

## **Carbon Dioxide Fire Extinguishing Systems**

These systems are used to protect facilities in which electrical equipment, such as power generators and transformers, are installed; communications equipment rooms; rooms where much flame is used, such as boiler rooms and drying rooms; automobile repair and service centers; parking areas; etc.

In addition to having high electrical insulation properties; not fouling, corroding, or damaging equipment; effectively extinguishing oil fires; and using an extinguishing agent can be stored for a long time without decomposing; the fire extinguishing agent and system costs are lower than those of other fire extinguishing systems. In addition, the technical level for safety measures has been established to make this a more reliable fire extinguishing system.

### **System Overview**

Carbon dioxide fire extinguishing systems consist of a storage container, combination pipe, selection valve, discharge heads, startup unit, control unit, and the piping and wiring that connect them. The system types are largely divided into a fixed type that uses piping to hold the heads in a fixed position, and a mobile type that uses nozzles and hoses. The fixed type is further divided into the total area discharge type, local area discharge type, and monitor nozzle type depending on the type of material that is being protected.

### **Total area discharge method**

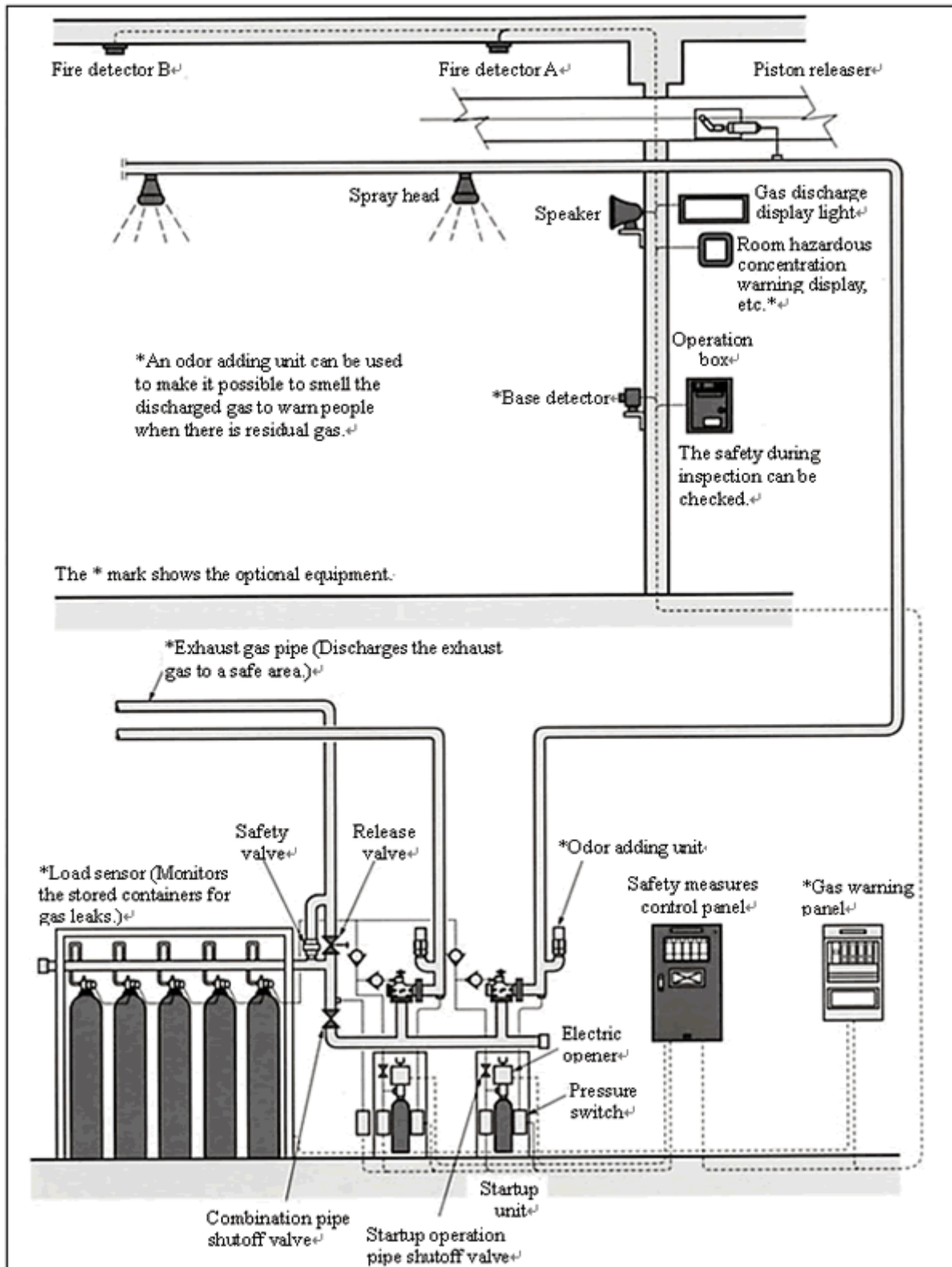
This method is used in structures with a structure that can be sealed and partitioned by floors, walls, and ceilings (or roofs) made of non-flammable materials. The fire extinguishing agent is uniformly discharged at a set density into the sealed off area.

This method uses a broadcast warning device to allow the people in the zone to evacuate before the fire extinguishing agent is discharged, automatic closing unit that stops the air circulation and closes the openings that reduce the fire extinguishing effect, and a sign and discharge indicator light to prevent people from entering the room while the gas is being discharged.

