

Air conditioning inspection report

Pizza Hut (UK) Ltd Unit 6, Festival Way, Festival Leisure Park BASILDON SS14 3WB	Report number 0797-9632-8150-1000-7803
	Valid until 19 July 2023

Executive summary

ACI Reports Ltd has been instructed to undertake a TM44 Air Conditioning Inspection Report on these premises by Luis and Bell Surveyors Ltd, Ashbourne Business Centre, Dig Street, Ashbourne DE6 1GF
Pizza Hut (UK) Ltd 384 Basildon 3
Unit 6 Festival Way
Basildon
SS14 3WB

The subject building is a modern single storey unit, constructed of cavity brick with a pitched roof and a flat roof area, fitted with double glazing, built circa 2000. The building is located on The Festival Way Retail Park, on the outskirts of Basildon and operates as a Restaurant, consisting of two Air Conditioned areas. Building occupancy hours are 11:30 to 22:00 Monday to Thursday, 11:30 to 23:00 Friday, 11:30 to 23:00 Saturday and 12:00 to 20:00 on Sunday with a maximum estimated occupancy of 65 people.

The Inspection and Report were undertaken in accordance with CIBSE's methodology, Inspection of Air Conditioning Systems TM44: 2012 Edition by an inspector accredited to the National Occupational Standard and accredited by Sterling Certification.

The primary aim of the report is to give the building owner, or operator, information about the performance of the system and plant and to identify opportunities to save energy and cut operating costs. This Report identifies any operating anomalies; no-cost/low-cost savings; capital investment opportunities; the size and appropriateness of refrigeration plant in relation to cooling loads and the effectiveness of current maintenance regimes.

Included within this report will be a description of the air conditioning services, system efficiencies and approximate sizing of the system compared to industry guidelines and suggested improvements, which could be made to increase the system efficiency. The inspection and report will benefit the owner or manager only if its findings are acted upon.

Whilst some items with regard to Health and Safety may have been noted, this should not be taken as a complete Report on Health and Safety. Similarly, whilst some items may refer to replacement of life expired plant, this should not be taken as a complete life cycle replacement report.

The building is cooled by x 4 split systems. x 4 Toshiba's serving the Restaurant Area and Kitchen. The terminal units consist of x 4 Toshiba FCU's and x 12 ceiling grilles. The cooling plant is located on the flat roof of the building, floor mounted. The systems are controlled by x 3 hard wired wall mounted controllers. The total estimated installed cooling capacity is approximately 50kW.

For the purposes of the report elements of the equipment were inspected to demonstrate the age, condition and method of control. The Report is based on a visual inspection only. No equipment or plant was removed or stripped down. Cooling requirements have been calculated in accordance with CIBSE Guides and therefore should not be treated as an in depth heat load calculation.

Equipment Inspected:-

Three Toshiba RAV SP1404AT-E external condensing units.

Three Ducted ceiling grilles.

Three Toshiba hard wired LCD wall controllers.

As no pre-survey information was provided, we requested access for compliance documents whilst on site. For the purposes of this report any missing asset information was gathered during the site visit.

The equipment inspected is in good condition, fully operational and is acceptably efficient for current operations. The Company uses Regional M&E Companies to maintain its air conditioning equipment.

The A/C systems inspected appeared to be appropriately maintained for current operations. The company undertakes 6 monthly filter cleaning programmes plus annual maintenance, which is adequate for the systems surveyed. We have not had sight of the latest maintenance records on this specific site.

The systems in the subject property are affected by the F-Gas Regulations, records should be available for F-Gas charge weights, F-Gas recovery and equipment should be labelled where applicable. SYS001, CP1, CP2 and SYS002 contain more than 3kg of refrigerant which is more than the equivalent GWP value of 5 tonnes of CO₂ and should have records available for leak checks in accordance with the F-Gas Regulation (EC) 517/2014 which came into effect on 1st January 2015 and uses the 4th IPCC assessment values.

The threshold level for leak checking different refrigerants varies dependent upon the GWP of the refrigerant that is used; refer to relevant Legislation tables. At the time of the inspection, leak test records were not available.

The control of the systems is local, however is adequate for current operations, but could be improved to gain maximum efficiency. Review on an ongoing basis to take advantage of evolving technology.

A number of opportunities are outlined within the report that should be considered to maximise efficiency. While there is no mandatory requirement to carry out any recommendations, acting upon the advice within the report may lead to a reduction in energy consumption and operating costs.

Key recommendations

Efficiency

Lighting controls and lamps play an important part in the heat load of a building. Improvements made in this area can significantly reduce heating load and therefore energy consumption used by the HVAC system. This site uses low voltage lighting.

Consider improving the control of the systems. See advice and comments on the control of AC sub system(s).

