



Business in the Community

Chooses sustainable HVAC solution

The fundamental ethos behind the charity Business in the Community (BITC) is to promote business and workplace sustainability. The charity's remit promotes sustainable practice in all aspects of business operation and its culture.

The BITC offices are on the ground floor of a four-storey building located in Shepherdess Walk, within the Greater London area. The existing air conditioning system, which contained the refrigerant R-22, had experienced a drop in efficiency, primarily due to the condensers being enclosed which was carried out some time after completion of the installation. As the system will not be able to be topped up with R-22 from 2014, performance would continue to decrease and result in increased running costs. Demand for air conditioning had risen, since the system was installed, due to increasing staff numbers.

A feasibility study was carried out to ascertain the optimum approach to bring the system up-to-date. The existing system could not have a top-up of reclaimed R-22 after December 2014, because of legislation banning its use due to the detrimental effect on the atmosphere's ozone layer. The installation of a completely new system was also considered but not pursued, due to cost and installation logistics.

The Solution

The Daikin VRVIII-Q system was chosen for true heat recovery, as this allowed the existing pipe run to be utilised for the new system. Retaining the existing pipe run overcame the problem

of accessing the ceiling void throughout the office areas and meant that cost savings on the installation could be made. Norman Disney & Young, a firm of consulting engineers was employed to oversee the mechanical services design and build scheme by ISG, interior fit-out specialists, to ensure it met the client's requirements. This included the fitting of system condensers within the limited external plant space. To keep noise levels to a minimum and avoid disturbance to residential neighbours the condensers were housed within a custom designed acoustic enclosure. The design of this was agreed with Daikin.

The new installation includes 12 externally fitted Heat Recovery Condenser units connected using the existing copper pipework to 35 new fan coil units fitted internally for the distribution of uniform air flow at a controlled temperature within set parameters. The fan coil units consist of a mixture of concealed ceiling mounted units and Round Flow Cassettes of varying capacities between 2kW and 6kW.

To facilitate independent heating or cooling of different fan coil units each unit had a branch selector box fitted to enable separate unit outputs.



Heat can be recovered from the system where fan coil units are in cooling mode and transferred to areas requiring heating, or surplus heat can be transferred and released externally.

The Daikin VRVIII-Q system operates within the pressure parameters of the old system to allow the re-use of the existing pipework. The lower pressure results in a minor reduction in capacity and duty of the units in relation to a completely new system, however the cost savings outweigh the capital cost of the installation.

The latest systems incorporating current technology and R-410A refrigerant can operate with an increased efficiency of up to 30% in comparison with older systems containing the R-22 refrigerant. Therefore the capital costs of replacing, or updating, the system can be partially offset by lower, ongoing running costs.

The installation also included a Daikin Sky Air Seasonal Smart DX Split AC system to serve the IT Communications room and provide high levels of seasonal efficiency. This is ideal for IT rooms to allow constant cooling at low humidity levels, thus providing ideal temperature control for computer equipment. Evaporating and condensing temperatures can also be altered to further enhance energy efficiency levels.

A total of 27 wired remote controls were installed for users to be able to easily set winter, summer, or mid-season schedules. Maximum and minimum temperature set points are configured so that they can be easily changed by the user. Presence sensors were set up to run automatically on the Round Flow Cassettes with a potential running cost saving of up to 27% over a three hour period of non-occupancy achieved by altering the temperature based on occupancy levels.

The Daikin i-Touch controller was installed to manage the temperature parameters for the complete system with thermostatic cut off to improve energy usage. The temperature band can be widened to save even more energy. From this controller, detailed monitoring and simplified operation of the system is accessible with current and historical energy consumption performance data. This can be monitored across the internet and adjustments made as required.

The installation

Sutton Cooling Services, of Sutton, Surrey, which has over 25 years of experience in the supply and installation of comfort cooling and air conditioning systems, carried out the installation of the replacement air conditioning system at Shepherdess Walk.

Kellie Lord, Facilities Manager at the BITC commented,

“We are very happy with the Daikin system – it is 1000 times better than the old system and was installed just in time for the hot summer weather. A total of 200 employees work here and the system should help with productivity.”

R-22 Replacement

From December 2014 older air conditioning and chiller systems containing the R-22 refrigerant will not be able to be topped-up: these in-situ systems will therefore become obsolete over time. To provide an efficient system the Daikin VRVIII-Q system can be utilised with the existing pipework, saving on cost and installation time.

The Government’s Enhanced Capital Allowance (ECA) scheme can help towards the purchase of updated air conditioning equipment by providing enhanced tax relief for investment in energy saving equipment. This can help lighten the effect of the capital purchase cost.

Conclusion

The Daikin VRVIII-Q heat recovery and air conditioning system aptly caters for the increased demand for both heating and cooling. With new systems which incorporate the latest technological advancement, and new refrigerant, optimum running cost and carbon savings can be achieved. This compares favourably with the running costs of previous, outdated systems.

The new system runs on R410-A refrigerant instead of the R-22 refrigerant which cannot be used to top up systems after December 2014. Old air conditioning systems running on R-22 will gradually become redundant over the coming years with either complete replacement or partial replacement becoming necessary.

Code	Description	No of units
RQEQ140P	VRVIII-Q Heat Recovery Condenser units	12
FXFQ-A	Roundflow Cassette	24
FXSQ-P	Ducted Fan Coil Unit	10
FCQG-F	Cassette Fan Coil Unit - Slim	1
RZQG100L7V1	Condensing unit – Seasonal Smart	1
DCS601C51	Intelligent Controller	1