete installation to a scale of not less than 1:50
  - (b) outline dimensioned drawings of each of the principal items of plant; each be accompanied by a schedule with full particulars of fittings, instruments and components
  - (c) sectional drawings of each of the major items of plant with parts named and numbered to facilitate maintenance and overhauls; these drawings shall also show the type of fit and running clearance for fitted and running parts and with them shall be included such detailed workshop drawings as may be necessary for the manufacture of replacement components during the working lifetime of the plant
  - (d) electrical, hydraulic and operational diagrams as may be necessary.

#### 5.5.2 Test Records

- 1 The format of recording tests shall be agreed with the Engineer. The Engineer shall be present at the tests and be at liberty to participate in them.
- 2 The Contractor shall make all records during the test and on completion thereof, shall provide the Engineer with a Test Report.
- 3 Test Reports shall be arranged and collated in a logical order. This data shall form a permanent record to be used as the basis for required future testing, adjusting and commissioning.
- 4 Test Records shall comply with the relevant provisions of Section 1, General.

END OF PART





# **Company Profile**





## INTRODUCTION

UNION Fire Protection company was established in 2016 in state of Qatar. We give the best in class products and services for all your fire and gas protection needs at compelling prices.

The aim of the company is to maintain the variety, quality and professionalism of provided services in close connection with customers requirements.

We specialize in design, supply, installation, testing, commissioning, FACP Programming and Annual maintenance contract. Our range of products includes Fire alarm system, Fire Fighting, Suppression system, Kitchen Hood System & Spare parts.

Our team of professional sale and operation individual are equipped with expertise and knowledge to service many requirements within the fire and security business.

We Committed to continuous improvement to ensure the highest standards of service at all time. The objective is to recommend, provide and a maintain optimal solutions for all fire and security.

We take pride in our reputation, technical expertise and business excellence and proud to be associated with some of the leading brands in the region and one of the QCCD Certified company in the STATE OF QATAR.,



## NATURE OF BUSINESS



We at Union Fire protection dedicated teams of service engineers, support customer base to offer electrical, mechanical, preventative and reactive Service Teams provide routine planned maintenance and urgent repairs. We also specialize in providing teams of engineers who are able to carry out modifications or extensions to existing systems at short notice. We provided solution wide range of market sector such as Oil and Gas, Commercial, Facilities management, Industrial, Power and water Sector.

Our Portfolio of solution and services include:

- Fire Alarm system
- Fire Sprinkler System
- FM -200 Gas Extinguisher System
- Kitchen Hood System
- Vesda Detection System
- Public Addressable System

- Emergency & Exit Light
- Wet & Dry Riser
- Deluge System
- Foam System
- Fire Doors
- Fire alarm system programming

## LIST OF PRODUCTS



#### Model : FC501, FC503, FC506, FC702 & FC708

- Low cost digital panel
- Auto learn and auto addressing
- Highly featured 1-8 loop digital addressable FACP
- Touch screen multilingual user interface
- Up to 128 -1,000 devices per panel
- Easy to programming, Fast and simple system



#### Type : Multi, Smoke, Heat & CO Detector

- Robust and reliable communications
- Multiple fire detection modes
- Highly featured service tool
- Variety of sounder and relay detector base

#### Type : Indoor & Outdoor Call Point with Isolator

- EN54-11 certification
- Compact, modern styling
- Test key for fast testing
- IP67 ingress protection for external applications



- Type : Input & Output Modules
- Interfaces to flow switch, ZVC, Monitoring etc..
- Interfaces to AC units, Lift controls etc..
- Multi-voltage relay module up to 240V AC



- Type : Indoor & Outdoor Sounder with Flasher
- Power and data from the loop. No additional wiring or power supplies required

FIRECLASS

- Built-in line isolator & 16 selectable tones
  - Select the tone volume and flash rate



**Fire Pump** is a part of a water supply and powered by electric & diesel . The pump provides water flow at a higher pressure to the sprinkler system riser sand hose standpipes. A fire pump is tested and listed for its use specifically for fire service by a third-party testing and listing agency, such as UL or FM Global. The main code that governs fire pump installations in North America is the National Fire Protection Association *NFPA 20*.



**Fire suppression systems (FM200)** are design specific and most commonly used for larger installations where the system is designed for a particular application, large marine, server rooms, industrial paint lines and electrical switch rooms. Engineered systems use a number of gaseous or solid agents with many of them being specifically formulated in accordance with NFPA2001.



**Kitchen Hood -** Fire Extinguishers are designed specifically to fight some of the toughest fires hot grease, cooking oil, and fat fires in the kitchens and food-prep areas of restaurants, convenience stores, food courts, hospitals, school cafeterias, and other facilities. This compliance with NFPA 10 fire extinguisher size and placement for Class A Hazards which means you can protect the kitchen area without additional extinguishers .

## **PROJECTS & BRANDS**

- Mixed Use Development Al Asmakh
- Company House Musherib Properties
- Al Madar Welding Factory Al Madar Group
- QP School Dukhan Galfar Al Minsad
- Woqod Bitumen plant phase-2 QP Petroserv Limited
- Ashghal School Al Sailiya
- Multistory Car Parking Qatar University- Techno Q
- Al Saad Mall Al Sharan Development Group
- HQ Techno Q Office Techno Q
- Residential Building Sterling Wilson
- Woqod Petrol Station CDCT
- Warehouse & Workshop Gulf Contracting
- Barwa City Al Asmakh
- Warehouse GWC
- Barwa Al Baraha Al Waseef
- Warehouse & Accommodation- Al Bader constriction









FIRE PROTECTION PRODUCTS

الاتسحساد لآنظمية اطفياء البريسق والبر

UNION FIRE PROTECTION





www.unionfireprotection.co

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SIEMENS

Innovative Fire Solutions

FIRE

## CERTIFICATION

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**FIRECLASS** 







# **Manufacture Profile**







## Fire Detection. Product Catalogue. Issue 4 2020.

The power behind your mission

















FireClass is a revolutionary new class of commercial fire detection products.

FireClass consists of a comprehensive range of fully approved quality products designed and manufactured in Europe.

FireClass is designed to appeal to both the end user and installer with the latest fire detection technology packaged in an easy to install, out-of-thebox, digital open-protocol solution.

A new class of fire detection designed to meet all of your needs from a single supplier.





#### **Comprehensive Range**

FireClass provides a broad range of detection solutions. FireClass conventional fire detection products range from the low cost J408-2 2 zone panel to the expandable 24 zone J424 panel.

These are complemented by an enviable range of conventional fire detectors

and accessories focused on providing comprehensive protection and minimum false alarms.

FireClass addressable fire detection products range from the easily installed out-of-the-box FC501 and FC MAE software to monitor various locations via IP to the 4 Loop FireClass 64 and FireClass 240 networked digital protocol fire panels with optional FireClass Graphics.

FireClass Addressable uses a powerful and robust digital protocol for high reliability and flexibility in installation.



## CONTENTS

#### **FireClass General Content**

FireClass Locations Why FireClass FireClass Scenarios FireClass a Solution Focused Approach Total Solutions from Johnson Controls Johnson Controls Security Products Introduction FireClass Icon Library Best in Class from FireClass







1 PO Box 61355 Block D, Floor 3 Office Park Building #56, Dubai Internet City, Dubai, United Arab Emirates



Johnson Controls Tyco Park Grimshaw Lane Newton Heath, Manchester M40 2WL United Kingdom

2



Johnson Controls Yangin Korunum Sistemleri Anonim Sirketi Ehibeyt Mahallesi, Aykon Plaza 1242, Cadde, Nox 36 Kat 2/10 06520 Balgat -Ankara Turkey



5 Johnson Controls Via Gabbiano 22 Zona Industriale S. Scolastica 64013 Corropoli (TE) Italy



Johnson Controls 3 Rua Robert Bosch, 568 Barra Funda São Paulo / SP 01141-010 Brazil



6 Johnson Controls c/ Isaac Peral 3 28823 Coslada (Madrid) Spain



7 Johnson Controls Unit 3, Thandanani Office Park Halfway Gardens Midrand 3610 South Africa



8 Johnson Controls Kopersteden 1 P.O. Box 198, 7500 AD Enschede The Netherlands



9 Johnson Controls 1002, Wing, c'/ 10th Floor Godrej Coliseum Sion, Mumbai - 400 022 India










10 59-61. Etele út 1119 Budapest Hungary



Johnson Controls 2 Serangoon North Avenue 5 07-01 Singapore 554911



# Locations





# Why FireClass?



FireClass is a digital fire detection technology built on over 50 years of dedication and performance from Johnson Controls



The panel's core technology uses a digital fail safe algorithm to talk to each device and determine if that device is functioning as it should. The system can then promptly and precisely alert facilities management personnel, based either on-site or remotely, to any breakdowns or maintenance issues.



FireClass encompasses three main levels of detection including optical smoke detection, heat detection and detection of CO levels. Depending on the application; these can be adjusted to various levels of sensitivity in order to sense a fire and reduce false alarms.



FireClass provides an extended 10 year lifespan on the CO sensitivity element. This device is primarily used to protect occupants whilst they sleep.



The Triple Sensor Detectors can sense all signatures of fire including heat, smoke and CO. The system analyses all three channels of data and rapidly analyses, using sophisticated algorithms to provide an accurate confirmation of a real fire.





Widely chosen as the fire detection product of choice, FireClass addressable control panels take today's computer performances and adapt them to become one of the most effective and sophisticated fire alarm panels on the market.



### Commercial

The FireClass range comprises a complete fire detection solution for all commercial environments. Bringing sophisticated fire detection technology into these public spaces, used by millions each day, will ensure a safe and secure environment.

FireClass systems provide an unbeatable level of accuracy and ease of use for building personnel, installers and firefighters. At the first sign of danger, the FireClass system triggers a pre-programmed coordinated alarm, people are led out of the danger area via both audio and visual messages, and extinguishing systems are activated if required.

Our detectors can be found in almost every commercial environment including office complexes, hotels and shopping centres, schools and hospitals around the world.

FIRECLASS

# FireClass for Residential and Work Environments

Keeping your home, business, loved ones and property safe is of paramount importance. For ultimate safety and adaptability FireClass products can be installed to protect any environment.

The FC501 Panel saves installation time and cost, and provides an out-of-the-box solution which does not require configuration. It's easy to set up with a little training and has full local and remote monitoring control.



FIRECLASS





# FireClass for Office and Corporate Environments

In corporate office buildings false alarms can be an expensive and time consuming blight on business and the fire and rescue services. The FireClass range features a number of enhanced fire detection technologies designed to improve the management of false alarms and reduce their impact. These include, the Triple Sensing Detectors (sensitive to Heat, CO and Optical smoke detection) FireClass Graphics fire alarm management system and a selection of manual call points with covers.



# FireClass for Retail Environments

Retailers large and small face the constant challenge of loss prevention, whether the risk is vandalism or arson, customer or staff theft, fraud or robbery. Protecting a business against fire and smoke damage, but most importantly, safeguarding the welfare of employees and customers, should be of primary concern in the overall running costs of any business.

Industry statistics tell us that commercial fires cost more than £2 billion to the UK economy in 2013 and 60% of private businesses never recover from a fire.

Johnson Controls is committed to helping customers achieve their commercial and industrial safety and security goals so that they may maintain and improve business productivity.

FireClass FC501 offers the ideal solution for retail premises; from large and multi-site to smaller, single shops. Retailers often alter or modify their internal shop architecture and some shop alterations are often carried out with conservative time frames in order to minimise off-trading. FC501 provides triple loop inputs, spurs and radials. It can be wired in many ways to achieve the desired result for a suitable fire detection system as it has the flexibility to match requirements in any shop size, whilst being able to adapt to new layouts as easily and quickly as possible. The FC501 also has the added advantage of integrating IP based cameras into the Graphics package, to allow remote confirmation of alarms.

FIBECLASS

### **FireClass for Hotels**

Hotels often offer a complex challenge with varying room sizes, restaurants, leisure facilities and public areas all under one roof. The reliability of the system is paramount as its primary function is to protect life. FireClass systems provide the most effective cover, performance you can count on with minimum disruption to the operation of the building and its occupants.

Most hotel bedrooms have en-suite facilities containing bath and shower. Both of these can generate substantial amounts of steam which is known to trigger some smoke detectors. This disruption could be extreme and result in an unnecessary full evacuation. Various sensitivities are available to truly tailor the system to the building owner's needs. Guests can be inconvenienced if sleeping, eating in the restaurant, relaxing in the bar, or in a meeting or conference in one of the hotel's meeting rooms. Not to mention the financial penalties when guests refuse to pay or take their business elsewhere for the next visit.

The FC460PC Multisensory uses sophisticated technology to ensure that the steam escaping from the en-suite facility will not trigger an alarm. However the sensor is still highly sensitive to the products of combustion generated by a smouldering fire and will raise an alarm even before a normal sensitivity smoke detector, due to its ability to sense the combustion gas; carbon monoxide, produced by the fire.

