Technical Interface Specifications

for the SG Ready Label for Electric Space-Heating and Hot Water Heat Pumps and Compatible System Components

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I. General Information on the SG Ready Label for Smart Grid-Compatible Heat Pumps and System Components

The energy sector is increasingly shaped by fluctuating renewable energy input. Heat pumps can act as demand-flexible consumers by actively storing excess electricity as thermal energy when it cannot be fed into the local grid. This stored energy can be used to meet heating demands or to reduce consumption peaks by temporarily shutting down the heat pump. Load management with heat pumps is a proven and energy-efficient method that creates synergies between the electricity and heating sectors, reduces dependency on energy imports, and contributes to climate protection.

The SG Ready label helps identify heat pumps that feature a defined interface for grid-friendly load management. This interface can be used by grid operators to control the device or by homeowners to maximize self-consumption in combination with a photovoltaic system.
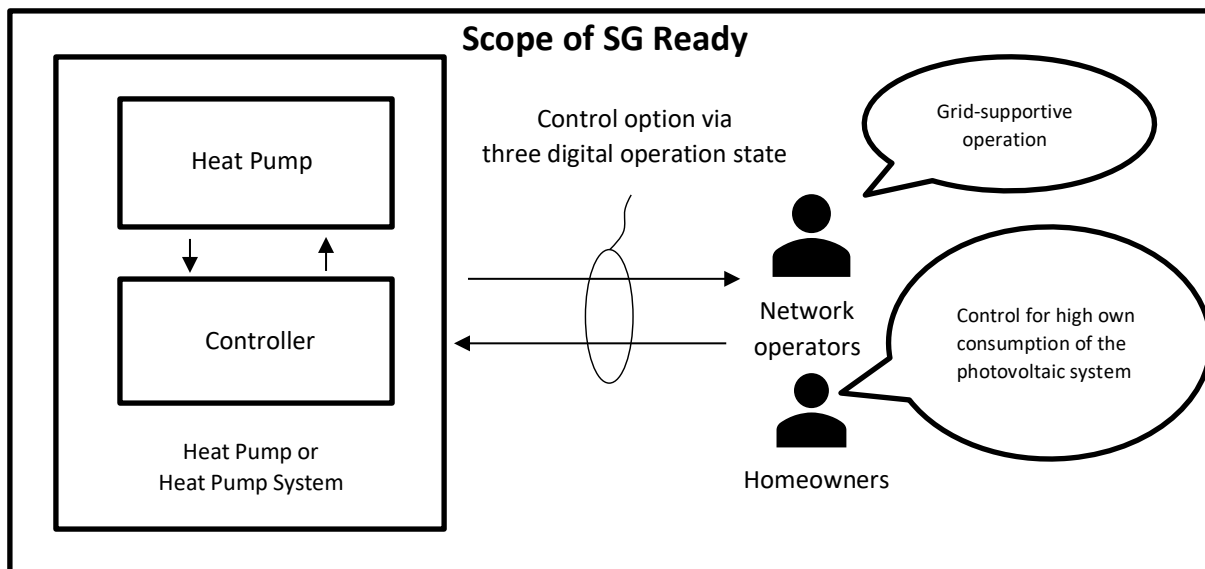
2. SG Ready Interface for Heat Pumps

2.1 Space-Heating Heat Pumps

- Space-heating heat pumps must be equipped with a controller that supports four operating states:

    a) **Operating State 1** (1 switching state, terminal solution: 1:0)

    This state is backward compatible with utility provider (EVU) time-based blocking mechanisms. It allows a maximum of two hours of "hard" shutdown.

    b) **Operating State 2** (1 switching state, terminal solution: 0:0)

    The heat pump runs in energy-efficient normal mode. Partial heat storage is enabled to account for the maximum two-hour EVU blocking.

    c) **Operating State 3** (1 switching state, terminal solution: 0:1)

    The heat pump operates in boost mode for space heating and domestic hot water production. This is not a mandatory start command, but a recommendation for activation.

    d) **Operating State 4** (1 switching state, terminal solution: 1:1)

    This state provides a definitive start command, provided it aligns with the controller's regulatory settings.

    Various regulatory models must be adjustable for different tariff and usage models:

    a. Option 1: The heat pump (compressor) is actively switched on.

    b. Option 2: The heat pump (compressor and electric booster heaters) is switched on. Optionally, storage temperatures are increased.

- Room temperature can optionally be used to regulate system temperatures (supply/return temperature). A room thermostat alone cannot block the heat pump based on room temperature.

- Planning documents must be available for each model or model range, describing how SG Ready heat pumps should be dimensioned for load management. These documents must be included in the application and be available in the language of the sales region.

2.2 Domestic Hot Water Heat Pumps

Domestic hot water heat pumps must be equipped with a controller that enables an automatic increase in the hot water target temperature for thermal storage purposes.

This corresponds to Operating State 3 in section 2.1.

3. Interface-Compatible System Components

3.1 Interface-Compatible System Components

- System components that are compatible with the SG Ready interface must include logic to control heat pumps using all three operating states as defined in sections 2.1 and 2.2.

- Configuration documents must be available to explain how to set up system components for controlling SG Ready-compatible heat pumps. These must be included in the application.

- Control functions need to be configurable in a way to at least meet the following criteria:

  a) When the load shedding signal (Operating State 1) is activated via the digital input, it must remain active for at least 10 minutes. After deactivation, the signal must not be reactivated for another 10 minutes.

  b) When the activation recommendation/startup command signal (Operating State 3/4) is activated via the digital input, it must remain active for at least 10 minutes. After deactivation, the signal must not be reactivated for another 10 minutes.