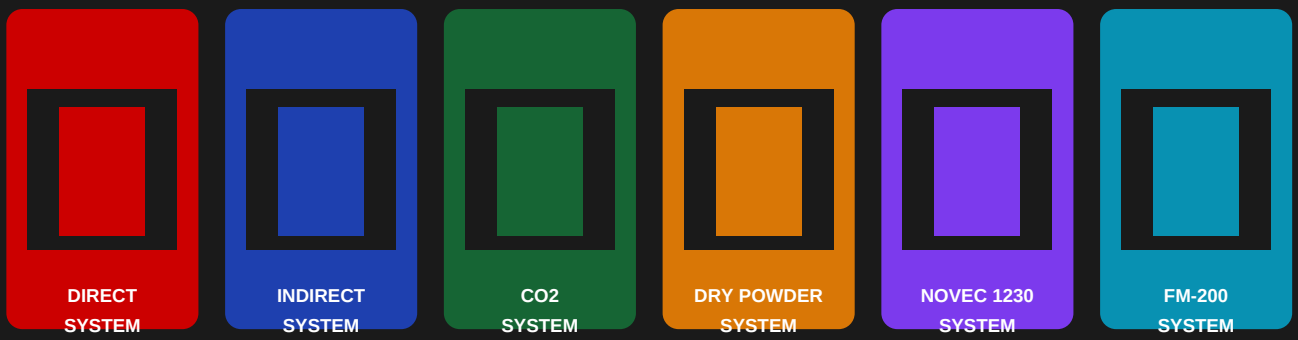
FIRE GROUP

"fire protection excellence, flexibility custom-made"

AUTOMATIC SUPPRESSION SYSTEMS

PANEL / CABINET FIRE SUPPRESSION — CATALOGUE



- FM Approved
- UL Listed
- VdS Certified
- CE Marked

KEY APPLICATIONS

- Electrical Panels
- CNC Machines
- Server Rooms
- Vehicles
- Archive Shelving
- ATMs
- UPS Units
- Wind Turbines
- Rail/Metro Wagons
- Raised Floors

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EDITION 1 - 2024

AUTOMATIC PANEL & CABINET SUPPRESSION SYSTEMS

What is an Automatic Suppression System? An automatic suppression system uses heat-sensitive detection tubing installed inside enclosed spaces (panels, cabinets, machines). When exposed to heat, the tubing bursts and directly discharges the extinguishing agent onto the fire source — with **no human intervention required**. Safe for people, no toxic residue in most agent types. Certifications: FM, UL, VdS, CE.

How It Works — Two Technologies

	DIRECT SYSTEM	INDIRECT SYSTEM
Detection	Heat-sensitive polymer tubing acts as both detector AND discharge pipe	Heat-sensitive polymer tubing acts as detector only
Discharge	Agent bursts through the tubing at the exact point of fire	Agent discharges via separate nozzle network covering the enti
Best for	Small enclosed cabinets, panels, engine bays — localized fire	Large enclosures, server rooms, CNC machines — total floodin
Activation	~100 degC — nitrogen pressure released, cylinder valve opens	Same detection tube triggers cylinder; agent floods via pipework

Key Advantages

- No fire alarm panel required — fully self-contained detection and suppression
- Activates at source — extinguishes fire before it spreads beyond the cabinet
- Cost-effective: protects only the fire-risk enclosure, not the entire room
- Fast installation — minimal downtime for protected equipment
- Easily recharged / refilled after activation
- Suitable for new and retrofit installations on old or new equipment
- Up to 8.5 m3 volume protection with a single cylinder system
- Operating principle: nitrogen-pressurised polymer tube at 12 bar

EXTINGUISHING AGENTS

Fire Group Georgia systems can be configured with the following certified extinguishing agents depending on the application, enclosure type and risk classification:

FM-200 (HFC-227ea)

- Clean agent — leaves no residue, safe for sensitive electronics
- Does not require oxygen removal — people can evacuate first
- Fast discharge: extinguishes fire in < 10 seconds
- Ideal for: server rooms, electrical panels, telecoms equipment
- Internationally certified: FM, UL, CE

CO2 (Carbon Dioxide)

- High-pressure or low-pressure system configurations
- Total flooding and local application options
- Leaves no residue — ideal for machinery and industrial equipment
- Direct and indirect system configurations available
- Note: CO2 displaces oxygen — evacuate enclosed spaces before/during discharge

AFFF Foam

- Aqueous Film Forming Foam — highly effective on hydrocarbon fires
- Class A and Class B fire suppression
- Creates vapor-sealing layer to prevent re-ignition
- Used in: fuel storage, kitchen areas, flammable liquid risks
- 1–6% proportioner compatible

Novec 1230 (FK-5-1-12)

