Air conditioning inspection report

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Fitness First
Festival Leisure Park, Festival Way
BASILDON
SS14 3WB

Report number
9666-5099-0025-0590-1895

This report expired on
19 November 2017

Executive summary

ACI Reports Ltd has been commissioned to undertake an inspection of the air conditioning systems and associated controls at Fitness First - Basildon. Festival Leisure Park, Festival Way, Basildon SS14 3WB.

The subject building is a modern five storey semi-detached structure located in a business park area of Basildon and operates as a gymnasium comprising of two floors of which the public and staff areas are treated space. Building occpancy hours are Monday to Thursday 0530 to 2300. Friday 0530 to 2100. Saturday and Sunday 0700 to 2030.

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 :
5No. Daikin R410a inverter driven RZQG140L7Y1B condensers connected to 10No. Ceiling underslung cassettes with hardwired controllers.
5No. Daikin R410a inverter driven RZQG140L7Y1B condensers connected to 10No. Ceiling cassettes with hardwired controllers.
1No. Daikin R410a inverter driven RZQG140L7Y1B condenser connected to 1No. Ceiling cassette with hardwired controller.
1No. Daikin R410a inverter driven RZQG71L7Y1B condenser connected to 1No. Ceiling underslung cassette with hardwired controller.
3No. Daikin R410a inverter driven RXS50J2V1B9 condensers connected to 3No. wall mounted cassette with hardwired controller.
1No. Daikin R410a inverter driven REYQ8P9Y1B VRV condenser connected to 8No. wall mounted cassettes with hardwired controllers.

For the purpose of the report samples have been taken in accordance with CIBSE TM44. Samples taken from areas 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. The report may also cover areas under a landlords' control, this will be specified where included.

Equipment inspected:
3No. Daikin R410a inverter driven condensers (42kW).
3No. Daikin Ceiling underslung cassettes
2No. Daikin ceiling cassettes.
3No. Daikin hardwired controllers.

System Documentation was readily available during the inspection process.

The equipment was found to be in good working condition and is acceptably efficient for current operations.

A six-monthly maintenance regime was verbally confirmed as being in place. The internal filters were dirty suggesting the maintenance schedule requires increasing to quarterly.

Evidence suggests maintenance has been conducted within the manufactures guidelines.

The control of the systems is adequate for current operations. However we reccomend that a central controller is installed on site to allow timeclocking.

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

1) The systems appear appropriately sized for the cooling load.

Maintenance

1) Although some of the systems were found to contain less than 3Kg of refrigerant and are not required to comply with F-Gas regulations, good practice guidelines suggest that regular refrigerant leak checks are essential to ensure that the systems are well maintained and operating efficiently.

2) Consider checking Insulation refrigeration pipework on a frequent basis, insulation deteriorates over time and can lead to inefficiencies.

3) A maintenance regime is currently in place but no records were available on site. Evidence suggests maintenance is not regular or sufficient enough; grilles, filters, and terminal units are dirty. Increasing the frequency of maintenance will increase efficiency and lifetime of equipment.

Controls

1) Consider providing guidance notices to staff on the general use of the system controllers. Limit who can set and control the system.

2) Consider regularly checking that system temperature schedule programmes match current occupancy requirements. In non-critical areas lower heating set points to as low as possible, around 19 degrees Celsius, and raise cooling set points to 25 degrees Celsius. Ensure controls strategy has a “dead band” of at least 3 degrees Celsius between the need for cooling and the need for heating. Consider allowing temperatures in non-critical areas to fluctuate more widely than is traditionally expected but in a controlled manner. Refer to Carbon Trust CTG 005 Good Practice Guide.

3) Consider the use of PIR sensors for limited use rooms such as meeting rooms. The PIR sensor can trigger the room A/C unit and lighting upon occupancy and will automatically switch off the system when the room is empty. We advise that this is considered as part of an overall power saving and carbon emitting review.

4) Consider installing a central controller to allow timeclocking . Easy gains with regard to reducing energy consumption are available by ensuring that HVAC equipment is time scheduled and only operates when required. Staff notices should be placed near timers to prevent unauthorised use. Consider whether to lock timers and allow only senior management to review.

Management

1) Documentation; some necessary information could not be located during the inspection. It is strongly recommended that documentation is maintained in a building log book. It is recommended that all missing data is collated and storage and referencing of information is available for future inspections.

2) 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.

Subsystems inspected

VOL001 / SYS001 Gym 1.

