## Standard Cascade System

<table>
<thead>
<tr>
<th>Item</th>
<th>Qty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20</td>
<td>Self Contained Positive Pressure Breathing Apparatus Set complete with 1200 litre compressed air cylinder charged to a pressure of 207 bar (3000 psi) having a duration of 30 minutes.</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>Spare 1200 litre compressed air cylinder charged to a pressure of 207 bar (3000 psi) having a duration of 30 minutes for use with item 1.</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>Carrying case labeled “Breathing Apparatus“ for the transportation and stowage of item 1.</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>Positive Pressure, hip mounted, 10 minute duration escape set.</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
<td>Carrying case for the transportation and stowage of item 4.</td>
</tr>
<tr>
<td>6.</td>
<td>120</td>
<td>ELSA Emergency Life Support Apparatus complete with carrying case and 10 minute cylinder.</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>MARS Manual and Automatic Resuscitator complete with three sizes of facemask and airway, all contained in carrying case. (On Request)</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>Compressed oxygen cylinder for use With item 7.</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td>Personal H₂S Gas Detection Monitor</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>Portable H₂S Gas Detection Monitor with LCD display and remote head.</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>Gas Sampling Pump</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>Packets of Sampling Tubes that will be invoiced at the end of each rental period for the quantity used, for use with item 11.</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>High Pressure Air Compressor for charging the breathing air cylinders.</td>
</tr>
<tr>
<td>14</td>
<td>2</td>
<td>10’ Container to transport equipment and to be used as a workshop control centre whilst onboard the rig. Second 10’ Container can be back loaded after mobilization</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>Cascade Low Pressure Air System, with 15 cylinder air bank, low pressure air line and 17 Air outlets.</td>
</tr>
</tbody>
</table>
### Standard Fixed Gas Detection System

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<td>20</td>
<td>Spare 1200 litre compressed air cylinder charged to a pressure of 207 bar (3000 psi) having a duration of 30 minutes for use with item 1.</td>
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<td>3</td>
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<td>Carrying case labelled “Breathing Apparatus” for the transportation and stowage of item 1.</td>
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<td>4</td>
<td>20</td>
<td>Positive Pressure, hip mounted, 10 minute duration escape set.</td>
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<td>20</td>
<td>Carrying case for the transportation and stowage of item 4.</td>
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<tr>
<td>6</td>
<td>120</td>
<td>ELSA Emergency Life Support Apparatus complete with carrying case and 10 minute cylinder.</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>MARS Manual and Automatic Resuscitator complete with three sizes of facemask and airway, all contained in carrying case. (On Request)</td>
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<tr>
<td>8</td>
<td>2</td>
<td>Compressed oxygen cylinder for use With item 7.</td>
</tr>
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<td>9</td>
<td>10</td>
<td>Personal H₂S Gas Detection Monitor</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>Portable H₂S Gas Detection Monitor with LCD display and remote head.</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>Gas Sampling Pump</td>
</tr>
<tr>
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<td></td>
<td>Packets of Sampling Tubes that will be invoiced at the end of each rental period for the quantity used, for use with item 11.</td>
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<td>1</td>
<td>High Pressure Air Compressor for charging the breathing air cylinders.</td>
</tr>
<tr>
<td>14</td>
<td>2</td>
<td>10’ Container to transport equipment and to be used as a workshop control centre whilst onboard the rig. Second 10’ Container can be back loaded after mobilization</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>Cascade Low Pressure Air System, with 15 cylinder air bank, low pressure air line and Air outlets.</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td>8 Point Gas Detection System for hydrogen sulphide and sulphur dioxide, with visual and audio alarms.</td>
</tr>
</tbody>
</table>
Quantitative Fit Testing

(to comply with COSHH guidelines HSE282/28)

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<tr>
<td>1</td>
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<td>Fit Test 3000 + adapter kits</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>Toshiba Laptop</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>Epson Colour Printer</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>OHD FitTrack Software</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>Various sizes and Types of Face Mask</td>
</tr>
</tbody>
</table>

