

irene energia



DISTRICT HEATING IN TURIN
MARTINETTO HEAT ACCUMULATORS





The essential function of the accumulation system is the storage of the thermal energy produced by thermoelectric power plant in cogenerations overnight, when the heat demand for heat is lower and its use during the hours of maximum load of the district heating system, minimizing the use of the integration boilers.

The plant consists of:

- a heat accumulation system for superheated water made up of six pressurised vessels with a total capacity of 5,000 m³ with the relative pump assembly;
- a station to repump the superheated water in the district heating grid;
- two chambers with gate valves for

the district heating connection of the plant to grid;

- the common facilities, such as electric cabinets, HVAC systems, wastewater system, fire-fighting systems, video controls, etc.

The energy provided by the accumulation system ensures that the following objectives are reached:

- high operating flexibility and fast start-up;
- highly flexible control of the heat flows;
- saving of about 5,000 Tep/year of primary sources and reduction of greenhouse gas emissions;

The plant can accumulate and provide superheated water at a delivery tem-

perature normally between 105°C and 120°C.

The plant and systems interfacing with the district heating grid are operated from the remote control rooms of Power Plants of Moncalieri, Torino Nord, Bit and Politecnico.

From a plant engineering point of view, the system is made up of six pressurised vessels with the following characteristics:

- design pressure: 18 bars;
- design temperature: 210°C;
- corrosion overthickness: 1 mm;
- outside diameter of plating: 7,600 mm;
- height of the cylindrical part: 14,710 mm;
- internal radius of hemispherical heads: 3,800 mm;
- height above ground 20 m.





Based on the operation conditions, the accumulation vessels may be filled and emptied several times a day.

Inside each accumulation vessel, there is a water distribution system in both directions, with a maximum capacity of 230 kg/s, in order to guarantee the correct stratification.

All the elements inside the vessels (pipes and distribution system) are made of stainless steel.

The pumping station is made up of a set of three identical pumps in parallel with variable speeds obtained by varying the power supply frequency of the electric motors.

The three pumps of the Pumping Station, have the following characteristics:

- nominal capacity: 365 kg/s;
- head at nominal capacity: 8.2 bars;
- N.P.S.H. required at nominal capacity at 20°C: 4.8 m;
- capacity regulation range with frequency converter: 30%÷100%.

The three pumps of the Repumping Station, have the same features of the pumping station ones.

In order to ensure the optimal architectural and environmental compatibility, the vessels are covered with AISI 304 stainless steel plates fixed to elements anchored directly to the steel plate of the vessels.

The architectural solution reaches beyond the top of the vessels so as to mitigate the visual impact of the equipment at the top.

As for Politecnico, Martinetto plant is equipped with a special lighting system to enhance its artistic value.



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