Maintenance

The systems in the subject property are affected by the F-Gas Regulations, records should be available for F-Gas charge weights, F-Gas recovery and equipment should be labelled where applicable. SYS001, CP1, CP2 and SYS002 contain more than 3kg of refrigerant which is more than the equivalent GWP value of 5 tonnes of CO₂ and should have records available for leak checks in accordance with the F-Gas Regulation (EC) 517/2014 which came into effect on 1st January 2015 and uses the 4th IPCC assessment values. The threshold level for leak checking different refrigerants varies dependent upon the GWP of the refrigerant that is used; refer to relevant Legislation tables. At the time of the inspection, leak test records were not available.

The Company has an efficient maintenance programme using regional maintenance contractors. It also utilises an on line portal for management of tasks; Verisae.

Controls

Consider reviewing the control of cooling equipment system functions where available; (a) Controls are set to the correct time and day; (b) Temperature Set points and Dead Bands are appropriately selected. (c) Weekday and weekend set on and off periods are set. (d) Equipment cannot operate when the building is not occupied. Consider reviewing new control equipment.

Management

Consider sub metering. See CIBSE TM39 / TM44 section 1.6. Where energy consumption has been recorded on a regular basis it may be possible to deduce whether a system is running excessively. This may indicate basic faults, for example undercharged systems, undersized systems, or control systems that may not be adequate or are incorrectly set.

Essential necessary documentation referred to in the record checklist pre inspection information could not be located during the inspection. It is strongly recommended that documentation is maintained in a building log book or online portal. It is recommended that all missing data is collated and storage and referencing of information is available for future inspections.

Subsystems inspected

VOL001/SYS001 Restaurant

Volume definitions	VOL001 Pizza Hut
Description	Toshiba x 2 RAV-SP1404AT-E split system, serving x 4 ducted ceiling diffusers.
Effective rated cooling output	12 kW
Area served	Restaurant
Inspection date	19 July 2018
Cooling plant count	2
AHU count	0
Terminal units count	2
Sub system controls count	1

VOL001/SYS002 Kitchen

Volume definitions	VOL001 Pizza Hut
Description	Toshiba x 1 RAV-SP1404AT-E split system, serving x 4 ducted ceiling grilles.
Effective rated cooling output	12 kW
Area served	Kitchen
Inspection date	19 July 2018

Cooling plant count	1
AHU count	0
Terminal units count	1
Sub system controls count	1

Pre-inspection records requested

Essential records

These records were not available:

- Itemised list of installed air conditioning and refrigeration plant including product makes, models and identification numbers
- Cooling capacities, with locations of the indoor and outdoor components of each plant
- Description of system control zones, with schematic drawings
- Description of method of control of temperature
- Description of method of control of periods of operation.
- Floor plans and schematics of air conditioning systems.

Desirable records

These records were not available:

- Reports from earlier inspections of air conditioning systems, and for the generation of an energy performance certificate
- Records of maintenance operations carried out on refrigeration systems, including cleaning indoor and outdoor heat exchangers, refrigerant leakage tests, repairs to refrigeration components replenishing with refrigerant
- Records of maintenance operations carried out on air delivery systems, including filter cleaning and changing, and cleaning of heat exchangers
- Records of calibration and maintenance operations carried out on control systems and sensors, or BMS systems and sensors
- Records of sub-metered air conditioning plant use or energy consumption
- For relevant air supply and extract systems, commissioning results of measured absorbed power at normal air delivery and extract rates, and commissioning results for normal delivered delivery and extract air flow rates (or independently calculated specific fan power for the systems)

Optional records

These records were not available:

- An estimate of the design cooling load for each system (if available). Otherwise, a brief description of the occupation of the cooled spaces, and of power consuming equipment normally used in those spaces
 - Records of any issues or complaints that have been raised concerning the indoor comfort conditions achieved in the treated spaces
 - Where a BMS is used the manager should arrange for a short statement to be provided describing its capabilities, the plant it is connected to control, the set points for the control of temperature, the frequency with which it is maintained, and the date of the last inspection and maintenance
 - Where a monitoring station, or remote monitoring facility, is used to continually observe the performance of equipment such as chillers, the manager should arrange for a statement to be provided describing the parameters monitored, and a statement reviewing the operating efficiency of the equipment
-

Cooling plants

Cooling plant 1

Unit Identifier	VOL001/SYS001 Restaurant
-----------------	--------------------------

Component Identifier	VOL001/SYS001/CP1 Restaurant
----------------------	------------------------------

Equipment Inspected

Rated Cooling Capacity (kW)	12
-----------------------------	----

Description (type/details)	Single Split
----------------------------	--------------

Location of Cooling Plant	Flat roof of building, floor mounted.
---------------------------	---------------------------------------

Manufacturer	Toshiba
--------------	---------

Model/Reference	RAV-SP1404AT-E
-----------------	----------------

Refrigerant Charge (kg)	3
-------------------------	---

Refrigerant Type	R410A
------------------	-------

Serial Number	404B0071
---------------	----------

Year Plant Installed	2014
----------------------	------

Areas/Systems Served	Restaurant
----------------------	------------

Note below any discrepancy between information provided by client and on site information collected, or any information of additional relevance to the cooling plant/system:

There are no discrepancies

Approved sections

CS2.1 Is the refrigeration plant operational?

