



SIEMENS

Building Technologies

Controllers for district heat substations: easy to use, convenient and highly efficient



The comprehensive range of controllers that satisfies all needs

District heat – the environment-compatible solution

District heat protects the environment – in contrast to the separate generation of electric power and heat in decentralized small combustion plants. Through the utilization of highly efficient power generation, combined heat and power and the recovery of residual and exhaust heat, thousands of tons of CO₂ per year are not released to the atmosphere. Hence, an increase of the proportion of district heat for space and domestic hot water heating is more than desirable. This can be accomplished in two ways: either through the more intensive use or expansion of existing district heat networks or the construction of smaller decentral community heating schemes.

Competition stimulates business

One aspect is to be noted, however: district heat is always in direct competition with other types of energy carriers. The generation of district heat requires substantial amounts of capital, due to the investments needed for heat generating plants, distribution networks and substations. For this reason, there is one major objective: all sections of the district heat supply network must be designed and optimized in a way that, for the end-user, the benefits of district heat become obvious. The individual

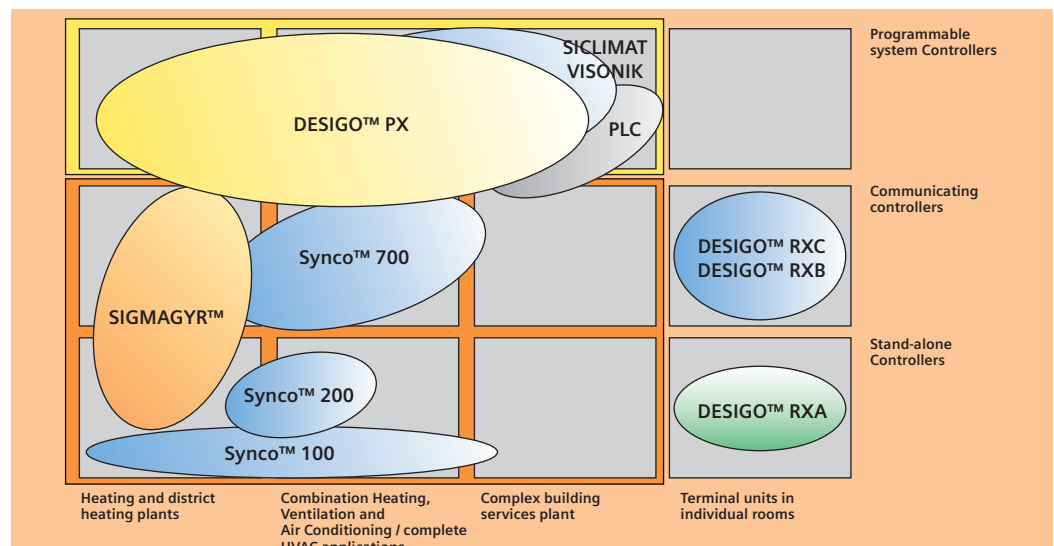
substations are of particular importance here, because they are the connecting link between the district heat utility and the end-user. Hence, the products used must satisfy the needs of both the utility and the heat consumer.

