



iPlantManager

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DAIKIN CAN PROVIDE AN EFFECTIVE AND PROFITABLE WAY TO IMPROVE THE ENERGY PROFILE OF COMMERCIAL AND INDUSTRIAL BUILDINGS.

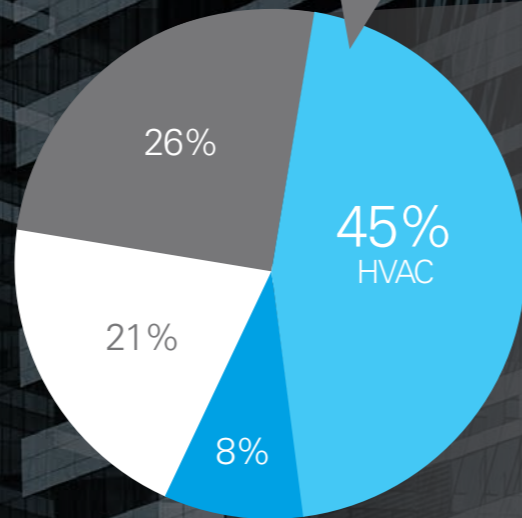
Following on from their vast experience as leading HVAC solution providers, Daikin has designed

iPlant Manager: A highly specialised control and optimisation solution dedicated to plant rooms.

Created with an in-depth understanding of all thermodynamic variables involved in managing plant room HVAC equipment, iPlant Manager enables optimum control of every device and its integration into a single synergistic system.

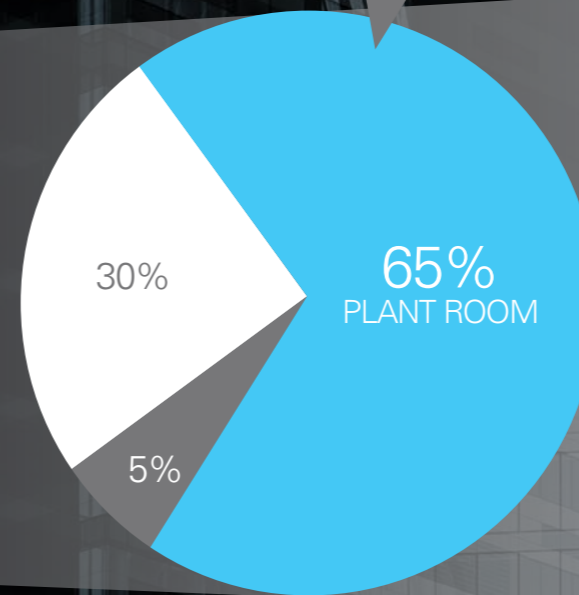
iPlant Manager is therefore the best investment to harness the energy saving potential offered by HVAC plant room equipment, driving real energy saving routines and effectively reducing your total energy bill.