Yes

The refrigeration plant was operational at the time of inspection

CS2.2/a Is the area around the refrigeration plant clear of obstructions & debris?

Yes

The area around the refrigeration plant is clear of obstructions and debris.

CS2.2/b Is the general condition of refrigeration and any associated central plant in good order?

Yes

The refrigeration and associated plant appeared to be in good condition.

CS2.2/c Is the condenser placed clear from warm air discharge louvres?

Yes

The condenser is placed clear from warm air discharge louvres.

CS2.3/a Are compressors operational or can they be brought into operation?

Yes

The compressors were operational at the time of inspection.

CS3.1/a Is the heat rejection plant operational?

Yes

The heat rejection plant was operational when conducting the survey.

CS3.1/b Are condenser heat exchangers undamaged/ un-corroded and clean?

Yes

The condenser appeared undamaged and clean.

CS3.2/a Is the area around the heat rejection plant clear of obstructions & debris?

Yes

Yes the refrigeration plant was clear of obstructions and debris. Carry out regular inspections to ensure the area around the equipment is clear of obstructions and debris.

Regularly check refrigeration plant to ensure obstructions do not accumulate behind the heat rejection grills.

CS3.2/b Is the condenser free of any possibility of air recirculation?

Yes

The condenser is positioned correctly and free from any possibility of any warm air recirculation.

CS4.1 Is the insulation on circulation pipe work well fitted and in good order?

Yes

All of the refrigerant pipework for the condenser was in good condition.

Appropriately Sized Cooling Plant

Installed Cooling Capacity (kW)	36.0
---------------------------------	------

Occupant Density (m2/person)	3.87
------------------------------	------

Total Floor Area served by this plant(m2)	155
---	-----

Total Occupants served by this plant	40
Maximum Instantaneous Heat Gain (W/m2)	200.0
The Installed Size is Deemed	More than expected

Notes and Recommendations

The current version of the Building Regulations Approved Document Part L documentation provides guidance suggesting that the plant should not be more than 20% oversized. This should be adopted as means of comparison to stay in line with current standards.

Industry benchmark

The calculation refers to x 3 Toshiba split systems serving the Restaurant. The area has an estimated total of 40 occupants and a total square area of 155m2. CIBSE Guide F implies an upper heat gain for a retail environment as 200W/ m2. Therefore $200\text{W/m}^2 \times 155\text{m}^2 = 31000\text{W} / 1000 = 31.0\text{kW}$, this calculation allows for a margin of between + or - 20% of the implied upper heat gain. The installed capacity is 36.5kW. The installed system size is deemed to be as more than expected for the area served.

Refrigeration

Pre Compressor(°C)	12
Post Compressor(°C)	6
Ambient(°C)	9
The Temperature is Deemed	As expected
Refrigerant Type	R410A
Assess the refrigeration compressor(s) and the method of refrigeration capacity control	Inverter controlled.

Are there any signs of a refrigerant leak?

No

No visible signs of refrigerant leakage.

Montreal/ODS/F-Gas controlled?

Yes

The system in the subject building is affected by the F-Gas Regulations, records should be available for F-Gas charge weights, F-Gas recovery and equipment should be labelled where applicable. SYS001 CP1

contains more than 3kg of refrigerant which is more than the equivalent GWP value of 5 tonnes of CO² and should have records available for leak checks in accordance with the F-Gas Regulation (EC) 517/2014 which came into effect on 1st January 2015 and uses the 4th IPCC assessment values. The threshold level for leak checking different refrigerants varies dependent upon the GWP of the refrigerant that is used; refer to relevant Legislation tables. At the time of the inspection, leak test records were not available.

Notes and Recommendations

Regular Maintenance

Is there evidence of regular maintenance?

Yes

Maintenance records are stored on-line (Verisae) and were also requested on site, the systems inspected appeared to be appropriately maintained for current operations.

Is the maintenance undertaken by suitably competent people and in accordance to industry guidelines?

Yes

Maintenance is managed on the Verisae system.

Metering Comparison to appropriate energy benchmarks

Is metering installed to enable monitoring of energy consumption of refrigeration plant?

