

Answers for infrastructure.

■ Megatrends driving the future

The megatrends – demographic change, urbanization, climate change and globalization – are shaping the world today. These have an unprecedented impact on our lives and on vital sectors of our economy.

■ Innovative technologies to answer the associated toughest questions

Throughout a 160-year history of proven research and engineering talent, with more than 50,000 active patents, Siemens has continuously provided its customers with innovations in the areas of healthcare, energy, industry and infrastructure – globally and locally.

■ Increase productivity and efficiency through complete building life cycle management

Building Technologies offers intelligent integrated solutions for industry, commercial and residential buildings and public infrastructure. Over the entire facility's life cycle, our comprehensive and environmentally conscious portfolio of products, systems, solutions and services for low voltage power distribution and electrical installation technology, building automation, fire safety and security, ensures the:

- optimum comfort and highest energy efficiency in buildings,
- safety and security for people, processes and assets,
- increased business productivity.



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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.

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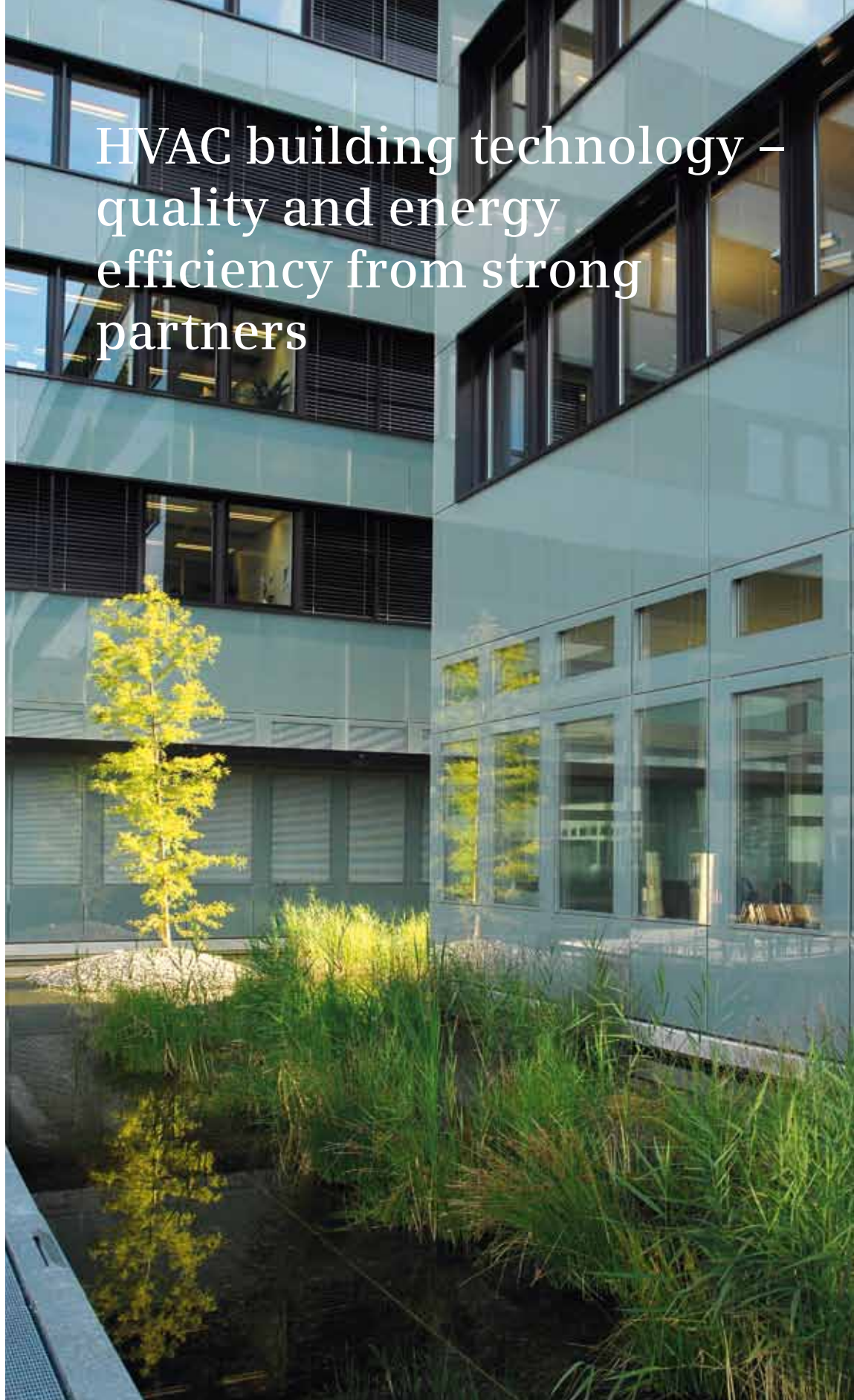
Solution
Partner

