

**SUPPLEMENT SE - CONNECTED HEATERS**

**INTRODUCTION**

**SE1 Scope**

SE1.1 These requirements apply to connected (smart enabled) appliances with a control to receive and respond to a command from a wireless or remote location control device. These requirements add to the applicable requirements in the body of this Standard.

SE1.2 These requirements are not applicable to handheld wireless controls that can only transmit commands within line-of-sight, such as infrared transmitters.

**CONSTRUCTION**

**SE2 General**

SE2.1 The appliance shall require the main power switch at the appliance to be in the ON position after connection to the source of supply before enabling a control at the appliance to receive and respond to a wireless or remote location command.

SE2.2 Controls of Table SE2.1 shall be incorporated at the appliance. See Table SE2.1.

**Table SE2.1  
Control Designations**

Controls <sup>1</sup>	Reference	Control Evaluation <sup>2</sup>
Manual enable	SE2.4	Operating
Manual disable	SE2.5	Protective
Visual indicator	SE2.6	Operating
Disable as a result of a manual operation	SE2.7	Protective
Movement detection	SE2.8	Protective
Ambient temperature detection	SE2.9(c)	Protective
Maximum 24 hour disable timer	SE2.12	Protective
Manual timer reset (refresh)	SE2.13	Operating
Maximum 24 hour limit operation	SE2.14	Protective
Manual continued operation reset (refresh)	SE2.15	Operating
<sup>1</sup> Auxiliary control functions related to connected functions are not referenced here and shall comply with auxiliary controls requirements in accordance with Section 4.3.		
<sup>2</sup> See SE2.16.		

SE2.3 Controls of Table SE2.1 shall be automatic, except where manual activation is indicated. See Table SE2.1.

SE2.4 A control at the appliance shall require a momentary-contact manual activation prior to enabling the appliance to receive and respond to a wireless or remote location command that initiates a heating function or increases a temperature setting. The control shall be independent of a power ON switch.

SE2.5 A manually activated control or switch shall be provided to disable any wireless or remote commands that initiate a heating function or increase a temperature setting, until manually enabled per SE2.4. This control or switch and the control of SE2.4 are permitted to be a single control.

SE2.6 A visual indicator shall be provided to indicate when the appliance is in the enabled mode. The visual indicator color shall be other than red or amber. The visual indicator shall be located on the front or top surface of the heater. The visual indicator shall be visible from a point 10 feet (3 m) in front of the center of the heater and 5 feet (1.5 m) above the floor. Compliance with this requirement shall be determined while the heater is:

- a) Standing on the floor if the heater is intended for placement on the floor while in operation;
- b) Elevated from the floor by 3 feet (0.91 m) if the heater is intended for use at an elevated location (see 3.11); or
- c) Standing on the floor and also when it is elevated by 3 feet (0.91 m) for a heater intended to be used either on the floor or at an elevated location.

SE2.7 Manual activation of any control at the appliance shall disable the appliance from receiving and responding to a wireless or remote command that initiates a heating function or increases a temperature setting.

SE2.8 A movement detection system shall be provided with a moveable heater that senses if the enclosure of the appliance has moved. Upon detection of movement, the appliance shall disable any wireless or remote commands that initiate a heating function or increase a temperature setting. The movement detection system shall not be readily defeatable.

SE2.9 A control shall not permit the appliance to initiate a heating function or increase a temperature setting from a wireless or remote command at any time if any of the following are detected at the appliance:

- a) Actuation of a control of SE2.5;
- b) Activation of a protective control;
- c) An ambient temperature in excess of 30°C (86°F); or
- d) Detection of movement of the enclosure per SE2.8.

SE2.10 If any condition of SE2.9 is detected in the enabled mode, a control shall disable any wireless or remote commands that initiate a heating function from a wireless or remote control device. If a condition of SE2.9(b) or (c) is detected at any time, the appliance shall additionally disconnect the heating element from its source of supply without automatic reset. The control shall not permit the appliance to initiate a heating function or increase a temperature setting from a wireless or remote command until the condition of SE2.9 is no longer detected and the appliance is manually enabled per SE2.4.

SE2.11 Once a wireless or remote command has activated a heating function, a control shall continue to monitor the conditions of SE2.9 and comply with SE2.10.

SE2.12 If a wireless or remote command has not been received at the appliance within 24 hours after manually enabling per SE2.4, a control shall not permit the appliance to initiate a heating function or increase a temperature setting from the a wireless or remote command. See SE5.

SE2.13 A wireless or remote command to reset (refresh) the 24 hour period of SE2.12 is permitted if the user manually selects a reset function at the wireless or remote control device or at the appliance before 24 hours has elapsed. An automatic timer reset function is not permitted.

SE2.14 Within 24 hours of initiating a heating function or increasing temperature setting as a result of a wireless or remote command:

- a) The appliance shall disconnect the heating element from its source of supply; and
- b) The appliance shall become disabled from receiving and responding to a wireless or remote location command. See SE6.

SE2.15 Operation of the appliance per SE2.14 is permitted to be extended for an additional 24 hours if the user manually selects a wireless or remote command within that time period. An automatic timer reset function is not permitted.

SE2.16 Controls for connected functions are considered operating controls with respect to 3.19 but shall be evaluated as and comply with the applicable requirements for operating or protective controls as indicated in Table SE2.1 in accordance with Controls, Section 4.3.