الاتحاد لأنظمة اطفاء الحريق والحماية UNION FIRE PROTECTION

# FireClass for Care Home Environments

The reliability of a suitable fire detection and alarm system within a residential care home is paramount as its primary function is to protect life. Unlike most buildings whose occupants are of sound mind and body, this is not always the case in residential care premises and this should be taken into account when planning your fire detection system.

Disruption can be stressful to residents and it is therefore vital that the chosen system provides effective cover, performs reliably, and gives the maximum possible warning in the event of fire, given the additional difficulties in evacuating residents to safety.

Furnishings in residential homes often contain carbon. When these materials are involved in a slow smouldering fire, carbon monoxide is released. The combustion gas is highly toxic, odourless and colourless and poses a major threat to a person sleeping. Long before there are any visible signs, toxic gases can reach dangerously high levels. In older and frailer people the threat to life is exacerbated.

By installing the FC460PC Multisensory in each bedroom, protection is afforded to the highest level from the emissions from a fire of heat, smoke and carbon monoxide.

الاتحاد لأنظمة اطفاء الحريق والحماية UNION FIRE PROTECTION These three detection elements combine to provide a highly sensitive detector which although classed as an optical smoke detector, increases its sensitivity in a fire where there is a presence of carbon monoxide. This enables the detector to operate, in most cases, much faster than a standard optical smoke detector enabling the occupant of the room to be rescued earlier and suffering less from the effects of smoke/ toxic gas inhalation.

There are times when vulnerable occupants within a building are at risk but sounding a high level warning will just cause distress. In such cases FireClass sounders and beacons are addressed which means although installed on the same cables they can be programmed, when to operate and at what volume. Volume is set in software so some sounders can be set at lower levels than others, or even turned off leaving only the flashing beacon operating. This allows the designer to be flexible in his design whilst the installer and user do not incur extra costs for additional wiring of sounder circuits. In some cases designers even opt to use the feature whereby they sound just the one detector in alarm for a period of time, to allow the occupant to clear the cause of the activation.



# FireClass for Manufacturing and Warehouse Environments

Warehouses and manufacturing spaces can vary enormously in size and process, some being fully automated and some having multiple occupants at different times of the day.

Distribution warehouses can be difficult places in which to work as they may require specialist platforms for working at height and could present on-going problems for maintenance and repair.

Equipment used and access to escape routes are also major factors when planning and designing an effective fire detection system. Alternatives to the standard point detection systems are smoke beams, and aspirating systems within storage racking, providing the solution for a sensitive yet stable fire detection solution.

The FC460 addressable multisensory detectors are ideal for this environment. They can be programmed in such a way that at certain times of the day, when the building is fully occupied and the risk of fire going undetected is low, the smoke elements can be turned to low sensitivity and then turned back up to their normal sensitivity during unoccupied periods.

الاتحاد لأنظمة اطفاء الحريق والحماية UNION FIRE PROTECTION The FC460 addressable point detectors also have added protection applied to printed circuits and vital components to enable them to survive in environments that are more difficult. Threshold compensation overcomes the effects of dirt and dust and prolongs the life of the detector reducing lifetime costs. You can also read the contamination level of each sensing element for each device in the FireClass range at any time you wish.

The Fire Ray 5000 smoke beam and FC410 beam detector module allows direct connection to the addressable loop, saving wiring and associated costs. The beam detector is motorised so if the beam alignment shifts due to building movement, it realigns itself automatically.

The ICAM AS 460 and 461 single or dual air sampling systems combines the best of the FireClass 460 PH multisensory with proven air sampling techniques. This form of detection is ideal within racking where plastic pipes are all that exist and can easily be protected against the risk of mechanical damage.







# FireClass a Solution Focused Approach

VdS CE LPCB

The FireClass product range has been consistently developed with the views and needs of customers and end users in mind. All our products are specifically focused on providing the most effective and efficient system for the environment and for those responsible for installing and maintaining the system. Below are some examples.

#### Customer Requirement:

Often on a construction site, such as a newly built office block, fire detection installation contractors are requested to provide a first fix installation to all detectors but they are not able to return to the site for several months to complete the installation due to the installation of the ceiling.

#### Solution:

On a recent installation with Fire Detection and Suppression, Bristol, for installation of all detectors FireClass recommended that our customer use the Ceiling Tile Adaptor Kit (517.050.060), this way the engineers were able to not only first fix devices but they were also able to install and commission all smoke detectors and complete programming and testing in one visit.

The engineers clipped their standard bases to the ceiling tile adaptor back box then installed the detectors. They were then able to connect the devices to the loop and test each device.

On this project, the engineers were able to leave the ceiling tile adaptor bezel and clamp, which had been installed by the ceiling tile contractor, in positions marked on the installation drawings. This was done by drilling a 127mm hole in each tile and then pushing the bezel and clamp into the hole. The contractors were then able to pull through each detector as they installed the ceiling tiles.

Upon return to site the fire alarm engineers simply re-tested the system and handed over to the client to manage. No additional visits were required to second fix detectors, therefore offering a cost saving to the end user.

#### Outcome:

FireClass was able to save the end user costly re-visits for continued testing and commissioning of the system. This enabled our customer to win further work with this client and other clients as they had the time available to send their engineers to site.

#### **Customer Requirement:**

When dealing with a monitoring gas extinguishing system for instance in a server room with addressable fire detection in all areas, customers often require the system to be controlled by a central panel located in the engineers' maintenance office.

#### Solution:

Within the FireClass range, we offer an addressable panel which uses addressable smoke and multi sensors in the server rooms. This could be used to distinguish a fire condition in each server room giving full details and enabling Quad Input/Output units (555.800.771) to be programmed to operate a Prescient III gas extinguishing panel to operate the gas suppression required in the correct area.

The system also uses addressable detection for all areas outside of the server rooms and effectively reports back to the same panel. Using a four loop panel provided the capacity to have up to 1000 addresses, consequently leaving the end user enough space on the loop for future expansion.

These signals were all then reported back to a FireClass Graphics system (FCG-001) where, with the full flexibility of a computer, the end user was able to monitor all activations from site on a graphical representation of the area where the incident occurred. The user friendly software also enabled the end user to customize how they wanted to see the screen and all relevant buttons for controlling the fire alarm panel.

#### Outcome:

Using FireClass the customer was able to provide a building solution, using an addressable fire alarm panel and devices together with gas extinguishing panels and a full graphical interface to control the system and mimic the status at all times.











# **Total Solutions from Johnson Controls**

A global company with a strong local presence Johnson Controls' mission is to advance safety by finding smarter ways to save lives, improve businesses and protect where people live and work.

Our global presence, local knowledge, diversified product ranges and investment in research and development mean we can offer a complete solution from design, manufacture and installation to outstanding after sales support and training.

Part of our strength lies in our brand portfolio and complete solution offering. Johnson Controls offers products with some of the world's most trusted and recognized fire suppression, detection and mechanical products.

Individually, each represents the highest levels of research, development and proven performance, with ISO 9001-2000 quality registrations and major international performance standards and approvals. Together, they add up to the most encompassing source of protection a customer will find.



### **Fire Detection**

With over 50 years of experience designing fire detection technology, Johnson Controls offers a solution for every environment from simple conventional systems to complex integrated systems for hazardous industrial installations. Their team of expert engineers and designers are continuously researching fire detection technology to develop innovative and more enhanced systems to improve the fire safety and protection.

This expertise and heritage has been responsible for innovative solutions over the years, including the first carbon monoxide fire detection technology for commercial environments and triple sensing technology.







# 27



### **Special Hazards**

For today's businesses, survival depends on the management of critical assets like never before. With more than 600 years of combined experience in special hazard fire suppression, Johnson Controls sets the standard for the suppression and detection of fire in industrial, commercial, and other special hazards – offering a solution which considers all the risks of the hazard.





### Water Fire Suppression

More than 30 million specialised sprinklers are installed to protect environments and people throughout the world every year. Each year Johnson Controls is investing in new innovative technology to ensure our solutions meet the needs of our customers and offer the smartest protection for every environment.

### **Dedication to Innovation.**

Each year, Johnson Controls invests millions of dollars and countless hours in the development of new technologies to safeguard lives, property and the environment. Our innovations are based on customer needs, the outcome of a thorough understanding of their unique industries and the challenges and opportunities they face.

Supported by our advanced research and development facilities, and modernized manufacturing platforms throughout the world, the solutions we provide deliver measurable value, performance and sustainability to our customers.

For more information on complete solution offerings from Johnson Controls please visit www.johnsoncontrols.com





# **Johnson Controls Security Products**

tyco	American Dynamics	<i>tyco</i>   Bentel	tyco	CEM Systems
tyco	DSC	<i>tyco</i>   Exacq Cloud	tyco	Exacq
tyco	Illustra	<b>tyco</b>   Kantech	tyco	Visonic

tyco | Software House

# Multiple Discipline Systems Integration

Tyco, a Johnson Controls company, is a unified group of World-leading access control, video and intrusion brands. These brands -American Dynamics, Bentel, CEM Systems, DSC, Elpas, Exacq, Kantech, Software House, Sur-Gard and Visonic - have more combined years of experience in the security industry than any other group in the world. Our security integration platforms, built by our developers from across all product disciplines, allow our customers to see more, do more, and save more. Our solutions today are designed to be compatible with the technology of tomorrow.

In more than 40 offices with more than 2,000 employees around the world, we support our global, local, and regional customers to the highest level with sales, technical support and customer service before, during, and after the sale. Our world-class channel of dealers, integrators and distributors are trained to help customers with any complex problem in virtually any industry - retail, residential, gaming, transportation, healthcare, finance, education, government, POG to name but a few.







# **Company Registration**







إدارة التسجيل والتراخيص التجارية

مستخرج ببعض بيانات السجل التجارب

Registration and Commercial Licenses Department

تاريخ الطباعة: 2021/01/04

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رقم السجل التجارب:	85372	رقم التسجيل الضريب:	5000470724
الأسم التجارب:	الاتحاد لأنظمة اطفاء الحريق والحماية	السمة التجارية:	
تاريخ انشاء السجل:	17/07/2016	تاريخ انتهاء السجل:	12/01/2022
الشكل القانونى:	شركة ذات مسئولية محدودة	راس المال:	200000
حالة السجل:	نشط	جنسية المنشأة:	قطر
عدد الفروع:	0		

### معلومات الاتصال

أرقام الاتصال:

صندوق البريد:

### الشركاء

الحالة	النسبة	الجنسية	رقم السجل	رقم الإثبات	الأسم
نشط	51	قطر		27463400486	متعب تويم محمد المنخس المرب
نشط	49	الهند		28935624200	کورہ جیلو ام راجیندران

### المدراء (المخولون بالتوقيع)

الصفة (الصلاحية)	الجنسية	رقم السجل	رقم الإثبات	الأسم
صلاحيات كاملة ومطلقة - مدير	قطر		27463400486	متعب تويم محمد المنخس المرب
تسجيل والتراحم التجارية التجرير المسالتجارية التجارة والمنا	مذکورة اعلاه سجلت تحينا	Page 1 of 2 رقم السجل : 85372 فقطر بان المنشاة ال	غير MBER هد غرفة تجارة و صناعة	ພໍາ
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Registration and Commercial Licenses Department إدارة التسجيل والتراخيص التجارية

مستخرج ببعض بيانات السجل التجارب

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صلاحيات كاملة ومطلقة – مدير	الهند	28935624200	کورٹ جیلو ام راجیندران

### الأنشطة التجارية

إسم النشاط	الرقم	إسم النشاط	الرقم
ترکیب و صیانة مواد و اجهزة و معدات الانذار و الاطفاء و	4321301	تجارة اجهزة و معدات الانذار و الاطفاء و السلامة	4759601
السلامة			









إدارة التسجيل والتراخيص التجارية

وزارة التجارة والصناعة Ministry of Commerce and Industry

تاريخ الطباعة: صفحة رقم:

2020/09/22 No 1 of 1

Registration and Commercial Licenses Department

رخصة تجاربة

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رقم الرخصة: الأسم التجارى: نوع المنشأة التجاربة: السمة التجاربة:

124187 الاتحاد لأنظمة أطفاء الحريق والحماية شركة

تاريخ اصدار الرخصة: تاريخ انتهاء الرخصة: رقم السجل التجارت:

2016/10/05 2021/09/29 85372

بيانات المدير المسؤول :

اسم المدير المسئول: رقم الإثبات:	کورٹ جیلو ام  راجیندران 28935624200		جنسية المدير المسئول:	الهند
بيانات الموقع :			نمر	وذج ختم المنشأة التجارية
تصنيف الموقع:	تجارى	عقار رقم:	188	
نوع الموقع:	مكتب تجارب	رقم الدور/ الوحدة:	1	
المنطقة:	56 بو هامور	اسم مالك العقار :	خالد سلطان عبدالله الحسن السليطي	
الشارع:	السوق المركز	نوع الرخصة :	دائمة	
رقم الشارع : الأنشطة التجاربة :	995	وصف العنوان :	بلدية الربان	