Building
Technologies

SIEMENS



HVAC building technology – quality and energy efficiency from strong partners



Answers for infrastructure.

SIEMENS



HVAC building technology – energy savings and assured comfort from experienced partners

HVAC systems and products from Siemens can effectively reduce your operating costs thanks to their extremely efficient use of energy. This means you can achieve up to 30% savings*, while still maintaining a comfortable room climate.

These high standards of efficiency and quality are based on Siemens' decades-long HVAC application expertise, combined with regularly trained and highly knowledgeable certified Siemens Solution Partners. With Siemens as partner, they will support you and offer you the solution best tailored to your needs.

The choice for more efficiency and comfort

■ Complete HVAC building technology from a single source

Siemens offers a comprehensive range of HVAC systems and products for every area of use and for every technical application.

The components are optimally matched so you profit not only from minimised installation and operating costs, but from a high level of security against failure as well.

■ Intelligent comfort – whether room climate or operation

Room comfort is vital to your sense of well-being, whether you're working or simply relaxing at home. HVAC building technology optimally matches all requisite factors to the outside climate and your sphere of comfort.

Operation of the components is as easy as it is convenient. You can set the climate that is most comfortable for you – quickly, intuitively, without error.

■ Innovation and investment protection in every phase of the life cycle

Siemens continually optimises comfort and energy efficiency of buildings through technical innovations in the area of HVAC.

Any further development of the products is also aimed at protecting your investment – by providing simple, gradual modernisation options for the installed base in every phase of the life cycle.

■ Many years of experience and high quality standards

Siemens has been a driving force behind the development of HVAC control technology for more than 60 years. The company has also accumulated more than 30 years of experience with HVAC systems, resulting in comprehensive applications know-how. This knowledge, and a rigorous quality management, allows Siemens to offer you HVAC systems and products featuring the highest standards of quality, efficiency, and reliability.

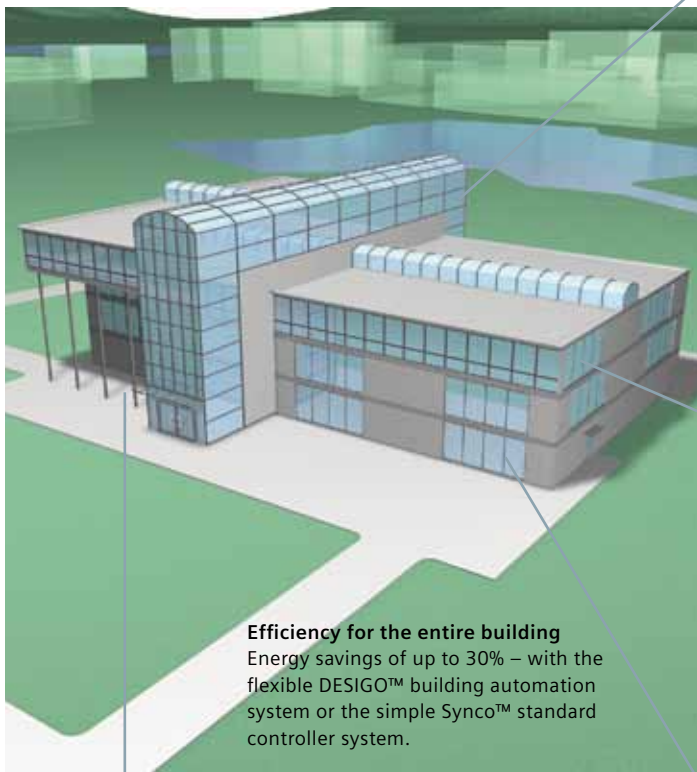
Highlights

- High energy and cost savings
- Reduction of CO₂ emissions
- Consistent, end-to-end operational reliability, guaranteed from a single source
- Intelligent comfort for the optimum room climate, thanks to intuitive operation
- Investment protection through gradual modernisation in every phase of the building life cycle



