قرار وزاري رقم (131) لسنة 2026
بشأن اعتماد الكود الفني الخاص بسخانات المياه في المباني

وزير الكهرباء والماء والطاقة المتجددة:

- بعد الاطلاع على المرسوم بقانون رقم (15) لسنة 1979 في شأن الخدمة المدنية والقوانين المعدلة له،
- وعلى القانون رقم (56) لسنة 1996 في شأن إصدار قانون الصناعة وتعديلاته،
- وعلى المرسوم الصادر في 1979/4/4 في شأن نظام الخدمة المدنية والمراسيم المعدلة له،
- وعلى المرسوم رقم (57) لسنة 2022 الصادر في شأن وزارة الكهرباء والماء والطاقة المتجددة وتعديله،
- وبعد عرض السيد / وكيل الوزارة،
- وبناء على ما تقتضيه المصلحة العامة، واستنادا إلى الصلاحيات المخولة لنا.

- قرر -

مادة أولى: يعتمد الكود الفني الخاص بسخانات المياه في المباني المتضمن الحد الأدنى من المتطلبات الخاصة بتصميم وتركيب أنظمة تسخين المياه في المباني في دولة الكويت.

مادة ثانية: يطبق الكود الفني المشار إليه على أنظمة تسخين المياه في جميع المباني (السكنية وغير السكنية) في الدولة، ويشمل نطاق تطبيقه التالي:

1. توفير المتطلبات الفنية المحددة في الكود لتحقيق الاستخدام الأمثل من خلال تحديد معدل استهلاك الماء الساخن، وذلك على المباني الجديدة بالكامل، وكذلك على التوسعات الجديدة للمباني القائمة التي تستلزم حملا كهربائيا إضافيا.
2. تلتزم المباني غير السكنية بالحد الأدنى لمتطلبات كفاءة الطاقة الخاصة بتصميم وتركيب أنظمة تسخين المياه، وبتركيب نظام يحقق وفرا لا يقل عن 60% من إجمالي الطلب على تسخين المياه.
3. للمباني السكنية حرية اختيار أي نظام لتسخين المياه، غير أن الامتثال لمتطلبات كفاءة الطاقة الخاصة بتصميم وتركيب أنظمة تسخين المياه الواردة في هذا الكود تصبح إلزامية عند اختيار أنظمة تسخين المياه ذات الكفاءة العالية مثل (أنظمة تسخين المياه الشمسية – أنظمة تسخين المياه باستخدام مضخات الحرارة) وما شابهها.

4. تخضع جميع الأنظمة والمعدات والمنتجات المشمولة ضمن هذا الكود لمتطلبات المواصفات الكويتية KWS 1903:2025 الصادرة عن الهيئة العامة للصناعة (PAI) أو أحدث إصدار لها.

مادة ثالثة: يعمل بهذا القرار بعد سنة من تاريخ نشره في الجريدة الرسمية، ويلغى ما يتعارض معه من قرارات سابقة، وعلى الجهات المعنية تنفيذه وإبلاغه لمن يلزم.

د. صبيح عبدالعزيز عبدالمحسن المخيزيم

وزير الكهرباء والماء والطاقة المتجددة

التاريخ: 13 محرم 1448
الموافق: 28 يوليو 2026

وزارة الكهرباء والماء والطاقة المتجددة

Ministry of Electricity & Water & Renewable Energy

State of Kuwait | دولـــة الكويـت

Water Heating Systems Code for Buildings

Renewable Energy & Energy Efficiency Department

Table of Contents

1. Purpose

The purpose of this Code is to set the minimum requirements for water heating systems for both residential and non-residential buildings in the State of Kuwait. It shall not be used to circumvent any safety, health, or environmental requirements.