**H2S Safety Technician**

Industrial Fire Services, Technicians are trained to a high degree in all aspects of H2S Safety Procedures. This training is stringently tested and documented so as to demonstrate Industrial Fires Services commitment to providing the highest level of expertise to our clients. Industrial Fires Services H2S Technicians are responsible for:

- Placements of H2S Safety Equipment in Accordance with the H2S Contingency Plan
- Maintenance and scheduled servicing of all safety equipment
- Completion of all required documentation
- Training of all personnel on site in H2S safety, alarm procedures and use of equipment.
- Quantitative Fit Testing
- Supervision of H2S drills
- Atmospheric H2S gas authentication and quantification in the event of an alarm.
CASCADE CONTAINER
INDUSTRIAL FIRE SERVICES
DATA SHEET

Request Information
www.industrialfireservices.com
INDUSTRIAL FIRE SERVICES
DATA SHEET
Stores Container
A dual reduction control panel, designed to the highest technical and quality specification, which is housed within the containerised safety system. The CP supplies low pressure breathing air, delivering in excess of 350 lpm, flows to all low pressure outlets, as well as having auxiliary high and low pressure supply capabilities.

The exact specification is determined by the exact requirements of the individual site approved Cascade airline system.

- 316 Stainless Steel facia with inlaid airflow diagram.
- High and low pressure, oil filled, gauges.
- 316 Stainless Steel high and low pressure control valves.
- 316 Stainless Steel pipework and fittings.
- RH 20 Dome Loaded Balanced Controllers and relief valves (see separate data on Dome Loaded Control Valves).
- Twin 1” 316 Stainless Steel feed pipes to low pressure distribution manifold.
INDUSTRIAL FIRE SERVICES
DATA SHEET
RETRACTABLE AIRLINE HOSE REELS

Designed to keep the work area safe and tidy when airline hoses are not required at the work area and for the user to be able to control the amount of hose that is “laid out” when low pressure airline breathing apparatus is used.
- High impact, ultra violet stabilised, polypropylene housing protects airline hose when not in use.
- Easily installed mounting bracket allows hose reel to swing through 270 degrees when in use.
- Hose reel can be locked to control amount of airline hose “laid out”.
- Fully automatic hose rewind with low effort rewind tensioner.
- Supplied complete with airline fitted.

Request Information
www.industrialfireservices.com
The 21 outlet distribution manifold is linked to either of the Cascade Control panels (CP1 or CP2) to provide individual control of the main supply lines that run to the outlet manifolds in the risk/work areas. The location of the manifold is determined by the exact requirements of the individual, site approved, Cascade airline supply system.

**SPECIFICATIONS**
- Manifold body constructed from 2” diameter 316 Stainless Steel S/20.
- 316 Stainless Steel low pressure control valves are ½ “ ball type with marine handles.
- Inline connectors and fittings are all 316 Stainless Steel.
- Twin 1” connector Supply ports.
The Outlet Manifolds are installed at the risk areas/work sites to supply breathing air to personnel via the retractable hose reels, personal airline hoses and working breathing apparatus.

Each outlet manifold can supply air to five users. A sixth outlet is designated for a warning device to alert working personnel to any interruption of normal air supply.

The exact location of the manifolds and the number of hose reels connected are determined by the individual, site approved, Cascade airline system.

**SPECIFICATIONS**

- Manifold body constructed from 2" diameter 316 Stainless Steel S/20.
- Stainless Steel, oil filled, low pressure gauge.
- 316 Stainless Steel pressure gauge isolation valve.
- 316 Stainless Steel relief valve.
- All couplings are 316 Stainless Steel, CEJN quick connect.
- Inline warning whistle sounds if supply pressure drops below 4.1 bar.
An ergonomically designed, self-contained breathing apparatus which is lightweight and allows for unrestricted operational movement.