IN COMMERCIAL BUILDINGS HVAC ACCOUNTS FOR 45% OF TOTAL ENERGY CONSUMPTION



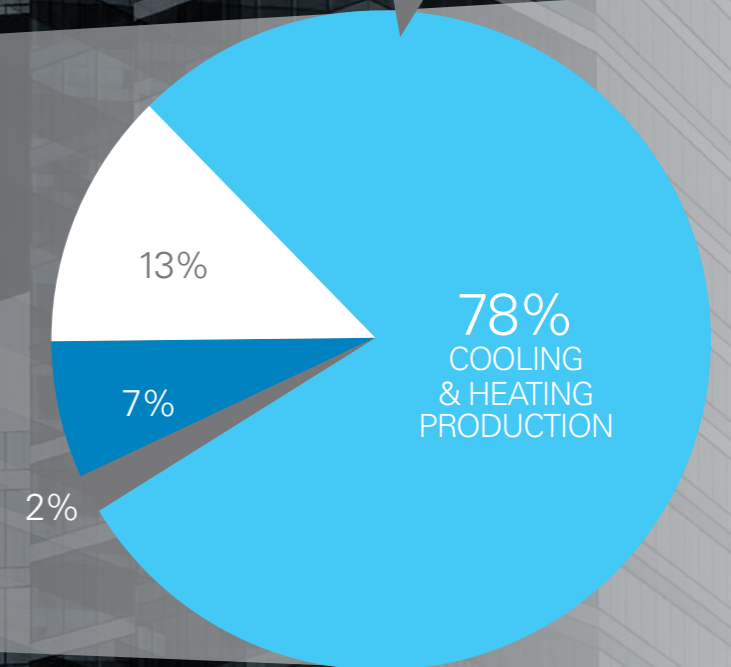
● HVAC ● LIGHTING ● OTHER ● OFFICE

65% OF THIS IS USED IN THE PLANT ROOM ALONE!



● PLANT ROOM ● AIR SIDE ● OTHER

78% OF PLANT ROOM ENERGY IS USED IN THERMAL FLUID GENERATION FOR HEATING & COOLING SYSTEMS!



● HEATING & COOLING PRODUCTION ● PUMPS ● COOLING TOWERS ● OTHER

IN COMMERCIAL BUILDINGS, HVAC IS BY FAR THE MOST ENERGY INTENSIVE SYSTEM, ACCOUNTING FOR CLOSE TO HALF OF THE TOTAL ENERGY CONSUMPTION.

For this reason every efficiency improvement in HVAC performance can significantly reduce the energy profile of the building, turning HVAC optimisation into a value generating opportunity.

TYPICALLY HIDDEN AWAY IN PLANT ROOMS, HVAC SYSTEMS CAN BE COMPLEX, CHALLENGING AND ARE FREQUENTLY OVERLOOKED. NO WONDER THAT ENERGY SAVING OPPORTUNITIES ARE MISSED IN THIS COMPLEX TECHNICAL ARENA

Dedicated, specialised control solutions are required to manage HVAC systems correctly and efficiently. By optimising the operation and maintenance of these systems, it is indeed possible to capture the true energy reduction potential available and to manage this over time.

THE PLANT ROOM

The plant room can be considered the HEART of the HVAC system within the building. It is typically where hot and cold water is created for distribution to other HVAC subsystems throughout the building. Typical HVAC equipment in plant rooms include; chillers, heat pumps and boilers; heat rejection systems: air, water, ground source; and distribution equipment: pumps, valves and pipework.

Chillers and heat pumps are the heaviest energy using components, accounting for 78% of total plant room energy consumption.

Optimisation of the energy used within the plant room is therefore critical to the overall building energy profile, and can only be effectively managed by suitably experienced technical experts.

Source: US Department Of Energy (DOE). Office Building Environment, DHW minimal requirement provided by the main boilers through a heat exchanger. Boiler plant and pumping assumed to be a separate system. In some instance heating and cooling may be required instantaneously

Excellent system design and the use of high quality components are essential. However, without accurate M&V, continuous controls commissioning and tuning even the best HVAC systems degrade over time.



iPlantManager

FEATURES AND BENEFITS



PLANT PERFORMANCE MONITORING



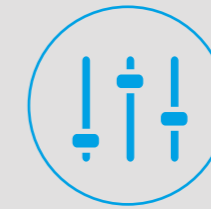
PLANT DIAGNOSTICS AND REPORTING



PLANT OPTIMISATION



PLANT MEASUREMENT AND VERIFICATION



PLANT CONTROL AND AUTOMATION



PLANT CONTINUOUS COMMISSIONING AND TUNING

iPLANT MANAGER IS THE NEW PLANT ROOM OPTIMISATION AND CONTROL SOFTWARE SYSTEM DEVELOPED BY DAIKIN.

IT PROVIDES A COMPREHENSIVE, RELIABLE AND DYNAMIC SOLUTION BACKED BY DAIKIN'S PROVEN EXPERIENCE AND KNOWLEDGE.

Optimisation is not achieved by the use of a single algorithm designed to ensure the best efficiency, but is rather a continuous process articulated through different levels of smart software functions, which contribute to ensure the best result.

