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**Special robot — Classification, symbol, mark**

特种机器人 分类、符号、标志

*(English Translation)*

GB/T 36321—2018

**National Standard of the People’s Republic of China**

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Foreword

SAC/SWG 13 is in charge of this English translation. In case of any doubt about the contents of English translation, the Chinese original shall be considered authoritative..

This standard is drafted in accordance with the rules given in GB/T 1.1-2009 Directives for standardization—Part 1: Structure and drafting of standards.

This standard was proposed and prepared by SAC/SWG 13 (Standardization Working Group 13 on Special TaskRobots of Standardization Administration of China).

Special robot — Classification, symbol,mark

1Scope

This standard specifies the classification, general symbols and signs of special robots.

This standard is applicable to special robots, which facilitate the identification and management of them in the process of manufacturing, using and maintaining.

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 36293-2018 Special robot-terms

3Terms and definitions

For the purposes of this document, the terms and definitions given in GB/T 36293-2018 and the following apply. For ease of use, some terms and definitions in GB/T 36293-2018 are listed repeatedly below.

3.1

special robot, professional service robot

Robots used in professional fields and generally operated or used by specially trained person to assist and/or replace humans in performing tasks

Note: Special robotsgenerally refer to professional service robot other than industrial robots, public service robots and personal service robots.

[GB/T 36293-2018, definition 2.1.1]

3.2

agricultural robot

Robots used in production procedures in agricultural fields (including plantation, forestry, animal husbandry, agriculture and sideline industries, fishery and other industries)

 [GB/T 36293-2018, definition 3.1]

3.3

electric power robot

Robots used in all aspects of power production, transmission, and utilization in the power industry

 [GB/T 36293-2018, definition 3.2]

3.4

construction robot

Robots used in engineering construction, decoration, repair, inspection and other links in the construction industry

[GB/T 36293-2018, definition 3.3]

3.5

logistics robot

Robots used for cargo transportation, sorting, inspection and other operations in the warehousing, logistics, and transportation industries.

[GB/T 36293-2018, definition 3.4]

3.6

medical robot

Robots used in preventive screening, diagnosis, treatment, surgery, medical training and other various procedures in the medical and health field

 [GB/T 36293-2018, definition 3.5]

3.7

nursing robot

Robots used to help or assist in caring for patients, the elderly, children, the handicapped, and sub-healthy people in daily life

[GB/T 36293-2018, definition 3.7]

3.8

rehabilitation robot

Robots used to assist people with limb motor dysfunction or disability inrehabilitation training, limb function recovery, reconstruction, enhancement, etc., in the fields of medical care, health care, and helpingthe elderly and the disabled

[GB/T 36293-2018, definition 3.6]

3.9

security and defense robot

Robots used for patrol, investigation, explosion removal, emergency handling, fire extinguishing, smoke exhaust, demolition, decontamination, search and rescue, and transportation in the field of security, police, fire protection, and other safety protection fields

[GB/T 36239-2018, definition 3.8]

3.10

military robot

Robots used to perform multiple combat tasks such as battlefield reconnaissance, armed strike, combat material transportation, communication relay and electronic interference, nuclear, biological and chemical and explosives processing, precise guidance and damage assessmentin the field of national defense and military

[GB/T 36293-2018, definition 3.9]

3.11

rescue robot

Robots used to assist or replace rescuers in completing tasks such as survivor search and rescue and environmental detection in environments where it is dangerous or difficult for rescuers to carry out rescue operations

[GB/T 36293-2018, definition 3.10]

3.12

space robot

Robots used to make experiments, operations, and detection activities in space

[GB/T 36293-2018, definition 3.11]

3.13

nuclear industry robot

Robots used for tasks such as inspection, maintenance, emergency handling, and decommissioning in nuclear industry applications such as nuclear technology applications and nuclear fuel cycles

[GB/T 36293-2018, definition 3.13]

3.14

mining robot

Robots used for geological survey, mine (field) construction, mining, transportation, washing and other production procedures, as well as for safety inspection, disaster rescue and other operations in the field of mining production

 [GB/T 36293-2018, definition 3.14]

3.15

petrochemical and chemical robot

Robots used to serve the procedures of production, storage, transportation, inspection, and cleaning in the fields of petroleum processing, chemical industry, and others

 [GB/T 36293-2018, definition 3.15]

3.16

municipal engineering robot

Robots used for the installation, overhaul, maintenance , and inspection of equipment and facilities in the construction and maintenance of municipal projects

[GB/T 36293-2018,definition 3.16]

4Classification

4.1Classified by industry

4.1.1General

According to the main industries in which special robots are applied, special robots may be divided intoagricultural robot, electric robot, construction robot, logistics robot, medical robot, nursing robot, rehabilitation robot, security and rescue robot, military robot, nuclear industrial robot, mining robot, petrochemical robot, municipal engineering robot and other robots.

