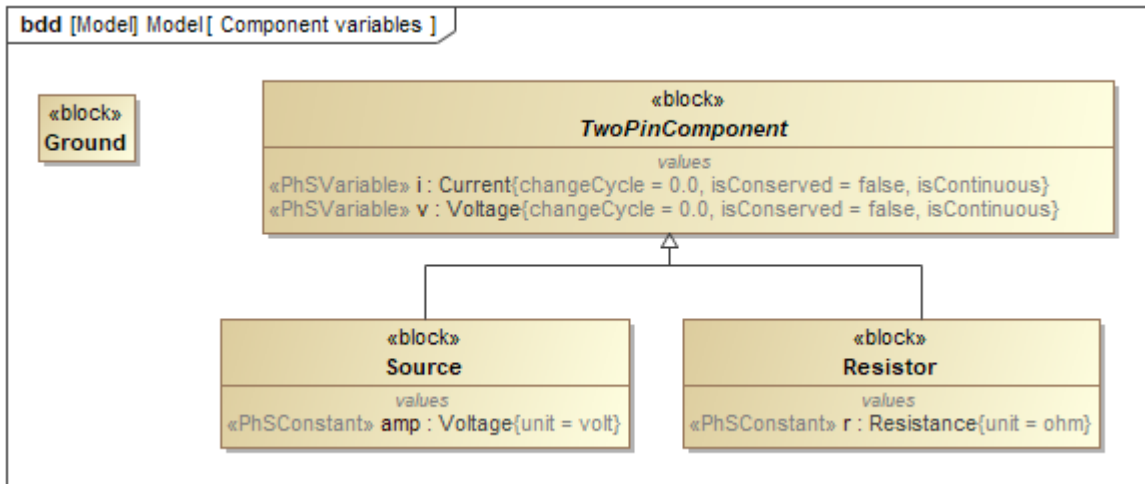


Component variables and parameters

Each of the electrical component has variables corresponding to the domain being modeled. Electrical components have *voltage* and *current*. The voltage corresponds to the difference of potential between the positive and negative pin (across the component), whereas the current corresponds to the amount of charge going through the component.

Two properties *v* and *i* are created in *TwoPinComponent*. During the simulation, the voltage and the current will vary over time. As a result, the properties need to be stereotyped by *PhSVariable*. Their type must be a *ValueType* that has a unit with a symbol. Voltage and Current are already provided by the simulation library, so they can be selected (remove filters if necessary). The resistor has an additional property - the resistance. A property *r* is created in the resistor. Since the resistance will not change during the simulation, the property needs to be stereotyped by *PhSConstant*. It is necessary to create a new *ValueType* called *Resistance* that will serve as a type for this property. It must have a corresponding SysML *Unit* with a symbol set to Ω . Additionally, it must be a specialization of SysML *Real*.

The image below shows how [Block Definition Diagram \(BDD\)](#) should look like at this point.



The *i* and *v* Value properties typed by *Current* and *Voltage* value types.