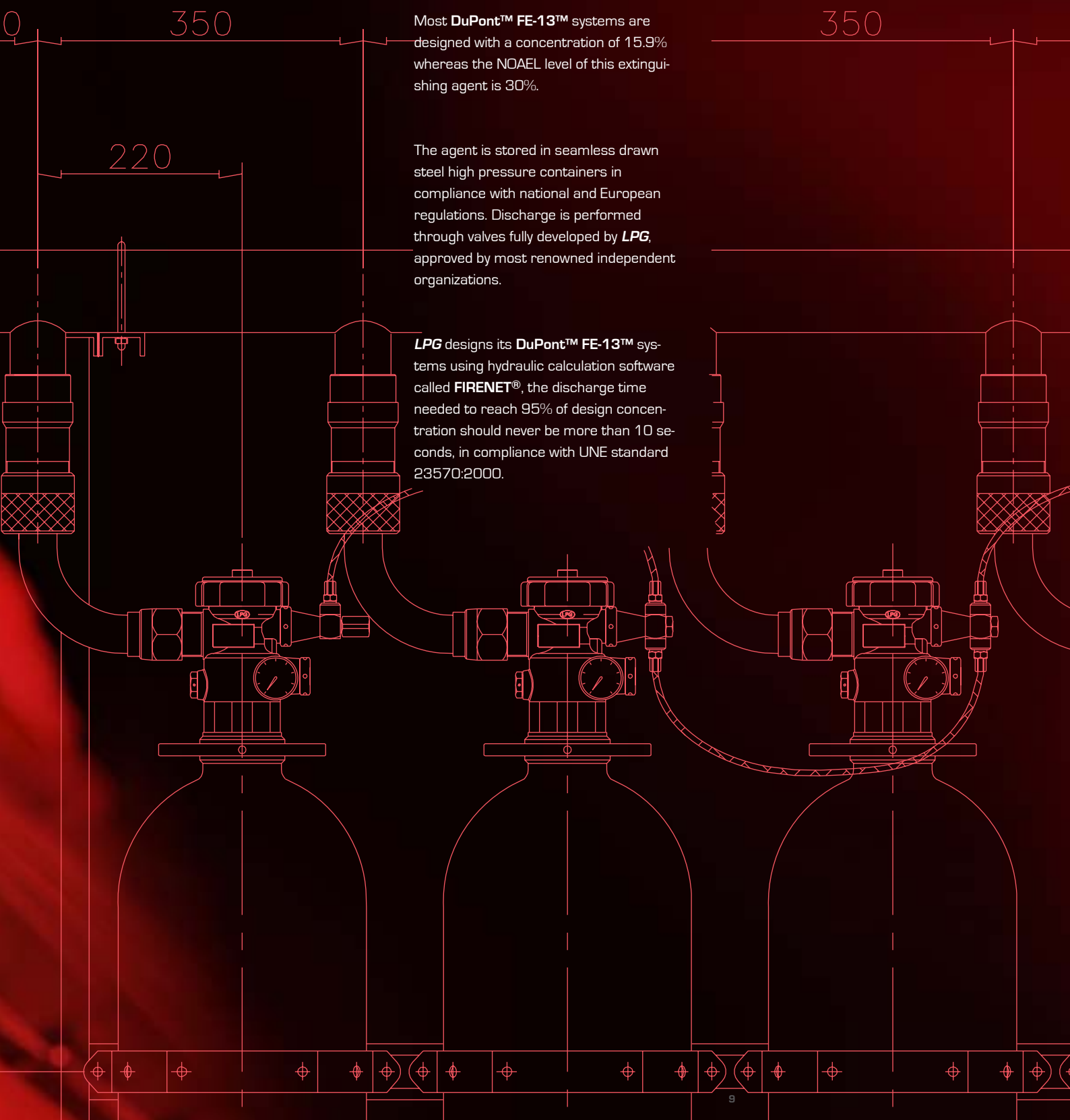


# LPG Systems with FE-13™



Most DuPont™ FE-13™ systems are designed with a concentration of 15.9% whereas the NOAEL level of this extinguishing agent is 30%.

The agent is stored in seamless drawn steel high pressure containers in compliance with national and European regulations. Discharge is performed through valves fully developed by **LPG**, approved by most renowned independent organizations.

**LPG** designs its DuPont™ FE-13™ systems using hydraulic calculation software called **FIRENET®**, the discharge time needed to reach 95% of design concentration should never be more than 10 seconds, in compliance with UNE standard 23570:2000.

# Properties

DuPont™ FE-13™ is a high pressure clean extinguishing agent certified by UL (Underwriters Laboratories). is particularly safe for applications in occupied areas and leaves no residue to clean up after the discharge, neither in an accidental discharge nor in the event of fire. Most DuPont™ FE-13™ is particularly safe for applications in occupied

areas and leaves no residue to clean up after the discharge, neither in an accidental discharge nor in the event of fire. Most DuPont™ FE-13™ systems are designed to a concentration of 15.9%. As all fluoride agents that substitute Halon 1301, FE-13™ extinguishes fire primarily by absorbing heat.

