

**East Central Railway**

**Office of the  
General Manager  
(Signal & Telecomm)  
ECR, Hajipur**

**Dated: 19.12.2024**

**No. ECR-HQ0SnT (CCP)/2/2024  
(Comp.no. 279039)**

**Sr. DSTEs  
DDU/DHN/DNR/SEE /SPJ,  
East Central Railway.**

**Sub:** Regarding comments on TAN for the item "Automatic Fire Detection & Alarm System for Signalling and Telecom Installations (Spec. No.: RDSO/SPN/217/2021 Ver.3.0)".


**Ref:** Director/Sig-III/RDSO letter no. -STS/E/AFD&SS Vol.-V dated 13.12.2024

\*\*\*\*\*

Please find enclosed herewith RDSO above letter regarding Comments of TAN for the item "Automatic Fire Detection & Alarm System for Signalling and Telecom Installations (Spec. No.: RDSO/SPN/217/2021 Ver.3.0)".

PCSTE desired that item wise comment / remarks on Technical Advisory Note (TAN) under the referred letter may be sent to this office earliest.

**DA:** As above.

  
**(Rajiva Shekhar)  
ASTE/Signal/HJP  
for GM (S&T)/ECR/HJP**

Fax : 91-522-2452332 Mob. No. 9794863311  
E-mail: dirsig3@rdsso.railnet.gov.in  
dirsig3rdsso@gmail.com



सत्यमेव जयते

Government of India - Ministry of Railways  
Research Designs & Standards Organisation

LUCKNOW – 226011

Room No. 206, II floor,

Signal Directorate, Annexie-I Building,  
Manak Nagar, LUCKNOW – 226011

No. STS/E/AFD&SS Vol. – V

Date- 13.12.2024

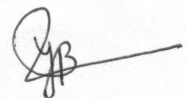
By E-mail

<p>प्रधानमुख्य सिगनल एव दूरसंचारअभियन्ता मध्य रेलवे, मुम्बईसी.एस.टी.- 400 001 पश्चिमरेलवे, चर्चगेट, मुम्बई- 400 020 पूर्वरेलवे, फेयरलीप्लेस, कोलकाता- 700 001 दक्षिणपूर्वरेलवे, गार्डनरीच, कोलकाता- 700 043 उत्तररेलवे, बडौदाहाउस, नईदिल्ली- 110 001 पूर्वोत्तररेलवे, गोरखपुर- 273 012 पूर्वोत्तरसीमान्तरेलवे, मालीगांव, गुवाहाटी- 781 011 दक्षिणरेलवे, पार्कटाउन, चेन्नई- 600 003 दक्षिण मध्य रेलवे, सिकन्द्राबाद-500 371 पूर्व मध्य रेलवे, हाजीपुर। पूर्वतटीय रेलवे, बी-1, रेलविहार, चन्द्रषेखरपुर, भुवनेश्वर-751023 उ०म० रेलवे, "गंगा"परिसर, सुबेदारगंज, इलाहाबाद उत्तरपश्चिमरेलवे, जयपुर-300206 दक्षिणपश्चिमरेलवे, कलबरोड, केषवपुर, हुबली-23 पश्चिम मध्य रेलवे, ओ०एस०डी० कार्यालय, जबलपुर दक्षिणपूर्वमध्य रेलवे, आर०ई० ऑफिसकाम्पलेक्स, बिलासपुर- 495004 कोर , नवाब युसुफअलीरोड, सिविललाईन्स, इलाहाबाद- 211 001 डी.एम.आर.सी., मेट्रोभवन, फायरब्रिगेडलेन, बाराखम्मारोड, नई दिल्ली-110001</p>	<p><b>P. C.S.T.E.</b> Central Rly., Mumbai, CST - 400001 Western Rly, Churchgate, Mumbai - 400020 Eastern Rly., Fairlie Place, Kolkata 700001 South Eastern Rly., Garden Reach, Kolkata - 700043 Northern Rly. Baroda House, New Delhi- 110001 North Eastern Rly., Gorakhpur- 273012 North East Frontier Rly., Maligaon, Guwahati - 781011 Southern Rly. Park Town, Chennai - 600003 South Central Rly., Secunderabad – 500371 East Central Railway, Hajipur. East Coast Railway, B-1, Rail Vihar, Chandrasekharapur, Bhubneshwar - 751023 N.C.Railway, Ganga Parisar, Subedarganj, Allahabad North Western Railway, Jaipur - 300206 South Western Railway, Club Road, Keshavapur, Hubli West Central Railway, OSD Office, Jabalpur South East Central Railway, R.E. Office Complex, Bilaspur - 495004 CORE, Nawab Yusuf Ali Road, Civil Lines, Allahabad- 211001. Delhi Metro Rail Corporation Ltd., Metro Bhawan, Fire Brigade Lane, Barakhamba Road, New Delhi-110001</p>
--	--

**Subject:** Regarding comments of TAN for the item "Automatic Fire Detection & Alarm System for Signalling and Telecom Installations (Spec. No.: RDSO/SPN/217/2021 Ver. 3.0)".

