Fire Protection Products and Services

TOTAL SOLUTIONS

PFC Marine
Company Profile

UK SERVICE NETWORK
PFC Marine is an independent company approved by Lloyds, DNV and ABS with our Head Office in the North East of England and a marine Branch Office in the south of the UK. Our dedicated and approved service teams operate nationally and cover all major ports. This cost effective structure allows us to be more flexible and cost efficient and most importantly keeps our overheads to a minimum allowing us to pass this saving onto you the customer.

WORLDWIDE SERVICE NETWORK
PFC Marine are a major service provider of Fire and safety equipment incorporating Fire Extinguishers, Hydrants, Hoses, rescue/crash equipment, Deck Foam/Water Monitors, Breathing Apparatus, resuscitation equipment, medical oxygen, CABA Compressors, integrity checks and Air purity analysis, Foam analysis testing & certification, Oxy Acetylene plant, Gas detection, Fire detection and alarms.

PFC Marine also maintain, design, supply, install, commission and re-certify Fire Suppression Systems to include CO2, Water mist, Foam, Sprinkler, Deluge, Powder, FM-200®, Novec 1230 and other approved systems.

PFC Marine also have the service capability to offer this service overseas allowing us to provide a worldwide service network on all Fire and Life Saving equipment to include the maintenance of Liferafts, Lifeboats, Lifejackets, Immersion Suits, Lifeboat launching Appliances inspections, testing and certification.

PFC Marine currently supports a number of major worldwide shipping companies with these services in the UK and overseas. We are able to support our overseas network through approved local service stations in all ports worldwide. We currently support a number of companies within the UK and worldwide with our services to include the following companies among many others.

* Novoship UK
* JSC Novoship – Russia
* BP Shipping
* Anglo Eastern Ship Management
* MOL Tankships / LNG Europe Ltd
* Zodiac Maritime Services
* Dobson Fleet Management Ltd - Cyprus
* GC Rieber Shipping Ltd
* Hanson Aggregates Marine Ltd
* United Marine Dredging
* EMS Ship Management
* Torbulk Ltd
* UECC
* Union Transport Group plc
* Technip
* Lundqvist Shipping – Finland
* Hanseatic Shipping – Cyprus
* Northern Marine Management
**BENEFITS**

* One point of contact for all UK & worldwide service enquiries.
* Very competitive service rates over our immediate & larger competitors.
* Facility to quote and invoice in US Dollars & Euros.
* Co-ordination of service jobs to completion.
* Port to Port service capability.
* Class and manufacturers approvals.

**LIFE RAFT SERVICING**
PFC Marine can offer approved service stations for the servicing, testing of the following Liferafts:

* Fujikura, Toyo
* RFD
* Viking
* Zodiac
* DBS
* Sea Safe
* Other manufacturers to be advised

**LIFEBOAT LAUNCHING APPLIANCES & ON-LOAD RELEASE GEAR**

**CIRCA: IMO MSC 1206**
PFC Marine can offer approved service stations for the servicing of freefall Lifeboat Launching Appliances:

The main concern of the shipping companies is to ensure availability of the technicians / companies that will perform such servicing. As we are all aware, the implementation of this regulation has resulted in a shortage of technicians and obvious advance booking for the existing companies / technicians.

In order to continue to provide the best possible servicing to our dedicated and committed customers, our associated company has decided to send their own team of technicians for training with several manufacturers.

**As of March 12th 2007**, our associated company is approved by the following:

**A. Lifeboats:**

* IHI Marine United INC. (including IHI Craft Co. Ltd and IHI AMTEC Co. Ltd)
* Jiangyin Xinjiang F.R.P. Co. Ltd
* Hoei Senpaka Co. Ltd

**B. Davits/Winches:**

* Oriental Precision & Engineering (OPCO)

They have been also fully trained during last training course organised by Japan Ship-Machinery Quality Control Association in Japan this March for the following Japanese Brands:

* Shigi Shipbuilding
* Tsuji Heavy Industries Co. Ltd
* Sekigahara Seisakusho Ltd
* Nishi-F (including the lifeboats manufactured by former Ishihara Dockyard Co. Ltd)
* Tsuneishi Holdings Co. Ltd
  (Tsuneishi Forestry Construction company)

They also have a record of attendance for following manufacturers:

* Wuxi Hai Hong Boat Making
* Greben
* Stocznia
* Schat Harding
* Hyundai Lifeboats
* Verhoef
* Norsafe
* Zuo Sezahor
* Dongnam
* Miura Vider

They have performed successfully services around the world for vessel’s flying following flag/classed with the following classification societies:

**FLAGS:**

* Bahamas
* Liberia
* Malta
* Cyprus
* Cayman Islands
* Isle of Man
* Hong Kong

**CLASSIFICATION SOCIETIES:**

* Lloyd’s Register
* Det Norske Veritas
* Bureau Veritas
* NKK

As our company is not approved by some manufacturers, you will need to apply to vessel’s Flag for having our associated company accepted for the service of lifeboats and davits. For your guidance, according to new regulations SOLAS MSC 82 annual inspection as described in MSC 1206 is not mandatory and is to be carried out only by manufacturers agents provided that service station carrying out the service is trained and certified by other manufacturers.
## Fire Extinguishers

<table>
<thead>
<tr>
<th>Extinguishing Medium</th>
<th>Foam</th>
<th>Foam</th>
<th>Foam</th>
<th>Foam</th>
<th>Foam</th>
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<tr>
<td><strong>Capacity</strong></td>
<td>2l</td>
<td>3l</td>
<td>5l</td>
<td>9l</td>
<td>-</td>
</tr>
<tr>
<td><strong>Model Number</strong></td>
<td>TFCE2</td>
<td>TFCE3</td>
<td>TFCE6</td>
<td>TFCE9</td>
<td>-</td>
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<tr>
<td><strong>Fire Rating</strong></td>
<td>8A 34B</td>
<td>8A 30B</td>
<td>21A 14B</td>
<td>21A 18B</td>
<td>-</td>
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<tr>
<td><strong>Height</strong></td>
<td>310mm</td>
<td>500mm</td>
<td>550mm</td>
<td>610mm</td>
<td>-</td>
</tr>
<tr>
<td><strong>Cylinder Diameter</strong></td>
<td>110mm</td>
<td>130mm</td>
<td>160mm</td>
<td>180mm</td>
<td>-</td>
</tr>
<tr>
<td><strong>Overall Width</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Full Weight</strong></td>
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<td>5.45kg</td>
<td>9.60kg</td>
<td>13.65kg</td>
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<td>&gt; 2m</td>
<td>&gt; 4m</td>
<td>&gt; 4m</td>
<td>-</td>
</tr>
<tr>
<td><strong>Discharge Duration</strong></td>
<td>19 sec</td>
<td>16 sec</td>
<td>18 sec</td>
<td>29 sec</td>
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</tr>
<tr>
<td><strong>Working Pressure</strong></td>
<td>14 bar</td>
<td>14 bar</td>
<td>14 bar</td>
<td>14 bar</td>
<td>-</td>
</tr>
<tr>
<td><strong>Temperature Range</strong></td>
<td>+ 5°C to + 60°C</td>
<td>+ 5°C to + 60°C</td>
<td>+ 5°C to + 60°C</td>
<td>+ 5°C to + 60°C</td>
<td>-</td>
</tr>
<tr>
<td><strong>Dielectrically Safe</strong></td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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</table>

### Foam Types

<table>
<thead>
<tr>
<th>Extinguishing Medium</th>
<th>ABC Powder</th>
<th>ABC Powder</th>
<th>ABC Powder</th>
<th>ABC Powder</th>
<th>ABC Powder</th>
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<tbody>
<tr>
<td><strong>Capacity</strong></td>
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<td>2</td>
<td>4</td>
<td>6</td>
<td>9</td>
</tr>
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<td><strong>Model Number</strong></td>
<td>TPCE1</td>
<td>TPCE2</td>
<td>TPCE3</td>
<td>TPCE6</td>
<td>TPCE9</td>
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<td><strong>Fire Rating</strong></td>
<td>8A 34B C</td>
<td>13A 66B C</td>
<td>21A 14B 8B</td>
<td>27A 183B C</td>
<td>43A 233B C</td>
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<td><strong>Height</strong></td>
<td>355mm</td>
<td>360mm</td>
<td>530mm</td>
<td>995mm</td>
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<tr>
<td><strong>Cylinder Diameter</strong></td>
<td>116mm</td>
<td>150mm</td>
<td>200mm</td>
<td>215mm</td>
<td>230mm</td>
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<tr>
<td><strong>Overall Width</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Full Weight</strong></td>
<td>2.25kg</td>
<td>3.65kg</td>
<td>6.65kg</td>
<td>9.65kg</td>
<td>13.65kg</td>
</tr>
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<td><strong>Discharge Range</strong></td>
<td>&gt; 2m</td>
<td>&gt; 2m</td>
<td>&gt; 4m</td>
<td>&gt; 4m</td>
<td>&gt; 4m</td>
</tr>
<tr>
<td><strong>Discharge Duration</strong></td>
<td>11 sec</td>
<td>22 sec</td>
<td>16 sec</td>
<td>21 sec</td>
<td>29 sec</td>
</tr>
<tr>
<td><strong>Working Pressure</strong></td>
<td>14 bar</td>
<td>14 bar</td>
<td>14 bar</td>
<td>14 bar</td>
<td>14 bar</td>
</tr>
<tr>
<td><strong>Temperature Range</strong></td>
<td>- 20°C to + 60°C</td>
<td>- 20°C to + 60°C</td>
<td>- 20°C to + 60°C</td>
<td>- 20°C to + 60°C</td>
<td>- 20°C to + 60°C</td>
</tr>
<tr>
<td><strong>Dielectrically Safe</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
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### ABC Powder Types