SE2.17 All controls of Table SE2.1 that rely on software to comply with the requirements of this Standard shall not be programmable or adjustable by individuals or through communication after its factory setting. See SE9.1.

## PERFORMANCE

### SE3 Movement Detection Test, Moveable Heaters

SE3.1 For each condition of SE3.2 – SE3.3, a movement detection system of SE2.8 shall:

- a) Sense when the enclosure of the appliance has moved; and
- b) Disable any wireless or remote commands that initiate a heating function or increase a temperature setting.

SE3.2 The appliance shall be enabled in accordance with SE2.1 while under a non-heated state. The appliance shall be placed on a supporting surface and then lifted a minimum 4 inches (102 mm) vertically above the supporting surface within one second. A wireless or remote command to initiate a heating function shall then be selected to confirm the command was not accepted at the appliance.

SE3.3 The appliance shall then be operated in accordance with the Normal Temperature Test. The appliance shall then be enabled in accordance with SE2.1. The appliance shall be placed on a supporting surface and then lifted a minimum 4 inches (102 mm) vertically above the supporting surface within one second. A wireless or remote command to increase a temperature setting shall be selected to confirm the command was not accepted at the appliance.

#### SE4 Ambient Temperature Test

SE4.1 When tested under the conditions of SE4.2 – SE4.4 under any mode of operation, an automatic control of SE2.9(c) shall:

- a) Sense when the ambient environment exceeds 30°C (86°F);
- b) Disable any wireless or remote command that initiates a heating function or increase a temperature setting; and
- c) Disconnect the heating element from its source of supply without automatic reset.

SE4.2 The heating element of the appliance shall be substituted with an equivalent non-heating resistive load or equivalent method so that the appliance does not thermally affect the test environment. All other circuits and controls shall be operable for the purpose of this test.

SE4.3 The appliance shall be placed in a suitable conditioning chamber with the temperature maintained within  $\pm 1.0^{\circ}\text{C}$  ( $\pm 1.8^{\circ}\text{F}$ ) of the temperatures specified for the test. Uniform temperatures of the appliance are to be maintained by holding the ambient temperature at 25°C (77°F) or 9°C (13°F) less than the set-point temperature of the automatic control of SE2.9(c), whichever is less, until conditions of equilibrium have been established.

SE4.4 The ambient temperature is then to be raised at a rate of not more than 0.5°C (1.0°F) per minute until the automatic control of SE2.9(c) disconnects the heating element load without automatic reset and does not permit the appliance to initiate a heating function or increase a temperature setting from the a wireless or remote command or until an ambient temperature of 30°C (86°F) is exceeded, whichever occurs first.

#### SE5 Enabled Timeout Test, Initiating a Heating Function

SE5.1 When tested under the conditions of SE5.2 – SE5.3 under any mode of operation, an automatic control of SE2.12 shall:

- a) Sense when a wireless or remote command has not been received at the appliance within 24 hours after manually enabling per SE2.4 and SE2.12; and
- b) Disable any wireless or remote command that initiates a heating function.

SE5.2 The appliance shall be connected to its source of supply and manually enabled per SE2.4. The appliance shall continuously remain in this condition without receiving a remote command until 24 hours has been exceeded.

SE5.3 Within 5 minutes of exceeding 24 hours of operation, a wireless or remote command shall be transmitted to initiate a heating function to confirm the command was not accepted at the appliance.

#### **SE6 Enabled Timeout Test, Increasing a Temperature Setting**

SE6.1 When tested under the conditions of SE6.2 – SE6.3 under any mode of operation, an automatic control of SE2.12 shall:

- a) Sense when a wireless or remote command has not been received at the appliance within 24 hours after manually enabling per SE2.4 and SE2.12; and
- b) Disable any wireless or remote command that increases a temperature setting.

SE6.2 The appliance shall be connected to its source of supply and manually enabled per SE2.4. The appliance shall be operated with the heating element energized at a setting that does not permit the automatic control of SE2.9(c) from activating. The appliance shall continuously remain in this condition without transmitting a remote command until 24 hours has been exceeded.

SE6.3 Within 5 minutes of exceeding 24 hours of operation, a wireless or remote command shall be transmitted to increase the temperature setting to confirm the command was not accepted at the appliance.

#### **SE7 Resistance to Electro Magnetic Phenomena (Immunity)**

SE7.1 The appliance operating control and protective control functions shall remain operable when tested in accordance with SE7.2 – SE7.3.

SE7.2 Compliance with SE7.1 is determined using the communication circuit source(s) adjusted to its maximum factory setting(s) in addition to any intermediate settings that are determined to present a risk to the acceptable operation of the protective control and operating control functions. Control functions shall be tested in accordance with H.26.4 – H.26.14 of the Standard for Automatic Electrical Controls - Part 1: General Requirements, UL 60730-1, as appropriate.

SE7.3 With respect to SE7.2, if it is determined that the source within the appliance or its accessory(ies) produces emissions addressed by the standard test conditions of H.26 of the Standard for Automatic Electrical Controls - Part 1: General Requirements, UL 60730-1, it is not necessary to repeat the tests.



## MARKINGS

### SE8 Details

SE8.1 The manual means of actuating the enabled mode of operation of SE2.4 on the appliance shall be clearly indicated via marking on or adjacent to the user actuator.

### SE9 Instructions

SE9.1 User instructions provided with the appliance shall identify the means to enable the wireless or remote operation, including an illustration depicting the location of the actuating means with information on how to enable or disable the function.