To enhance the reliability of the AFDAS (Specification No.: RDSO/SPN/217/2021 Ver. 3.0), a draft Technical Advisory Note (TAN) has been prepared, outlining guidelines and precautions for the installation, testing, maintenance, and cleaning of the AFDAS system. The draft is hereby issued to Zonal Railways for their comments and remarks within 15 days. Additionally, please pay special attention to the **text highlighted in red**.

DA: As Above.



(Y P Singh)  
Director/Sig-III  
For DG/S&T

Technical Advisory Note:Automatic Fire Detection & Alarm System (AFDAS)			
Subject	Guidelines and Precautions of AFDAS System for Installation, Testing, Maintenance & Cleaning etc.		
Document Number	STS/E/TAN/3009	Version	1.0
Dated	10/12/2024	Pages	01-19

<b>S N</b>	<b>Description</b>		
<b>1.</b>	<b>Automatic Fire Detection &amp; Alarm System:</b>		
1.1	Automatic Fire Detection & Alarm System (AFDAS) shall consist of all or any of the following: <ul style="list-style-type: none"> <li>a) Probe type Bimetallic Heat detectors.</li> <li>b) UV &amp; IR flame detectors.</li> <li>c) Heat and Smoke multi sensors.</li> <li>d) Linear Heat Sensing (LHS) cable/ Linear Heat Detection System.</li> <li>e) Aspirating (air sampling) type smoke detector.</li> <li>f) Control Panel.</li> <li>g) Manual Call Points.</li> <li>h) Audio Visual alarms.</li> </ul>		
<b>2.</b>	<b>Application of the Detectors</b>		
2.1	<ul style="list-style-type: none"> <li>• <b>Probe type Bimetallic Heat detectors:</b> Diesel Generator enclosure.</li> <li>• <b>UV &amp; IR flame detectors:</b> Diesel Oil Storage room.</li> <li>• <b>Heat and Smoke multi sensors:</b> Diesel Generator room, Power Supply Room, Relay Rooms, ASM Room and other rooms connected with Signalling &amp; Telecom Installations, as required.</li> <li>• <b>Linear Heat Sensing (LHS) cable/ Linear Heat Detection (LHD) System:</b> cable trays, cable troughs &amp; cable bunch etc.</li> <li>• <b>*Aspirating (air sampling) type smoke detector:</b> Relay Rooms, Major Telephone Exchanges, Satellite Hubs, Data Centre location &amp; Main Switching Centre (MSC), Base Station Controller (BSC) for MTRC, Test Room/Telecom Control Room and Main OFC Junction Equipment Room.</li> <li>• <b>Control Panel:</b> Station Master room or as per site condition such as IB/Gumpties.</li> <li>• <b>Manual Call Point:</b> At the entry and exit of rooms (Escape and rescue routes).</li> <li>• <b>Audio Visual Alarm:</b> It shall be provided with Control Panel.</li> </ul> <p>* An Aspirating type smoke detector shall be installed in both AC and non AC Relay room,withthe <b>filter being cleaned on a fortnightly basis.</b></p>		
<b>3.</b>	<b>Placement of the Detectors</b>		
3.1	<b>SN</b>	<b>Equipment</b>	<b>Sitting and Spacing</b>
	1	Probe type Bimetallic Heat Detector	Minimum <b>Two</b> in Diesel Generator enclosure
	2	UV & IR Flame Detectors	Minimum Two at a maximum distance of 10 meter. The radial distance of flame detection should not be more than 10 meter.

Technical Advisory Note:Automatic Fire Detection & Alarm System (AFDAS)			
Subject	Guidelines and Precautions of AFDAS System for Installation, Testing, Maintenance & Cleaning etc.		
Document Number	STS/E/TAN/3009	Version	1.0
Dated	10/12/2024	Pages	01-19