<table>
<thead>
<tr>
<th>Extinguishing Medium</th>
<th>Carbon Dioxide</th>
<th>Carbon Dioxide</th>
<th>-</th>
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<tbody>
<tr>
<td><strong>Capacity</strong></td>
<td>2kg</td>
<td>5kg</td>
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<td>-</td>
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<td><strong>Model Number</strong></td>
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<td>TCLE5</td>
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<td><strong>Fire Rating</strong></td>
<td>34B</td>
<td>55B</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Height</strong></td>
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<td>660mm</td>
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<td>-</td>
<td>-</td>
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<td><strong>Cylinder Diameter</strong></td>
<td>111mm</td>
<td>152mm</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Overall Width</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Full Weight</strong></td>
<td>5.20kg</td>
<td>12.10kg</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Discharge Range</strong></td>
<td>&gt; 4m</td>
<td>&gt; 4m</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Discharge Duration</strong></td>
<td>9 sec</td>
<td>14 sec</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
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<td><strong>Working Pressure</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td><strong>Temperature Range</strong></td>
<td>- 20°C to + 60°C</td>
<td>- 20°C to + 60°C</td>
<td>-</td>
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<tr>
<td><strong>Dielectrically Safe</strong></td>
<td>YES</td>
<td>YES</td>
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### Carbon Dioxide Types

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<thead>
<tr>
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<tbody>
<tr>
<td><strong>Capacity</strong></td>
<td>9lt</td>
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<td>-</td>
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</tr>
<tr>
<td><strong>Model Number</strong></td>
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<td>-</td>
<td>-</td>
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<tr>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Height</strong></td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Cylinder Diameter</strong></td>
<td>180mm</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Overall Width</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Full Weight</strong></td>
<td>13.65kg</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td><strong>Discharge Range</strong></td>
<td>&gt; 4m</td>
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<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td><strong>Discharge Duration</strong></td>
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<td>-</td>
<td>-</td>
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</tr>
<tr>
<td><strong>Working Pressure</strong></td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Temperature Range</strong></td>
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<tr>
<td><strong>Dielectrically Safe</strong></td>
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<td>-</td>
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**DRY CHEMICAL POWDER**

<table>
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<tr>
<th>Technical Specification</th>
<th>Stored Pressure</th>
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<tr>
<td>Extinguisher</td>
<td>ABC 30%</td>
<td>ABC 30%</td>
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<tr>
<td>Exting. charge</td>
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<td>50kg</td>
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<tr>
<td>Classes of fire</td>
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<td>ABC B1 C</td>
</tr>
<tr>
<td>Propellant</td>
<td>lt NO</td>
<td>3 lt N2</td>
</tr>
<tr>
<td>Cylinder Diameter</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Cylinder Material</td>
<td>Steel DD12 EN 1011</td>
<td></td>
</tr>
<tr>
<td>Wheels Diameter</td>
<td>300</td>
<td>300</td>
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<tr>
<td>Hose Length</td>
<td>3.7</td>
<td>4</td>
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<tr>
<td>Weight</td>
<td>80</td>
<td>85</td>
</tr>
<tr>
<td>Volume = 1 Unit</td>
<td>0.3</td>
<td>0.3</td>
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<tr>
<td>Height</td>
<td>1100</td>
<td>1100</td>
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<tr>
<td>Jet Length</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Test Pressure</td>
<td>26</td>
<td>26</td>
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<tr>
<td>Burst Pressure</td>
<td>&gt; bar</td>
<td>56</td>
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**CARBON DIOXIDE**

<table>
<thead>
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<td>B 2 C</td>
<td></td>
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<tr>
<td>Propellant</td>
<td>lt NO</td>
<td></td>
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<td>Cylinder Material</td>
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<tr>
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<td>Hose Length</td>
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<td>Weight</td>
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**FOAM A.F.F.F.**

<table>
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<td>50 lt</td>
<td>100 lt</td>
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<tr>
<td>Classes of fire</td>
<td>AB 4</td>
<td>AB 4</td>
</tr>
<tr>
<td>Propellant</td>
<td>lt NO</td>
<td>3 lt N2</td>
</tr>
<tr>
<td>Cylinder Diameter</td>
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<td>400</td>
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<td>Cylinder Material</td>
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<td>Steel DD12 EN 1011</td>
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<td>Wheels Diameter</td>
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<tr>
<td>Hose Length</td>
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<td>5</td>
</tr>
<tr>
<td>Weight</td>
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<td>160</td>
</tr>
<tr>
<td>Volume = 1 Unit</td>
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<td>0.65</td>
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<td>1300</td>
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<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Burst Pressure</td>
<td>&gt; bar</td>
<td>55</td>
</tr>
<tr>
<td>Discharge Time ~</td>
<td>Sec. 50</td>
<td>100</td>
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</table>
INTRODUCTION
PFC Marine offer a new, comprehensive range of easily installed hose reels, which combine high performance and rugged construction with compact and elegant design.

THE RANGE
All models are available as manual or automatic, with capacities for 19mm or 25mm hoses, they are offered as fixed or swinging models, with optional pedestals available and may be surface or recess mounted. PFC Marine hose reels are supplied fully assembled, complete with roller hose guide (fixed models) stop valve (manual models) and instructions. They are manufactured in accordance with BS5274. Offshore and marine specification hose reels are also available.

FEATURES AND BENEFITS
PFC Marine hose reels are designed for fast ‘hose on’ installation and maintenance and all feature a one piece stainless steel swinging arm for unmatched compactness. Automatic models may be supplied with optional ‘back feed’ inlet pipe so that no valve or piping is visible on the completed installation. A full 25mm bore throughout the automatic range ensures excellent performance and the traditional brass axle and bearings provide long term dependability. An all stainless steel automatic valve mechanism in the dust-tight hub compartment gives maximum reliability.

A slimline version of manual and automatic models with a larger diameter is available where installation can only take place in narrow corridors or where space is limited.

Offshore and marine hose reels have been specifically designed and developed for use in extreme conditions, therefore, all models are suitable for seawater use having gunmetal axle and bearings as well as glass filled HD polypropylene hub and waterway. Stainless steel sideplates, leaded bronze inlet pipes and heavy duty hose are options PFC Marine has utilised in the worst environmental extremes.

INSTALLATION
A major objective in the development programme of this new range, was to satisfy the fire industry’s understandable preference for a hose reel that could be easily installed by one person without the assistance of either an engineer or a plumber.

To this end, the modular component format allows the bracket to be wall mounted using the retaining clamps as drilling templates.

Not least of the many factors employed in the successful compliance with this criterion, is the use of a reinforced, flexible hose connection between water supply and hose reel which, in avoiding awkward plumbing joints and elbows, overcomes those often encountered, irritating, small variations of both pipe size and thread.

Additionally, the positioning of the hose reel hub flange onto the retaining bracket is now a simple operation in which the hub’s neat, unique valve system allows a rapid and secure connection between valve outlet, hose and subsequently, reel, resulting in an efficient, time saving operation.

INSPECTION, MAINTENANCE AND REPAIR
At least once a year the hose should be completely run out and the complete hose reel inspected and subjected to an operational water test to ensure all parts are in good working order, sound and free from leaks. PFC Marine engineers are experienced in the installation of hose reels as well as annual inspection to BS5306 part 1, and the relevant european and international standards.

PFC Marine recommends hose reels should not be kept under pressure unless operational.
COMPLIES WITH BS 5041 PART 3
Dry riser inlet breechings are normally fitted in glass-fronted cabinets on the outside walls of buildings and have either two or four inlet connections. For special requirements, a single inlet breeching is available.

They are used to feed water into the rising main through 2 1/2” fire hoses. A 100mm (4”) rising main uses a two-way inlet breeching and a 150mm (6”) main uses a four-way inlet breeching.