- Newly designed, injection moulded, composite back-plate ensures optimal load distribution and balance.
- Designed for use with either the new Vision 3 or standard Pana Seal Facemask.
- Harness fabricated from flame retardant materials.
- Automatic positive pressure demand valve features low breathing resistance, and unsurpassed dynamic performances; particularly at high flow rates.
- Available in either single or dual cylinder configuration.
- Optional airline attachments.
- Fully certified to EN 137, EN 139 with airline attachment.
A first breath positive pressure airline escape breathing apparatus with an Emergency air supply for egress or emergency escape procedures.
  • PanaSeal positive pressure facemask.
  • Automatic positive pressure demand valve with bypass facility.
  • Fully adjustable webbing bandolier harness.
  • Hip mounted emergency air cylinder for access and manoeuvrability in the smallest of spaces
  • CEN pattern safety lock couplings.
  • CE marked to EN 139 and EN 402.
  • Available in 10 & 15 minute escape duration.
  • Environmental Operating Parameters: -30 to +70 centigrade.
Elsa is the third generation of the compressed air, constant flow Emergency Life Support Apparatus. CE marked to EN 1146
• Unique cuboid hood with elastomeric neckseal for optimum performance
• 15 minutes of self – contained breathing air for escape (600 litres at 40 litres per minute).
• Very simple to don and use.
• Suitable for use over spectacles.
• Contained in high visibility, carry bag.
• Air source is alloy steel, rechargeable, compressed air cylinder.
• More than 20 year proven track record in the Oil and Gas industry.
RAE Systems' Hand Pump is for use with our line of Gas Detection Tubes. The Hand Pump, along with the Tubes, offers quick, on-the-spot measurements of many gases and vapors.

**Key Features**

- Solid metal construction with RAE Systems’ exclusive lifetime warranty
- Springless piston design for accurate 50 and 100 cc volumes
- Tube tip breaker and glass tip holder
- Clear end-of-flow indicator
- Tapered inlet design avoids leaks with different diameter tubes
- Simple stroke counter
- Additional accessories include remote sampling hoses with 15' (5 m) or 35' (11 m) lengths
The QRAE II is a full-featured, compact, one- to four-sensor gas detector for detection of combustibles, oxygen, hydrogen sulfide, and carbon monoxide.

Key features include easy-to-change, externally accessed battery packs (available in rechargeable and alkaline versions), sensors and filter, a water-resistant case and a new state-of-the-art O2 sensor technology with extended life.

The rechargeable Lithium-ion battery pack provides up to 14 hours of continuous operation. The QRAE II includes storage capacity for 64,000 datalogging points, which can be downloaded to any PC compatible with Windows 98, NT, 2000 or XP.

**Patented SPE O₂™ Oxygen sensor unique features:**

- Lead-free design that already complies with future RoHS Standard
  - Extended life compared to lead-type electrochemical oxygen sensors resulting in low cost of ownership
- Leak-free design, minimizing downtime
  
**Best EMI/RFI** immunity technology for products in its class, eliminating radio interference

**Easy access** to sensors, filter and battery compartment without exposing electronic components to potential damage
**Big graphic display** for easy overview of gas type and concentration

**Alkaline adapter and rechargeable Lithium-ion battery pack** provide up to 14 hours of continuous operation

**Rugged housing** withstands harsh environments:
- IP-65 Water- and dust-resistant case
- Strong, protective concussion-proof design

**Additional Advantages**

- One to four plug-in sensors (combustibles, oxygen SPE O2™, hydrogen sulfide, carbon monoxide)
- Diffusion mode, with optional manual sample pump
- Intuitive simple-to-operate two-button user interface
- Display can be flipped 180° with the push of a button for easy viewing from belt or hand
- Multi-language support
- One-button calibration with auto-zero capability
- Loud 95dB audible alarm
- Bright red flashing visible alarm
- Vibration alarm
- Interchangeable drop-in Lithium-ion and alkaline battery packs
- Charging cradle doubles as an external battery charger
- Compatible with AutoRAE calibration station
- Optional Confined Space Entry Kit
The MultiRAE Plus combines a PID (Photoionization Detector) with the standard four gases of a confined space monitor (O₂, LEL, and two toxic gas sensors) in one compact monitor with sampling pump. Like the Leatherman™ tool, the MultiRAE Plus gets the job done in more circumstances than any other gas detector. With more than 10,000 units in the field today, its versatility makes it the gas meter of choice for some of the highest profile HazMat/WMD teams in the United States. The MultiRAE Plus is quickly and easily changed from a sophisticated technician instrument to a simple text-only monitor. The same monitor can be used as a personal monitor, a hand-held sniffer, or as a continuous operational area monitor.