	3	Heat and Smoke Multi sensors	On the ceiling, on either side of each relay rack, cable termination rack, IPS rack, power panel, changeover panel, operating panel, maintenance panel, 230V AC points (used or unused), above air conditioners, and other locations where fire-like situations can arise. In no case should the spacing between two detectors exceed 5 meters.
	4	LHS Cable	In a Zig Zag fashion with bending radius not less than 50 mm.
	5	LHD System	Straight
	6	Aspirating type smoke detector	Piping just above the Relay Rack, cable termination rack, EI Rack, Datalogger/UFSBI/MSDAC rack with sampling point provided on either side of each Relay rack, Cable termination rack, EI/UFSBI/Datalogger/MSDAC rack, Air conditioner, 230V AC used or unused etc.
	7	Control Panel	1200 mm from the centre of Control Panel to the floor.
	8	Manual Call Point	1400 mm $\pm$ 200 mm measured from the middle of the manual call point to the floor.
	9	Audio Visual Alarm	2030 – 2440 mm from floor level to bottom level of Audio visual alarm.
4	<b>Sensitivity of Detectors</b>		
4.1	<b>SN.</b>	<b>Detectors</b>	<b>Sensitivity</b>
	1	Probe type Bimetallic Heat Detector	11°C above the maximum operating temperature of the diesel generator.
	2	UV & IR Flame Detectors	Upto 10 meter
	3	Heat and Smoke Multi sensors	(i) Fixed heat above 58°C (ii) Rate of temperature rise between 6°C/minute to 11.1°C/minute. (ii) Optical density of smoke/obscuration falls within the limit as follows: 1.6(%obs/m) & 12.5(%obs/m).
	4	LHS Cable	70°C with a tolerance not to exceed $\pm$ 8.3°C.
	5	LHD System	70°C with a tolerance not to exceed $\pm$ 8.3°C.
	6	Aspirating type smoke detector	Alarm for $\geq$ 2.0% obs/m

Technical Advisory Note:Automatic Fire Detection & Alarm System (AFDAS)			
Subject	Guidelines and Precautions of AFDAS System for Installation, Testing, Maintenance & Cleaning etc.		
Document Number	STS/E/TAN/3009	Version	1.0
Dated	10/12/2024	Pages	01-19

5	<b>Power Supply Arrangement to AFDAS</b>
	<ul style="list-style-type: none"> <li>• <b>Power Supply:</b> The primary supply required for AFDAS is 110/230 V AC (+10% to -15%).</li> <li>• <b>Lightning and Surge Protection:</b> The power input must be duly protected against lightning and power surges by using appropriate surge protection devices (SPDs) to safeguard the system from transient voltage events.</li> <li>• <b>Preferred Voltage Input:</b> The AFDAS must be powered by a stable and uninterrupted power supply, ensuring consistent operation. The 230V AC local supply available at the station is mostly extended without appropriate lightning and surge protection, making it susceptible to surges. <b>Therefore, the preferred input power supply is 110V AC, sourced from the Integrated Power Supply (IPS), which is protected against surges.</b></li> </ul>
6	<b>Cross Zoning of Detectors</b>
	Two adjacent detectors at a particular location shall be addressed for different zones. This is not applicable for Aspiration type detector.
7	<b>Monitoring through Datalogger or NMS</b>
	<ul style="list-style-type: none"> <li>• The PFC contact of the AFDAS system should be wired and validated in the Datalogger.</li> <li>• The NMS software, if provided, should preferably be networked as shown in the <b>Annexure-V</b>.</li> </ul>
8	<b>Testing Procedure</b>
	Correct testing procedures for Automatic Fire Detection and Alarm Systems are crucial to ensure reliable performance during emergencies and compliance with safety standards. Improper testing methods, such as using minimal smoke sources or burning fires on the ground, often lead to incorrect conclusions about detector sensitivity. Properly defined testing protocols help identify actual faults and ensure system reliability. Testing with correct parameters prevents false assessments and enhances confidence in the system's ability to protect life and property. This emphasizes the need for standardized and accurate testing procedures. The Testing procedure is attached as <b>Annexure-I</b> .
9	<b>Cleaning Procedure</b>
9.1	Regular cleaning of fire alarm detectors is essential to maintain their sensitivity and ensure prompt detection of smoke or heat. It reduces the likelihood of false alarms caused by dust and debris build up, enhancing system reliability. The detailed cleaning procedure is attached as <b>Annexure-II</b> .
10	<b>Maintenance Schedule</b>
	The maintenance schedule for the AFDAS system is attached as <b>Annexure-III</b> .
11	<b>Other Important Points</b>
	<ol style="list-style-type: none"> <li>1. The Armoured copper cables shall be used when the entire circuit is not within the same building.</li> <li>2. The Heat and Smoke Detectors should be located far from the exhaust fan.</li> </ol>



Technical Advisory Note:Automatic Fire Detection & Alarm System (AFDAS)			
Subject	Guidelines and Precautions of AFDAS System for Installation, Testing, Maintenance & Cleaning etc.		
Document Number	STS/E/TAN/3009	Version	1.0
Dated	10/12/2024	Pages	01-19