Advantages from every perspective

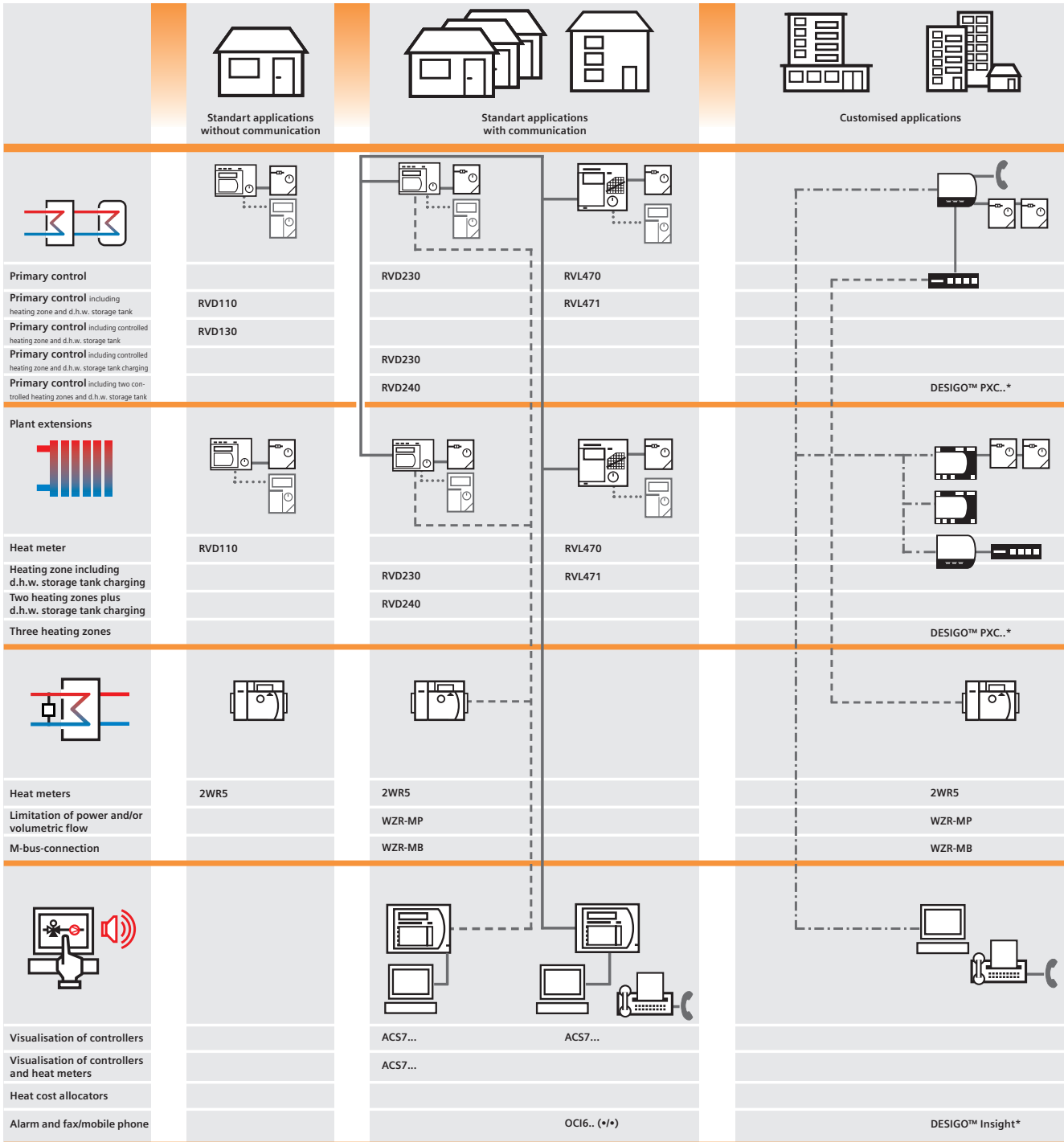
Utilities expect top performance from the control equipment used: the controllers are to provide the basis for trouble-free and energy-efficient operation of the network. If required, they shall be capable of being connected to a communications system for remote monitoring. In addition, the controllers should be equipped with interfaces for use with other substation components. For you as the end-user, the key features are thermal comfort, ease of operation, reliability and a good price / performance ratio. And as a substation supplier or installer, you expect the controllers to be conveniently and quickly installed and commissioned and to be service- and maintenance-friendly. The thoroughly conceived range of Siemens controllers satisfies all these needs.

Overview of the field and automation levels

Control systems for building services plant are investments which must represent value for our customers. At the development stage, Siemens attaches great importance to protecting your investment by ensuring that all solutions are open to future technologies.



District heating controllers for all fields of use



* for all applications

--- BACnet

— LPB

--- M-Bus

..... PROFIBUS

District heating controllers

SIGMAGYR® and DESIGO™

SIGMAGYR® RVD family

The district heating controllers of the RVD range excel in functionality while offering straightforward and uniform operation. For the control and monitoring of basic district heat substations with no communication, the affordably priced RVD110 and RVD130 controllers are the right solution. The preconfigured plant types offered by the controllers facilitate commissioning, because the LCD only shows the parameters required for the selected type of application. Convenient operation is also supported by an easy-to-understand set-point button and illuminated operating buttons. The controllers' scope of functions meets practically all requirements. Automatic optimization functions make certain that energy will not be wasted and the integrated DRT feature ensures a maximum reduction of the return water temperature on the primary side. These products complement the range of controllers in terms of functionality and communication. A wide choice of plant types is available, offering a broad field of use with plants having several heating zones and domestic hot water heating with a storage tank. The communication interface for integrating the controller in an interconnected system considerably expands the field of use. One and the same system can thus perform extensive control tasks ranging from district heat substations via heating circuit control to ventilation plant. In these cases also, the DRT feature ensures optimum operation of the interconnected system, complemented by electronic output and volumetric flow limitation is connection with heat meters. All this is made possible with easy-to-understand operation, which is a char-

acteristic feature of the RVD controllers.