Drain Valves to BS 5154
Normally fitted to inlet breechings but can be supplied separately.

Two-way Inlet Breechings
4” BSTD, 4” BSP parallel female or 100mm NP16 can be mounted either horizontally or vertically.

INLET AND OULET CABINETS
A range of inlet and outlet cabinets built to comply with BS5041: Part 5.
* Designed to house inlet breechings and landing valves.
* Georgian wired glass panel and spring cylinder lock with key.
* Manufactured from zintec, epoxy polyester powder coated in red.

<table>
<thead>
<tr>
<th>TYPE OF CABINET</th>
<th>WIDTH (mm)</th>
<th>LENGTH (mm)</th>
<th>DEPTH (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Way Vertical Inlet</td>
<td>395</td>
<td>595</td>
<td>295</td>
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<tr>
<td>Two Way Horizontal Inlet</td>
<td>595</td>
<td>395</td>
<td>295</td>
</tr>
<tr>
<td>Outlet</td>
<td>463</td>
<td>612</td>
<td>325</td>
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</tbody>
</table>

NB: Please measure size of aperture before ordering

OUTLET VALVES - BIB NOSE / RIGHT ANGLE
Landing Valves
Landing valves used on dry rising mains should normally be of the gate valve type, but globe pattern valves are occasionally used. They act as outlets from the rising main and are fitted in easily accessible positions on each floor above the first floor of a building and sometimes in deep basement areas.

Dry Riser Gate Valves
With 2 1/2” instantaneous female outlet to BS 336, blank cap and chain, strap and padlock. Dry riser gate valves comply with the requirements of BS 5041:Part 2. Valves can be mounted in boxes complying with BS 5041:Part 4.
* Inlet flanged 21/2” BSP or 3” BS Table D or 65mm BS 4504 Table 16/21.
* Inlet screwed 21/2” BSP.

Globe Pattern Landing Valves (LP)
These screw-down stop valves are primarily used as hydrant outlets on wet rising mains, but are occasionally used on dry risers under special circumstances and after discussion with the fire brigade.
* Gunmetal bodies, major working parts in manganese bronze.
* Comply with the requirements of BS 504:Part 1 and BS 5154.
* Outlets are 2 1/2” instantaneous female to BS 336 and inlets flanged or screwed as required.
* Accessories include blank caps and chain, straps and padlocks.

STANDPIPES / BARS / KEYS
Standpipes, keys and bars are used to obtain water from a pressurised mains supply via underground hydrants. The standard outlet for underground valves according to BS 750 is 2 1/2” BSRT male.

Standpipes have as standard a 2 1/2” BSRT female inlet, which is compatible with our underground hydrants. Standpipes are supplied either with single or double head outlets. Outlets are 2” female instantaneous with single twist release (BS 336). The double-head type is supplied with one blank plug as standard. Contractors’ standpipes are supplied with a brass double check valve as standard.
UNDERGROUND HYDRANTS

**BS 750 Type I Hydrant**
Sluice-valve type with duck-foot bend cast iron body and with gunmetal internals and forged bronze spindle. Supplied with blank cap, chain and frost valve.

**BS 750 Type II Hydrant**
Screw-down type, cast iron body with manganese bronze valve and forged bronze spindle. Supplied with blank cap, chain and frost valve.

<table>
<thead>
<tr>
<th>TECHNICAL SPECIFICATION</th>
<th>Inlet Flange</th>
<th>Outlet Connection</th>
<th>Body Test Pressure</th>
<th>Seat and Valve Tested To</th>
<th>Weight</th>
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<tbody>
<tr>
<td><strong>TYPE 1</strong></td>
<td>3&quot; BS Table 'E' or 80mm NP16</td>
<td>2 1/2&quot; BS Round Thread Male</td>
<td>24 Bar</td>
<td>16 Bar</td>
<td>52kg</td>
</tr>
<tr>
<td><strong>TYPE 2</strong></td>
<td>3&quot; BS Table 'E' or 80mm NP16</td>
<td>2 1/2&quot; BS Round Thread Male</td>
<td>24 Bar</td>
<td>16 Bar</td>
<td>23kg</td>
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</tbody>
</table>

HOSE AND COUPLINGS

**Layflat Hose to BS 6391:1983**
General-purpose synthetic delivery hose. Suitable for industrial and rural fire brigades as well as static building protection. For marine use and for general industrial, commercial and civil engineering applications (including water authority applications) where a high-burst performance hose is not necessary.
* Lightweight and flexible.
* Heat and cold resistant.
* Anti-rot and anti-twist.
* Type 2 version has a dirt-repellent, external elastomeric coating.

**FIRE HOSE RINA MED SOLAS APPROVED**
* Hose manufacturing in accordance to EN 14540.
* Certified MED according to directive 96/98 EC.
* The Crystal fire hose is made by PFC Marine. S.r.l. with woven in polyester with high resistance, inner waterproofed with EPDM Rubber.
* Great resistance to the UV X-ray and to the ageing test.
* Mould-prevention.
* Light.
* The Crystal hose is manufactured to avoid mould effects.
* The hose is complete with PVC maintenance label EN 671/3.
* The good quality and an attractive price made this popular hose well known all over Europe and Overseas.
* Being used by brigades, industries, for irrigation purposes, etc.

**HOSE DIMENSION**
1 1/2", 2", 2 1/2" and 2 3/4"

**FIRE HOSE ACCESSORIES**

**Branchpipe Nozzle RINA Approved.**
Jet, spray, curtain, Aluminium body.

**Marine Hose Holder**
* shine stainless steel Ø 25 mm
* shine stainless steel Ø 45 mm
FIRE BLANKETS
A range of top-quality fire blankets in white and red packs, with slim, flexible or square pack options. Suitable for smothering and extinguishing fires in homes, kitchens, schools, hospitals, laboratories, offices and factories.

* Ten-year guarantee on the cloth.
* 300-gram cloth rather than the commonly used 200-gram cloth, which can be susceptible to cracking.
* Environmentally friendly, water-based coating.
* The suppleness and strength of the blanket ensures user confidence as it is well insulated, yet easily drapes over the fire.
* Full traceability through individual blanket batch numbering.
* Flush end caps for easy cleaning.
* All blankets comply with the latest European Standard BS EN 1869:1997, which supersedes the British Standard BS 6575:1985.

HINGED DOOR CABINETS
A choice of single and double hinged cabinets made from tough new ABS and PE plastics. Traditional GRP cabinets are also still available if preferred.

ABS/Polyurethane Cabinets
* Environmentally friendly - manufactured from recyclable or recycled materials.
* Consistent, smooth finish (internal and external).
* Will not chip or crack.
* Easily transportable.
* Innovative design and manufacturing process.
* Higher impact strength than GRP.
* Hygienic - suitable for food preparation and clinical environments (unlike GRP).
* Suitable for wall or post mounting.
* Toggle clamp closure mechanism.

GRP Cabinets
* Encapsulated steel reinforcement for rear fixing.
* Specially designed base to give safe, two-handed removal of extinguisher.
* Polymide wing closure.
* Corrosion resistant construction.
* High-gloss finish.
* Suitable for wall or post mounting.

NB: Please measure size of aperture before ordering.

EXTINGUISHER COVERS
* Manufactured from PVC.
* Clear viewing port.
* Ideal protection in harsh environments.
* Designed for rapid removal.

ROTARY HAND ALARM BELL
* Ideal for outside locations such as caravan sites.
* Bell sounds 60dB alarm up to 35 metres.
* Die-cast aluminium dome, powder coated red.
* Base plate die-cast aluminium.
* Pre-drilled flange for fast and easy mounting (fixings not included).
* Weight 1.8 kg, overall diameter 280mm, depth 135mm.

FIRE BUCKETS METAL AND PLASTIC
* Suitable for garage forecourt protection and clearing up spillages.
* Metal buckets are epoxy polyester powder painted in red.
* ‘Fire’ label supplied loose with metal bucket.
* Lids for both buckets are supplied separately.
* Wall-mounting bracket suitable for metal and plastic buckets.

FIRST AID KITS
First aid kits are available in three sizes to suit most applications and comply with the 1990 revised Approved Code of Practice.
BRACKETS FOR PORTABLE FIRE EXTINGUISHER
Black painted with latch closure:
* Ø 160 mm
* Ø 190 mm
* Ø 104 mm
* Ø 111 mm
* Ø 136 mm
* Ø 152 mm

STAINLESS STEEL BRACKETS
Bracket with steel latch for 9 kg / 9 lt
Bracket stainless steel 6 kg / 6 lt
Bracket stainless steel 9 kg / 9 lt / 12 kg
Bracket for 5 kg steel stainless steel Ø 136 mm
Bracket for 5 kg aluminium stainless steel Ø 152 mm
Bracket steel galvanized kg 2 Ø 110 mm
Bracket steel galvanized kg 1 Ø 85 mm

BRACKETS FOR EASYFIRE
Available for:
* 1 kg
* 3 kg
* 6 kg
* 12 kg

WALL BRACKETS
Bracket for 6 kg / 6 lt with back wall holder and latch closure.
Bracket for 9 kg / 9 lt with back wall holder and latch closure.
Bracket for back wall holder for: 6 - 9 kg / 6 - 9 lt.
Wall bracket for portable fire extinguisher stored pressure hold on the valve available in Steel or Plastic.