Volume definitions	VOL001
Description	4No. R410a inverter driven RZQ140 twin split systems.
Effective rated cooling output	56 kW
Area served	Gym 1.
Inspection date	19 November 2012
Cooling plant count	4
AHU count	0
Terminal units count	8
Sub system controls count	4

VOL001 / SYS002 Male Changing.

Volume definitions	VOL001
Description	1No. R410a inverter driven RZQ140 twin split system.
Effective rated cooling output	14 kW
Area served	Male Changing.
Inspection date	19 November 2012

Cooling plant count	1
AHU count	0
Terminal units count	2
Sub system controls count	1

Pre-inspection records requested

Essential records

These records were reviewed:

- 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 method of control of temperature
- Floor plans and schematics of air conditioning systems.

These records were not available:

- Description of system control zones, with schematic drawings
- Description of method of control of periods of operation.

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 Gym 1.
Component Identifier	VOL001 / SYS001 / CP001, CP002.

Equipment Inspected

Rated Cooling Capacity (kW)	28
Description (type/details)	2No. Daikin R410a inverter driven condensers.
Location of Cooling Plant	Condenser compound at ground level.
Manufacturer	Daikin.
Model/Reference	2No. RZQG140L7Y1B
Refrigerant Charge (kg)	8
Refrigerant Type	R410A
Serial Number	CP001) 2200979. CP002) 2200978.
Year Plant Installed	2012
Areas/Systems Served	Gym 1.

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:

None.

Approved sections

CS2.1 Is the refrigeration plant operational?

Yes

All equipment is operational and working correctly.

1) Maintenance. Follow the manufacturer’s recommended maintenance guide to prolong longevity and ensure optimum performance.

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

Yes

The area around the equipment is free of obstructions and debris.

1) In-house procedures; carry out regular inspections to ensure the area around the equipment is clear of obstructions and debris.

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

Yes

All equipment is operational and working correctly.

1) Maintenance. Follow the manufacturer’s recommended maintenance guide to prolong longevity and ensure optimum performance.

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

Yes

The condenser is clear of warm air discharge sources.

1) As Expected.

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

Yes

All equipment is operational and working correctly.

1) Maintenance. Follow the manufacturer’s recommended maintenance guide to prolong longevity and ensure optimum performance.

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

Yes

All equipment is operational and working correctly.

1) Maintenance. Follow the manufacturer’s recommended maintenance guide to prolong longevity and ensure optimum performance.

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

Yes

Heat exchangers are clean and undamaged.

1) Maintenance. Follow the manufacturer’s recommended maintenance guide to prolong longevity and ensure optimum performance.

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

Yes

The area around the equipment is free of obstructions and debris.

1) In-house procedures; carry out regular inspections to ensure the area around the equipment is clear of obstructions and debris.

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

Yes

The condenser is free from recirculation.

1) As Expected.

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

Yes

Pipework where visible is adequately insulated.

1) The loss of insulation will directly affect system efficiency and should be regularly inspected.

Appropriately Sized Cooling Plant

Installed Cooling Capacity (kW)	56
Occupant Density (m2/person)	4.96
Total Floor Area served by this plant(m2)	372
Total Occupants served by this plant	75
Maximum Instantaneous Heat Gain (W/m2)	150
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.

1) The area has a total occupancy of 75 and a total floor area of 372m². CIBSE guide F implies an upper heat gain for gymnasiums of 150W/m². 150W/m² x 372m² = 55.8kW +20% = 66.9kW. This calculation allows for a 20% margin. Using typical heat gains of 150W/m² (CIBSE guide F) – This system is sized correctly.

2) This calculation takes into acocunt all four of the split systems that serve this area.

Refrigeration

Pre Compressor(°C)	0
Post Compressor(°C)	0
Ambient(°C)	11
The Temperature is Deemed	As expected

Refrigerant Type	R410A
Assess the refrigeration compressor(s) and the method of refrigeration capacity control	Compressors are inverter driven.

Are there any signs of a refrigerant leak?

No

Systems appear leak free.

Montreal/ODS/F-Gas controlled?

Yes

System base charges exceed 3kg and require an annual leak check to comply.

Notes and Recommendations

1) Systems provide adequate cooling with temperature differences accross the internal coils.

Regular Maintenance

Is there evidence of regular maintenance?

Yes

Evidence of bi-annual maintenance.

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

Yes

Company Unknown.

Metering Comparison to appropriate energy benchmarks

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

No

Recorded meter reading: No submetering.

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

No

No BEMS installed.

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

Not Applicable.

