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Town compressed natural gas (CNG) supply installations

城镇压缩天然气（CNG）供气装置

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Table of Contents

6 Requirements
6.2 Non-destructive testing
6.6 Safety device activation pressure setting value
7 Test Methods
7.1 Test Instruments
7.3 Non-destructive testing
7.4 Strength Test
7.5 Air tightness test

6 Requirements

6.1 Appearance The surface of the CNG supply unit should be free from obvious damage and defects. The coating should be smooth, uniform in color, and free from runs, streaks, and other defects. Missing areas, peeling, and bubbling.

6.2 Non-destructive testing

6.2.1 The shape, dimensions and appearance of the weld surface shall conform to the requirements of GB/T 20801.1 or GB 50236.

6.2.2 For CNG supply units, non-destructive testing is performed only on the welded joints of the pressure-bearing components of the pipeline. Non-destructive testing is divided into full (100%) and sampling testing. (>=10%) Two types. Detection methods include X-ray detection, ultrasonic detection, magnetic particle detection, and penetrant detection.

6.2.3 Radiographic testing, ultrasonic testing, magnetic particle testing, and penetrant testing shall be conducted in accordance with NB/T 47013 (all parts), and shall meet the following requirements. Require.

6.2.4 Magnetic particle testing and penetrant testing shall be of a quality grade not lower than Grade I.

6.3 Strength Test The piping components of the CNG gas supply unit should undergo strength testing; there should be no leakage, no visible deformation, and no abnormal noise during the test. Water... When used as a test medium, the test pressure is

1.5 times the design pressure and not less than

0.6 MPa; when the pressure does not exceed

0.6 MPa, safety measures should be taken. Under full protection, compressed air or inert gas can be used as the test medium, and the test pressure is

1.15 times the design pressure.

6.4 Air tightness test During the CNG supply unit airtightness test, the airtightness tests of the pipelines before and after the pressure regulator should be conducted separately. The test pressure before the pressure regulator is... Design pressure. The test pressure after the pressure regulator is

1.1 times the operating pressure of the safety device to prevent excessive outlet pressure, and not less than... 20 kPa. The airtightness test should show no leakage. If the temperature fluctuates during the test, the pressure should not change after temperature correction.

6.5 Outlet pressure setpoint The setpoint for the CNG gas supply unit's outlet pressure should meet the user's requirements, and the setting error should not exceed ±5% of the setpoint. (Two-way and...) For CNG supply devices with two or more pressure regulators and monitoring regulators, the outlet pressure of each regulator should be set appropriately.

6.6 Safety device activation pressure setting value

6.6.1 The set pressure of the safety valve on the CNG supply unit shall meet the following requirements.

a) The set pressure of the safety valve before the pressure regulator on the CNG supply unit should not exceed the design pressure of the pipeline;

b) When the set pressure is less than

0.5 MPa, the error between the safety valve opening pressure and the set value should not exceed ±

0.015 MPa;

c) When the set pressure is not less than

0.5 MPa, the error between the safety valve opening pressure and the set value should not exceed ±3% of the set value. pressure.

6.6.2 Other safety devices on CNG supply units shall meet the following requirements.

a) The starting pressure of the safety protection device of the CNG supply unit should meet the following requirements unless otherwise specified by the user. 1) When the regulator outlet pressure is less than or equal to 10 kPa, the starting pressure should be such that the gas appliance directly connected to the low-pressure pipeline is at a certain pressure. Within the permissible work pressure range. 2) When the outlet pressure of the pressure regulator is less than 0.08MPa, the starting pressure should not exceed 50% of the upper

limit of the outlet working pressure. 3) When the outlet pressure of the pressure regulator is equal to or greater than

0.08 MPa, but not greater than

0.4 MPa, the starting pressure should not exceed the outlet pressure. The maximum working pressure is

0.04 MPa. 4) When the outlet pressure of the pressure regulator is greater than

0.4 MPa but not greater than

4.0 MPa, the starting pressure should not exceed the outlet working pressure. 10% of the upper limit. 5) When the outlet pressure of the pressure regulator is greater than

7.1 Test Instruments

7.1.1 The instruments used for testing shall be verified or calibrated and be within their validity period.

7.1.2 The accuracy of the pressure gauge used for the strength test shall not be lower than Class 1.0, and the range of the pressure gauge shall be selected according to the test pressure.

7.1.3 The accuracy of the pressure gauge used for the airtightness test should not be lower than

0.4 grade, and the range of the pressure gauge should be selected according to the test pressure. Flow characteristic test The measurement accuracy of the pressure measuring instrument should not be less than one-quarter of the pressure regulation accuracy of the pressure regulator under test. The accuracy of the U-tube manometer should not be greater than... 10Pa.

7.1.4 The resolution of atmospheric pressure measuring instruments should not be greater than

7.1.5 The measurement accuracy of flow measurement instruments shall not be less than 1.5%.

7.1.6 The resolution of the temperature measuring instrument should not be greater than 0.5°C.

7.2 Appearance Inspection Visual inspection of the CNG supply unit shall be conducted to ensure its appearance meets the requirements of 6.1.2.

7.3 Non-destructive testing

7.3.1 The shape, size and appearance of the weld surface shall be inspected by visual inspection and weld inspection ruler, and shall meet the requirements of 6.2.1.

7.3.2 The specific operating procedures for non-destructive testing shall meet the following requirements.

a) Non-destructive testing of welded joints in pressure pipelines shall be conducted in accordance with NB/T 47013.2, NB/T 47013.3, and NB/T 47013.4. The methods specified in NB/T 47013.5, NB/T 47013.10, and NB/T 47013.11, when using the non-recordable pulse-echo method... When performing ultrasonic testing, X-ray testing or time-of-flight diffraction ultrasonic testing should be used as an additional local or sampling test.

b) For butt joints of pipes with a nominal thickness of 30 mm or less, radiographic testing should be used as the preferred method, with ultrasonic testing used as an alternative. X-ray testing should be approved by the designer and the owner; for butt joints with a nominal thickness greater than 30mm, ultrasonic testing may be used instead of radiographic testing. Testing.

c) X-ray inspection should be given priority for non-ferrous metal pressure pipeline joints.

d) Surface crack detection of welded joints should be performed using non-destructive testing.

e) Magnetic particle testing should be given priority for surface inspection of welded joints in pressure pipelines made of ferromagnetic materials.

7.3.3 For equipment that only requires sampling inspection, the inspection location of the welded joint to be inspected should be randomly selected.

7.3.6 After the welded joint is inspected by radiographic testing, check whether the test results meet the requirements of 6.2.2a).

7.3.7 After ultrasonic testing of the welded joint, check whether the test results meet the requirements of 6.2.2b).

7.3.8 After the welded joint is subjected to magnetic particle testing and penetrant testing, check whether the test results meet the requirements of 6.2.3.

7.3.9 The handling of non-destructive testing failures shall comply with the requirements of GB/T 20801.1, and the number of repairs for the same welded joint shall not exceed 2.

7.4 Strength Test

7.4.1 All pressure components constituting the CNG supply unit shall undergo strength testing. Reinforcing rings with openings shall be purged before the strength test. Use compressed air at 0.4MPa~0.5MPa to check the quality of the welded joint.

7.4.2 The test conditions shall meet the following requirements.

a) When using water as the pressure testing medium, the pipeline components shall be subjected to strength tests with clean, non-corrosive water at a temperature above 5°C.