

ICS 25.040.40
CCS N 18



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

GB/T 15969.7-2008

Replacing GB/T 17165.3-2001

Programmable controllers -- Part 7: Fuzzy control programming

可编程序控制器 第7部分：模糊控制编程

(English Translation)

Issued on: June 30, 2008

Implemented on: January 1, 2009

Issued by: Standardization Administration of China

Table of Contents

Introduction	
1 Scope	
2 Normative references	
3 Terms and definitions	
4 Fuzzy control programmable controller integrated	
5 Fuzzy Control Language (FCL)	
5.1 Fuzzy exchange control program	
5.2 Fuzzy Control Language Element	
5.3 Fuzzy Control Language (FCL) Example	
5.4 Fuzzy Control Language (FCL) of production rules and keywords	
6 Conformance	
6.1 Fuzzy Control Language (FCL) rating of 15 matches	
6.2 Data Checklist	
Appendix A (informative) 18 Theory	
Annex B (informative) Example	
Annex C (informative) Examples of industries. container crane	
Examples Appendix D (informative) using variables in the rule block	
Annex E (informative) Symbols, abbreviations, synonyms	
Fuzzy Control Function Block Diagram 1 in Function Block Diagram FBD representation	
Example	
Data Figure 2 Fuzzy Control Language (FCL) exchange program	
5 Membership functions variogram Usage Example	
Example 6 Single Image Point Set language item	
7 Fuzzy Function Block Example	
8 Conformance Level	
Figure A. Structural and functional elements of Fuzzy Control	22

Foreword

GB/T 15969 "Programmable Controller" is divided into the following sections.

- Part 1. General information;
- Part 2. device characteristics;

- Part 3. Programming languages;
- Part 4. user guidelines;
- Part 5. Communications;
- Part 6. PLC Communications Based on Field Bus;
- Part 7. Fuzzy control programming.

This section GB/T 15969 Part 7.

This section identical with IEC 61131-7:2000 "Programmable controllers - Part 7. Fuzzy control programming" (in English).

According to GB/T 1.1-2000 "Standardization Guide Part 1. Standard structure and drafting rules" to IEC 61131-7.

2000 The following editorial changes.

- a) "This standard" is replaced with "this Part";
- b) Remove the IEC 61131-7:2000 Foreword;
- c) Where "IEC 61131" where to "GB/T 15969";
- "." D) with a decimal point instead of a comma as the decimal point, "";

This Part replaces GB/T 17165.3-2001 "Fuzzy control devices and systems - Part 3. PLC fuzzy control programming." this section compared with the GB/T 17165.3-2001, the main changes are as follows.

- The "Fuzzy control devices and systems - Part 3. PLC fuzzy control programming" to the "Programmable Logic Controller Part 7. Fuzzy control programming ";
- The standard number from the "GB/T 17165.3-2001" to "GB/T 15969.7-2008";
- "Definition" to "Terms and Definitions" (GB/T 17165.3-2001 Chapter 3; Chapter 3 of this section);
- The order of terms in Chapter 3, according to IEC 61131-7:2000 in terms of the order have been adjusted (GB/T 17165.3-2001 Chapter 3; Chapter 3 of this section);
- According to GB/T 1.1-2000, has been re-typeset.

This section of the Appendix A, Appendix B, Appendix C, Appendix D, Appendix E are informative appendices.

This part is proposed by China Machinery Industry Federation.

This part of the measurement and control of Standardization Technical Committee Technical Committee under the jurisdiction of the Fifth National industrial processes.

This section is responsible for drafting unit. Southwest University, China Silian Instrument Group.

Participated in the drafting of this section. Machinery Industrial Instrumentation Technology and Economy Institute, Beijing Institute of Machinery Industry Automation.

1 Scope

This section GB/T 15969 defines the programmable controller fuzzy control programming language.

This section provides the manufacturers and users of fuzzy control applications integrated in GB/T 15969.3-2005 provisions of programmable logic controller the basic method of language, and the possibility of switching between different programming system portable fuzzy control program.

To assist the reader in understanding this section, Appendix A brief introduction of fuzzy control and fuzzy logic, basic content.

2 Normative references

The following documents contain provisions which, through reference GB/T 15969 in this section constitute provisions of this section. For dated references, all subsequent amendments (excluding corrections) or revisions do not apply to this section, however, encourage an agreement under this section Parties to study the latest versions of these documents. For undated reference documents, the latest versions apply to this section.

GB/T 2900.56-2002 Electrotechnical terminology automatic control (IEC 60050-351:1998, IDT) GB/T 15969.3-2005 programmable controllers Part 3. programming languages \u200b\u200b(IEC 61131-3:2002, IDT)

3 Terms and Definitions

The following terms and definitions apply to this section.

Other definitions of programming languages \u200b\u200bis determined by the GB/T 15969.3-2005.

NOTE: This chapter defines the terms used in the definition of the body appear in bold.

The summary results of the control rules of reasoning into a total of reasoning result.

Note: the aggregate results of reasoning.

By a plurality of sub-membership criteria of a rule to calculate the conditions that rule (antecedent part) of satisfaction.

Note: the identification of the degree of activation of a rule.

Satisfaction rule conditions applied to a process output fuzzy sets.

Simple or multidimensional fuzzy conditional statement "if, then" in the "then" portion.

NOTE: The output control rule, also known as the back piece (consequent).

Simple or multidimensional fuzzy conditional statement "if, then" in the "if" part.

NOTE: Also known as the antecedent (antecedent), fuzzy operators AND, OR, NOT in conjunction with the sub-conditions consisting of an expression.

GB/T 15969.7-2008/IEC 61131-7:2000