	<p>3. The heat and smoke detector should preferably be installed at least 910 mm away from the tip of the fan blades. However, if this is not feasible, Paragraph 3 must still be adhered to.</p> <p>4. The type and number of Detectors, along with spares, should be planned in the estimates. The AFDAS should be procured, including spares, as per the specifications.</p> <p>5. The Layout plan shall be approved by minimum JAG level officer before installation.</p> <p>6. Railway shall provide one 4.5 Kg capacity, IS 2878:2004, carbon dioxide extinguisher for every 100 m<sup>2</sup> of floor area or part thereof with minimum of two extinguishers so located as to be available within 10 m radius.</p>
--	--

### **List of Annexures**

Page No.	Annexure	Description
5	Annexure-I	Testing Procedure of AFDAS
11	Annexure-II	Cleaning Procedure of AFDAS
15	Annexure-III	<b>Maintenance Schedule of AFDAS</b>
18	Annexure-IV	Configuration Drawing of AFDAS System
19	Annexure-V	Network Drawing of AFDAS System

Technical Advisory Note:Automatic Fire Detection & Alarm System (AFDAS)			
Subject	Guidelines and Precautions of AFDAS System for Installation, Testing, Maintenance & Cleaning etc.		
Document Number	STS/E/TAN/3009	Version	1.0
Dated	10/12/2024	Pages	01-19

## **Annexure-I**

SN.	Testing Procedure of Automatic Fire Detection and Alarm System (AFDAS)
1.	Control Panel
	<p><b>1.1 Visual Test:</b></p> <ul style="list-style-type: none"> <li>• Check all cards and connections.</li> <li>• Verify fuse and battery connections.</li> <li>• Inspect mains AC connection and earthing.</li> <li>• Ensure proper connectivity for the connected loop.</li> </ul> <p><b>1.2 Electrical Parameters:</b></p> <ul style="list-style-type: none"> <li>• Measure input voltage (230 VAC/50Hz or 110 VAC).</li> <li>• Measure 24 VDC (24-27 VDC while charging).</li> <li>• Inspect display &amp; LEDs for proper functionality.</li> <li>• Check SMPS LED for: <ul style="list-style-type: none"> <li>- Battery charging.</li> <li>- Fault indications.</li> </ul> </li> <li>• Press the <b>"MENU"</b> key: <ul style="list-style-type: none"> <li>- Check display parameters.</li> <li>- Verify the correct date and time.</li> <li>- Look for any errors on the control panel.</li> </ul> </li> </ul> <p><b>1.3 Testing Parameters:</b></p> <ul style="list-style-type: none"> <li>• Ensure no errors are visible on the control panel after inspecting all detectors, devices and checkpoints.</li> </ul>
2	Manual Call point - MCP
	<p><b>2.1 Normal Condition:</b></p> <ul style="list-style-type: none"> <li>• Blinking RED LED indication.</li> </ul> <p><b>2.2 Active Condition:</b> Press the Button/Pull Bar of MCP.</p> <ul style="list-style-type: none"> <li>• Steady RED indication appears on the MCP.</li> </ul>



Technical Advisory Note:Automatic Fire Detection & Alarm System (AFDAS)			
Subject	Guidelines and Precautions of AFDAS System for Installation, Testing, Maintenance & Cleaning etc.		
Document Number	STS/E/TAN/3009	Version	1.0
Dated	10/12/2024	Pages	01-19

- Alarm activates on the control panel.
- The display shows the active device's name, number and location.

### 2.3 Testing Procedure of Manual Call Point:

Procedure	Observation
1. Press the Button in the middle of MCP/ Pull down the Pull bar	MCP activated within few seconds. Normal indication changes to activated indication
	<b>At Control Panel observe the followings:</b>
	a. Fire indication
	b. Place of activation
	c. Address of MCP
	d. Sounder is blowing
2. Reset the MCP by using a KEY & operating it to RHS/UP side or by Align Key. The Key is provided at MCP.	Normal indication of MCP is restored.
3. Reset the Control Panel (CP).	Normal indication of Control Panel is restored.

## 3 Heat & Smoke Multi-Sensor

### 3.1 Normal Condition:

- Blinking RED LED indication.

### 3.2 Active Condition:

- AftersensingHeatorSmoke:
- Steady RED LED indication.
- The control panel activates the alarm.
- Displays the active device name, number and location.





Technical Advisory Note:Automatic Fire Detection & Alarm System (AFDAS)			
Subject	Guidelines and Precautions of AFDAS System for Installation, Testing, Maintenance & Cleaning etc.		
Document Number	STS/E/TAN/3009	Version	1.0
Dated	10/12/2024	Pages	01-19

### 3.3 Testing Procedure of Heat and Smoke Multi-Sensor:

Procedure	Observation
1. Test the sensor by Aerosol and Hot Air Gun. Keep the Tester/source of Smoke at 10 to 15 cm away from the sensor.	Check that normal indication changes to Activated indication. <b>At Control Panel observe the following:</b> a. Fire indication b. Location of Heat & Smoke Multi Sensor c. Address of Heat & Smoke Multi Sensor d. Sounder is blowing
2. Remove the tester.	The normal indication of Sensor is restored.
3. Reset the Control Panel.	Normal indication of Control Panel is restored.

