

ICS 27.180
CCS F 19



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

GB/T 31138-2014

**Compressed hydrogen dispenser for vehicles
(English Translation)**

Issued on: September 3, 2014

Implemented on: January 1, 2015

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of PRC**

Table of Contents

Foreword...	3
1 Scope...	4
2 Normative references...	4
3 Terms and definitions...	5
4 Models...	5
5 System composition...	6
6 Technical requirements...	6
6.1 Basic requirements...	6
6.2 Functional requirements...	7
6.3 Safety requirements...	9
7 Test methods...	11
7.1 Test conditions...	11
7.2 Test items...	11
7.3 Test of whole dispenser...	12
8 Inspection rules...	17
8.1 Exit-factory inspection...	17
8.2 Type inspection...	17
8.3 Decision rules...	18
9 Marking, packaging, transportation and storage...	18
9.1 Marking...	18
9.2 Packaging...	18
9.3 Transportation and storage...	19

1 Scope

This standard specifies the technical requirements, test methods, inspection rules, marking, packaging, transportation and storage of compressed hydrogen dispenser for vehicles.

This standard is applicable to compressed hydrogen dispensers which have a rated working pressure of not more than 70 MPa for hydrogen refueling stations of hydrogen energy vehicle.

2 Normative references

The following documents are indispensable for the application of this document.

For dated references, only the dated version applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

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

GB/T 2423.1 Environmental testing for electric and electronic products - Part 2. Test methods - Tests A. Cold

GB/T 2423.2 Environmental testing for electric and electronic products - Part 2. Test methods - Tests B. Dry heat

GB/T 2423.4 Environmental testing for electric and electronic products - Part 2. Test method - Test Db. Damp heat, cyclic (12h + 12h cycle)

GB 3836 (all parts) Electrical apparatus for explosive gas atmospheres

GB 10543 Rubber hose and hose assemblies for aircraft ground fueling and defueling

GB/T 13384 General specifications for packing of mechanical and electrical product

GB/T 19237 Compressed natural gas dispenser for vehicle

GB/T 24499 Technology glossary for gaseous hydrogen, hydrogen energy and hydrogen energy system misalignment. Exposed parts and decorative parts shall not have defects such as damage, peeling, rust;

c) The movement of each sliding and rotating part shall be light, flexible, stable, without blockage;

d) Fasteners shall be securely connected and not loose. The connecting conductors shall be crimped or soldered well. The grounding wire of each electrical equipment casing and the grounding wire of the whole dispenser shall be well connected and firm. The connector shall be in good contact, it shall have an interconnect structure that prevents mis-insertion and has anti-lifting measures;

e) The components and devices that directly affect metering accuracy shall have reliable seals or other locking devices;

f) There shall be a display for the user to view, to display the hydrogen filling amount, filling price, unit price, etc. The display shall have complete and clear character.

6.2.1 Metering accuracy

The hydrogen dispenser shall be metered by mass flow meter, which has a minimum division value of 10 g. The maximum indication error of the hydrogen dispenser shall not exceed $\pm 2.5\%$.

6.2.2 Repeatability

The metering repeatability of the hydrogen dispenser shall not exceed 1%.

6.2.3 Metering unit and count indication range

6.2.3.1

The metering unit of the hydrogen dispenser is set as follows.

- a) Hydrogen filling amount. kg;
- b) Amount. Yuan;
- c) Unit price. yuan/kg.

6.2.3.2

The count indication range of the hydrogen dispenser is set as follows.

The count indication range shall meet the following requirements.

- a) Single counting range. 0.00 kg ~ 999.99 kg or 0.00 ~ 9999.99 yuan;
- pressure for 10 minutes. It shall not have permanent deformation and cracking.

6.2.10 Electromagnetic compatibility

The electromagnetic compatibility of the hydrogen dispenser shall comply with the relevant provisions of GB/T 19237.

6.2.11 Power-down protection and re-display

When the hydrogen dispenser interrupts the refueling during the refueling process due to power failure, it shall completely retain all data and redisplay it after the power supply is restored.

6.3 Safety requirements

6.3.1

It shall install the safety valve on the filling pipe of the hydrogen dispenser.

The opening pressure of the safety valve shall be set to 1.05 ~ 1.1 times of the maximum working pressure of the hydrogen dispenser, meanwhile it shall not be greater than the

design pressure. When an overpressure condition occurs, the hydrogen dispenser shall be able to automatically discharge hydrogen for pressure relief.

6.3.2

The flow rate of hydrogen dispenser's hydrogen injection shall not exceed 60 g/s.

6.3.3

The hydrogen dispenser which has a rated working pressure of 70 MPa shall be provided with a communication interface that can be connected to the vehicle in accordance with the corresponding standard, so as to input the temperature and pressure signals of the vehicle's cylinder into the hydrogen dispenser during the filling process. If the communication is interrupted or there is an over-temperature or over-pressure condition, the hydrogen injection shall be stopped automatically.

6.3.4

A hydrogen dispenser which has a rated working pressure of 70 MPa shall be provided with a pre-cooling system in the hydrogen supply system, to cool the hydrogen to a predetermined temperature and then fill it into the vehicle's cylinder. The pre-cooling temperature range is -40 °C ~ 0 °C.

6.3.5

The hydrogen dispenser shall be equipped with an emergency stop button.

When the button is pressed in an emergency, it shall be able to close the valve to stop gas filling; meanwhile issue a shutdown signal to the control system in the hydrogen refueling station.

6.3.6

In the hydrogen accumulating place inside the hydrogen dispenser, it shall be equipped with the hydrogen detection and alarm device. When the hydrogen leakage occurs and its content in the air reaches to 0.4% (10% LEL), it shall

Electrostatic discharge test of hydrogen filling hose 6.3.7 7.3.9.6 sqrt -

Test of hydrogen detection alarm 6.3.6 7.3.9.7 sqrt -

Note: "sqrt" means the item to be inspected; "-" means the items not inspected.

7.3.1 Routine inspection

Use the visual inspection and routine method to check the hydrogen dispenser, which shall be in accordance with the requirements of 6.1.1, 6.1.2, 6.2.3.