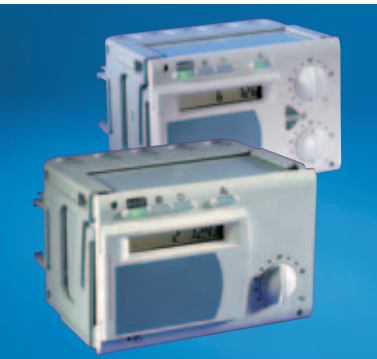
The choices offered by the RVD230 and RVD240 are rounded off by optional integration in an operator's station, which facilitates monitoring of the controllers and readout of the connected heat meters via M-bus in compliance with EN 1434.

SIGMAGYR® RVL family

These two types of digital controllers for district heat substations with or without domestic hot water heating are the advanced interpretation of the proven controller family featuring the analog heating curve. The controllers have been designed for an array of control tasks. Key features from the user's point of view are ease of operation thanks to the analog, adjustable, graphic heating curve and the room temperature setpoint readjustment. The large LCD supplies the user with a host of information, enabling him to view the plant status at a glance. The preconfigured plant types make commissioning more straightforward because the parameters indicated and acted upon are only those required for the respective type of plant. Thanks to their communication interface, several controllers can be interconnected to form one large system covering the district heat substation, additional heating zones plus ventilation and part air conditioning plants. And all this with no need for bothersome software and hardware tools. All that is required is parameterization of the controller. Using the optional OCI6.. communication centre, you will always have a full picture of the plant, via handy, fax, or even graphically with the help of your desktop computer.



RVD110 and RVD130



RVD230 and RVD240



RVL470 and RVL471



DESIGO™ PX-Family Programmable automation stations

With its family of programmable automation stations, DESIGO™ PX offers maximum flexibility. This means that building services plant can be optimally controlled and monitored. Comprehensive system functions, such as alarm handling, time scheduling and trend data storage meet all the requirements of building services. The automation stations, which operate autonomously in a distributed network, are available in two ranges. Communication takes place via the open BACnet protocol over LON or Ethernet.

Professional software tools and a large number of tested application software blocks are available for engineering, servicing and commissioning of the automation stations. The program engineering is based on user-friendly function blocks and application blocks created in D-MAP (DESIGO™ Modular Application Programming), the new programming language.

The DESIGO™ PX automation system can be enhanced and extended at any time:

DESIGO™ INSIGHT management station

■ The DESIGO™ INSIGHT management station software provides convenient, system-wide multi-user operation. This means that the entire building services plant can be controlled and monitored from any connected management station.



Individual room control with DESIGO™ PX

■ DESIGO™ RX, the innovative, LONMARK-compatible range of individual room controllers integrates the control of HVAC, lighting and blinds in rooms and zones.

Third-party integration

■ Other third-party systems, such as fire detection, intrusion protection, lighting and refrigeration systems, can be integrated easily and cost-effectively into DESIGO™ PX. There are various options for integration:

- I/O-Open
- PX-Open
- INSIGHT-Open (OPC server)

Motorized valves and heat meters complement the range of district heat controls

The Siemens product range includes control valves for use on the primary and secondary side of substations in all types of district heating plants.



DESIGO™ PXC... Assortment



QAW70 – Room unit with digital display



QAW50 – Room unit without digital display



SONOHEAT® ultrasonic heat meters excel in great metering stability and low failure rates. The product range covers volumetric flows from 0,6...60 m³/h.

Overview of technical data

Plant function

Primary control

	RVD110	RVD130	RVD230	RVD240
Flow temperature control	●	●	●	●
Return temperature control	●	●	●	●
Limitation of hydraulic creep			●	●
DRT limitation	●	●	●	●
Monitoring the level fouling of heat exchangers				
Flow temperature control based on heat demand via bus			●	

Heating zone functions

Mixing heating circuits		1 ¹⁾	1	2 ¹⁾
Pump heating circuits	1	1	1	1
Return temperature limitation			●	●

Domestic hot water heating

Pump charging	●	●	●	●
Instantaneous flow system with heat exchanger		●	●	●
Storage tank with primary control			●	●
Storage tank charging system			●	●
Circulating pumps via time switch program		●	●	●
Legionella function	●	●	●	●