4.1.2Agricultural robot

Agricultural robots mainly include plantation robots, forestry robots, animal husbandry robots, agricultural and sideline robots, fishery robots, etc.

4.1.3Electric power robot

Electric power robots mainly include power generation robots, power transmission robots, power transformation robots, power distribution robots, and power consumption robots, etc.

4.1.4Construction robot

Construction robots mainly include house construction robots, civil engineering construction robots, construction installation robots, architectural decoration and other robots, etc.

4.1.5 Logistics robot

Logistics robots mainly include storage robots, sorting robots, transportation robots, and delivery robots, etc.

4.1.6 Medical robot

Medical robots mainly include prevention and screening robots, inspection and diagnosis robots, treatment robots, drug delivery robots, and medical training robots, etc.

4.1.7 Nursing robot

Nursing robots mainly include health care robots, diet care robots, active care robots, escort robots, emotional communication robots, blind guide robots, intelligent care (bed) robots, etc.

4.1.8 Rehabilitation robot

Rehabilitation robots mainly include rehabilitation training robots, exoskeleton assisted walking robots, biofeedback (training) robots, and neuromodulation robots, etc.

4.1.9　Security, defense and rescue robot

Security and rescue robots mainly include security robots, police robots, fire-fighting robots, rescue robots, etc.

4.1.10 Military robot

Military robots include battlefield reconnaissance robots, strike robots, logistics support robots, and battlefield cleaning robots, etc.

4.1.11 Nuclear industry robot

Nuclear industry robots mainly include nuclear military working robots, nuclear power plant operation and maintenance robots, nuclear technology application robots, nuclear facility emergency robots, and nuclear facility decommissioning robots, etc.

4.1.12 Mining robot

Mining robots mainly include mineral exploration robots, miningrobots, mineral transportation robots, mineral sorting robots, mine disaster relief robots, etc.

4.1.13 Petrochemical robot

Petrochemical robots mainly include petrochemical exploration robots, petrochemical mining robots, petrochemical transportation robots, petrochemical processing robots, petrochemical storage and canning robots, etc.

4.1.14　Municipal engineering robot

Municipal engineering robots mainly include equipment installation robots, construction inspection robots, facility equipment maintenance robots, and pipeline robots, etc.

4.1.15　Other special robots

Special robots that do not belong to the above-mentioned 4.1.2 to 4.1.14 categories.

4.2Classified by space used

4.2.1General

Special robots (land, sea, air, outer space), special robots may be divided into ground robot, underground robot, floating robot, underwater robot, aerial robot, space robot and other robots according to the feature of working space.

4.2.2 Ground robot

Ground robots mainly include ground mobile robots,mountain mobile robots, polar mobile robots, cable mobile robots, wall climbing robots,tidal flat robots,etc.

4.2.3 Underground robot

Underground robots mainly include hoistway operation robots, pipeline operation robots, and tunnel operation robots.

4.2.4 Floatingrobot

Floating robots mainly include surface unmanned boats and marine rescue robots, etc.

4.2.5　Underwater robot

Underwater robots mainly include diving robots, underwater gliding robots, underwater robots, etc.

4.2.6　Aerial robot

Aerial robots mainly include flying robots and floating operation robots, etc.

4.2.7 Space robot

Space robots mainly include space cabin robots, space extravehicular robots, planet exploration robots and space flight robots, etc.

4.2.8　Other robots

Robotsthat used in more than two (including) workspaces, such as amphibious robotsand stern robots.

4.3Classified by movement mode

4.3.1General

Special robots may be divided into wheeled robot, crawler robot, legged robot, creeping robot, flying robot, diving robot, stationary robot, jet robot, wearable robots, hybrid robot and other robots according to the movement modes.

4.3.2　Wheeled robot

Mobile robots move with wheels.

4.3.3　Crawler robot

Mobile robots move with crawlers.

4.3.4　Legged robot

Mobile robots move with one or more legs.

4.3.5　Creeping robot

Mobile robots move with its own creep.

4.3.6　Flying robot

Mobile robots fly or move with its own flying devices.

4.3.7　Diving robot

Mobile robots dive or swim with diving and swimming devices.

4.3.8　Stationary robot

Robots fixed in a certain area and cannot move autonomously.

4.3.9　Jet robot

Mobile robots move through the reaction force generated by the ejected material.

4.3.10　Wearable robot

Robots move in the direction that adapts to active and passive momvements of human body.

