BECAUSE BUS FIRES

COULD BE BRUTAL KILLERS

Ceasefire TranSafe Series

Bus Fire Suppression System

www.ceasefire.in

Ceasefire **TranSafe Bus Fire Suppression System**

CONTENTS

FIRE FACTS THAT NEED YOUR ATTENTION

THE GRIM REALITY OF BUS FIRES IN INDIA

- *Fragmented reports indicate India witnesses between 300 to 500 bus fire incidents annually over the last decade.*
- *At least 35 major bus fire incidents reported in Delhi-NCR alone over the last 8 years.*

  6 incidents in 2024, 4 incidents in 2023, 7 in 2022, and several others in previous years.
- *Reasons reported are occasional surges due to aging fleets, poor maintenance, and lack of fire safety systems.*

Source: Hindustan Times | OneIndia

INCIDENTS REPORT

The Hindu
https://www.thehindu.com › News › Cities › Delhi

Fire breaks out in school buses in Dwarka

15 Apr 2024 — A fire broke out in two buses parked at a private school in Dwarka on Sunday afternoon, the police said. Later, the fire spread to four more buses and two …

Times of India
https://timesofindia.indiatimes.com › city › articleshow

Fire breaks out in school bus in Ghaziabad, 15 students ...

14 Nov 2024 — All 15 students onboard the bus were rescued safely. No casualties have been reported so far, as per officials. (More details are awaited) ...

International Fire & Safety Journal
https://internationalfireandsafetyjournal.com › public-a...

Public and school buses in India mandated to get active ...

31 Mar 2022 — India's Ministry of Road Transport and Highways (MoRTH) has mandated that all passenger and school buses will have to be equipped with a fire alarm system and …

Times of India
https://timesofindia.indiatimes.com › ... › delhi News

School bus carrying 21 children catches fire in Delhi

21 Jul 2022 — "The bus (tempo traveller) of Bal Bharti Public School carrying 21 children caught fire. All the kids and the driver escaped unhurt," he said.

WHY BUS FIRES TURN DEADLY IN INDIA

Tragic incidents expose how absence of proper fire safety systems, poor maintenance, and systemic lapses can quickly escalate minor faults into fatal disasters.

- *Lucknow Sleeper Bus Fire (May 2025): Source* ***NDTV***

  5 deaths (incl. 2 children), 13 injuries

  Root Gaps: *No fire detection system; blocked emergency exits; absence of evacuation protocols; electrical failure undetected.*

- *Pune Company Minibus Fire (March 2025): Source* ***Hindustan Times***

  4 deaths, 10 injuries (4 critical)

  Root Gaps: *Locked doors; no emergency hammers; lack of passenger fire awareness; rapid fire spread with no suppression system.*

THE REAL CAUSES

- Fires often start in hidden compartments like the engine bay or on-road mishaps.
- Negligence and delayed evacuation during emergencies.
- In most cases, passengers and drivers have little or no time to react.

IMPACT GOES BEYOND SAFETY

- Loss of vehicle and revenue.
- Damaged reputation for operators.
- Legal and regulatory consequence.

REGULATIONS TO THE RESCUE

In a major move aimed at bolstering safety measures in the transportation sector, the Ministry of Road Transport and Highways has made significant amendments to the Automotive Industry Standard (AIS) -135 through a noteworthy notification on January 27, 2022. The initiative reflects a dedication to strengthening passenger safety, marking a pivotal stride towards aligning the automotive industry with rigorous fire prevention protocols.

Additionally, the time required for the evacuation of passengers from a bus during a fire incident, emphasises saving human life over property.

> *"The Ministry of Road Transport and Highways, vide notification dated 27th January 2022, has introduced the Fire Alarm System and Fire Protection System in buses through an amendment in the AIS (Automotive Industry Standard)-135 for Type III buses ['Type III' Vehicles are those designed and constructed for long-distance passenger transport, for seated passengers] and School Buses."*

INTRODUCTION

The Ceasefire TranSafe Series Bus Fire Suppression System marks a breakthrough in vehicle safety, meticulously crafted to tackle the inherent fire hazards associated with passenger buses.

Tailored to meet the standards of AIS-135, these state-of-the-art suppression systems are uniquely engineered to ensure the safety of passengers and protection of vehicle engines against fire. The system incorporates integrated mechanisms that deploy totally green agents- Watermist for passenger safety and Fluorine-Free Agent to safeguard engines against fires.

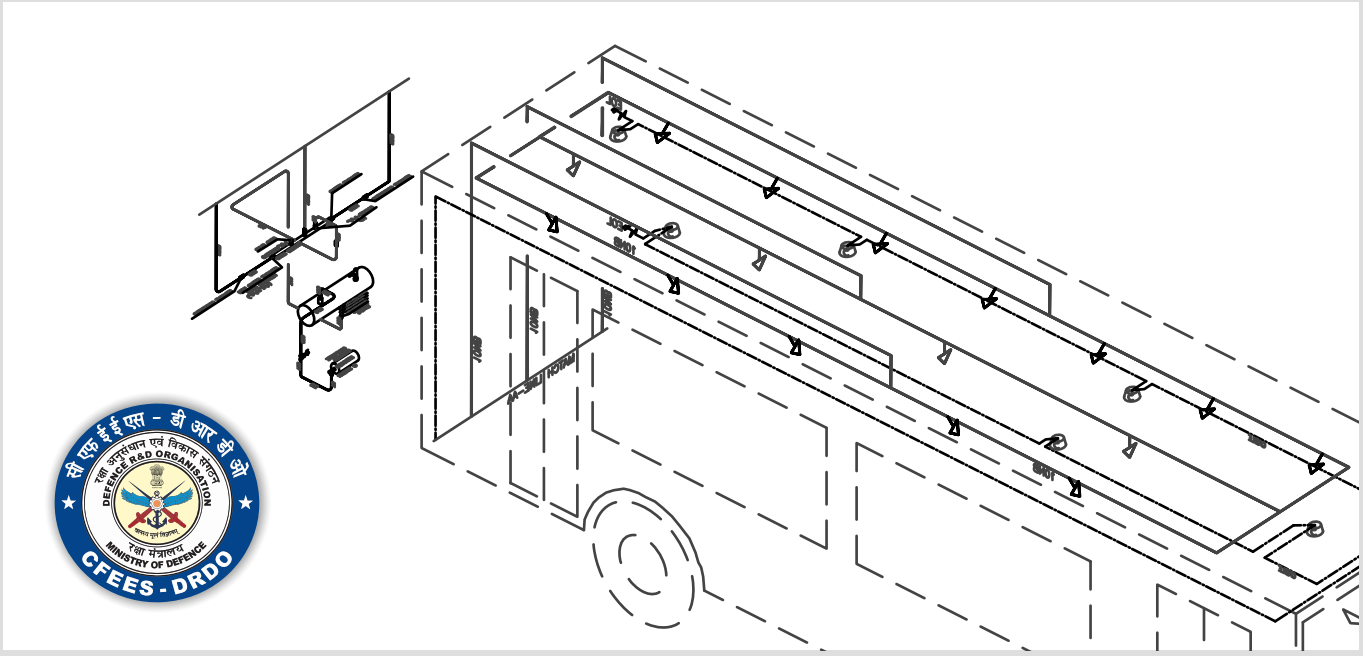
The flagship feature of TranSafe Series is the intelligent fire detection & activation mechanism that is designed to truly safeguard vehicles and rescue human lives. Also, what makes the system truly outstanding is that it could be integrated into a wide range of vehicle layouts and structural configurations.

Additionally, the system comes with a single control panel to monitor passenger area and engine bay fire protection system. This gives higher operational efficiency and makes monitoring easier for the driver.

Watermist Based Passenger Compartment Fire Rescue System

The passenger compartment fire suppression system is designed for automatic fire detection and manual activation, considering a real life fire scenario in a passenger bus. The system protects the area by Watermist as an agent, which uses pure water to suppress fire and aid passenger rescue. Programmed to ensure a four-minute continuous discharge of Watermist through a network of specialized nozzles, the system is designed to ensure safe evacuation of all occupants.

