

ICS 45.020
CCS S 61



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

GB 10494-2018

Replacing GB 10494-1989

**Technical specification for level crossing signalling equipment
on open line**

铁路区间道口信号设备技术条件

Issued on: July 13, 2018

Implemented on: February 1, 2019

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

Table of Contents

- 1 Scope
- 2 Normative references
- 3 Terms and definitions
- 4 Environmental conditions
- 5 Technical requirements

1 Scope

China's mandatory technical specification for the signalling equipment of level crossings on the open line - the barriers, road signals, warning bells and control circuits at a crossing between stations, where the equipment must detect an approaching train by itself and give the road user a warning long enough to clear the crossing before the train arrives, whatever the train's speed. It is the companion of GB 10493, which covers the crossings inside station limits, and the difference between the two is the source of the warning: here it comes from the detection of the train on the approach section, not from an interlocking, so the standard is concerned above all with the approach warning time, with what happens when a train stops or reverses within the approach section, and with the behaviour of the equipment when the detection fails. The standard specifies the terms and definitions, the environmental conditions and the technical requirements for the level crossing signalling equipment of the open line, and it applies to the crossings located between stations. The requirements cover the detection of the approaching train and the approach warning time, the sequence and timing of the audible and visual warning and of the barriers, the road signals with the aspects of GB 14887 and their mounting to GB 14886, the noise limits of GB 3096 and the road vehicle envelope of GB 1589, the fail-safe behaviour of the control circuits and their power supply, and the reliability, availability, maintainability and safety framework of GB/T 21562 with the software of GB/T 28808, the safety-related electronic systems of GB/T 28809 and the electromagnetic compatibility of GB/T 24338.5. Issued on 13 July 2018 and in force since 1 February 2019, it replaces GB 10494-1989.

This standard specifies the terms and definitions, environmental conditions and technical requirements of signal devices for railway crossings. This standard applies to crossings located in the railway section.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article. Pieces. For undated references, the

latest edition (including all amendments) applies to this document.

GB 1589-2016 Car, trailer and car train profile size, axle load and mass limit

GB 3096-2008 Acoustic Environmental Quality Standard

GB 10493 Railway station internal crossing signal equipment technical conditions

GB 14886-2016 Road traffic signal installation and installation specifications

GB 14887-2011 road traffic lights

GB/T 21562-2008 Rail transit reliability, availability, maintainability and safety specifications and examples (IEC 62278. 2002, IDT)

GB/T 24338.5-2009 Electromagnetic compatibility of rail transit - Part 4. Transmission and immunity of signal and communication equipment (IEC 62236-4.2003, IDT)

GB/T 28808-2012 Rail transit communication, signal and processing system control and protection system software (IEC 62279.2002, IDT)

GB/T 28809-2012 Safety-related electronic systems for signals for rail transit, signalling and processing systems (IEC 62425. 2007, IDT)

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 The width of the pavement on the railway line is 2.5m and above, which directly intersects the plane through which the road passes.

3.2 Located outside the inbound signal, the distance from the inbound signal (or station landmark) to the crossing is less than the length of the required section.

3.3 The general name for the signal and protective equipment installed at the railway crossing.

3.4 When the train approaches the crossing, it automatically knows the mouth guard.

3.5 When the train approaches or leaves the crossing, a signal indicating that the passage is prohibited or permitted is automatically displayed in the direction of the road.

3.6 Facing the road, indicating the means by which road vehicles or pedestrians are prohibited or permitted to pass.

3.7 A device that prohibits passage is displayed to the train.

3.8 According to the information of the train approaching and leaving the crossing, the automatic action of the crossing bar.

3.9 The time when the road vehicle passes the crossing at the specified minimum speed,

the action time of the crossing of the crossing bar, and the emergency braking of the train driver. The time and the sum of the time that is appropriately increased according to the actual use of the crossing.

3.10 The length of the train approaching the notification time, the length of the crossing center to the length of the intercepting signal, and the length of the train's emergency braking.

4 Environmental conditions

4.1 Ambient temperature is.

- a) Indoor. $-5^{\circ}\text{C} \sim +40^{\circ}\text{C}$; no temperature control place in alpine region. $-25^{\circ}\text{C} \sim +40^{\circ}\text{C}$;
- b) Outdoor. $-40^{\circ}\text{C} \sim +70^{\circ}\text{C}$.

4.2 Relative humidity is.

- a) Indoor. no more than 85% (at a temperature of $+25^{\circ}\text{C}$);
- b) Outdoor. no more than 95% (at a temperature of $+25^{\circ}\text{C}$).

4.3 Atmospheric pressure is.

- a) not less than 70.1kPa (conventional type. altitude not exceeding 3000m);
- b) Not less than

54.0 kPa (high prototype. altitude not exceeding 5000 m).

4.4 The vibration conditions are.

- a) Indoor. sinusoidal steady-state vibration with an acceleration of 5m/s^2 should be able to withstand from 10Hz to 150Hz;
- b) Outdoor. It should be able to withstand sinusoidal steady-state vibration with an acceleration of 10m/s^2 at 10Hz~500Hz.

4.5 There are no corrosive gases and no harmful gases that may cause an explosion hazard.

5 Technical requirements

5.1 crossing signal equipment is divided into the following four categories.

- a) Automatic notification device at the crossing;
- b) crossing automatic signal equipment;
- c) automatic notification of crossings and automatic signalling devices for crossings;
- d) Automatic notification of crossings and automatic signal of crossings, automatic bar

equipment.

5.2 The crossing signal shall ensure that when the train approaches, the signals of the road direction and the railway direction shall not be opened at the same time.

5.3 The crossing signal shall ensure that when any train approaches the crossing, it shall automatically know the mouth guard or report to the road direction, and the alarm shall comply with The following requirements.

- a) When using the automatic notification device of the crossing, the warning should be given to the crossing guard;
- b) When using the automatic signal device of the crossing, it should report to the road direction;
- c) When using the automatic notification of the crossing and the automatic signal equipment of the crossing, the warning should be given to the road direction and the crossing guard;
- d) When using the automatic notification of crossings and the automatic signal of crossings and automatic bar equipment, the warning should be given to the road direction and the crossing guards;
- e) When the alarm mode uses audio and light signals, the room should be equipped with an audio cutting device.

5.4 The control conditions for sensing and logic judgment...