

CARBON DIOXIDE FIRE SUPPRESSION SYSTEM

CARBON DIOXIDE GAS INTRODUCTION

Carbon Dioxide constitutes a colourless, odorless and inert gas. During usage, no damage is provoked (contrary to water or dry powder, the use of which can cause important damage to equipment), it is a safe agent for the majority of materials, non-hazardous for food, non-corrosive and non-conductive.

It evaporates completely in a few seconds after the extinguishing procedure and leaves no traces. Consequently, it can be used with no risk to various spaces containing electrical and electronic devices, precious artworks, paintings or manuscripts, or to flammable liquid warehouses, electric substations, kilns and ovens.



The use of CO₂ must be avoided to spaces where humans or animals are, because of its provoking suffocating conditions. The three-dimension use of CO₂ means that it can extinguish fires in vertical and horizontal direction. Its fast diffusion constitutes the key to a successful extinguishment, since it can penetrate through a break on a wall to all secret and remote places regardless of the obstacles that may exist.

Carbon Dioxide constitutes a stable commercial product with many other applications and it is widely used all over the world. Permanent CO₂ Systems can be automatically or manually activated, while the activation can be effected mechanically and pneumatically or electronically or from another combination of the above depending on existing conditions.

Carbon Dioxide is stored in normal temperature conditions in high pressure steel cylinders. Pressure changes depending on the temperature (at 21°C it is about 59bar).

SYSTEM DESCRIPTION

Single-Cylinder or multi-Cylinder systems can be applied according mainly to the volume of the under protection areas. In multi-cylinder systems a Pilot Cylinder is used for activating the rest cylinders of the system.

The Pilot Cylinder can be activated automatically by use of detonator which gets activated by a Detection System (Smoke & Rate-of-rise Heat Detectors and Control Panel). It can also get activated manually by a Remote «System-Activation» Button.

The valve of Pilot Cylinder is connected through a High Pressure EPDM Flexible Hose to the valve of the 1st cylinder of the system. When the detonator gets activated the valve of the Pilot Cylinder opens and the propellant gas activates pneumatically at first the valve of the 1st cylinder of the system and then the valves of the rest cylinders, which are connected through High Pressure EPDM Flexible Hoses to each other.

The Carbon Dioxide Gas of the Cylinders of the system is led to through High Pressure EPDM Flexible Hoses to the Manifold System. The

Manifold System consists of Manifold Pipes, Manifold Tee Pieces, Manifold Blind Caps and Non-Return Valves.

At the end, the Carbon Dioxide Gas passes through the Pipe Network (Red Color SCH40 or SCH80 tubes and 3.000lbs Spare Parts) and heads to the Local or Total Flooding Nozzles from where it is discharged over the under-Protection Area.

The Detection Equipment consists of Rate-of-rise Heat Detectors and Smoke Detectors, which must be installed in pairs over the under-Protection Area.

A Three-Zone Fire Alarm-Detection Control Panel gets the signal from the detectors in case of fire and an Optical-Sound Siren warns the user that the system will get activated. The panel has the essential Time-Delay Option. When the time delay ends, the control panel sends electrical current to the Detonator of the Pilot Cylinder which explodes and the System gets activated. In parallel a STOP GAS Security Sign gets activated and warns the user not to enter in the under-Protection Area.

SYSTEM COMPONENTS

Certified Steel High Pressure CO₂ Cylinders

- 16Ltr(12Kg), 40Ltr(30Kg), 50Ltr(35Kg), 67.5Ltr(45Kg), 67.5Ltr(50Kg), 80Ltr(60Kg).
- Cylinder Valves activated pneumatically, manually or by detonator. *Furthermore an electrically activated valve can be used, depending on the needs of the user.*
- Cylinder Valve Metal Protection Disk
- Cylinder Brackets in various sizes

Certified Steel High Pressure 3ltr (2Kgr) CO₂ Pilot Cylinder

- Certified Pilot Cylinder Valve activated by detonator or manually. *Furthermore, an electrically activated valve can be used depending on the requirements of the user (Pilot Cylinder is used in case of a multi-cylinder system).*
- Detonator $\frac{1}{4}$ ".
- Pilot Cylinder Bracket