إسم النشاط	رقم النشاط	إسم النشاط	رقم النشاط
تركيب و صيانة مواد و اجهزة و معدات الانذار و الاطفاء و السلامة	4321301	تجارة اجهزة و معدات الانذار و الاطفاء و السلامة	4759601









# بطاقة ضريبية - TAX CARD

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TIN Number	5000470724		رقم التعريف الضريبي
Taxpayer Name:	لمة اطفاء الحريق والحماية	الاتحاد لآنخ	إسم المكلف:
	Al-athad L'aanzmh Atfa'a A	l-hryq Walhma	
Commercial Registration Number	85372		رقم السجل التجاري القطري
Address	Building منطقة: Zone: 56	: المبنى :و	العنوان
[Headquarter]:	: طر <mark>یق س</mark> لوی : <mark>St</mark> reet	شارع	(المركز الرئيسي):
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Legal Form:	and fire safety material ذات مسؤولية محدودة معنطانامونا لمعانسا ا	<b>s and equi</b> شرکة	الشكل القانوني:
Activity Commencement Date:	17/07/2016		تاريخ بدئ النشاط:
Number of Branches:	0		عدد الفروع:
Registered taxes :			الضرائب المسجلة :
Income Tax	REGISTERED - 17/07/2	مسجل <b>-016</b>	الضريبة على الدخل

Income Tax

مسجل - REGISTERED - 17/07/2016



الهيئـة العامة للضـرائـب GENERAL TAX AUTHORITY

هذه الوثيقة مستخرجة من النظام الآلي و ليس من الضروري التوقيع عليها

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	المفوضين Authorizers	
التوقيع	الاسم	رقم الوثيقة
pjose-n	کوری جیلوام راجیندران KOORICHELVAM RAJENDRAN	28935624200
and the second	متعب تويم محمد المنخس المرى METEB TOWAIM AL-MARRI	27463400486
Cards 1	ا ا mstruction عدد البطاقات 1 /	تعليمانك
• Whoever finds	طاقة ان يقوم بتسليمها الى اي مركز للشرطة this card should deliver it to any police station	، على من يجد هذه البر





# **ISO Certificate**







# **CERTIFICATE OF REGISTRATION**

This is to certify that the Quality Management System of

# **UNION FIREPROTECTION W.L.L.**

Zone 56, Street No.995, Building No.188, Wholesale Market Road, Doha, Qatar

has been assessed and registered by TNV as conforming to the requirements of:

# ISO 9001:2015

### For the following Scope

"Supply, Installation and Maintenance of Fire Alarm System, Fire Fighting System, FM-200 System, Fire Suppression System and FACP Programming Support"

"IAF Group-28"

TNV is accredited by International Accreditation Services (IAS),Status of Certificate can be verified on TNV's website www.tnvgroup.org

Certificate Number : Initial Issue Date: Issue Date: Valid Until: 1" Surveillance Date: 2<sup>nd</sup> Surveillance Date: Revision: 201119017401 19<sup>th</sup> Nov. 2020 19<sup>th</sup> Nov. 2020 18<sup>th</sup> Nov. 2021 19<sup>th</sup> Oct. 2021 19<sup>th</sup> Oct. 2022 00



Of TNV House \$37.8/197.9. Amber Vitar, Lucknow-20 UP, Mail: info@tnvgroup.org

day of the certificate a subject to the organization maintaining its system in accordance with respective Management System Standards along with TNV's

conficter entries the experts of Sty System. Certification P Ltd., to whom it must be returned upon request. If noo must be accordance address address requirement of the TNV and Accreditation board (if any) failure to meet the requirement shall be held table for action. Certificate in not that evidence at the Uncertice status, must be verified with current status as given in TNV's official website i.e. www.thvgroup.org or writer to



MANAGEMENT SYSTEM



Pragyesh Singh

TNV System Certification P Ltd.

CEO

# **QCDD Engineers Certificates**





تاريخ الطباعة :07-2019-2019 وقت الطباعة :AM 8:37		4	A CLEUNS ST		وزارة الداخليــة الإدارة العامة للدفاع المدن إدارة الوقــايــــة
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### لا مانع من إضافة المهندسين المؤهلين والمذكورين بعالية علما بأن تصنيف الشركة فئة ثالثة إنذار

ملاحظات :

1 - يجب على المهندسين المسجلين الالتزام بكافة اللوانح والقوانين المنظمة لمزاولة المهنة بدولة قطر مع مراعاة أي قرارات تصدر من لجنة قبول المهندسين بصفتها جهة الاختصاص

2 - يجب مر اجعة الإدارة العامة للدفاع المنني في حلة الرغبة بإعتماد مهندسين إضافيين للشركة من اجل الحصول على بطاقة تسجيل المهندس. 3 - ضرورة تواجد المهندس في الموقع انتاء مواعيد تفتيش الإدارة العامة للدفاع المدني وإيراز بطاقة تسجيل المهندس الخاصة به والصادرة من قبل إدارة الوقاية. 4 - ان تكون تقارير الفحص والصيانة موقعة ومصدقة من قبل المهندسين المذكورين أعلاه.

# \* هذه الإفادة صالحة حتى شهر من تاريخ الطباعة.





# **Products & Services**





SNo	Product & Services
1	1 Loop Addressable FACP FC501
2	Smoke Detector / Base FC460 P
3	Heat Detector FC460 H
4	Manual Call Point FC420CP -I
5	Multi Detector/ Base FC460 PH
6	Sounder/Flasher Addressable FC440AVR
7	Interface Module FC410 RIM / FC410 CIM
8	Remote Indicator
9	Supply & Installation of Devices, and Cable Pulling
10	Programming of Fire Alarm System, Document Submission & QCD Inspection





# **Technical Catalogue**









# FC501 Addressable Fire Control Panels

The FC501 easy-to-programme control panel has a 4-line, 40 character per line, LCD module display with a backlight, which provides written information regarding the system status, such as temperature, CO level, and smoke level, and is also used for programming the control panel.

The front panel controls enable text and configuration changes.

The FC501 auto-addressing panel has 3 in 1 loops that can support up to 128 addressable devices and 32 zones.

There are two versions available (1.8A or 2.7A power supply), as well as an optional IP board.

# 

### Figure 1: FC501 addressable fire control panel with FC500 repeater

#### Specifications

- · The encolsure and front door are plastic.
- H x W x D: 369mm x 335mm x 115mm

FC-FC501-P-DS Doc. Version 2.0





# Features

### Additional Panel Features

- Up to 400mA current dynamically shared across 3 circuits in 1 loop
- · Auto mapping with Intelli-Zone feature
- Online Help function
- · USB interface dual role Host/Device
- · Multi users and multi installers (Up to 2 installers, 8 users)
- Walk test function
- 4000 Event Log
- Loop break location
- On board PSTN communicator
- · GSM/GPRS as external module
- · Up to 4 repeaters and multifunction interfaces for printer / simplified fire brigade panels
- · Event transmission through PSTN and IP
- Automatic drift compensation

### Software Features

- · Fast and simple system configuration, also offline
- Transferable user database
- Device graphic displayed
- · Battery and wiring calculation
- Customizable cables database
- · Visualization of all the devices assigned to a single zone
- · Remote real time visualization of control panel loop and zone status, and so on.
- · Easy Remote user interface with control buttons (reset, silence, evacuate)
- · Multilevel map based on a tree structure
- · Access device data from any pages of the map
- · Configuration downloadable to USB memory stick
- Capability to print zone label sheet for front panel customization

# **Ordering information**

### Table 1: Product and accessories ordering information

Order number	Product details
Variants	
557.200.719	FC501-L: Triple Circuit Single Loop Panel Icons - 1,8A PSU
557.200.718	FC501-H: Triple Circuit Single Loop Panel English - 2,7A PSU
557.200.720	FC501-HK: Triple Circuit Single Loop Panel - 2,7A PSU, Icons

2 FC501 Datasheet





Product details				
Accessories: SKU Description				
FC500MFI: Multifunctional Interface	]			
FC500IP3: IP Module				
FC500BX: Cabinet for Spare 38Ah Batteries				
USB 5m: USB 5m cable type A				
FC500DISPSpare Display	ĭ			
FC-MAE: FC500 Panels Monitoring Software				
FC500 FireClass Repeater				
	Product details   escription   FC500MFI: Multifunctional Interface   FC500IP3: IP Module   FC500BX: Cabinet for Spare 38Ah Batteries   USB 5m: USB 5m cable type A   FC500DISPSpare Display   FC-MAE: FC500 Panels Monitoring Software   FC500 FireClass Repeater			

### Table 1: Product and accessories ordering information

# **Performance characteristics**

### **Table 2: Performance characteristics**

	FC501-L	FC501-H and FC501-HK	FC500
Dimensions H x W x D mm	369 x 335 x 115		234 x 345 x 55.7
Weight	3 kg		2.7kg
Operating Temp	-5°C ÷ 40°C		
Storage Temp	-40 ÷ 80 °C		
Humidity	Up to 95% Non Co	ondensing	5. fr
Supply Voltage	230VaC 50Hz - 15	19 Vdc - 30 Vdc	
PSU Imax	1,8A 2,7A		130 mA (dc)
Aux output rated voltage	27,6 Vdc 27,6 Vdc		NA
Max Battery Size	12 Ah	12Ah - 38Ah external box	NA
Loop Power	200mA	400mA	NA
IP Rating	IP30 IP30		
Enclosure colour (cabinet and door)	RAL 7035		-





# Approvals

### **Table 3: Approvals**

	CE	CPR Approval			European Type Approvals			International Listings					
	0051 19 Tyco Fire & Security GmbH, Victor von Bruns-Strasse 21, 8212 Neuhausen am Rheinfall, Switzerland.	EN 54-2	EN 54-4	EN 54-21	MED	LPCB	VDS	AFNOR	FNO	SB SC	FP ANZ	HK FSD	TFTF
FC501	DOP-2018-4260-0051	×	×	x									

All required Declarations and certificates are publically available on the website <u>www.fireclass.net</u> and are searchable by number or model name. The above fire detection products are components designed for use in Addressable Systems exclusively available to registered partners only. They are intended for installation by trained registered personnel only. Systems should be installed and configured according to local regulations.

# Comparision of FC501, FC503, and FC506 features

Feature	FC501	FC503	FC506		
Addressable loops	- 	75	۵. ۲		
No. of Loops	1 Loop	1 Loop	2 Loops		
Loop Splitter / Sub- Loops	3	3	6		
Max Current Draw per Loop	0.5A*	1A*	1A*		
No. of Devices	128	250	500		
Outputs		12			
Fault	1	1	1		
Fire	1	1	1		
Programmable Open collector Outputs	2	2	2		
USB Interface	1	1	1		
RS232 Interface	1	1	1		
RS485 Interface	1	1	1		
24V (for RS485 Devices)	1,	1,	1,		
	Max Current: 0.5 A	Max Current: 1 A	Max Current: 1 A		
24 V Auxiliary	1,	1,	1,		
	Max Current: 0.5 A	Max Current: 1 A	Max Current: 1 A		
24V Resettable	1,	1,	1,		
8	Max Current: 0.5 A	Max Current: 1 A	Max Current: 1 A		

#### Table 4: Comparison of FC501, FC503, and FC506 features

4 FC501 Datasheet





Feature	FC501	FC503	FC506		
Sounder / NAC Outputs	2 , Max Current: 0.5 A	2 , Max Current: 0.5 A	2 , Max Current: 0.5 A		
	per NAC	per NAC	per NAC		
Power supply	÷	16 16			
AC Mains Voltage	230Vac -15%/+10%, 50-	60Hz	No.		
PSUs	BAW75T24	BAQ140T24	BAQ140T24		
	(27.6V, 2.7A)	(27.6V, 5.5 A)	(27.6V, 5.5 A)		
Maximum Battery Size (Inside Panel)	2 (12A/h)	2 (17A/h)	2 (17A/h)		
Maximum Battery Capacity	38 Ah	38 Ah	38 Ah		
Battery Optional Box	YES	YES	YES		
Panel Cabinet	Plastic Box	Metal Box, Plastic Door	Metal Box, Plastic Door		
Management software		5			
Software	FireClass console	FireClass console	FireClass console		
Communication	RS232, USB,	RS232, USB,	RS232, USB,		
Channels	RS485,IP	RS485,IP	RS485,IP		
SW Zones	32	32	32		
Number of zonal LEDs	8	8	8		
Auto Addressing	YES	YES	YES		
Events logged	4000	4000	4000		
FC500 MFI Interface	4	4	4		
FC500 Repeaters	4	8	8		
FC500 Clients	No Support	7	7		
Standard compliance	s (1757)				
EN54-2	x	x	x		
EN54-4	x	x	x		
EN54-21	x x x		x		
Communicators	\	20	101		
PSTN (Voice, Data)	On Board	On Board	On Board		
IP	FC500IP (Add On)	d On) FC500IP (Add On) FC500IP (Ad			

### Table 4: Comparison of FC501, FC503, and FC506 features

O Note: \*Absolute maximum value, the panel displays a warning on the screen when the current exceeds 80% of the maximum value.