Energy-efficient technology for the entire building

HVAC building technology from Siemens encompasses all components for the primary energy plant, transmission, and consumption, ensuring demand-based, efficient control and switching of HVAC systems for all building types.



Optimum room climate
Regardless of the room requirements: on-demand control of heating, cooling, and ventilation ensure optimum room climate with minimum energy consumption – this can be achieved with various room thermostats, Symaro™ sensors, and RX room controllers with high control accuracy.





A partnership that creates security

Building technology and demands change constantly. Only companies who understand and have mastered the technology required – like Siemens Solution Partners – can offer you a solution that meets your needs and operates reliably and economically.

■ **Trained and certified partners**

Only well-established, financially viable, and competent companies are certified by Siemens as Solution Partners. Intensive training and comprehensive support ensure that Siemens Solution Partners continuously improve their knowledge and are up to date when it comes to technology. As a result, you can be sure that the technologies are combined into intelligent solutions and accompanied by outstanding service.

■ **Expertise for today and tomorrow**

Competent, experienced, and reliable, Siemens Solution Partners are experts at adapting the HVAC control system to specifically meet your needs and ensure that everything functions precisely, day in and day out. You can also absolutely rely on Siemens Solution Partners when it comes to servicing your system or updating it to meet new requirements.

■ **Optimum planning and implementation**

Siemens Solution Partners have the latest version of all Siemens tools for truly optimum planning of your installation. They also have up-to-date system and product documentation to ensure that you can familiarise yourself quickly with your system.

■ **Networked support**

Siemens stands side by side its Solution Partners – and thus supports you as well. Siemens Solution Partners have anytime access to a support hotline to ensure that you receive expert answers to any questions you may have. They can also access the latest documents, product information, FAQs, and guidelines via Extranet.

Highlights

- Highest project security and reliability through strict certification, verification, and intensive training
- One contact partner with the right expertise for all questions
- Optimum solution provided by one partner, who is always technically up to date with the latest tools from Siemens
- Answers to every question, thanks to networked support



DESIGO – the flexible system for energy-saving building automation

With DESIGO, you can efficiently reduce energy usage in your building, react flexibly to changes in utilisation, and protect your investment in the long term.

■ Everything you need – for plants from simple to complex

DESIGO provides you with building automation for every kind of application. It's a comprehensive, modular range providing reliable automation, operation, and optimisation.

At the management level, DESIGO INSIGHT acts as a master system for the control, monitoring, and analysis of all connected systems and plants, by means of central alarm and data management, for example. At the automation level, DESIGO PX programmable automation stations provide a reliable method of controlling and switching the primary plants. In addition, DESIGO RX enables the user to control the comfort settings in individual rooms and to also control lighting and blinds.

■ Open communication – for versatile integration and flexibility

DESIGO provides comprehensive integration options, thanks to open and standardised communication and interfaces. You can not only control and monitor your HVAC plant from a central point but also integrate other systems – for example, for access control, video surveillance, and fire protection. This allows you to identify faults quicker and have all relevant information available at a glance.

As an added benefit, the open system allows you to remain flexible. Thanks to vendor-neutral communication standards and interfaces, you can expand, modify, and modernise the system at any time.

■ Saving energy without sacrificing comfort








With DESIGO, you can achieve significant energy savings while still maintaining a comfortable room climate. A number of factors contribute to this, especially the central and intelligent energy management, innovative energy saving functions, and the efficient interaction between all system components and control processes.

Trend analysis and evaluation functions, for example, identify energy saving potentials. Via remote access, you can quickly detect and correct energy overuse without the need to visit sites. To ensure energy-efficient plants, extensive and proven libraries are available, containing tested and ready-to-use applications.