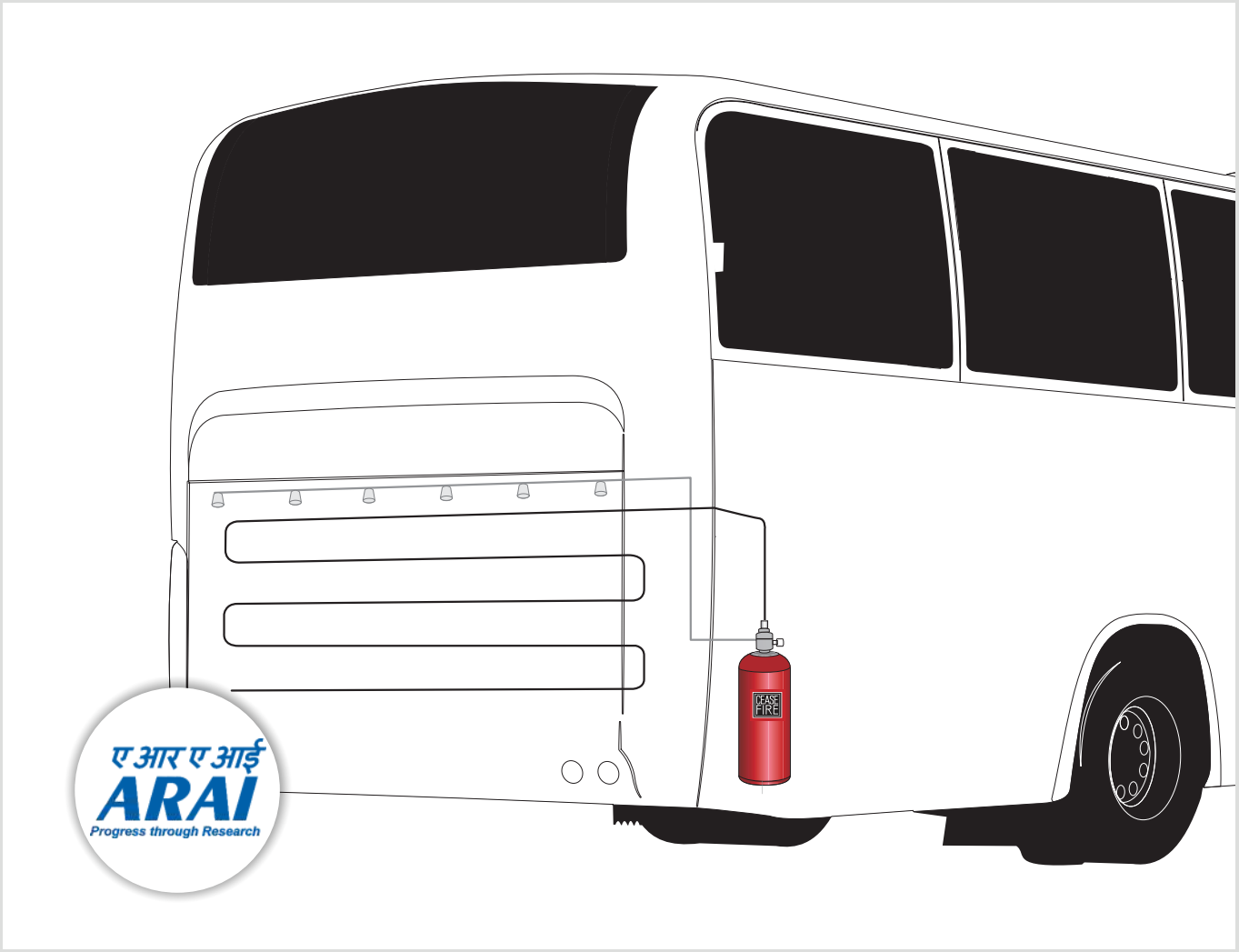
The system is developed by Ceasefire together with DRDO/CFEES on a Transfer of Technology (TOT) agreement.



Fluorine Free Agent Vehicle Engine Fire Suppression System

The engine suppression system is designed to be fully automatic with an added provision of manual activation, considering the remote location of the engine in a passenger bus and the likelihood of fire being detected early by the driver. Programmed to detect fire and activate under 10 seconds, the system deploys Fluorine Free Agent, which is not only highly potent on dousing all types of fires that can occur inside an engine, but is also absolutely environment-friendly with no PFAS/PFOA and 100% biodegradable.

The system is fully tested and approved by ARAI (Automotive Research Association of India) which makes it highly reliable and safe.



WHO IS THIS SYSTEM FOR?

Where there is a bus on the road, there is a risk associated with it. Whether it's a tourist coach cruising across states or a city bus packed during rush hour, every category of bus has its own fire risks. The Ceasefire Bus Fire Suppression System is engineered to adapt and respond instantly, protecting passengers, assets, and uptime alike.

Bus Manufacturers

Corporate Shuttles

School & Educational Institutional Fleet

Long Route Buses

Tour Operators

PSUs & Government Bodies

Ceasefire TranSafe

WATERMIST BASED PASSENGER COMPARTMENT FIRE RESCUE SYSTEM

The Future Of Passenger Safety

The Ceasefire TranSafe Series is an intelligently configured bus suppression system that isolates fire detection and system activation considering real-life bus fire scenarios.

The AIS-135 standards mandates the fire detection within 30 seconds, ensuring rapid threat recognition, and a three-minute agent discharge to allow passengers for safe evacuation.

However, the Ceasefire TranSafe goes a step further. While the system meets detection in under 30 seconds criteria, it is configured to deliver a continuous four-minute watermist discharge, providing passengers with an extended evacuation window and an added layer of safety.

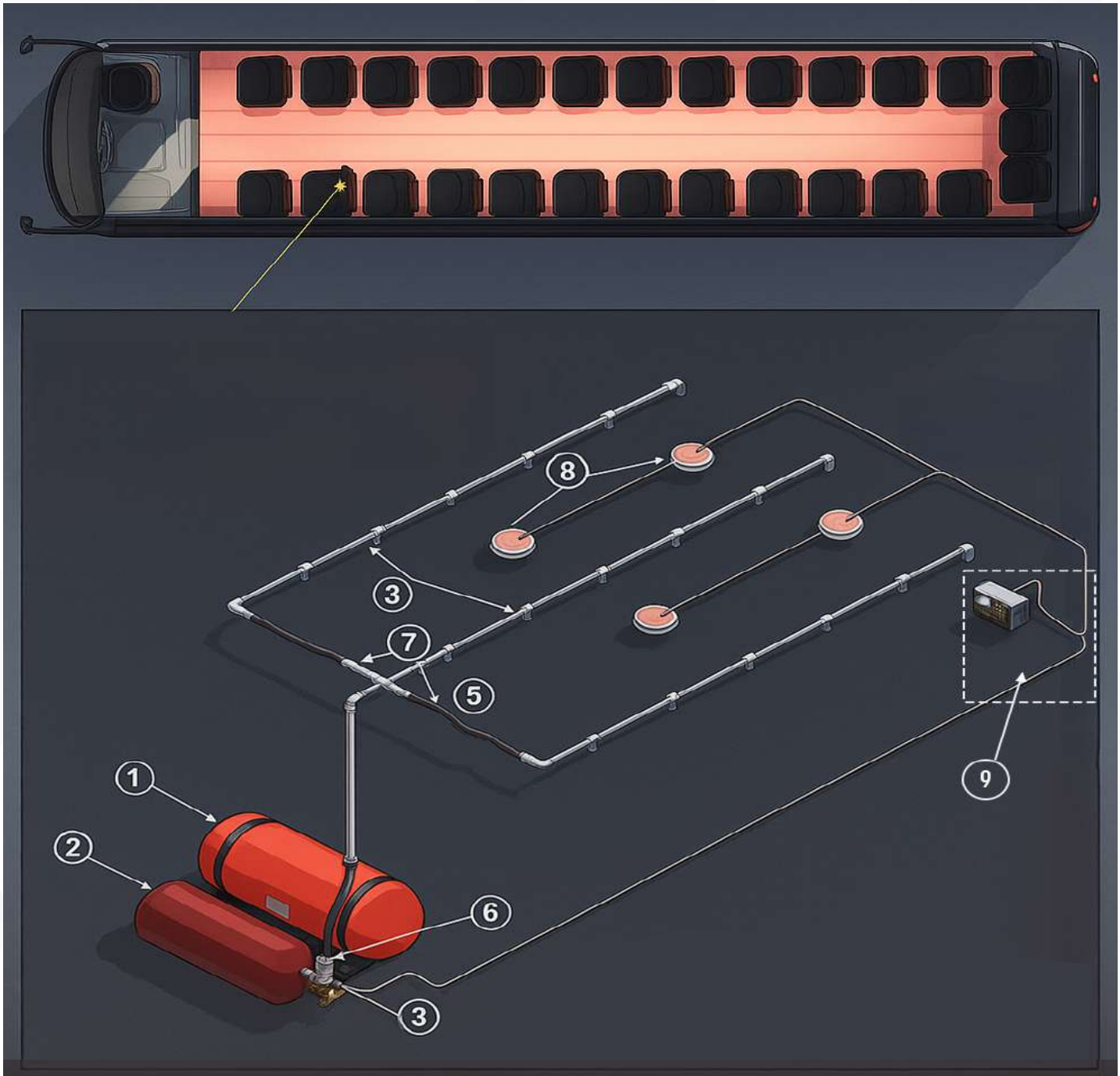
On detection of fire, the smoke detectors send the signal to the control panel which sounds an alarm, prompting the driver to act. The driver using his own judgement either chooses to activate the system in case of fire or not in case of a non-emergency scenario, through the manual push button in the control panel located on his dashboard.

On activation, the system discharges fine watermist of 180-300 microns, through specialized nozzles (Tested by CFEES) that are strategically positioned, guaranteeing no blind-spots and effective & safe evacuation for all passengers. This size of the microns ensures not only that the fire is controlled effectively, but also that passengers are not drenched and prevents water accumulation or flooding in the compartment.

Moreover, these nozzles are strategically positioned not just for internal coverage but also to create a shielding curtain along the window panes, protecting passengers from external flames in case fire is emerging from outside the bus. The number of nozzles used and their placement depends upon the bus size, layout, volume, or and seating capacity.

How the system works

The system is programmed to get actuated through a dual-layered approach. The smoke sensors detect fire in the passenger area and sound an alarm. The driver's dashboard is equipped with a manual activation/abort panel. Using his good judgement, the driver can choose to activate the system or not. On activation, the system discharges fine water mist which is absolutely safe to be used in human presence through a network of specially designed nozzles, controlling the fire and aiding in safe evacuation of the passengers.