- Environmentally friendly — zero ozone depletion potential (ODP = 0)
- Ultra-low global warming potential (GWP = 1)
- Clean, no residue — safe for electronics and documents
- Ideal for: data centers, archives, museums, sensitive equipment
- Longest atmospheric lifetime of the clean agents: < 5 days

ABC Dry Powder

- Effective against Class A, B and C fires
- Low-pressure system — simple and robust
- Cost-effective for industrial and vehicle applications
- Suitable for engine bays, generators, outdoor equipment
- Requires cleaning of residue after discharge

FE-36 / FE-25

- Halon-replacement clean agents
- Safe for occupied spaces — low toxicity
- Fast suppression with minimal agent quantity
- Compact cylinder size — ideal for small enclosures
- Effective on Class B and C fires

ELECTRICAL PANEL PROTECTION

Electrical panels, distribution boards and control cabinets are among the highest-risk fire locations in any building or facility. Overheating cables, short circuits and component failures can ignite fires inside closed panels. These fires are difficult to detect from outside — the system provides **fully automatic, no-alarm-required suppression directly at the source**.

How Panel Protection Works

Step 1 — Installation

Heat-sensitive tubing is routed throughout the inside of the panel, ensuring complete coverage of all risk areas. The cylinder is mounted externally.

Step 2 — Detection

When temperature reaches ~100 degC at any point along the tube, the polymer tube ruptures at that point — acting as a pinpoint nozzle.

Step 3 — Suppression

Extinguishing agent is propelled by nitrogen pressure directly through the rupture point onto the fire source. No external alarm needed.

Step 4 — Reset

Replace the detection tube and recharge the cylinder. System is fully operational again within minutes.

Panel Protection Specifications

Detection method	Heat-sensitive polymer tube (direct or indirect)
Activation temperature	Approx. 100 degC (configurable)
System pressure	12 bar nitrogen pressurised
Max. protected volume	Up to 8.5 m3 per cylinder
Agents available	FM-200, Novec 1230, CO2, FE-36, Dry Powder
Certifications	FM, UL, VdS, CE
No. of alarm panels req.	None — fully self-contained
Installation time	Typically 2-4 hours per cabinet

VEHICLE & MACHINE PROTECTION

Vehicle Protection

Buses, trucks, heavy vehicles and specialty vehicles are constantly exposed to fire risk in their engine compartments. Fuel leaks, overheating and electrical faults can start fires rapidly. The heat-sensitive polymer tube system is installed throughout the engine bay — automatically detecting and suppressing fire before it spreads. **Suitable for both new and retrofit vehicle installations.**

- Buses (intercity, city, school), coaches and minibuses
- Trucks, HGVs, lorries and articulated vehicles
- Construction machinery — excavators, bulldozers, cranes
- Forklifts and warehouse equipment
- Agricultural machinery — harvesters, tractors
- Military and defense vehicles
- Mobility vehicles and ambulances
- Rail and metro wagons — engine and battery compartments

CNC & Industrial Machine Protection

CNC machining centres, moulding machines, printing machines and diagnostic equipment are extremely sensitive to fire. Cutting, milling and grinding operations generate heat and sparks. Even small equipment such as forklifts, generator motors and alternators carry constant overheating and ignition risk. Conventional sprinkler systems are insufficient for these enclosed machine spaces.

- CNC machining centres and turning/milling machines
- Injection moulding and die casting machines
- Printing and paper-processing machinery
- Laser cutting machines and plasma cutters
- Generator sets and motor control centres
- Compressors and hydraulic power units
- Electrical and electronic test equipment
- Laboratory analytical equipment and fume cupboards

HIDDEN SPACES, SERVER ROOMS & RAISED FLOORS

Many facilities including offices, data centres and educational buildings use raised floors and suspended ceilings for cable routing. These concealed voids present a serious fire risk — overloaded cables overheat, and fires in these hidden spaces are extremely difficult to detect with conventional detectors. The automatic suppression system is fully self-contained and requires no human intervention — the fire will be extinguished before it can spread.

Raised Floor (Under-floor Cable Void)

- Detection tubing routed along cable trays under raised floor panels
- Activates automatically at source — no need to lift panels
- Prevents fire spread to structural elements and main floor
- Agents: FM-200, Novec 1230, CO2

Suspended Ceiling Cable Trays

- Tubing follows cable routes above suspended ceiling tiles
- Detects overheating cables before ignition point
- Protects the most common hidden fire route in office buildings
- No disruption to ceiling aesthetics

Server Rooms & Data Centres

- Total flooding with FM-200 or Novec 1230 clean agents
- No damage to servers or storage media — zero residue
- Activates while servers continue operating or on shutdown
- Meets ISO/IEC 24764 data centre suppression requirements

Telecommunications & GSM Equipment

- Protection for GSM base stations and telecom rack enclosures
- Remote monitoring integration available
- Compact cylinder sizes for tight equipment rooms
- Clean agent discharge — no interruption to service

