

TECHNICAL SPECIFICATION

(A) This section of the specification includes the supply, installation, testing, commissioning and handing over of an Analog addressable fire alarm system which is required to form a complete, operative, coordinated system for theSite Address Details.....It shall include, but not be limited to, Alarm initiating devices, Alarm notification appliances, Control panels, Auxiliary control devices, Annunciation, Power supplies and wiring as specified herein.

(B) The fire alarm system shall generally comply with the requirements of EN-54 for protected premises signaling systems except as modified and supplemented by this specification. The system shall be supervised either electrically or by software-directed polling of field..

GENERAL FIRE ALARM SYSTEM DESCRIPTION

The main FACP shall contain a Microprocessor based Central Processing Unit (CPU). The Panel Shall communicate with and control various field devices used to make up the system, such as smoke, Thermal (heat) and Multi Sensor detectors, Addressable modules, including initiating circuits and notification appliance circuits, local and remote operator terminals, annunciation, and other system controlled devices.

The FACP shall be capable of disabling an individual detector, Facility shall be provided on the FACP for simulating the fire condition to enable testing of the various alarm circuits.

The FACP shall have the facility to silence/ acknowledge/ reset the alarm. Apart from the FACP, Repeater panel present in the control room shall have the facility to acknowledge the fault/Fire sounds of Repeater panel alone. Repeater panel have in built One form C relay for third part panel/system integration.

In case of a Fire alarm initiation by an alarm initiating device, the audio-visual alarm shall be generated at the respective fire alarm control and the Annunciation/Repeater Panel located in the Control Room, various locations and also initiate signal to operate Sounders located in the various locations.

The FACP shall be programmed for the events to happen in case of fire like closing of fire dampers, shutting down supply fans for HVAC, deactivating the access control system .

The FACP shall have in built buzzer to alert the personnel in case of maintenance requirement.

The electronic circuit shall be of solid state and of fail-safe design, protected from humidity, corrosion and dust to ensure uninterrupted operation.

The circuit shall be protected against usual electrical transients, electromagnetic and electrostatic interference present in that vicinity.

Spares and shall be made available for a minimum period of 7 years from the date of commissioning of the system.

SLC cable should be placed at-least minimum of one meter away from any High Voltage cable And the routing shall not permit multiple T joints.

The FACP shall have facility to alter access or reset the stored program through a password to avoid unauthorized use.

The system shall have reverse polarity protection, sensitivity adjustment, and alert for drift compensation.

- 1) The system shall be capable of diagnosing the cabling for open and short circuits, unauthorized removal of detector head and AC failure.
- 2) In case of multiple alarms, the indication shall display in chronological order.

FIRE ALARM CONTROL PANEL (FACP):

The FACPs used in the Building shall confirm with the EN-54 complies with CE mark.

The fire alarm control panel (FACP) shall be suitable for Class-A Style 5, 6 or 7 wiring and Class-B Style 4 type of wiring as per NFPA-72. It shall have provision to accept the range of 110V - 230V \pm 10% single phase, 50 Hz SMPS supply. The processor shall be of 32 bit, capability for Day & Night mode. The panel shall maintain 2000 events, each with a time and date stamp. The control panels shall exclusively maintain 1000 alarm event and 1000 other events (troubles supervisory pre alarm etc). The system shall support three password levels, (i.e. Advance / Admin/ user). It shall have inbuilt USB 2.0 Interface for easy configuration facility via PC/Laptop. The FACP shall have Minimum 160 Characters LCD in which the LCD clearly indicates the location of fire, Fault & Supervisory. The FACP should have capacitive Touch Keypad, instead of mechanical snap dome switches for trouble free operation. The panel shall have degraded operating mode. In case of main CPU failure the panel still gives audio and visual notification.

