

Calculation and Selection – Buffer storage tank

Initial data

15000 [W]	Thermal power of the heat source	24.0 [hours]	Time for hot water withdrawal from the tank
4000 [W]	Thermal power of the heat consumer	6.4 [hours]	Time of simultaneous operation of heat source and heat consumer
90 [°C]	The temperature of the hot water entering the tank from the heat source	3 [bar]	Maximum pressure in the system
40 [°C]	The temperature of the cold water entering the tank from the heat consumer	Heat consumer	Priority

Calculation results

$$4000 [W] * 24.0 [hours] / 15000 [W] = 6.4 [hours]$$

The number of operating hours of a heat source with thermal power 15000 [W] required to provide a consumer with thermal load 4000 [W] for 24.0 [hours]

$$4000 [W] * 24.0 [hours] - 4000 [W] * 6.4 [hours] = 70400 [W*h]$$

The amount of heat that must be stored in the tank to provide the consumer with thermal power 4000 [W] for the time when the source does not generate heat

$$1003 - 0.156 * 90 - 0.0029 * 90^2 = 966 [kg/m^3]$$

Water density in the tank $t=90^{\circ}C$

$$(3600 * 70400 [W*h]) / \{ 4.187 * (90^{\circ}C - 40^{\circ}C) * 966 [kg/m^3] \} = 1253 [liters]$$

Estimated volume of the tank

Selection result

Buffer storage tank

Теплобак : ВТА-1 1500

Ukraine

1500 [liters]	Volume of the tank
PN 3 [bar]	Nominal pressure for the tank
dT 5 ... 95°C	Operating temperature range
D 1180 / H 2150 [mm]	Diameter / height of the tank
steel	Tank body material
90 [mm]	Thickness of tank insulation
two smooth tubes	Heat exchanger
	S1 = 5.7 [m ²] S2 = 2.3 [m ²] PN 6/10 bar