REPLACEMENT SPARE CHARGE FOR POWDER / FOAM EXTINGUISHER
Available for:
* 6 kg
* 9 kg
* 50 kg
* 6 lt
* 9 lt
* 50 lt
* 100 lt
* 150 lt

TEST GAUGE FOR EXTINGUISHER
Test gauge for extinguisher with check valve.
* M10x1 and 1/8”
Test gauge glicerine 0-315.
* Body in stainless steel and brass with box for nitrogen cylinder.
INTRODUCTION
To enhance the installation and maintenance of fire suppression systems, it is imperative that effective fire alarms and emergency lighting are provided for advance warning and early means of escape.
To this end, PFC Marine are able to supply, install and maintain the most advanced fire control panels (analogue and conventional), gas suppression panels and emergency lighting equipment.

PRODUCT RANGE
With conventional or analogue addressable fire alarm systems the panels have been designed to meet the requirements of EN54 (parts 2 & 4) and, where appropriate, BS 5839 (part 4).
The panels are available as single, two, four, six, eight, twelve, sixteen, twenty four and thirty two zone and can be used with existing installations without the need to change the field devices. The front panels and indicators have been designed to provide immediate visual clarity and are supplied with suitable power supply and generous battery space to give extended battery stand-by if required. Available as surface or flush mounted in two tone grey, or any other finish to meet the customer requirements.
Analogue addressable fire alarm control panels are available from 1 to 10 loops.

FEATURES
Basic panels boast two monitor sounder outputs, zone and sounder disable function, one man zone test mode, remote evacuate input (intermittent or continuous), auxiliary fire and fault VFCO contacts.
Superior panels include remote signal contact & isolate, common fire & fault contacts, zonal volt free contacts, class change input, zonal selection for operation with IS barriers, zone isolate facility, zonal one man test and even a bomb alert facility.

REPEATER PANELS
To compliment the fire alarm control panels, repeater panels use the same high quality indicators with a similar layout. Zonal fire indicators, system fault, system healthy and buzzer muted indicators, or full systems controls are provided. Available in the same colour options as control panels, the repeater panels are well suited to areas where space is limited and aesthetics are an important consideration.

LINE CONTINUITY MONITORING UNIT (LCMU)
Currently all call points must remain operational upon removal of detectors to comply with the most recent amendment to BS 5839 (part 1) and the LCMU can be fitted in place of the end-of-line resistor. It is probably the smallest device of its kind on the market, which enables it to be fitted either within the last device on a zone or in the black box thus eliminating the need for an additional wiring point.
To use the LCMU, a diode must be fitted to the breaking connection of the detector base.
Note: a wrongly connected LCMU will produce a short circuit fault condition.

SERVICE OPTIONS
PFC Marine service engineers have been fully trained and are conversant with monitoring units, control and repeater panels and emergency lighting. As with any product, routine and preventative maintenance is essential in assuring both moral and legal peace of mind. In this respect, PFC Marine offers a comprehensive range of packages to suit all installations, including:

FIRE ALARM MAINTENANCE CONTRACTS
These provide for a predetermined number of visits, during which full system integrity is checked. An inclusive, annual maintenance inspection covers the activation of all control panels. A full written report is issued subsequent to every visit and end users are made fully aware of their responsibilities in respect of routine testing, in accordance with BS 5839, the BS Code of Practice for fire alarm installations.

EMERGENCY LIGHTING MAINTENANCE CONTRACTS
These provide for a twice yearly visit incorporating the inspection of every facet of the emergency lighting system, with specific regard to its ability to respond in mains failure conditions. A full written report is issued subsequent to every visit, detailing the system’s condition in accordance with BS 5266, the BS Code of Practice covering emergency lighting installations.

COMBINED SYSTEMS MAINTENANCE CONTRACTS
These are available to cover integrated emergency lighting and fire alarm installations and on which our service department will be only too pleased to advise.
Detection Equipment

INTRODUCTION
Essential to complement fire and security systems, these products are provided for early warning and to provide early means of escape. PFC Marine provides, installs and maintains the above equipment throughout the U.K.

SMOKE AND HEAT MONITORS
Analogue addressable monitors are available with an automatic addressing card. Depending upon the combination of pips punched out, the switches in the monitor head are operated to produce the correct address when the monitor head is inserted. As this is fitted into a base free of electronic parts, this eliminates the risk of damaging electronic components during electrical test of loop wiring.

To enhance response, the protocol has been extended by 16 bits. In addition, an “Alarm Flag” and “Alarm Address” has been incorporated. The registering system can provide an analogue-to-digital conversion within one second of its last polling whilst at the same time, putting the address on the line so that the panel can poll that monitor next.

SMOKE AND HEAT DETECTORS

Ionisation Smoke Detector
The sensing part of the detector consists of two chambers - an open outer chamber and a semi-sealed reference chamber within. An integrating detector, suitable for use in areas where transient high levels of smoke may be expected, is also available.

Optical Smoke Detector
In the event of smoke from a fire entering the labyrinth (which is designed to exclude light from an external source), the light pulse from the LED will be scattered and hence registered by the photo-diode. If smoke is “seen” by the photo-diode on the two following pulses, the detector changes to the alarm state when the indicator LED will light up.

Heat Detector
Rate of rise detectors are designed to detect a fire as the temperature rises, but they also have a fixed upper limit at which the detector will go into alarm if the rate of temperature increase has been too slow to trigger the detector earlier. Fixed heat detectors only change to the alarm state at a preset temperature.

ELECTRONIC SOUNDERS
A wide range of electronic sounders are available for use within fire alarm systems, intruder alarm systems and industrial signalling systems. Within the range are several different models suited for signalling outdoors or indoors.

Each model boasts various features, such as weather resistance to IP65 and twenty four signal tones. To discuss your exact requirements, you will find our experienced staff able to take you through the range of equipment available to suit your needs.

MOTORISED BELLS
Designed for internal use, these bells incorporate a highly efficient centrifugal movement and are available in 4”, 6” and 8” diameter, giving various levels of sound output for different locations.

All 24v DC bells are fitted with a series diode to facilitate fault monitoring and comply with BS 800 in respect of radio interference.

MAGNETIC DOOR RELEASE UNITS
These are available for 24v DC or 240v AC operation. Each unit consists of two parts - a door plate and a solenoid unit. The solenoid is controlled by the fire alarm system so that it is continuously operated, thus magnetically attracting the door plate (fitted to the door) and holding the door open. A manual release button is fitted to the side of the solenoid unit to enable doors to be closed without operating the fire system.

BREAK GLASS CALL POINTS
A hammer is not required, for PFC Marine call points. The switch is held off by the ‘edge’ of the glass. When the glass is broken, the switch is released in a simple, effective operation. Call points can be tested quite easily by inserting the special test key. Also available in waterproof versions.

CUSTOMER SERVICE
PFC Marine experienced staff are on hand to offer advice on all the above products to ensure you make the correct selection for your needs, from design to installation. Smoke & Heat Monitors and Detectors can be maintained as part of your Fire Alarm Maintenance Contract.
Halon fire extinguishants were regarded for many years as the most effective fire suppressants for a wide range of applications. Amendments to the Montreal protocol of 1987 focused on the manufacture of Halons, however, and their production has now ceased in recognition of their virulent destruction of the ozone layer. In addition, new European legislation requires that Halon systems within the EU should have been removed by the end of 2003.

As a result, recent years have seen a substantial reappraisal of approaches to fire protection. PFC Marine is at the forefront of new technologies in fire safety, offering a range of state-of-the-art fire extinguishing systems.

PFC Marine offers GX-20 systems containing FM-200®, a gaseous agent manufactured by Great Lakes Chemical Corporation, which has emerged as a viable alternative to the Halons on the basis of extensive trials. FM-200® is fast and effective with a low space/weight characteristic which is also environmentally-acceptable and safe for human exposure.

FM-200® has been adopted by the majority of the world’s fire protection companies and is the most widely used Halon replacement, with tens of thousands of systems installed across the globe.

**BENEFITS**

* Fast and effective against a wide range of Class A, B and electrical fires
* Safe for occupied areas
* Non-corrosive and electrically non-conductive
* No post-discharge residue and clean-up
* Environmentally-acceptable
* 25 bar system
* Engineered and pre-engineered systems available
* Range of system release options
* Low installation and maintenance costs
* Computer design maximises effectiveness of system
* FMRC/LPCB approved components with ULI listed systems available on request
* Marine systems available

**ASSET PROTECTION**

It is a chilling statistic that of companies suffering an accidental fire event, 43% never re-open and a further 29% close within three years. Ensure that your business is adequately protected and does not yield to this fate.