With DESIGO, the tested HVAC system components conform to the highest categories in European standard EN 15232, enabling you to realise savings of up to 30%*. In addition, our eu.bac-certified DESIGO RX controllers help you achieve up to 14% in energy savings**.



DESIGO – the comprehensive system for flexible and energy-efficient building automation

Management station	Automation system	Room automation system
		
DESIGO INSIGHT	DESIGO PX	DESIGO RX
User-friendly management station for overall control, monitoring, evaluation, and optimisation of all integrated systems and processes	Scalable automation system for the control, switching, operation, and monitoring of primary plants with control units and optional Web operation	Flexible, adaptable room automation system for controlling the comfort in individual rooms and for controlling lighting and blinds
DESIGO OPEN		
		
Interfaces to integrate the most varied equipment at all system levels, for example, heating boilers, refrigeration machines, pumps, variable speed drives, energy measurement, fire detection systems, access control etc.		
Open BACnet communication to network automation and management level 		
LONWORKS® and KNX to network room automation and decentralised secondary processes  		
M-Bus, Modbus, OPC, and other interfaces to integrate third-party equipment and systems		

■ Ease of operation – for optimum comfort

Comfortable temperatures and good air quality – with DESIGO you can always set the perfect room climate quickly and easily, thanks to exceptionally user-friendly operation. From local control units to the management station, clear, intuitive user prompts and easy to understand, graphical displays cut familiarisation times and ensure ease of use.

In addition, the system can also be controlled via a Web browser, at any time and from any location, making building management even more efficient and reliable.

■ Broadly based experience

DESIGO offers you the reliability of a well-proven system with a wide installed base. Tens of thousands of DESIGO building automation systems are operating successfully all over the world.

Highlights

- Long-term investment protection, thanks to open communication and simple expandability
- Flexible system adaptation whenever the building use changes, thanks to a modular range
- Reduced energy costs through intelligent energy management
- Optimum building climate, thanks to user-friendly operation
- Reliability of an extensively proven system with a wide installed base

* for example, in the office compared with the standard, see page 16

** compared with non-certified controllers



Synco – the system for simple, energy-efficient HVAC control

Whether as a communicative control system or a stand-alone control – Synco delivers HVAC standard controllers featuring simple operation and quick commissioning.

■ **Modular range of HVAC controllers for every control requirement**

Synco offers you a comprehensive array of standard controllers for all applications – from straightforward temperature control with stand-alone controllers to the complete control of HVAC plants with a communicative control system, including individual room control.

■ **Optimum climate for work and living spaces**

For maximum performance efficiency from offices to conference rooms: Synco RXB/RXL or Synco 700, with the appropriate room devices, are the simplest way to achieve the right room temperature at the right time. With the help of time-based programmes, the primary energy plant is matched to your needs, based on the scheduled occupancy of the rooms.

■ **Ease of use, thanks to simple operation and remote monitoring**

Based on Siemens' comprehensive know-how, Synco is extremely user- and service-friendly – through its straightforward operation, optimally adjusted controllers, pre-programmed standard applications, and integrated energy saving functions. For you, that means smooth, energy-efficient operation. Thanks to the Synco operating central communication unit with integrated Web server, the system can also be operated and controlled from any PC at any time and from any location.

■ **Designed to be highly energy-efficient and cost-effective**

Synco controllers are designed for maximum energy efficiency, cost savings, and environmental friendliness. Synco thus provides important prerequisites for achieving class A energy efficiency, with savings of up to 30%*.

All controllers have integrated energy saving functions. Moreover, by exchanging data via KNX, Synco switches on only the required energy generators, based on demand. Furthermore, the eu.bac certification of the Synco RXB/RXL controllers guarantees high control accuracy and energy efficiency. Energy savings of up to 14% over non-certified controllers are achievable. And thanks to Siemens' many years of experience, Synco features a variety of tested applications and simple operation, making it easy for you to set the entire HVAC plant to optimise energy consumption.



