

## Refrigerant Detection and Pump Down Systems

Mitsubishi Electric's range of high specification Refrigerant Detection Systems supply a total refrigerant detection package.

The systems are designed to identify and minimise air conditioning gas leaks, with the option of providing refrigerant pump down of City Multi VRF R2 systems. Refrigerant Detection Systems help safeguard against refrigerant levels exceeding permitted concentration levels and react effectively in the event of a leak.

### Key Features

- Enables compliance with BS EN378 - Safety of Building Occupants, critical in hotel applications
- Can help achieve recognition within BREEAM Pollution Prevention Assessment, ideal for assisting in the design of modern, sustainable buildings
- Robust and tested leak detection with refrigerant pump down option
- Flexible refrigerant gas detection systems - semiconductor or infrared, in standalone or cost effective aspirated panel options
- Pump down panel incorporating all elements required for safety and environmental protection along with ease of installation
- Actuated ball valves to isolate refrigerant on pump down
- Alarm system to alert occupants and staff of any refrigerant leakages



#### The need for Refrigerant Detection Systems

**Mitsubishi Electric air conditioning systems use refrigerant, which if installed and maintained correctly are designed to never leak into the atmosphere.**

To protect against a worst case scenario, BS EN378, is in place as safety guidance for calculating the critical concentration of refrigerant if it were all to leak into an occupied space, which for R410A refrigerant is 0.44kg/m<sup>3</sup>.

Focusing specifically on sustainable buildings, BREEAM Pol 01 aims to minimise pollution under the unlikely event of leakage of refrigerant from the air conditioning system. Designed to reduce such pollution, the system provides an option which can help achieve recognition within BREEAM, subject to evaluation by an accredited BREEAM assessor.

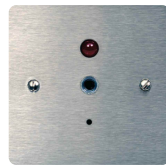
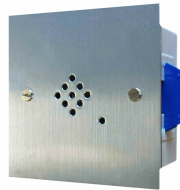
#### Safety of Building Occupants

Mitsubishi Electric's systems are designed to provide an audible and visual alarm if refrigerant leaks from an air conditioning system, which is a common requirement for hotel rooms and small occupied spaces as required by BS EN378.

The Refrigerant Detection Systems range from simple standalone sensors to advanced multi point aspirated systems covering multiple rooms. Available in a range of specifications using different technologies covering all applications, Mitsubishi Electric can provide the solution for refrigerant detection to ensure the safety of building occupants.



■ Semiconductor (White / Silver)



■ Aspirated



■ Aspirated Standalone

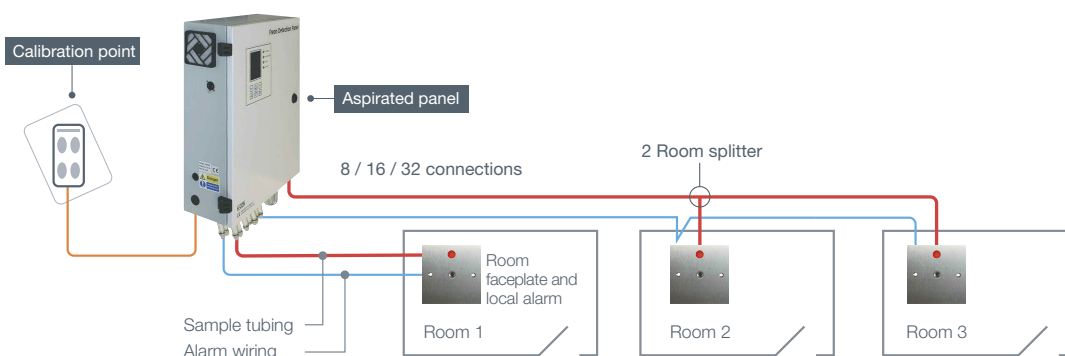
#### Semiconductor System

These systems have one sensor per space which includes refrigerant sensor and visual /audible alarm. KSGD-01 Semiconductors can be used stand alone or with 32/64 Remote Alarm panel.

