INTERPRETATION IC 90.1-2022-3 OF
ANSI/ASHRAE/IES STANDARD 90.1-2022
Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings

Date Approved: January 30, 2024

Request from: Aaron McEwin, Jordan & Skala Engineers, Inc., 6201 West Plano Pkwy, Suite 250, Plano, TX 75093.

Reference: This request for interpretation refers to ANSI/ASHRAE/IES Standard 90.1-2022, Section 7.4.2 and Table 7.4-1, regarding Heat Pump Water Heaters used for Domestic Water Heating.

Background: We are seeing many new projects that are using commercial heat pump water heaters to provide domestic water heating. Appendix E to Subpart G of Part 431 of the Code of Federal Regulations provides a test procedure for Commercial Heat Pump Water Heaters, but the U.S. Department of Energy has not set an energy conservation standard.

ASHRAE/IES Standard 90.1 uses Part 431 Appendix E for Electric Instantaneous Water Heaters and Gas and Oil-fired equipment, but heat pumps water heaters are not listed. Pool Heat Pump water heaters are listed at an inlet temperature of 80°F, this is higher than typical ground water generally coming into buildings for domestic water. In 7.4.2, it states "Equipment not listed in Table 7.4-1 has no minimum performance requirements."

Interpretation No.1: Electric source Commercial and Residential Heat Pump Water Heaters used for potable water heating purposes are to meet the Electric storage water heaters or Electric instantaneous water heaters.

Question No.1: Is this interpretation correct?

Answer No.1: No

Comments No.1: ASHRAE/IES 90.1-2022 does not include a test procedure or energy efficiency requirements for heat pump water heaters (HPWHs) used for service water heating. Requirements for hydronic heat pumps used for space heating are found in Table 6.8.1-16.

Users should be aware the U.S. Department of Energy (DOE) regulates consumer HPWHs under the electric storage water heater class. Consumer HPWH are HPWH that have a maximum current rating of 24 amperes at a voltage no greater than 250 volts.[1] Manufacturers that sell consumer HPWH in the United States must follow the DOE test procedure and meet the minimum energy conservation standards for electric storage water heaters found in 10 CFR 430.32(d).[2]

[1] https://www.ecfr.gov/current/title-10/part-430/section-430.2#p-430.2(Water%20heater)
[2] https://www.ecfr.gov/current/title-10/part-430/section-430.32#p-430.32(d)

For commercial HPWH, DOE has published a test procedure for Commercial Heat Pump Water Heaters but has not published energy conservation standards currently. Local jurisdictions in the United States and other countries jurisdictions may have their own test procedure or efficiency requirements.

Interpretation No.2: Buildings can utilize heat pump water heaters that are not rated for energy efficiency.

Question No.2: Is this interpretation correct?

Answer No.2: Yes

Comments No. 2: Though ASHRAE/IES 90.1-2022 does not include a test procedure or minimum energy conservation standards for HPWH used as service water heaters, U.S DOE has published a test procedure, and local regulations or regulations in countries other than the United States may apply. Also, see Section 7.4.2 of the standard.