

## Section A. Nomenclature Topics

### Part II. Thermal Coefficients, Energy, and Work

#### Chapter 7. Heat and Work Consideration

### LECTURE 8. HEAT AND WORK RELATIONS

#### § 1.9. Heat and work

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Bodies in the thermodynamic process exchange energy between themselves. The energy of some bodies increases, the others, on the contrary, decreases instead. The transfer (transition, transmission) of the energy can be realised by two ways [113, pp. 23-24].

The **first way of the energy transfer** (transition, transmission) represents by itself the transition of the energy in the form of **heat**. The amount (quantity) of the energy transmitted in this way is called the **amount (quantity) of heat**.

Heat, as any energy is measured in Joules (J), after the name of **James Prescott Joule**. An **arbitrary amount of heat** is depicted by the character (letter)  $Q$ , and **specific (related to 1 kg) –  $q$** . Introduced (flown (taken) in) heat is considered **positive**, withdrawn (put out) – **negative**.

The **second way of the energy transfer** (transition, transmission) is called the transition of the energy in the form of **work**, and the amount (quantity) of the energy transmitted in this way is called the **work**. The energy transfer (transition,

transmission) in this case realises by the displacement of either the entire (whole) body or its parts in space.

If a body receives (gets in) the energy in the form of work, it is considered that the work is performed (done, executed) upon (over) this body. When a body gives out the energy in the form of work (puts it out, gives it away) – the body spends work. The work performed (spent) by a body is considered **positive**, and the work done over (upon) a body, – **negative**. Work, as heat is also measured in Joules (J). An **arbitrary amount of energy, transferred (transitioned, transmitted) in the form of work** is depicted by the character (letter)  $L$ , and **specific (related to 1 kg) –  $l$** .

Thus, heat and work are two quality and quantity different forms of the energy transfer (transition, transmission) from one bodies to others.

Work represents by itself the macro-physical form of the energy transfer (transition, transmission), and heat is a composite of microphysical processes. The energy transition in the view of heat realises at the molecular level without visible motion of bodies [113, pp. 23-24].

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