MAIN ADVANTAGES:		STANDARDS:
<ul style="list-style-type: none"> <li>• Suitable for high ceilings (up to 7.5 m)</li> <li>• Suitable for low temperatures (-40° C)</li> <li>• Discharge in 10 seconds</li> </ul>	<ul style="list-style-type: none"> <li>• Wide safety margin in occupied areas (NOAEL 30%)</li> <li>• Non conductive</li> <li>• Leaves no residue</li> </ul>	<ul style="list-style-type: none"> <li>• NFPA 2001</li> <li>• ISO 14520-10</li> <li>• ISO 14520-1</li> <li>• UNE-EN 15004-1</li> </ul>

## Characteristics

Chemical name	Trifluoromethane
Chemical formula	CHF3
Denomination according to ISO 14520, UNE-EN 15004-1 & NFPA 2001	HFC 23
Molecular weight	70,01
Boiling point at 1.013 bar	-82,1°C
Density of the liquid at 20° C	807 kg/m³
Critical temperature	25,9° C
Critical pressure	48,36 bar
Vapour pressure at 20° C	41,83 bar
Relative electrical resistance at 1 atm. 25° C (N2=1.0)	1,04
Maximum filling density	0,85 kg/l
NOAEL	30%
LOAEL	>50%
Maximum concentration in a 5' exposure	30%
Ozone depletion potential	0
Greenhouse effect potential	11.700
Approvals and recognitions	EPA-NFPA, UL-FM
Improvement factor	s/hydraulic calculation ± 20%

## Certifications



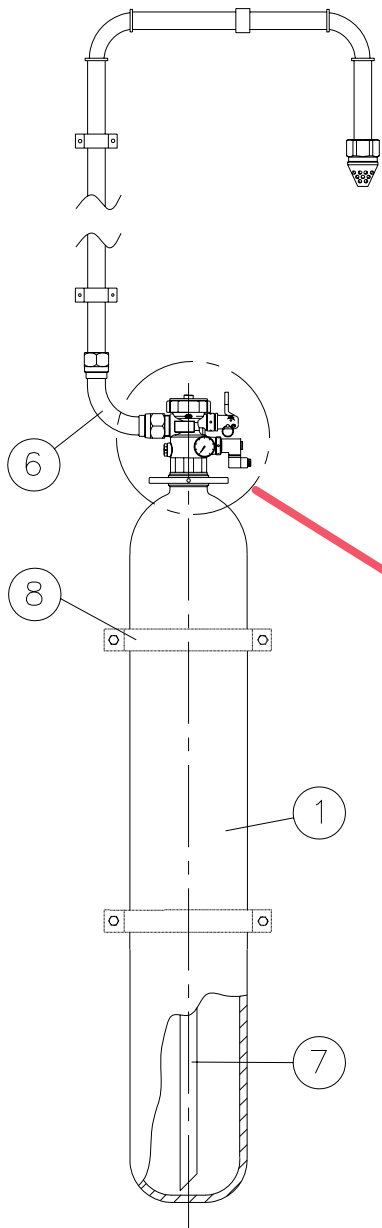
LPG systems and components for DuPont™ FE-13™ are certified by the LPCB (Loss Prevention Certification Board) of England No.: 446b/01 (system), 446a (components), by CNPP (Centre National de Prévention et Protection) of France N° PV/MM 01 07 390, by VNIIPPO of Russia under NPB-51-96 (gas) y NPB-54-96 (hardware) and by APCI of Cuba N° SE 416424. IMO protocol MSC/Circ. 848.

## Notes to consider

The maximum working pressure in the pipes is 137 bar (UNE-EN 15004). Use of pipes compliant with standard ASTM / ANSI B.36.10-XS or equivalent is recommended. Up to 3/4" Sch.40, for larger diameters,

Sch.80. Up to 2", pipes should be threaded, with forged accessories up to 3000 lb. ANSI B.16.11, and from 2 1/2" pipes should be welded, and ANSI B.16.9 and B.16.28 accessories used.

# Modular systems



## Components for the calculation of a quotation

- Cylinder
- Gas
- Accessories (see page 111)
- Diaphragm and embellishment plate (see page 112)
- Nozzles (see page 112)

## List of materials included in the price

- 1 Cylinder
- 2 Manual release
- 3 Solenoid valve
- 4 LPG valve
- 5 Flange
- 6 Discharge hose
- 7 Syphon tube
- 8 Bracket

Set of labels and protector cap for cylinder are included.