# **FireClass FC460 Detectors**



## **Detection Modes**

The FC460 range of detectors use the FireClass digital protocol to provide robust and reliable communications to the control panel. A wide range of cable types can be used and the open topology capability of the system makes it ideal for the upgrade of older systems whilst reusing the cables to reduce cost.

Whilst the optical detector can be set to three different sensitivities and the heat detector programmed in one of three different detection modes, the photo/heat multisensor has available a total of 14 approved modes/sensitivities. The photo/heat multisensor can also, simultaneously operate as two independently addressed detectors using different modes of operation.

For sleeping risk applications the FC460PC triple multisensor will rapidly detect across the widest range of fire types including very slow smouldering fires typical of soft furnishings. By selecting resilient mode the FC460PC triple multisensor provides early detection with unrivalled levels of false alarm rejection, ideal for hotel applications.

### **Product Description**

FireClass FC460 detectors provide the best in class environmental and detection performance with the capability of detecting all fire types. The Range includes an Optical/Heat Multisensor and Optical/Heat/CO Triple Multisensor.

Automatic self testing of each sensor element offers reassurance of operation at all times and the 360° alarm, isolated and fault LED on each detector provides instant line of sight. Fourteen EN54 approved modes/sensitivities for the Optical/ Heat Multisensor help to provide one of the best and most versatile detectors on the market.

# **General Features**

- · Multiple fire detection modes
- FireClass detection algorithms
- · CO fire detection technology
- · Up to 250 detectors per loop
- · Optional bi-directional line isolation
- Remote detector verification & temperature read out
- · Highly featured service tool
- Programmable alarm LED with 360° viewing angle
- · Optional detector locking pin
- · Variety of sounder and relay detector base
- · Internationally approved





www.fireclass.co.uk الاتحاد لأنظمة اطفاء الحريق والحماي JNION FIRE PROTECTION

# A new class of Fire Detection

### FC460PH

With its ability to detect a wide range of fires, from flaming to smouldering types, the combined optical and heat multi-sensor detector is the preferred choice for a range of applications including light industrial, retail and office environments. It operates in a number of approved modes and sensitivities that can be dynamically selected to suit different environmental conditions.

### **FC460P**

More benign environment where any potential fire will be slow burning can be protected using the optical detector. A choice of sensitivities gives this detector a broad range of applications.

### FC460H

Complimenting the range is the heat sensor which can operate in fixed temperature and rate-of-rise modes. It is most often used in areas where high levels of dust are present or where the environment precludes the use of smoke detectors.

### FC460PC

For life protection and when the environmental conditions are challenging, the multisensor smoke, heat and CO detector provides the ultimate in detector performance. It uses the three sensor elements in concert to accurately determine the presence of fire with false alarm rejection properties that make it the ideal choice for hotel bedrooms where steam from bathrooms is a common source of false alarms.

### Product Order Codes

516.460.501	FC460PH Combined Optical and Heat Detector
516.460.502	FC460P Optical Detector
516.460.503	FC460H Heat Detector
516.460.504	FC460PC Multi-Sensor Smoke,
	Heat and Carbon Monoxide Detector

### **Installation Features**

- Standard bases with multiple mounting options simplify installation
- Unique 'park' position for commissioning and service procedures
- Detector addressing programmed from the Service tool or FireClass control panels
- Address flag—fixed to the base to prevent mix ups during service
- Full range of remote installation and service tools
- Dirty detector read-out can be viewed on the service tool or panel



DS:FC460 Detectors Rev0 WWW.fireclass.co.uk



# **Addressable Call Points and Accessories**



### **General Information**

A comprehensive range of call points for use with FireClass addressable systems, using the robust and reliable FireClass open protocol. All the callpoints are designed to enable an alarm signal to be given by a plastic resettable element, which means that the call point can be easily reset after it has been activated. Any change in the status of the switch is immediately communicated to the FireClass Control and Indicating Equipment (CIE). All call points have an integral short-circuit isolator for monitoring the addressable loop wiring. The integral LED indicator is normally off. When the frangible element is broken, an alarm is registered and the LED will illuminate red. If a section of the loop wiring adjacent to the call point is shorted, the built-in short-circuit isolator trips, isolating the shorted section and the LED is illuminated yellow. The status remains until the short is removed. If required, an optional transparent hinged cover may be installed to guard against accidental operation. Both indoor and outdoor versions are available.

# **General Features**

- · Integral Short Circuit Isolator
- · Dual Colour LED Indication
- EN54-11 Certification
- · Compact, Modern Styling
- Test Key for Fast Testing
- IP67 Ingress Protection models for external applications

## **Product Codes**

514.800.805	FC420CP-I Indoor Callpoint with isolator – no Back box
514.800.806	FC421CP-I Outdoor Callpoint with isolator
10-115	Mount Back Box for FC420CP-I with terminals
515.001.021	Standard Back Box for FC420CP-I
515.001.127	Deformable FC400 MCP element
515.001.119	Spare glasses for Manual Call Point (pack of 5)
515.001.128	Manual Call Point Plastic Hinged Cover
515.001.045	Spare Manual call point keys (pack of 10)



TYPENADDCALLPOINTSNEW (7/14) www.fireclass.net

الاتحاد لأنظمة اطفاء الحريق والحماية UNION FIRE PROTECTION
# A new class of Fire Detection

#### FC420CP-I Wiring details - Rear view



The FC420CP-I has a factory set (invalid) address of 255. The FC420CP-I is field programmed with the address prior to installation using an FireClass address programming tool. The associated ancillary programming lead plugs into the programming port. Ensure that the pins of the ancillary programming lead are inserted completely into the lower row of the programming port for effective communication with the address programming tool.

- 1. Ancillary programming port
- 2. Ancillary programming lead
- 3. Connected to Loop + IN
- 4. Connected to Loop IN
- 5. Connected to Loop + OUT
- Connected to Loop OUT

## FC420CP-I Installation



The FC420CP-I may be fitted to a standard (surface mounting) call point back box which is available separately.

## FC420CP-I & FC430CP-I Testing







A test key is provided with each MCP to allow easy testing of the switch mechanism and wiring, without breaking the frangible element. The key is inserted into a slot in the base of the MCP, allowing the frangible element to drop away from the switch, thus activating it and registering an alarm at the CIE. Note: the key should not be left with the MCP after commissioning, but may be left inside the CIE for convenience.





## A new class of Fire Detection

#### FC421CP-I Wiring details - Rear view



#### FC421CP-I Installation

Ø 4.5 Fixing Holes

The FC421CP-I has a factory set (invalid) address of 255. The FC421CP-I is field programmed with the address prior to installation using a FireClass address programming tool. The associated ancillary programming lead plugs into the programming port.

Ensure that the pins of the ancillary programming lead are inserted completely into the lower row of the programming port for effective communication with the address programming tool.

- 1. A1 Ancillary programming port
- 2. Ancillary programming lead
- Connected to Loop + IN
- Connected to Loop IN
- Connected to Loop + OUT
- 6. Connected to Loop OUT
- 7. Gasket

Ensure the cable entry holes are in the vertical plane, with either the single or double entry holes at the top.

Mount the FC421CP-I back box to a suitably flat surface in the required location using the three fixing holes and screws provided. Two hole stoppers with plastic washers are provided for use where cable glands are not required. Ensure that all cable entry holes are securely sealed. The recommended sealant is Loctite 5331. Ensure that the gasket is correctly seated in its channel on the rear of the cover.

An Earth Continuity Terminal is situated in the rear of the back box. An earthing plate is provided for continuity of metal conduits. The body of the MCP is fixed to the back box with four fixing screws supplied.







## **Product Codes**

MODEL	DIMENSIONS (mm)	WEIGHT	OPERATING TEMPERATURE	QUIESCENT CURRENT	ALARM STATE CURRENT	I.P. RATING
514.800.805	93 x 89 x 45mm	110g	-10°to +55°C	280µA	2.8mA	IP24D
514.800.806	93 x 98 x 73mm	240g	-25° to +70°C	280µA	2.8mA	IP67

(\*) The beacon in this product should be used for supplementary indication purposes only. In this case the device is not required to be used as a Visual Alarm Device (VAD) and EN54-23 is not relevant to its classification.

TYPENADDCALLPOINTSNEW (7/14) WWW.fireclass.net





# FIRECLASS

## Visual Alarm Device Sounder Beacon Series



The Visual Alarm Device (VAD) Sounder Beacons are loop powered units that are driven from an addressable controller panel. They are available in ceiling and wall mounted variants, including an outdoor wall version.

The ceiling mounted variants provide a base for fitting a fire detector. Alternatively, a blanking cap is fitted.

All VAD Sounder Beacons have a built-in two port loop short circuit isolator.

Settings for tones, volume, beacon flash and status monitoring are configurable using the control panel.

Selectable flash rates are: IHz (one flash every second)

0.5Hz (one flash every two seconds)

#### Summary of the range

Product	Details	Order number	In scope/fitted
Base variant			
FC440AVB	Addressable Base Sounder Beacon VAD Standard Power	576.440.006	
FC441AVB	Addressable Base Sounder Beacon VAD High Power	576.440.014	а П
Wall variant			
FC440AVW	Addressable Wall Sounder Beacon VAD White Housing	576.440.007	
FC440AVR	Addressable Wall Sounder Beacon VAD Red Housing	576.440.008	
FC445AVR	Addressable Wall Sounder Beacon VAD Weatherproof	576.440.009	
Accessories			
B-CAP	Blanking Cap For Sounder / VID / VAD Bases	557.080.001	0
A-CON	Conduit Adaptor For Sounder / VID / VAD Bases	557.080.002	
S-BOXR	Shallow Surface Back Box for Indoor Wall Sounder/VAD/VID Red	557.080.007	
S-BOXW	Shallow Surface Back Box for Indoor Wall Sounder/VAD/VID White	557.080.008	
A-BOX	Flush Back Box Adaptor For Indoor Wall Sounder/VAD/VID	557.080.010	
D-BOXR	Deep Surface Back Box for Indoor Wall Sounder/VAD/VID Red	557.080.011	
D-BOXW	Deep Surface Back Box for Indoor Wall Sounder/VAD/ VID White	557.080.012	

#### **Performance characteristics**

	FC440AVB	FC441AVB	FC440AVW	FC440AVR	FC445AVR						
Mounting orientation	Ce	ailing	1	Wall							
Indoor type A/Outdoor type B		Ir	ndoor		Outdoor						
Weight (g)	178	188	202	202	380						
Housing material	1	PC-ABS									
Housing colour	C	lear	White		Red						
Operating temperature (°C)	-25	to +70		-10 to 55	-25 to +70						
Storage temperature (°C)	41		-25 to +70		Street Contracts						
Humidity			Up to 95% non-conde	nsing							
Pressure		Sounde	er SPL output quoted fo	or 1000 mBar							
Sounder volume settings			2								
EN54-17 isolator			Yes								
EN54-3 sounder	2	Yes									
EN54-23 visual alarm	1		Yes								
Vibration, shock, corrosion, EMC		Comp	lies with EN54 series re	equirements							
Beacon flash rates	1		0.5 and 1 Hz								
Beacon intensity settings			2								
Ingress protection rating		1	P21C		IP55						
	Ty	pical Sounder output	at 1 metre								
High volume	90	dBA		100 dBA							
Low volume	70	dBA		90 dBA							
		Beacon performa	ince								
Rash colour		1.8	White								
Beacon intensity low (open class)	Open class (0-2.1-7.0)	Open class (0-2.7-8.5)		Open class (O-1.6-5	5.1)						
Beacon intensity high	C-3-8	C-3-15		W-2.4-7.5							
		Electrical character	ristics								
Addressable loop voltage			20 V - 40 V, 35 V Typ	ical							

Note 1: The open class settings have the same volumetric shape as the equivalent wall or ceiling class but with the revised parameters specified. Note 2: For IP21C protection a fire detector or blanking cap must be fitted to the base variants.

#### Address programming

Default address = 255. Set the address before installation using the FC490ST service tool with its ancillary lead. Remove the front cover to access the programming port on wall devices.



















#### Cabling and wiring



#### Wiring notes

All wiring must comply with local installation regulations and local fire system design requirements.

Ensure all conductors are free of earths.
 Verify correct wiring and wiring polarity before connecting the devices to the addressable loop.

