



Refrigeration and Ammonia

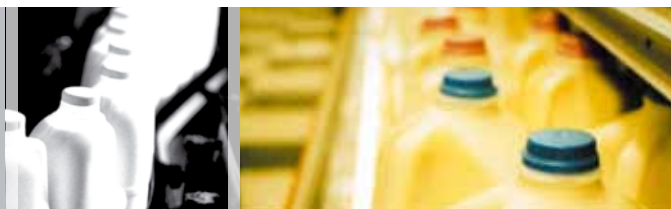


Industrial refrigeration systems are used in a wide variety of industries including food and beverage production, chemical manufacture and marine vessels. International agreements designed to address global warming have resulted in a reduction of CFCs and HFCs used in refrigeration systems. This has generated growth in the use of NH₃ (Ammonia) based refrigeration systems for medium to large industrial applications. To support this growth, new and revised safety standards have been implemented either on a national or international scale.

Market Drivers

Growing environmental protection legislation -
(Montreal / Kyoto Protocols on climate change
and the reduction in use of CFCs and HFCs used
in refrigeration systems, EC directive 2037/2000)
Revised ammonia refrigeration safety
regulations - (European EN378, US ASHREA 15)
Growing personnel safety regulations -
(UK COSHH, European SCOEL)

Potential Applications



Application 1:

Personal Protection

Food and drink factory, production or processing plant which uses NH₃ as a refrigerant to cool the product during production and storage. Personal protection would need to be provided where personnel are working in the same or neighbouring area to NH₃ filled refrigeration equipment. Potential monitoring solutions include the use of portable gas monitors supplied to employees working in the area of concern or the installation of a fixed monitoring system. Typical gases to be detected include: 0-100ppm NH₃, CO₂ measurements from 0-3%V, O₂ deficiency and flammable vapors 0-100%LEL..

Application 2:

Machinery Rooms

Machinery rooms can be found in food and drink processing plants and ice rinks and contain a variety of equipment which form the heart of the refrigeration system. These would include compressors, valves, surge tanks, evaporators, pumps etc. There is a potential risk that this equipment could permit gas / vapor releases and demand monitoring equipment. Under these circumstances, fixed point gas detection systems certified for the area classification are installed. These systems are designed to trip at predetermined thresholds, as laid down by the relevant international or national regulations.

EN378 demands low alarm thresholds be set below 500ppm for mechanical ventilation activation. A high alarm threshold must be set at 30,000ppm (3.0% v/v) or below for automatic plant shut down. Sensing points should be located above compressors and surge tanks. The system must have an emergency battery backup supply that is able to activate audible and visual alarms to enable occupants to take appropriate action.

Application 3:

Food / Product Tainting During Cold Storage

One major concern of food processing plants is the potential tainting of product from the release of refrigerant into a product storage area. This tainting can result in a major loss of revenue and production downtime. The levels of refrigerant which taint a product is dependant upon the type and packaging of the product, e.g. raw, unpacked foodstuffs will taint at lower concentrations when compared with those processed and packaged. Equally, the type of packing governs the ability of a refrigerant to taint the product, e.g. boxed or wrapped. Tainting can typically occur anywhere between 1-10ppm.

Reference Lists

Company Name: Bass / United Distillers / Unigate / Carlsberg-Tetley / Nestlé

Routes to Market:

Supply Chain	Example	Companies
End Users:	Beverage Petrochemical Chemical	Bass, Carlsberg-Tetley, Nestlé, United Distillers, Unigate, Shell, BP Shell Zeneca
Refrigeration Eng Contractors		M W Kellogg
Refrigeration Plant Manufacturers		York International, Star Refrigeration, Linde, J & E Hall, 3CL, Sabroe, Gresco, Gram, Beales Hunter, Hiwden, Trane, Grasso, Duham Bush, Promac, Vanguard, Century Corporation
Ammonia Manufacturers and Distribution		British Oxygen Company (BOC), Air Products, Zeneca, Dupont, Rhone Poulenc, Elf Atochem
Test Cell Design and Builders		IAC, Magellan Aerospace, APU, APS, AIOLOS, ASE
Professional Bodies	US	ASHRAE (www.ashrae.org) Refrigeration Engrs & Techs Association (www.reta.com) International Inst of Ammonia Refrigeration (www.iiar.org)

Who / What levels sold to:

- 1 Plant Safety Officer
- 2 Plant / Works Manager
- 3 Plant Refrigeration Engineer
- 4 Plant Engineer
- 5 Plant Maintenance Engineer
- 6 Project Manger
- 7 Occupational Hygienist

Sales Arguments / Drivers for each of the various levels:

- 1 Legislation compliance (COSHH & EN378) which concerns itself with personnel and plant protection only.
- 2 Product tainting and the potential loss/damage of a product batch. Refrigeration system availability and the potential impact upon production rates and costs.
- 3 Legislation compliance, ease of maintenance
- 4 Ease of maintenance
- 5 Legislation compliance, cost
- 6 COSHH compliance

Refrigeration and Ammonia



Product Packages:

1 Personnel protection: (25 & 35 ppm)

Portable gas monitors:

Single gas portable-Impulse Pro
0-100ppm NH₃
Multi gas portable-Impact Pro
NH₃ 0-100ppm, CO₂ 0-3% v/v,
O₂ deficiency, Flammable 0-100% LEL
Fixed detection system:
Signalpoint toxic electrochemical cells 0-50ppm
for non designated hazardous areas
Sensepoint toxic electrochemical cells 0-50ppm
NH₃ for designated hazardous
areas located within the breathing zone
System 57 with TWA facility)

2 Plant protection (Special Machinery Rooms):

Fixed detection system:

Sensors:
Low alarm < 500ppm for mechanical ventilation activation
(Sensepoint toxic electrochemical cells 0-1000ppm NH₃)
High alarm < 30,000ppm (3.0 % v/v) for auto plant
shut down.
(Sensepoint flammable electro-catalytic, ranged to 0-4%)
Located above compressors and surge tanks.
Control panels: Must be powered by an independent
emergency system e.g. battery back up.
Must operate audible / visual alarms so appropriate action
may be taken by the occupants.