### Modular systems

DESCRIPTION	MAX. KILOS	P.NUMBER
Cylinder 120 litres	102	CC720FE930
Cylinder 100 litres	85	CC795FE930
Cylinder 75 litres	63	CC775FE930
Cylinder 67 litres	56	CC767FE130
Cylinder 40 litres	34	CC740FE130
Cylinder 26 litres	22	CC726FE130
Cylinder 13 litres	11	CC713FE130
Cylinder 5 litres	4	CC705FE130

### Gas

NAME	P.NUMBER
Kilo Dupont™ FE-13™	400FE130

### Modular systems optional accessories

#### MORE INFORMATION PAGE 111

- Gooseneck wrench for the manual lever release
- Pressure switch

# Modular Systems with weighing device

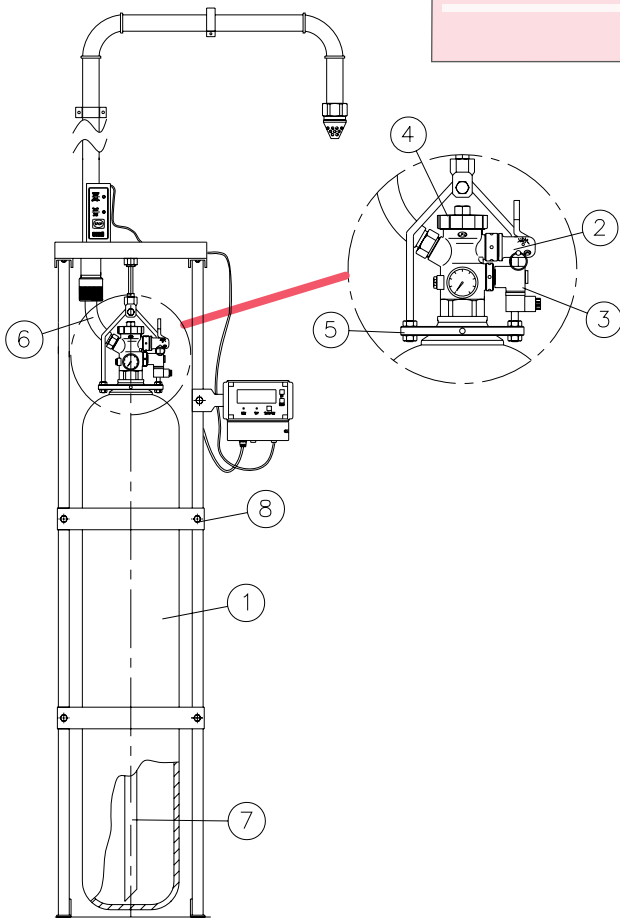
## Components for the calculation of a quotation

- Cylinder
- Gas
- Accessories (see page 111)
- Nozzles (see page 112)
- Weighing device
- Diaphragm and embellishment plate (see page 112)

## List of materials included in the price

- |                  |                  |
|------------------|------------------|
| 1 Cylinder       | 5 Flange         |
| 2 Manual lever   | 6 Discharge hose |
| 3 Solenoid valve | 7 Syphon tube    |
| 4 LPG Valve      | 8 Bracket        |

Set of labels and protector cap cylinder are included.



### Modular Systems

CYLINDERS	MAX. KG	P. NUMBER
Cylinder 120 litres	102	CCP720FE930
Cylinder 100 litres	-	-
Cylinder 75 litres	63	CCP775FE930
Cylinder 67 litres	56	CCP767FE130
Cylinder 40 litres	34	CCP740FE130

### Load cell weighing device

DESCRIPTION	P. NUMBER
WEIGHING CONTROL PANEL C 110 V (one per centralized system, max. 31 cylinders.)	30332110
WEIGHING CONTROL PANEL 230 V (one per centralized system, max. 31 cylinders.)	30332230
Bracket for CONTROL PANEL (only one per control panel)	30312000
Load Cell Weighing Unit with fork (one per cylinder 40 to 75 l.)	30116000
Load Cell Weighing Unit with fork (one per cylinder 100 and 120 l.)	37116000

For more information on load cell weighing device systems see page 13.

### Mechanical weighing device

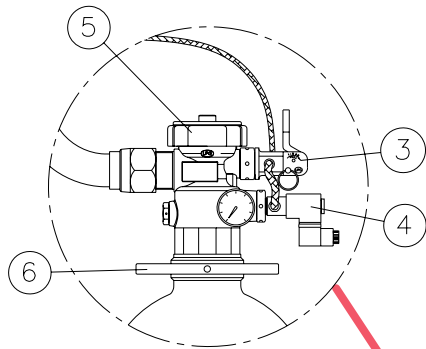
DESCRIPTION	P. NUMBER
1 <sup>ST</sup> OPTION: Photo electrical detector with a reflector for a length of 10 metres. For double row systems, count 2 units	30331014
2 <sup>ND</sup> OPTION: Micro switch – end of the line (Count 1 per cylinder if photoelectric detector is not used)	30331000
Mechanical weighing unit with fork for 40 / 67 litres	30331006
Mechanical weighing unit with fork for 75 litres	30331007
Mechanical weighing unit with fork for 100 and 120 litres	30331008

For more information on mechanical weighing device systems see page 13.