No

Consider installing sub metering to the plant to enable the recording of electricity consumption. The benefits of completing these works will be more compelling as energy monitoring can create immediate savings when combined with the use of latest technology. Introduce policy that all new electrical installations should be fitted with Sub-meters as standard

Is the refrigeration plant connected to a BEMS that can provide out of range alarms?

No

No BMS in use.

Are there any records of air conditioning plant usage or sub-metered energy consumption with expected hours of use per year for the plant?

No

No records available to indicate usage or sub-metered energy consumption.

Is the energy consumption or hours of use excessive?

No

No data available at the time of the inspection.

Water Cooled Chillers (Cooling Towers & Evaporative Condensers)

Is the water flow through cooling towers or evaporative coolers even and efficient, and there is no loss of water?

No

Not Applicable

Is there a management regime in place to ensure that water is regularly checked and treated to ensure that there is no Legionella risk?

No

Not applicable.

Humidity Control

Is there separate equipment installed for humidity control?

No

Not applicable.

Cooling plant 2

Unit Identifier	VOL001/SYS001 Restaurant
-----------------	--------------------------

Component Identifier	VOL001/SYS001/CP2 Restaurant
----------------------	------------------------------

Equipment Inspected

Rated Cooling Capacity (kW)	12
-----------------------------	----

Description (type/details)	Single Split
----------------------------	--------------

Location of Cooling Plant	Flat roof of building, floor mounted.
---------------------------	---------------------------------------

Manufacturer	Toshiba
--------------	---------

Model/Reference	RAV-SP1404AT-E
-----------------	----------------

Refrigerant Charge (kg)	3
-------------------------	---

Refrigerant Type	R410A
------------------	-------

Serial Number	404B0038
---------------	----------

Year Plant Installed	2014
----------------------	------

Areas/Systems Served	Restaurant
----------------------	------------

Note below any discrepancy between information provided by client and on site information collected, or any information of additional relevance to the cooling plant/system:

There are no discrepancies

Approved sections

CS2.1 Is the refrigeration plant operational?

Yes

The refrigeration plant was operational at the time of inspection

CS2.2/a Is the area around the refrigeration plant clear of obstructions & debris?

Yes

The area around the refrigeration plant is clear of obstructions and debris.

CS2.2/b Is the general condition of refrigeration and any associated central plant in good order?

Yes

The refrigeration and associated plant appeared to be in good condition.

CS2.2/c Is the condenser placed clear from warm air discharge louvres?

Yes

The condenser is placed clear from warm air discharge louvres.

CS2.3/a Are compressors operational or can they be brought into operation?

Yes

The compressors were operational at the time of inspection.

CS3.1/a Is the heat rejection plant operational?

Yes

The heat rejection plant was operational when conducting the survey.

CS3.1/b Are condenser heat exchangers undamaged/ un-corroded and clean?

Yes

The condenser appeared undamaged and clean.

CS3.2/a Is the area around the heat rejection plant clear of obstructions & debris?

Yes

Yes the refrigeration plant was clear of obstructions and debris. Carry out regular inspections to ensure the area around the equipment is clear of obstructions and debris.

Regularly check refrigeration plant to ensure obstructions do not accumulate behind the heat rejection grills.

CS3.2/b Is the condenser free of any possibility of air recirculation?

Yes

The condenser is positioned correctly and free from any possibility of any warm air recirculation.

CS4.1 Is the insulation on circulation pipe work well fitted and in good order?

Yes

All of the refrigerant pipework for the condenser was in good condition.

Appropriately Sized Cooling Plant

Installed Cooling Capacity (kW)	36.0
---------------------------------	------

Occupant Density (m2/person)	3.87
------------------------------	------

Total Floor Area served by this plant(m2)	155
---	-----

Total Occupants served by this plant	40
--------------------------------------	----

Maximum Instantaneous Heat Gain (W/m2)	200.0
--	-------

The Installed Size is Deemed	More than expected
------------------------------	--------------------

Notes and Recommendations

The current version of the Building Regulations Approved Document Part L documentation provides guidance suggesting that the plant should not be more than 20% oversized. This should be adopted as means of comparison to stay in line with current standards.

Industry benchmark

The calculation refers to x 3 Toshiba split systems serving the Restaurant. The area has an estimated total of 40 occupants and a total square area of 155m2. CIBSE Guide F implies an upper heat gain for a retail environment as 200W/ m2. Therefore $200\text{W/m}^2 \times 155\text{m}^2 = 31000\text{W}$ $1000 = 31.0\text{kW}$, this calculation allows for a margin of between + or - 20% of the implied upper heat gain. The installed capacity is 36.5kW. The installed system size is deemed to be as more than expected for the area served.

