THE CARBON DIOXIDE FIRE EXTINGUISHING SYSTEM

The CARBON DIOXIDE (CO₂) system is the most vital part of the vessel and can be assimilated to the heart of the latter as it will control all the parts that can be endangered.

Carbon dioxide as extinguishing agent

1. Carbon dioxide gas is stable and does not wield influence on oil, metal or electric insulator.
2. Since no pollution is caused at the fire fighting, the equipment, which is not damaged by the fire, can resume the operation immediately after the fire is put off.
3. As carbon dioxide has higher electric insulation property than air, it can be safely used to the electric equipment.
4. Since it can penetrate to any gap, the fire is extinguished completely no matter what complicated form the burning object may have.
5. The quality is not deteriorated if stored over a long period.

Since a large amount of oil is found in the engine room, boiler room, pump room, e.t.c. the fire may be spread rapidly. In the case of the engine room, therefore, it is necessary that 85% of required amount of carbon dioxide is discharged within 2 minutes for the prompt fire extinguishments.

The fire extinguishing system in the room consists of discharge nozzles, the carbon dioxide gas cylinders and the large type selection valve, the latter two being connected with the fixed piping for pressure use.

Maintenance and inspection

The daily maintenance and inspection work are quite important, if the performance of this unit, which is rarely used is to be exploited fully at the fire fighting time.

1. Arbitrary inspection
Visual inspection and checking for the deformation or damage of the tube, pipe, valve, electric wire or other accessories. These have to be kept in well-maintained status.

2. Half-yearly inspection
Inspection on the sounding of audible alarms such as sirens, bells, etc. Also checking and inspection of the electric safety circuits like the emergency stop of the ventilating device.

3. Yearly inspection
Weighting of the carbon dioxide cylinder and inspection of the filled gas amount. If the filled amount is reduced by more than 10%, it has to be refilled.

4. Two year inspection
Blow-through the lines of carbon dioxide or compressed air to the respective pipe system and checking for the pipe clogging, leakage or other abnormality.

5. Record after inspection
Records of the results must be kept in a record form, certificates.
Component of the system

Carbon dioxide gas cylinder

The carbon dioxide gas cylinder for fire extinguishments is equipped with the dip tube and the cylinder valve for the rapid discharge. The cylinder valve is connected to the check valve and gathering pipe by means of the connecting pipe. The cylinders usually have the net volume of 68 litres, to which 45.4 kg of carbon dioxide is filled.

Cylinder valve and releaser

1. Manual operation
Disengage the safety clip of the releaser and push the knob for operation.

2. Automatic operation by gas pressure
Even if the safety clip remains, the automatic activation can be made, when the gas pressure drives the needle cutter.

3. Gas discharge
When the release disc is ruptured by the needle cutter, the gas in E chamber is purged into the air. Then, the piston retreats by the pressure of D section, and the valve is instantaneously open to the full extent. The gas in the cylinder is discharged from A via B.
**Group release mechanism**

In case many carbon dioxide gas cylinders are to be discharged by manual operation at the same time, the trigger is used. The trigger is mounted at the gathering pipe and is connected to the cylinder discharge device via the control copper pipe.

**Selection release mechanism**

In order to use the carbon dioxide cylinder for fire extinguishment for the engine room and pump room in common, the selection valve is installed at each compartment. The selection release mechanism consists of:

1. **The selection valve**
   This is used for the rapid release of the carbon dioxide gas to the room. When the actuating gas drives the piston releaser, the lever is actuated and the valve is opened. It is also possible to open the lever directly by hand. After the use, push the valve spindle in, hang the spindle hanger on the pin and fix the lever at the original position.

2. **The selection valve box**
   If the selection valve is to be opened by hand at the fire in the room, first open the door of the selection valve box. The alarm switch interlock is arranged at the door, so that the alarm may sound without fail before the gas is released.

3. **The discharge nozzle**