

Change of temperature of the heating fluid - water, heating or cooling, causes the change in volume of water in the central heating installation. During the sludge removal and venting, a certain amount of water is also lost from the installation.

Compactc device DSU ensures maintenance of the working pressure in the installation, taking over of the excess water volume from the installation and its refilling.

Increase of the water pressure in the installation, due to the spreading during heating, is compensated by opening the solenoid overflow valve. Surplus of water volume is accepted by the expansion tank. After the termination of heating, the water pressure in the installation drops down, because of water shrinking while cooling. Maintaining of the set pressure is done by switching on the pump to increase the pressure and, in this way, water from the expansion tank returns to the installation. Filling up of the installation and maintaining the level of water in the expansion tank is done by opening the solenoid valve for filling up of water from the filling up system. The microprocessor control unit DSC-10 controls the operation of the device.

The basic elements of the device are:

- ▶ Expansion tank,
- ▶ Pump for pressure increase,
- ▶ Transmitter of water pressure in the installation,
- ▶ Transmitter of pressure for the level of water in the tank, alternatively level regulators with probes min-max and min-min,
- ▶ Overflow solenoid valve,
- ▶ Solenoid valve for filling up,
- ▶ Microprocessor controller,
- ▶ Electrical cabinet.



Expansion Tank

The Expansion tank is open, with the overflow pipe (in the case when the maximum water level in the tank is exceeded), and with drain tap. The volume of the tank is calculated so that it includes the volume of the water expansion and the volume of the required water reserves, which compensates for losses in the system (venting, sludge removal, installation leaking). The recommended volumes of the expansion tank are shown in the tables.

Pressure Maintenance Pump

Depending on the operating pressure and the flow rate of water, which is added to the installation, the three types of centrifugal high pressure pumps are installed:

- ▶ pressure range (2-4) bar
- ▶ pressure range (4 - 6) bar
- ▶ pressure range (6 - 10) bar

Type of device	DSU-1	DSU-2	DSU-3	DSU-4	DSU-5	DSU-6
Heating capacity (kW)	up to 300	300 – 500	500 – 800	800 – 1.200	1.200 – 1.600	1.600 – 2.000
Tank volume* (l)	200	400	600	800	1.000	1.200
Tank diameter* (mm)	500	600	600	800	900	900
Tank height* (mm)	1.200	1.500	2.000	2.000	1.600	2.000

* Dimensions of the expansion tank and volume are subject to correction upon customer's request.

Water pressure transmitter in instalation and Water level transmitter in the expansion tank

Water pressure transmitter in the installation is mounted on the pipe line that connects the pump for the pressure increase and the heating installation return pipe. The range of the pressure transmitter is (0 - 6) bar or (0 - 10) bar. Signal for the pressure drop switches on the pump, while signal for the pressure increase opens the solenoid valve. Transmitter of the water level (water pressure in the tank) is installed in the lower part of the expansion tank, below the intake connection of the pump. Upon registering a signal of the minimal level, the refilling starts, while upon registering the maximum level, the filling in of the expansion tank stops. The pump unconditionally switches off at the signal for the protection level (absolute minimum). The range of the pressure transmitter is (0 to 0.25) bar or (0 - 0.5) bar.

Level Regulators with Probes

To maintain the water level in the expansion tank, the level regulators with electrical conductivity probes may also be used, such as:

Two-position level regulator (min-max) with two probes for the control of solenoid valve for refilling and one-position level regulator (min-min) with one probe for the detection of the absolute minimum level of water in the tank, and blockade of the pump operation in order to increase the pressure.

Overflow Electromagnetic Valve and Filling Electromagnetic Water Valve

When the pressure in the installation is increased, the electromagnetic valve opens, and the excess of water is overflowed into the expansion tank.

With the occurrence of the minimum level of water in the tank (transducer signal "min" on the level regulator or water level transmitter) a solenoid valve on the pipe line for refilling opens. In the case of maximum level, the valve closes. Solenoid valves are "normally closed" while running.

Microprocessor Control Unit DSC-10

Microprocessor control unit controls the operation of the device. In the case when water level transmitter is used, the operating pressure is maintained, as well as, the level of water in the expansion tank and the blockade of the "pump dry running". A display of the operations parameters is enabled, as well as, the change of the set values and the alarm signalization. In case of power failure, storage of the operating parameters is provided and the automatic return to operation after power is restored.

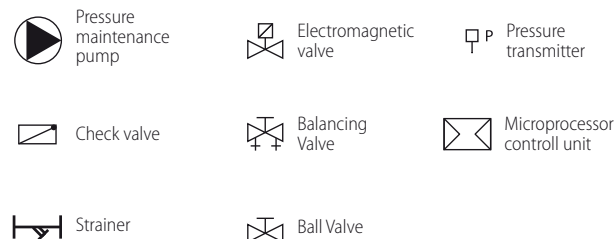
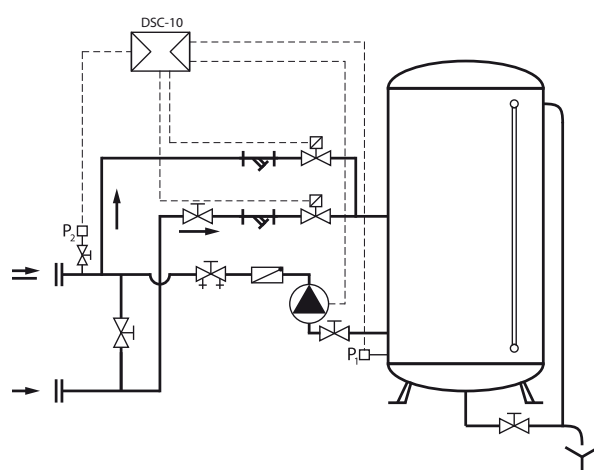
Microprocessor control unit is equipped with communication interface RS485 (MODBUS protocol) for connecting to the wider system of communication.

Electrical Cabinet

The Electrical Cabinet has a built in electrical equipment for securing and protecting the pump, a microprocessor control unit and the auxiliary equipment for the supply of elements in the field, relay protection and signaling.

Supply voltage for the cabinet is 380 V AC, and the connection power is:

- the device DSU-1 and DSU-2: 0,55 kW;
- the device DSU-3 and DSU-4: 1,1 kW;
- the device DSU-5 and DSU-6: 1,5 kW



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