## 4 Aspirating Type Smoke Detector

### 4.1 Normal Condition:

- Steady Green LED indication.

### 4.2 Active Condition:

- Steady RED LED indication.

<b>Stage 1</b>	Steady Third LED	0.5 to 0.95 %obs/m
<b>Stage 2</b>	Steady Fifth LED	1.0 to 1.45 %obs/m
<b>Stage 3</b>	Steady Seventh LED	1.5 to 1.95 %obs/m
<b>Stage 4</b>	Steady Tenth LED with RED indication	≥ 2.0 %obs/m



### 4.3 Testing Procedure of Aspirating Type Smoke Detector:

Procedure	Observation
1. Generate smoke using Aerosol (Solo A3 Aerosol) & wait for one minute. Keep the source of Smoke at 10 to 15 cm away from	Level wise alarm will be generated at the interfacing module. Normal indication changes to activated indication.

Technical Advisory Note:Automatic Fire Detection & Alarm System (AFDAS)			
Subject	Guidelines and Precautions of AFDAS System for Installation, Testing, Maintenance & Cleaning etc.		
Document Number	STS/E/TAN/3009	Version	1.0
Dated	10/12/2024	Pages	01-19

	the detector. Allow smoke to get through the air sampling hole.	<b>At Control Panel observe the following</b>
		a. Fire indication
		b. Location of ASD
		c. Address of ASD
		d. Sounder is blowing
	2. Wait for smoke to Disappear.	The normal indication of Sensor is restored.
	3. Reset the Control Panel.	The normal indication of Control Panel is restored.
<b>5</b>	<b>Linear Heat Sensing (LHS) Module</b>	
	<b>5.1 Indication:</b> <ul style="list-style-type: none"> <li>• <b>Normal Condition:</b> Steady <b>GREEN</b> indication.</li> <li>• <b>Active Condition:</b> Steady <b>RED</b> indication.</li> <li>• Use boiling water to dip a loop of cable or a heat gun (ensure not to overheat the cable).</li> </ul>	
	<b>5.2 Testing Procedure of Linear Heat Sensing (LHS) Module:</b>	
	<b>Procedure</b>	<b>Observation</b>
	1. Heat the Tube/Cable by Hot Air Gun or use boiling water to dip. Hold hot Air Gun till the temperature reaches above the set value.	Alarm gets initiated at Interfacing module. Normal indication change to activated indication.
		<b>At Control Panel observe the following:</b>
		a. Fire indication
		b. Location of LHS/LHD
		c. Address of LHS/LHD
		d. Sounder is blowing
	2. Remove the Hot Air Gun and allow it to cool to room Temperature.	The normal indication of Sensor/Detector is restored.
	3. Reset the Control Panel (CP).	The normal indication of CP is restored.



Technical Advisory Note:Automatic Fire Detection & Alarm System (AFDAS)			
Subject	Guidelines and Precautions of AFDAS System for Installation, Testing, Maintenance & Cleaning etc.		
Document Number	STS/E/TAN/3009	Version	1.0
Dated	10/12/2024	Pages	01-19

<b>6</b>	<b>Probe Type Heat Detector</b>														
	<p><b>6.1 Normal Condition:</b></p> <ul style="list-style-type: none"> <li>Blinking RED LED indication.</li> </ul> <p><b>6.2 Active Condition:</b></p> <ul style="list-style-type: none"> <li>Steady RED LED indication.</li> </ul> <p><b>6.3 Testing Procedure of Probe Type Heat Detector:</b></p> <table border="1"> <thead> <tr> <th>Procedure</th><th>Observation</th></tr> </thead> <tbody> <tr> <td rowspan="6">1. Heat the Detector by Hot Air Gun.</td><td><b>At Control Panel observe the following:</b></td></tr> <tr> <td>a. Fire indication</td></tr> <tr> <td>b. Location of Fire</td></tr> <tr> <td>c. Address of DG set</td></tr> <tr> <td>d. DG set no.</td></tr> <tr> <td>e. Sounder is blowing</td></tr> <tr> <td rowspan="2">2. Remove the Hot Air Gun from Detector.</td><td>e. Activated indication on Monitor module.</td></tr> <tr> <td>Normal indication is restored on monitor module.</td></tr> <tr> <td>3. Reset the control Panel.</td><td>Normal indication of CP is restored.</td></tr> </tbody> </table>	Procedure	Observation	1. Heat the Detector by Hot Air Gun.	<b>At Control Panel observe the following:</b>	a. Fire indication	b. Location of Fire	c. Address of DG set	d. DG set no.	e. Sounder is blowing	2. Remove the Hot Air Gun from Detector.	e. Activated indication on Monitor module.	Normal indication is restored on monitor module.	3. Reset the control Panel.	Normal indication of CP is restored.
Procedure	Observation														
1. Heat the Detector by Hot Air Gun.	<b>At Control Panel observe the following:</b>														
	a. Fire indication														
	b. Location of Fire														
	c. Address of DG set														
	d. DG set no.														
	e. Sounder is blowing														
2. Remove the Hot Air Gun from Detector.	e. Activated indication on Monitor module.														
	Normal indication is restored on monitor module.														
3. Reset the control Panel.	Normal indication of CP is restored.														
	 														
