

# CO<sub>2</sub>

- **Contrasting technology and efficacy**
- **Low refilling cost**
- **Local application or total flooding application**
- **Applicable to deep - seated fires**
- **No residue to clean up after the discharge**
- **Zero Ozone Depletion Potential**
- **Electrically non-conductive**
- **Excellent grade of risk penetration**

At atmospheric pressures carbon dioxide (CO<sub>2</sub>) is a colourless, odourless and non – conductive gas capable of penetrating quickly and efficiently the area to be protected. Its density is approximately 50% greater than the density of air. CO<sub>2</sub> is stored in high-pressure cylinders as liquefied gas.

CO<sub>2</sub> has been used effectively for many years, not only in fire protection but also in other commercial applications. Although the use of CO<sub>2</sub> as extinguishing agent declined with the introduction of halons, it is still widely used for fire protection, specially since Montreal Protocol was introduced (where bases were established to ban the use of Halon extinguisher).

CO<sub>2</sub> extinguishes fires by physical means according to two main mechanisms. The first one is by decreasing the oxygen level inside the enclosure from 21% to a level below 15%. Most fires are unable to maintain combustion at such low levels. The second mechanism is by means of cooling and heat absorption.

When dealing with the protection of occupied areas, consideration shall be given to the fact that if CO<sub>2</sub> is inhaled, even in low concentrations, it may lead to asphyxia. Under required safety precautions, CO<sub>2</sub> has been effectively applied for over 50 years to protect areas such as transformer rooms, archives, electrical hazards, record stores and computer rooms. In some countries regulations ban automatic control of CO<sub>2</sub> systems for the protection of occupied areas.

## Carbon Dioxide Proven Technology



VdS  
Schadenverthung  
Vertrauen durch Sicherheit



Agencia Protección Contra  
Incendios Ministerio del  
Interior



VNIPO  
Russian Certification Body





In other countries it is allowed, as long as the system and protected area have the relevant safety devices fitted.

Thanks to their experience in the field of fire protection gained through **CO<sub>2</sub>** systems, **LPG** fire extinguishing systems are now installed in more than 40 countries in Europe, America, Asia and Africa.

**LPG** range of **CO<sub>2</sub>** systems include two types of valves fully developed by **LPG**, approved by the most renowned independent organizations.

**LPG 128** valve is fitted on pilot cylinder and allows electrical actuation using a solenoid or pyrotechnical charge.

**LPG 110** valve is fitted on auxiliary cylinders and activated using the pneumatic pressure provided by pilot cylinder. They offer greater flexibility for all types of actuation and release systems currently in use in the market, even allowing combinations of several of them. Incorporated in their design protection elements against accidental actuation due to micro leakages. They also allow checking and maintenance of all critical elements contained in a fixed extinguishing system, at the time of commissioning and later system preventive maintenance, thus preventing the risk of accidental discharge.

To check for weight loss of the extinguishing agent in cylinders, **LPG** has available a charge cellular weighing system, which allows continuous control of condition of charge of cylinders containing **CO<sub>2</sub>**.

**LPG CO<sub>2</sub>** system and its components are certified by VdS and VNIIPO.

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## Physical Properties

Chemical name:	Carbon Dioxide
Chemical formula:	CO <sub>2</sub>
Molecular weight:	44.01
Triple point Temperature:	-55.60 C
Triple point Pressure:	517,8 kPa
Liquid density at 20° C:	777 kg./m <sup>3</sup>
Critical temperature:	31.0° C
Critical pressure:	73.82 bar
Pressure at 21° C:	58.8 bar
Vapour pressure at 20° C:	57.2 bar
Maximum filling density:	0.75 kg./l.
Air relative density:	1.5
Deep seated electrical fire concentration Vol < 57m <sup>3</sup> :	1.6 kg./m <sup>3</sup>
Deep seated electrical fire concentration Vol < 57m <sup>3</sup> :	1.33 kg./m <sup>3</sup>
Archive extinguishing concentration :	61% (2.0 kg./m <sup>3</sup> )
Ozone depletion potential:	0
Greenhouse effect potential:	1
Surfacefire design concentration:	34%

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