2. Scope

This Code sets the minimum energy requirements for the design and installation of water heating systems in buildings. The measures are stipulated for both entirely new buildings and new extensions of existing buildings that require additional electrical load. Non-residential buildings shall install a system that achieves at least 60% energy savings in the total heating demand. Meanwhile, residential buildings may select any water heating system they consider suitable; however, compliance with the requirements of the energy efficient water heating systems mentioned in this Code become mandatory when adopted. These include, but not limited to, solar water heating systems, heat pump water heating systems, or other renewable and high-efficient technologies. Such systems shall comply with the requirements of this Code. As for residential buildings, a minimum of 40% saving in the total heating demand is recommended.
In addition, all systems, equipment, and products covered under this Code shall comply with the requirements of KWS 1903:2025 published by the Public Authority for Industry (PAI) or the latest version.

3. Definitions

Solar Water Heater	Water heater equipped with one or more solar collectors, solar hot water tanks, heat generators and possibly pumps in the collector loop and other parts. A solar water heater is placed on the market as one unit.
Natural Circulation System	Relies on the natural flow of water due to temperature differences (Thermosiphon). Known as: Thermosyphon system - Standard Solar System Integral collector storage system - Passive system.
Forced Circulation System	Utilizes pumps to circulate water or heat transfer fluid such as glycol based fluid. Known as: Active Pumped System - Closed Loop System - Indirect pumped heating System.
Counter Flow System	Uses two separate flows of fluid in opposite directions to maximize heat exchange efficiency. Known as: Instantaneous solar thermal heating systems with double tube heat exchanger.
Coefficient of Performance (COP)	The efficiency of a Heat Pump is usually called its 'Coefficient of Performance' - (COP) which is simply a ratio of heat output to energy input, both being expressed in kW. Thus, a Heat Pump absorbing 1 kW of electricity, collecting 4 kW of energy from the air, and delivering 5 kW of heat to the water is said to have a COP of 5:1.

	Naturally this ratio will vary according to the temperature of the environment.
Solar Collector	A device designed to absorb global solar irradiance and transfers the captured heat to a circulating fluid, which is stored for later use in solar water heating system.
Solar Radiation	The amount of sunlight available in the area, which determines system efficiency.
Heat Pump Water Heater	Water heater using ambient temperature of an air source, water source or ground source, and/or waste heat for heat generation.
Hybrid Integrated System	A water heating system that combines two or more heating technologies within an integrated arrangement, such as solar water heating, heat pump water heating, electric heating, or heat recovery, in order to improve energy efficiency and ensure continuous hot water supply.
Heat Recovery for Service Water Heating System	A water heating system that utilizes recovered waste heat from building systems, such as air-conditioning, refrigeration, or industrial processes, for service water heating to reduce primary energy consumption.
System Sizing	The required solar collector area and tank capacity are based on simulation results and energy savings goals with hot water requirements calculations.
Simulation Software Report	Is a detailed analysis generated by specialized software to model the performance of solar water heating systems based on factors like climate conditions, building type, water demand, and system design. It simulates energy performance, efficiency, and expected savings, ensuring the system meets the required performance criteria, including energy savings and reduced electricity consumption.
Residential Buildings	All types of buildings are meant for residential purposes, including single- and multiple-family residences, such as villas, apartments, and the like as stated in the building's municipality license.
Non-Residential Buildings	Common buildings which have similar design features and can be categorized as follows: Commercial buildings: All types of buildings meant for private commercial business such as offices, shops, malls, souks, hotels, banks, schools, universities, apartments, and clinics as well as mosques built with private funds, and the like. Governmental buildings: All types of buildings meant for public convenience such as government institutional buildings (ministries, authorities, buildings of non-profit organizations (under the jurisdiction of Ministry of Social Affairs), buildings owned by government establishments and companies and their subsidiaries, etc.), schools, universities, clinics, mosques, police stations. This category also includes residential buildings built by the government through its Housing Welfare program. Mixed-use buildings: Buildings with two or more functional uses.

4. Climate Design Conditions – Cold Water Inlet Temperature

Water heating calculations shall use the monthly average cold-water inlet temperatures as the default design values for system sizing and performance evaluation. Designers can consider 24°C as the steady state rate all over the year.

5. General Design Requirements

It is the responsibility of the consulting office to design and select a suitable water heating system in compliance with the Code and the relevant executive regulations. The consultant shall ensure that the main components of the water heating system are sourced from the same supplier.