#### **Isolator characteristics**

Parameter	Isolator	
V <sub>min</sub> , V <sub>max</sub> , V <sub>nom</sub>	Line voltage range	20V-40V, 35V nominal
V <sub>SO min</sub> .V <sub>SO max</sub>	Isolator trip threshold range	18.5V - 19.99V
VSC min, VSC max	Isolator recovery threshold	2.9V, 3.5V
lc max	Maximum rated continuous current	1.1A
I <sub>L max</sub>	Leakage current into short circuit (isolated tripped)	10 mA
ISmax	Maximum rated switching current	1.1A non-inductive
Z <sub>C max</sub>	Maximum series impedance	0.5Ω
Z <sub>C typ</sub>	Typical series impedance	0.25Ω

#### Sounder tones and performance

Tone name		T	Configurable/	monitored (only if vol- or above)	
	Pattern	Frequency	Rate	Wall	Ceiling
Dutch Slow Whoop	Sweep	500 to 1200	Rising over 3.5 s, 0.5 gap	Yes/Yes	Yes/Yes
7 Hz Fast Sweep	Sweep	800 to 970	142.8 ms ramp 7 Hz	Yes/Yes	Yes/Yes
BS 1 Hz Sweep	Sweep	800 to 970	1 Hz	Yes/Yes	
2 Tone	Alternating	660 / 880	500 ms per tone	er tone Yes/Yes	
Temporal 4	Intermittent	880	500 ms On 500 ms Off x 4 then 1 second gap	Yes/Yes	Yes/Yes
Temporal 3	Intermittent	880	500 ms On 500 ms Off x 3 then 1 second gap	Yes/Yes	Yes/Yes
March Time Beep	Intermittent	880	500 ms On 500 ms Off	Yes/Yes	Yes/Yes
Continuous 970	Continuous	970	Steady	Yes/Yes	Yes/Yes
Continuous 850	Continuous	850	Steady	Yes/Yes	No/No
DIN 1 Hz Sweep	Sweep	1200 to 500	Falling over 1 s	Yes/Yes	Yes/Yes
Banshee LF Buzzer	Sweep	800 to 950	120 Hz	Yes/Yes	Yes/Yes
3 Hz Banshee	Sweep	800 to 950	3 Hz	Yes/Yes	Yes/Yes
9 Hz Banshee	Sweep	800 to 950	9 Hz	Yes/Yes	Yes/Yes
Alternating	Alternating	554,440	554 Hz for 100 ms and 440 Hz for 400 ms	Yes/Yes	Yes/Yes
Yodalarm	Alternating	800/1000	250 ms for each frequency	Yes/Yes	Yes/Yes
Conventional Bell	Continuous	1450	Steady	Yes/Yes	Yes/Yes

Note 1: If the pulse pattern is assigned by the control panel, then only continuous tones can be configured. Note 2: The conventional bell is a simulated tone with limited bandwidth. It is not advisable to mix conventional bells with electronic sounders producing a simulated bell tone.

#### Loop loading

Sounder volume	Beacon flash rate	Beacon intensity	Wall VAD FC440AVW, FC440AVR, FC445AVR	Base VAD standard power FC440AVB	Base VAD high power FC441AVB
OFF	OFF	N/A	0.475 mA	0.475 mA	0.50 mA
HIGH	OFF	N/A	8.5 mA	4.3 mA	4.3 mA
HIGH	0.5 Hz	Low	391 mW	275 mW	404 mW
HIGH	1 Hz	Low	473 mW	393 mW	628 mW
HIGH	0.5 Hz	High	471 mW	395 mW	629 mW
HIGH	1 Hz	High	637 mW	608 mW	1119 mW

Note: Please refer to the loop loading calculator for these units.





#### Sounder performance Volume HIGH- ceiling devices FC440AVB, FC441AVB

Volume HIGH	1	Ceiling devices - sound performance horizontal (dBA at 1 m)						Ceiling devices - sound performance vertical (dBA at 1 m)						
	Angle	15"	45*	75*	105*	135*	165*	15*	45*	75*	105*	135*	165*	
Tone														
Dutch Slow	40V	> 95	> 87	> 83	> 82	> 80	> 80	> 94	> 87	> 82	> 81	> 84	> 87	
Whoop	20V	> 93	> 86	> 82	> 80	> 78	> 78	> 92	> 83	> 80	> 79	> 82	> 87	
7 Hz Fast	40V	> 93	> 85	> 81	> 79	> 77	> 78	> 92	> 85	> 81	> 80	> 81	> 87	
Sweep	20V	> 91	> 83	> 79	> 77	> 76	> 76	> 90	> 82	> 79	> 78	> 80	> 86	
BS 1 Hz	40V	> 94	> 86	> 82	> 81	> 78	> 79	> 93	> 86	> 82	> 80	> 83	> 88	
Sweep	20V	> 92	> 85	> 81	> 79	> 77	> 77	> 91	> 83	> 79	> 79	> 82	> 86	
2 Tone	40V	> 94	> 86	> 83	> 82	> 76	> 80	> 94	> 86	> 82	> 80	> 84	> 88	
	20V	> 93	> 85	> 82	> 80	> 76	> 78	> 91	> 83	> 79	> 79	> 82	> 85	
Temporal 4	40V	> 98	> 90	> 87	> 85	> 80	> 84	> 97	> 89	> 84	> 84	> 88	> 92	
	20V	> 93	> 87	> 84	> 82	> 77	> 81	> 95	> 87	> 79	> 79	> 82	> 89	
Temporal 3	40V	> 98	> 90	> 87	> 85	> 80	> 84	> 97	> 90	> 84	> 84	> 88	> 92	
	20V	> 95	> 87	> 84	> 82	> 77	> 81	> 95	> 88	> 82	> 82	> 85	> 89	
March Time	40V	> 98	> 90	> 87	> 85	> 80	> 84	> 97	> 90	> 84	> 84	> 87	> 91	
beep	20V	> 95	> 87	> 84	> 82	> 77	> 81	> 96	> 88	> 81	> 81	> 87	> 91	
Continuous	40V	> 92	> 82	> 79	> 77	> 77	> 74	> 92	> 83	> 79	> 76	> 79	> 83	
970 Hz	20V	> 91	> 79	> 77	> 75	> 75	> 72	> 90	> 81	> 79	> 75	> 79	> 83	
DIN 1 Hz	40V	> 94	> 86	> 81	> 79	> 78	> 78	> 93	> 86	> 81	> 81	> 82	> 87	
Sweep	20V	> 91	> 83	> 79	> 77	> 75	> 75	> 91	> 83	> 80	> 79	> 81	> 86	
Banshee LF	40V	> 94	> 86	> 81	> 79	> 77	> 77	> 93	> 85	> 81	> 80	> 82	> 87	
Buzzer	20V	> 91	> 84	> 78	> 75	> 75	> 73	> 91	> 84	> 79	> 79	> 80	> 85	
3 Hz Banshee	40V	> 94	> 86	> 82	> 82	> 77	> 78	> 93	> 85	> 81	> 80	> 82	> 87	
	20V	> 91	> 83	> 79	> 77	> 75	> 76	> 91	> 83	> 79	> 78	> 81	> 86	
9 Hz Banshee	40V	> 94	> 85	> 81	> 78	> 76	> 77	> 92	> 85	> 81	> 80	> 81	> 87	
	20V	> 92	> 83	> 79	> 76	> 74	> 75	> 90	> 83	> 79	> 78	> 80	> 85	
Alternating	40V	> 95	> 86	> 82	> 80	> 78	> 79	> 94	> 87	> 81	> 81	> 84	> 87	
999999999999 <del>5</del> 6	20V	> 91	> 84	> 79	> 76	> 76	> 76	> 92	> 85	> 79	> 79	> 82	> 86	
Yodalarm	40V	> 94	> 85	> 81	> 78	> 76	> 78	> 93	> 86	> 81	> 80	> 81	> 87	
	20V	> 90	> 82	> 78	> 76	> 75	> 75	> 90	> 83	> 79	> 79	> 80	> 85	
Conventional	40V	> 91	> 83	> 78	> 79	> 76	> 77	> 91	> 83	> 81	> 79	> 81	> 86	
Bell	20V	> 89	> 81	> 78	> 77	> 75	> 76	> 89	> 82	> 80	> 78	> 79	> 84	

#### Sounder performance Volume LOW- ceiling devices FC440AVB, FC441AVB

Volume LOW		Ceiling	g devices -	sound per	formance	horizontal	(dBA at 1 m)	Ceiling devices - sound performance vertical (dBA at					BAat1m)
	Angle	15°	45*	75*	105*	135*	165*	15*	45*	75*	105°	135*	165*
Tone	1												
Dutch Slow	40V	> 77	> 69	> 64	> 63	> 61	> 62	> 75	> 68	> 64	> 62	> 66	> 71
Whoop	20V	> 77	> 69	> 64	> 63	> 61	> 62	> 75	> 68	> 64	> 62	> 66	> 71
7 Hz Fast	40V	> 71	> 63	> 59	> 59	> 59	> 65	> 70	> 63	> 59	> 59	> 61	> 66
Sweep	20V	> 71	> 63	> 59	> 59	> 59	> 65	> 70	> 63	> 59	> 59	> 61	> 66
BS 1 Hz	40V	> 71	> 64	> 60	> 60	> 61	> 66	> 71	> 62	> 62	> 58	> 57	> 55
Sweep	20V	> 71	> 64	> 60	> 60	> 61	> 66	> 71	> 62	> 62	> 58	> 57	> 55
2 Tone	40V	> 72	> 65	> 59	> 59	> 61	> 66	> 73	> 63	> 61	> 59	> 57	> 56
	20V	> 72	> 65	> 59	> 59	> 61	> 66	> 73	> 63	> 61	> 59	> 57	> 56
Temporal 4	40V	> 80	> 72	> 67	> 66	> 62	> 65	> 79	> 71	> 66	> 66	> 69	> 73
	20V	> 80	> 72	> 67	> 66	> 62	> 65	> 79	> 71	> 66	> 66	> 69	> 73
Temporal 3	40V	> 80	> 72	> 67	> 66	> 62	> 65	> 79	> 71	> 66	> 66	> 69	> 73
	20V	> 80	> 72	> 67	> 66	> 62	> 65	> 79	> 71	> 66	> 66	> 69	> 73
March Time	40V	> 79	> 72	> 69	> 67	> 62	> 65	> 79	> 72	> 65	> 65	> 70	> 73
beep	20V	> 79	> 72	> 69	> 67	> 62	> 65	> 79	> 72	> 65	> 65	> 70	> 73
Continuous	40V	> 72	> 62	> 60	> 60	> 59	> 61	> 72	> 61	> 59	> 59	> 59	> 61
970 Hz	20V	> 72	> 62	> 60	> 60	> 59	> 61	> 72	> 61	> 59	> 59	> 59	> 61
DIN 1 Hz	40V	> 73	> 66	> 61	> 61	> 62	> 67	> 74	> 66	> 62	> 61	> 63	> 68
Sweep	20V	> 73	> 66	> 61	> 61	> 62	> 67	> 74	> 66	> 62	> 61	> 63	> 68
Banshee LF	40V	> 71	> 63	> 59	> 59	> 60	> 65	> 72	> 63	> 61	> 59	> 57	> 57
Buzzer	20V	> 71	> 63	> 59	> 59	> 60	> 65	> 72	> 63	> 61	> 59	> 57	> 57
3 Hz Banshee	40V	> 71	> 63	> 59	> 59	> 60	> 65	> 72	> 63	> 62	> 59	> 57	> 57
	20V	> 71	> 63	> 59	> 59	> 60	> 65	> 72	> 63	> 62	> 59	> 57	> 57
9 Hz Banshee	40V	> 70	> 63	> 59	> 58	> 59	> 65	> 72	> 62	> 61	> 59	> 57	> 56
	20V	> 70	> 63	> 59	> 58	> 59	> 65	> 72	> 62	> 61	> 59	> 57	> 56
Alternating	40V	> 76	> 68	> 64	> 64	> 65	> 70	> 76	> 69	> 64	> 63	> 66	> 70
	20V	> 76	> 68	> 64	> 64	> 65	> 70	> 76	> 69	> 64	> 63	> 66	> 70
Yodalarm	40V	> 70	> 63	> 60	> 60	> 61	> 63	> 72	> 65	> 60	> 61	> 61	> 66
	20V	> 70	> 63	> 60	> 60	> 61	> 63	> 72	> 65	> 60	> 61	> 61	> 66
Conventional	40V	> 70	> 63	> 61	> 58	> 59	> 65	> 71	> 62	> 62	> 58	> 57	> 55
Beli	20V	> 70	> 63	> 61	> 58	> 59	> 65	> 71	> 62	> 62	> 58	> 57	> 55





