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Herz Substation

Compact Heating Substations for District Heating

A heating substation is one of the basic components of a district heating system. It is designed to control the delivery of heating energy to the secondary heating system from a primary network or district heating system.

The compact heating substation enables the measurement of delivered heating energy and integration in a remote monitoring and control system. It is produced in accordance with the technical requirements of local heat energy distributors.

The compact heating substation equipment consists of a mechanical (thermal engineering) element and an electrical element.

The thermal engineering installation contains all the necessary components for the safe operation of the heating substation: heat exchanger, control (combination) valve, ultrasonic flow sensor (heat meter component part), strainers, vessels for elimination of air and dirt, measuring devices and isolation valves, circulation pump, closed diaphragm expansion vessel or pressure maintenance device, safety valve, sensors for temperature measurement and water pressure.

The electrical component part contains power plant equipment, equipment for measurement and control and communication equipment.

Advantages

- Complete solution of heat transfer requirements including all necessary hydraulic and control components
- Large range of thermal capacities 20 kW to 4 MW
- Heating or Cooling applications
- Bespoke designs individually planned and built for each application area
- Compact design, easy access from components (service, maintenance)
- "Plug and heat" functionality: saving of installation costs and time
- Connections to suit specification requirements
- Factory pressure test
- Certified production in consistently high quality
- 3D designs available on request

