DESIGO

Proven applications – sustainably energy-efficient

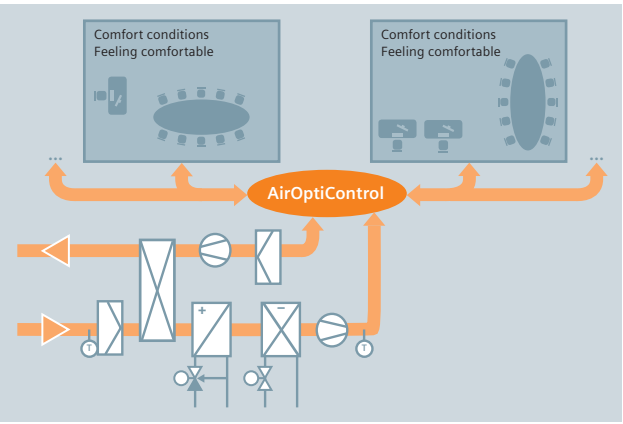
Answers for infrastructure. SIEMENS

Wide variety of applications for enhanced energy efficiency

Using DESIGO™ PX automation stations, heating, ventilation, and air conditioning plants as well as other building systems can be controlled and monitored flexibly and based on demand. As such, the DESIGO applications – tested for control accuracy and energy efficiency under practical conditions – make a decisive contribution. These innovative applications allow for sustainable cost savings in building operation, conserving energy resources, and lowering CO_2 emissions.

Thanks to favorably priced planning and commissioning plus moderate training effort, payback times are very short. In addition, DESIGO applications are fully documented and allow for short response times owing to clear, self-explanatory status messages, should faults occur, for instance.

- Sustainable reduction of energy usage and building operating costs
- Innovative, reliable control strategies for demanding applications
- Comprehensive application library for immediate use
- Contribution to meeting the requirements of EN 15232 in the highest energy performance classes
- Added plant value due to the use of energy-saving, modern equipment

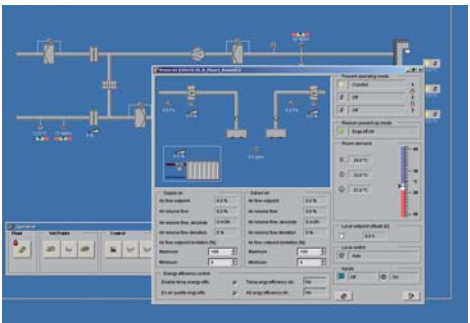


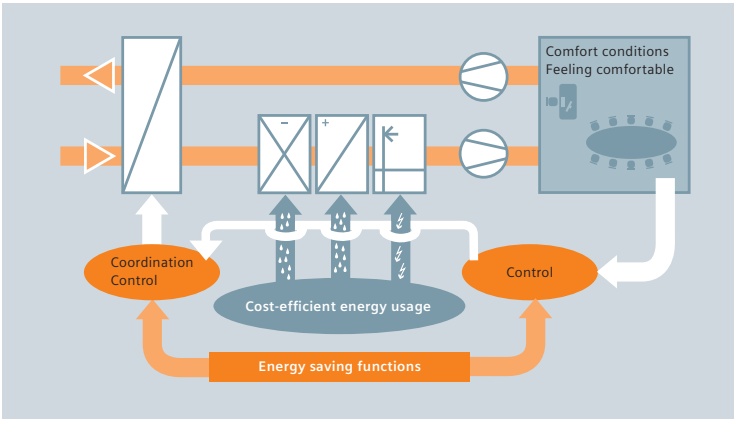
AirOptiControl: optimized volumetric air flow saves costs

Use: ventilation and air conditioning
AirOptiControl optimizes the volumetric air flow, thus providing an excellent basis for energy-efficient operation of ventilation and air conditioning systems. At the same time, comfort control ensures adherence to the boundaries of temperature, indoor air quality, and humidity. The innovative, modular designed application offers a number of function variants for the control of air handling plants or for optimum fan operation. Demand control can be varied depending on the design of the VAV (variable air volume) controls installed in the plant. AirOptiControl is suited for individual room systems or several zones and also controls basic load heating.

- Energy costs reduced by 50% in comparison with constant air volume control systems, thanks to unique energy efficiency mode for demand-based air volume control
- Full adherence to the required temperature, indoor air quality, and humidity levels
- Existing plants can be upgraded while ensuring short payback times

Specific visualization options for managing and monitoring the energy-efficient plant operation.