The FACPs shall have maximum capacity of one loop. It shall have inbuilt RS485 facility for networking. Comprising of 127 devices in any combination and 20 loop sounders. The FACP should have one inbuilt Notification Appliances circuits. The FACP shall have provision to interface RS 485 communication for Repeater. The panel shall have minimum three programmable form C, potential free Relays, Auto-learn facility for easy installation and commissioning, capability to add or delete the devices without affecting the existing configurations, facility to program 192 groups with label, programmable time delay facility. The Panel should be capable of alerting duplication of address, mismatch on the device type. The panel shall have provision to restore factory default setting. The FACP should give audio and visual indication for main and/or standby power supply failure. The panel shall indicate degraded power supply in case both the mains and standby power supplies are below the rated level with inbuilt battery charging circuit to charge up to 26Ah SMF batteries. Shall have Programmable Trouble Reminder facility, AC loss Delay facility and also on site and off site programming.

The FACP shall have the following functions activated through the touch key pad:

- Acknowledge
- Silence
- Evacuate

- Reset
- Scroll
- Test

Each loop shall accommodate minimum 127 devices (detectors and modules) in any combination and 20 loop sounders. All the alarm initiating devices shall be addressed through SOFT addressing panel/ programming kit. All types of detectors offered will be restorable type i.e. suitable for operating a fresh after each actuation on alarm without replacement or adjustment. The sensitivity of smoke sensor shall be individually adjusted from the FACP to suit the conditions of each location. Each detector shall have self-test facility, which is monitored in the FACP. The FACP should be able to monitor each detector and raise maintenance alert once the drift compensation level is reached.

CONSTRUCTION DETAILS:

The FACP shall be of ABS Plastic cabinet. It shall be capable of being wall Mounted or flush mounted. The cabinet and front shall be corrosion protected, given a rust-resistant, and manufacturer's standard finish. It shall be of Gray color finish as per requirement. The FACP's shall be provided with earthing terminals with cable entry from the top. The panel shall be completely factory wired, absolutely ready-in all respects for installation at site. The internal wiring of the panel shall be carried out with 650V grade, stranded copper wires of size rated for the current in the corresponding circuit. The minimum size of the wire shall be not less than 0.8 sq.mm for electronic-circuits and 1.5sq.mm for electrical circuits & 14AWG for grounding.

POWER SUPPLY:

The System shall operate in the range of 110-240VAC, 50/60 Hz main supply (SMPS). The power supply shall have Glass fuse/auto resettable fuses. The panel shall have protection against transient and surges. The Power Supply shall be provided with an earth detect circuit, capable of detecting earth faults. The power supply shall have Battery charging facility with thermal fuses to avoid reverse polarity damages.

CENTRAL PROCESS UNIT (CPU):

The FACP shall have a processor which shall be 32 bit ARM cortex M3controller. The sophisticated software shall facilitate extensive memory for storing the logs of alarms, times and action taken report. The memory shall store data in a non-volatile format and retrievable for at least seven years.

REPEATER PANEL:

The Repeater Panel shall have minimum 160 characters LCD display in which the LCD clearly indicates the location of fire, fault & supervisory status. Repeater panel shall be suitable for wall mounting or mounting on table which shall display all the parameters occurring on the fire alarm control panel. It shall connect one main panel in the network. It shall be provided with an external power supply. The repeater panel shall replicate the main panel indications. It shall have provision to accept the range of 110V - 220V \pm 10% single phase, 50 Hz SMPS supply.

ADDRESSABLE DETECTORS

Addressable Multi Sensor (Optical & Thermal) Detector:

The Optical & Thermal (combined) detector shall conform to the relevant standards having the following features:

1. The detector shall be CE approved.
2. It shall have smoke sensitivity of 1.9 +/- 0.6 %/ft
3. The detector should have fixed temperature rating of 59 deg C and rate of rise of 11.1°C/min
4. The multi detector shall be loop powered and soft addressing.
5. All the detectors shall have a visible dual blinking LED to indicate the healthiness/ trouble/ alarm condition of the detector. The LED shall be located in such a way that it shall be visible 360°.
6. It shall possess false alarm immunity and a superior signal to noise ratio.
7. It shall be capable of supporting style 7 wiring.
8. It shall have inbuilt drift compensation facility.
9. In case of a failure, panel shall allow to replace the detector with the same type without the need of additional programming.
10. The detector shall change sensitivity settings based on day/night mode or with schedules based on the programming.
11. The detector shall have at least 3 levels of sensitivity settings.
12. The detector wiring shall be polarity free.
13. The detector shall have the connection details on the bottom.