Operation and communication

Operation

Analog room temperature setpoints	●	●	●	●
Analog heating curve				
Digital parameterization and setpoints / actual values	●	●	●	●
Operation unit PXM...				
Room units (analog/digital)	(1/1)	(1/1)	(1/1)	(2/2)
Yearly clock	●	●	●	●

Communication

Communication in an interconnected system			LPB	LPB
Communication with heat meters			Impuls	Impuls
Building management system			ACS7...	ACS7...
Modul for system integration			integrated	integrated
Plug & Play system integration			●	●
Telephony, Faxfunction (F) and SMS (S)			OZW10	OZW10
Data sheet number	CE1N2381	CE1N2381	CE1N2383	CE1N2384

1) Depending on the type of unit and programming

2) Graphic display (PXM20)

3) CA1N9211, CA1N9221, CA1N9231

All types of heating controllers operate on AC 230V. Controlling elements and pumps are controlled by AC 230V or AC 24V signals. All types of LG-Ni1000 sensors can be used.

RVL470	RVL471	DESIGO™ PXC...
●	●	●
●	●	●
●	●	●
●	●	●
●	●	●
●	●	●
●	●	●
		●
1	1	●
		●
	●	●
	●	●
	●	●
	●	●
	●	●
	●	●
	●	●
	●	●
	●	●
●	●	●
●	●	2)
●	●	●
●	●	●
(1/1)	(1/1)	●
●	●	●
LPB	LPB	BACnet
		M-Bus
ACS7...	ACS7...	DESIGO™ INSIGHT
integrated	integrated	integrated
●	●	
OCI6..(F)(S)	OCI6..(F)(S)	●
CE1N2522	CE1N2524	3)



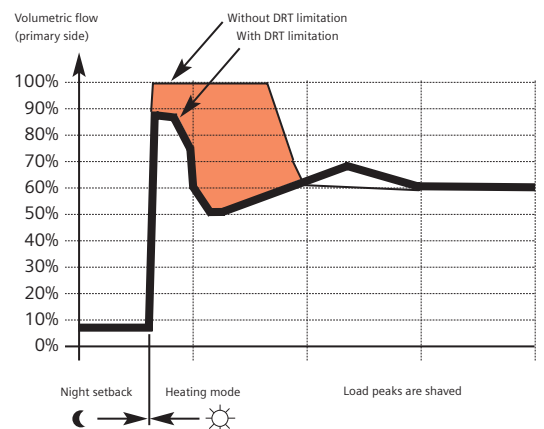
Unique: monitoring the level of fouling
Heat exchangers in district heat substations are prone to fouling. Often, fouling occurs rather quickly, causing the return temperature to rise and the heat transfer capacity to drop. This can also lead to a complete failure of the substation. Supervision of the heat exchanger's level of fouling reliably eliminates these disadvantages. In addition, the effort required for maintenance is minimized and the network's efficiency increased.

Unique: DRT limitation
The return temperature is an important factor in the economical operation of all types of district heat networks. Dependent on the return temperature are the transmission capacity, pumping power, heat losses and efficiency. To ensure the return temperature in the network will be as low as possible, the district heating controllers made by Siemens acquire the differential of primary and secondary return temperature and limit it, thereby offering the following benefits: load peaks will be shaved, incorrectly sized heating plants only obtain as much volumetric flow as they can handle, eliminating the transport of unused heat.

The DRT function is a good solution that ensures economical and ecological operation of district heat networks and that optimizes plant, thus offering shorter pay-back times. The patented function was developed by Siemens and represents a milestone in control technology. It provides unprecedented opportunities in energy management.

Major benefits at a glance

- High level of thermal comfort while minimizing the use of energy
- Two room units for optimum convenience
- High availability and long life
- Fast and straightforward commissioning
- Lowest possible return temperatures for maximum efficiency
- Programmable legionella function
- Interface for heat meters to implement innovative control functions
- Communication made to measure, including the monitoring of controllers and readout of heat meters



Siemens Switzerland Ltd.

Building Technologies Group
International Headquarters
Gubelstrasse 22
CH-6301 Zug
Tel. +41 41-724 24 24
Fax +41 41-724 35 22

Siemens Building Technologies Ltd.

HVAC Products
Hawthorne Road
Staines
Middlesex TW18 3AY
United Kingdom
Tel. +44 1784-46 16 16
Fax +44 1784-46 46 46

Siemens Building Technologies Ltd.

HVAC Products
Hong Kong Branch
3/F, Laford Centre
838 Lai Chi Kok Road
Kowloon, Hong Kong
Tel. +852-2917 5700
Fax +852-2917 5733

www.sbt.siemens.com

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