<b>7</b>	<b>UV/IR Flame Detector</b>														
	<p><b>7.1 Normal Condition:</b></p> <ul style="list-style-type: none"> <li>Blinking GREEN LED indication.</li> </ul> <p><b>7.2 Active Condition:</b></p> <ul style="list-style-type: none"> <li>Steady RED LED indication.</li> </ul> <p><b>7.3 Testing Procedure of UV/IR Flame Detector:</b></p> <table border="1"> <thead> <tr> <th>Procedure</th><th>Observation</th></tr> </thead> <tbody> <tr> <td rowspan="3">1. Use manufacturer Prescribed test lamp or Lighter towards flame detector. Keep the Tester/ Lighter at 10 to 15 cm away from the detector. Direct the brightest part of</td><td>Flame Detector LED turned ON steady after blinking</td></tr> <tr> <td><b>At Control Panel observe the following:</b></td></tr> <tr> <td>a. Fire indication</td></tr> <tr> <td></td><td>b. Location of UV-IR</td></tr> </tbody> </table>	Procedure	Observation	1. Use manufacturer Prescribed test lamp or Lighter towards flame detector. Keep the Tester/ Lighter at 10 to 15 cm away from the detector. Direct the brightest part of	Flame Detector LED turned ON steady after blinking	<b>At Control Panel observe the following:</b>	a. Fire indication		b. Location of UV-IR						
Procedure	Observation														
1. Use manufacturer Prescribed test lamp or Lighter towards flame detector. Keep the Tester/ Lighter at 10 to 15 cm away from the detector. Direct the brightest part of	Flame Detector LED turned ON steady after blinking														
	<b>At Control Panel observe the following:</b>														
	a. Fire indication														
	b. Location of UV-IR														
															

Technical Advisory Note:Automatic Fire Detection & Alarm System (AFDAS)			
Subject	Guidelines and Precautions of AFDAS System for Installation, Testing, Maintenance & Cleaning etc.		
Document Number	STS/E/TAN/3009	Version	1.0
Dated	10/12/2024	Pages	01-19

	light towards detecting part.	c. Address of UV-IR	
		d. Sounder is blowing	
	2. Press operation Switch of test lamp or Lighter/ Matchstick (OFF).	The normal indication of Sensor is restored	
	3. Reset the Control Panel (CP).	Normal indication of Control Panel is restored.	

## 8 Audio-Visual Alarm

### 8.1 Testing Procedure of Audio-Visual Alarm:

Procedure	Observation
Activate any device (MCP, Heat & Smoke multi sensor, Flame Detector, ASD or LHS/LHD) for Fire (May be tested in FIRE condition).	Flashing white LED Sounder start sounding Check-Sounder is adjustable.



## 9 Required Tools/Tester for the Testing

- Screwdriver set.
- Hot Air Gun.
- Aerosol (Test fire 1000 series).
- Lighter for Flame (for UV/IR).
- Multimeter.

Technical Advisory Note:Automatic Fire Detection & Alarm System (AFDAS)			
Subject	Guidelines and Precautions of AFDAS System for Installation, Testing, Maintenance & Cleaning etc.		
Document Number	STS/E/TAN/3009	Version	1.0
Dated	10/12/2024	Pages	01-19

## **Annexure-II**

SN.	Cleaning Procedure of Automatic Fire Detection and Alarm System
	Cleaning fire detection equipment is critical to maintaining their functionality and reliability. Below are detailed cleaning procedures for each type of detector:
<b>1.</b>	<b>Multi-Sensor Heat and Smoke Detector (Optical Type)</b>
	<p><b>1.1 Materials Required:</b></p> <ul style="list-style-type: none"> <li>• Soft brush</li> <li>• Compressed air blower</li> <li>• Damp lint-free cloth</li> <li>• Mild cleaning solution (if required)</li> </ul> <p><b>1.2 Procedure:</b></p> <p><b>i. Power Down the System:</b> Ensure the detector is isolated from the fire alarm system or Switch Off the Fire Alarm system to avoid false alarms.</p> <p><b>ii. Remove the Detector:</b> Detach the detector from its base carefully.</p> <p><b>iii. Surface Cleaning:</b></p> <ul style="list-style-type: none"> <li>- Use a soft brush to remove dust from the outer surface.</li> <li>- Use compressed air to blow out dust from vents and optical chambers.</li> <li>- Use lint free cloth to clean the dust hardened on the sensor.</li> </ul> <p><b>iv. Inspect for Damage:</b> Check for cracks, discoloration, or other damage.</p>





