NAFFCO® CO₂
FIRE SUPPRESSION SYSTEM

ENGINEERED FOR PERFECT PROTECTION
NAFFCO carbon dioxide fire protection system offers a unique high pressure carbon dioxide fire suppression system to minimize the potential loss of lives and properties in today's highly specialized environments. The above system is designed in accordance with NFPA-12.

A carbon dioxide fire protection system can be used safely and effectively in a variety of special hazard applications due to the following benefits.

- HIGHLY EFFICIENT EXTINGUISHING AGENT
- FAST EXTINGUISHMENT
- ELECTRICALLY NON-CONDUCTIVE
- NO DAMAGE TO PROTECTED EQUIPMENT
- NO POST-DISCHARGE RESIDUE OR CLEAN-UP
- ZERO ODP, ENVIRONMENTALLY ACCEPTABLE

The CO₂ system is actuated by different modes.

- SOLENOID VALVE
- ELECTRICAL ACTUATOR
- PNEUMATIC ACTUATOR
- LOCAL MANUAL RELEASE (AT CONTROL HEAD)
- REMOTE MANUAL RELEASE

**SYSTEM OPERATION**

Reducing the oxygen content from the normal 21% to below 15% will extinguish most surface fires thus requiring a 34% CO₂ concentration level. Depending upon the application a significant amount of cooling is also provided. Rapid expansion of the snow to gas reduces the ambient temperature in the hazardous area which accelerates the extinguishing process and retards re-ignition.

CO₂ is stored as a liquid under pressure, usually 58 bar at 20°C, in high pressure steel containers.

When the system is actuated, the closed valve opens, allowing the container vapor pressure to propel the liquid CO₂ via the distribution pipe work to discharge through specially designed nozzles where it readily vaporizes resembling a cloud of steam. This clouding is due to moisture in the air becoming frozen as a result of the extremely low temperature of the expanding CO₂.

**SYSTEM TYPES**

NAFFCO Fixed Carbon Dioxide Systems are designed using two methods of application:

**TOTAL FLOODING**

A total flooding system consists of a fixed supply of carbon dioxide normally connected to fixed piping with nozzles arranged to discharge carbon dioxide into an enclosed space or enclosure around the hazard.

**LOCAL APPLICATION**

A local application system consists of a fixed supply of carbon dioxide normally connected to fixed piping with nozzles arranged to discharge carbon dioxide directly on the burning material.
Our Flexible Approach To Engineering Allows Our Clients To Depend On Us For Their Any Type Of Fire Protection Need

CYLINDER & VALVE ASSEMBLIES: NAFFCO Carbon dioxide cylinder and valve assemblies are of heavy-duty construction, specifically designed for rugged service conditions and to provide rapid response when needed.

Cylinders are available in a wide range of sizes offering a choice of fill capacities to meet your specific needs and ensure maximum economy in installation. Each cylinder is manufactured from high strength alloy steel. Cylinders with CE marking is available on request. D.O.T. Approved Cylinders available on request.

CONTROL HEADS: Control heads are a vital part of the system operation, and must respond immediately to initiate system discharge. The control heads consist of three types:

1. MANUAL & PRESSURE OPERATED
2. ELECTRICAL & PRESSURE OPERATED
3. PRESSURE OPERATED

The quick opening control heads are manufactured from tough, corrosion-resistant brass, under stringent quality control standards. UL Listed F.M. Approved Valves are available as option.

DIRECTIONAL VALVES: Multiple hazards may be protected from a common supply of CO₂ by using pneumatically operated directional valves. This is essentially an economy measure designed to reduce system size. It is also used only when it is certain that only one hazard could require a discharge at any one time. It is operated pneumatically by gas pressure through cartridge system which can be actuated Manually/Electric Actuator/Solenoid Valve.

<table>
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<th>DV40A</th>
<th>DV50A</th>
<th>DV65A</th>
<th>DV80A</th>
<th>DV100A</th>
<th>DV125A</th>
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NOZZLES: NAFFCO discharge nozzles use the multijet principle. The discharge flow is divided into separate patterns and then directed towards the inner side wall of the nozzle before exiting. This permits greater volumes of carbon dioxide to be discharged by a single nozzle. The result is fewer nozzles, less pipe, less fittings and lower installation costs.

The nozzles are made of steel, aluminium, stainless steel 316 and corrosion-resistant brass in different types, shapes and diameters to assure the effectiveness of extinguishing agents as per system design and quantity of gas required.

ODORIZER: This device induces a characteristic smell to indicate CO₂ system discharge.

WEIGHT MONITORING SYSTEM: This system enables to continuously monitor or determine the weight of agent in a CO₂ cylinder. It consists of the following two types.

- MECHANICAL TYPE
- ELECTRONIC TYPE
DETECTION & CONTROLS

A vital part of any automatic fire suppression system is the means for detection and control. NAFFCO offers sophisticated detection and control systems (electric or pneumatic) which sense fires in their early development. This results in rapid detection, early suppression, and less potential for damage or injury.