### **Local discharge method**

This method is used to extinguish fires when there are no effective partitioning walls or enclosures to protect the entire area around the object to be protected. The fire extinguishing agent is directly discharged on the object to be protected to surround the object and extinguish the fire.

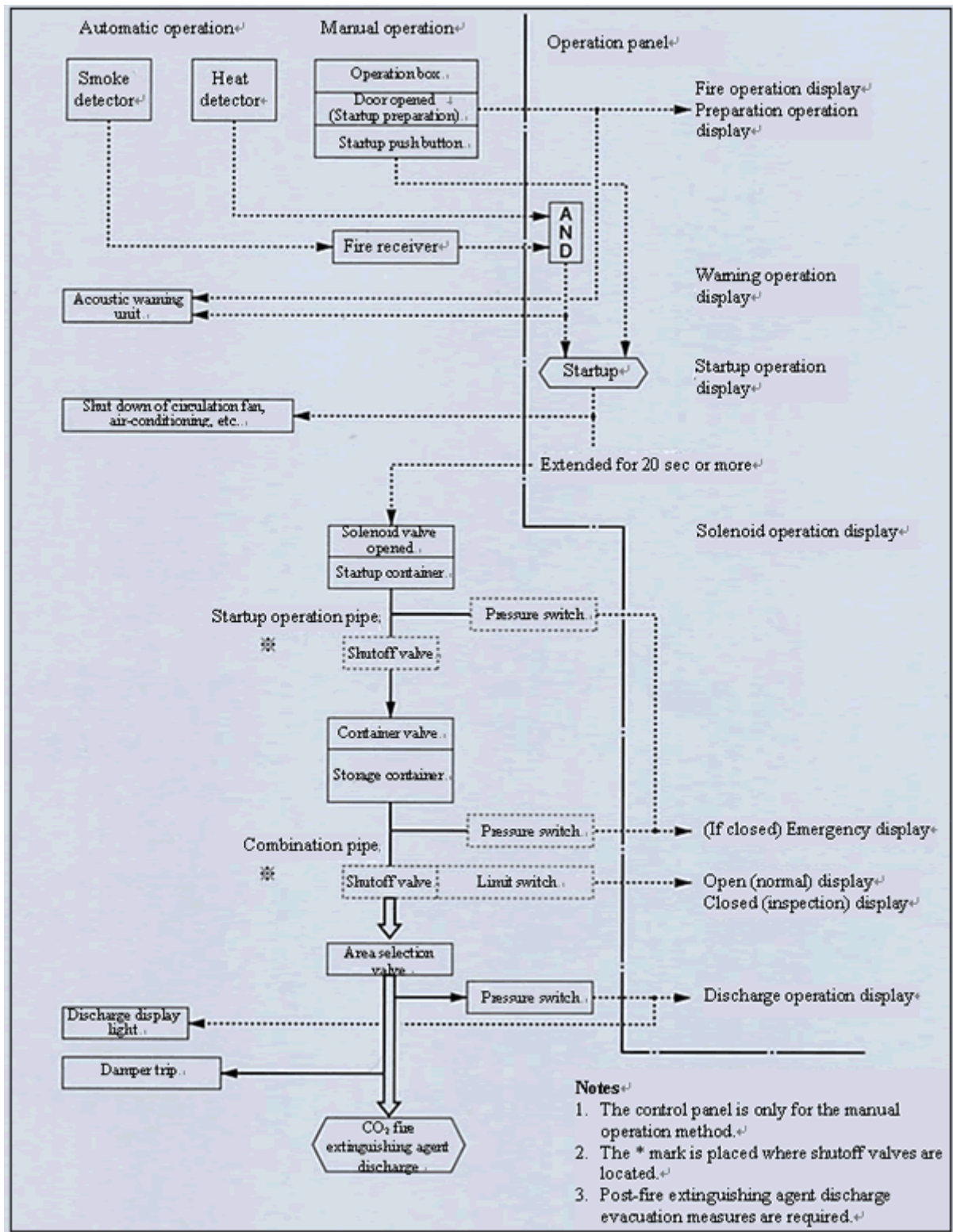
**Carbon dioxide fire extinguishing system configuration diagram  
(Total area discharge type)**



## **System Operation Method**

There are two startup methods, automatic and manual. The automatic startup method starts up when multiple fire singles are received by the operation panel, and the manual startup method uses an operation box placed in the vicinity of the protected area entrance to operate and start the system. The electrical signal from the control unit operates the startup unit and opens the selection valve and storage containers. The carbon dioxide stored in the storage containers as a liquid under high pressure evaporates under its own vapor pressure and flows through the combination pipe and piping to be discharged from the spray heads into the protected area.

## Standard System Operation Flow Chart



The carbon dioxide fire extinguishing system control panel, operation box, and shutoff valves comply with the technical standards for safety measures to prevent accidents to people from mistaken discharge and have been certified by the Japan Fire Equipment Safety Center. (Model No. NDC-CSS/Model No. System No. 007)

## Overview of Safety Measures

①The discharge of the fire extinguishing agent can be prevented when an erroneous signal enters the startup signal circuit.

- Electrical circuit short-circuit signal for the operation panel and manual startup unit (operation box)
- Startup signal circuit electrical circuit short-circuit signal

②To ensure safety during inspections, a shutoff valve is installed in the combination pipe between the storage tanks and the selection valve or between the operation gas container and the storage tanks, and the inspector can determine that the shutoff valve is closed from the operation box and control panel flashing indicator lights.

③Safety can be further increased by installing an odor adding device.