Technical Advisory Note:Automatic Fire Detection & Alarm System (AFDAS)			
Subject	Guidelines and Precautions of AFDAS System for Installation, Testing, Maintenance & Cleaning etc.		
Document Number	STS/E/TAN/3009	Version	1.0
Dated	10/12/2024	Pages	01-19

- v. Reassemble and Test:** Reinstall the detector, power up the system, and perform a functionality test.



## 2 Aspirating Smoke Detector

### 2.1 Materials Required:

- Compressed air blower
- Damp lint-free cloth

### 2.2 Procedure:

- i. **Deactivate the System:** Turn off the aspirating system to prevent alarms.
- ii. **Clean the Filter:** Remove and clean the filter with compressed air. Replace it if heavily clogged.
- iii. **Clean the Housing for Filter:** Wipe the filter housing with a dry or slightly damp cloth.
- iv. **Inspect and Test:** Reassemble power up, and perform a smoke test to ensure functionality.



- v. Detach the sampling pipes and use compressed air to clear out dust or debris. (This should be performed once every quarter.)

Technical Advisory Note:Automatic Fire Detection & Alarm System (AFDAS)			
Subject	Guidelines and Precautions of AFDAS System for Installation, Testing, Maintenance & Cleaning etc.		
Document Number	STS/E/TAN/3009	Version	1.0
Dated	10/12/2024	Pages	01-19

<b>3</b>	<b>UV &amp; IR Flame Detector</b>
	<p><b>3.1 Materials Required:</b></p> <ul style="list-style-type: none"> <li>- Soft lint-free cloth</li> <li>- Isopropyl alcohol (70% or higher)</li> </ul> <p><b>3.2 Procedure:</b></p> <ol style="list-style-type: none"> <li><b>Power Down the Detector:</b> Disconnect the power supply or isolate it from the system.</li> <li><b>Inspect the Lens:</b> <ul style="list-style-type: none"> <li>- Check the lens for dirt, oil, or scratches.</li> <li>- Avoid touching the lens directly with bare hands.</li> </ul> </li> <li><b>Clean the Lens:</b> Use a lint-free cloth dampened with isopropyl alcohol to gently clean the lens and allow it to air dry completely before reassembly.</li> <li><b>Clean the Housing:</b> Wipe the detector housing with a dry or slightly damp cloth.</li> <li><b>Test the Detector:</b> Reconnect power and perform a flame simulation test to confirm functionality.</li> </ol>
<b>4</b>	<b>Probe Type Heat Detector</b>
	<p><b>4.1 Materials Required:</b></p> <ul style="list-style-type: none"> <li>- Soft brush</li> <li>- Compressed air blower</li> <li>- Damp cloth</li> </ul> <p><b>4.2 Procedure:</b></p> <ol style="list-style-type: none"> <li><b>Isolate the Detector:</b> Disconnect the heat detector from the alarm system.</li> <li><b>Inspect for Damage:</b> Look for signs of corrosion, dirt, or physical damage to the probe.</li> </ol>



Technical Advisory Note:Automatic Fire Detection & Alarm System (AFDAS)			
Subject	Guidelines and Precautions of AFDAS System for Installation, Testing, Maintenance & Cleaning etc.		
Document Number	STS/E/TAN/3009	Version	1.0
Dated	10/12/2024	Pages	01-19

	<p>iii. <b>Clean the Probe:</b></p> <ul style="list-style-type: none"> <li>- Use a soft brush to remove dirt and debris from the probe and housing.</li> <li>- Blow compressed air around the probe to clear hidden dust.</li> <li>- If necessary, wipe with a damp cloth, ensuring the area is thoroughly dried afterward.</li> </ul> <p>iv. <b>Inspect Mounting Points:</b> Check for loose connections or signs of wear.</p> <p>v. <b>Reinstall and Test:</b> Secure the detector back into place, power up the system, and conduct a heat simulation test.</p>
<b>5</b>	<b>General Precautions</b>
	<ul style="list-style-type: none"> <li>i. Always consult the manufacturer's manual for specific cleaning instructions and limitations.</li> <li>ii. Ensure no cleaning materials leave residue or damage sensitive parts.</li> <li>iii. Perform functionality tests after cleaning to verify the detectors are operational.</li> <li>iv. Maintain records of cleaning schedules and findings for future reference.</li> </ul>