6. Energy Efficient System Selection

Depending on the building type and intended application, the water heating system shall be selected from one of the following options and shall comply with Chapter 9 requirements.

- Solar water heaters (combined or not, with additional energy supply)
- Heat pump water heaters
- Hybrid integrated system
- Heat Recovery for Service Water Heating System

Other energy efficient systems are allowed only with documented compliance to EN/ISO standards or to the Ministry of Electricity and Water and Renewable Energy (MEWRE) approval.

In the event that the requirements for selecting a new or alternative system are not stated in this document, the contractor shall submit a detailed comparison with the above systems, and provide a justification for the use of the proposed system.

6.1 Back-up Element

- All solar heating systems have to be equipped with a backup electrical heater that will be used whenever solar energy is not enough.
- For non-residential buildings, the backup heating element capacity shall not exceed 40% of the total heating system capacity.

7. Hot-Water Demand

All systems shall be designed based on the maximum hot water demand in accordance with Table 1 below, adopted from ***Chapter 51***"Service Water Heating" in the **2023 *ASHRAE Handbook* – HVAC Applications,** or its latest application edition. It shall be used to determine the size of water-heating equipment from the number of fixtures. To obtain the probable maximum demand, multiply the total quantity for the fixtures by the demand factor shown in line 19. In all situations, total demand is never less than the demand for the largest single fixture. The heater or coil should have a water-heating capacity equal to this probable maximum demand. The storage tank should have a capacity equal to the probable maximum demand multiplied by the storage capacity factor shown in line 20.
Calculation sheets shall be submitted for all water-heating systems for both residential and non-residential buildings as shown in Part A of Appendix A.

Table 1 Hot-Water Demand per Fixture for Various Types of Buildings

#	Fixture	Apartment House	Club	Gymnasium	Hospital	Hotel	Industrial Plant	Office Building	Private Residence	School
1	Basin, private lavatory	2	2	2	2	2	2	2	2	2
2	Basin, public lavatory	4	6	8	6	8	12	6	-	15
3	Bathtub	20	20	30	20	20	-	-	20	-
4	Dishwasher	15	50-150	-	50-150	50-200	20-100	-	15	20-100
5	Foot basin	3	3	12	3	3	12	-	3	3
6	Kitchen sink	10	20	-	20	30	20	20	10	20
7	Laundry, stationary tub	20	28	-	28	28	-	-	20	-
8	Pantry sink	5	10	-	10	10	-	10	5	10
9	Shower	30	150	225	75	75	225	30	30	225
10	Service sink	20	20	-	20	30	20	20	15	20
11	Hydrotherapeutic shower				400					
12	Hubbard bath				600					
13	Leg bath				100					
14	Arm bath				35					
15	Sitz bath				30					
16	Continuous-flow bath				165					
17	Circular wash sink				20	20	30	20		30
18	Semicircular wash sink				10	10	15	10		15
19	DEMAND FACTOR	0.30	0.30	0.40	0.25	0.25	0.40	0.30	0.30	0.40
20	STORAGE CAPACITY FACTOR	1.25	0.90	1.0	0.60	0.80	1.00	2.00	0.70	1.00

Note: Gallons of water per hour per fixture, calculated at a final temperature of 60 °C.

8. Water Heating Systems

8.1 Solar Water Heating Systems

Solar water heating systems utilize solar energy to produce domestic hot water by converting solar radiation into thermal energy, thereby reducing electricity consumption and supporting energy efficiency objectives.
Given Kuwait's high solar irradiation levels, solar water heating systems provide an effective renewable energy solution. This section defines the minimum design, submittals, testing, and approval requirements for solar water heating systems in residential and non-residential buildings in accordance with MEWRE regulations and internationally recognized standards.

Three types of solar water heating systems are considered in this Code:

- Solar Natural Circulation System
- Solar Forced Circulation System
- Solar Counter Flow System

8.1.1 Requirements

a. Manufacturer Requirements and Quality Assurance
Quality Management Systems: Certification to ISO 9001:2015 – The quality management system shall cover the design, manufacturing, and testing of the main components of the solar water heating system (collectors, heat exchangers, and storage tanks).

b. Required Certifications and Technical Standards

1- Solar Collectors: Shall be certified with the Solar KEYMARK in accordance with:

- EN 12975-1: General Requirements.
- EN 12975-2: Test Methods.