Archive & Document Storage

- FM-200 or Novec 1230 for irreplaceable document protection
- Indirect system for total flooding of archive rooms
- Automatic discharge without activating water suppression
- Compliant with archive protection standards

Bank ATMs & Financial Equipment

- Compact direct system fits inside ATM enclosure
- Protects cash, electronics and customer data
- Self-contained — no building alarm connection required
- Rechargeable after activation without equipment replacement

CO2 SUPPRESSION SYSTEMS

DIRECT CO2 SYSTEM

- Agent: carbon dioxide (CO2) — electrically non-conductive, leaves no residue
- High-pressure cylinder — compact storage
- Detection tubing routes agent directly to fire source
- Ideal for: small electrical panels, compact machinery enclosures
- Fast discharge time — fire suppressed within seconds
- Multiple cylinder sizes available: 1 kg to 45 kg

INDIRECT CO2 SYSTEM

- Total flooding configuration — agent distributed via dedicated nozzle network
- Suitable for larger enclosed spaces with complex geometry
- Heat-sensitive tube acts as detection device only; discharge via piped nozzles
- Covers full volume of the protected enclosure uniformly
- Ideal for: CNC machines, printing machinery, generator enclosures
- Pre-engineered or custom-designed piping configurations

CO2 System Technical Parameters

Agent	Carbon Dioxide (CO2) — stored as liquid, discharged as gas
System type	Direct (tube discharge) or Indirect (nozzle network)
Pressure	High pressure: 180–200 bar stored; Low pressure: -18 degC / 20 bar
Design concentration	34–75% by volume depending on application
Cylinder sizes	1 kg, 2 kg, 5 kg, 10 kg, 20 kg, 45 kg
Warning	CO2 displaces oxygen — evacuate personnel before/during discharge
Residue	None — no cleanup required
Certifications	EN 12094-1, FM, UL, VdS

CLEAN AGENT SYSTEMS — FM-200 & NOVEC 1230

FM-200 SYSTEM (HFC-227ea)

- Clean gaseous agent — zero ozone depletion potential
- Suppresses fire by heat absorption and chemical chain reaction interruption
- Safe for occupied spaces — does not displace oxygen significantly
- Leaves absolutely no residue — equipment can restart immediately
- Discharge time: typically < 10 seconds
- Design concentration: 7–8% by volume
- Cylinder sizes: 5 kg to 147 kg
- Certifications: FM, UL, EN 15004

NOVEC 1230 SYSTEM (FK-5-1-12)

- Next-generation clean agent — atmospheric lifetime < 5 days
- Global Warming Potential (GWP) = 1 — most environmentally sustainable clean agent
- Zero Ozone Depletion Potential (ODP = 0)
- Stored as liquid, discharges as gas — compact storage per kg of protection
- Safe for people — rated for occupied spaces
- Design concentration: typically 4–5.9% by volume
- Ideal for: data centres, archives, museums, historic buildings
- Certifications: FM, UL, CE, EN 15004

FM-200 vs Novec 1230 Comparison

Property	FM-200	Novec 1230
GWP (100yr)	3,220	1
ODP	0	0
Atm. Lifetime	33 years	< 5 days
Safety (occupied)	Yes (NOAEL 9%)	Yes (NOAEL 10%)
Residue	None	None
Design concentration	7–8%	4–5.9%
System cost	Lower	Higher
Environmental impact	Moderate	Minimal

SYSTEM COMPONENTS & ACCESSORIES

Each automatic suppression system consists of the following key components. All parts are sourced from certified manufacturers and supplied with full documentation.

Detection Components

- Heat-sensitive polymer detection tube (various diameters)
- Tube fittings: T-pieces, elbows, straight connectors, end plugs
- Tube brackets and routing clips for interior installation

Cylinders & Valves

- Agent cylinders: 1 kg to 147 kg depending on agent and system type
- Nitrogen-charged valve head assembly
- Pressure gauge and low-pressure indicator
- Safety pin and tamper seal

Mounting & Installation

- Wall brackets and cylinder mounting hardware
- Explosion-proof fittings for hazardous areas
- Discharge tube adapters for various nozzle types
- Cable gland entries for tube routing through panels

Discharge Components

- Discharge nozzles (direct and indirect configurations)
- Metal discharge pipework and fittings
- Manifolds for multi-nozzle systems

Control & Monitoring

- Pressure switches for alarm and monitoring integration
- Manual release actuator (optional)
- Remote status indicator light / panel
- BMS / fire alarm integration interface

Maintenance Kits

- Replacement detection tube kits (post-activation)
- Recharge service for all agent types
- Annual inspection and certification service
- Full system documentation and as-built drawings

CONTACT & COMPANY INFORMATION

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Fire Group Georgia reserves the right to make technical changes without prior notice. All system designs and agent quantities must be verified by a qualified fire engineer. Systems are supplied with full installation, commissioning and maintenance documentation.

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