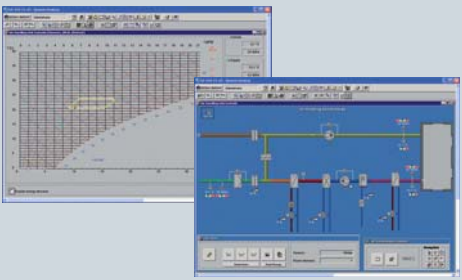


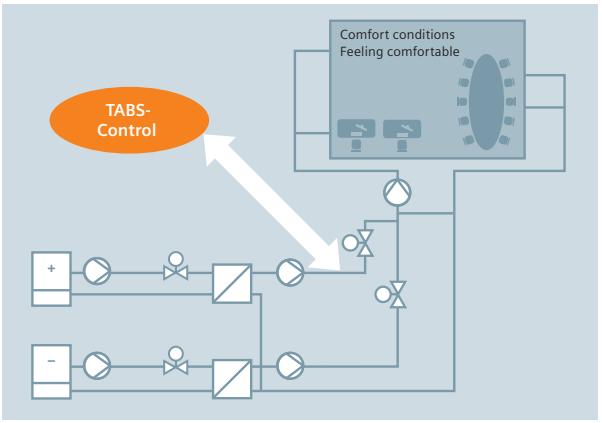
Energy-optimized air conditioning plants with tx2 Economizer

Use: air conditioning
DESIGO tx2 Economizer controls air conditioning plants with a focus on energy optimization. The air supplied to the rooms is always conditioned by utilizing the most favorably priced form of energy. Using this patented process, the air conditioning costs are continually calculated to be able to choose the cheapest method. If, for example, a plant calls for cooling in the summer, the application selects the most inexpensive way of cooling, depending on energy costs: either air cooling coil or air humidifier. The tx2 Economizer ensures the required comfort level and delivers energy savings of up to 50% compared with conventional air conditioning systems.

- Targeted usage of the most favorably priced form of energy and of the associated heating or cooling method
- Energy savings based on a selectable setpoint zone for temperature and humidity

The comfort zone is selected with the help of the graphic user interface of the DESIGO INSIGHT management station and is clearly presented on the h,x-chart.



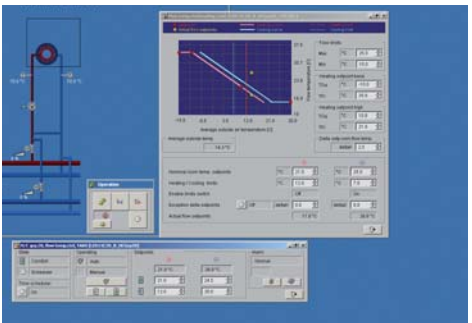


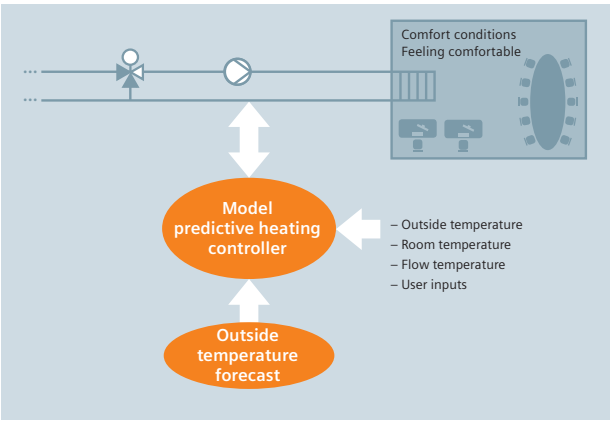
TABS-Control – unique control of concrete building structures

Use: heating and cooling
Using thermally active building structures (TABS), concrete floors of entire stories are heated or cooled. This approach for room air conditioning places demanding requirements on the respective control system. DESIGO TABS-Control satisfies these needs based on a patented process. Additional benefits are offered by advanced control functions like the one for the cycling module that controls the pump for circulating water through the concrete structures. In case of a typical office building, up to 75% of pumping power can be saved.

- Innovative control functions like cycling pump operation for reduced energy usage
- Lower maintenance costs thanks to automatic operation throughout the year
- Optimum adjustment of control using calculated values during commissioning and when usage changes

DESIGO INSIGHT plant diagram with setpoint window.