2- Performance testing: Must be conducted based on ISO 9806 – Solar thermal collectors – Test methods, ensuring standardized assessment of thermal performance, durability, and mechanical reliability.
Shall be certified according to SRCC OG-100.

3- Complete System Certification: Factory-made solar water heating systems shall be certified in accordance with:

- EN 12976-1: Thermal solar systems and components – Factory made systems – General Requirements.
- EN 12976-2: Test Methods

4- Hydrostatic Pressure Testing: The solar storage tank must undergo a hydrostatic pressure test in accordance with ASME Section VIII – Rules for Construction of Pressure Vessels.

Additional notes:

1. The tests shall be performed according to standard testing methods approved by PAI.
2. Test reports from international third-party laboratories are accepted, provided that these laboratories are fully calibrated and certified by an approved testing authority.
3. The test report shall include the total unit electrical input in kW.
4. Test reports and certifications shall be obtained for each model separately and shall not be considered for brand names.
5. Any modification to improve the model efficiency shall render that model as a new model and hence shall have a different model number.
6. MEWRE reserves the right to revoke its approval at any time during the approval period if investigations reveal any deviation from submitted results.

8.1.2 Simulation Report

A system simulation report shall be obtained using one of the certified simulation software programs. Local companies are strongly encouraged to obtain a licensed copy of certified simulation software. In cases where a local company does not hold a certified license, the manufacturer shall be required to provide a validated simulation report or calculation report to substantiate the system performance.

8.1.3 Overheating Protection

In solar systems, adequate overheating protection must be incorporated into the design to prevent overpressure or excessive heat buildup. This ensures system reliability, enhances operational safety, and prolongs equipment lifespan.

8.1.4 Submittals

The following are the minimum required submittals for the design of the solar water heating system. However, the Consulting Office or the solar contractor shall provide any additional documentation requested by the MEWRE engineer. The solar water heating system **drawings** shall include, but are not limited to, the following:

1. Technical information and declaration (Appendix B).
2. Type of water heating system.
3. Location of the storage tank, solar collectors, and control panel.
4. Orientation and tilt angle of the solar collectors relative to the sun.
5. System components, along with the quantity of solar water heating equipment.
6. Model numbers of System components, along with the quantity of the solar water heating equipment.
7. Hot water demands requirements as per Chapter 7.

Other documents shall include (For non-residential buildings):

1. Solar water heating system data sheets.
2. The equipment list of the system.
3. A simulation report from any certified simulation software or from suppliers, clearly indicating the building type and the estimated electricity savings as mentioned in Chapter 11.
4. Previous approvals in Kuwait and the Gulf Cooperation Council (GCC).

Additional notes:

1. The solar circulation pump and the counter flow pump in counter flow systems shall be equipped with integrated Variable Frequency Drives (VFDs) to optimize system performance and minimize electricity consumption.
2. For buildings that experience periodic shutdowns (e.g., during public holidays, national days, Eid, or extended vacations), it is recommended to utilize a counter flow (instantaneous) type solar water heating system. This design helps prevent bacterial growth resulting from water stagnation.
3. In non-residential buildings, the solar collectors should be equipped with an automatic cleaning system.

8.2 Heat Pump Water Heating Systems

Heat pump water heating systems produce domestic hot water providing higher energy efficiency. This section defines the minimum submittal, performance, and approval requirements for heat pump water heating systems in residential and non-residential buildings in accordance with MEWRE regulations and applicable international standards.

8.2.1 Requirements

a. Manufacturer Requirements and Quality Assurance

Quality Management Systems: Certification to ISO 9001:2015 – The quality management system shall cover the design, manufacturing, and testing of the main components of the heat pump water heating system.

b. Product Compliance

All equipment and products covered under this section shall comply with the requirements of KWS 1903:2025 published by PAI or the latest version.

c. Product Certification

A valid test report issued by an accredited laboratory shall be submitted for the selected unit, demonstrating compliance with applicable performance and efficiency requirements.