Communicating controllers for the system – communication via the KNX standard bus



Synco 700

Versatile HVAC controller
range of modular design

Synco RXB/RXL

Enhanced comfort thanks to
individual room climate

Synco operating

Efficient operation of plant including straightfor-
ward remote control

Open **KNX communication** for optimum interplay between controllers with standardised data exchange



Stand-alone controllers for small buildings and basic applications



Synco 200

HVAC controller for all standard applications

Synco 100

Temperature sensor, controller, and control panel combined in one unit

■ Durable products that protect your investment for the long term

All Synco products are characterised by their very long service life, guaranteed by rigorous and systematic tests. Controllers and functions are thoroughly tested by Siemens in their own HVAC laboratory. The more than 200,000 plants currently operating successfully with Synco are proof of the effectiveness of this approach.

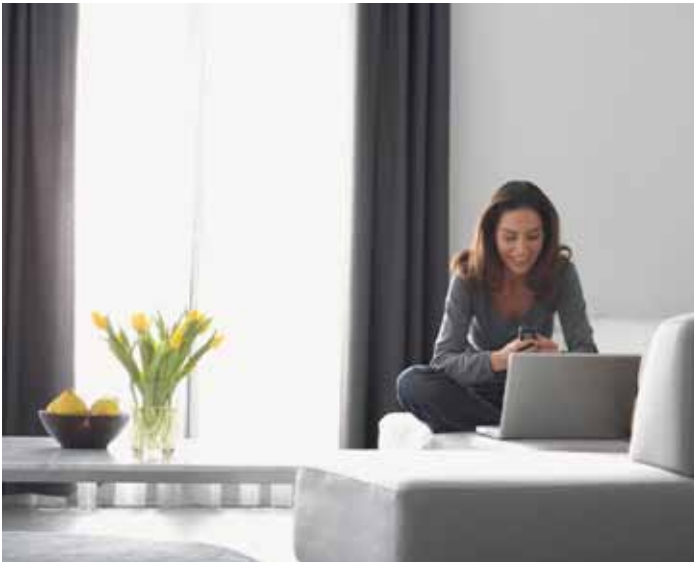
■ Flexible and expandable for the future

Synco supports the entire building life cycle. Synco controllers can be expanded and adapted to plant extensions, changes in building usage or in case of modernisation. As your HVAC plants grow with your requirements, you can make your investment in phases.

Highlights

- Optimum climate for relaxed living and high-productivity workspaces
- Reliable, efficient plant operation, thanks to user friendliness
- High energy efficiency and cost savings, thanks to pre-programmed energy saving functions
- Durable, tested controllers to protect your investment
- High flexibility – through easy expandability and adaptation of controllers and standard functions

* for example, in the office compared with the standard, see p. 16



Room thermostats – individual variety

The optimum climate in all areas, precisely when you need it: Room thermostats are an efficient, convenient way to set the right room temperature.

■ Room thermostats for every requirement

Attractively designed and matched to your needs: The Siemens portfolio offers room thermostats for a wide range of different heating, ventilation, and cooling applications and for the use in flats, hotels or commercial buildings. Many of the room thermostats are easy to replace should your requirements change.

■ The efficient, convenient way to control temperature

Adjusting the temperature to the comfort level only when the room is in use saves energy and costs. That is why you can

set the temperature individually with the room thermostats, many of which also allow timed settings. User-friendly operation options make optimised settings easy. Some units also have energy saving functions to reduce energy consumption, while for example the patented control technology from Siemens provides for exceptionally consistent heating.

■ Equipped for most types of installation

The room thermostats cover all possible forms of installation, in particular wall mounting and installation on flush mounting boxes.

Highlights

- A wide range of room thermostats to meet every requirement
- Energy-efficient and cost-saving temperature control
- Simple operation and high control accuracy for optimum comfort and ease of use
- Attractive design for all types of installation

Room thermostats for a wide range of heating, ventilation, and cooling applications

<p>For heating only/cooling only</p>	<p>For fan coils and heat pumps</p>	<p>Universal for heating/cooling</p>
<p>For living spaces and work areas: switching and control of hot water, electrical heaters as well as radiator and floor heating</p>	<p>For small zones in commercial buildings, single- or multi-family houses, and hotel rooms: switching and control of fan coils and heat pumps</p>	<p>For small zones in commercial buildings: switching and control, e.g. of variable or constant air volume systems, ventilation systems, and chilled ceilings</p>



Symaro – innovative sensors

Durable Symaro sensors pay for themselves quickly and reduce energy consumption thanks to their high measuring accuracy and speed.