The MultiRAE Plus detector can be made wireless with the use of RAELink2. This allows real-time monitoring information from the detector to be integrated into an existing AreaRAE system. A wireless, RF (radio frequency) modem allows detectors equipped with Firmware version 1.20 or higher to communicate and transmit readings and other information on a real-time basis with a remotely located AreaRAE base controller up to two miles away.

**Key Features**

- O₂, LEL, PID, and any two plug-in “smart” toxic sensors: CO, H₂S, SO₂, NO, NO₂, Cl₂, HCN, NH₃, PH₃
- 0-2,000 ppm measurement of VOCs (volatile organic compounds) with 0.1 ppm resolution
- Measure more chemicals than with any other PID: With over 60 Correction Factors built into the MultiRAE Plus memory and the largest printed list of Correction Factors in the world (300+), RAE Systems offers the ability to accurately measure more ionizable chemicals than any other PID!
- Drop-in Battery: When work schedules require putting in more hours than the 14 hours supplied by the advanced Lithium ion (Li-ion) battery, the drop-in alkaline pack supplied with every MultiRAE Plus allows you to finish the job.
- User friendly screens make it easy to use for simple applications and flexible
enough for sophisticated options.

- Rugged Rubber Boot assures that the MultiRAE Plus survives the bumps and knocks of tough field use.
- Strong, built-in sample pump draws up to 100 feet (30m) horizontally or vertically.
- Large external filter and automatic low flow alarm protect the MultiRAE Plus from damage.
- Large keys are operable even with 3 layers of gloves
- Easy-to-read display with backlight
- Store up to 80 hours of data at one minute intervals for all 5 sensors for download to PC (with the optional datalogging).
- Loud audible alarm that varies for different alarm conditions and an optional external vibration alarm for noisy areas
- Access sensors and battery in seconds with the new, improved case

**Applications**  *HazMat/Homeland Security*

- Initial PPE (personal protective equipment) assessment
- Leak detection
- Perimeter establishment and maintenance
- Spill delineation
- Decontamination
- Remediation

**Confined Space Entry**

- Aviation/wing tank entry with jet fuel
- Shipyard and maritime confined spaces with diesel fuel
- Pulp and paper industry for confined space entry in turpentine environments

**Environmental**

- Soil and water headspace analysis
- Leaking underground storage tanks (LUST)
- Landfill monitoring

**Industrial Hygiene, Plant Health & Safety,**

- Confined Space Entry
- Indoor Air Quality (IAQ)
The ToxiRAE II is a single gas, personal protection monitor that continuously displays toxic gas concentrations. It costs just a little more than disposable detectors. Unlike typical disposables that only display "remaining life", the ToxiRAE II is a full-featured gas monitor providing continuous, digital display of the gas concentration, STEL, TWA, and Peak values as well as high, low, TWA, and STEL alarms.

A simple to use one-button product, the ToxiRAE II is easy to calibrate. Use the pre-set alarms, or modify the alarms to meet your specific requirements. In contrast to disposables that are turned on once and remain on until their batteries expire, you decide when and where to use your ToxiRAE II and you turn it on and off accordingly.

**Key Features**

- Large, easy-to-read continuous display of gas concentration in ppm
- Displays STEL, TWA, and Peak values
- Sensors available: H₂S, CO, O₂, NH₃, Cl₂, ClO₂, HCN, NO, NO₂, PH₃, SO₂
- Field replaceable battery and sensor
- 2-Year warranty
- User adjustable high, low, STEL, and TWA alarms
- Varying audio alarm signals for different alarm conditions
• Bright red flashing alarm
• Loud 90 dB buzzer
• Built-in vibration alarm
• Holds Peak values
• Simple calibration
• Durable, highly impact-resistant, carbon loaded ABS housing
• Highly resistant to RFI interference
• IP-65 rated weather resistant
• Stainless steel corrosion resistant attachments
• Small enough to be clipped onto a hard-hat, shirt pocket, shoulder-strap, or belt