Is the energy consumption or hours of use excessive?

No

Not Applicable.

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 / SYS002 Male Changing.
Component Identifier	VOL001 / SYS002 / CP008.

Equipment Inspected

Rated Cooling Capacity (kW)	14
Description (type/details)	R410a inverter driven RZQ140 condenser.
Location of Cooling Plant	Condenser compound at ground level.
Manufacturer	Daikin.
Model/Reference	RZQG140L7Y1B.
Refrigerant Charge (kg)	4
Refrigerant Type	R410A

Serial Number	2200976.
Year Plant Installed	2012
Areas/Systems Served	Male changing.

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:

None.

Approved sections

CS2.1 Is the refrigeration plant operational?

Yes

All equipment is operational and working correctly.

1) Maintenance. Follow the manufacturer's recommended maintenance guide to prolong longevity and ensure optimum performance.

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

Yes

The area around the equipment is free of obstructions and debris.

1) In-house procedures; carry out regular inspections to ensure the area around the equipment is clear of obstructions and debris.

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

Yes

All equipment is operational and working correctly.

1) Maintenance. Follow the manufacturer's recommended maintenance guide to prolong longevity and ensure optimum performance.

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

Yes

The condenser is clear of warm air discharge sources.

1) As Expected.

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

Yes

All equipment is operational and working correctly.

1) Maintenance. Follow the manufacturer's recommended maintenance guide to prolong longevity and ensure optimum performance.

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

Yes

All equipment is operational and working correctly.

1) Maintenance. Follow the manufacturer’s recommended maintenance guide to prolong longevity and ensure optimum performance.

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

Yes

Heat exchangers are clean and undamaged.

1) Maintenance. Follow the manufacturer’s recommended maintenance guide to prolong longevity and ensure optimum performance.

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

Yes

The area around the equipment is free of obstructions and debris.

1) In-house procedures; carry out regular inspections to ensure the area around the equipment is clear of obstructions and debris.

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

Yes

The condenser is free from recirculation.

1) As Expected.

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

Yes

Pipework where visible is adequately insulated.

1) The loss of insulation will directly affect system efficiency and should be regularly inspected.

Appropriately Sized Cooling Plant

Installed Cooling Capacity (kW)	14
Occupant Density (m2/person)	4.5
Total Floor Area served by this plant(m2)	90
Total Occupants served by this plant	20
Maximum Instantaneous Heat Gain (W/m2)	150
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.

1) The area has a total occupancy of 20 and a total floor area of 90m². CIBSE guide F implies an upper heat gain for gymnasiums of 150W/m². 150W/m² x 90m² = 13.5kW +20% = 16.2kW. This calculation allows for a 20% margin. Using typical heat gains of 150W/m² (CIBSE guide F) – This system is sized correctly.

Refrigeration

Pre Compressor(°C)	0
Post Compressor(°C)	0
Ambient(°C)	11
The Temperature is Deemed	As expected
Refrigerant Type	R410A
Assess the refrigeration compressor(s) and the method of refrigeration capacity control	Compressor is inverter driven.

Are there any signs of a refrigerant leak?

No

System appears leak free.

Montreal/ODS/F-Gas controlled?

Yes

System base charge exceeds 3kg and requires an annual leak check to comply.

Notes and Recommendations

1) System provides adequate cooling with temperature differences accross the internal coils.

Regular Maintenance

Is there evidence of regular maintenance?

Yes

Evidence of bi-annual maintenance.

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

Yes

Company Unknown.

Metering Comparison to appropriate energy benchmarks

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

No

Recorded meter reading: No submetering.

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

No

No BEMS installed.

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

Not Applicable.

Is the energy consumption or hours of use excessive?

No

Not Applicable.

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 Gym 1.
Component	VOL001 / SYS001 / TU001 / Gym 1.
Description of unit	Ceiling underslung cassette.
Cooling plant serving terminal unit	CP001.
Manufacturer	Daikin.
Year installed	2012
Area served	Gym 1
Discrepancies noted	None.

CS4.1 Insulation

Is the pipework adequately insulated?

Yes

Pipework where visible is adequately insulated.

Is the ductwork adequately insulated?

No

Not Applicable.

CS4.2 Unit condition

Are the terminal units in good working order?

Yes

All equipment is operational and working correctly. Filters are dirty.

The assessor made the following notes and recommendations:

- 1) Maintenance. Follow the manufacturer’s recommended maintenance guide to prolong longevity and ensure optimum performance.