#### Sounder performance Volume HIGH- wall devices FC440AVW, FC440AVR, FC445AVR

Volume HIGH	1	Wall de	evices - so	und perfor	mance hor	izontal (dE	A at 1 m)	Wall - sound performance vertical (dBA at 1 m)						
	Angle	15"	45*	75"	105*	135*	165'	15'	45*	75*	105*	135"	165*	
Tone	1													
Dutch Slow	40V	> 91	> 95	> 95	> 95	> 95	> 91	> 91	> 95	> 95	> 95	> 95	> 91	
Whoop	20V	> 89	> 93	> 93	> 93	> 93	> 89	> 89	> 93	> 93	> 93	> 93	> 89	
7 Hz Fast	40V	> 87	> 94	> 94	> 94	> 94	> 87	> 87	> 94	> 94	> 94	> 94	> 87	
Sweep	20V	> 85	> 92	> 92	> 92	> 92	> 85	> 85	> 92	> 92	> 92	> 92	> 85	
3S1 Hz	40V	> 91	> 95	> 95	> 95	> 95	> 91	> 91	> 95	> 95	> 95	> 95	> 91	
Sweep	20V	> 87	> 93	> 93	> 93	> 93	> 87	> 87	> 93	> 93	> 93	> 93	> 87	
2 Tone	40V	> 88	> 94	> 94	> 94	> 94	> 88	> 88	> 94	> 94	> 94	> 94	> 88	
	20V	> 87	> 93	> 93	> 93	> 93	> 87	> 87	> 93	> 93	> 93	> 93	> 87	
Femporal 4	40V	> 89	> 95	> 95	> 95	> 95	> 89	> 89	> 95	> 95	> 95	> 95	> 89	
	20V	> 87	> 94	> 94	> 94	> 94	> 87	> 87	> 94	> 94	> 94	> 94	> 87	
Temporal 3	40V	> 89	> 96	> 96	> 96	> 96	> 89	> 89	> 96	> 96	> 96	> 96	> 89	
	20V	> 87	> 94	> 94	> 94	> 94	> 87	> 87	> 94	> 94	> 94	> 94	> 87	
March Time	40V	> 89	> 96	> 96	> 96	> 96	> 89	> 89	> 96	> 96	> 96	> 96	> 89	
oeep	20V	> 87	> 94	> 94	> 94	> 94	> 87	> 87	> 94	> 94	> 94	> 94	> 87	
Continuous	40V	> 87	> 90	> 90	> 90	> 90	> 87	> 87	> 90	> 90	> 90	> 90	> 87	
970 Hz	20V	> 84	> 88	> 88	> 88	> 88	> 84	> 84	> 88	> 88	> 88	> 88	> 84	
Continuous	40V	> 89	> 94	> 94	> 94	> 94	> 89	> 89	> 94	> 94	> 94	> 94	> 89	
350 Hz	20V	> 88	> 92	> 92	> 92	> 92	> 88	> 88	> 92	> 92	> 92	> 92	> 88	
DIN 1 Hz	40V	> 89	> 94	> 94	> 94	> 94	> 89	> 89	> 94	> 94	> 94	> 94	> 89	
Sweep	20V	> 88	> 92	> 92	> 92	> 92	> 88	> 88	> 92	> 92	> 92	> 92	> 88	
Banshee LF	40V	> 89	> 94	> 94	> 94	> 94	> 89	> 89	> 94	> 94	> 94	> 94	> 89	
3 uzz er	20V	> 87	> 92	> 92	> 92	> 92	> 87	> 87	> 92	> 92	> 92	> 92	> 87	
3 Hz Banshee	40V	> 89	> 94	> 94	> 94	> 94	> 89	> 89	> 94	> 94	> 94	> 94	> 89	
	20V	> 87	> 92	> 92	> 92	> 92	> 87	> 87	> 92	> 92	> 92	> 92	> 87	
Hz Banshee	40V	> 88	> 93	> 93	> 93	> 93	> 88	> 88	> 93	> 93	> 93	> 93	> 88	
	20V	> 86	> 91	> 91	> 91	> 91	> 86	> 86	> 91	> 91	> 91	> 91	> 86	
Alternating	40V	> 89	> 94	> 94	> 94	> 94	> 89	> 89	> 94	> 94	> 94	> 94	> 89	
	20V	> 87	> 92	> 92	> 92	> 92	> 87	> 87	> 92	> 92	> 92	> 92	> 87	
Yodalarm	40V	> 89	> 93	> 93	> 93	> 93	> 89	> 89	> 93	> 93	> 93	> 93	> 89	
	20V	> 87	> 91	> 91	> 91	> 91	> 87	> 87	> 91	> 91	> 91	> 91	> 87	
Conventional	40V	> 86	> 90	> 90	> 90	> 90	> 86	> 86	> 90	> 90	> 90	> 90	> 86	
Bell	20V	> 84	> 88	> 88	> 88	> 88	> 84	> 84	> 88	> 88	> 88	> 88	> 84	

#### Sounder performance Volume LOW- wall devices FC440AVW, FC440AVR, FC445AVR

Volume LOW	J	Wall d	evices - so	und perfor	mance hor	izontal (dE	SA at 1 m)	m) Wall - sound performance vertical (dBA at 1				A at 1 m)	1 m)		
	Angle	15*	45*	75*	105*	135*	165*	15"	45*	75*	105*	135*	165*		
Tone	1														
Dutch Slow	40V	> 80	> 84	> 84	> 84	> 84	> 80	> 80	> 84	> 84	> 84	> 84	> 80		
Whoop	20V	> 80	> 84	> 84	> 84	> 84	> 80	> 80	> 84	> 84	> 84	> 84	> 80		
7 Hz Fast	40V	> 77	> 83	> 83	> 83	> 83	> 77	> 77	> 83	> 83	> 83	> 83	> 77		
Sweep	20V	> 77	> 83	> 83	> 83	> 83	> 77	> 77	> 83	> 83	> 83	> 83	> 77		
BS 1 Hz	40V	> 78	> 84	> 84	> 84	> 84	> 78	> 78	> 84	> 84	> 84	> 84	> 78		
Sweep	20V	> 78	> 84	> 84	> 84	> 84	> 78	> 78	> 84	> 84	> 84	> 84	> 78		
2 Tone	40V	> 77	> 84	> 84	> 84	> 84	> 77	> 77	> 84	> 84	> 84	> 84	> 77		
	20V	> 77	> 84	> 84	> 84	> 84	> 77	> 77	> 84	> 84	> 84	> 84	> 77		
Temporal 4	40V	> 78	> 87	> 87	> 87	> 87	> 78	> 78	> 87	> 87	> 87	> 87	> 78		
	20V	> 78	> 87	> 87	> 87	> 87	> 78	> 78	> 87	> 87	> 87	> 87	> 78		
Temporal 3	40V	> 78	> 87	> 87	> 87	> 87	> 78	> 78	> 87	> 87	> 87	> 87	> 78		
	20V	> 78	> 87	> 87	> 87	> 87	> 78	> 78	> 87	> 87	> 87	> 87	> 78		
March Time	40V	> 78	> 87	> 87	> 87	> 87	> 78	> 78	> 87	> 87	> 87	> 87	> 78		
beep	20V	> 78	> 87	> 87	> 87	> 87	> 78	> 78	> 87	> 87	> 87	> 87	> 78		
Continuous	40V	> 75	> 79	> 79	> 79	> 79	> 75	> 75	> 79	> 79	> 79	> 79	> 75		
970 Hz	20V	> 75	> 79	> 79	> 79	> 79	> 75	> 75	> 79	> 79	> 79	> 79	> 75		
Continuous	40V	> 79	> 83	> 83	> 83	> 83	> 79	> 79	> 83	> 83	> 83	> 83	> 79		
850 Hz	20V	> 79	> 83	> 83	> 83	> 83	> 79	> 79	> 83	> 83	> 83	> 83	> 79		
DIN 1 Hz	40V	> 79	> 83	> 83	> 83	> 83	> 79	> 79	> 83	> 83	> 83	> 83	> 79		
Sweep	20V	> 79	> 83	> 83	> 83	> 83	> 79	> 79	> 83	> 83	> 83	> 83	> 79		
Banshee LF	40V	> 77	> 83	> 83	> 83	> 83	> 77	> 77	> 83	> 83	> 83	> 83	> 77		
Buzzer	20V	> 77	> 83	> 83	> 83	> 83	> 77	> 77	> 83	> 83	> 83	> 83	> 77		
3 Hz Banshee	40V	> 78	> 84	> 84	> 84	> 84	> 78	> 78	> 84	> 84	> 84	> 84	> 78		
	20V	> 78	> 84	> 84	> 84	> 84	> 78	> 78	> 84	> 84	> 84	> 84	> 78		
9 Hz Banshee	40V	> 77	> 82	> 82	> 82	> 82	> 77	> 77	> 82	> 82	> 82	> 82	> 77		
	20V	> 77	> 82	> 82	> 82	> 82	> 77	> 77	> 82	> 82	> 82	> 82	> 77		
Alternating	40V	> 77	> 83	> 83	> 83	> 83	> 77	> 77	> 83	> 83	> 83	> 83	> 77		
	20V	> 77	> 83	> 83	> 83	> 83	> 77	> 77	> 83	> 83	> 83	> 83	> 77		
Yodalarm	40V	> 78	> 80	> 80	> 80	> 80	> 78	> 78	> 80	> 80	> 80	> 80	> 78		
	20V	> 78	> 80	> 80	> 80	> 80	> 78	> 78	> 80	> 80	> 80	> 80	> 78		
Conventional	40V	> 73	> 77	> 77	> 77	> 77	> 73	> 73	> 77	> 77	> 77	> 77	> 73		
Bell	20V	> 73	> 77	> 77	> 77	> 77	> 73	> 73	> 77	> 77	> 77	> 77	> 73		





#### Approvals

	CE	CPR A	CPR APPROVAL			EURO	PEAN T	YPE A	PPROV	PROVALS			NAL S
	0832 TYCO FIRE & SECURITY GMBH NEUHAUSEN AM RHEINFALL 8212 SWITZERLAND	EN54-3	EN54-23	EN54-17	MED	LPCB	NDS	AFNOR	FNO	DBI	FPANZ	HKFSD	TFTF
FC440AVB	DOP-2017-4235 / 0832-CPR-F2242	•	•			•							- 00
FC441AVB	DOP-2017-4236 / 0832-CPR-F2243		•			•					1		
FC440AVW	DOP-2017-4237 / 0832-CPR-F2238	•	•			•							
FC440AVR	DOP-2017-4238 / 0832-CPR-F2239											-	
FC445AVR	DOP-2017-4239 / 0832-CPR-F2240	•	•			•						-	

All required Declarations and certificates are publically available on the website <u>www.fireclass.co.uk</u> and are searchable by number or model name. The above fire detection products are components designed for use in Addressable Systems exclusively available to registered partners only. They are intended for installation by trained registered personnel only. Systems should be installed and configured according to local regulations.









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## **Addressable Loop Modules**



#### Introduction FC410MIM

The FC410MIM Mini Input module is designed to monitor fire contacts, such as extinguishing system control, ventilation control, fire door control etc. The module provides one identifiable detection spur which is capable of monitoring multiple normally open contacts or a single normally closed contact.

The FC410MIM can be mounted in any electrical enclosure with sufficient depth to accommodate FC410MIM and the contacts monitored by the IN+ and IN- terminals, ie, no field wiring. The remote LED (if required, not supplied) must be located within the same electrical enclosure.

PRODUCT CODE	TYPE	DESCRIPTION	DIMENSIONS (mm)	WEIGHT (g)	OPERATING TEMPERATURE	EOL RESISTOR VALUE	MONITOR RESISTOR VALUE	NUMBER OF INPUTS	NUMBER OF OUTPUTS
555.800.701	410MIM	Mini Contact Module	PCB 48x57x13	22	- 25 - + 70 °C	200 Ohms	100 Ohms	1(N/O or N/C)	1xLED



#### Introduction FC410CIM

The FC410CIM FC Addressable Contact Input Module is designed to monitor fire contacts such as extinguishing system control, ventilation control, fire door control etc. The FC410CIM can be configured as: Two spur circuits monitoring multiple normally open contacts, with short circuit giving a fault output. Two spur circuits monitoring single normally closed contacts, with short circuit giving a fault output.

PRODUCT CODE	TYPE	DESCRIPTION	DIMENSIONS (mm)	WEIGHT (g)	OPERATING TEMPERATURE	EOL RESISTOR VALUE	MONITOR RESISTOR VALUE	NUMBER OF INPUTS	NUMBER OF OUTPUTS
555.800.702	410CIM	Contact Module	PCB 48x57x13	100	- 25 - + 70 °C	200 Ohms	100 Ohms	2 (N/O or N/C)	0







#### **Description FC410DDM**

The FC410DDM provides the ability to connect and interface 2 conventional zones, to the FireClass fire alarm controller.

The FC410DDM monitors the status of the detectors and the wiring to the detectors and signals detector and wiring status back to the controller. The conventional detector circuits can be configured as one Class A circuit (loop) or two Class B spur circuits. The FC410DDM can be either loop powered or driven from a local 24Vdc supply. Supports Detector Removal using diode bases.

