

About

Provide general information regarding the described model.

Model name	
Author / organization	
Short description	
Present use / development status	

Classification

Describe the context of the model regarding application (modelling domain, intended use) and technical details (modelling approach, model dynamics, model of computation, functional representation).

Domain	<input type="checkbox"/> electrical storage <input type="checkbox"/> thermal storage <input type="checkbox"/> energy conversion device <input type="checkbox"/> other, please specify:
Intended application (including scale and resolution)	
Modelling of spatial aspects <i>Explain the approach of how this model describes the spatial distribution of the system.</i>	<input type="checkbox"/> lumped (single device) <input type="checkbox"/> discretized (single device) <input type="checkbox"/> averaged (multiple devices) <input type="checkbox"/> other, please specify:
	Details:
Model dynamics <i>Explain how the model captures the dynamic behaviour of the system.</i>	<input type="checkbox"/> static <input type="checkbox"/> quasi-static <input type="checkbox"/> dynamic <input type="checkbox"/> other, please specify:
	Details:
Model of computation <i>Explain how the model captures the system's evolution with respect to time and/or external stimuli.</i>	<input type="checkbox"/> time-continuous <input type="checkbox"/> discrete-event <input type="checkbox"/> state machine <input type="checkbox"/> other, please specify:

	Details:
Functional representation <i>Are the model functions explicit, i.e., of type $y = f(x)$, or implicit, i.e., of type $g(x,y) = 0$?</i>	<input type="checkbox"/> explicit <input type="checkbox"/> implicit <input type="checkbox"/> other, please specify:
	Details:

Mathematical Model

This section provides information about the actual mathematical model by specifying variables, parameters and equations. Variables and parameters should be specified with type (Real, Integer, Boolean, String) and (physical) unit. In case the equations are too complex to be reproduced here, also a reference to a book or any other publication can be given.

Input variables (name, type, unit, description)	
Output variables (name, type, unit, description)	
Parameters (name, type, unit, description)	
Internal variables (name, type, unit, description)	
Internal constants (name, type, unit, description)	
Model equations <i>Formulate or provide references to the model's governing equations (describing the system state) and the constitutive equations (describing material properties)</i>	Governing equations Constitutive equations
Initial conditions	
Boundary conditions	
Optional: graphical representation (schematic diagram, state transition diagram, etc.)	

Testing

Please provide a (simple) test design for the purpose of component model characterization. This test should enable two different kinds of comparisons:

- **model validation:** compare the behaviour of an implementation of the exact same model based on time-series data
- **model harmonization:** compare the behaviour of an implementation of a (supposedly) similar model with the same or comparable intrinsic or lower time resolution based on the comparison of key performance indicators

Model Validation Provide the description of a test setup (i.e., simulation) that enables others to validate their implementation of the same model. The results should be provided as <u>time series</u> .	
Narrative Provide a simple description of the test specification.	
Test system configuration Describe the test setup, including: How long does the simulation run? Are there any other models required for this setup? If yes, provide a link to their description. Is a controller required for this setup (see also below)?	
Inputs and parameters Specify the (exogeneous) inputs of the model used in this test. Also specify the model parameters used in this test. If necessary, attach this information as dataset (SmILES data format).	
Control function (optional) Specify any additional control functions used for this test.	
Initial system state Describe the initial state of the system.	
Temporal resolution Provide information regarding the temporal resolution of the test simulation, such as integrator step size, time resolution for event handling, etc.	
Evolution of system state Describe (textual and/or graphical) the expected <u>qualitative behaviour</u> of	

the component model in this simulation.	
Expected results <i>Provide a <u>quantitative description</u> of the expected simulation output based on time series. This information must be comprehensive enough for someone else to validate his/her own implementation of this model. If necessary, attach this information as dataset (SmILES data format).</i>	

Model harmonization <i>Provide information that enables others to compare the behaviour of similar models with this model. The results should be provided as KPIs, targeting a time resolution that is lower than that of the model itself. For instance, if the intrinsic time resolution of the model is seconds, then the provided KPI should measure a significant attribute of the modelled system on an hourly or daily basis.</i>	
Narrative <i>Provide a simple description of the test specification.</i>	
Test system configuration <i>Describe the test setup, including: How long does the simulation run? Are there any other models required for this setup? If yes, provide a link to their description. Is a controller required for this setup (see also below)?</i>	
Inputs and parameters <i>Specify the (exogeneous) inputs of the model used in this test. Also specify the model parameters used in this test. If necessary, attach this information as dataset (SmILES data format).</i>	
Control function (optional) <i>Specify any additional control functions used for this test.</i>	
Initial system state <i>Describe the initial state of the system.</i>	

Temporal resolution <i>Provide information regarding the temporal resolution of the test simulation, such as integrator step size, time resolution for event handling, etc.</i>	
Evolution of system state <i>Describe (textual and/or graphical) the expected <u>qualitative behaviour</u> of the component model in this simulation.</i>	
Expected results <i>Provide a <u>quantitative description</u> of the expected simulation output <u>based on key performance indicators</u>. This information must be comprehensive enough for someone else to validate his/her own implementation of this model. If necessary, attach this information as dataset (SmILES data format).</i>	

Sensitivity analysis (optional) <i>Provide additional information that enables others to validate their implementation of the same model. The goal is to understand how different sources of uncertainty in the component model input affect the model's output.</i>	
Narrative <i>Provide a simple description of the test specification.</i>	
Test system configuration <i>Describe the test setup, including: How long does the simulation run? Are there any other models required for this setup? If yes, provide a link to their description. Is a controller required for this setup (see also below)?</i>	
Source of uncertainty <i>Specify the source of uncertainty for this specific sensitivity analysis.</i>	
Inputs and parameters	

Specify the (exogeneous) inputs of the model used in this test. Also specify the model parameters used in this test. If necessary, attach this information as dataset (SmILES data format).	
Control function (optional) Specify any additional control functions used for this test.	
Initial system state Describe the initial state of the system.	
Temporal resolution Provide information regarding the temporal resolution of the test simulation, such as integrator step size, time resolution for event handling, etc.	
Evolution of system state Describe (textual and/or graphical) the expected <u>qualitative behaviour</u> of the component model in this simulation.	
Expected results Provide a <u>quantitative description</u> of the expected simulation output. This information must be comprehensive enough for someone else to validate his/her own implementation of this model. If necessary, attach this information as dataset (SmILES data format).	

Additional Information

Provide any other additional information here.

Reference implementation	
Similar / related models	
Related publications	
Intellectual property concerns (if applicable)	