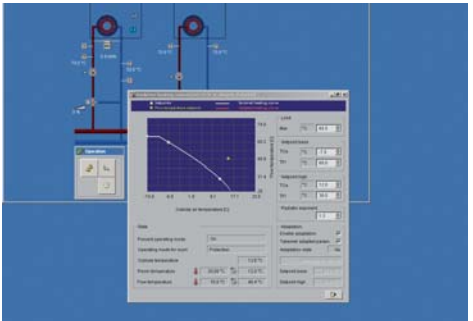


Innovative predictive heating controller

Use: heating
The innovative, patented predictive heating controller combines the following elements: outside temperature forecast (based on previously recorded outside temperature data), adaptation of heating curve and building model parameters, model-related forecast of room temperature, start/stop function, plus optimization of flow temperature setpoint. Due to complete adaptation of the building model parameters, commissioning and maintenance costs are cut and energy savings are reached. Excellent system management improves both the transition from boost heating to comfort mode and the behavior in case of undersized heating output.

- Shorter pump running times and lower energy costs
- Upgrading with no need for installing extra plant components
- Inherently correct behavior in different heating systems and with different types of usage

Graphic DESIGO INSIGHT user interface for display and readjustment of setpoints, and for optimum plant operation.

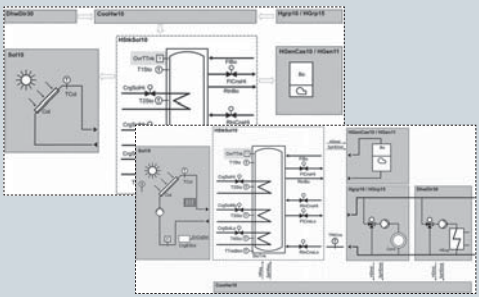


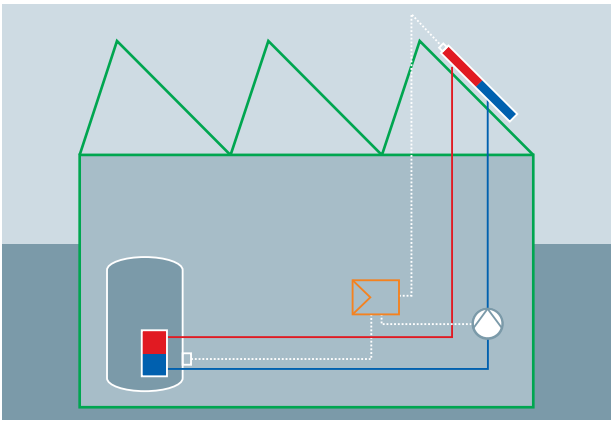
Heat storage charged by solar energy for more energy efficiency

Use: heating
The DESIGO application ensures optimum charging and discharging of heat storages. Charging takes place primarily through solar energy, then by heat supplied by a heating boiler. When using solar collectors, discharging and consumer return can be operated at two levels. The integrated charging level indication shows the operating state of the heat storage.

- Cost savings and lower emission levels to protect the environment thanks to efficient usage of renewable energy sources
- Investment protection due to high plant reliability and availability
- Low costs thanks to quick and straightforward commissioning and maintenance

Consistent documentation of all applications ensures efficient service, even after years of operation.





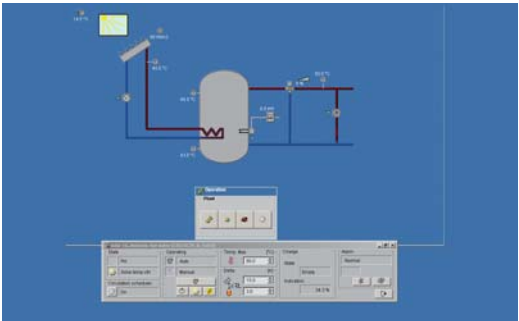
Solar energy for domestic hot water heating

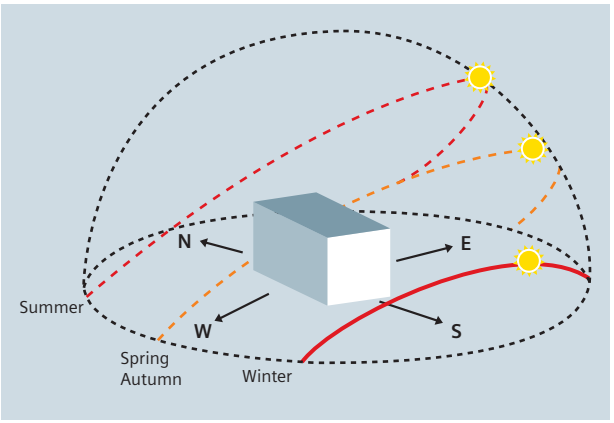
Use: domestic hot water

The use of alternative energy sources, such as solar energy, becomes more and more important. Very often, alternative energy cannot be produced at the time it is required and, therefore, optimum management of the domestic hot water storage tank is of prime importance. The DESIGO application controls charging of the storage tank and, when there is less solar radiation, provides optional activation of recharging. Demand-oriented control minimizes the pump's running time, therefore saving pumping power. Special safety functions protect the storage tank and the solar collector from overtemperatures. The legionella function ensures reliable compliance with hygienic standards.