**WHAT IS FM-200®**

FM-200® is a colourless, odourless gas containing only carbon, hydrogen and fluorine, thereby lacking the ozone-depleting presence of bromine atoms. Highly penetrative and achieving an homogeneous dispersion in the hazard zone, it acts on fires largely by physical means, lowering the temperature of the flame and fuel to a point at which combustion reactions cannot be sustained. There is no significant obscuration on discharge and this non-corrosive and electrically non-conductive agent causes no damage to sensitive equipment with no post-discharge clean-up required.

**SAFETY TO PERSONNEL**

A significant body of toxicity data has been obtained for FM-200® from over 70 studies. The US Environmental Protection Agency and the UK Halon Alternatives Group accepts the use of FM-200® in occupied spaces up to 9% concentration without mandated egress times and at up to 10.5% with mandated evacuation times. Since the agent does not act by oxygen-depletion in the hazard zone, it poses no human asphyxiation threat.

**THE ENVIRONMENT**

FM-200® has a zero ozone-depletion potential and a short atmospheric lifetime. When used in a fire event, FM-200® mitigates the effects of an uncontrolled fire and at the end of the lifetime of the system, the gas can be readily recovered and recycled.

**SYSTEM DESIGN**

The GX-20 range comprises a versatile line of cylinders, valves and related components which have been selected for use with FM-200® and have been subject to stringent testing procedures. Flexibility, quality and reliability make the PFC Marine GX-20 range the world’s finest in fire safety. The equipment carries third party listing through the Factory Mutual Research Corporation and the Loss Prevention Certification Board. Systems are UL1066 compliant. Both engineered and pre-engineered systems are available. The pre-engineered systems offer a low engineering/design cost option with defined maximum design parameters. Engineered systems offer optimum designs for the defined risks with reduced pipe sizes, unbalanced flows and common room and void protection possible.
EASYFIRE®: AUTOMATIC FIRE EXTINGUISHING SYSTEM

* It is an efficient and economical extinguishing system specially designed for boats and yachts.
* It is filled with the ECO CLEAN GAS OZONE FRIENDLY, HFC 227 better known as FM-200®.
* It is conform to NFPA 2001, accepted by EPA.
* It fully respects the Ozone layer because its ODP is ZERO. Its use is admitted in rooms with presence of people.
* The gas is recognized as a clean agent and it fully respects the environment.
* In case of fire the engine room of the boat is immediately safe extinguished in less than 10 seconds.
* The gas is transparent, absolutely clean, it does not leave residues, it does not damage the engine, and it is safe for the living person and animals.
* The fire is extinguished immediately upon the gas HFC 227 is released.
* It works automatically when the temperature in the engine room reaches 93°C.
* The unit fully charged ready to use includes a strong wall bracket.
* A pressure gauge signs in a green area the functionality of the units.
* Manufactured under surveillance of Bureau Veritas and marked CE.
* Tested, approved and certified ISO 9094 by RINA Marine authority worldwide.

EASYFIRE® OPTIONAL ACCESSORIES

Electric Actuator
With control box and termocable for faster fire detection and manual from dashboard.

Control Box
Green led: system watching. Red led: system worked, or fault. Push button for quick manual activation discharge, alarm bell, stop fuel. To be used only with pressure switch.

Pressure Switch N.C.
Warms for low pressure, it actuates alarms, other safety device.

Thermocable
The fire melts the cable enabling contacts to close the circuit for automatic activation of discharge. Standard temperature 105°C, or 88°C, or 137°C.

Manual Actuator
In combination with remote cable in the dashboard for manual emergency activation.

Aluminium Pulley
For wire steel cable remote control actuator.

Remote Pull Cable
For manual activation.

Box Pull Cable Handle
Gold or Silver plated.

COMPLETE WITH MARINE BRACKET

<table>
<thead>
<tr>
<th>Code</th>
<th>Charge Kg</th>
<th>Diam mm</th>
<th>H mm</th>
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Firekill®

FOR INBOARD MOTORBOAT
SYSTEM APPROVED RINA ISO 9094

FIREKILL®: NOZZLE FIXED ON THE TOP OF MOTOR ENGINE
* Firekill® is a pressurized cylinder filled with clean gas HFC227, ABC powder or with Sealfire®.
* It is automatic with manual remote control.
* It is equipped with one thermosensitive bulb, at 93°C (or on request at 68°, and 141°C).
* Firekill® has a versatile valve, completely automatic without use of any source of energy.
* It has a manual remote control pull cable and on request an electric actuator. Moreover it is possible to connect a control box that controls thermocable or smoke detectors.
* Firekill® unique valve has two outlets, diam. 3/8" pipes, a maximum of 4 nozzles.
* Its great advantage is that it may distribute the jet with precision in the effective point of the fire risk.
* Assembly without necessity to thread tubes, extremely easy and quick.
* Suitable also to protect mixers of varnishes, garages, flammable liquids storage, etc.
* The gas is clean, does not leave residue, it is safe for humans and animals, and fully ecological with the environment.

THE FIREKILL® SYSTEM IS SUPPLIED WITH:
* Steel cylinder CE approved Marine.
* Rapid discharge valve made by chromed brass M30x1.5.
* Pipe with couplings.
* Discharge nozzles made by chromed brass.
* Remote control with handle.
* Electric actuator (optional) which connects the remote control to an automatic control panel.
* Wall bracket.

FIREKILL® OPTIONAL ACCESSORIES

Control Box

Thermocable
The fire melts the cable enabling contacts to close the circuit for automatic activation of discharge. Standard temperature 105°C, or 88°C, or 137°C.

Pressure Switch
It warns for low pressure, it actuates alarms, other safety devices.

Minibend For Copper Pipe
Diameter 8mm, 10mm or 12mm.

Electric Actuator

BULBS:
* Standard Bulb 93°C.
* Different temperatures available on request.
INTRODUCTION
PFC Marine supply and fit the most advanced CO₂ Fire Fighting Systems currently available. Proven over many years of service in industrial and marine environments, such a system can rapidly extinguish fires of even the most volatile in origin.

THE TECHNOLOGY
Honed by years of intensive research and development in order to achieve today’s optimum performance, CO₂ System Technology is based expressly upon the singular use of pure Carbon Dioxide, fed under pressure to either strategically positioned, static outlet nozzles, or through hand held hoses.

FIRE SUPPRESSION MECHANISM
CO₂ is stored in pressurised steel cylinders of 45 kg capacity. When applied to a fire, the consequent blanket of gas; which, being 50% heavier than air; rapidly displaces the oxygen content of the immediate atmosphere to below a level at which combustion can be sustained.

An important benefit of this system, over and above that of its impressive efficiency, is that the inherent utilisation of a ‘dry’ mechanism renders it the ideal solution for fires emanating from an electrical source.

SYSTEM OPERATION
An automatic CO₂ System can be activated by any combination of fire, smoke and heat detectors which, on identifying the presence of fire conditions, send an electronic signal via a control panel to a control head, releasing the CO₂ from its cylinder.

The gas is then discharged by directionally static nozzles supplied by a fixed network of distribution pipes.

Fully manual systems can also be installed, and indeed, even those of automatic design have a manual override, the implementation of which is essential when the protected area is occupied.

EFFECTS ON RELEASE
On activation, CO₂ significantly reduces both the surrounding temperatures and radiated heat produced by the fire. The clean, odourless, electrically non-conductive nature of the gas supplements its cooling and oxygen starvation functionality by ensuring a total lack of residual contamination.

This ‘clean action’ is achieved by the gas’s dissipation into the atmosphere, and is thus enormously beneficial in aiding both rapid clean-up and minimal downtime.

In addition, airborne pollution is negated by the system’s ODP (Ozone Depletion Potential) of zero, which consequently offers a viable and immediate alternative to Halons in occupied areas and in local application.

APPLICATIONS
CO₂ Systems are suitable for numerous applications, not least in industrial processes where flammable liquids and vapours present a potential hazard that requires immediate detection and suppression.

SYSTEM DESIGN
Systems are intrinsically simple, and can be designed in modular form employing stand-alone units dedicated to specific areas.

The control Heads are a fundamentally vital part of the system design. Manufactured from corrosion resistant brass, the choice of electric, pneumatic or manual versions provide for any requirement.

The CO₂ cylinders and valve assemblies are of heavy duty construction, specifically designed not only to withstand the most inhospitable of environments, but also to reliably provide the necessary rapid response.

The corrosion resistant brass valve is engineered to provide high flow and maximum efficiency during discharge, and is subjected to rigorous, extensive testing to ensure its durability and long service expectancy.