PRODUCT CODE	TYPE	DESCRIPTION	DIMENSIONS (mm)	WEIGHT (g)	OPERATING TEMPERATURE	EOL RESISTOR VALUE	MONITOR RESISTOR VALUE	NUMBER OF INPUTS
577.800.706	410DDM	Universal Detection Module	PCB: 84x60x25 mm (includes LED on rear)	100	- 25 - + 70 ℃	Conventional Circuit: 4.7 kohm, 1% standard. Detector Removal: 18 V, 2% Zener Diode	100 Ohms	One Class A or two Class B



## Introduction FC410DIM

The Addressable FC410DIM provides the ability to connect and Interface one zone of conventional detectors (non-addressable) to the Fire Alarm Controller.

The FC410DIM monitors the status of detectors and wiring to detectors and signals detector and wiring status back to the Controller. The FC410DIM requires a 24Vdc power supply.

PRODUCT CODE	TYPE	DESCRIPTION	DIMENSIONS (mm)	WEIGHT (g)	OPERATING TEMPERATURE	EOL RESISTOR VALUE	NUMBER OF OUTPUTS
555.800.712	410DIM	Conventional Zone Monitor	PCB 48x57x13	100	- 25 - + 70 °C	4.7k Ohms	1







## Introduction FC410BDM

The FC410BDM Beam Detector Interface Module is designed to power and interface one FIRERAY 50/100/2000/5000 Beam Detector to the FireClass Digital Addressable Loop.

The FC410BDM monitors the Fire and Fault contacts and also monitors for open and short circuits on the connections between the interface and the beam detector. For remote siting of the FIRERAY detector an optional BTM800 Terminal Module can be used.

PRODUCT	TYPE	DESCRIPTION	DIMENSIONS (mm)	WEIGHT (g)	OPERATING TEMPERATURE	TYPICAL STANDBY mA	TYPICAL ALARM mA	OVERLOAD mA
555.800.766	410BDM	Beam Detector	PCB 48x57x13	100	- 10 - + 55 °C	14	21	35



### Introduction BTM800

In many cases it will be necessary to site the FC410BDM Beam Detector Module some distance from the beam detector itself. To minimise and simplify wiring in such cases an optional unit, the BTM800 beam termination module is available. The BTM800 is also housed in a standard double gang ancillary cover and has all the connections and components required to minimise installation time.

#### **Features**

Simplifies the wiring between Beam detector and FC410BDM

Allows FC410BDM to be sited up to 40m from the beam detector

PRODUCT CODE	TYPE	DESCRIPTION	DIMENSIONS (mm)	WEIGHT (g)	OPERATING TEMPERATURE
555.800.067	BTM800	Beam Termination Module	60x84x14 PCB	130	- 20 - + 70 °C







## Introduction FC410RIM

The FC410RIM Relay Interface Module provides one volt-free relay changeover contact on a latching relay. The relay is controlled by a command sent from the FireClass fire controller via the addressable loop. The relay state (activated, deactivated or stuck) is returned to the controller as confirmation.

PRODUCT CODE	TYPE	DESCRIPTION	DIMENSIONS (mm)	WEIGHT (g)	OPERATING TEMPERATURE	QUIESCENT CURRENT mA	RELAY CONTACTS	ALARM CURRENT mA	NUMBER OF OUTPUTS
555.800.702	410RIM	Relay Interface Module	PCB 48x57x13	100	- 25 - + 70 °C	0.46	100 Ohms	4.6	1 Volt Free Change Over



## Introduction FC410SNM

The FC410SNM Sounder Notification Module is designed to provide an output, in response to a command signalled from a controller, to activate a number of polarised and suppressed sounders. The sounders are powered from an independent power supply and the module is capable of passing up to a maximum of 2A (eg, 24V dc 50mA company sounders or a mixture of different current rated sounders not exceeding a maximum current of 2A).

PRODUCT CODE	TYPE	DESCRIPTION	DIMENSIONS (mm)	WEIGHT (g)	OPERATING TEMPERATURE	EOL RESISTOR VALUE	RELAY CONTACTS	POWER REQUIREMENT	NUMBER OF OUTPUTS
577.800.705	410SNM	Sounder Circuit Controller	PCB 48x57x13	100	- 25 - + 70 ℃	27k Ohms ½ Watt	2A @ 24Vdc	24Vdc	1 Monitored Sounder Circuit









#### Introduction SB520

The SB520 sounder booster module enables the FC410SNM to drive circuits with higher currents whilst maintaining the reverse polarity integrity line monitoring. It is non-addressable and requires a local 24 V DC supply to drive a single circuit of polarised and suppressed sounders.

PRODUCT CODE	TYPE	DESCRIPTION	DIMENSIONS (mm)	WEIGHT (g)	OPERATING TEMPERATURE	OUTPUT RATING	EOL RESISTOR VALUE	NUMBER OF OUTPUTS
577.001.023	SB520	Sounder Booster Module	PCB 48x57x13	100	- 20 - + 70 °C	15A @ 24Vdc	270 Ohms 6 Watt	1 Monitored Sounder Circuit



### Introduction HVR800

The HVR800 High Voltage Relay Interface is a non-addressable multi-voltage relay module (operating from 24V dc, 24V ac, 120V ac and 240V ac). The encapsulated HVR800 provides a 10 amp volt-free contact that can be used to extend the contact ratings of FC410RIM Addressable Relay Module applications.

A maximum of four HVR800s can be individually driven and controlled by an FC410MIO Small Addressable Multi-Input/Output module if all HVR800s are powered by 120V ac or 240V ac.

For ac operation, no external dc power supply unit is required to operate the relay.

When used to switch 24V dc, the HVR800 must be provided with an external 24V dc supply which should be switched through the clean relay contacts of an FC410MIO or FC410RIM.

PRODUCT CODE	TYPE	DESCRIPTION	DIMENSIONS (mm)	WEIGHT (g)	OPERATING TEMPERATURE	RELAY CONTACTS 28Vdc	RELAY CONTACT 240VAC
568.800.004	HVR800	High Voltage Relay	Module 26.5 x 73.6 x 41.5	172	- 20 - + 70 °C	8A	10A







## Introduction FC410SIO

The FC410SIO Single Input/Output Module is designed to provide a monitored open collector input and a volt free relay changeover output. FC410SIO can switch up to 2 A @ 24 Vdc.

PRODUCT CODE	TYPE	DESCRIPTION	DIMENSIONS (mm)	WEIGHT (g)	OPERATING TEMPERATURE	RELAY CONTACT	EOL RESISTOR VALUE	NUMBER OF INPUTS	NUMBER OF OUTPUTS
555.800.763	410SIO	Single Input/ Ouput Unit	PCB 60x84x14	105	- 20 - + 70 °C	2A @ 24Vdc	3.3k Ohm	1	1

## Introduction FC410MIO



The FC410MIO Multi I/O Module has three inputs and two outputs from latching relays. The inputs can monitor fire contacts such as extinguishing system control, ventilation control, fire door control etc. The two relays outputs provide volt-free relay changeover contacts.

PRODUCT CODE	TYPE	DESCRIPTION	DIMENSIONS (mm)	WEIGHT (g)	OPERATING TEMPERATURE	RELAY CONTACTS	EOL RESISTOR VALUE	NUMBER OF INPUTS	NUMBER OF OUTPUTS
555.800.765	410MIO	Multi Input/ Ouput Unit	PCB 72x110x18	70	- 20 - + 70 °C	27k Ohms ½	330 Ohm	3	4

Output 1 and 2 HVR Driver and Relay / Output 3 and 4 HVR Driver only









## Introduction FC410QMO

The FC410QMO comprises of four monitored relay outputs that are suitable for 24Vdc sounders. The outputs are monitored for short and open circuit faults.

PRODUCT CODE	TYPE	DESCRIPTION	DIMENSIONS (mm)	WEIGHT (g)	OPERATING TEMPERATURE	RELAY CONTACTS	EOL RESISTOR VALUE	NUMBER OF INPUTS	NUMBER OF OUTPUTS
555.800.770	410QMO	Quad Output Unit	Module 133x96x40	105	- 20 - + 70 °C	2A @ 30Vdc	27k Ohm	0	4



#### Introduction FC410QIO

The FC410QIO Quad Input/Output Module is designed to provide four monitored digital inputs and four potential free relay changeover outputs.

The outputs can be connected to an Auxiliary Voltage source and its voltage can be monitored.

The FC410QIO has an integral FireClass loop isolator. When a section of the loop adjacent is shorted, the isolator trips, isolating the shorted section, then the yellow LED illuminates. This status remains until the short is removed. The FC410QIO must be fitted in a control enclosure or any distributor enclosure. The FC410QIO will be preferably mounted via a DIN rail. Alternatively, it can be directly fixed on the rear side of the enclosure.

The digital input monitoring and isolator functions are both configurable. Furthermore, all outputs can be connected to the HVR800 which allows switching to high power galvanic isolated loads.

PRODUCT CODE	TYPE	DESCRIPTION	DIMENSIONS (mm)	WEIGHT (g)	OPERATING TEMPERATURE	RELAY CONTACTS	EOL RESISTOR VALUE	NUMBER OF INPUTS	NUMBER OF OUTPUTS
555.800.771	410QIO	Quad Input/ Output Unit	133x96x40 module	150	- 20 - + 70 °C	2A @ 30Vdc	3.3k Ohm	4	4





# A new class of Fire Detection



#### Introduction FC410QRM

The FC410QRM Quad Relay Module is designed to provide four potential free relay changeover outputs. The outputs are monitored with parallel contacts of the relays. The outputs can be connected to an Auxiliary Voltage source and its voltage can be monitored.

The FC410QRM has an integral FireClass loop isolator. When a section of the loop adjacent is shorted, the isolator trips, isolating the shorted section, and illuminating a yellow LED. This status remains until the short is removed.

The FC410QRM must be fitted in a control enclosure or any distributor enclosure. The FC410QRM will preferably be mounted via a DIN rail. Alternatively, it can be directly fixed on the rear side of the enclosure. Furthermore, all outputs are configurable to the HVR - mode (High Voltage Relay), which allows to connect up to four HVR800 modules for switching e.g. 240V loads galvanic isolated.

PRODUCT CODE	TYPE	DESCRIPTION	DIMENSIONS (mm)	WEIGHT (g)	OPERATING TEMPERATURE	RELAY CONTACTS	NUMBER OF OUTPUTS
555.800.773	410QRM	Quad Relay Module	133x96x40 module	150	- 20 - + 70 °C	2A @ 30Vdc	4



### Introduction FC410LI

The FC410LI Line Isolator Module is designed to be used on the FireClass addressable controller loop. It monitors the line condition and when detecting a short circuit will isolate the affected section whilst allowing the rest of the loop to function normally. The purpose of the FC410LI Line Isolator Module is to ensure that, on a looped addressable system, no short circuit fault can disable more detection devices than would be lost on a conventional non-addressable fire circuit.

PRODUCT CODE	TYPE	DESCRIPTION	DIMENSIONS (mm)	WEIGHT (g)	OPERATING TEMPERATURE	TYPICAL NUMBER OF DEVICES BETWEEN ISOLATORS
545.800.704	410LI	Line Isolation Module	60x84x14 PCB	100	- 20 - + 70 °C	20

DS:FCAdd Modules Rev0 WWW.fireclass.co.uk

UNION FIRE PROTECTION



# **QCDD – Product Certificates**





وزارة ال	ناقليسة	5 31	تاريخ الطباعة :	2021-02-10
الادارة العامة	للدفاع المدنى		وتست الطباعة :	AM 7:09
ادارة	الولاية	ALLENS P	رقسم الطلب :	PAC21001317
	d d t	شهــــادة عدم ممانعة		
وع الشهادة	: اعتماد منتج			
يانات المنشأة				
لإسم التجاري	: الاتحاد لانظمة اطفاء الحريق	يق والحماية		
قم السجل التجاري	85372 :	رقم الرخصة التجار	124187 : 4	
	16-0624-00 :	رقم الهاتف		
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قم قيد المنشاة لبريد الإلكتروني لتصنيف	on and Alarm System	Fire Detection	1211	,
قم قيد المنشاة لبريد الإلكتروني لتصنيف سم المنتج	ion and Alarm System : Control Units	Fire Detection		· ·
قم قيد المنشاة لبريد الإلكتروني لتصنيف سم المنتج فاصيل الشهادة	: on and Alarm System : Control Units :	Fire Detection		
قم قيد المنشاة لبريد الإلكتروني لتصنيف سم المنتج فاصيل الشهادة م مراجعة الطب المقد	: : on and Alarm System : Control Units م وانضح بأنه لا مانج من اعتماد ال	Fire Detection المنتج /المنتجات الموضحه في الة	رير الفنى المرفق بناء علر	، اعتماده من قبل الھ
قم قيد المنشاة لبريد الإلكتروني لتصنيف سم المنتج فا <b>صيل الشهادة</b> م مراجعة الطلب المقدر لمختبرية الموضحه في	: : on and Alarm System : Control Units م واتضح بأنه لا مانع من اعتماد ال التقرر الفني المرفق	Fire Detection المنتج /المنتجات الموضحه في الت	رير الفنى المرفق بغاء علر	, اعتماده من قبل الھ

- 1. يجب على الشركه الالتزام والعمل بما جاء في اشتراطات قسم أنظمة السلامه التي تم الاطلاع والموافقة عليها من خلال الموقع
  - يجب ان يقوم بتركيب هذا المنتج من قبل مهندسين وفنيين معتمدين من الإدارة العامة للدفاع المدني.
    - 3. يجب أن يحمل المنتج العلامة التجارية للهيئه المختبرية المعتمدة والموضحه في التقرير الفني المرفق.