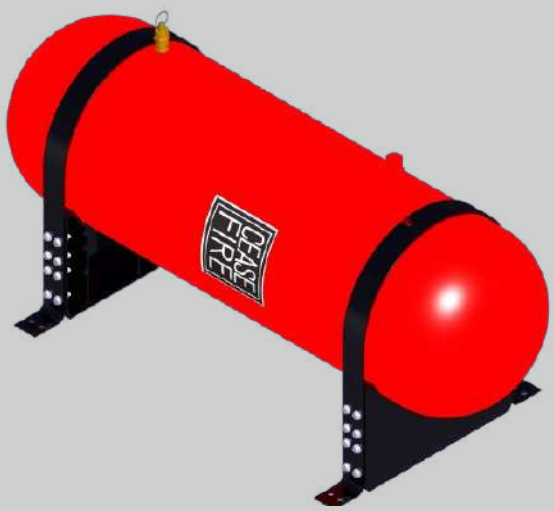


1. Water Cylinder 2. Nitrogen Cylinder 3. Pressure Regulator 4. Panel for Vehicle Fire Suppression System
5. Solenoid Operated 2X2 Valve 6. Watermist delivery nozzles (full cone spray) 7. Hose Pipe
8. Smoke Detector 9. Driver's Compartment

System Components

1.) Cylinder With Holding Bracket:

A horizontal cylinder without a dip tube, fitted with a pressure relief valve, is used for the passenger compartment suppression system. The cylinder capacity is determined by the number of seats in the passenger compartment. AIS 135 specifies the required water volume and number of nozzles based on seating capacity (refer to the table below for details).



No. of seats	No. of nozzles (Nos.)	Vol. of water required (Liters)
20	9	55
30	13	80
40	18	110
50	22	130
60	26	155
70	30	185
80	35	210

2.) Nitrogen Cylinder (expellant gas cylinder):

A nitrogen-filled cylinder serves as the propellant gas, maintaining a constant pressure system in the passenger compartment. The nitrogen cylinder is equipped with a pressure regulator and a high-pressure 2X2 solenoid-operated valve for controlled discharge.

3.) Hose Pipe:

Braided hose pipes are used to connect the nitrogen cylinder to the water cylinder and within the pipe network. The hoses are available in ½" and ⅜" diameters with lengths of 1m, 1.5m, and 3m to ensure flexible and secure connectivity.

4.) Nozzles:

The suppression system in the passenger compartment utilizes full-cone, single-fluid water mist nozzles made of stainless steel. Their flow characteristics are defined as per AIS 135, ensuring optimal fire suppression performance.

5.) Detection And Control Panel:

Mounted inside the passenger compartment near the driver, the control panel allows manual activation of the suppression system during emergencies, even while driving. It is designed to control both the engine and passenger compartment suppression systems, with separate manual activation switches for each area, ensuring swift and precise response in case of a fire.

6.) Detector:

A smoke detector is used as the fire detection element inside the passenger compartment. The placement and selection of detectors follow the guidelines specified in AIS 135 to ensure maximum coverage and rapid fire detection.

Key Features Of

Watermist Based Passenger Compartment Fire Rescue System

Isolated Detection and Activation for Greater Reliability

Employing a dual-layered approach, the system features separate detection and actuation mechanisms, ensuring a reliable defence against false alarms and accidental discharges.

Safe Watermist as Agent

The system uses watermist as an extinguishing agent in the passenger area which is proven safe to be on humans.

Swift Response Time

Experience peace of mind with detection within 30 seconds, ensuring rapid identification of potential threats.

Optional PESO Approved Solenoid Valve

The optional solenoid valve between the propellant cylinder and the water container allows the pressure to be contained within the propellant cylinder. This ensures a safer installation as compared to the Fixed Key Valve option.

Mist Nozzles Tested & Approved By CFEES

Strategically positioned mist nozzles that are tested by CFEES and adhere to industry standards, ensure precise and effective dispersion of firefighting agent.

Developed on TOT with DRDO: CFEES

The system is developed by Ceasefire in collaboration with DRDO: CFEES, ensuring high reliability, making it ideal for protecting lives in public transport environments.

Detection Panel

Features an advanced detection panel equipped with cutting-edge technology for swift and accurate fire detection.

Optional Container Cage

The system comes with an optional protective container cage, specifically designed to shield the agent and propellant cylinders from external impacts, environmental exposure, and operational hazards.

Flexible Design

Embrace innovation with our open design approach, allowing customization to fit your bus designs, seating capacity and layout.

24x7 Action Ready

The system deploys constant pressure (separate water container and nitrogen cylinder) agent containers that makes the system always ready for action.

Ceasefire TranSafe

FLUORINE-FREE AGENT BASED VEHICLE ENGINE FIRE SUPPRESSION SYSTEM

The Future Of Engine Safety

Recognizing the distinct challenges involved in safeguarding low-floor bus engines, Ceasefire TranSafe Series Engine Fire Suppression System incorporates state-of-the-art fire detection and activation technology. The automated system rapidly detects flames at their earliest stage, approximately under 10 seconds, prompting a swift and targeted suppression response that employs a highly effective extinguishing Fluorine Free Agent to quickly and safely extinguish the flames.

Being 100% biodegradable, Fluorine Free Agent leaves no residue and provides a cooling effect, mitigating the risk of re-ignition. The system comes with specially engineered mounting brackets which ensure that the suppression container remains firmly secured even under intense vibrations and dynamic vehicle movements.

Moreover, the system is specially designed to operate seamlessly on all axes, keeping in consideration real-life fire scenarios that may occur due to accidental collisions or rollovers. The system is programmed to function effectively even when the vehicle is tilted or completely overturned-up to 180 degrees, ensuring full and reliable discharge of the extinguishing agent, regardless of the system's orientation.

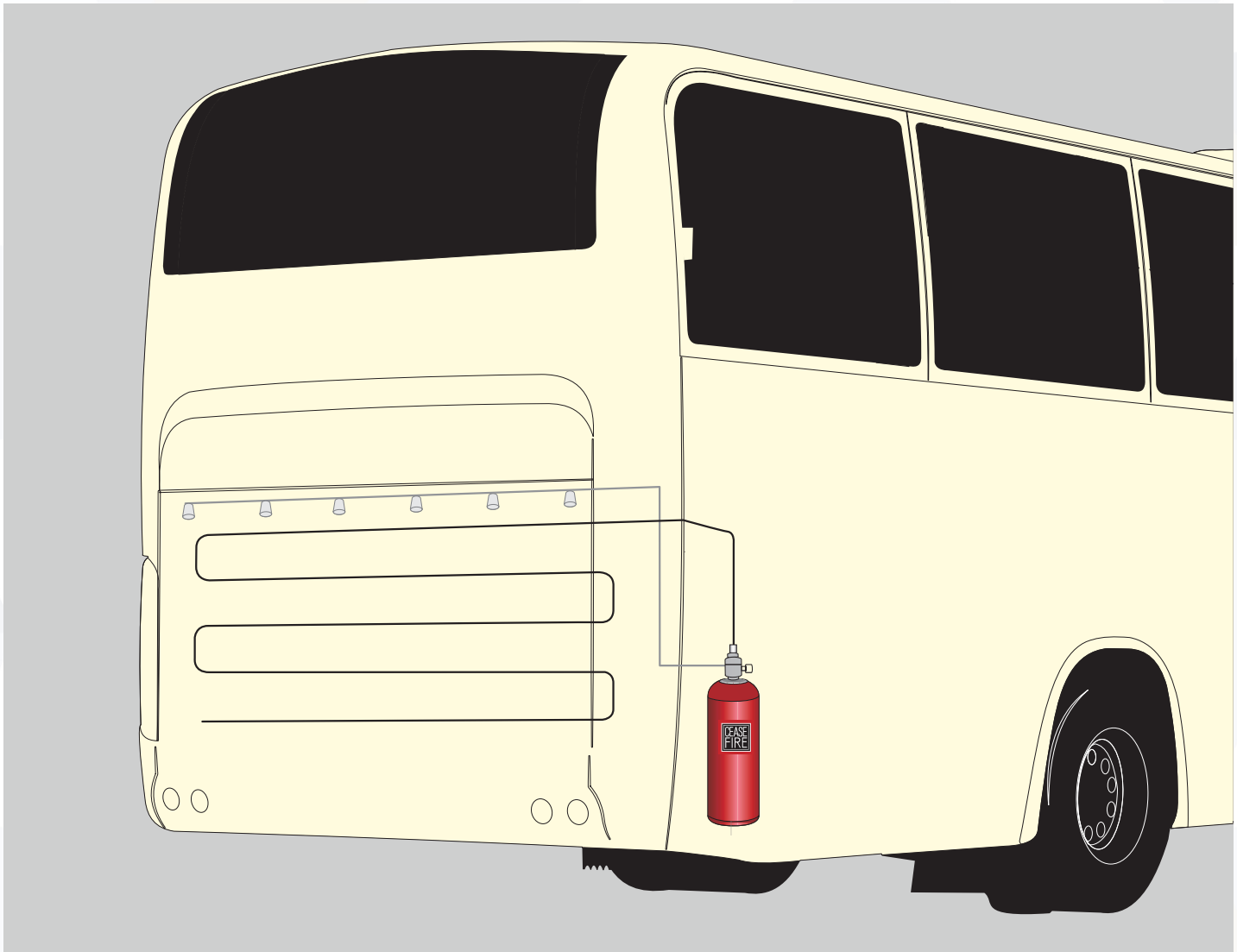
How The System Works

The system's detection module can be configured using Liner Heat Detection Cable (LHDC) or a Pneumatic Heat Sensing Tube that detects fires in seconds and activates the system automatically.

Being a stored pressure system, the system is always ready for action for prompt and targeted protection in the engine bay with strategic nozzle placement that cover all vulnerable points. These nozzles are specially designed for engine bay fire fighting application. On activation, the system notifies the driver through a loud and clear sounder, informing the driver about the fire episode in the engine compartment.

To provide an added layer of safety, the system can also be kicked into action manually through a control panel placed inside the driver's compartment. This ensures that if the driver detects the fire early, he can activate the system manually, bypassing the system's automatic actuation mechanism.