NAFFCO CO2 Fire Extinguishing Panels are based on advanced microprocessor based system. NAFFCO offers a wide range of control panels to choose from for special hazard applications. These range from simple single zone releasing panels up to the most technologically advanced multi-zone detection panels. UL Listed Control Panels are available on request from FIKE U.S.A. In addition to Control Panels the Detection System consists of the following components.

DETECTORS: Detectors can be conventional ionization, photoelectric, thermal or analogue addressable sensors and other types of special hazard detection systems including optical, if necessary.

PRESSURE SWITCH MODEL NFPS-22: This switch is used to give an indication of gas discharge in the control panel.

MANUAL RELEASE UNIT MODEL NFMU-103: This is used to operate the system manually to discharge the CO2 gas immediately, in case of fire.

MAIN RESERVE TRANSFER SWITCH MODEL NFTS-100: This switch is used to change over the discharge of gas manually from the main cylinders to the reserve cylinders.

ABORT STATION MODEL NFTS-125: This unit employs a non-latching contact push button switch which provides a temporary manual means by which the system actuator circuit can be interrupted, when operated prior to the circuit actuation. Even though it is not recommended, it can be provided upon request.

STATUS INDICATOR MODEL NFSD-206: This unit indicates the current mode of the extinguishant release system, i.e., Gas release, manual or automatic.

FIRE-ALARM BELL MODEL NFBL-106: This unit operates and rings in the 1st stage alarm indicating the presence of fire.

FLASHER MODEL NFPL-28: This unit shows that the system is in the 2nd stage visual alarm and CO2 gas will be discharged upon termination of calibrated time.

ALARM SOUNDER MODEL NFB-29: This unit operates during pre-discharge second alarm (2nd stage audible alarm).

WARNING SIGNS: These signs will be posted inside/ outside the area protected by this system just for warning purposes which means that:
1. The area is protected by CO2 fire extinguishing system.
2. The area is to be evacuated upon hearing of alarm sound prior to gas discharge.
WIDE APPLICATIONS

NAFFCO CO₂ systems are used for the protection of a variety of risks like flammable liquid fuels, electrical equipment, paper, wood and textiles. Fire in industrial or commercial areas spreads rapidly and becomes so intense that many times they cannot be approached and extinguished with portable fire equipment. A fixed CO₂ system designed specifically for the hazard and operated automatically, assures immediate detection and rapid suppression.

The list of hazards which can be protected by Carbon dioxide system includes:

- **Power Generation**
  - Base Load Plants
  - CO generation & combined cycle Plants
  - Power Peaking Units
  - Upgrading Existing Plants: w/ Coal Conversions
  - Coal Storage/Handling/ Pulverizing

- **Cement Plant/Blast Furnace Indirect Coal Firing Systems**

- **Metals Production and Processing**
  - Electric Furnaces
  - Continuous Casters
  - Rolling Mills (Steel & Aluminium)
  - Coating Lines
  - Oil Quench Tanks

- **Printing**
  - Newspaper Production
  - Periodical Printing
  - Packaging

- **Automotive**
  - Assembly: Painting-Mixing & Storage
  - Parts: Machining
  - Heat Treating

- **Electronics Operations**
  - Computer Areas
  - Automated Information Storage Systems

- **Electronics Production**
  - Computer Production: West Benches
  - Wave Soldering Machines

- **Food Processing**

- **Research Facilities:**
  - Test Facilities
  - Anechoic Chambers

- **Shipboard (Marine) Systems**

- **Flammable Liquid Storage Areas**

- **Electrical Hazards of All Types**
ENGINEERING...
NAFFCO is backed by a team of professionals who are well-qualified and specialized in their respective fields viz - Design, Development and Project Implementation. Our engineering department is one among the best and is equipped to provide total engineered solutions. Our investment in applied research and development program concentrates on innovations which meet customer needs.

PHILOSOPHY...
NAFFCO perceives that the future of the Fire Protection market is for those companies having technical innovations, adaptability to market requirements and ability to find new ways of solving problems. For this reason we concentrate on the three major areas:

1. Applied Research
2. Providing Environmentally-friendly Technology
3. Quality Control

OUR COMPANY
NAFFCO has over 25 years experience in fire protection engineering including manufacturing, designing and commissioning industrial, commercial and marine fire protection systems.

NAFFCO is backed by a team of well experienced engineers who are committed to providing advanced technology which is necessary to meet the challenge of complex hazards of today. Each system is specifically engineered to accommodate the individual requirements of the areas to be protected. Our Computer Aided Design (CAD) and U.L./FM & U.L.C. Flow Calculation Program allows even calculations for irregularly shaped areas or hazards requiring long, unbalanced piping with complicated nozzle layouts.

Our Mission.... To Protect & Save

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APPROVED ISO 9001 QUALITY MANUFACTURER

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