High Pressure Galvanized Manifold System

- Galvanized High Pressure Manifold Pipes of diameters $1\frac{1}{4}$ "-3".
- Galvanized High Pressure Manifold Tee pieces of $\frac{3}{4}$ " inlet & outlet $1\frac{1}{4}$ "-3".
- Galvanized High Pressure Manifold Blind Caps $1\frac{1}{4}$ "-3".
- Galvanized High Pressure Manifold Reducing Couplings $1\frac{1}{4}$ " \rightarrow $\frac{3}{4}$ ", 2" \rightarrow 1", $2\frac{1}{2}$ " \rightarrow $1\frac{1}{2}$ ", 3"-2".
- Brass Non Return Valve $\frac{3}{4}$ "- $\frac{3}{4}$ ".

High Pressure EPDM Connection Flexible Hoses

- High Pressure EPDM Flexible Hose (21,78mm - $\frac{3}{8}$ ") for connecting the valve of the 1st cylinder of the system to the valve of the pilot cylinder.
- High Pressure EPDM Flexible Hose ($\frac{3}{8}$ " - $\frac{3}{8}$ ") for connecting to each other the valves of the cylinders of a system.

- High Pressure EPDM Flexible Hose (21,78mm - $\frac{3}{4}$ ") for connecting the valve of a cylinder to the non-return valve of the manifold system.
- High Pressure EPDM Flexible Hose ((21,78mm - $\frac{1}{2}$ ") for connecting the valve of a cylinder directly to the pipe network leading to discharge nozzles (*this is used in single-cylinder system*).

Other Parts

- Brass Male Couplings ($\frac{3}{8}$ " - $\frac{3}{8}$ ") adjusted on the valves of the cylinders for connecting the High Pressure EPDM Flexible Hoses.
- Brazen Blind Cap $\frac{3}{8}$ " for sealing the Valve of the last Cylinder of the System as well as the Valve of the Pilot Cylinder.
- Nickel Plated Discharge Nozzle $\frac{1}{2}$ " used for Local Flooding
- Brass Discharge Nozzle $\frac{1}{2}$ " used for Total Flooding