CS5.1, CS5.2 Grilles and air flow

Do air delivery openings provide good distribution?

Yes

System provides good distribution.

Is there evidence of tampering with diffusers?

No

Equipment is appears free from tampering.

Are chilled and hot water being supplied to terminals simultaneously?

No

Not Applicable.

Are there are any records of occupant complaints regarding air distribution?

No

No complaints recorded.

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

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

No

Equipment is free from short circuiting.

Is the position of partitioning or furniture adversely affecting performance?

No

Equipment is clear of obstructions.

Is the control and operation adequate?

Yes

Equipment provides adequate control over treated space.

The assessor made the following notes and recommendations:

- 1) As Expected.

Terminal unit 2

Unit	VOL001 / SYS001 Gym 1.
Component	VOL001 / SYS001 / TU002 / Gym 1.
Description of unit	Ceiling underslung cassette.

Cooling plant serving terminal unit	CP001
Manufacturer	Daikin.
Year installed	2012
Area served	Gym 1.
Discrepancies noted	None.

CS4.1 Insulation

Is the pipework adequately insulated?

Yes

Pipework where visible is adequately insulated.

Is the ductwork adequately insulated?

No

Not Applicable.

CS4.2 Unit condition

Are the terminal units in good working order?

Yes

All equipment is operational and working correctly. Filters are dirty.

The assessor made the following notes and recommendations:

- 1) Maintenance. Follow the manufacturer’s recommended maintenance guide to prolong longevity and ensure optimum performance.

CS5.1, CS5.2 Grilles and air flow

Do air delivery openings provide good distribution?

Yes

System provides good distribution.

Is there evidence of tampering with diffusers?

No

Equipment is appears free from tampering.

Are chilled and hot water being supplied to terminals simultaneously?

No

Not Applicable.

Are there are any records of occupant complaints regarding air distribution?

No

No complaints recorded.

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

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

No

Equipment is free from short circuiting.

Is the position of partitioning or furniture adversely affecting performance?

No

Equipment is clear of obstructions.

Is the control and operation adequate?

Yes

Equipment provides adequate control over treated space.

Terminal unit 3

Unit	VOL001 / SYS001 Gym 1.
Component	VOL001 / SYS001 / TU002 / Gym 1.
Description of unit	Ceiling underslung cassette.
Cooling plant serving terminal unit	CP002.
Manufacturer	Daikin.
Year installed	2012
Area served	Gym 1.
Discrepancies noted	None.

CS4.1 Insulation

Is the pipework adequately insulated?

Yes

Pipework where visible is adequately insulated.

Is the ductwork adequately insulated?

No

Not Applicable.

CS4.2 Unit condition

Are the terminal units in good working order?

Yes

All equipment is operational and working correctly. Filters are dirty.

The assessor made the following notes and recommendations:

- 1) Maintenance. Follow the manufacturer’s recommended maintenance guide to prolong longevity and ensure optimum performance.

CS5.1, CS5.2 Grilles and air flow

Do air delivery openings provide good distribution?

Yes

System provides good distribution.

Is there evidence of tampering with diffusers?

No

Equipment is appears free from tampering.

Are chilled and hot water being supplied to terminals simultaneously?

No

Not Applicable.

Are there are any records of occupant complaints regarding air distribution?

No

No complaints recorded.

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

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

No

Equipment is free from short circuiting.

Is the position of partitioning or furniture adversely affecting performance?

No

Equipment is clear of obstructions.

Is the control and operation adequate?

Yes

Equipment provides adequate control over treated space.

The assessor made the following notes and recommendations:

- 1) As Expected.

Terminal unit 4

Unit	VOL001 / SYS002 Male Changing.
Component	VOL001 / SYS002 / TU014 / Male Changing.
Description of unit	Ceiling cassette.
Cooling plant serving terminal unit	CP008.
Manufacturer	Daikin.
Year installed	2012
Area served	Male Changing.
Discrepancies noted	None.

CS4.1 Insulation

Is the pipework adequately insulated?

Yes

Pipework where visible is adequately insulated.

Is the ductwork adequately insulated?

No

Not Applicable.

CS4.2 Unit condition

Are the terminal units in good working order?

Yes

All equipment is operational and working correctly. Filters are dirty.

The assessor made the following notes and recommendations:

- 1) Maintenance. Follow the manufacturer's recommended maintenance guide to prolong longevity and ensure optimum performance.

CS5.1, CS5.2 Grilles and air flow

Do air delivery openings provide good distribution?

Yes

System provides good distribution.