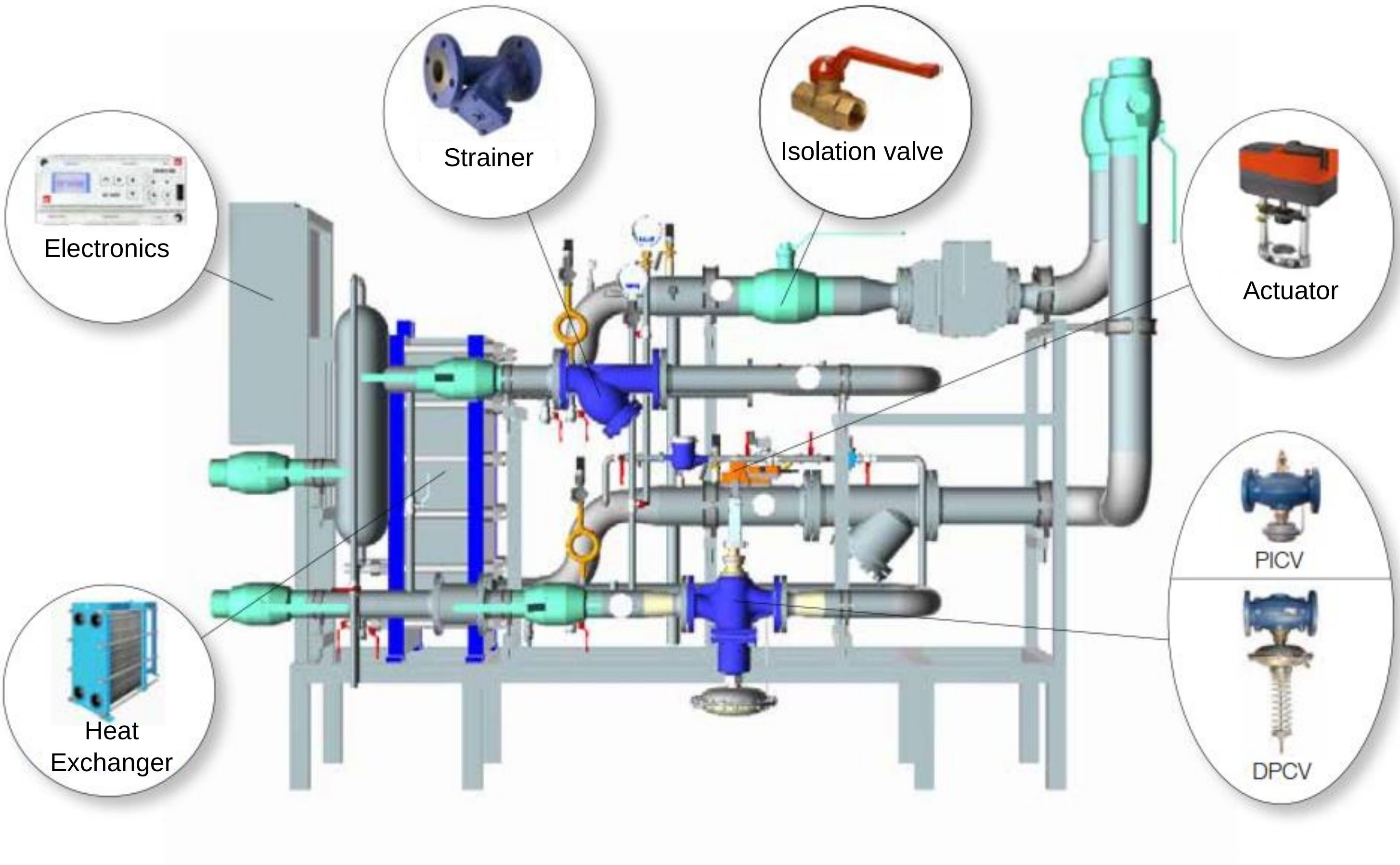
Mechanical element

The compact heating substation mechanical design can include a heat exchanger (brazed or bolted), a Pressure Independent Control Valve which would be fitted with an electric actuator, an ultrasonic flow meter, a circulation pump (frequency controlled), instruments for measuring pressure and water temperature, an expansion vessel, a pressure maintenance device, strainers, check valves, isolation valves and a safety valve.

Electrical element

The electronics in the substation comprise measuring and control equipment which includes a microprocessor controller, an acquisition module, a calculation unit for the heat meter, relevant fuses, contacts and switches, temperature sensors, pressure transmitters and communication equipment.

3D Illustration of the Herz substation



Pressure Independent control Valve

The valve is a combination of a control valve, a regulating valve and a differential pressure control valve and is operated by an electric actuator controlled by a microprocessor controller. This creates a fully pressure independent automatic regulating and control valve with simple design and operation.

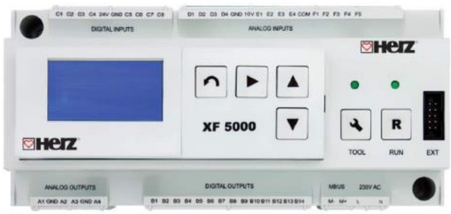
The maximum flowrate of the valve is set by limiting the valve stroke via an adjustable setting nut. The flow adjustments required during operation are carried out by the integrated control valve via the electric actuator, with the “valve authority” being kept constant by the integrated differential pressure controller.

Heat exchangers

The heat exchangers used in the substation are of high quality and are sized for the specific duties. The profiled plates are made from stainless steel and can be brazed or bolted in accordance with the technical specification. The heat exchangers can have all types of connections depending on the specification.

Automatic control

The XF 5000 series microprocessor controller controls the operation of the substation, ensuring efficient control of the heat/cooling supply. The XF 5000 series microprocessor controller is certified according to the following standards



EMC

- SRPS EN 61000-6-2: 2008
- SRPS EN 61000-6-3: 2008
- SRPS EN 61000-6-4: 2008

LVD

- SRPS EN 61010-1

The basic control functions that enable the optimal operation of the substation are:

- Restriction of maximum flow through the primary part of the substation
- Controlling the temperature of the supply water in the heating system depending on the outside air temperature.
- Programming and selection of heating mode

The microprocessor controller is used in a basic design with additional modules, which increases the number and type of signals. The functional keypad and graphic LCD screen give an overview of the current value of all measured sizes, set the values and enable the manual operation of electric actuators and circulation pumps.

Delivery and commissioning

The Herz compact heating substation can be designed as a wall mounted unit or as a free-standing heat transfer substation with a steel frame and adaptable height.