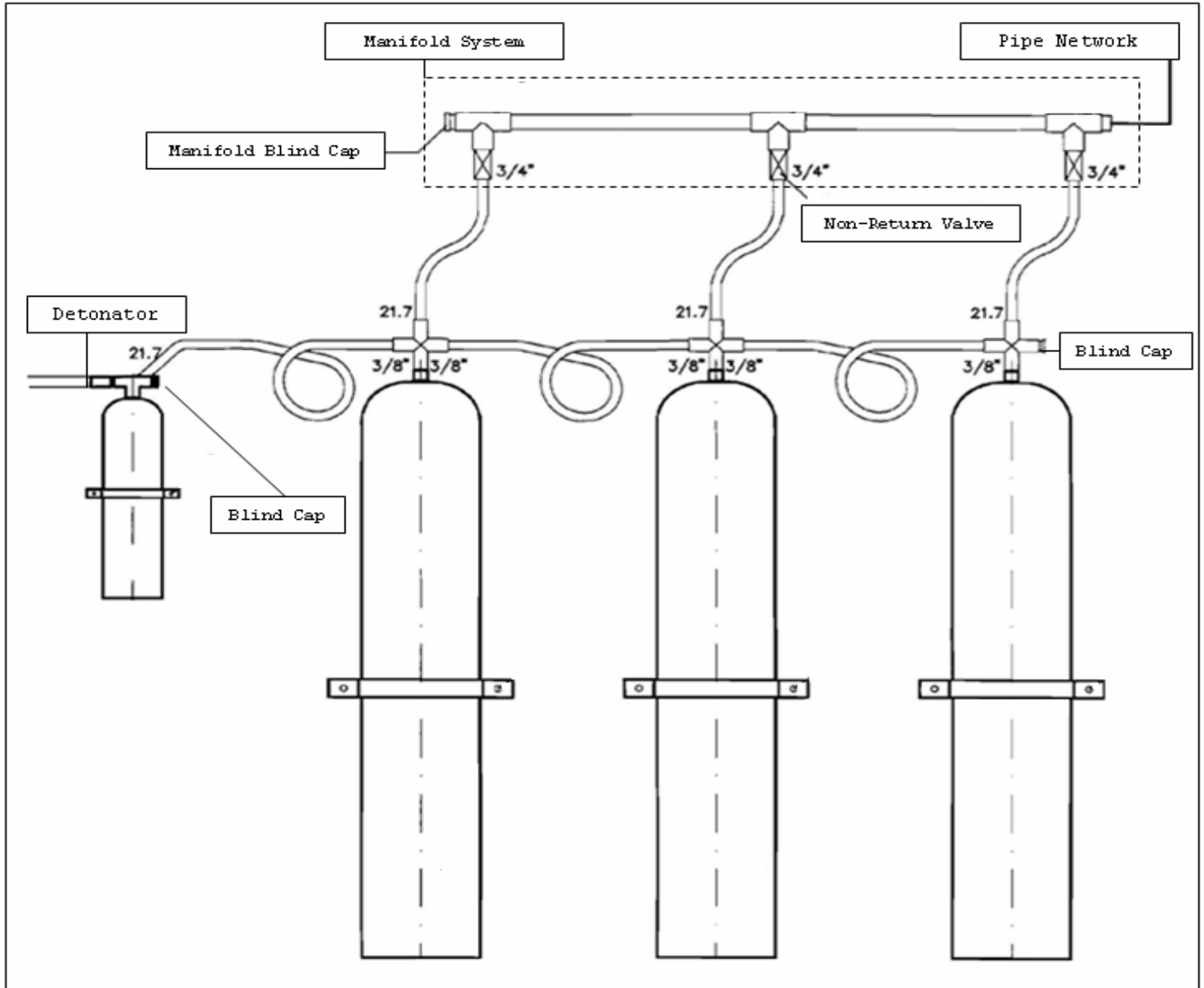
Control Panel and rest Electrical Equipment

- Three Zone Fire Detection-Alarm Control Panel
- Optical-Sound Siren
- Remote «System-Activation» Button
- Remote System «System-Cancellation» Button
- Rate-of-rise Heat Detectors
- Smoke Detectors
- STOP GAS Security Sign

BRIEF INSTALLATION GUIDE

1. Install the Cylinder Brackets and the Pilot Bracket on the Wall.
2. Place the Cylinders and the Pilot Cylinder on the Brackets and Secure the Nuts.
3. Connect the Pilot Cylinder Valve to the Valve of the 1st Cylinder of the System using the appropriate Flexible Hose (21,78mm - $\frac{3}{8}$ ").
4. Connect the Valves of the System Cylinders to each other using the appropriate Flexible Hose ($\frac{3}{8}$ " - $\frac{3}{8}$ ").
5. Adjust two blind caps, the 1st one to the free end of the Pilot Cylinder Valve and the 2nd one on the free end of the last Cylinder of the System.
6. Assemble the Manifold System.
7. Connect the outlet of the Valves of the System to the Non-Return Valves of the Manifold System using the appropriate Flexible Hose (21,78mm - $\frac{3}{4}$ ").
8. Adjust a Manifold Blind Cap to the 1st free end of the Manifold System.
9. Adjust a Manifold Reducing Coupling at the last Tee Piece of the Manifold System for connecting the Pipe Network which will head the CO₂ gas to the Discharge Nozzles of the System.
10. Screw the Detonator in the Pilot Cylinder Valve.
11. Install Smoke Detectors and Rate-of-Rise Heat Detectors (in pairs) over the under-Protection areas.
12. Install a Remote «System-Activation» Button.
13. Install a Remote «System-Cancellation» Button.
14. Install an Optical-Sound Siren.
15. Install a STOP GAS Security Sign.