In order to achieve and maintain the high level of efficiency as per original design, optimised management of the plant room is essential. Every single element of the system involved in the production and the distribution of the energy must therefore operate in perfect harmony.

For this reason it is essential to use a dedicated optimisation & control software system which includes high-end logic, to ensure real energy savings as well as delivering long term reliability.

PLANT PERFORMANCE MONITORING

Ensuring complete control of all HVAC devices in the plant room through its user friendly interface, iPlant Manager allows easy management of the plant room with continuous monitoring of its performance, thus creating the cornerstone for optimisation.

PLANT DIAGNOSTICS & REPORTING

The masses of data managed by iPlant Manager is readily accessible and easy to use thanks to smart reporting and diagnostics functions. These tools allows complex data to be quickly and easily transformed into useful information. Decisions can now be made based on real knowledge thanks to a full range of pre-scheduled and on-demand instant reports and diagnostic alarms.

By comparing real values against design data and monitoring trends, this module allows early detection of faults, poor performance, and system degradation, providing excellent support for a condition based maintenance regime.

PLANT OPTIMISATION

iPlant Manager is designed to run the plant room at the optimum efficiency, driven through real and measurable energy saving strategies, integrating advanced algorithms in the control of all main HVAC component plants.

PLANT MEASUREMENT & VERIFICATION

"You can't manage what you can't measure." On a continuous basis, iPlant Manager measures the process, enabling real-time comparisons of the measured actual efficiency versus design data. This is a fundamental demonstration of your actual progress on the journey towards optimum efficiency.

PLANT CONTROL AND AUTOMATION

Enabling the automated control of all components is a prerequisite to effectively tackle the challenge of improved plant room management.

PLANT CONTINUOUS COMMISSIONING AND TUNING

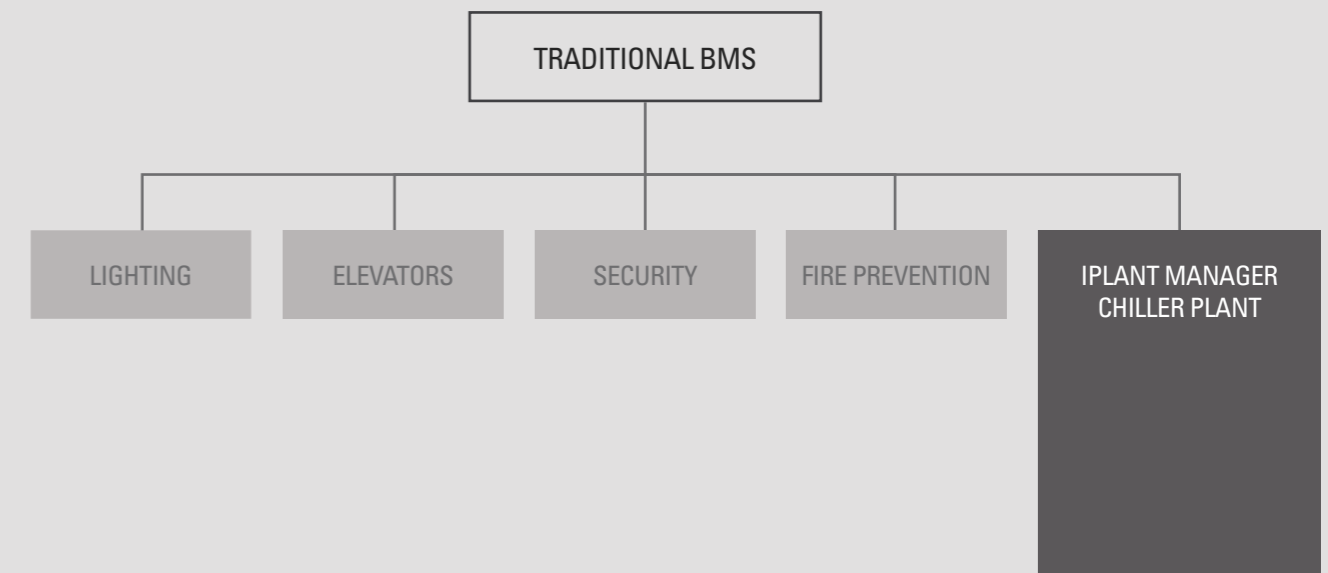
iPlant Manager is continuously monitoring plant conditions and adjusting it's operation to ensure that the most reliable and efficient operation exists. Powerful tools within iPlant Manager makes both automatic and manual continuous commissioning and tuning simple and effective.