- Energy savings thanks to demand-oriented pump control
- Intelligent solar application for new or existing plants to ensure domestic hot water heating at low emission levels

Easy-to-understand user interface of the DESIGO INSIGHT management station for visualizing the application.

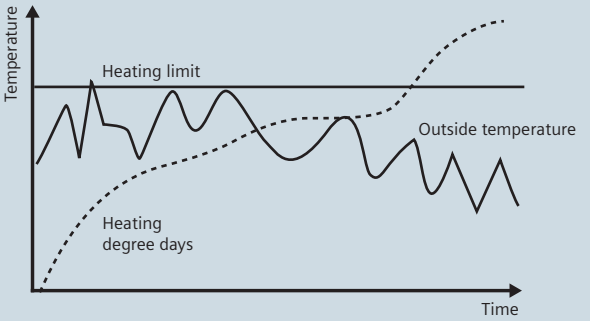




Saving valuable energy in the building by following the sun

Use: optimization of building's energy balance
The sun as the largest energy source has an impact on a building's energy demand. Depending on the situation, the energy delivered by the sun is desired, or adversely affects the energy balance and comfort conditions. The DESIGO application for calculating the sun's position gives consideration to vertical and inclined building facades and – depending on the situation – makes it possible to take appropriate actions, such as blind control providing protection against sunlight and intrusion or enhancing comfort, or control lighting. Furthermore, it ensures optimum usage of the solar collectors.

- High investment protection thanks to compliance with DIN 5034-2 (daylight in interior rooms)
- Implementation of room automation functions as per VDI 3813 directive
- Low investment costs since installation of sensors is not required

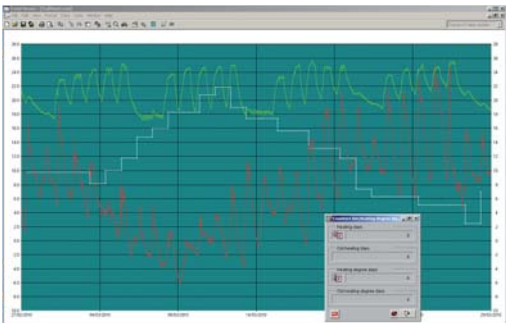


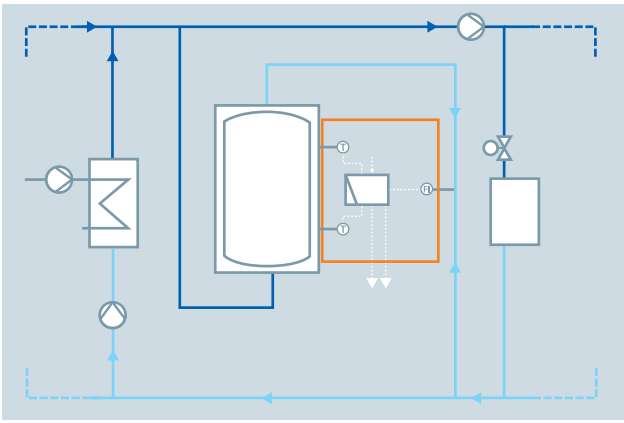
Heating degree days – the basis for successful optimization

Use: optimization of control
Heating degree days are used to calculate the impact of the climate on a building's energy consumption. Heating degree days in connection with a building's energy usage show the success of the optimization measures taken and reveal the weak points of a plant at an early stage. The application calculates the number of heating degree days from the difference of daily average of outside temperature and daily average of room temperature. If the daily average lies below the heating limit, the day is classified as a heating day. The calculated heating degree day is added to the total number of heating degree days and stored.

- Allows heat consumption data comparison
- Helps revealing weak points at an early stage – to support optimum building operation

Clear presentation of heating degree days in DESIGO INSIGHT.





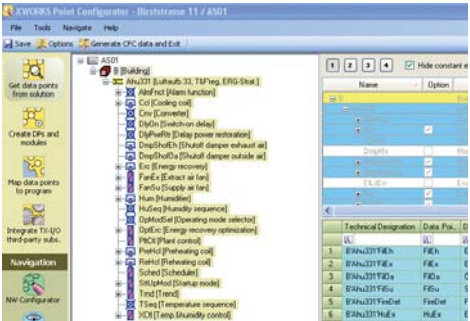
Energy-efficient operation of refrigeration plants