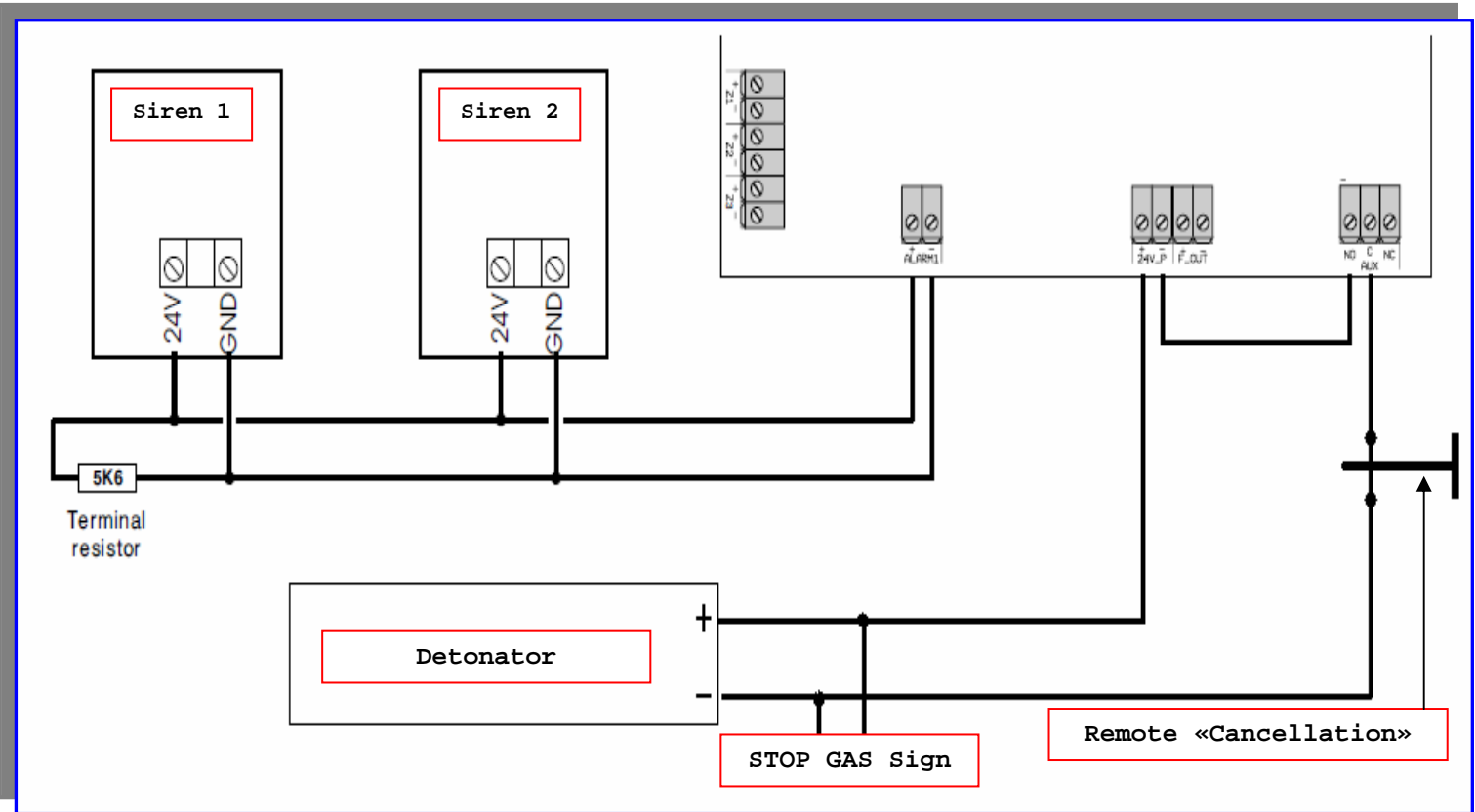
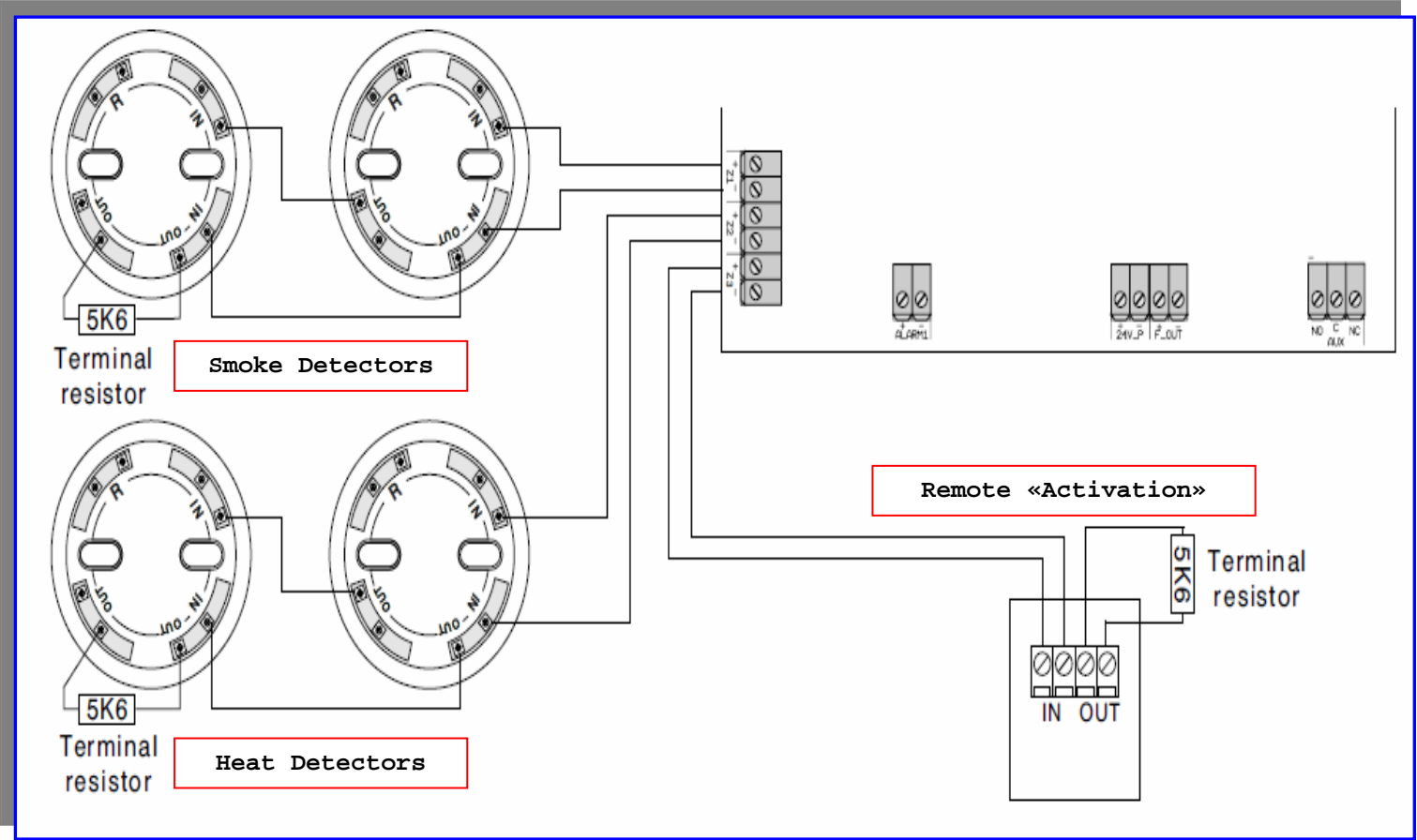
16. Install the Three-Zone Fire Alarm-Detection Control Panel on the wall and connect on its contacts (according to Electrical Layout Instructions) the Detonator, the Detectors, the Remote «System-Activation» Button, the Remote «System-Cancellation» Button, the Optical-Sound Siren and the STOP GAS Security Sign.
17. Set the Time Delay time and connect the Control Panel to 220V.



CERTIFICATIONS

- ISO 9809-1, EN 1964-1, n 99/36/EC
- CE CYLINDER 97/23/EC (TUV)
- CE Pilot Cylinder 97/23/EC (TUV)
- Valve (BV) CE0062
- Manifold tested at 300bar by MIRTEC S.A.

ELECTRICAL EQUIPMENT GUIDE



REAL TIME PHOTOS