FUNCTIONS / FEATURES IN THE PLANT ROOM	BMS WHEN APPLIED TO PLANT ROOM	IPLANT MANAGER WHEN APPLIED TO PLANT ROOM	iPlantManager MAIN BENEFITS
"Design once, apply many"	Ad hoc customisation necessary	✓ + Highly configurable proven, standard solutions	Tailored customisation only required for very special plant room designs or to accommodate unique needs
Factory tested features	Not available	✓	
Management	✓	✓	Scheduling, temperature settings and management functions dedicated to the plant room
Monitoring	✓	✓	3D graphics and user friendly dash board
Web accessibility	Possible	✓ Native embedded	Licence-free full accessibility from anywhere
Communication and transparency to other systems	Possible	Embedded	Niagara Framework by Tridium offers native open protocol integration into BMS
Possible plant room configurability	All types, by means of custom programming	Most types standard, all types possible. "Design once, apply many"	Certain tailored, one-off plant configurations may require some custom programming
Time to complete commissioning	Long	Short	"Design once, apply many" approach, all functionality is factory tested
Configurability	Ad hoc custom programming	✓	Configuration of main parameters by means of powerful wizard, proven standard functions, all factory tested
Support for maintenance	Limited	✓ In-depth advanced	Advanced diagnostics offer "Condition based maintenance" (instead of the usual scheduled maintenance typically offered by most BMS)
Advanced Diagnostics	Not available	✓	Turns data into easy-to-read, actionable system knowledge. iPlant Manager automatically assigns and displays a colour rating at which each HVAC unit is operating (well- or under-performing)
Performance Measurement	Possible	✓	User friendly dashboard
Efficiency Verification	Not Available	✓	Benchmark actual performance of each HVAC unit when compared to design data in real-time and then monitor this data over time
Sensor auto check	None	✓ For water cooled	By means of "heat balance" calculation
Charts	Limited	✓ Powerful	Standard charts come with the system, chart builder function enables users to easy produce customised charts for all measured values
Reports	Possible	✓ Powerful, including energy and downtime	Comes with a set of standard reports, incorporates functions for easy creation of customised reports
Produced energy cost calculation	Optional	✓	Available in real-time and also by means of dedicated energy reports
CO2 emissions calculations	Possible	✓ Standard	
Control	To be developed ad hoc	✓ Standardised, proven, tested	For all type of units
Optimisation	Limited	✓ High level	Holistic approach integrating source, generation and/or distribution hydraulic configurations

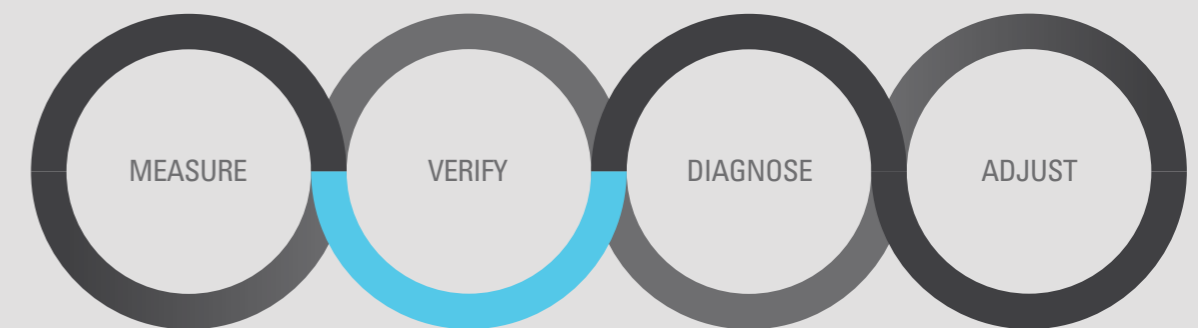
IPLANT MANAGER IS THE DEDICATED SOLUTION FOR OPTIMAL CONTROL OVER THE ENTIRE PLANT ROOM.