### Gas

NAME	P. NUMBER
Kilo Dupont™ FE-13™	400FE130

# Centralized Systems



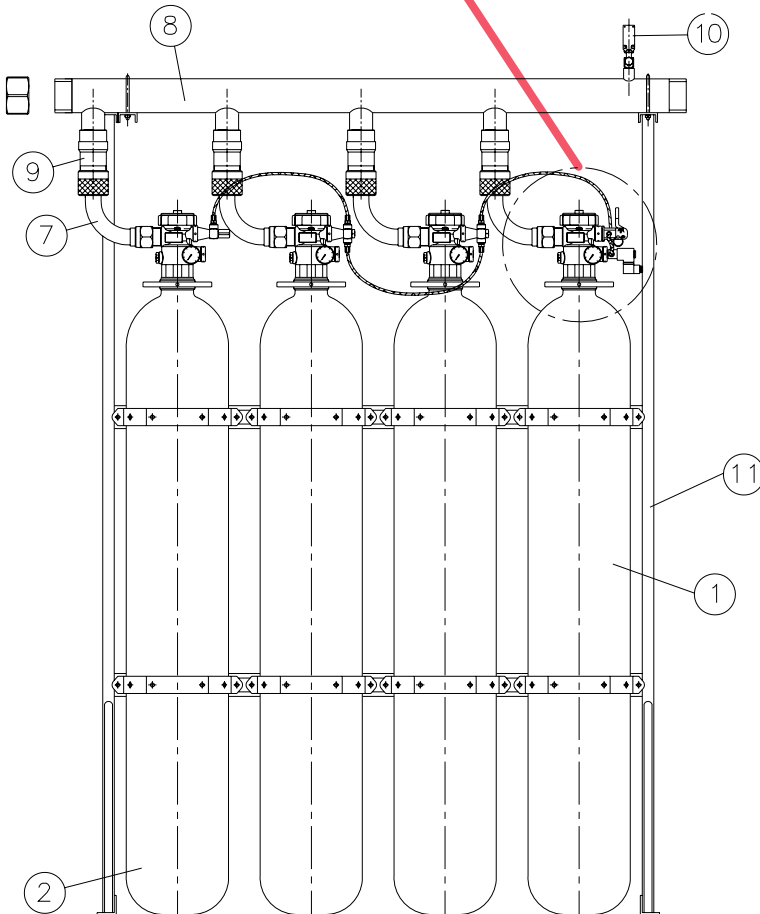
Components for the calculation of a quotation

- Centralized system
- Gas
- Accessories (see page 111)
- Nozzles (see page 112)
- Diaphragm and embellishment plate (see page 112)

List of materials included in the price

- 1 Cylinder
- 2 Auxiliary cylinder
- 3 Double manual pneumatic discharge
- 4 Solenoid valve coupling  $\frac{1}{8}$ "
- 5 LPG valve
- 6 Flange
- 7 Discharge hose
- 8 Manifold
- 9 Retention valve
- 10 Pressure switch with locking device
- 11 Bracket

Set of labels and protector cap are included.



**Notes to consider:**

In a bank that contains 9 or more cylinders, activation will occur by a 3 litre nitrogen-filled pilot cylinder. Please contact **LPG** if a bank activated by pilot cylinder with less than 9 cylinders should be needed.

Gas	
NAME	P.NUMBER
Kilo Dupont™ FE-13™	400FE130

Cylinder bank of 120 litres			
N CYL.	MAX. KILOS	Ø MAN.	P. NUMBER
2	204	2 1/2"	CC57021206
3	306	3"	CC57031206
4	408	3"	CC57041206
5	510	4"	CC57051206
6	612	4"	CC57061206
7	714	4"	CC57071206
8	816	4"	CC57081206
9	918	4"	CC57091206
10	1020	4"	CC57101206

# Centralized systems

Cylinder bank of 100 litres			
N CYL.	MAX. KILOS	Ø MAN.	P. NUMBER
2	170	2"	CC57021007
3	255	2 1/2"	CC57031007
4	340	3"	CC57041007
5	425	3"	CC57051007
6	510	4"	CC57061007
7	595	4"	CC57071007
8	680	4"	CC57081007
9	765	4"	CC57091007
10	850	4"	CC57101007

Cylinder bank of 75 litres			
N CYL.	MAX. KILOS	Ø MAN.	P. NUMBER
2	126	2"	CC57020758
3	189	2"	CC57030758
4	252	2 1/2"	CC57040758
5	315	3"	CC57050758
6	378	3"	CC57060758
7	441	3"	CC57070758
8	504	4"	CC57080758
9	567	4"	CC57090758
10	630	4"	CC57100758