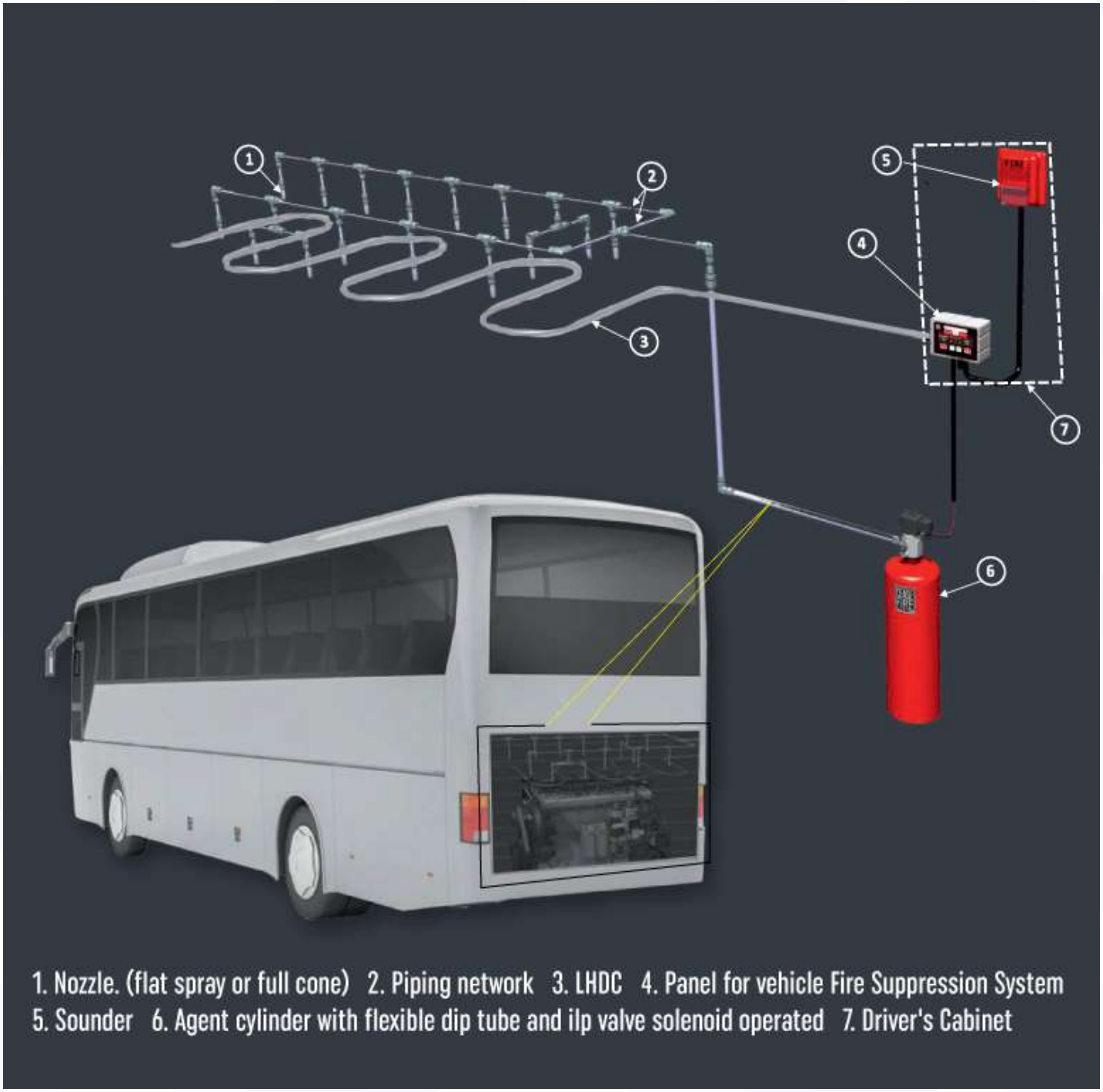
The system is powered by a fluorine free agent which has a proven record against engine fires. It has an instant dual fire fighting effect: **1) Brings down the temperature in the high-heat engine fire zone immediately,** and **2) Has a blanketing effect on the fire surfaces, suffocating the flames and extinguishing the fire.**



The Three Ways to Configure Engine Fire Suppression System

1. Electrically (Solenoid) Operated System:

In this configuration, the fire detection is carried out by a Liner Heat Detection Cable (LHDC). On detection of fire, the control panel sends an electrical impulse to the solenoid valve placed on the agent container head to activate the system and release the agent through the network of nozzles placed strategically in the engine compartment, while an alarm is sounded through a sounder in the driver's cabin. As an added feature, there is also a provision of manual activation of the system by the driver through a control panel present in the driver's cabin. This ensures that the driver can activate the system in case he detects the fire early.



System Components

1.) Cylinder:

The suppression system cylinder for the engine compartment is selected based on the volume that needs protection. For an engine compartment with a volume of 4 m^3, a 4-liter agent capacity is required, with a maximum of 16 nozzles. AIS provides a scale-up and scale-down formula to determine the minimum agent requirement and maximum number of nozzles needed. When using an LHDC (Linear Heat Detection Cable) as the detector element, a solenoid-operated valve is employed. The available cylinder capacities are listed below. Our cylinders can be mounted in both horizontal and vertical positions and feature a flexible dip tube for enhanced functionality.

S.No.	Vol. Of Engine (m_3)	Min. Agent Required (Ltr)	Cylinder Size Used	Maximum Number Of Nozzle (nos)
1	2	3	4	12
2	4	4	6	16
3	9	6	9	24
4	16.5	9	12	36

2.) Nozzles:

The number of nozzles used in the engine bay is determined based on the required suppression agent. Two types of nozzles are used:

a. Flat Spray Nozzle: Designed for areas where deep-seated or hidden fires may occur, flat spray nozzles (Fig. A) offer cone angles ranging from 15° to 60°, ensuring effective coverage in case of a fire emergency.

Fig. A

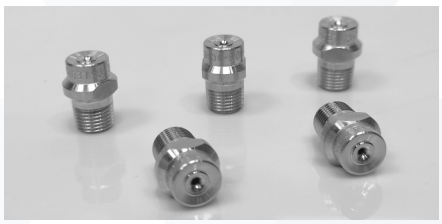
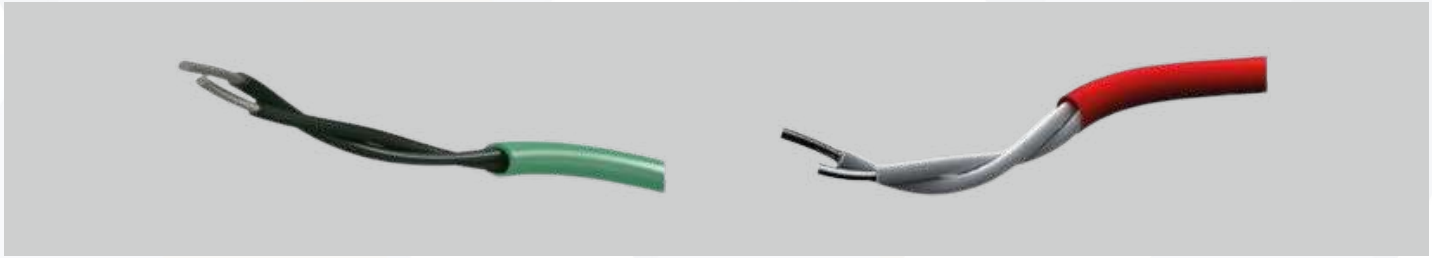


Fig. B

b. Full Cone Nozzle: Suitable for any location inside the engine compartment, full cone nozzles (Fig. B) provide broader coverage with cone angles ranging from 15° to 120°, ensuring every corner of the engine compartment is protected.

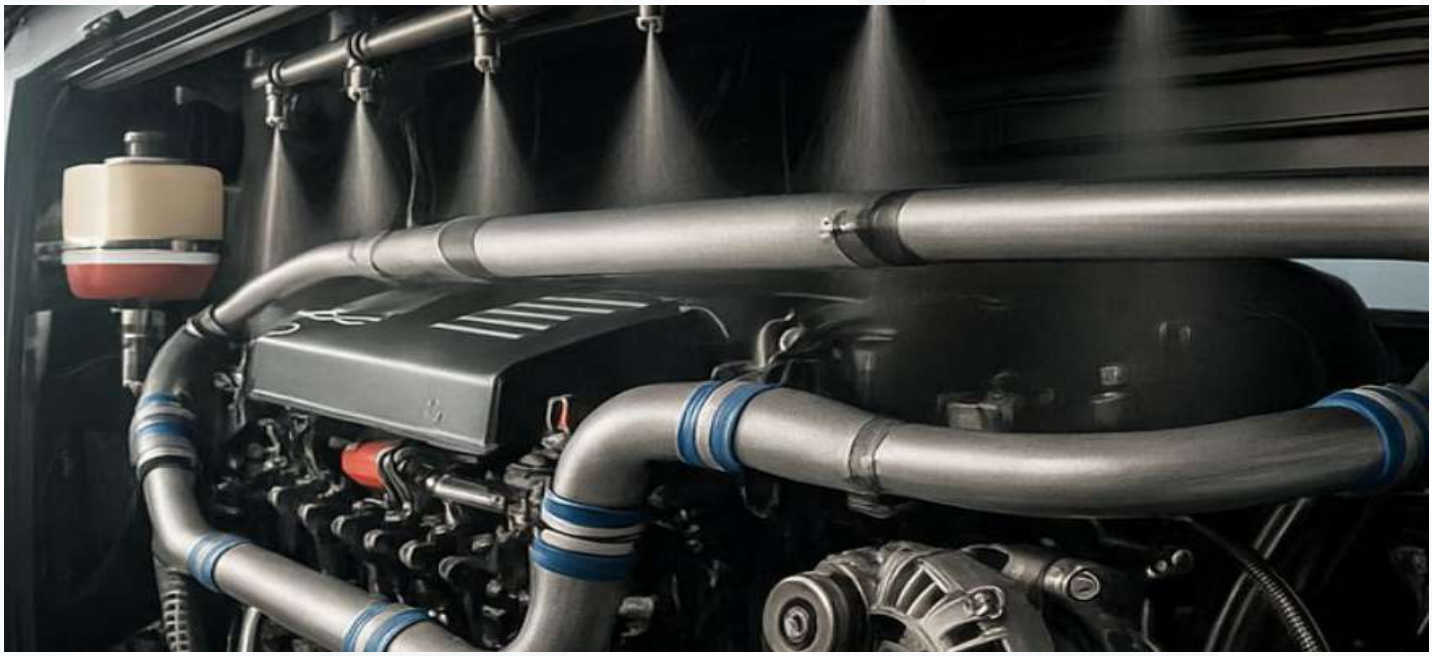
3.) Linear Heat Detection Cable:

This cable acts as the fire detection element within the engine compartment. It is available in different temperature ratings, with 185°C being the standard for engine compartment installations.