■ A sensor for every type of measurement

Whether for measuring temperature, humidity, air quality or pressure in rooms, ducts or outside areas, Symaro offers a transparent, clearly structured range of systematically tested sensors for all HVAC measurements and applications. The range also includes multisensors that measure all kinds of different media as well as certified sensors for special areas, such as the pharmaceutical industry.

■ Innovative measurement saves energy

Durable Symaro sensors are a secure investment because they are so innovative.

For you, that means lasting savings in energy and costs. Symaro sensors detect and transmit values quickly and accurately – the best possible basis for precise, energy-efficient, and economic control of your HVAC plant.

■ High room comfort and user-friendly operation

The sensors allow demand-controlled ventilation for optimum room quality, combined with a high degree of comfort and energy savings of 20 – 70%. Changes in building occupancy and utilisation or system design are automatically adjusted. Symaro multisensors show measured values in a simple way on their LCD display.

Highlights

- Modular sensor portfolio for all measurement ranges and applications
- Innovative sensor technology for maximum measurement accuracy
- Energy savings of 20 – 70% through demand-controlled ventilation and fast, high-precision measurement
- Air quality sensors for maximum room comfort

Symaro sensors for all conventional HVAC measurement ranges and applications

				
Temperature sensors	Humidity sensors	Air quality sensors	Pressure sensors	Xtra
Reliable and precise temperature measurement for any location	Highly stable humidity measurement even under difficult conditions	Stable, long-term air quality measurement for high energy efficiency and room comfort	High-precision measurement of differential and absolute pressure	Highest measurement quality even for special applications, such as solar irradiation

Applications are tested for full compatibility with DESIGO and the Synco HVAC controllers



Acvatix – a variety of valves and actuators

Durable, reliable Acvatix valves and actuators are key building blocks of an economical, efficient HVAC system.

■ **A wide choice of valves and actuators for every application**

The Acvatix range contains the right valves and actuators for every requirement and application, offering a unique variety for residential and office buildings as well as industrial plants. Five different actuator technologies, a wide selection of valves, and actuators for refrigeration plants and clean rooms ensure maximum economy and reliability.

We supply valves and actuators for small to very large HVAC and refrigeration applications as well as for room, zone, and radiator applications. The range also features 2- and 3-port, butterfly, and

slipper valves with flanged, threaded, and soldered connections as well as combi valves for perfect hydraulic balancing and easy sizing.

■ **Active energy saving through high control accuracy and speed**

The high quality of the range is also reflected in the control accuracy and energy efficiency of the valves and actuators. Whether magnetic valves, combi valves or low energy electro-hydraulic technology – all help you substantially reduce your energy consumption, thereby efficiently reducing costs.

Investments in continuous magnetic valves from Acvatix offer a particularly high return on your investment, thanks to energy savings of as much as 15% due to their high precision and their ability to adjust to controller setpoint values within fractions of a second. And they can be used in a wide range of different application areas, including ventilation, refrigeration, district heating, drinking water supply, and high-precision operation of industrial HVAC applications.

Acvatix valves and actuators for a wide range of applications – from residential and office buildings to industrial plants



Room and zone applications

Comfort (well-being) ensured by high control quality and noiseless operation
Minimum space needed thanks to compact design