Cylinder bank of 67 litres			
N CYL.	MAX. KILOSg	Ø MAN.	P. NUMBER
2	112	1 1/2"	CC54020676
3	168	2"	CC54030676
4	224	2 1/2"	CC54040676
5	280	2 1/2"	CC54050676
6	336	3"	CC54060676
7	392	3"	CC54070676
8	448	3"	CC54080676
9	504	4"	CC54090676
10	560	4"	CC54100676

## Centralized systems optional accessories

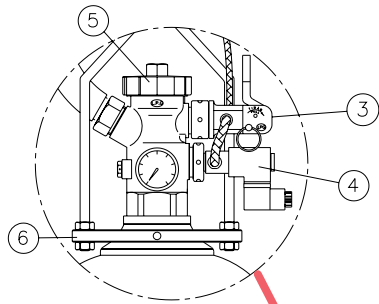
### MORE INFORMATION PAGE 111

Gooseneck wrench for the manual lever release

Zinc coated joint

Pressure switch

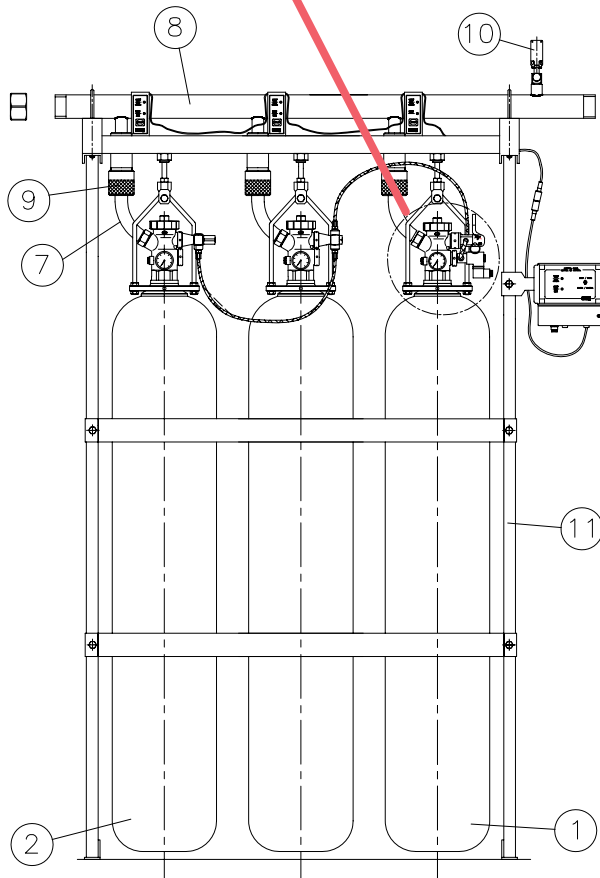
# Centralized systems with weighing device



## Components for the calculation of a quotation

- Centralized system
- Gas
- Accessories (see page 111)
- Nozzles (see page 112)
- Diaphragm and embellishment plate (see page 112)
- Weighing device

## List of materials included in the price



- |    |                                     |
|----|-------------------------------------|
| 1  | Cylinder                            |
| 2  | Auxiliary cylinder                  |
| 3  | Double manual pneumatic discharge   |
| 4  | Solenoid valve coupling 1/8"        |
| 5  | LPG valve                           |
| 6  | Flange                              |
| 7  | Discharge hose                      |
| 8  | Manifold                            |
| 9  | Retention valve                     |
| 10 | Pressure switch with locking device |
| 11 | Bracket                             |

Set of labels and protector cap are included.

### Notes to consider:

In a bank that contains 9 or more cylinders, activation will occur by a 3 litre nitrogen-filled pilot cylinder. Please contact **LPG** if a bank activated by pilot cylinder with less than 9 cylinders should be needed.

The bank includes the necessary items on which to mount the weighing device.

### Cylinder bank of 120 litres

N. CYL.	MAX. KILOS	Ø MAN.	P. NUMBER
2	204	2 1/2"	CCP5702120P
3	306	3"	CCP5703120P
4	408	3"	CCP5704120P
5	510	4"	CCP5705120P
6	612	4"	CCP5706120P
7	714	4"	CCP5707120P
8	816	4"	CCP5708120P
9	918	4"	CCP5709120P
10	1020	4"	CCP5710120P

### Gas

NAME	P. NUMBER
Kilo Dupont™ FE-13™	400FE130

# Centralized systems with weighing device

Cylinder Bank of 100 litres			
N CYL.	MAX.KILOS	Ø MAN.	P.NUMBER
2	170	2"	CCP5702100P
3	255	2 1/2"	CCP5703100P
4	340	3"	CCP5704100P
5	425	3"	CCP5705100P
6	510	4"	CCP5706100P
7	595	4"	CCP5707100P
8	680	4"	CCP5708100P
9	765	4"	CCP5709100P
10	850	4"	CCP5710100P