SYSTEM CONFIGURATIONS
There are three main types of CO₂ Fire Suppression Systems:

THE TOTAL FLOODING SYSTEM comprises a fixed supply of CO₂ connected to a network of distribution pipes and nozzles so arranged as to discharge the gas into either an enclosed space, or enclosed around the target hazard.

A LOCAL APPLICATION SYSTEM again comprises a fixed supply of CO₂ connected to a network of distribution pipes and nozzles, but is designed to discharge directly onto the surface of a target hazard that is either not enclosed, or where the degree of enclosure does not conform to the requirements of Total Flooding.

THE HAND HOSE LINE simply comprises a fixed supply of CO₂ distributed through flexible hose lines producing a large volume discharge much greater than that of portable extinguishers, and thus an excellent, superior first aid unit for many applications.

SERVICE
As with all our systems, we offer comprehensive maintenance and service backup.
Hot cooking surfaces, round the clock operations, high-efficiency appliances. Today’s commercial cooking facilities have all the elements necessary for devastating fires, disasters that can shut down a food service establishment for a day, a month, or forever.

That’s why the engineers at PFC Marine have introduced the next generation in commercial cooking fire suppression, the PFC Marine Wet Chemical System. Your insurance company and local fire authorities will like the system because it exceeds the tough U.L. 300 standard. Your managers will appreciate that the PFC Marine system installs out of sight, remains on duty around the clock and uses a fire suppression agent that minimises after-fire cleanup operations.

But owners and operators of commercial cooking facilities will quickly come to realise the biggest benefit of the new PFC Marine system... its ability to rapidly detect and suppress fire in any type of cooking appliance before there is extensive damage or a costly business interruption.

EXCEEDS UL 300
UL 300 is the stringent standard of performance brought about by the evolution of new cooking trends and appliances that operate at higher temperatures. PFC Marine’s systems also comply with NFPA 96 and 17A, and other regulatory and insurance requirements.

SUPERIOR WET AGENT
The PFC Marine wet chemical agent provides quicker flame knockdown and faster fire suppression, while blanketing the hazard area with a thicker saponification layer to prevent fire reflash.

QUICKER AFTER-FIRE CLEANUP
Simply use a damp cloth to wipe away the foam PFC Marine wet chemical agent residue as soon as the appliances are cool and you’re back in business.

MOST EFFECTIVE COVARIANCES
The PFC Marine system offers unmatched coverage that uses fewer discharge nozzles and flow points to protect the hazard area, resulting in more efficient fire suppression with less hardware cost.

A PRECISE FIT FOR EVERY APPLICATION
PFC Marine’s flexible pre-engineered design concept, coupled with the widest array of cylinder sizes in the industry, enable our engineers to offer the most effective, efficient protection for every type of cooking appliance... fryers, range tops, griddles, broilers, woks as well as hood and duct systems.

ON DUTY - OUT OF SIGHT
PFC Marine systems blend seamlessly into any decor thanks to a flexible design concept that maximises nozzle placement options and minimises piping while offering a choice of black steel or stainless steel piping or stainless steel tubing.

AUTOMATIC OR MANUAL OPERATION
Choose from three types of actuators, the PFC Marine KRS-50 control box that pneumatically discharges up to five cylinders; the PFC Marine mechanical control head, a reliable spring loaded device that uses fusible link technology to trigger the PFC Marine system, or the electrical control head using any normally-open electric contact device (i.e. electric heat detectors). An optional PFC Marine manual pull station is also available.

WORLDWIDE SERVICE
Every PFC Marine Wet Chemical system is backed by PFC Marine’s reputation for quality and a worldwide network of pre-engineered systems distributors who install and maintain your PFC Marine System, supported by direct access to factory assistance and genuine PFC Marine parts.

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1. Fire is detected by heat detectors which activate the control box (or the manual pull station is activated) causing the cylinder valve to open.

2. Pressure stored in the cylinder propels the Wet Chemical through the system piping and out of strategically-located nozzles onto the fire. The system automatically shuts off appliances to remove the heat source.

3. Wet Chemical knocks down flames quickly and forms a protective layer that suppresses fire and prevents fire reflash.
INTRODUCTION
Even the most reliable of gaseous fire fighting systems can be undermined by the substandard integrity of a protected room. That is to say, the room’s inability to retain gas within a given level of leakage.

FULL DISCHARGE TESTING
Until recently, Full Discharge Testing had been the sole available method of monitoring and evaluation but has two inherent disadvantages. First; the technique causes disruption to normal activity within the room, and second; if only a halon system is being tested, significant, environmentally harmful emissions are released into the atmosphere.

A PRACTICAL ALTERNATIVE
In response to these shortcomings, the Montreal Protocol on the Protection of the Environment has developed the alternative Room Integrity Testing method, which calculates the gas-tightness of a room, and predicts how long the descending interface between the gas and air will reach a given level.

Fully endorsed by PFC Marine this positive step has allowed us to formulate a progressive policy whereby only the most essential Full Discharge Testing will be executed, but strictly when no suitable alternative is feasible.

ROOM INTEGRITY TEST
OPERATION
A portable, variable speed fan unit, complete with pressure gauges and a dedicated computer, is fitted into a doorway of the room being tested.

On activation, the fan gradually increases the air pressure within the room by a small amount until it is equivalent to the column weight of halon that would be attained after a discharge of gas, and is thus maintained while the pressure gauge read-outs are recorded.

During the pressurising period it is possible to identify leaks with smoke pencils enabling the room to be sealed as much as is practicable prior to the final test.

TEST RESULT CALCULATIONS
The measured rate of air input needed to maintain this constant level of pressure is equivalent to the amount leaking from the room.

The computer then uses this information to calculate the Equivalent Leakage Area (ELA), which is then processed using a proprietary software programme, in compliance with the National Fire Protection Association (NFPA), to effectively predict the duration of time that the given concentration will be maintained in the room.

This retention time can be calculated for different heights as might correspond to that known for particular combustible hazards.

The computer programme is necessarily conservative in its predictions, as it assumes a worst-case scenario in which 50% of the openings are at a low level, where the heavier halon gas/air mixture will seep out, and 50% are at a high level where lighter air will enter to displace it.

The test is then repeated in reverse by depressurising the room, and the results of both tests are averaged.

TEST CONCLUSIONS
On completion of the tests, the computer is used to generate a detailed print-out of the input and test results.

FAILURE is indicated if it takes less than ten minutes for the halon/air interface to drop below the minimum specified protected height.

A holding time of ten minutes is the period suggested by NFPA 12A, however, the computer can easily be reprogrammed to give a longer or shorter test period.

THE MAIN BENEFITS
Room Integrity Testing is a proven, practical, alternative to Full Discharge Testing of gaseous fire fighting systems. Because the test is conservatively designed, the results are extremely reliable. Any system which passes a Room Integrity Test is virtually certain of passing a Full Discharge Test.

Unlike Full Discharge Testing, this method causes little disruption to production, as staff may continue to work in the test area.

PFC Marine provide a repeatable service. The integrity of a room can be thoroughly tested at any time as part of a regular servicing arrangement, or whenever changes are made to the hazard area.

Using a correction factor, rooms protected by only a halon and carbon dioxide extinguishing system may also be tested using the same techniques and computer programme. Because the test does not interfere with the actual extinguishing system, we are also able to offer this service for areas protected by non-PFC Marine systems.

SERVICE
PFC Marine is experienced at providing Room Integrity Testing and will arrange to test your premises as and when required. As with all our systems, we offer comprehensive maintenance and service back-up.
INTRODUCTION

PFC Marine supply and fit the most advanced automatic Sprinkler Fire Suppression Systems currently available. Now recognised as both the principal and proven method of protecting life and property from the devastation of fire, such a system can rapidly extinguish fires in even the most volatile of situations, by using nothing more than mains water to force-spray droplets of water onto the target area.

THE TECHNOLOGY

Years of continuous research and development, combined with the very latest manufacturing techniques, have maintained the Sprinkler System’s position at the vanguard of the fire fighting industry’s combative arsenal. Based on an intrinsically simple premise, Sprinkler System Technology relies expressly upon the singular use of mains water fed, under pressure, to strategically positioned, ceiling mounted, static outlet nozzles.

FIRE SUPPRESSION MECHANISM

As simple as it is effective, the extinguishing mechanism is purely the removal of heat via the controlled addition of water which, on contact with the heat source, turns to steam, ultimately starving the fire of oxygen to below the level at which combustion can be sustained. Both rapid and efficient, Water Fog Systems can even effectively deal with fire involving highly volatile hydrocarbons.

