Physical quantities

Note: Abbreviations of the **scalar** quantities are presented in *italic* (*l*, *s*, *x*..), abbreviations of the **vector** quantities are presented in **bold** (**v, a, F**..)

The natural phenomenon or property → the human-derived imagination of it	**Physical quantity describing this**	**Abbreviation of the quantity**	**Measuring unit in the SI system of units**	**Abbre-viation of the unit**
The property of the body to differ from other bodies by size (to be *longer* or *shorter*, *higher* or *lower*) → a human imagination of **space**	length, path length	l s	meter	1 m
The **location** of the body during the translational motion → a human imagination of the system of coordinates (the reference frame)	coordinate displacement	x $\mathbf{s}$	meter	1 m
The state of translational motion of the body → a human wish **to compare** various translational motions	speed velocity	v $\mathbf{v}$	meter per second	1 m/s
Difference of motions → comparison of the motions → a human imagination of the **duration** of the processes	time time interval	t Δt	second	1 s
The **change** of the state of translational motion of the body → a human imagination of the speed of the velocity change	acceleration	$\mathbf{a}$	meter per squared second	1 m/s^2
The property of the **body** to maintain its state or status of the translational motion (the property of **inertia**)	(inertial) mass	m	kilogram	1 kg
The property of the **substance** to contain some mass in the unit of volume	density	ρ [the Greek letter *rho*]	kilogram per cubic meter	1 kg/m^3
The strength or intensity of the **interaction** between the bodies at the **translational** motion → a human wish **to compare** interactions between various bodies in the case of translational motion	force	$\mathbf{F}$	newton	1 N = 1 kg m/s^2
The ability of the substance or the field to act with some **force** on the unit **area** of a base or a wall of the container	pressure	p	newton per square meter = pascal	1 N/m^2 = 1 Pa
The ability of the translationally moving body to bring other bodies to motion (the **quantity** of the **translational motion**)	linear momentum	$\mathbf{p}$	kilogram times meter per second	1 kg m/s
The property of the body to participate in the **gravitational** interaction	(heavy) mass *)	m_h	kilogram	1 kg
The property of the body to participate in the **electromagnetic** interaction	electric charge	q	coulomb	1 C

The **position** of the body at the rotational motion → a human need to describe the difference between various positions of the rotating body with respect to the axis of rotation	coordinate angle	θ [the Greek letter *theta*]	radian	1 rad
The state of rotational motion of the body → a human wish **to compare** various rotational motions	angular velocity	ω [the Greek letter *omega*]	radian per second	1 rad/s or 1 s^{-1}
The **change** of the state of rotational motion of the body → a human imagination of the speed of the angular velocity change	angular acceleration	α [the Greek letter *alpha*]	radian per squared second	1 rad/s^2
The strength or intensity of the **interaction** between the bodies at the **rotational** motion → a human wish to describe the **action of a force** on the rotational motion of the body.	torque	τ [the Greek letter *tau*]	newton times meter or newton-meter	1 N · m
The ability of the rotationally moving body to bring other bodies in motion (the **quantity** of the **rotational motion**)	angular momentum	**L**	kilogram times squared meter per second	1 kg m^2/s
The property of the body to maintain its state of the rotational motion (the property of **inertia** of the rotation)	rotational inertia	I	kilogram times squared meter	1 kg m^2
Process changing the state or status of the bodies, the change itself (displacement) and the effort needed for this change (force).	work	W (US, UK) A (DE, RU)	joule	1 J
The ability of the body to change the situation (to perform **work**) deriving from the **motional** state of the body.	kinetic energy	E_k	joule	1 J
The ability of the body to change the situation (to perform **work**) deriving from the **position** of the body with respect to the other bodies and **interactions** with them	potential energy	E_p	joule	1 J
The ability to change the situation (to perform **work**) caused only by the **existence** of the body or field	rest energy	E_r	joule	1 J
Speed of the **process** (work per time unit) required for the change of the situation	power	P	watt	1 W = 1 J/s

Note: *) Inertial and heavy masses are defined to be equal and are both measured in **kilograms**.