Cylinder bank of 75 litres			
N CYL.	MAX. KILOS	Ø MANIFOLD	P.NUMBER
2	126	2"	CCP5702075P
3	189	2"	CCP5703075P
4	252	2 1/2"	CCP5704075P
5	315	3"	CCP5705075P
6	378	3"	CCP5706075P
7	441	3"	CCP5707075P
8	504	4"	CCP5708075P
9	567	4"	CCP5709075P
10	630	4"	CCP5710075P

### Notes to consider:

In a bank that contains 9 or more cylinders, activation will occur by a 3 litre nitrogen-filled pilot cylinder. Please contact **LPG** if a bank activated by pilot cylinder with less than 9 cylinders should be needed.

The bank includes the necessary items on which to mount the weighing device.

Cylinder bank of 67 litres			
N CYL.	MAX. KILOS	Ø MANIFOLD	P.NUMBER
2	112	1 1/2"	CCP5402067C
3	168	2"	CCP5403067C
4	224	2 1/2"	CCP5404067C
5	280	2 1/2"	CCP5405067C
6	336	3"	CCP5406067C
7	392	3"	CCP5407067C
8	448	3"	CCP5408067C
9	504	4"	CCP5409067C
10	560	4"	CCP5410067C

### Centralized systems optional accessories

#### MORE INFORMATION PAGE 111

Gooseneck wrench for the manual lever release

Zinc coated joint

Pressure switch



# Centralized systems with weighing device



## Load cell system

It is thought to allow the continuous control of the cylinder charge in modular or centralized systems. Following standards of electromagnetic compatibility are fulfilled: EN 50081-1 / EN 50130-4 / EN 61000-3-2 / EN 61000-3-3 and with CEI 60950 of electric security. The equipment gives an alarm signal when the gas loss in the cylinders exceeds 5% of the initial charge. All the systems are equipped with a weighing control

panel connected to the fire detection and extinguishing control panel and there are as many weighing units by load cell as cylinders to be monitored. The system allows controlling the loss with a precision of 1 kg. All the weighing units by load cell are connected to the weighing control panel unit by means of a unique monitored line (BUS). **Each control panel is designed to monitor a maximum of 31 control units.**

Load cell weighing device	
DESCRIPTION	P. NUMBER
WEIGHING CONTROL PANEL C 110 V (one per centralized system, max. 31 cylinders.)	30332110
WEIGHING CONTROL PANEL 230 V (one per centralized system, max. 31 cylinders.)	30332230
Bracket for CONTROL PANEL (only one per control panel)	30312000
Load Cell Weighing Unit with fork (one per cylinder 40 to 75 l.)	30116000
Load Cell Weighing Unit with fork (one per cylinder 100 and/or 120 l.)	37116000

## Mechanical system

It is thought to allow the **continuous control of the cylinder charge** in modular or centralized systems. The systems consist of control modules working mechanically. The commissioning for each cylinder is easy. If there is a loss of charge, the mobile part falls down. Optionally, they can have an electrical sur-

veillance system such as an electrical micro switch for each module or a photoelectrical detector able to control module rows of up to 10 metres.



Mechanical weighing device	
DESCRIPTION	P. NUMBER
1 <sup>ST</sup> OPTION: Photoelectrical detector with a reflector for a length of 10 metres. For double row systems, count 2 units	30331014
2 <sup>ND</sup> OPTION: Micro switch - end of the line (Count 1 per cylinder if photoelectric detector is not used)	30331000
Mechanical weighing unit with fork for 40 / 67 litres	30331006
Mechanical weighing unit with fork for 75 litres	30331007
Mechanical weighing unit with fork for 100 / 120 litres	30331008

# Properties

LPG has introduced the pressurization with nitrogen in the DuPont™ FE-13™ systems. In this way, it is possible to control the cylinders load by reading the pressure gauge and/or pressure switch in compliance with regulations for the leakage control of fluorinated gases 842/2006/CE. LPG offers this

system for the control of leakage online and permanently in order to reduce costs as we can get rid of the mechanical systems, or through cell, of the load control. The new regulation for systems with HFC gases requires a certificate of accredited training to perform the installations. LPG offers

training courses for installers to ensure the environmental manipulation of the systems.

The use of nitrogen to pressurize these systems is patented by LPG.

## Comply with the regulations!

Once again LPG cleverly adapts to the new market demands, particularly, the new regulations on fluorinated gases 842/2006/CE for leakage control. The aim of such proposal is to reduce emissions of fluorinated greenhouse gases and, in turn, to improve containment and control.

