NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 33215-2025

Replacing GB/T 33215-2025

Pressure relief devices for gas cylinders

气瓶安全泄压装置

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Foreword

This document was drafted in accordance with the provisions of GB/T 1.1-2020 “Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents”.

This document replaces GB/T 33215-2016, “Pressure relief devices for gas cylinders.” Compared with GB/T 33215-2016, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

a) ADD the terms and definitions of “thermally activated pressure relief device” and “vent area” (see 3.1.4 and 3.1.5 of this document);

b) ADD the description of fusible alloy activated devices (see 4.2 of this document);

c) ADD the description of glass bulb activated devices (see 4.3 of this document);

d) MODIFY the provisions that the pressure relief device shall be installed (see 5.1 of this document; 5.1 of the 2016 edition);

e) MODIFY the provisions that the pressure relief device may be exempted (see f) ADD the requirement that oxygen, nitrogen and inert gas cylinders are not equipped with pressure relief devices (see 5.5 of this document);

cryogenic insulated gas cylinders (see 6.4 of this document; 6.4 of the 2016 edition);

h) ADD the requirements for the selection of pressure relief devices for liquefied petroleum gas cylinders for vehicles, liquefied dimethyl ether cylinders for vehicles, compressed natural gas cylinders for vehicles, compressed hydrogen cylinders for vehicles, non-refillable steel welded cylinders, fiber-wound gas cylinders for breathing apparatus, seamless steel gas cylinder bundles containing liquefied gas, and other types of gas cylinders (see 6.5 ~ 6.11 of this document);

i) ADD the requirements for TPRDs installed on compressed hydrogen cylinders for vehicles (see 7.1.6 of this document);

refillable steel welded cylinders (see 7.3.2 of this document; 7.3.3 of the 2016 edition);

k) ADD the requirements for the installation of pressure relief devices for acetylene cylinders, large-volume gas cylinders for tube trailers and tube bundle containers, cryogenic insulated gas cylinders, and cylinders for metal hydride reversible hydrogen storage and release systems (see 7.3.3, 7.3.4, 7.3.5, 7.3.7, and 7.3.8 of this document).

l) ADD the requirements for the installation of bursting discs in bursting disc-fusible plug composite devices (see 7.3.9 of this document).

m) ADD the requirements for the installation of pressure relief devices for longer gas cylinders (see 7.3.10 of this document).

n) MODIFY the provisions for the value of the discharge coefficient K (see 8.2 of this document; 8.2 of the 2016 edition).

o) ADD the provisions for the calculation of the rated capacity of pressure relief devices for compressed hydrogen cylinders for vehicles (see 8.4 of this document).

p) ADD the provisions for the calculation of the rated capacity of pressure relief devices for cylinders for tube trailers and tube bundle containers containing compressed hydrogen (see 8.5 of this document).

r) ADD the provisions for the operating temperature of TPRDs (see 9.3 of this document);

s) ADD the provisions for the marking of pressure relief devices (see 10.1 of this document).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The issuing authority of this document shall not be held responsible for identifying any or all such patent rights.

This document was proposed by and shall be under the jurisdiction of National Technical Committee on Gas Cylinders of Standardization Administration of China (SAC/TC 31).

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This document was first published in 2016. This is the first revision.

1 Scope

This document specifies the types and structural types, installation requirements, selection requirements, basic requirements, calculation of minimum flow capacity for safety and rated capacity, requirements for the determination of operating pressure or operating temperature, as well as marking, installation, and maintenance of pressure relief devices for gas cylinders.

This document applies to gas cylinders of various structures and types containing various gases.

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 17268 Non-refillable steel welded cylinders for industrial use GB

18428 Glass bulbs used for automatic fire extinguishing systems GB/T 42536 Assembly valve on high pressure hydrogen storage cylinder for vehicles

3 Terms, definitions, and symbols

3.1 Terms and definitions 3.1.1

A pressure relief device installed on a gas cylinder to automatically and rapidly release gas and relieve pressure in unexpectedly high-temperature environments to protect the cylinder shell from explosion.

NOTE: This includes thermally activated or pressure activated pressure relief devices.

Minimum flow rate that needs to be released, to ensure that the gas pressure inside the cylinder does not continue to rise after reaching the gas cylinder’s permissible pressure under unexpectedly high temperature conditions.

Mass of gas that can be released per unit time by a pressure relief device under specified discharge conditions.

A temperature activated pressure relief device.

NOTE: This includes fusible plug devices, fusible alloy activated devices, and glass bulb activated devices.

Geometric flow area of the minimum cross-section of a pressure relief device for discharging the medium.

3.2 Symbols

NOTE: For bursting disc devices, this is the design bursting pressure; for TPRDs, when the medium in the cylinder is liquefied gas, this is the saturated vapor pressure of the medium contained at its operating temperature; when the medium in the cylinder is compressed gas, this is the ideal pressure at its operating temperature; for safety valves, this is the rated discharge pressure.

4 Types and structural types of pressure relief devices

4.1 Fusible plug device