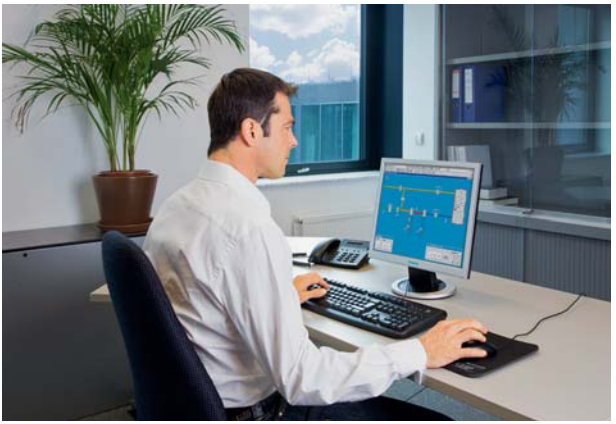
Use: refrigeration

The generation of refrigeration by mechanical means is associated with very high operating costs that are often twice as high as heat generation costs. Therefore, optimum and energy-efficient overall control of the refrigeration machine, the refrigeration storage and the consumer are very important. For that purpose, the DESIGO application uses an intelligent switching control designed to regulate the output of the refrigeration machine. The components used include a refrigeration storage equipped with two temperature sensors and bidirectional flow measurement.

- Low maintenance costs thanks to output regulation with improved plant dynamics and a smaller number of switching cycles
- Reduced energy costs due to demand-dependent control

The proven applications are configured depending on customer needs – conforming to all standards, including EN 15232.



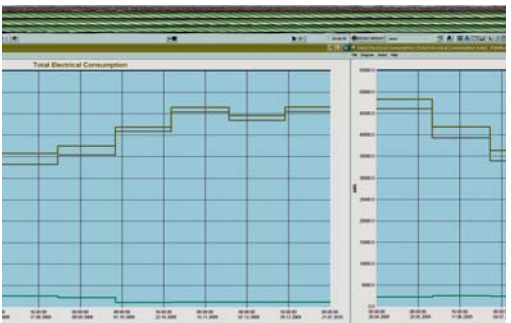


Quick and easy presentation of energy-related information

Use: analysis and optimization
DESIGO INSIGHT with its integrated energy reports satisfies the demand for energy-related evaluations. Wizard-driven energy reporting supports the generation and visualization of statistical analyses about energy-related data. Different types of reports can be produced, depending on the requirements: Energy consumption, energy costs, consolidated energy costs, CO_2 emissions, or annual heating report based on the number of heating degree days.

- Supply of energy figures as basis for achieving cost cuts
- Low training effort thanks to wizard function
- Transparent plant operation thanks to multiple types of reports

Using the wizard function, various energy reports, such as power consumption according to different types of tariff, can be produced easily and quickly.

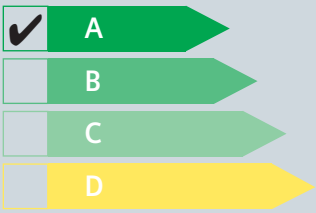


Sustainable energy savings – with DESIGO

The DESIGO building automation and control system controls and monitors reliably not only the entire HVAC plant, but also all other building systems, thus representing the brain of a building. DESIGO affords effective control as well as active optimization of energy usage and energy costs. With innovative energy saving functions and the versatile, proven applications, DESIGO delivers sustainable building energy savings. This is also confirmed by EN 15232 that DESIGO conforms to in the highest energy performance classes.

- Compliance with EN 15232 – proof of impact of building automation and control on the energy efficiency of buildings
- Meeting the requirements of energy efficiency class A as per EN 15232
- Individual room controllers DESIGO RX with best-in-class eu.bac certification due to their high level of control accuracy

BACS Energy Performance Classes – EN 15232



BACS Building Automation and Control System
TBM Technical Building Management System

eu.bac Cert

Siemens Switzerland Ltd
Industry Sector
Building Technologies Division
International Headquarters
Gubelstrasse 22
6301 Zug
Switzerland
Tel +41 41 724 24 24

Siemens Building Technologies
Industry Sector
Brunel House
Sir William Siemens Square, Frimley
Camberley
Surrey, GU16 8QD
United Kingdom
Tel +44 1276 696000

Siemens Ltd
Industry Sector
Building Technologies Division
Units 1006-10
10/F, China Resources Building
26 Harbour Road
Wanchai, Hong Kong
Tel +852 2870 7888

The information in this document contains general descriptions of technical options available, which do not always have to be present in individual cases. The required features should therefore be specified in each individual case at the time of closing the contract.

Pictures used show the new court house in Gent, designed in 2007 by the architects Stéphane Beel and Lieven Achtergael from Beel-Achtergael architecten F.V and by Technum.

www.siemens.com/desigo