Refrigeration

Pre Compressor(°C)	12
--------------------	----

Post Compressor(°C)	6
---------------------	---

Ambient(°C)	9
-------------	---

The Temperature is Deemed	As expected
---------------------------	-------------

Refrigerant Type	R410A
------------------	-------

Assess the refrigeration compressor(s) and the method of refrigeration capacity control	Inverter controlled.
---	----------------------

Are there any signs of a refrigerant leak?

No

No visible signs of refrigerant leakage.

Montreal/ODS/F-Gas controlled?

Yes

The system in the subject building is affected by the F-Gas Regulations, records should be available for F-Gas charge weights, F-Gas recovery and equipment should be labelled where applicable. SYS001 CP2 contains more than 3kg of refrigerant which is more than the equivalent GWP value of 5 tonnes of CO₂ and should have records available for leak checks in accordance with the F-Gas Regulation (EC) 517/2014 which came into effect on 1st January 2015 and uses the 4th IPCC assessment values. The threshold level for leak checking different refrigerants varies dependent upon the GWP of the refrigerant that is used; refer to relevant Legislation tables. At the time of the inspection, leak test records were not available.

Notes and Recommendations**Regular Maintenance*****Is there evidence of regular maintenance?***

Yes

Maintenance records are stored on-line (Verisae) and were also requested on site, the systems inspected appeared to be appropriately maintained for current operations.

Is the maintenance undertaken by suitably competent people and in accordance to industry guidelines?

Yes

Maintenance is managed on the Verisae system.

Metering Comparison to appropriate energy benchmarks***Is metering installed to enable monitoring of energy consumption of refrigeration plant?***

No

Consider installing sub metering to the plant to enable the recording of electricity consumption. The benefits of completing these works will be more compelling as energy monitoring can create immediate savings when combined with the use of latest technology. Introduce policy that all new electrical installations should be fitted with Sub-meters as standard

Is the refrigeration plant connected to a BEMS that can provide out of range alarms?

No

No BMS in use.

Are there any records of air conditioning plant usage or sub-metered energy consumption with expected hours of use per year for the plant?

No

No records available to indicate usage or sub-metered energy consumption.

Is the energy consumption or hours of use excessive?

No

No data available at the time of the inspection.

Water Cooled Chillers (Cooling Towers & Evaporative Condensers)

Is the water flow through cooling towers or evaporative coolers even and efficient, and there is no loss of water?

No
Not Applicable

Is there a management regime in place to ensure that water is regularly checked and treated to ensure that there is no Legionella risk?

No
Not applicable.

Humidity Control

Is there separate equipment installed for humidity control?

No
Not applicable.

Cooling plant 3

Unit Identifier	VOL001/SYS002 Kitchen
-----------------	-----------------------

Component Identifier	VOL001/SYS002/CP1 Kitchen
----------------------	---------------------------

Equipment Inspected

Rated Cooling Capacity (kW)	12
-----------------------------	----

Description (type/details)	Single Split
----------------------------	--------------

Location of Cooling Plant	Flat roof of building, floor mounted.
---------------------------	---------------------------------------

Manufacturer	Toshiba
--------------	---------

Model/Reference	RAV-SP1404AT-E
-----------------	----------------

Refrigerant Charge (kg)	3
-------------------------	---

Refrigerant Type	R410A
------------------	-------

Serial Number	404B0064
---------------	----------

Year Plant Installed	2014
----------------------	------

Areas/Systems Served	Kitchen
----------------------	---------

Note below any discrepancy between information provided by client and on site information collected, or any information of additional relevance to the cooling plant/system:

There are no discrepancies

Approved sections

CS2.1 Is the refrigeration plant operational?

Yes

The refrigeration plant was operational at the time of inspection

CS2.2/a Is the area around the refrigeration plant clear of obstructions & debris?

Yes

The area around the refrigeration plant is clear of obstructions and debris.

CS2.2/b Is the general condition of refrigeration and any associated central plant in good order?

Yes

The refrigeration and associated plant appeared to be in good condition.

CS2.2/c Is the condenser placed clear from warm air discharge louvres?

Yes

The condenser is placed clear from warm air discharge louvres.

CS2.3/a Are compressors operational or can they be brought into operation?

Yes

The compressors were operational at the time of inspection.

CS3.1/a Is the heat rejection plant operational?

Yes

The heat rejection plant was operational when conducting the survey.

CS3.1/b Are condenser heat exchangers undamaged/ un-corroded and clean?

Yes

The condenser appeared undamaged and clean.

CS3.2/a Is the area around the heat rejection plant clear of obstructions & debris?

Yes

Yes the refrigeration plant was clear of obstructions and debris. Carry out regular inspections to ensure the area around the equipment is clear of obstructions and debris.

Regularly check refrigeration plant to ensure obstructions do not accumulate behind the heat rejection grills.