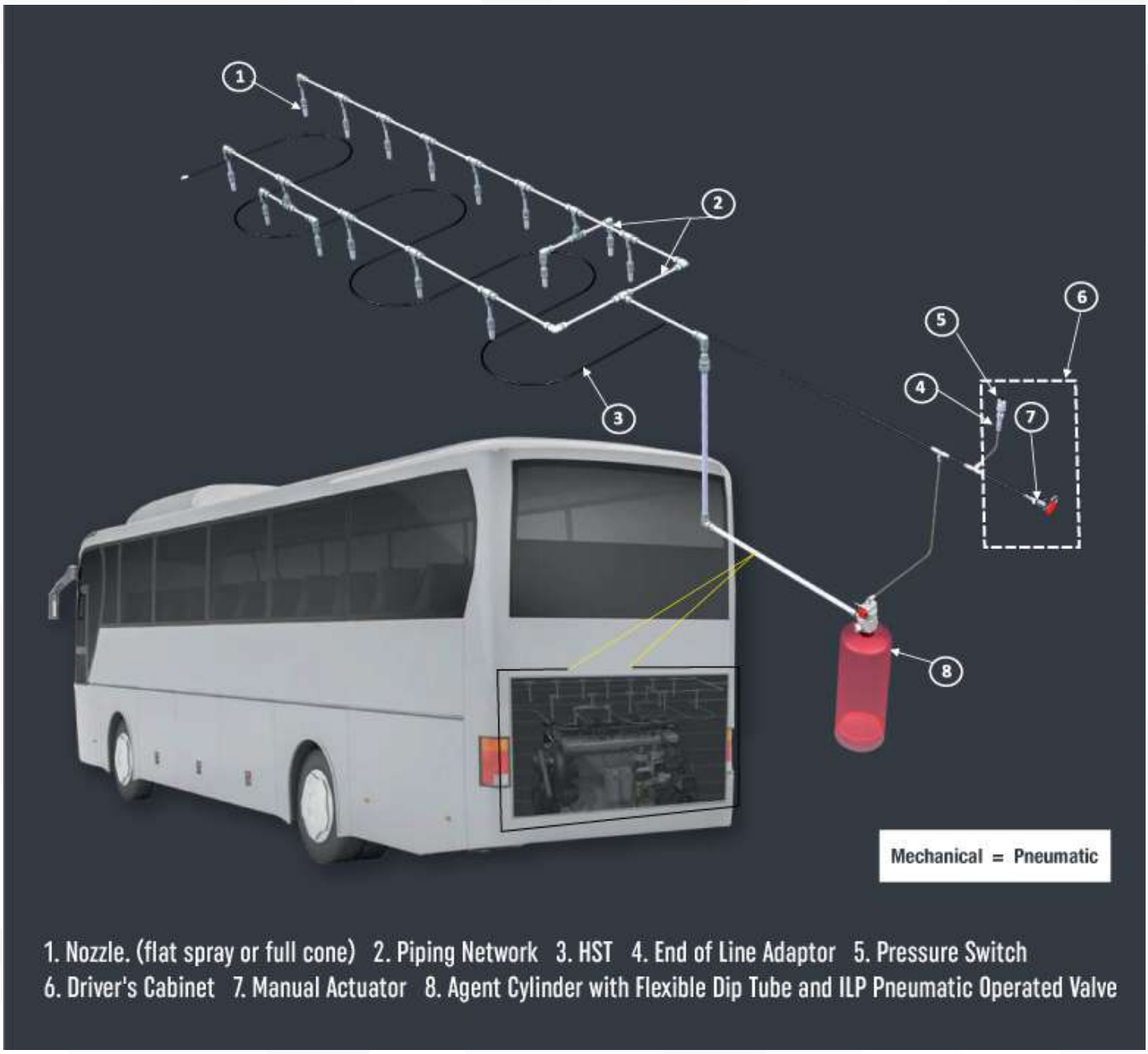
4.) Detection And Control Panel:

Mounted inside the passenger compartment near the driver, the control panel allows manual activation of the suppression system during emergencies, even while driving. It is designed to control both the engine and passenger compartment suppression systems, with separate manual activation switches for each area, ensuring swift and precise response in case of a fire.



2. Mechanically Operated System:

Here, the fire detection is carried out by Pneumatic Heat Sensing Tube. On detection of fire, the tube bursts open to release its pressure and eventually activates the indirect valve placed on the container head that works on the pressure differential principle. This activates the system to release the agent through a network of nozzles placed strategically, aiming at all vulnerable points in the engine bay. On activation, an audible alarm is sounded in the driver's cabin. Here again, there is a provision to activate the system manually with a manual actuator placed inside the driver's cabin.



System Components

1.) Cylinder:

The cylinder used in the engine compartment suppression system is selected based on the volume that needs protection. For an engine compartment with a volume of $4m^3$, a 4-liter agent capacity is required, with a maximum of 16 nozzles. AIS provides a scale-up and scale-down formula to determine the minimum agent requirement and maximum number of nozzles needed. When using LHDC (Linear Heat Detection Cable) as the detector element, a solenoid-operated valve is used. The available cylinder capacities are listed below. Our cylinders can be mounted in both horizontal and vertical positions and feature a flexible dip tube for enhanced functionality.

S.No.	Vol. Of Engine (m_3)	Min. Agent Required (Ltr)	Cylinder Size Used	Maximum Number Of Nozzle (nos)
1	2	3	4	12
2	4	4	6	16
3	9	6	9	24
4	16.5	9	12	36

2.) End-of-line Adaptor:

Installed at the end of the HST tube, the end-of-line adaptor seals the connection and pressurizes the system. It is fitted with a Schrader valve on its inner diameter (ID), allowing for easy pressure filling. A pressure switch can also be installed after filling, which generates a signal in case of pressure loss or fire detection.

3.) Pressure Switch:

Mounted on the End-of-Line Adaptor (EOL), the pressure switch continuously monitors the system's pressure, triggering an alert in case of a pressure drop.

4.) Manual Mechanical Release:

This mechanism allows for the manual activation of the suppression system in an emergency, ensuring immediate fire response even if the automatic system fails.

5.) Manual Electrical Release:

This device enables manual activation of the suppression system through the control panel, providing an alternative method of triggering the system when needed.

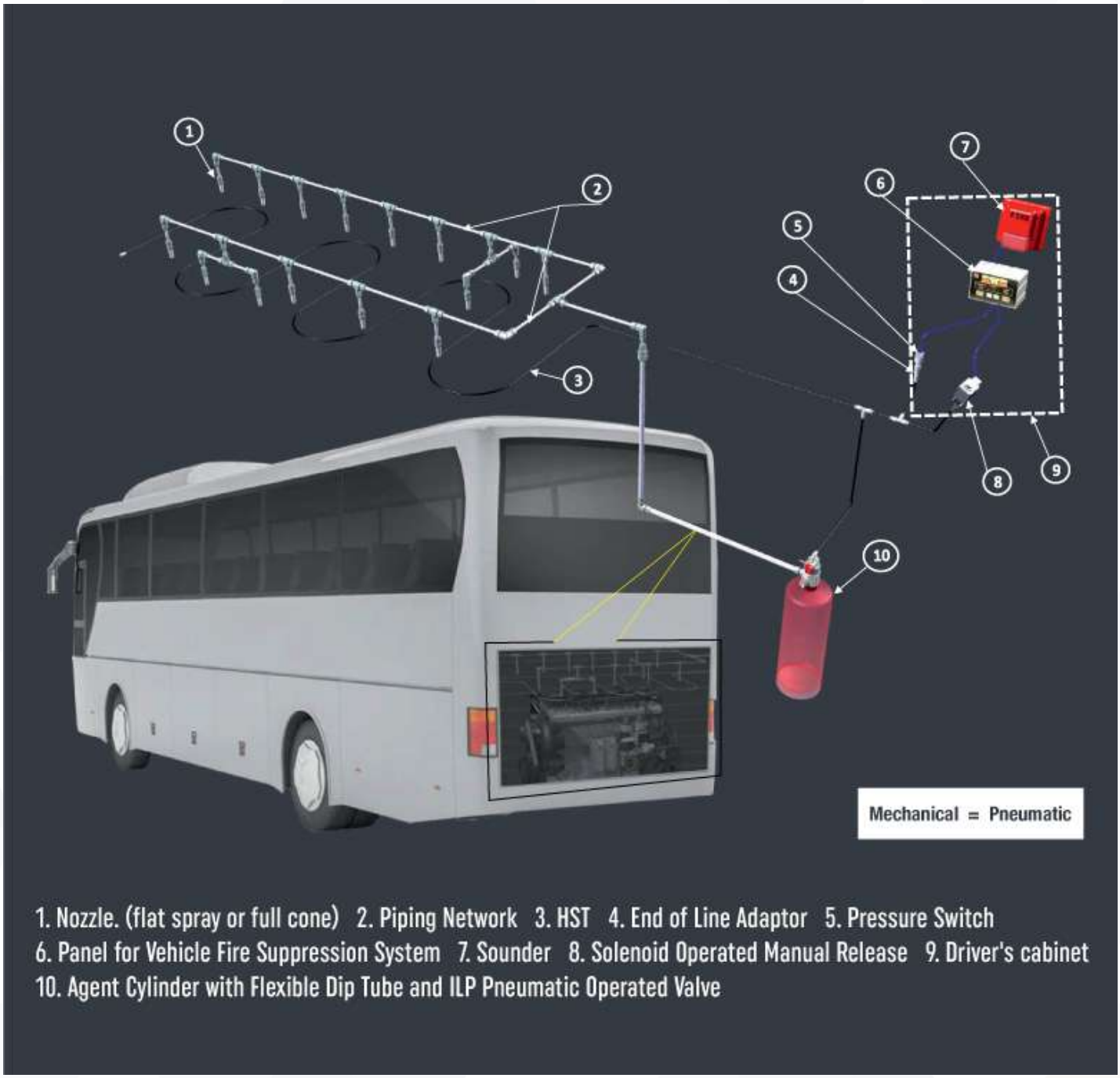
6.) Sounder And Strobe:

This device generates an audio-visual alarm signal upon receiving a fire detection signal from the panel, alerting passengers and crew to take immediate action.