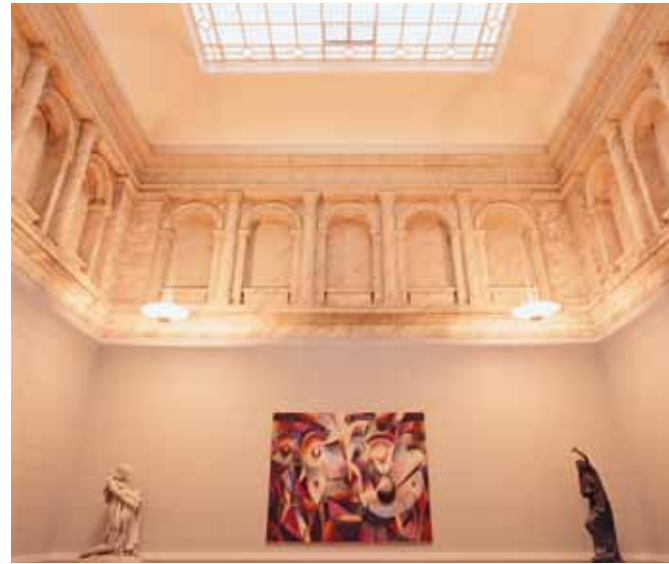
Distribution

Energy efficiency through fast and precise actuators
Safety functions and differential pressure resistance for reliable operation



Processing

Investment protection thanks to long operating life
Reliable even under demanding conditions



■ **A safe investment thanks to high quality**

Whether single- or multi-family houses, complex air conditioning systems in ultra-modern office buildings or plants with large volume flows – Acvatix valves and actuators offer an attractive combination of high quality and long service life. All originated in Siemens' own development and production facilities and are intensively tested in in-house laboratories.

The robust electro-hydraulic valve actuators, for example, consistently offer the highest level of security even with large volume flows and enormous pressure differences. They require no maintenance,

operate reliably over a long service life, and are protected by a unique emergency control function.

Your investment is safe for many years thanks to the durability of the products and their backward compatibility guaranteed over decades. If necessary, individual components can be easily replaced at any time. The high reliability and stability of Acvatix valves and actuators also ensure continuous system availability, thus safeguarding your investment over the long term.

Highlights

- Unique varied range for optimum control of the entire hydraulic circuit
- Energy-efficient thanks to high control accuracy and speed
- High quality and long operating life guaranteed by intensive tests
- Safe investments thanks to a high level of reliability and system availability





OpenAir – robust damper actuators

With OpenAir damper actuators, you get extremely durable and reliable actuators for energy-efficient ventilation.

■ A high-performance range

With four housing sizes, the OpenAir damper actuators cover the entire application area – from recirculated air dampers, outside air dampers, shutoff dampers, fire protection dampers to variable air volume controls and centralised air conditioning plants.

■ Robust design for a long service life

OpenAir damper actuators have a very long operating life. Thanks to their robust housing, they are resistant to harsh everyday conditions during transport, in the warehouse or on the construction site. A function-tested building block concept ensures highest quality and reliability.

In addition, every actuator undergoes a rigorous function test prior to shipment.

■ Powerful action for little energy

OpenAir uses motors with low energy consumption, designed to provide large actuating forces using very little energy. The variable air volume actuators further enhance this energy efficiency through static measuring which prevents energy losses.

■ Comfort for room climate

Brushless motors, already run-in gears, a truly sturdy housing, and technology mounted with high precision ensure exceptionally quiet operation.

Highlights

- Robust housing for long service life and maximum reliability
- Energy and cost savings thanks to low-consumption motors and high precision operation
- Low-noise motors for optimum comfort at home or at work

Actuators for a wide range of applications

<p>Actuators for ventilation applications</p>	<p>Actuators for variable air volume controllers</p>	<p>Actuators for fire protection dampers</p>
<p>Reliable and powerful for recirculating air and outside air applications as well as centralised air conditioning plants</p>	<p>Highly precise as well as quick and easy to parameterise for convenience and energy efficiency from installation through to operational use</p>	<p>Highly reliable and safe – integrated in safety systems, they prevent fire and smoke spreading via the ventilation duct</p>



SED2 – efficient variable speed drives

SED2 simply and efficiently control the energy demand of equipment with high power consumption – with minimum maintenance and operating costs.

■ Latest technology for HVAC areas

SED2 variable speed drives are based on state-of-the-art converter technology specially designed for HVAC applications. They can be easily integrated into the DESIGO building automation system via interfaces.

■ Simple commissioning and maintenance

You can install the variable speed drives quickly and with little effort. Thanks to their modular design and ease of access, individual components can be replaced quickly. That reduces costs and minimizes downtime for maintenance.

■ Saving energy every day

Fans and pumps equipped with SED2 variable speed drives use up to 50% less energy, in particular thanks to the precise, on-demand control of the motor speed. The speed of fans or pumps is automatically reduced when there is little or no need for them to be used. The low harmonics technology also reduces mains harmonics to a minimum and increases efficiency.