CS3.2/b Is the condenser free of any possibility of air recirculation?

Yes

The condenser is positioned correctly and free from any possibility of any warm air recirculation.

CS4.1 Is the insulation on circulation pipe work well fitted and in good order?

Yes

All of the refrigerant pipework for the condenser was in good condition.

Appropriately Sized Cooling Plant

Installed Cooling Capacity (kW)	12.5
---------------------------------	------

Occupant Density (m2/person)	8.12
------------------------------	------

Total Floor Area served by this plant(m2)	65
---	----

Total Occupants served by this plant	8
--------------------------------------	---

Maximum Instantaneous Heat Gain (W/m2)	200.0
--	-------

The Installed Size is Deemed	As expected
------------------------------	-------------

Notes and Recommendations

The current version of the Building Regulations Approved Document Part L documentation provides guidance suggesting that the plant should not be more than 20% oversized. This should be adopted as means of comparison to stay in line with current standards.

Industry benchmark

The calculation refers to x 1 Toshiba split systems serving the Kitchen. The area has an estimated total of 8 occupants and a total square area of 65m2. CIBSE Guide F implies an upper heat gain for a retail environment as 200W/ m2. Therefore $200\text{W/m}^2 \times 65\text{m}^2 = 13000\text{W}$ $13000\text{W} / 1000 = 13.0\text{kW}$, this calculation allows for a margin of between + or - 20% of the implied upper heat gain. The installed capacity is 12.5kW. The installed system size is deemed to be as expected for the area served.

Refrigeration

Pre Compressor(°C)	12
--------------------	----

Post Compressor(°C)	6
---------------------	---

Ambient(°C)	9
-------------	---

The Temperature is Deemed	As expected
---------------------------	-------------

Refrigerant Type	R410A
------------------	-------

Assess the refrigeration compressor(s) and the method of refrigeration capacity control	Inverter controlled.
---	----------------------

Are there any signs of a refrigerant leak?

No

No visible signs of refrigerant leakage.

Montreal/ODS/F-Gas controlled?

Yes

The system in the subject building is affected by the F-Gas Regulations, records should be available for F-Gas charge weights, F-Gas recovery and equipment should be labelled where applicable. SYS002 contains more than 3kg of refrigerant which is more than the equivalent GWP value of 5 tonnes of CO₂ and should have records available for leak checks in accordance with the F-Gas Regulation (EC) 517/2014 which came into effect on 1st January 2015 and uses the 4th IPCC assessment values. The threshold level for leak checking different refrigerants varies dependent upon the GWP of the refrigerant that is used; refer to relevant Legislation tables. At the time of the inspection, leak test records were not available.

Notes and Recommendations**Regular Maintenance*****Is there evidence of regular maintenance?***

Yes

Maintenance records are stored on-line (Verisae) and were also requested on site, the systems inspected appeared to be appropriately maintained for current operations.

Is the maintenance undertaken by suitably competent people and in accordance to industry guidelines?

Yes

Maintenance is managed on the Verisae system.

Metering Comparison to appropriate energy benchmarks***Is metering installed to enable monitoring of energy consumption of refrigeration plant?***

No

Consider installing sub metering to the plant to enable the recording of electricity consumption. The benefits of completing these works will be more compelling as energy monitoring can create immediate savings when combined with the use of latest technology. Introduce policy that all new electrical installations should be fitted with Sub-meters as standard

Is the refrigeration plant connected to a BEMS that can provide out of range alarms?

No

No BMS in use.

Are there any records of air conditioning plant usage or sub-metered energy consumption with expected hours of use per year for the plant?

No

No records available to indicate usage or sub-metered energy consumption.

Is the energy consumption or hours of use excessive?

No

No data available at the time of the inspection.

Water Cooled Chillers (Cooling Towers & Evaporative Condensers)

Is the water flow through cooling towers or evaporative coolers even and efficient, and there is no loss of water?

No

Not Applicable

Is there a management regime in place to ensure that water is regularly checked and treated to ensure that there is no Legionella risk?

No

Not applicable.

Humidity Control

Is there separate equipment installed for humidity control?

No

Not applicable.

Terminal units

Terminal unit 1

Unit	VOL001/SYS001 Restaurant
Component	VOL001/SYS001/TU1 Restaurant
Description of unit	Toshiba ducted ceiling diffuser.
Cooling plant serving terminal unit	VOL001/SYS001/CP1 Restaurant
Manufacturer	Toshiba
Year installed	2014
Area served	Restaurant
Discrepancies noted	There are no discrepancies.

CS4.1 Insulation

Is the pipework adequately insulated?

Yes

Pipework insulation where visible, is generally adequate and in good condition. Follow the manufacturers recommended maintenance guide to prolong the longevity and ensure optimum performance. Follow best practice guidelines, CIBSE / HVCA SMG 2000.