Thanks to its advanced system architecture, iPlant Manager offers additional, unique functions that allow you to carve out the control of the plant room HVAC equipment from the BMS, thereby achieving an unchallenged quality of optimisation.

Its state-of-the-art technology infrastructure is designed to be completely transparent to the BMS, enabling full control and operation of the system in the easiest and most intuitive way through a standard, interoperable BMS interface.



IPLANT MANAGER CYCLE



Measure the key data points and calculate the efficiency of each chiller and ancillary devices.

Report the results via HMI and through on demand and scheduled reporting.

Check the instantaneous efficiency against the manufacturers design data and best case efficiency modelling.

Determine Total Plant Efficiency.

Analyse the data and run in a diagnostics engine to determine the cause of any gaps between actual design and best case chiller and plant efficiency.

Adjust the plant through automation where possible to correct back to optimised plant efficiency.

Dispatch service personnel to attend to adjustments and repairs that cannot be rectified through automation.

ASSUMPTIONS

All representations made in Daikin marketing and promotional material are based on the assumptions that the correct equipment has been selected, appropriately sized and installed in accordance with Daikin's installation instructions and standard industry practices.

QUALITY CERTIFICATIONS

Daikin Industries Limited was the first air conditioning equipment manufacturer in Japan to receive ISO 9001 certification. All Daikin manufacturing facilities have been certified to ISO 9001 Quality Management System requirements. ISO 9001 is a certificate for quality assurance concerning 'design, development, manufacturing, installation and related service' of products manufactured at that factory.

ENVIRONMENTAL CERTIFICATIONS

Daikin Industries Limited has received ISO 14001 Environmental Certification for the Daikin production facilities listed below. ISO 14001 is an international standard specifying requirement for an environmental management system, enabling an organisation to formulate policy and objectives, taking into account legislative requirements and information about significant environmental impacts. It applies to those environmental aspects within the organisation's control and over which it can be expected to have an influence.

The certification relates only to the environmental management system and does not constitute any endorsement of the products shipped from the facility by the International Organisation for Standardisation.

Head Office /Tokyo Office
Shiga Plant (Japan)
Sakai Plant (Japan)
Daikin Industries Ltd (Thailand)
Yodogawa Plant (Japan)
Daikin Australia Pty. Ltd.

Certificate number: EC02J0355
Certificate number: EC99J2044
Certificate number: JOA-E-80009
Certificate number: JOA-E-90108
Certificate number: EC99J2057
Certificate number: CEM20437

**Daikin Australia Pty Limited
(ISO 9001)**
QEC 23256 May 12, 2006
Sydney, Brisbane, Adelaide,
Melbourne, Newcastle,
Townsville, Perth



**Daikin Australia Pty Limited
(ISO 14001)**
CEM 20437 October 27, 2006
Sydney, Brisbane, Adelaide,
Melbourne, Perth



**Residential Air Conditioning
Manufacturing Div (ISO 9001)**
JQA-0486 May 2, 1994
(Shiga Plant)

**Commercial Air Conditioning
and Refrigeration
Manufacturing Div (ISO 9001)**
JMI0107 December 28, 1992
(Kanaoka Factory and Rinkai
Factory at Sakai Plant)

**Industrial System and Chiller
Products Manufacturing Div
(ISO 9001)**
JQA-0495 May 16, 1994
(Yodogawa Plant and Kanaoka
Factory and Kishiwada Factory)

Daikin Europe N.V (ISO 9001)
Lloyd 928589.1 June 2, 1993

Daikin Industries (Thailand) Ltd
JQA-1452 September 13, 2002
(ISO 9001)



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