### MAIN ADVANTAGES:

- Suitable for high ceilings (up to 7.5 m)
- Suitable for low temperatures (-40° C)
- Discharge in 10 seconds
- Wide safety margin in occupied areas (NOAEL 30%)
- Non conductive
- Leaves no residue

### STANDARDS:

- NFPA 2001
- ISO 14520-10
- ISO 14520-1
- UNE-EN 15004-6

## Characteristics

Chemical name	Trifluoromethane
Chemical formula	CHF <sub>3</sub>
Denomination according to ISO 14520 and NFPA 2001	HFC 23
Molecular weight	70,01
Boiling point at 1.013 bar	-82,1°C
Density of the liquid at 20° C	807 kg/m <sup>3</sup>
Critical temperature	25,9° C
Critical pressure	48,36 bar
Vapour pressure at 20° C	41,83 bar
Relative electrical resistance at 1 atm. 25° C (N <sub>2</sub> =1.0)	1,04
Maximum filling density	0,85 kg/l
NOAEL	30%
LOAEL	>50%
Maximum concentration in a 5' exposure	30%
Ozone depletion potential	0
Greenhouse effect potential	11.700
Approvals and recognitions	EPA-NFPA, UL-FM
Improvement factor	s/hydraulic calculation ± 20%

## Certifications



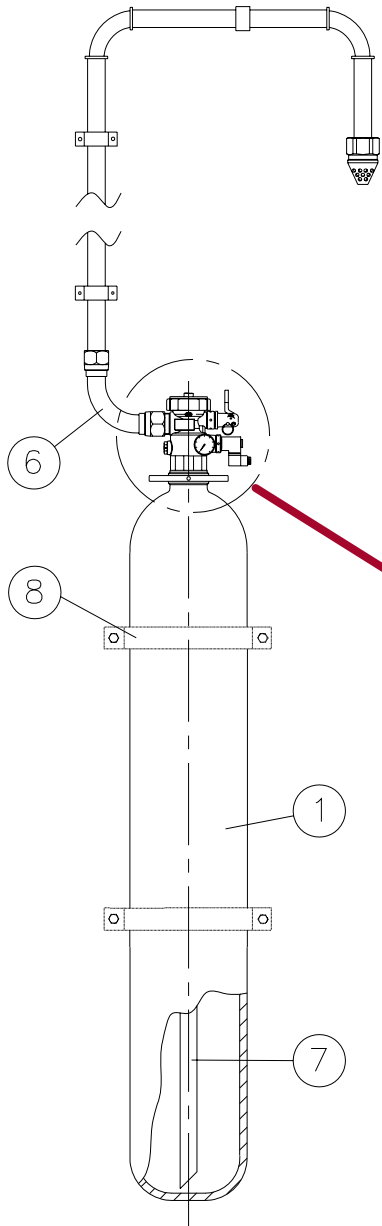
LPG systems and components for DuPont™ FE-13™ pressurized with Nitrogen are certified by CNPP (Centre National of Prevention and Protection) in France N° PV/MM 01 07 390 and by IMO certificate number 14374/BO EC (Bureau Veritas).

## Notes to consider

The maximum working pressure for the piping is 165 bars. (UNE-EN 15004). We recommend using the pipe Sch. 80 according to standard ASTM / ANSI B.36.10-XS or

equivalent. Up to 2" we recommend threading the pipe with forged fittings of 3000 lb. ANSI B.16.11, and from 2" ½ we suggest welding the pipe with fittings and ANSI

# Modular systems



## Components for the calculation of a quotation

- Cylinder
- Gas
- Accessories (see page 111)
- Diaphragm and embellishment plate (see page 112)
- Nozzles (see page 112)

## List of materials included in the price

- |   |                |
|---|----------------|
| 1 | Cylinder       |
| 2 | Manual release |
| 3 | Solenoid valve |
| 4 | LPG valve      |
| 5 | Flange         |
| 6 | Discharge hose |
| 7 | Syphon tube    |
| 8 | Bracket        |

Set of labels and protector cap for cylinder are included.

### Modular systems

DESCRIPTION	MAX. KILOS	P. NUMBER
Cylinder 120 litres	102	CC75100000
Cylinder 100 litres	85	CC74100000
Cylinder 75 litres <b>(On Demand)</b>	63	CC72100000
Cylinder 67 litres	56	CC71100001
Cylinder 40,2 litres.	34	CC70100011
Cylinder 26,8 litres	22	CC70100010
Cylinder 13,4 litres	11	CC70100008
Cylinder 5 litres	4	CC70100006

### Gas

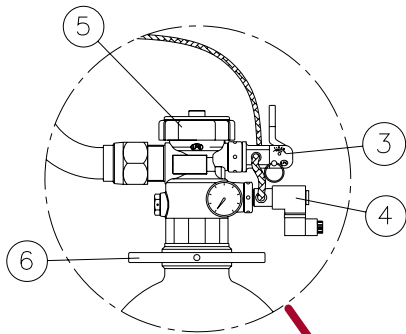
NAME	P. NUMBER
Kilo Dupont™ FE-13™	400FE130