SYSTEM OPERATION

An automatic Sprinkler System is activated by an individual heat sensor at every outlet nozzle which, on identifying the presence of fire conditions, opens the relevant nozzles, discharging a finely dispersed spray onto the target area via an integral network of fixed distribution pipes. The consequent drop in water pressure is monitored by a control panel which immediately activates an electric pump in order to maintain the necessary system pressure until manually shut down.

EFFECT ON RELEASE

On activation, the system significantly reduces both the surrounding temperatures and radiated heat produced by the fire. The fine spray also improves visibility and reduces airborne contamination by absorbing soluble gasses, and stripping particles of smoke from the atmosphere, thus providing extended survival/evacuation time courtesy of the resultant cleaner environment. One important, additional benefit, of course, is that there are no environmental problems associated with the use of water.

APPLICATIONS

Sprinkler Systems are suitable for numerous applications in a wide range of markets, and include the home, high rise blocks, and industrial, commercial and leisure buildings.

SYSTEM DESIGN

Whatever the application, our design teams will advise on the most appropriate and cost effective solution. The sprinkler (outlet nozzle) is the cornerstone of the entire system. An individual sprinkler opens automatically and independently of others, thereby operating only where necessary. Often, only a small proportion of sprinklers are deployed in combating a localised fire. Indeed, in more than 90,000 recorded fires expunged by such a system, 85% utilised five or less sprinklers. In stand-by mode, each sprinkler is sealed shut by a glass bulb containing heat-sensitive liquid. Increased heat from a fire expands the contents to bursting point, releasing a jet of water which, on hitting an integral deflector, cascades over the target area as fine droplets. The bursting temperature of the glass bulb is about 30° above maximum ambient temperature, and can be selected in five stages from 68° to 182°C. After use, a system can only be rendered operational following the replacement of spent sprinklers which is one part of our comprehensive range of service and maintenance contracts.

SYSTEM CONFIGURATION

There are two main types of Sprinkler Fire Suppression Systems:

THE WET PIPE SYSTEM is entirely filled with water up to the farthest sprinkler, and is suitable for use in frost-protected areas.

THE DRY PIPE SYSTEM is filled with water only as far as the dry pipe valve, beyond which is filled with compressed air, and is the advisable option in areas subject to frost.

INSURANCE

Provided an approved company such as PFC Marine is commissioned, installation of a Sprinkler System can procure considerable insurance discounts on policies from specialist insurers.

SERVICE

As with all our systems, we offer comprehensive maintenance and service backup.
Foam/Deluge Systems

PFC Marine WASP SYSTEM represents a major advance in foam proportioning technology for closed-head Foam-Water Sprinkler Systems (FWSS). The WASP SYSTEM meets four key criteria now being demanded by many insurance organisations and loss prevention consultants:

1. To proportion accurately across the full sprinkler system flow range and fully meet the stringent requirements of NFPA 16A:1988.
2. To be reliable, simple in operation and independent of external power sources.
3. To discharge foam at the correct induction rate immediately the first one or two heads operate. This is critical for rapid fire control.
4. Simplicity of installation, to give a cost effective 'plug-in' system.

The heart of the WASP SYSTEM is the Wide-range Accurate Sprinkler proportioner (WASP), which is mounted on a WASP bag tank containing Alcoseal 3-3 AR-FFFP multi-purpose foam.

Standard foam proportioning devices are designed for dry pipe deluge type systems, and therefore cannot operate under the very low flow conditions imposed by a wet pipe FWSS.

Fast response sprinkler heads are increasingly being chosen to provide quick operation for permanently flooded systems, in recognition that early action provides fast control and minimises resulting loss and damage. The PFC Marine WASP SYSTEM has been specially engineered to achieve the fast response proportioning necessary to obtain this rapid control and extinction. The WASP SYSTEM uniquely provides accurate foam mixing into the water supply from the first one or two heads operating up to the maximum operating head scenario. It fully meets the stringent accuracy requirements of NFPA 16A:1988 and BS5306 section 6.1:1988. Fast accurate proportioning by the WASP SYSTEM at this early stage is crucial, to avoid serious escalation of the incident, and prevent potentially massive consequential losses.

Flammable liquid warehousing and processing areas, rarely store a single liquid and the inventory frequently changes. Usually there is a cocktail of flammable liquid. The choice of Alcoseal 3-3 AR-FFFP foam ensures that the FWSS will be highly effective not only on hydrocarbon liquids but also on the more aggressive polar solvents which attack and destroy standard foam types. Alcoseal 3-3 AR-FFFP is induced at 3% for all these risks, minimising the size of WASP bag tank required and providing the most compact, cost-effective solution.

The WASP SYSTEM is powered by the sprinkler water supply and so performance is not affected electricity power failures.

In order to fully meet the varied demands of FWSS designs, the WASP SYSTEM is available with three sizes of WASP proportioner matched to five sizes of WASP bag tank. Table 2 will help you select the WASP SYSTEM to meet your particular requirements.

The Alcoseal 3-3 AR-FFFP foam concentrate is stored within a reinforced butyl rubber bladder which is fixed inside the steel pressure vessel. As soon as the first sprinkler head breaks, the WASP SYSTEM is operated. Solution flowing from the head activates the Sprinkler Alarm Control Valve. Should a back flow be caused by other parts of the system, the internal design enables the WASP to act as a partial non-return valve, when mounted in the less conventional upstream position. This feature minimises the risk of diluting the foam concentrate stock, but also the risk of foam migration into the pipework when the WASP SYSTEM is in its "ready to go" state.

The WASP SYSTEM is also designed to thoroughly mix foam concentrate into the water supply even at low flows, preventing globularization or globular drop out, which can occur when AR foams are used with some standard proportioners. This is particularly important in a wet pipe FWSS where an accurate, stable and uniform AR foam solution is required behind each head.

Each WASP SYSTEM can be supplied in either left hand (LH) or right hand (RH) versions, depending upon whether the water flow is entering the WASP proportioner from the left or right side. This must be clearly specified when ordering.

To prevent unintended closing of the foam supply to the FWSS once the WASP SYSTEM is set for operation, padlockable foam and water valves are supplied so they will lock in the open or closed position as an additional safety feature. A flushing line is also provided for use after the FWSS pipework is refilled with Alcoseal 3-3 AR-FFFP foam solution, following operation or annual test. This feature ensures flushing can take place when supervised by authorised personnel. Such features instil long term reliability into this low maintenance trouble free system. The water drain and foam valves can also be tamperproof to avoid interference.

Two pressure gauges are fitted either side of the WASP proportioner to allow simple pressure drop tests to indicate correct WASP operation during routine annual testing. A 50mm (2") test connection is provided to allow foam solution samples to be tested, or to allow connection to test sprinklers replicating low flow conditions outside the risk area. This connection can also be used to drain premix solution from the FWSS as necessary.

It is recommended that foam induction accuracy tests are conducted at least annually in accordance with NFPA 16A:1988.

To avoid unforeseen problems or delays, fast bag tank commissioning and Foam accuracy testing is also available by specialist foam system engineers, who are trained to ensure a trouble free system handover.

PRINCIPLE OF OPERATION

The Alcoseal 3-3 AR-FFFP foam concentrate is stored within a reinforced butyl rubber bladder which is fixed inside the steel pressure vessel. As soon as the first sprinkler head breaks, the WASP SYSTEM is operated. Solution flowing from the head activates the Sprinkler Alarm Control Valve allowing water at fire main pressure to enter the tank between the vessel wall and the rubber bag. Alcoseal 3-3 AR-FFFP concentrate is then expelled from the sprinkler bag into the WASP proportioner.

The WASP bag tank is powered by the sprinkler water supply. Compensation for variations in flow and pressure is automatic. The Alcoseal 3-3 AR-FFFP will therefore always be discharged at this same pressure.

Provided there is flow through the WASP proportioner creating a pressure drop, accurate induction will occur.
COBRA

COMPRESSOR BREATHING APP. AIR H.P. 300 BAR FROM 80 TO 215 LTM
COBRA is a range of quality production of high pressure compressors and scuba diving equipment for breathable air and technical gases like Nitrox, Trimix, Helium, Nitrogen, Hydrogen and Methane.

PFC Marine kept on evolving in the mechanical area continuously updating planning and designing equipment and producing ever-improving reliable products.

PFC Marine have taken up the challenge of the technological evolution and export their products all over the world also thanks to a widespread distribution network offering qualified service & repair. PFC Marine produce portable compressors and large-sized recharge stations.

This catalogue shows the recharge station product line: with single-phase and three-phase electric motor. PFC Marine compressors guarantee the divers quality breathable air and a versatile equipment.

From the firefighters who need to rely on the equipment even in the most extreme conditions to the keen Paintball players, everybody is enthusiastic about PFC Marine products which embody passion and accuracy.