Depending on the dimensions, the substations can be delivered as a complete unit or in several modules. All Substations are factory-tested and ready for operation.

Detailed step by step assembly instructions are provided with the unit to facilitate quick and easy installation, full commissioning and operation instructions are also provided with full support available.

Technical parameters and selection

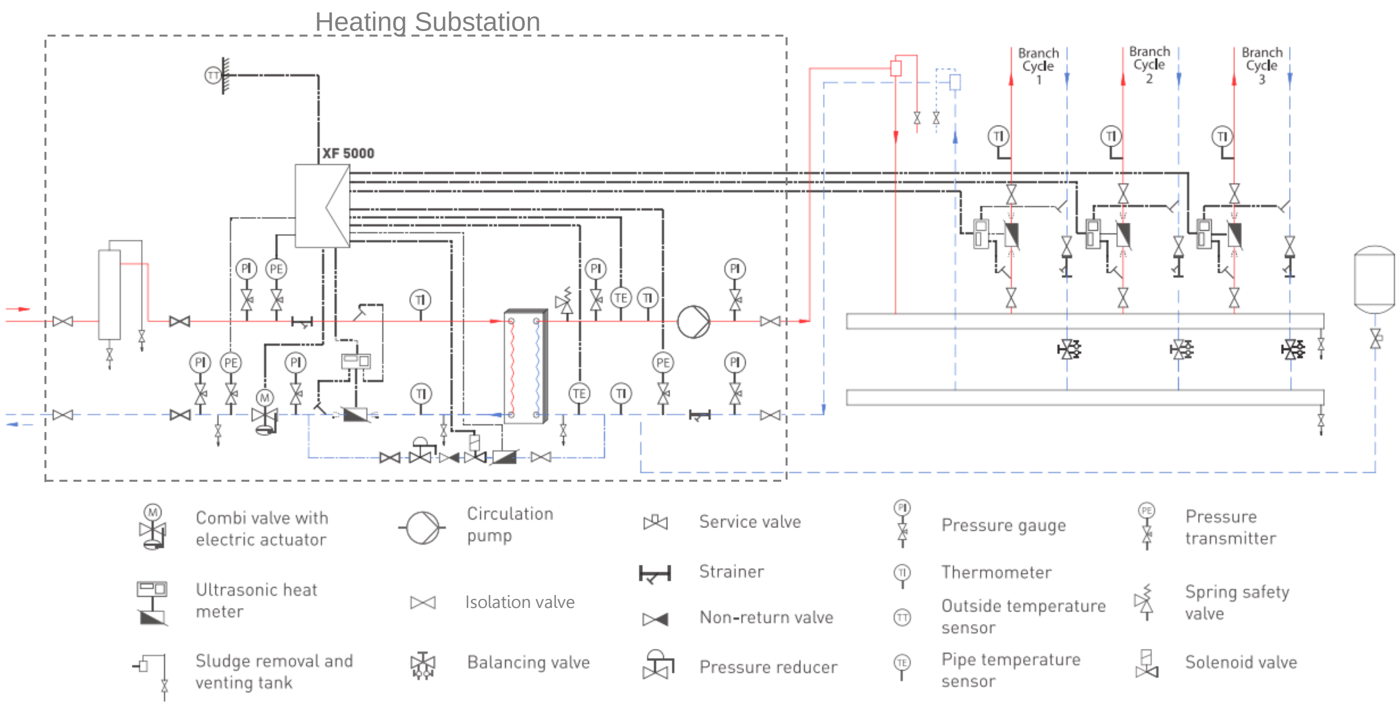
Herz compact heating substations are manufactured on standard principles but can be made to customer requirements with bespoke designs to specific specifications and the dimensions can be adapted to the intended assembly location.

All installed equipment is quality certified confirming compliance with the standards and requirements.