Is the ductwork adequately insulated?

No

Not applicable.

CS4.2 Unit condition

Are the terminal units in good working order?

Yes

The terminal unit was in good working order.

The assessor made the following notes and recommendations:

- Continue regular maintenance inspections, review maintenance seasonally to ensure that filters, grilles and diffusers are free from debris. Follow the manufacturers recommended maintenance guide to prolong the longevity and ensure optimum performance. Follow best practice guidelines, CIBSE / HVCA SMG 2000 / Guide M

CS5.1, CS5.2 Grilles and air flow

Do air delivery openings provide good distribution?

Yes

The air delivery openings provide good distribution.

Is there evidence of tampering with diffusers?

No

There is no evidence of the diffusers being altered in any way.

Are chilled and hot water being supplied to terminals simultaneously?

No

Not applicable.

Are there any records of occupant complaints regarding air distribution?

No

There were no records of occupant complaints.

CS5.3, CS5.4, CS5.5 Diffuser positions

Is there potential for air to short-circuit from supply to extract?

No

Equipment is positioned correctly and there is no potential to short circuit.

Is the position of partitioning or furniture adversely affecting performance?

No

Equipment is positioned well away from any obstructions.

Is the control and operation adequate?

Yes

The control of the system is adequate for the terminal units to operate correctly.

Terminal unit 2

Unit	VOL001/SYS001 Restaurant
------	--------------------------

Component	VOL001/SYS001/TU2 Restaurant
-----------	------------------------------

Description of unit	Toshiba ducted ceiling diffuser.
---------------------	----------------------------------

Cooling plant serving terminal unit	VOL001/SYS001/CP2 Restaurant
-------------------------------------	------------------------------

Manufacturer	Toshiba
--------------	---------

Year installed	2014
----------------	------

Area served	Restaurant.
-------------	-------------

Discrepancies noted	There are no discrepancies.
---------------------	-----------------------------

CS4.1 Insulation

Is the pipework adequately insulated?

Yes

Pipework insulation where visible, is generally adequate and in good condition. Follow the manufacturers recommended maintenance guide to prolong the longevity and ensure optimum performance. Follow best practice guidelines, CIBSE / HVCA SMG 2000.

Is the ductwork adequately insulated?

No

Not applicable.

CS4.2 Unit condition

Are the terminal units in good working order?

Yes

The terminal unit was in good working order.

The assessor made the following notes and recommendations:

- Continue regular maintenance inspections, review maintenance seasonally to ensure that filters, grilles and diffusers are free from debris. Follow the manufacturers recommended maintenance guide to prolong the longevity and ensure optimum performance. Follow best practice guidelines, CIBSE / HVCA SMG 2000 / Guide M

CS5.1, CS5.2 Grilles and air flow

Do air delivery openings provide good distribution?

Yes

The air delivery openings provide good distribution.

Is there evidence of tampering with diffusers?

No

There is no evidence of the diffusers being altered in any way.

Are chilled and hot water being supplied to terminals simultaneously?

No
Not applicable.

Are there any records of occupant complaints regarding air distribution?

No
There were no records of occupant complaints.

CS5.3, CS5.4, CS5.5 Diffuser positions

Is there potential for air to short-circuit from supply to extract?

No
Equipment is positioned correctly and there is no potential to short circuit.

Is the position of partitioning or furniture adversely affecting performance?

No
Equipment is positioned well away from any obstructions.

Is the control and operation adequate?

Yes
The control of the system is adequate for the terminal units to operate correctly.

Terminal unit 3

Unit	VOL001/SYS002 Kitchen
Component	VOL001/SYS002/TU1 Kitchen
Description of unit	Toshiba ducted ceiling grille.
Cooling plant serving terminal unit	VOL001/SYS002/CP1 Kitchen
Manufacturer	Toshiba
Year installed	2014
Area served	Kitchen

Discrepancies noted

There are no discrepancies.

CS4.1 Insulation

Is the pipework adequately insulated?

Yes

Pipework insulation where visible, is generally adequate and in good condition. Follow the manufacturers recommended maintenance guide to prolong the longevity and ensure optimum performance. Follow best practice guidelines, CIBSE / HVCA SMG 2000.

Is the ductwork adequately insulated?

No

Not applicable.

CS4.2 Unit condition

Are the terminal units in good working order?

Yes

The terminal unit was in good working order.

The assessor made the following notes and recommendations:

- Continue regular maintenance inspections, review maintenance seasonally to ensure that filters, grilles and diffusers are free from debris. Follow the manufacturers recommended maintenance guide to prolong the longevity and ensure optimum performance. Follow best practice guidelines, CIBSE / HVCA SMG 2000 / Guide M

CS5.1, CS5.2 Grilles and air flow

Do air delivery openings provide good distribution?

