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

GB/T 18901.1-2025

Replacing GB/T 18901.1-2002

Fibre optic sensors - Part 1: Generic specification

光纤传感器 第1部分：总规范

(English Translation)

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References

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 1 of GB/T 18901 "Fiber Optic Sensors". GB/T 18901 has already published the following parts.

---Part 1: General Specifications.

This document supersedes GB/T 18901.1-2002 "Fiber Optic Sensors Part 1: General Specifications" and is consistent with GB/T 18901.1-2002.

Compared to previous versions, aside from structural adjustments and editorial changes, the main technical changes are as follows.

a) Added "Accuracy", "Analog Signal Interface", "Characteristic Curve/Calibration Curve",

"Communication Interface", "Drift", "Durability", and "Gauge Length".

"Measurement Standard/Measurement Reference", "Influence Factor", "Measurement Device Uncertainty", "Limiting Operating Conditions/Working Limits", "Measurement Accuracy", "Measurement Standard" Measurement range/interval", fiber optic cable, rated operating conditions, resolution, sensitivity, spatial resolution, stability, step response.

Terms and definitions for "response time" and "influence/cross-sensitivity" (see 3.1-3.4, 3.6, 3.7, 3.10, 3.11, 3.14-3.17, 3.20) 3.25, 3.26, 3.27, 3.30~3.33);

b) The terms and definitions for "extended fiber optic sensor" and "optical receiver" have been changed (see 3.12, 3.23, 3.7, 3.10 of the 2002 edition);

c) The section on "Units, Symbols, and Dimensions" has been removed (see Chapter 4 of the 2002 edition);

d) The quality assessment requirements have been changed (see Chapter 4, Chapter 5 of the 2002 edition);

e) The phrases "correspondence between the measured object and the sensor output at the optical or signal interface" and "ensuring no degradation of the sensing element" have been removed.

"Metrological characteristics of the range of non-destructive test objects" (see 6.5.2 and 6.5.7 in the 2002 edition);

f) Increased accuracy, durability, measurement device uncertainty, limiting operating conditions/limiting values, sensitivity, and stability.

Seven metrological parameters, including drift and influence/cross-sensitivity (see 5.6);

g) Added test methods for nominal wavelength and appropriate spectral characteristics, polarization state, and optical performance parameters of fiber optic connectors (see 5.7);

h) The electrical test parameter "Influence of Damped Oscillation Waves" and its test procedure have been deleted (see 6.7.2 in the 2002 edition);

i) Mechanical tests for "macrobending loss of optical fiber", "tensile strength of optical fiber", "geometry of optical fiber and coating" and "peelability of coating" have been added.

Test parameters and test procedures (see 5.9.2);

j) Added environmental test parameters for "biological attack" and test procedures for "nuclear radiation" (see 5.10.2);

k) The test on "Long-term characteristics of fiber optic sensors" has been removed (see 6.11 in the 2002 edition);

l) The functions and definitions of various tested objects have been removed (see 7.1 in the 2002 edition);

m) The functional definitions for single-point, multi-point, extended, and distributed sensors have been removed (see 7.3 in the 2002 edition);

n) Added markings for "meter markings on distributed sensor fiber optic cables" and "applicable laser radiation warning information or warning labels".

(See 7.1);

o) Increased inherent safety requirements for combustible gases (see 9.3).

This document adopts IEC 61757:2018 "General Specification for Fiber Optic Sensors".

The following minimal editorial changes have been made to this document.

---To align with existing standards, the standard name has been changed to "Fiber Optic Sensors Part 1: General Specification".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed and is under the jurisdiction of the Ministry of Industry and Information Technology of the People's Republic of China.

Introduction

Fiber optic sensors utilize fiber optic technology and related optical principles to convert the measured quantity into a usable output signal, featuring high sensitivity and resistance to electromagnetic interference.

Due to its interference-resistant properties, its application fields are becoming increasingly wide, and product performance is constantly improving. After years of development, domestically produced fiber optic sensors have gradually achieved high quality.

The technology has reached the level of imported products of the same type. Currently, the International Electrotechnical Commission (IEC) has developed and promulgated the IEC 61757 series of fiber optic sensor standards, covering the market...

The mainstream fiber optic sensors on the market are important international standards supporting the design, production, inspection, and acceptance of fiber optic sensor products. To further...

To better align with international markets and enhance industrial competitiveness, China plans to gradually build its fiber optic sensing system by combining IEC 61757 series standards with industry realities.

Instrument standard system.

GB/T 18901 is proposed to consist of the following parts.

---Part 1: General Specifications. The purpose is to establish general requirements for the