Additional notes:

1. The tests shall be performed according to standard testing methods approved by PAI.
2. Test reports from international third-party laboratories are accepted, provided that these laboratories are fully calibrated and certified by an approved testing authority.
3. The test report shall include the total unit electrical input in kW.
4. Test reports and certifications shall be obtained for each model separately and shall not be considered for brand names.
5. Any modification to improve the model efficiency shall render that model as a new model and hence shall have a different model number.
6. MEWRE reserves the right to revoke its approval at any time during the approval period if investigations reveal any deviation from submitted results.
7. MEWRE reserves the right to request any additional documentation for verification.

8.2.2 Calculations

A performance calculation shall be submitted using the manufacturer COP curves and design ambient conditions. Full dynamic simulation is required only for central systems serving more than 10 dwelling units or when combined with solar preheat.

8.2.3 Submittals

For residential buildings:

- Technical information and declaration (Appendix B).

For non-residential buildings:

The following are the minimum required submittals for the design of the heat pump water heating system. However, the Consulting Office or the contractor shall provide any additional documentation requested by the MEWRE engineer. These documents shall include, but not limited to, the following:

a. **Product Data:** Submit manufacturer's technical product data including rated capacities and efficiencies of selected model clearly indicated; operating weights; furnished specialties and accessories; and installation and start up instructions.
b. **Shop Drawings:** Submit manufacturer's assembly type shop drawings indicating dimensions, required clearances, and methods of assembly of components.
c. **Schematic Diagrams:** Submit mechanical diagram showing all the components in the system including heat pumps, tanks circulation pumps and other accessories
d. **Wiring Diagrams:** Submit manufacturer's electrical requirements for power supply wiring to heat pumps.
e. **Sequence of Operation (SOP):** Submit SOP for the system with all expected scenarios.
f. **Performance Rating:** Submit the catalog selection data showing equipment ratings and compliance with required heating capacities and COP values as applicable.

8.3 Electric Water Heating System

Electric water heating systems generate domestic hot water using electrical resistance heating elements and may be used in residential buildings.

8.3.1 Requirements

a. Manufacturer Requirements and Quality Assurance

Quality Management Systems: Certification to ISO 9001:2015 – The quality management system shall cover the design, manufacturing, and testing of the main components of the electric water heating system.

b. Product Compliance

All equipment and products covered under this section shall comply with the requirements of KWS 1903:2025 published by PAI or the latest version.

Additional notes:

1. Electric water heaters shall be selected and sized based on the hot water demand calculations specified in Chapter 7.
2. For non-residential buildings, electric resistance water heaters should preferably be used only as backup systems or, where renewable or high-efficient alternatives are technically impractical.
3. The use of timer controls, smart controllers, or Building Management System (BMS) integration is encouraged to reduce unnecessary electrical consumption.
4. Increasing the use of load management strategies is encouraged to reduce peak electrical demand.

8.3.3 Submittals

For residential buildings:

- Technical information and declaration (Appendix B).

For non-residential buildings:

The following are the minimum required submittals for the design of the electric water heating system. However, the consulting office or the contractor shall provide any additional documentation requested by the MEWRE engineer. These documents shall include, but not limited to, the following:

a. **Product Data:** Submit manufacturer's technical product data including rated capacities and efficiencies of selected model clearly indicated; operating weights; furnished specialties and accessories; and installation and start up instructions.
b. **Schematic Diagrams:** Submit mechanical diagram showing all the components in the system.
c. **Wiring Diagrams:** Submit manufacturer's electrical requirements for power supply wiring.
d. **Sequence of Operation (SOP):** Submit SOP for the system when integrated with other heating systems.
e. **Performance Rating:** Submit the catalog selection data showing equipment ratings and compliance with required heating capacities and COP values as applicable.