Page 1 of 2

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PRODUCT APPLICATION		Fire Detection and	Alarm System	صنيف المعدة
APPLICANT / P.O BOX	M	اطفاء الحريق والحماية	الاتحاد لانظمة	يقدم الطلب
MANUFACTURER / LOCATION	Tyco Fir	e and Security Gm	bH / SWITZERLAND	شركة المصنعة / بلد الصنع
	ومث	31		الموديل
Part no. 557.200.718, Tr	iple Circuit Sin	gle Loop Panel Eng	glish - 2,7A PSU	FC501-H
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تاريخ الطباعة : 2020-07-29	Le Lies	وزارة الداخليـــة
وتـت الطباعة : AM 8:13		الادارة العامة للدفاع المدني
رقسم الطلب : PAC20007504	S CIENS	ادارة الهقاية
	شهــــادة عدم ممانعة	
		يع الشهادة اعتماد منتج
		<u>انات المنشأة</u>
	نريق والحماية	سم التجاري : الاتحاد لانظمة اطفاء الد
124187 :	رقم الرخصة التجارية	نم السجل التجاري : 85372
	رقم الهاتف	نم قيد المنشأة : 16-0624-00
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X		تصنيف Fire alarm systems :
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		مختبرية الموضحه فى التقرر الفني المرفق
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		والحماية	: الاتحاد لانظمة اطفاء الحريق	الإسم التجاري
	ية : 124187	رقم الرخصة التجار	85372 : .	رقم السجل التجاري
		رقم الهاتف	16-0624-00 :	رقم قيد المنشأة
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	15	Initiating Dev	vices and Accessories	إسم المنتج
				تفاصيل الشهادة
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			ى التقرر الفني المرفق	المختبرية الموضحه فر
				<u>ملاحظات</u>
غلال الموقع.	للاع والموافقة عليها من ذ	قسم أنظمة السلامه التي تم الاط	لتزام والعمل بما جاء في اشتراطات	1. يجب على الشركه الا
	للدفاع المدني	ننيين معتمدين من الإدارة العامة	ب هذا المئتج من قبل مهندسين وذ	2. يجب ان يقوم بتركي
	الفني المرفق .	ة المعتمدة والموضحه في التقرير	نج العلامة التجارية للهيئه المختبرية	3. يجب ان يحمل المئة
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AM 7:15	وتست الطباعة :		اع المدنى	الادارة العامة للدذ
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	124187 :	رقم الرخصة التجارية	85372 :	رقم السجل التجاري
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تم مراجعة الطلب المقدم واتضح بأنه لا مانع من اعتماد المنتج /المنتجات الموضحه في التقرير الفني المرفق بناء على اعتماده من قبل الهيئه المختبرية الموضحه فى التقرر الفنى المرفق

#### ملاحظات

يجب على الشركة الالتزام والعمل بما جاء في اشتراطات قسم أنظمة السلامة التي تم الاطلاع والموافقة عليها من خلال الموقع

يجب ان يقوم بتركيب هذا المنتج من قبل مهندسين وفنيين معتمدين من الإدارة العامة للدفاع المدنى.

3. يجب ان يحمل المنتج العلامة التجارية للهيئه المختبرية المعتمدة والموضحه فى التقرير الفنى المرفق.

تاريخ الاعتماد : 00-08-09 ألعامة لل تاريخ الإنتهاء :

2022-08-09



**FIRECLASS** 



Page 1 of 2





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نوع الشهادة : اعتماد منتج			
بيانات المنشأة			
الإسم التجاري : الاتحاد لانظمة اطفاء الد	يق والحماية		
رقم السجل التجاري 🛛 : 85372	رقم الرخصة التجارية	124187 :	
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ا. يجب على الشركة الالترام فالعمل. يما جاء في اشترا	ات قسم أنظمة السلامه التي تم الأطلاع	والموافقة عليها من	فلال المعقع
<ol> <li>يجب ان يقوم بتركيب هذا المنتج من قبل مهندسي</li> </ol>	وفنيين معتمدين من الإدارة العامة للد	والمدني	XX
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	Page 1 of 2		XX
		الاتحادة	مية اطفاء الحريق والحم
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2020-08-11	تاريخ الطباعة :	× 4	1 entre		X	وزارة الداخليــــ
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	124187 :	لرخصة التجارية	رقم ا	1"-	85372 :	رقم السجل التجاري
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				المرفق	التقرر الفئي	المختبرية الموضحه فى
			H		2	<u>ملاحظات</u>

- 1. يجب على الشركه الالتزام والعمل بما جاء في اشتراطات قسم أنظمة السلامه التي تم الاطلاع والموافقة عليها من خلال الموقع
  - يجب ان يقوم بتركيب هذا المنتج من قبل مهندسين وفنيين معتمدين من الإدارة العامة للدفاع المدني.
    - 3. يجب أن يحمل المنتج العلامة التجارية للهيئه المختبرية المعتمدة والموضحه فى التقرير الفنى المرفق.

الريخ الاعتماد : 2020-08-10 الوامة الل الريخ الإنتهاء :

انتها: 2022-08-10

مدير ادارة الهقاية

الادارة العامة للدغاع







Page 1 of 2



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**FIRECLASS** 





الاتحاد لأنظمة اطفاء الحريق والحماية UNION FIRE PROTECTION



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TECHNICAL REPORT		قرير الغني
RODUCT	Control Unit, Accessories	M M Me
PRODUCT APPLICATION	Fire alarm systems	منيف المعدة
PPLICANT / P.O BOX	الاتحاد لانظمة اطفاء الحريق والحماية	دم الطلب
IANUFACTURER / LOCATION	TYCO FIRE & SECURITY GMBH / SWITZ	ركة المصنعة / بلد الصنع ERLAND
	الرصف	الموديل
Contact	input module (FireClass).	FC410CIM
PPROVAL	6811/02 LPCE	هادة المختبرات المساندة بن هيئات معتمدة )
ECOMMENDATIONS		
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الالحصاد لانظمية أطفاء الحرييق والحمياية		
# **Distributors Letter**







TYCO BUILDINGSERVICES PRODUCTS (M.E.) Block D, Floor 3, Office Park Building #56, Dubai Internet City, Dubai, United Arab Emirates

18 November 2020

#### Subject: Authorised FireClass Distributor

To whom it may concern

Tyco Fire Protection Products Middle East sell product through an approved and trained Distributor network. We do not sell product directly to end users neither do we provide product to untrained and non-approved distributors.

We can confirm that the following Company is an authorised dealer of FireClass Fire Detection. They are trained to provide design, supply, install, test, commission, and maintenance services of FireClass Products and Systems in Qatar.

M/s. Union Fire Protection P.O.Box. 45014 Doha, Qatar

Tel: +974 4002 2604

This authentication is valid for one year from that date of this letter, and is renewed annually.

Should you have any questions please contact the undersigned

Sincerely yours, Best Regards Yazeed Alahmad EX ITCOMACY W Sales Manager - ME





# **Country Of Origin**





1 Afzender / Consignor / Expéditeur / Remitente		
Tyco Fire & Security Kederland BV Voltaweg 20 6303 XK ECHT Netherlands Voltaweg and Services Products B.V Koperteden 1 7550 AD Enachede Netherlands	Nr. S20032589	ORIGINEEL/ ORIGINAL
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Qatar	CERTIFICATE	OF ORIGIN
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oestemming 2017002 Kamer van Koophandel Nederland. Art. 3	455 - Versie 4.0 - Ultoave Beurtvaartadres w	ww.beurtvaartadres.nl - Tel. 088-55 22 111





#### Attachment List

# Pages: 1

Pos.	Art. Nr.	Description	Quantity	Invoicenr.	Country of origin
01	568.800.703	FC410RIM RELAY I/F MODULE	100	99129648	CZ
02	557.202.844	PNI800 Panel Net Interface	1	99129630	CZ
03	576.501.063	BANSHEE EXCEL LITE RED IP45	17	99129630	GB
04	557.202.844	PNI800 Panel Net Interface	2	99129544	02
05	516.460.502	FC460P Photo Detector	500	99129544	02
06	516.460.503	FC460H Heat Detector	50	99129544	02
07	516.460.501	FC460PH Photo Heat Detector	50	99129544	CZ
08	517.050.041	4B Detector Base	550	99129544	CZ
09	576.440.001	FC440DSB Detector Base Sounde	50	99129544	CZ
10	514.800.805	FC420CP-I	25	99129544	GB
11	514.800.806	FC421CP-I	20	99129544	CZ
12	576.440.008	FC440AVR Ad Wall Sdr VAD Red	50	99129544	CZ
13	576.440.009	FC445AVR Ad Wall Sdr VAD IP	20	99129544	CZ
14	555.800.702	FC410CIM CONTACT I/P MODULE	100	99129544	02
15	20-118	FL/RL/R/D FLASHNI	20	99129544	GB
16	557.200.701	FireClass 32 1 Loop 32 zone	2	99129549	65
17	557.200.703	Fireclass FC64-4 panel	1	99129549	02
18	514.800.805	FC420CP-I	45	99129620	GB

TYCO European Distribution Centre Voltaweg 20, 6101 XK Echt The Netherlands Tel.: +31(0)475 371666 Fax: +31(0)475 371660

Page 1 of 1





## **Previous Project Approvals**





#### شركة الخليج للمقاولات (ذ.م.م) GULF CONTRACTING CO. (W.L.L) Material Approval Sheet انتـرسييـس المتدRSP CE



Submission No. : 001					
	Manufacturer: Simplex				
Material Submission No. : MAR-FA-001	Country of Origin: Mexico ,USA				
	Date: 24.08.2020				
Material Name: Fire Alarm System	Supplier: Union fire protection system	n			
BOQ Ref. N/A	Material Delivery Period: 2-3 Weeks				
	Material Required at Site: As per the Program				
Spec. Ref.: QCS 2014, Section 23, Part 2	B.S. Ref.:				
DWG. Ref.:	Sample Attached	YES / NO			
Location: All area	Certificate Attached	YES / NO			
Quantity: As Required	Assurance of Delivery on Time	YES / NO			
Warranty from the Manufacturer / Supplier	YES / NO				
Contractor Remarks (if any): Copies of technica	I literature attached for your reference				
A Gundand Comments – Main Contractor Material Approved Materia Comments: Signature / Stamp	al Approved with Comments D Ma (Se	terial Rejected e Comments below) Date:			
Comments - Client	al Approved with Comments	terial Rejected			
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PROJECT TITLE: Headquarter of General Directorate of Borders Passports, Expatriates Affairs, Nationality and Travel Documents Department	LOCATION WADI ALBANAT
BA NO. 1003 DATE : 20-November-2017	SUBMITTAL NO .: MAT-ELE-0031 REV: 0
CONSULTANT: CEG INTERNATIONAL	CONTRACTOR : AL AALI INTERNATIONAL
DISCIPLINE CIVIL ARCH	_√ MEP
LANDSCAPE INTERIOR	MISC/OTHER 28/11/17 10
SPECIFICATION REF:- Project Specs- VOL.3/5-Part 3	MATERIAL ORIGINALLY SPECIFIED: ELECTRICAL
BOQ ITEMS:	MATERIAL SUBMITTED:
DRAWING REF:	DESCRIPTION: Fire Alarm System
LOCAL AGENT: Name Union Fire Protection	MANUFACTURES:
Address : Doha, Qatar	Address : 50 Technology Drive, Westminster
Tele./Fax : 4002 2604	Tele./Fax : (+1)978 731 7913 / (+1)978 790 8537
DATE REQUIRED@	Coupley of origin: Maxico, Canada & UK
DELIVERY PERIOD:	TOTAL QUANTITY
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Project Name	: Floresta Gardens Residential Tov	wer (FG-106)		Ref. HTCO/20	19/15
Owner	: Danat Qatar L.L.C.				
Consultant	Hany Tawfik Consulting Office				
Contractor	Ramaco Trading & Contracting				
Subcontractor /Supplier	: Resco Gulf	Ref No:	n/a	1	
Prepared by	Electrical Design & Tender Manager	Rev and App by	Eng. Hu Project I	Issein Faress	_
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Tel: 078 731 2500 Few 07	nology Drive Westminster, MA 01	441-0001	0014	A	
16. 970-731-2500 Fax: 970	-131-1000 Web Address - WWW	SIMPLEX-FIRE	E.COM		
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	DECLARATION (II	F APPROVED)			
This is to certify that	this submission has been verified	& found in com	pliance with	o contract requirem	ients.
	CONSULTANT COMMENTS	/ RECOMMENT	DATIONS		
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