Heating capacity [kW]	Temperature mode				Standard dimensions		
	110/75°C Primary [DN]	70/90°C Secondary [DN]	130/75°C Primary [DN]	70/90°C Secondary [DN]	L [mm]	H [mm]	W [mm]
50	25	32	25	32	1200	1000	300
80	32	40	25	40	1600	1400	400
100	32	40	32	40			
150	40	50	32	50			
200	50	65	40	65			
300	50	65	50	65	2200	1600	500
400	65	80	50	80			
500	65	80	50	80			
600	65	80	65	80	2400	1800	600
700	80	100	65	100			
800	80	100	65	100			
900	80	100	65	100			
1000	80	100	80	100			

Nominal pressures PN16/25 Maximum primary temperature Tmax = 150°C

Functional Schematic



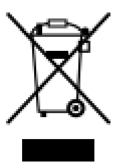
Safety Instructions

All activities relating to the testing, maintenance and operation of the Herz compact heating substation must be carried out in accordance with the associated operating and maintenance manual and the instructions for use.

Non-compliance with the instructions for use and measures described in the operating instructions can cause serious personal injury, damage or destruction of the substation equipment and components.

The testing, maintenance and servicing of the substations may only be carried out and performed by authorised, qualified and trained personnel.

Recycling and Disposal



The compact heating substation and accessories should be disposed of sensibly and properly and not in household waste.

Disposal of the packaging is the contractor’s responsibility.

Compact heat substation enquiry questionnaire

1. Customer information					
Contact					
Company					
E-mail/Telephone/fax					
Technological/ hydraulic diagram (**must enclose**)				**Yes:**	
2. Operating conditions					
1. Total capacity	kW				
2. Operating pressure	bar				
3. Pressure drop (primary side)	bar				
4. Outdoor design temperature	°C				
5. Primary temperature regime – winter	°C	Supply:		Return:	
6. Primary temperature regime – summer	°C	Supply:		Return:	
7. Ultrasonic heat meter		Yes:		Fitting piece:	
8. Power supply of the heat meter		220 V AC:		Battery:	
3. Heating		**Yes:**		**No:**	
1. Heating capacity	kW				
2. Secondary temperature regime	°C	Supply:		Return:	
3. Heat exchanger (if existing)	type	Brazed:		Bolted:	
4. Pressure drop of HE (if required)	kPa	Hot side:		Cold side:	
5. Pressure drop in the heating system (secondary side)	bar				
6. Required pump head	m				
7. Static head of the heating system	m				
8. Control valve	type	PICV:		Two-port:	
				Three-port:	
9. Power supply of the valve actuator (Nominal voltage)		230 V AC:		24 V AC:	
10. Control valve actuator (control signal)		Three-point:		0 – 10 V DC:	
11. Circulation pump (speed control)		Variable:		3 speed:	
4. Filling loop (if required as part of CHS)		**Yes:**		**No:**	
1. Water meter for refilling		Yes:		Fitting piece:	
2. Water meter for refilling	type	Turbine:		Ultrasonic:	
3. Solenoid valve		Yes:		No:	
5. Pressure maintenance (if required as part of CHS)		**Yes:**		**No:**	
1. Diaphragm expansion vessel		Yes:		No:	
2. Pressure maintenance station		Yes:		No:	
3. Another type according to the technical diagram		Yes:		No:	
6. Additional information					
1. Orientation of connections (left or right)		Primary side:		Secondary side:	
2. Available dimension space (WxHxD) (mm)	mm	W x H x D:			
3. Note: Special requirements for the microprocessor controller: functions, software, communication and eletrical cabinet, etc					

Herz Valves UK Ltd.
Progress House, Moorfield Point
Moorfield Road, Slyfield Industrial Estate
Guildford, Surrey GU1 1RU
Tel: 01483 502211
E-Mail: sales@herzvalves.com

Herz Armaturen Gmbh
Richard-Strauss-Str. 22, A - 1230 Vienna
Tel.: +43 (0)1 616 26 31-0, Fax: +43 (0)1616 26 31-27
E-Mail: office@herz.eu

www.herzvalves.com