3 Food tainting during cold storage:

Tainting of food stuffs can occur between 1 and 10ppm
dependant upon the type of food and whether it is
packed or unpacked. The end customer will be able to
advise. Tainted product results in major revenue loss and
production downtime. ZA solution:

Singlepoint monitor
MDA SPM 0.5-30.0 ppm, battery or mains operated.
Max line length: Standard 3 metres, Extended 30 metres
Multipoint (1-4)
MDA CM4 3.0-75.0 ppm
Max line length: up to 90 metres.

Refrigeration

Website/Contact

Summary of Content:

Air Conditioning & Refrigeration News	Tel: 020 8657 7100	Journal covering all aspects of the air conditioning and refrigeration industry. Read by air conditioning and refrigeration operatives and experts.
ACR Today	www.aydee.com	Magazine containing news and information on a wide range of refrigeration and air conditioning topics. Aimed at air conditioning and refrigeration engineers, consultants, specifiers and end users.
RAC - Refrigeration & Air	www.emap.com	Journal covering the air conditioning and refrigeration industry. Read by senior decision makers and buyers in the UK and overseas. Also aimed at installers, distributors and manufacturers.
Chaud Froid Plomberie CFP	http://www.edipa.fr / http://www.e-delta-t.com	Technical review covering design and installation of heating, air conditioning and refrigeration systems as well as plumbing and sanitation.
Contracting Canada	Tel: 905-56 92 777	Written for professional HVAC/refrigeration, plumbing and mechanical service/installation contractors. Includes product profiles, installation, maintenance and service tips and complete trade show coverage.
La Termotecnica	http://www.bias.it	Official journal of ATI (Italian Thermotechnics Association). Provides information on heating and refrigeration techniques
Kälte Klima aktuell	http://www.fachzeitschriften.de	Magazine about refrigeration and cooling.
L' Installatore Italiano	http://www.elsevier.it	Magazine concerning industrial and civil plant engineering and installation. Includes articles on refrigeration, plumbing, ventilation, air conditioning, heating and electrical installations.
HVAC Insider	http://www.insidernewspapers.com	Published in 14 regional editions for the Eastern United States heating, air conditioning and refrigeration industry. Editorial includes up-to-date information on technical tips, product reviews, commercial and industrial industry news, a job bulletin, new businesses and promotions and a calendar of events.
A S H R A E Journal	http://www.ashraejournal.org	Provides the latest HVAC and refrigeration information and technology through application oriented articles. Features cover system design, construction and service life, new products, industry meetings, shows and news, as well as promotions and awards for industry leaders.
Engineered Systems	http://www.esmagazine.com	Provides practical, application-oriented information to assist facility engineers, consulting engineers and mechanical contractors who design, specify, install, maintain, and purchase non-residential heating, ventilating, air conditioning and refrigeration equipment and components.
Tidningen kyla	http://www.kyl.se/kyla/	Magazine containing news and information about the cold storage and commercial refrigeration industry, including heatpumps and air conditioning. Also provides articles on new products and materials.
The Specifier's Guide to Heating, Ventilating, Air Conditioning & Refrigeration Association	Tel: 020 8277 5403	Provides a directory of heating, ventilation, refrigeration and air conditioning. Published on behalf of the Heating and Ventilating Air Conditioning & Contractors. Aimed at specifiers of heating, ventilation, refrigeration, air conditioning Directory products and services.

Our Product Range



Fixed Gas Monitoring

Honeywell Analytics offers a wide range of fixed gas detection solutions for a diverse array of industries and applications including: Commercial properties, industrial applications, semiconductor manufacturers, energy plants and petrochemical sites.

- » Detection of flammable, oxygen and toxic gases (including exotics)
- » Innovative use of 4 core sensing technologies – paper tape, electrochemical cell, catalytic bead and infrared
- » Capability to detect down to Parts Per Billion (ppb) or Percent by Volume (%v/v)
- » Cost effective regulatory compliance solutions

Portable Gas Monitoring

When it comes to personal protection from gas hazards, Honeywell Analytics has a wide range of reliable solutions ideally suited for use in confined or enclosed spaces.

These include:

- » Detection of flammable, oxygen and toxic gases
- » Single gas personal monitors – worn by the individual
- » Multi-gas portable gas monitors – used for confined space entry and regulatory compliance
- » Multi-gas transportable monitors – used for temporary protection of area during site construction and maintenance activities

Technical Services

At Honeywell Analytics, we believe in the value of great service and customer care. Our key commitment is providing complete and total customer satisfaction. Here are just a few of the services we can offer:

- » Full technical support
- » Expert team on hand to answer questions and queries
- » Fully equipped workshops to ensure quick turnaround on repairs
- » Comprehensive service engineer network
- » Training on product use and maintenance
- » Mobile calibration service
- » Customised programmes of preventative/corrective maintenance
- » Extended warranties on products

Find out more

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