#### Aspirated Systems

These systems have one master panel sensing from multiple spaces through tubing and termination room face plates. The panels include a refrigerant sensor but require additional local visual and audible alarm for BS EN378 compliance. These systems can also sample 2 rooms per channel, enabling up to 32 rooms to be monitored. These are ideal to install with City Multi R2 heat recovery VRF systems, as the tubing and alarm wiring can be run with the refrigerant pipes.

#### Aspirated System Diagram Example:



#### Pollution Prevention within BREEAM Assessment

Designed to reduce pollution under the unlikely event of refrigerant leaking from the air conditioning, the system provides an option to pump down and isolate the refrigerant within City Multi R2 heat recovery VRF systems.

Components are available to work alongside any of the leak detection systems including standalone and aspirated, to provide full safety and environmental protection from refrigerant leakage.

These systems can help achieve recognition within the Pollution section of BREEAM, subject to evaluation by an accredited BREEAM assessor.

#### City Multi Pump Down Control System KS8-OC1~8

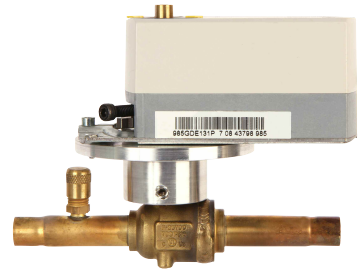
The controls panel is required to pump the refrigerant down in the system, providing the link between the leak detection system and the Mitsubishi Electric City Multi R2 heat recovery VRF system.

Panels are available to control from 1 to 8 outdoor units. Automatic pump down is only currently available on City Multi R2 heat recovery VRF (PURY, YHM, YJM, YKM models).

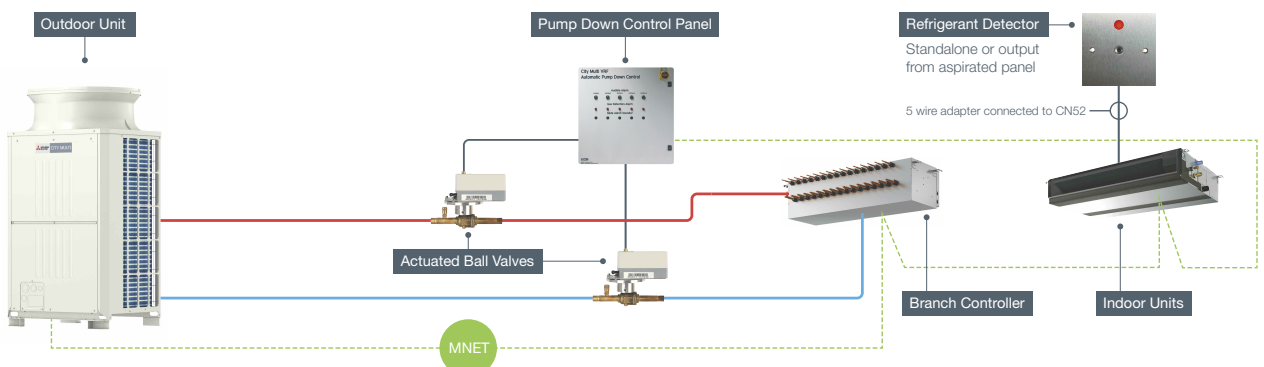


#### Actuated Isolation Ball Valves KS8-5/8~1.5/8ABV

The actuated ball valves enable the system to isolate refrigerant during and after pump down to minimise the effect of any refrigerant leakage should this occur, with one on the high and one on the low pressure refrigerant pipework of each system, situated between the outdoor unit and branch controller.