Is there evidence of tampering with diffusers?

No

Equipment is appears free from tampering.

Are chilled and hot water being supplied to terminals simultaneously?

No

Not Applicable.

Are there are any records of occupant complaints regarding air distribution?

No

No complaints recorded.

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

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

No

Equipment is free from short circuiting.

Is the position of partitioning or furniture adversely affecting performance?

No

Equipment is clear of obstructions.

Is the control and operation adequate?

Yes

Equipment provides adequate control over treated space.

The assessor made the following notes and recommendations:

- 1) As Expected.

Terminal unit 5

Unit	VOL001 / SYS002 Male Changing.
Component	VOL001 / SYS002 / TU15 / Male Changing.
Description of unit	Ceiling cassette.
Cooling plant serving terminal unit	CP008.
Manufacturer	Daikin.
Year installed	2012
Area served	Male Changing.
Discrepancies noted	None.

CS4.1 Insulation

Is the pipework adequately insulated?

Yes

Pipework where visible is adequately insulated.

Is the ductwork adequately insulated?

No

Not Applicable.

CS4.2 Unit condition

Are the terminal units in good working order?

Yes

All equipment is operational and working correctly. Filters are dirty.

The assessor made the following notes and recommendations:

- 1) Maintenance. Follow the manufacturer’s recommended maintenance guide to prolong longevity and ensure optimum performance.

CS5.1, CS5.2 Grilles and air flow

Do air delivery openings provide good distribution?

Yes

System provides good distribution.

Is there evidence of tampering with diffusers?

No

Equipment is appears free from tampering.

Are chilled and hot water being supplied to terminals simultaneously?

No

Not Applicable.

Are there are any records of occupant complaints regarding air distribution?

No

No complaints recorded.

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

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

No

Equipment is free from short circuiting.

Is the position of partitioning or furniture adversely affecting performance?

No

Equipment is clear of obstructions.

Is the control and operation adequate?

Yes

Equipment provides adequate control over treated space.

The assessor made the following notes and recommendations:

- 1) As Expected.

System controls

Control for VOL001 / SYS001 Gym 1.

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

Yes

Single zone controller.

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

No time displayed.

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

No inbuilt timer.

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

No

No timer shortfall.

The assessor made the following notes and recommendations:

- 1) As Expected.

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

Spatial temperature sensors are in the return air of the AHU.

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.

Set point is Cool 21degrees, Heat 16degrees.

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

Dead band is 5degrees.

The assessor made the following notes and recommendations:

- 1) As Expected.

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

Yes

Controls integrate effectively.

The assessor made the following notes and recommendations:

- 1) As Expected.

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

Airflow is controlled by selectable fan speed and modulated by internal fan speed controller.

The assessor made the following notes and recommendations:

- 1) Set to automatic for optimal efficiency.

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

No guidance notices.

The assessor made the following notes and recommendations:

- 1) Consider guidance notices for general operation.

Control for VOL001 / SYS001 Gym 1.

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

Yes

Multi zone area.

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

No time displayed.

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

No inbuilt timer.

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

No

No timer shortfall.

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

Spatial temperature sensors are in the return air of the AHU.

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.

Set point is Cool 21degrees, Heat 16degrees.

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

Dead band is 5degrees.

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

Yes

Controls integrate effectively.

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

Airflow is controlled by selectable fan speed and modulated by internal fan speed controller.

The assessor made the following notes and recommendations:

- 1) Set to automatic for optimal efficiency.

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

No guidance notices.

Control for VOL001 / SYS002 Male Changing.

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

Yes

Single zone controller.

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

No time displayed.

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

No inbuilt timer.

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

No

No timer shortfall.

The assessor made the following notes and recommendations:

- 1) As Expected.

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

Spatial temperature sensors are in the return air of the AHU.

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.

Set point is Cool 21degrees, Heat 20degrees.

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

Dead band is 1degree.

The assessor made the following notes and recommendations:

- 1) As Expected.

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

Yes

Controls integrate effectively.

The assessor made the following notes and recommendations:

- 1) As Expected.

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

Airflow is controlled by selectable fan speed and modulated by internal fan speed controller.

The assessor made the following notes and recommendations:

- 1) Set to automatic for optimal efficiency.

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

No guidance notices.

The assessor made the following notes and recommendations:

- 1) Consider guidance notices for general operation.

Assessor’s details

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Inspection certificate

See the air conditioning inspection certificate for this property. (/energy-certificate/0160-0562-6059-6999-8096)