9. Energy Conservation Measures

The integration of water heating systems is a key strategy for reducing energy consumption in buildings by decreasing reliance on conventional water heating methods. For non-residential buildings, the system must be designed to offset a substantial portion of the domestic hot water demand as mentioned in Table 2. Its performance and energy savings must be verified using certified simulation software, ensuring compliance with MEWRE and ASHRAE guidelines. As for residential buildings, it is recommended to comply with the minimum percentage shown in Table 2 when energy efficient systems outlined in Chapter 6 are selected.
Additional energy conservation measures are encouraged to further enhance system efficiency.

Table 2 Annual Minimum Energy Savings in the Total Heating Demand for Various buildings

Building type	Annual Minimum Energy Savings in the total Heating Demand
Residential buildings	40 %
Non-residential buildings	60 %

Note: All water heating systems in residential and non-residential buildings subject to this Chapter shall submit annual calculations demonstrating the minimum required Energy savings in the total heating demand as shown in Part B of Appendix A.

10.Swimming Pools

For swimming pools, a dedicated sustainable heating system must be installed to accommodate at least 50% of the energy required to heat the pool water volume.

11.Enforcement

MEWRE reserves the right to conduct site audits or factory visits to verify compliance with declared quality management systems and product specifications.

Appendix A: Calculation Sheet

Part A: Mandatory for both residential and non-residential buildings.

Based on *Table 1 Hot-Water Demand per Fixture for Various Types of Buildings* in Chapter 7:

1. Determine the size of water-heating equipment from the number of fixtures from Table 1.
2. Determine the maximum hot water demand in gallons per hour (GPH) by multiplying the total quantity for the fixtures by the demand factor shown in line 19 of Table 1 depending on the building type.
3. Determine the Storage Capacity in Liters based on the Storage Capacity Factor.

Part B: Mandatory when energy efficient systems outlined in Chapter 6 are selected and full compliance with Chapter 9 is achieved.

1. Use Equation 1 to calculate the total energy in Wh required to heat the hot water demand per day:

   Equation 1 $Q = m * c_p * \Delta T$

   where

   Q = energy required in Wh
   m = mass of water in liters
   c_p = specific heat of water (1.16 Wh/L °C)
   ΔT = temperature rise in °C (60°C - 24°C =36°C)

2. Determine the total annual energy in kWh.
3. Determine the total annual energy savings through multiplying the percentage of the Table 2 Annual Minimum Energy Savings in the Total Heating Demand for Various buildings (Table 2) by the annual energy in kWh.

a. Residential buildings
   40% * Annual energy in kWh = Saved energy (kWh)
   Allowed energy consumption = Annual energy in kWh - Saved energy (kWh)

b. Non-residential buildings
   60% * Annual energy in kWh = Saved energy (kWh)
   Allowed energy consumption = Annual energy in kWh - Saved energy (kWh)

Note: Increasing the percentage of savings beyond the minimum requirement is strongly encouraged.

Appendix B: Technical Information and Declaration

The following technical information and declaration must be completed and attached to the application to fulfill the mechanical and safety requirements; otherwise, the installation will not be accepted.

Name:							
Address:		Block:		Street:		House:	

Type of water heating system:

☐ Electric	☐ Solar Water Heater	☐ Heat Pump Water Heater
☐Hybrid Integrated System	☐ Heat Recovery for Service Water Heating	☐ Other

Quantity:

Brand Name: **Made In:**

Capacity:

Working pressure: **Operation pressure:**

Operation Temperature:

Heat Element:

Total collector Area Size:

Fracture limiter (energy shut off device) provided: **Yes / No**

Station system provided: **Yes / No**

Per pipe & fitting used: **Yes / No**

We hereby declare that the above-mentioned items have been correctly installed. In the event of replacing any water heater, the new unit shall be equipped with all the previously listed safety devices.

نقر بأن العناصر المذكورة أعلاه قد تم تركيبها بالشكل الصحيح. وفي حال استبدال أي سخان مياه، يجب أن تكون الوحدة الجديدة مزوّدة بجميع أجهزة السلامة المذكورة سابقًا.

اسم الشركة:	اسم المالك:
اسم المسؤول:	توقيع المسؤول:
العنوان:	التاريخ:
ختم الشركة:	