Technical Advisory Note:Automatic Fire Detection & Alarm System (AFDAS)			
Subject	Guidelines and Precautions of AFDAS System for Installation, Testing, Maintenance & Cleaning etc.		
Document Number	STS/E/TAN/3009	Version	1.0
Dated	10/12/2024	Pages	01-19

### **Annexure-III**

#### **Maintenance Schedule**

##### **A. Fortnightly Schedule**

SN	Check the Following	Observations	Remarks (if Any)
1	Date and time of the system at the Control Panel.		
2	<b>Visual indications:</b>		
a.	Control Panel (Power On LED).		
b.	Manual Call Points.		
c.	Detectors.		
d.	Other devices.		
e.	Each device in the loop(LED blinking).		
3	<b>Check Internal Buzzer</b> (disconnect primary power):		
a.	Mains fail indication at Control Panel.		
b.	Mains fail LED lit at the Control Panel.		
c.	Internal buzzer starts.		
d.	Restore power supply, the Control Panel should normalize.		
4	Press Menu on Control Panel and check <b>Device status</b> (Failed, Fault, Fire, and Disablement logs).		
a.	Clean the detector showing a fault.		
b.	Address faults like detector missing, disablement, earth fault, low/no battery voltage, mains power failure, or sounder/strobe faults (refer to user manual/troubleshooting guide).		

Technical Advisory Note:Automatic Fire Detection & Alarm System (AFDAS)			
Subject	Guidelines and Precautions of AFDAS System for Installation, Testing, Maintenance & Cleaning etc.		
Document Number	STS/E/TAN/3009	Version	1.0
Dated	10/12/2024	Pages	01-19

## B. Monthly Schedule

SN	Check the Following	Observations	Remarks (if Any)
<b>1</b>	<b>Supply voltage</b>		
a.	Input supply voltage: 230/110V AC (+10% and -15%).		
b.	SMPS output at Control Panel (24-27V DC).		
c.	Standby battery voltage (24-26V DC).		
d.	Loop IN and Loop OUT voltage (24-26V DC).		
<b>2</b>	<b>Self-test</b> on the Control Panel (CP):		
a.	All LEDs on the Control Panel should light up.		
b.	Internal buzzer should sound.		
c.	Panel display should go blank temporarily.		
d.	After 2-3 seconds, the CP should restore to normal working condition.		
<b>3</b>	Remove any detector from the loop and check if its address and location are displayed on the Control Panel.		
<b>4</b>	Perform "Find Me" test on the CP (Level III):		
a.	Select the device address and check if the LED status changes on the device.		
b.	If any device LED doesn't light, check loop wiring connections, fittings, or voltage.		
<b>5</b>	<b>Manual Call Point (MCP)</b>		
a.	Press the button and verify audio and visual indications on the Control Panel.		
b.	Check sounder/strobe activation at all locations.		
c.	Reset the MCP using the Reset Key and restore the CP to normal.		
<b>6</b>	Clean the detectors		
<b>7</b>	Test the detectors		



Technical Advisory Note:Automatic Fire Detection & Alarm System (AFDAS)			
Subject	Guidelines and Precautions of AFDAS System for Installation, Testing, Maintenance & Cleaning etc.		
Document Number	STS/E/TAN/3009	Version	1.0
Dated	10/12/2024	Pages	01-19

## C. Quarterly Schedule

SN	Check the Following	Observations	Remarks (if Any)
1	Ensure proper fitting of detectors/devices.		
2	Inspect the complete system wiring.		
3	Verify that the Control Panel displays the correct device names and addresses.		
4	Observe visual indications and messages on the Control Panel.		
5	Check voltage levels:		
a.	Main supply voltage to the system (230/110V AC).		
b.	SMPS output at Control Panel (24-27V DC).		
c.	Standby battery voltage (24-26V DC).		
d.	Loop IN and Loop OUT voltage (24-26V DC).		
6	Test at least 25% of the detectors.		
7	Simulate a fire-like situation (use a standard device or follow user manual instructions):		
a.	Perform fire tests in a safe and controlled manner to ensure all loop devices function correctly.		
b.	Reset the system after the fire test and verify that it is restored to normal.		
8	The piping of Aspirating type detector to be cleaned as per cleaning procedure mentioned in <b>Annexure-I</b> .		

Technical Advisory Note:Automatic Fire Detection & Alarm System (AFDAS)			
Subject	Guidelines and Precautions of AFDAS System for Installation, Testing, Maintenance & Cleaning etc.		
Document Number	STS/E/TAN/3009	Version	1.0
Dated	10/12/2024	Pages	01-19

## **Annexure-IV**

### **Configuration Drawing of AFDAS**

DRAFT