Addressable Optical Smoke Sensor Detector:

The Optical Detector shall conform to the relevant standards having the following features-

1. Detector shall be CE approved.
2. It shall have smoke sensitivity of 1.9 +/- 0.6 %/ft
3. The Detector shall be loop powered and SOFT addressing.
4. All the detectors shall have a visible dual blinking LED to indicate the healthiness/ trouble/ alarm condition of the detector. The LED shall be located in such a way that it shall be visible from the 360°.
5. It shall possess False alarm immunity and a superior signal to noise ratio.
6. It shall be capable of supporting style 7 wiring.

7. It shall have inbuilt drift compensation facility.
8. In case of a failure, panel shall allow to replace the detector with the same type without the need of additional programming.
9. The detector shall change sensitivity settings based on day/night mode or with schedules based on the programming.
10. The detector shall have at least 3 levels of sensitivity settings.
11. The detector wiring shall be polarity free.
12. The detector shall have the connection details on the bottom.

Addressable Heat Detector:

The Heat Detector shall conform to the relevant standards having the following features:

1. Detector shall be CE approved.
2. The detector should have fixed temperature rating of 59°C and rate of rise of 11.1°C/min
3. The Detector shall be loop powered and addressed by SOFT addressing.
4. All the detectors shall have a visible dual blinking LED to indicate the healthiness/ trouble/ alarm condition of the detector. The LED shall be located in such a way that it shall be visible from the 360°.
5. It shall possess False alarm immunity and a superior signal to noise ratio.
6. It shall be capable of supporting style 7 wiring.
7. In case of a failure, panel shall allow to replace the detector with the same type without the need of additional programming.
8. The detector wiring shall be polarity free.
9. The detector shall have the connection details on the bottom.

Standard base:

1. The base shall be CE approved
2. The base shall be common for PHOTO, THERMAL AND MULTI SENSOR.
3. Terminals of base shall be rust resistant.
The base shall have separated in and out terminals.
4. The base shall have terminals to connect remote indicator.

ADDRESSABLE MODULES

Control Module(CM):

1. The Control Module shall be EN complies.
2. The CM shall have LED indication to show the status.
3. The CM shall activate notification devices and 24V DC operated devices.
4. It shall have a capability of handling at least 1A @ 30VDC to integrate with third party

system.

5. The CM shall be capable of powering through the auxiliary source and shall supervise the auxiliary power. The CM shall communicate faults and troubles related to the NACs, power supply to the panel.
6. The CM shall be of soft addressing.
7. The CM shall be loop powered.
8. Shall have inbuilt isolator for preventing short circuit in the Loop

Monitor Module (MM):

1. Monitor Module shall be EN complies.
2. The MM shall have LED indication to show the status.
3. The MM shall have supervised monitoring circuit.
4. The MM shall monitor any number of potential free NO contact.
5. The MM shall be soft addressing.
6. The MM shall be loop powered.
7. Shall have inbuilt isolator for preventing short circuit in the Loop.

Relay Module (RM):

1. The Relay Module shall be EN complies.
2. The RM shall provide two dry potential free contacts for activating a variety of auxiliary devices and other firefighting / ventilation equipment.
3. The RM shall have contact rating of 2A @30V DC, 0.5 @125 VAC
4. The RM shall be soft addressing.
5. The RM shall have LED for status indication.
6. The RM shall be loop powered.
7. Shall have inbuilt isolator for preventing short circuit in the loop .

Isolator Base:

Isolator base shall be part of the loop. This base shall be provided to automatically isolate wire-to-wire short circuits on an SLC Style 6 (Class A) or Style 4 (Class B branch). The isolator base shall limit the number of modules or detectors that may be rendered inoperative by a short circuit on the SLC loop segment or branch. At least one isolator base shall be provided for each floor or protected zone of the building. If a wire-to-wire short occurs, the isolator base shall automatically open-circuit (disconnect) the SLC. When the short circuit condition is rectified, the isolator Base shall automatically reconnect the isolated section. The isolator Base shall not

require any address setting, and its operations shall be totally automatic. It shall not be necessary to replace or reset an isolator Base after its normal operation.