### Modular systems optional accessories

#### MORE INFORMATION PAGE 111

Gooseneck wrench for the manual lever release

# Centralized Systems



## Components for the calculation of a quotation

- Centralized system
- Gas
- Accessories (see page 111)
- Nozzles (see page 112)
- Diaphragm and embellishment plate (see page 112)

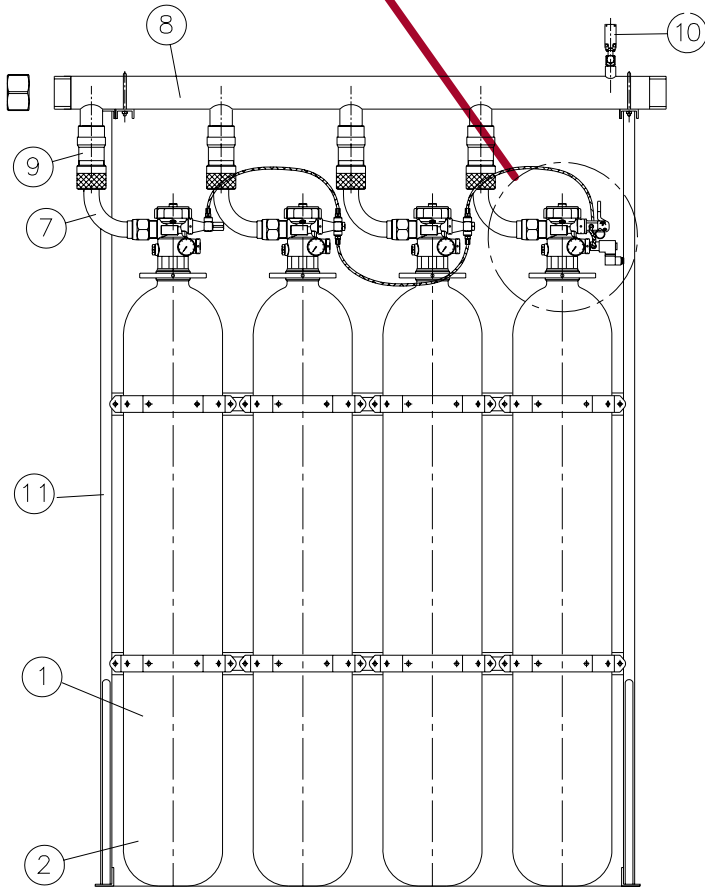
## List of materials included in the price

- 1 Cylinder
- 2 Auxiliary cylinder
- 3 Double manual pneumatic discharge
- 4 Solenoid valve coupling 1/8"
- 5 LPG valve
- 6 Flange
- 7 Discharge hose
- 8 Manifold
- 9 Retention valve
- 10 Pressure switch with locking device
- 11 Bracket

Set of labels and protector cap for cylinder are included.

### Notes to consider:

In a bank that contains 9 or more cylinders, activation will occur by a 3 litre nitrogen-filled pilot cylinder. Please contact **LPG** if a bank activated by pilot cylinder with less than 9 cylinders should be needed.



### Gas

NAME	P. NUMBER
Kilo Dupont™ FE-13™	400FE130

### Cylinder bank of 120 litres

N CYL.	MAX. KILOS	Ø MAN.	P. NUMBER
2	204	2 1/2"	CC55100015
3	306	3"	CC55100016
4	408	3"	CC55100017
5	510	4"	CC55100018
6	612	4"	CC55100019
7	714	4"	CC55100020
8	816	4"	CC55100021
9	918	4"	CC55100022
10	1020	4"	CC55100023

## Centralized systems

Cylinder bank of 75 litres			
N CYL.	MAX. KILOS	Ø MAN.	P. NUMBER
2	126	2"	CC52100014
3	189	2"	CC52100015
4	252	2 <sup>1</sup> / <sub>2</sub> "	CC52100016
5	315	3"	CC52100017
6	378	3"	CC52100018
7	441	3"	CC52100019
8	504	4"	CC52100020
9	567	4"	CC52100021
10	630	4"	CC52100022

Cylinder bank of 67 litres			
N CYL.	MAX. KILOS	Ø MAN.	P. NUMBER
2	112	1 <sup>1</sup> / <sub>2</sub> "	CC51100014
3	168	2"	CC51100015
4	224	2 <sup>1</sup> / <sub>2</sub> "	CC51100016
5	280	2 <sup>1</sup> / <sub>2</sub> "	CC51100017
6	336	3"	CC51100018
7	392	3"	CC51100019
8	448	3"	CC51100020
9	504	4"	CC51100021
10	560	4"	CC51100022

### Centralized systems optional accessories

#### MORE INFORMATION AND PRICES PAGE 111

Gooseneck wrench for the manual lever release

Zinc coated joint