3. Electro-Mechanically Operated System:

In this type of system configuration, the fire detection is carried out by Pneumatic Heat Sensing Tube. When a fire is detected, the tube opens to release pressure, which in turn triggers the pneumatic valve on the container head that operates on the basis of pressure differential. This causes the system to discharge the agent through a strategically positioned network of nozzles that target every hotspot in the engine bay.

What makes this system configuration unique is the addition of an interface between pneumatic detection & activation and an electrical module to activate the system manually and sound the alarm inside the driver's cabin. The key components behind this interface are the Pressure Switch and the Solenoid-Operated Manual Release that integrates the pneumatic line with the control panel.



Key Features Of

Fluorine Free Agent Based Vehicle Engine Suppression System

Automatic Activation
Intelligent and automatic triggering mechanism for enhanced safety.

Manual Activation Provision
Provision for manual activation for the driver through a special control panel in case fire is detected early.

Specially Developed Nozzles For Engine Fire Protection
The nozzles are specially developed to suppress engine fires and are strategically placed to cover all the vulnerable points.

Solid Cone Nozzles: Provides broader coverage with cone angles ranging from 15° to 120°, ensures the corner of the engine compartment is protected.

Flat Cone Nozzles: Designed for areas where deep-seated or hidden fires may occur. Offer cone angles ranging from 15° to 60°, ensuring effective coverage in difficult to reach spots.

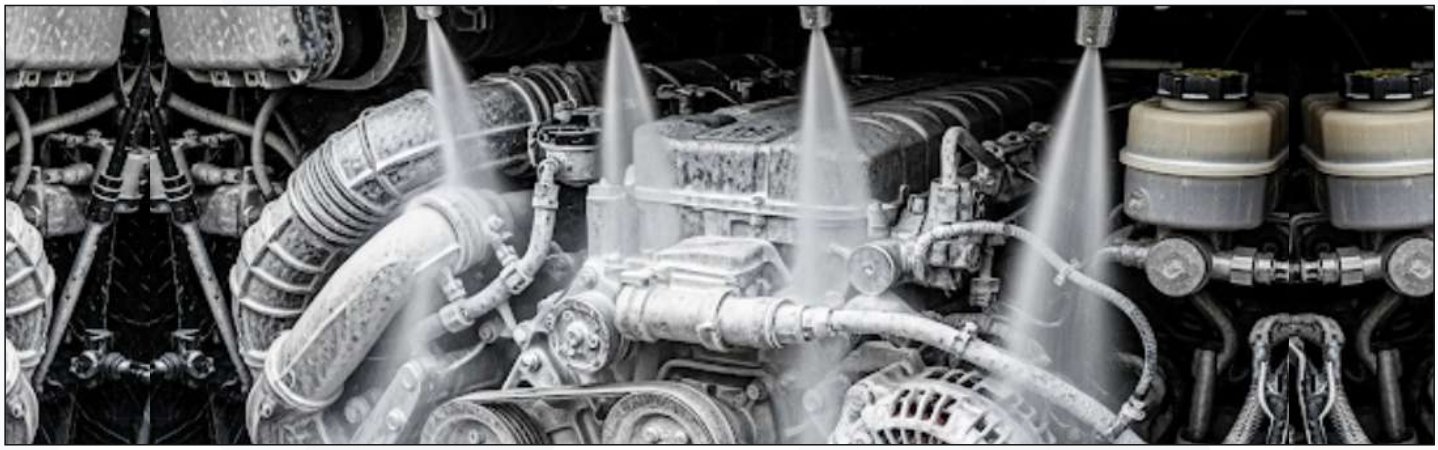
Stored Pressure Technology
The system deploys stored pressure agent containers that makes the system always ready for action.

Powerful & Green Agent
The agent being Fluorine Free is a powerful fire suppressant with a proven track record on engine fires. The agent is totally green with zero PFAS/PFOA and is 100% biodegradable.

Tested & Approved by ARAI
The system is rigorously tested and approved by ARAI (Automotive Research Association of India). This certification ensures that the engine fire protection system meets the most stringent safety and performance standards, reinforcing reliability and compliance for on-road use.

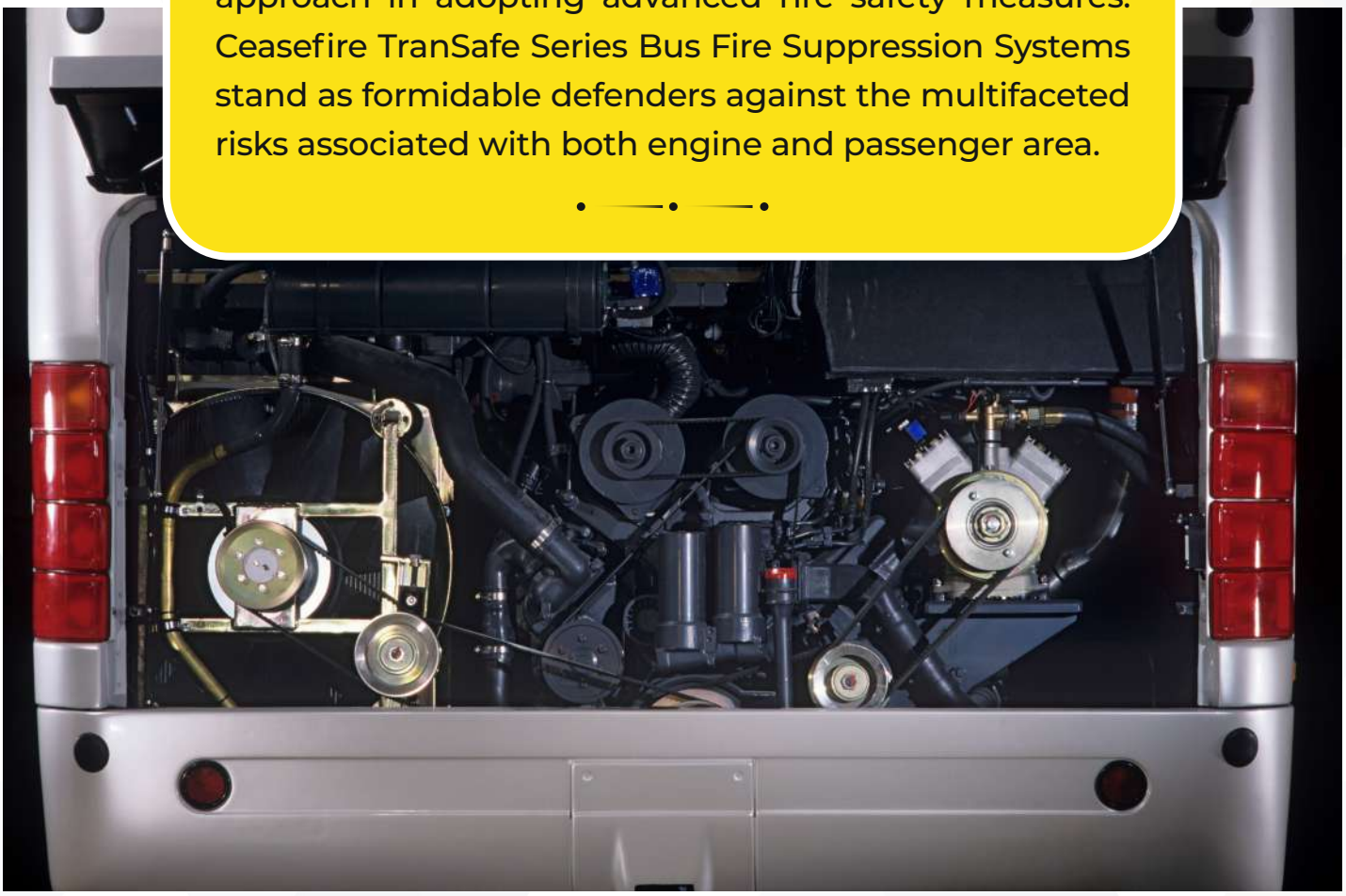
Customizable for Diverse Vehicle Designs
Built to adapt to a wide range of engine bay layouts and structural configurations, ensuring seamless integration across various vehicle types.

Works on all Axes
The system is engineered to operate even when the vehicle is tilted or overturned (up to 180°), ensuring complete agent discharge in real-life accident scenarios.



