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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 32224-2020

Replacing GB/T 32224-2015

Heat meters

热量表

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Table of Contents

1	Scope
2	Normative references
3	Terms and definitions
3.1	Heat meters and sub-assemblies
4	Symbols
5	Technical characteristics
6	Requirements
7	Test methods
8	Inspection rules
9	Marking, packaging, transportation and storage
A	Annex A (normative) Density and specific enthalpy of water
B	Annex B (normative) Structure and installation of temperature sensor
C	Annex C (normative) Data interface and communication
D	Annex D (normative) Error test and calculation of complete heat meter
E	Annex E (normative) Measurement and calculation of calculator error
F	Annex F (normative) Error test and calculation of temperature sensor pair
G	Annex G (normative) Measurement and calculation of flow sensor error
H	Annex H (normative) Electromagnetic compatibility test methods
I	Annex I (normative) Flow disturbance test device and flow disturbance device

Foreword

GB/T 32224-2020 was issued on 19 November 2020 by the State Administration for Market Regulation and the Standardization Administration of the People's Republic of China, and has been in force since 1 October 2021. It replaces GB/T 32224-2015, the only previous edition.

This standard was proposed by the Ministry of Housing and Urban-Rural Development of the People's Republic of China, and was prepared by SAC/TC 455 on Municipal Heating-supply of the Standardization Administration of China.

Among the changes made with respect to the 2015 edition: the overall requirements for data interface and communication are modified (see Annex C); the measurement point requirements for the overall test of the heat meter are modified and test points for cooling meters added (see Table D.1); requirements for confirmation of the display value during the

overall test are added (see D.2.3); the test temperature points of the calculator are modified and requirements for testing the calculator of meters for heating and cooling added (see Table E.1 and E.1); requirements for simulated flow signals during calculator testing are added (see E.2.3); the temperature test range of the temperature sensor is modified (see F.2.1); special requirements for testing flow sensors larger than DN250 are added (see G.2.1); requirements on water temperature change during the flow sensor test are added (see G.2.2); and the test requirements for electromagnetic compatibility are modified (see Annex H).

1 Scope

China's national standard for heat meters - the instruments that measure how much thermal energy a building actually takes from a district heating network. For most of the history of Chinese district heating the bill did not depend on consumption at all: an apartment paid by floor area, so closing a radiator saved the occupant nothing and the network had no way to reward anyone for using less. Metering is what turns heat into something that can be sold by the unit, and it is harder than metering electricity, because the quantity is not measured directly. A heat meter infers energy from three separate measurements - the volume flowing, the temperature at the inlet and the temperature at the return - and a small error in the temperature pair becomes a large error in the bill, since the difference between the two may be only a few degrees. That is why this standard devotes nine normative annexes to error testing, temperature sensor construction, electromagnetic compatibility and flow disturbance. It specifies the terms and definitions, symbols, technical characteristics, requirements, test methods, inspection rules, and the marking, packaging, transport and storage of heat meters, and applies to the manufacture and inspection of meters using water as the medium; for other liquids it can be applied once the specific enthalpy and density of that liquid are known.

This standard specifies the terms and definitions, symbols, technical characteristics, requirements, test methods, inspection rules as well marking, packaging, transport and storage of heat meters.

This standard is applicable to the manufacture and inspection of heat meters using water as the medium. When the medium is other kinds of liquid, this standard can be implemented after obtaining the specific enthalpy and density parameters of the liquid.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 191 Packaging - Pictorial marking for handling of goods.

GB/T 1800.2 Geometrical product specifications (GPS) - ISO code system for tolerances on linear sizes - Part 2: Tables of standard tolerance classes and limit deviations for holes and shafts.

GB/T 2423.1, GB/T 2423.2, GB/T 2423.3 and GB/T 2423.4 Environmental testing for electric and electronic products - cold, dry heat, damp heat steady state and damp heat cyclic.

GB/T 4208-2017 Degrees of protection provide by enclosure (IP code); GB 4706.1-2005 Household and similar electrical appliances - Safety - Part 1: General requirements.

GB/T 7307 Pipe threads with 55 degree thread angle where pressure-tight joints are not made on the threads; GB/T 9124.1 and GB/T 9124.2 Steel pipe flanges; GB/T 17241.6 Integral cast iron flanges.

GB/T 9254 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.

GB/T 17626.2, GB/T 17626.3, GB/T 17626.4, GB/T 17626.5, GB/T 17626.6-2017, GB/T 17626.8 and GB/T 17626.11 Electromagnetic compatibility - Testing and measurement techniques.

GB/T 26831.1, GB/T 26831.2, GB/T 26831.3 and GB/T 26831.6 Society energy metering for reading system specification.

GB/T 30121-2013 Industrial platinum resistance thermometers and platinum temperature sensors; CJJ 34 Design code for city heating network.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 Heat meters and sub-assemblies

3.1.1 heat meter - instrument for measuring and displaying the energy released (heating) or absorbed (cooling) by medium flowing through heat exchange system. Note: it is generally divided into heating meter, cooling meter and meters for heating and cooling.

3.1.2 heating meter - heat meter for measuring and displaying the energy released by medium flowing through heat exchange system.

3.1.3 cooling meter - heat meter for measuring and displaying the heat absorbed by the medium flowing through heat exchange system, covering the temperature range from 2 degrees C to 30 degrees C and temperature difference up to 20 K.

3.1.4 meters for heating and cooling - heat meter for measuring and displaying heating and cooling energy which is released or absorbed by medium flowing through heat exchange

system and separately displayed and stored in two separate registers.

3.1.5 complete instrument - heat meter containing flow sensor, calculator, paired temperature sensor, which does not have separable sub-assemblies and must be installed and used as a whole.

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