Applications
• Refineries
• Oil production
• Contractors
• Scheduled plant maintenance turnarounds
• Chemical plants
• Fire service
• Industrial safety
• Pulp & Paper
• Heavy industry
• Waste water treatment plants
• Shipyards and maritime
• Landfill operations
• Trenches, silos, railcars
• Power plants
• Steel mills
The Rapid Deployment Kit (RDK) is designed for quick assessment and management of gaseous threats. The kit includes four wireless, 5-gas, AreaRAE monitors with in-case charging as well as the Host Controller for monitoring from a command center up to two miles away. The system can scale up to 32 AreaRAEs with the addition of Detector Kits.

The AreaRAE monitors can be rapidly deployed and re-deployed in situations that require a quick and adaptable response. They can be arranged in a perimeter to detect chemical hazards and to monitor the environmental safety of a large public event. The units help response teams gain control over potentially perilous situations by assessing the environment and determining the geographic disbursement of hazardous gases and chemicals. Housed in a military-grade self-contained case, the RDK is easy to transport and deploy.

The RDK also provides protection in the monitoring of environmental remediation, oil, gas platforms, petrochemical applications, and refineries. The AreaRAE can detect gaseous VOCs, LEL, O₂, H₂S, and CO and offers datalogging for event documentation. The RDK is available with two additional options:

- **Global Positioning Satellite (GPS) option**: Includes the ability to track and display readings from up to 32 remotely located detectors on a GPS map.
- **Gamma Radiation option**: A Gamma radiation sensor replaces one of the toxic gas sensors on the AreaRAE units. (See the AreaRAE Gamma product description for more details.)
The AreaRAE Steel is an ATEX-certified multi-gas, wireless monitor. Housed in a welded stainless-steel enclosure, it is rugged, portable and weather-resistant, making it suitable for harsh environments. Ideal for hazardous materials and other emergency response monitoring applications, strategically placed AreaRAE Steel monitors can be used to quickly establish a perimeter, allowing first responders to back off to a safe position and monitor readings from up to 3 kilometer away.

The photoionization detector (PID) in the AreaRAE Steel can measure parts per million of volatile organic compounds (VOCs). In addition, it can be equipped with a lower explosive limit (LEL) sensor, an oxygen sensor, and one or two electrochemical toxic sensors for measuring specific substances such as hydrogen sulfide or chlorine.

An integrated wireless modem transmits real-time gas measurement data to a base station, which employs a standard Windows-based PC running ProRAE Remote software. The base station can simultaneously control and display readings for up to eight AreaRAE Steels and/or AreaRAE Steel Gammas (or other AreaRAE-compatible monitors, including MultiRAE Plus, MiniRAE 2000, ppbRAE Plus, Smiths APD-2000®, BAE ChemSentry®, and Coastal Environmental Systems Weatherpak®). This provides a multi-threat detection network that can monitor a wide geographic area. Employing mesh networking capabilities, the AreaRAE Steel is designed for extended-range performance in difficult radio environments. The AreaRAE Steel is available individually...
or as part of the Rapid Deployment Kit (RDK) system package.

**Key Features**

- Up to five sensors (PID, LEL, O2 and two electrochemical toxic gas)
- Loud buzzer and large, extra-bright warning light
- Large LCD display and keypad
- Rugged, weather-resistant stainless-steel housing
- Built-in sampling pump
- Interchangeable Li-ion or alkaline battery pack
- Continuous operation via AC source

**Additional Advantages**

- Real-time wireless data transmission with built-in RF modem
- View real-time sensor data and alarm status at headquarters or command center
- ProRAE Remote software simultaneously controls and displays readings for up to eight remote detectors
- License-free, 869MHz wireless transmission with communication range up to 3km
- Automatic mesh networking that allows each AreaRAE Steel to function as a repeater, greatly extending wireless range
- Optional wall-mounting bracket or field-mounting tripod adapter

**Applications**

- HazMat and Emergency Response
- Refineries and Petrochemical Plants
- Power Plants
- Pulp and Paper Industry
- Marine and Offshore Wells