Addressable Zone Interface Module (ZIM):

1. The zone Interface module (ZIM) will facilitate connection of conventional detectors in the same circuit /loop consisting of addressable detectors.
2. The ZIM shall be capable of powering the detectors through the auxiliary source and shall supervise the IDC power supply.
3. The ZIM shall communicate alarm and troubles related to detector and power supply to the Panel.
4. The ZIM shall allow resetting conventional detectors from the panel.
5. The ZIM shall have LED status indication
6. The ZIM shall be capable to connect at least 16 Initiating Devices.

Manual Call Point:

The Manual call point (MCP) shall conform to the relevant standards having the following features.

1. Suitable for flash or surface mount.
2. Re-settable by an Element Kit.
3. Shall be the inbuilt Monitor module.
4. Shall have 6 amp@120VAC rating SPDT contact.
5. Shall be made of ABS plastic.
6. Shall be EN-complies.
7. The MCP shall be soft addressing.
8. Shall have RED LED Blink Facility.

Loop sounder/Base sounder:

The Loop Sounder shall conform to the relevant standards having the following features.

1. The Sounder shall be an addressable Loop sounder.
2. Shall have 8 Different Audio tone setting, address through soft addressing.
3. The sounder shall have audibility level of 85dB @1meter
4. The sounder shall have the capability of being tested from the FACP
5. Suitable for flash or surface mount.
6. Shall be made of ABS plastic.

Sounder:

The Sounder shall confirm to the relevant standards having the following features.

1. The Sounder shall be a Conventional sounder. (Bidder shall consider external power supply, cable, conduits, modules required for activating externally powered sounders and include the costing as part of the item – Sounders)
2. The sounder shall have audibility level of 85dB @1meter.
3. The sounder shall have the capability of being tested from the FACP.
4. Shall be UL listed

Sounder Cum Strobe:

The Sounder Cum Strobe shall confirm to the relevant standards having the following features.

- 1.The Sounder Cum Strobe Shall have audibility level of 85db @1meter.
- 2.The Sounder Cum Strobe shall have 4 Candela setting 15/30/75/110cd flashing capacity at 1HZ for Visual indications.
- 3.The Sounder Cum Strobe shall be integrated with Control Modules with necessary auxiliary voltages.
- 4.The Sounder Cum strobe shall be working on 24VDC auxiliary power supplies.
5. 2 Audible tone settings.
- 6.Shall be UL listed

LPG detector:

The propane LPG gas detector are suitable for use with conventional fire detection control panel as well as addressable fire detection control panel that can accept conventional detector via zone module.

1. Advanced algorithms provide advanced detection, discrimination.
2. Stable gas sensing chamber .No adjustment or replacement required.
3. High immunity against unwanted alarms
- 4.4 wire system operation
5. Detector auto- reset once gas level fall below alarm threshold level
6. Internal reed switch for hush and test functions.
7. N/O alarm output
- 8.70dB internal sounder
9. Easy installation and not required any programming
10. Connect to zone module or monitor module for use addressable control and indicating equipments.

Beam Detector:

The Beam Detector Shall conform to the relevant standards having the following features.

1. Shall have a Infrared transmitter and receiver in a single housing.
2. Shall have an interoperating Prism Reflector.
3. Shall supports from 5 meter to 100 meter in range.
4. Shall have an inbuilt LASER light for easy alignment with the reflector.
5. Shall have a adjust screws for precise alignment.
6. Shall have inbuilt Drift level compensation.
7. Shall have three levels of sensitivity threshold settings (i.e) 18%,30%,50%
8. Shall operates on the temperature of -25deg C to 55 Deg C
9. Shall operate on 24VDC power supply.
10. Shall have a provision to connect the Response Indicator.

A. Batteries:

- (i) Battery shall have sufficient capacity to power the fire alarm system for not less half an hour in alarm condition and at least 24 hours in normal condition.
- (ii) The batteries are to be completely maintenance free.
- (iii) The batteries shall be of Lead acid type.

B. Cables/conduits:

All cables/conduits to be laid on wall, ceiling and on the hangers wherever necessary and as directed by the authority with required hardware. The cables shall be armored PVC twisted 1.5 sq mm multi strand insulated, copper conductor, conforming to IS: 1554 and shall be of specified make. The cables shall be properly terminated and labeled.