■ Safety in the event of fire

In the event of a fire, the SED2 reliably ensure that escape routes are kept free of smoke by means of overpressure.

Highlights

- Seamless integration in the DESIGO building automation system
- Cost savings through fast, simple commissioning and maintenance
- Energy savings of up to 50% thanks to demand control, hibernation function, and low harmonics technology
- Reliable control in the event of fire



Control panel design

Protection class IP20
Output 0.37 – 90 kW

Wall mounting

Protection class IP54
Output 1.1 – 90 kW



Actively saving energy and reducing costs

HVAC building technology from Siemens saves energy and reduces CO₂ emissions. That reduces costs and conserves valuable resources.

■ Energy-saving automation

Substantial energy savings can be achieved through the use of intelligent, integrated building and room automation. The tested HVAC system components with DESIGO comply with the highest energy efficiency classes contained in European standard EN 15232. Class A systems can also be realised with Synco. In office buildings, for instance, 30% energy savings will be possible compared with the standard.

■ eu.bac-certified energy efficiency

Tested quality, control precision, and energy efficiency in compliance with international test standards: eu.bac-certified RX room controllers offer high control accuracy and energy saving functions. Depending on the air conditioning zone, they can give you energy savings as high as 14% compared with non-certified controllers.

■ Integrated energy saving functions

Many of the HVAC components have integrated energy saving functions, such as SED2 variable speed drives. A time switching function and a PID controller allow consumption-based control. Another feature is the hibernation function that switches the SED2 off when demand is low.

Optimum air quality with low energy consumption: Symaro air quality sensors used in conjunction with controllers and variable speed drives provide optimized ventilation with on-demand control. Experience and measurement results have shown that this can lead to energy and cost savings of 20 – 70%.

■ Eco-friendly quality

The environment benefits not only from the energy efficiency of the HVAC products and systems, but from their high quality and durability as well. In addition, their production fulfils the highest requirements of environmental policy, such as the RoHS guideline for restricting the use of dangerous substances in electrical and electronic equipment.

Highlights

- Up to 30% energy savings thanks to intelligent, integrated building and room automation
- Up to 14% energy savings thanks to eu.bac-certified controllers
- 20 – 70% energy savings thanks to on-demand ventilation with air quality sensors
- High degree of environmental friendliness due to lasting quality and environmentally compatible production

eu.bac



eu.bac certification stands for tested quality, control accuracy, and energy efficiency

BACS Energy Performance Classes – EN 15232

High energy performance
BACS and TBM

A

Advanced
BACS and TBM

B

Standard
BACS

C

Non-energy-efficient
BACS

D

BACS Building Automation und Control System
TBM Technical Building Management System

Thermal energy efficiency factors (heating and cooling)

	D	C	B	A
BACS efficiency factors – EN 15232 in commercial buildings	Not energy-efficient	Standard (benchmark)	Increased energy efficiency	Highly energy efficient
Offices	1.51	1	0.80	0.70
Lecture rooms	1.24	1	0.75	0.50
Educational facilities (schools)	1.20	1	0.88	0.80
Wholesale and retail buildings	1.56	1	0.73	0.6



Actual reference example

Sports halls in Rotterdam,
The Netherlands

Project	Solution	Customer benefits
By order of the Rotterdam City Council, air conditioning and access systems in the municipal sports halls were combined, thereby reducing energy consumption. The innovative and highly efficient solution was a result of the successful cooperation between Siemens and one of its Solution Partners.	<ul style="list-style-type: none"> – Linking of Synco 700 for the on-demand control of heating and lighting with an access control system* in every building – 70 Synco 700 controllers installed for HVAC control – Synco controls the HVAC plants and the lighting on the basis of a simple presence signal from the access control system <p>* implemented with SiPass in this case</p>	<ul style="list-style-type: none"> – 20% energy savings – equivalent to energy efficiency class A in schools – 10% increase in revenues – Remote maintenance – Customer-friendly booking system – Reduced planning costs, faster implementation, and maximum safety for future projects – by making acquired know-how available