FILLING STATION FOR AIR CYLINDER 215 L/MIN - TECHNICAL CHARACTERISTICS
Charging rate : 215 l/min - 13 m3/h
Filling time cylinder at 300 bar:
3 lt cylinder : < 3 min
15 lt cylinder : 14 min
Working pressure : 315 bar - 3200 Psi
Rpm pumping unit : 1350
Driven by : Three-phase electric motor
Power : 4.8 Kw (440/480V - 60Hz)
Dimension
Height : 0.84 m (33”)
Width : 0.89 m (35”)
Depth : 0.60 m (23”)
Noise : 71.9 dB ISO 3746
Dry weight : 177 kg (390 lbs)
Breathing air : DIN 3188 EN 12021 CGA E

FILLING STATION FOR AIR CYLINDER 100 L/MIN - TECHNICAL CHARACTERISTICS
Charging rate : 100 l/min - 4.8 m3/h
Filling time cylinder at 300 bar:
3 lt cylinder : < 6 min
15 lt cylinder : 37 min
Working pressure : 315 bar - 4300 Psi
Rpm pumping unit : 2800
Driven by : Three-phase electric motor
Power : 3 Kw - 4 HP
Dimension
Lenght : 0.84 m (33”)
Height : 0.89 m (35”)
Width : 0.60 m (23”)
Noise : 83 dB ISO 3746
Dry weight : 56.7 kg (125 lbs)
Breathing air : DIN 3188 EN 12021 CGA E

STANDARD ACCESSORIES
* Automatic condensate drain
* Autostop
* Electronic switchboard with hourmeter

OPTIONAL ACCESSORIES
* Remote filling pannel
* Extra filling hose BC valve (1,2 m) max two pieces
* 300 bar version

COMPLETE WITH
* Start stop switch
* Pressure switch for automatic stop
* Hourmeter
* Manual drain
* Automatic condensate drain with timer
* Oil level

FILLING STATION FOR AIR CYLINDER 100 L/MIN - TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
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<tbody>
<tr>
<td>Charging rate</td>
<td>100 l/min - 4.8 m³/h</td>
</tr>
<tr>
<td>Filling time cylinder at 300 bar:</td>
<td></td>
</tr>
<tr>
<td>3 lt cylinder</td>
<td>&lt; 6 min</td>
</tr>
<tr>
<td>15 lt cylinder</td>
<td>37 min</td>
</tr>
<tr>
<td>Working pressure</td>
<td>315 bar - 4300 Psi</td>
</tr>
<tr>
<td>Rpm pumping unit</td>
<td>2800</td>
</tr>
<tr>
<td>Driven by</td>
<td>Three-phase electric motor</td>
</tr>
<tr>
<td>Power</td>
<td>3 Kw - 4 HP</td>
</tr>
<tr>
<td>Dimension</td>
<td></td>
</tr>
<tr>
<td>Lenght</td>
<td>0.84 m (33”)</td>
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<tr>
<td>Height</td>
<td>0.89 m (35”)</td>
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<td>Width</td>
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<tr>
<td>Noise</td>
<td>83 dB ISO 3746</td>
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<td>Dry weight</td>
<td>56.7 kg (125 lbs)</td>
</tr>
<tr>
<td>Breathing air</td>
<td>DIN 3188 EN 12021 CGA E</td>
</tr>
</tbody>
</table>

OPTIONAL ACCESSORIES
* Autostop
* 1.2 m extra filling hose
* Stainless steel frame
* Filter cartridge with CO2 catalys
FILLING STATION FOR AIR CYLINDER 215 L/MIN - TECHNICAL CHARACTERISTICS
Charging rate: 215 l/min - 13 m³/h
Filling time cylinder at 300 bar:
3 lt cylinder: < 3 min
15 lt cylinder: 14 min
Working pressure: 315 bar -3200 Psi
Rpm pumping unit: 1350
Driven by: Three-phase electric motor
Power: 4.8 Kw (440/480V - 60Hz)

Dimension
Height: 0.84 m (33”)
Width: 0.89 m (35”)
Depth: 0.60 m (23”)
Noise: 71.9 dB ISO 3746
Dry weight: 177 kg (390 lbs)
Breathing air: DIN 3188 EN 12021 CGA E

OPTIONAL ACCESSORIES
* Automatic condensate drain
* Autostop
* Complete automatic switchboard

COMPLETE WITH
* Pressure gauge
* Overpressure valve
* Maxi filter
* Manual condensate drain

ACCESSORIES
Glycerine Stainless Steel Pressure Gauge
0-400 bar for testing breathing apparatus valves DIN 300 & DIN 200.

Filling Panel
Complete with pressure regulator.

Filling Device
With safety valve, 300F / 200M bar DIN.

COMPRESSED AIR BREATHING APPARATUS
* Proven technology for 200- and 300 bar.
* Unisize carrying plate of sturdy heat resistant plastic.
* Carrying harness of non-flammable.
* Modacrylic-Aramid fibres.
* Comfortable hip-pad for equal weight distribution.

SELF-LUMINESCENT PRESSURE GAUGE, OR ALTERNATIVELY INTEGRATED CONTROL UNIT ICU.
The compressed air breathing apparatus offers a choice of options for all requirements, like the warning signal near the ear, Quick-Fill or second connection. The cylinder holder with variable strap permits accommodation of one or two air cylinders with 4 to 6.8 liters.

APPROVALS AND STANDARDS EN 137 AND MED 96/98/EC.
Wherever sudden outbreaks of hazardous gases and oxygen deficiency are to be expected, in particular in industry and merchant marine, the compact is ready to immediately provide breathing air.

Other size and type available on request.

<table>
<thead>
<tr>
<th>Cylinder</th>
<th>Air Breathing</th>
<th>Capacity Lines</th>
<th>Pressure Bar</th>
<th>Ø mm</th>
<th>Dimension mm Inlet</th>
<th>Weight Kgs</th>
<th>Endurance min.</th>
<th>Alarm Calibration</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>300</td>
<td>140</td>
<td>310x660x220</td>
<td>15.5</td>
<td>55</td>
<td>55+/-5</td>
<td></td>
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</tr>
</tbody>
</table>

FIRE SUITE MED APPROVED
* Jacket and trousers in Rayon MED Approved.
* Protective gloves MED Approved.
* Safety rubber boots with steel cap MED Approved. (Height 38 cm)
* Helmet for Naval Fireman MED Approved.
* Wall cabinet for autobreath. Dimension 57.5 x 50 x 105 cm
INDIVIDUAL PROTECTION
* Semimask CE EN 140 without filter.
* Filter for semimask.
* Full face mask with panoramic visor.
* Filter combined multipurpose 89 ABEK HG P3.

Other filters with all kind of protection available on request.

FOAM PORTABLE APPLICATOR RINA MED APPROVED
Equipped with:
* Main foam liquid tank capacity 20 LT.
* Spare foam liquids (on request).
* Foam liquid shut-off valve.
* Flexible pipe for foam liquid suction.
* Foam branchpipe with injector water and shut-off ball valve.
* Fire hose (on request).

LIQUID LEVEL INDICATOR ULTRASONIC FOR CO2 RINA APPROVED
The Portable Liquid Level Indicator operates on the principle of generating an ultrasonic sound wave to travel through the steel cylinder and into the liquefied gas.

The instrument interprets the changes in the echoes that occur as the sound beam responds to the different characteristic impedance’s it encounters between the liquid and the gas above it.

The change in the response is indicated by the deflection of the meter pointer. The set up procedure for the instrument ensures maximum deflection of the meter at the gas/liquid interface, thus making a reliable determination of the liquid level.

COMPLETE WITH
* Control Panel
* Battery Charger
* Ultrasonic Probe
* Carry Case

FOAM MED APPROVED

<table>
<thead>
<tr>
<th>Description</th>
<th>CAN or DRUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foam compound proteinic 3%</td>
<td>Can 25 kg</td>
</tr>
<tr>
<td>Foam compound 6%</td>
<td>Can 25 kg</td>
</tr>
<tr>
<td>Foam compound Synthetic</td>
<td>Can 25 kg</td>
</tr>
<tr>
<td>Foam AFFF 3%</td>
<td>Drum 100 kg</td>
</tr>
<tr>
<td>Foam AFFF 6%</td>
<td>Drum 100 kg</td>
</tr>
<tr>
<td>Foam Fluoroproteinic</td>
<td>Drum 100 kg</td>
</tr>
<tr>
<td>Foam Proteinic 6%</td>
<td>Drum 100 kg</td>
</tr>
<tr>
<td>Foam Universal 6% for Alcohol</td>
<td>Drum 100 kg</td>
</tr>
<tr>
<td>Foam Proteinic 6%</td>
<td>Drum 200 kg</td>
</tr>
<tr>
<td>Foam AFFF Synthetic 3-6%</td>
<td>Drum 200 kg</td>
</tr>
<tr>
<td>Foam Universal 6% for Alcohol</td>
<td>Drum 200 kg</td>
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</tbody>
</table>