A SAFETY STANDARD EVERY VEHICLE DESERVES

The alarming reality of bus fires necessitates a proactive approach in adopting advanced fire safety measures. Ceasefire TranSafe Series Bus Fire Suppression Systems stand as formidable defenders against the multifaceted risks associated with both engine and passenger area.



Extended Applications of

CEASEFIRE TRANSAFE SERIES
TRANSPORT SUPPRESSION SYSTEMS

The Ceasefire System is engineered to adapt across a wide variety of internal combustion engines that includes vehicles and fixed machinery. Its modular design, robust performance, and automatic functionality make it ideal for protecting engines that operate in a wide variety of environments including vehicles as well as industrial/factory setups.

Agricultural Machinery

Harvesters

Tractors

Construction & Mining Equipment

Excavators

Dumpers

Commercial And Cargo Vehicles

Trailers

Fuel Tankers

Marine Engines

Boats

Ferries

Utility & Special Vehicles

Military Vehicles

Mobile Service Units

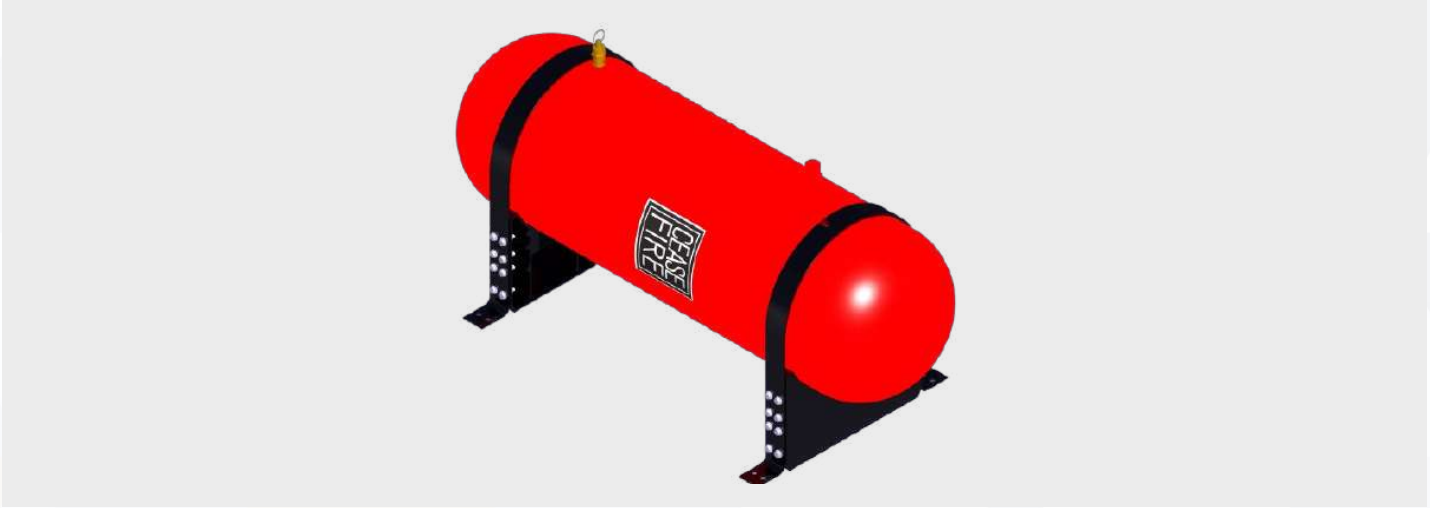
Industrial & Factory Machine Engines

Moulding Machines

Generators

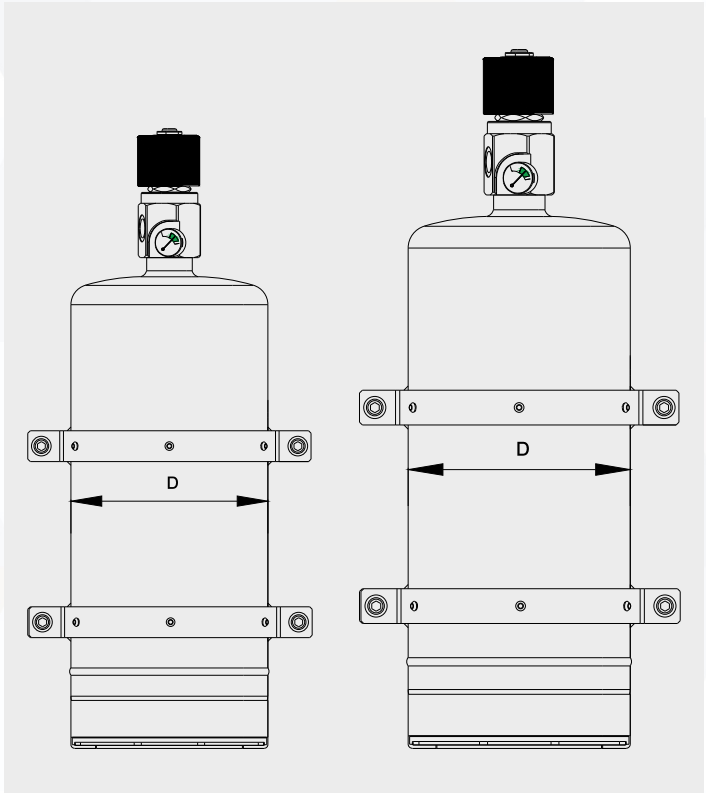
TECHNICAL SPECIFICATIONS

Agent Containers For Passenger Area

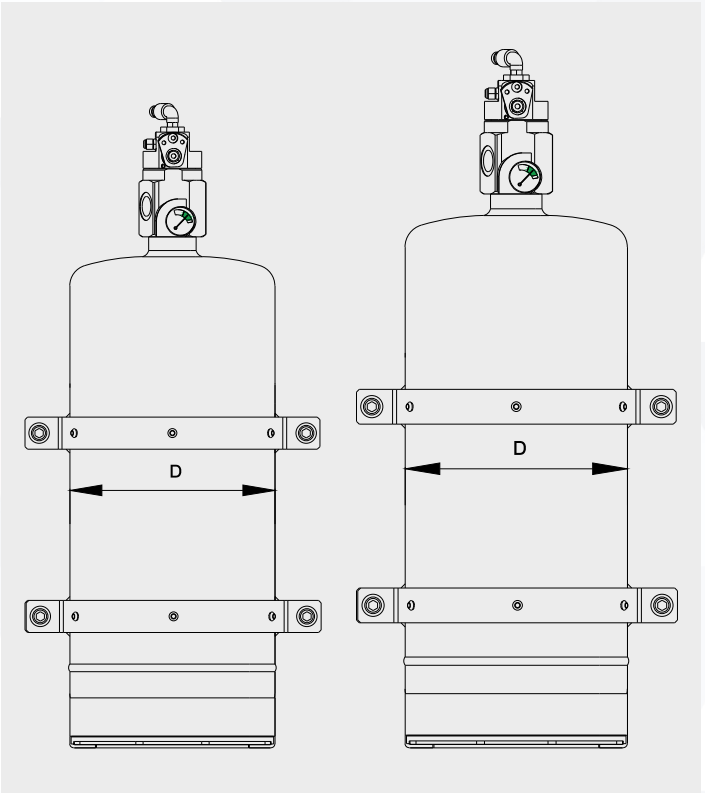


TECHNICAL SPECIFICATIONS								
Nomenclature	**UOM**	**Technical Detail**						
Product Code		CF-001672	CF-001672	CF-001672	CF-001672	CF-001672	CF-001672	CF-001672
Description	- -	Ceasefire TranSafe FPS & FAS for 20 seat/vol 20m3	Ceasefire TranSafe FPS & FAS for 30 seat/vol 30m3	Ceasefire TranSafe FPS & FAS for 40 seat/vol 40m3	Ceasefire TranSafe FPS & FAS for 50 seat/vol 50m3	Ceasefire TranSafe FPS & FAS for 60 seat/vol 60m3	Ceasefire TranSafe FPS & FAS for 70 seat/vol 70m3	Ceasefire TranSafe FPS & FAS for 80 seat/vol 80m3
Length (L)	**mm**	725	1040	1040	1310	1310	1340	1500
Width (W)	**mm**	710	725	725	770	770	860	860
Height (H)	**mm**	580	630	630	680	680	680	680
Shell Of Water Container								
Outer dia D (Regular)	mm	300	300	350	350	350	400	400
Length L (Regular)	mm	844	1207	1221	1434	1700	1570	1775
Wall Thickness (min.)	mm	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Test Pressure	Bar	35	35	35	35	35	35	35
Water capacity	Ltr	55	80	110	130	155	185	210
Material Of Construction	-	Stainless Steel						
Construction	-	Drawn, Rolled and Mig Welded						
Anti Corrsive Treatment (External)	-	Outer surfaces were EP Powder coated having Thickness 50 Micron Min. Shade 536/538 Of IS-5						
Anti Corrsive Treatment (External)	-	Epoxy Polyester Coating						
System Operating Temprature Range	C^0	+5 to + 60						
Service Pressure	Bar	10-12						