#### Refrigerant Gas Detection with City Multi VRF Automatic Pump Down Installation Example:



#### Refrigerant Detection Systems

Technology	Sensor	How it works	Application
<b>Semiconductor</b>	Metal oxide sensor	High resistance with oxygen (air). Resistance drop occurs when the oxygen is replaced with another gas	Open, clean environments (e.g Offices & Hotels)
<b>Infrared</b>	A gas sample tube with infrared light emitter and sensor at opposite ends	Different gases absorb different wave lengths of infrared light, so accurate detection is possible	Ideal for an array of applications including hotels as active detection of refrigerant sets off the alarm

Refrigerant Detector	KSGD-01W	KSGD-01S	KSIR-01	KS8-IR8C
<b>Description</b>	 Semiconductor white sensor	 Semiconductor silver sensor	 Standalone aspirated detector	 Aspirated panel
<b>Sensing Type</b>	Semiconductor	Semiconductor	Infrared	Infrared
<b>Power Supply</b>	12VDC (via KSTR12)	12VDC (via KSTR12)	12VDC (via KSTR12)	240VAC
<b>Number of rooms</b>	1	1	1	8 (16 max) / 16 (32 max) / 32 (64 max)
<b>Audible alarm</b>	✓	✓	✓	✓
<b>Visual alarm</b>	✓	✓	✓	X

Additional Items required for detection systems	Model Ref.
Transformer 12VDC	KSTR12
250m drum sampling tube for aspirated panel (black)	KS8-BST250
Stainless steel room faceplate with alarm for aspirated panel	KS8-SSFPA
Sampling tube two way manifold for aspirated panel	KS8-ST2M
Room alarm indicator (visual and audible alarm)	KSRA1

**Please note:** Commissioning is required on pump down systems.  
It is recommended that system design is completed with your local Mitsubishi Electric sales office.



Telephone: 01707 282880  
email: [air.conditioning@meuk.mee.com](mailto:air.conditioning@meuk.mee.com)  
web: [airconditioning.mitsubishielectric.co.uk](http://airconditioning.mitsubishielectric.co.uk)

UNITED KINGDOM Mitsubishi Electric Europe Living Environment Systems Division  
Travellers Lane, Hatfield, Hertfordshire, AL10 8XB, England General Enquiries Telephone: 01707 282880 Fax: 01707 278881  
IRELAND Mitsubishi Electric Europe Westgate Business Park, Ballymount, Dublin 24, Ireland  
Telephone: Dublin (01) 419 8800 Fax: Dublin (01) 419 8890 International code: (003531)

Country of origin: United Kingdom – Japan – Thailand – Malaysia. ©Mitsubishi Electric Europe 2017. Mitsubishi and Mitsubishi Electric are trademarks of Mitsubishi Electric Europe B.V. The company reserves the right to make any variation in technical specification to the equipment described, or to withdraw or replace products without prior notification or public announcement. Mitsubishi Electric is constantly developing and improving its products. All descriptions, illustrations, drawings and specifications in this publication present only general particulars and shall not form part of any contract. All goods are supplied subject to the Company's General Conditions of Sale, a copy of which is available on request. Third-party product and brand names may be trademarks or registered trademarks of their respective owners.

**Note:** The fuse rating is for guidance only. Please refer to the relevant databook for detailed specification. It is the responsibility of a qualified electrician/electrical engineer to select the correct cable size and fuse rating based on current regulation and site specific conditions. Mitsubishi Electric's air conditioning equipment and heat pump systems contain a fluorinated greenhouse gas, R410A (GWP:2088), R32 (GWP:675), R407C (GWP:1774) or R134a (GWP:1430). \*These GWP values are based on Regulation (EU) No 517/2014 from IPCC 4th edition. In case of Regulation (EU) No.626/2011 from IPCC 3rd edition, these are as follows. R410A (GWP:1975), R32 (GWP: 550), R407C (GWP:1650) or R134a (GWP:1300).



[www.greengateway.mitsubishielectric.co.uk](http://www.greengateway.mitsubishielectric.co.uk)  
Mitsubishi Electric UK's commitment to the environment

Follow us @meuk\_les  
Follow us @green\_gateway

Mitsubishi Electric  
Living Environmental Systems UK

mitsubishielectric2