Yes

The air delivery openings provide good distribution.

Is there evidence of tampering with diffusers?

No

There is no evidence of the diffusers being altered in any way.

Are chilled and hot water being supplied to terminals simultaneously?

No

Not applicable.

Are there any records of occupant complaints regarding air distribution?

No

There were no records of occupant complaints.

CS5.3, CS5.4, CS5.5 Diffuser positions

Is there potential for air to short-circuit from supply to extract?

No

Equipment is positioned correctly and there is no potential to short circuit.

Is the position of partitioning or furniture adversely affecting performance?

No

Equipment is positioned well away from any obstructions.

Is the control and operation adequate?

Yes

The control of the system is adequate for the terminal units to operate correctly.

System controls

Control for VOL001/SYS001 Restaurant

CS8.1 Is the zoning appropriate in relation to anticipated cooling demand?

Yes

Zoning is appropriate in relation to cooling demand.

CS8.2 Note the current indicated weekday and time of day on controllers or BMS against the actual time.

No time or date displayed.

The assessor made the following notes and recommendations:

- Regularly review date and time are set correctly.

CS8.3/a Note the set on and off periods (for weekday and weekend if this facility is available with the timer).

Not determined.

CS 8.3/b Is there a shortfall in timer capabilities?

No

There is no shortfall in timer capabilities.

CS8.4 Identify and assess zone heating and cooling temperature control sensors. Are the sensor types and locations appropriate in relation to heating and cooling emitters, heat flows or likely temperature distributions in the zone or space?

Yes

There are return temperature sensors installed within the internal unit, which are appropriate for this equipment.

CS8.5 Note the set temperature in each zone for heating and cooling in relation to the activities and occupancy of zones and spaces in relation to the manager's intent.

18 degrees.

CS8.6 Note whether a 'dead band' is, or can be, set between heating and cooling.

Not determined

CS8.7 Do the sub system controls integrate effectively with the overall system control strategy?

Yes

CS8.8 Assess the means of modulating or controlling air flow rate through the air supply and exhaust ducts.

Air flow can be controlled, via inverter.

PS3.6 Are guidance notices visible or controls available to inhibit use of cooling equipment whilst windows are open or cooling/heating is on?

No

There were no notices visible at the time of the inspection.

The assessor made the following notes and recommendations:

- Consider providing guidance notices and educating to staff on the general use of the systems and operating environment

Control for VOL001/SYS002 Kitchen

CS8.1 Is the zoning appropriate in relation to anticipated cooling demand?

Yes

Zoning is appropriate in relation to cooling demand.

CS8.2 Note the current indicated weekday and time of day on controllers or BMS against the actual time.

No time or date displayed.

The assessor made the following notes and recommendations:

- Regularly review date and time are set correctly.

CS8.3/a Note the set on and off periods (for weekday and weekend if this facility is available with the timer).

Not determined.

CS 8.3/b Is there a shortfall in timer capabilities?

No

There is no shortfall in timer capabilities.

CS8.4 Identify and assess zone heating and cooling temperature control sensors. Are the sensor types and locations appropriate in relation to heating and cooling emitters, heat flows or likely temperature distributions in the zone or space?

Yes

There are return temperature sensors installed within the internal unit, which are appropriate for this equipment.

CS8.5 Note the set temperature in each zone for heating and cooling in relation to the activities and occupancy of zones and spaces in relation to the manager's intent.

18 degrees.

CS8.6 Note whether a 'dead band' is, or can be, set between heating and cooling.

Not determined

CS8.7 Do the sub system controls integrate effectively with the overall system control strategy?

Yes

CS8.8 Assess the means of modulating or controlling air flow rate through the air supply and exhaust ducts.

Air flow can be controlled, via inverter.

PS3.6 Are guidance notices visible or controls available to inhibit use of cooling equipment whilst windows are open or cooling/heating is on?

No

There were no notices visible at the time of the inspection.

The assessor made the following notes and recommendations:

- Consider providing guidance notices and educating to staff on the general use of the systems and operating environment

Assessor's details

Assessor's name

Rodney Hay

Email

rodney.hay@acireports.co.uk

Assessor ID

STER001057

Employer/Trading name

ACI Reports Ltd

Employer/Trading address

Suite A9, Allied Business Centre, Potter Place,
Skelmersdale, WN8 9PW

Accreditation scheme

Sterling Accreditation Ltd

Accreditation scheme telephone

0161 727 4303

Accreditation scheme email

info@sterlingaccreditation.com

Inspection certificate

[See the air conditioning inspection certificate for this property. \(/energy-certificate/0930-7907-0688-2110-6074\)](#)