Agent Containers For Engine Area



With Solenoid Operated Discharge Valve



With Pneumtaic Operated Discharge Valve

TECHNICAL SPECIFICATIONS

Nomenclature	UOM	Technical Detail			
Product Code	-	CF-001679 / CF - 001683	CF-001680 / CF - 001684	CF-001681 / CF - 001685	CF-001682 / CF - 001686
Description	-	Ceasefire Transafe FDSS Agent Supply Unit WC 4.55ltr with Agent Capacity 3ltr	Ceasefire Transafe FDSS Agent Supply Unit WC 7.5ltr with Agent Capacity 4ltr	Ceasefire Transafe FDSS Agent Supply Unit WC 11ltr with Agent Capacity 6ltr	Ceasefire Transafe FDSS Agent Supply Unit WC 13ltr with Agent Capacity 9ltr
Outer Dia (OD)	mm	140	160	175	204
Height	mm	345.5	429.5	520.5	571.5
Wall Thickness	mm	1.4	1.4	1.4	1.6
Neck Thread Size	mm	M30X1.5			
Test Pressure	Bar	35			
Water Capacity	Ltr	4.5	7.5	11	13
Agent Capacity	Ltr	2	3	6	9
Material Of Construction	-	CRCA			
Anit Corrsive Treatment	-	Epoxy Powder coated internal & external			
Operating Temprature Range	C^0	-30 to +60			
Siphone Tube Type	-	Flexible dip tube			
Service Pressure	Bar	19 BAR @ 21°C			
Mounting For Cylinder	-	Transport Bracket			

High Pressure Gas Regulator

TECHNICAL SPECIFICATIONS		
Nomenclature	**UOM**	**Technical Detail**
Spare Part Code	-	SM-RM
Description	-	High pressure Regulator Single Stage
Width (W)	mm	142
Height (H)	mm	165
Material of construction	-	SS316L
Seal	-	Sealing PTFE/ PCTFE
Leak Integrity	-	< 1 x 10-6 mBar l/s Body & < 1 x 10-3 m/Bar l/s for Seat
Working Temperature	C^0	-50 to +200OC
Inlet pressure Gauge	-	MS / SS
Outlet pressure Gauge	-	MS / SS
Outlet working Pressure	Bar	MAX 0-18
Inlet pressure Bar	Bar	200
Outlet pressure Bar	Bar	10-18
Maximum Flow	LPM	450 LPM @ 18
End connection	inch	3/8" BSP male
Application	-	Used to pressurised the water cylinder of Fire detection and supression system for passenger compartment

Cylinder's Valve

Solenoid Operated Discharge Valve

Pneumtaic Operated Discharge Valve

TECHNICAL SPECIFICATIONS			
Nomenclature	**UOM**	**Technical Detail**	
Spare Part Code	-	SM-RM1961	SM-RM1675
Description	-	Solenoid Operated Discharge Valve	Pneumtaic Operated Discharge Valve
Neck Thread Size	mm	M30X1.5	
Pressure Gauge Thread Size	mm	M10X1.0 WITH SHREDER VALVE IN BULIT	
Valve Oulet Thread Size	inch	G 1/4"	
Siphone Tube Thread Size	mm	M16X1.5	
Seat Diameter	mm	8	
Operating Temprature Range	C^0	-20°C to + 65°C	
Material Of Construction	-	BRASS NICKLE PLATED	
Working Pressure	Bar	23 BAR AT 15°C	
Coil Rating	VDC	24 VDC	NA
Power Consumption	Watt	12	NA
Protection Class	IP	IP 65 WITH CABLE PLUG	NA

Electro-magnatic Release

TECHNICAL SPECIFICATIONS		
Spare Part Code	**UOM**	SM-RM1836
Description	–	Electro-magnatic Release.
Product Dimmention	MM	99 x 65 x 40
Material of construction (Body)	–	brass (nickel-plated/non plated), stainless steel, copper, nickel, elastomeric sealings, polytetrafluorethen
Total Weight	GRM	550
Operating voltage	VDC	24 (±10%) or 12 (±10%)
Operating temperature	℃	-20 to +65
Power consumption	WATT	12
Power supply	–	100% on-duration
Protection class	–	Ip65 with cable plug
Installation position	–	As required, preferable solenoid actuator up right
Electrical connection	–	DIN EN 175301-803, Form A (previously DIN 43650A)
Thread size	–	M20 x 1.5
Application	–	Use for actuating all indirect valves

Nozzles

Full Cone Nozzle

Flat Spray Nozzle

TECHNICAL SPECIFICATIONS - FULL CONE NOZZLE				
Nomenclature	**UOM**	**Technical Detail**		
Spare Part Code	-	SM-RM4448	SM-RM4449	SM-RM4450
Description	-	Full Cone Nozzle	Full Cone Nozzle	Full Cone Nozzle
Inlet Connection	inch	1/8" BSPT Male Thread	1/8" BSPT Male Thread	1/8" BSPT Male Thread
Type Of Coverage	-	Solid Cone	Solid Cone	Solid Cone
Flow Rating	LPM	1.7 @ 2 Bar	1.7 @ 2 Bar	1.7 @ 2 Bar
Spray Angle	Degree	60	90	120
Material Of Construction	-	SS 304	SS 304	SS 304

TECHNICAL SPECIFICATIONS - FLAT SPRAY NOZZLE							
Nomenclature	**UOM**	**Technical Detail**					
Spare Part Code	-	SM-RM4448	SM-RM4448	SM-RM4448	SM-RM4448	SM-RM4448	SM-RM4448
Description	-	Flat Spray Nozzle					
Inlet Connection	inch	1/4" BSPT Male Thread					
Type Of Coverage	-	Flat Spray					
Flow Rating	LPM	2.5 @ 2 Bar					
Spray Angle	Degree	15	30	45	60	90	120
Material Of Construction	-	SS 304					

Flexible Hose Pipe

TECHNICAL SPECIFICATIONS				
Nomenclature	**UOM**	**Technical Detail**		
Spare Part Code	-	SM-RM	SM-RM	SM-RM
Description	-	Flexible Hose 3/8" BSP - 1 meter long	Flexible Hose 1/2" BSP - 1.5 meter long	Flexible Hose 1/2" BSP - 3 meter long
Hose (ID)	mm	9.5	12.7	9.5
Hose (OD)	mm	15.5	18.2	15.5
Total Length (L)	mm	1000	1500	1000
Working Pressure	Bar	90	90	90
Test Pressure	Bar	135	135	135
Temperature Range	C^0	-40 to 100	-40 to 100	40 to 100
Hose End Fitting Thread Size/type (E)	-	3/8" BSP- Female	1/2" BSP- Female	1/2" BSP- Female
Material of construction		SS 304 single wire braiding	SS 304 single wire braiding	SS 304 single wire braiding
Application		Used to connect solenoid valve to water tank to pressurise in Fire detection and supression system for passenger compartment	Used to connect a feeder line to discharge line in Fire detection and supression system for passenger compartment	Used to connect a feeder line to discharge line in Fire detection and supression system for passenger compartment

Pressure Switch

TECHNICAL SPECIFICATIONS	
Product Code	**SM-RM4307**
Description	Pressure Switch SPDT (Switch Point 5Bar / 72.5 PSIG decreasing) NC & NO -Imp
Increasing Activation	130 PSIG ± 9 PSIG [9 BAR]
Decreasing Activation	72.5 PSIG ± 7 PSIG [5 BAR]
Max Pressure	290 PSIG
Connector	NONE.
Fitting	M10 WITH DEFLATOR.
Fitting Material	BRASS.
Body Material	PLASTIC
Electrical Rating	3A 240 VAC/28 VDC.
Wire Jacket/insulator Material	PVC
O-ring Provided With Switch	NBR-70 SHORE (7.8X1.9 mm)
Certification	UL, RoHS, CE

Sounder and Strobe

TECHNICAL SPECIFICATIONS		
Nomenclature	**UOM**	**Technical Detail**
Spare Part Code	-	SM-RM1961
Description	-	Sounder and Strobe
Current Consumption	mA	100 / 150
Operating Voltage	DC V	12 / 24
Operating Temperature	C^0	-10 to +60
Humidity	%	(+/-) 95
Colour	-	Red
Sounder Level	dBA	100
Flashing Intensity	-	+/- 1.2 ws
Flashing Period	-	+/- 1.5 s
Weight	gms	200
Dimensions (W X H X D)	mm	126 x 126 x 55
Housing	MOC	ABS Plastic

Conventional Optical Smoke & Thermal Detector

TECHNICAL SPECIFICATIONS		
Spare Product Code	**TI-002265**	**TI-002267 / TI-002268**
Alarm Temperature	—	78oC (Class BS)
Operating Voltage	10-30V DC	10-30V DC
Standby Current Consumption	90µA @ 24V DC	90µA @ 24V DC
Max. Alarm Current Consumption	40mA	40mA
Max. Remote Output Current	18mA	18mA
Ambient Temperature	-10°C to +55°C	-10°C to +55°C
Relative Humidity	95% (non condensing)	95% (non condensing)
Dimensions (Diameter x Height)	110mm (Ø) x 54mm (depth)	110mm (Ø) x 54mm (depth)
Standard	EN 54-7	EN 54-7
LED Indicator	Bi-coloured LED indicator with 3600 visibility.	—
Certification/Approval Authority	LPCB	LPCB
Protection Class	Ip40	Ip40

Fire Detection And Control Panel

TECHNICAL SPECIFICATIONS		
Nomenclature	**UOM**	**Technical Detail**
Spare Part Code	-	SM-RM1961
Description	-	Fire Detection And Control Panel
Model Numer	-	BFSS-22
Power Supply	-	INPUT VEHICLE BATTERY 930 VDC, STAND BY BATTERY 12 VDC, NORMAL STATE CURRENT 35 50mA
Input	-	TWO INITIATING DEVICE CIRCUIT (IDC), VOLATGE + 12 VDC, END OF LINE 4.7 KΩ,1W, CLASS B WIRING, ZONE1 SOMKE DETECTOR, ZONE2 LHD SENSOR
Output	-	FIRE,FAULT, BATTERY,DISCHARGE AND ABORT LED INDICATION, NOTIFICATION APPLINACE CIRCUITS (NAC1, NAC2) 2427 VDC,1A RAC1 & RAC2 WITH 24 VDC 2.5 AMP MAX
Operating Temprature	C^0	-10 to + 60
Humidity	-	5 to 95% Rh

-

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