4.3.11　Hybrid robot

Robots with two or more movement modes at the same time.

4.3.12 Robots with other movement modes

Robots that move by other ways.

4.4 Classified by function

The functional classification of special robots is related to the industry. Functions mainly include mining, installation, inspection&test, maintenance, repair, patrol, reconnaissance, explosion removal, search and rescue, transportation, diagnosis, treatment, rehabilitation, cleaning, etc.

5 Symbol

5.1General

The special robot classification symbols are based on the two representative capital of Chinese characters in Chinese Pinyin.

5.2Industrial classification symbols for special robots

Industrial classification symbols for special robots are outlined in table 1.

Table 1 Industrial classification symbols for special robots

|  |  |  |
| --- | --- | --- |
| Classification | Chinese Pinyin | Symbol |
| Agricultural robot | Nong Ye | NY |
| Electric power robot | Dian Li | DL |
| Construction robot | Jian Zhu | JZ |
| Logistics robot | Wu Liu | WL |
| Medical robot | Yi Yong | YY |
| Nursing robot | Hu Li | HL |
| Rehabilitation robot | Kang Fu | KF |
| Security，defense and rescue robot | An Jiu | AJ |
| Military robot | Jun Yong | JY |
| Nuclear Industry robot | He Gong Ye | EJ |
| Mining robot | Kuang Ye | KY |
| Petrochemical robot | Shi You Hua Gong | SG  |
| Municipal engineering robot | Shi Zheng Gong Cheng | SC |
| Robots in other industries | Qi Ta Hang Ye | HQT |

5.3 Working space classification symbols for special robots

Working space classification symbols for special robots are outlined in table 2.

Table 2 Industrial classification symbols for special robots

|  |  |  |
| --- | --- | --- |
| Classification | Chinese Pinyin | Symbol |
| Ground robot | Di Mian | DM |
| Underground robot | Di Xia | DX |
| Floating robot | Shui Mian | SM |
| Underwater robot | Shui Xia | SX |
| Aerial robot | Kong Zhong | KZ |
| Space robot | Kong Jian | KJ |
| Other robots | Qi Ta | KQT |

5.4 Movement mode classification symbols for special robots

Movement mode classification symbols for special robots are listed in table 3.

Table 3 Industrial classification symbols for special robots

|  |  |  |
| --- | --- | --- |
| Classification | Chinese Pinyin | Symbol |
| Wheeled robot | Lun Shi | LS |
| Crawler robot | Lv Dai | LD |
| Legged robot | Zu Tui | ZT |
| Creeping robot | Ru Dong | RD |
| Flying robot | Fei Xing | FX |
| Diving robot | Qian You | QY |
| Stationary robot | Gu Ding | GD |
| Jet robot | Pen She | PS |
| Wearable robot | Chuan Dai | CD |
| Hybrid Robot | Fu He | FH |
| Robots with other movement modes | Qi Ta | XQT |

5.5Functional classification symbols for special robots

Functional classification symbols for special robots are listed in table 4.

Table 4 Functional classification symbols for special robots

|  |  |  |
| --- | --- | --- |
| Classification | Chinese Pinyin | Symbol |
| mining | Cai Jue | CJ |
| installation | An Zhuang | AZ |
| inspection&test | Jian Ce | JC |
| maintenance | Wei Hu | WH |
| repair | Wei Xiu | WX |
| patrol | Xun Jian | XJ |
| reconnaissance | Zhen Cha | ZC |
| EOD (Explosive Ordnance Disposal) | Pai Bao | PB |
| search and rescue | Sou Jiu | SJ |
| delivery | Shu Song | SS |
| diagnosis | Zhen Duan | ZD |
| treatment | Zhi Liao | ZL |
| rehabilitation | Kang Fu | KF |
| clean | Qing Jie | QJ |
| other | Qi Ta | GQT |

6Model number coding principles

6.1 The product model number indicates the main characteristics of the special robot, which is used for design, production, sales, inspection,testing and other productive activities.

6.2 Products shall be identified with a unique model number. Different products shall not use the same model number.

6.3The product model is composed of capital Chinese pinyin letters, Arabic numerals (number) and Greek letters. The model number coding rules shall follow the following three principles:

a）Product classification adopts the classification principles in Chapter 4 of this document;

b）The capital letters cannot be I, O, X and other letters that are easily confused with numbers or Greek letters;

c）Composition format:

The product model is composed of company code, name code, industry code, space code, movement mode code, function code, design code, etc., and the length shall not exceed 16 digits.The product model code shall be as simple as possible. Part of the code may be omitted under the premise of clear expression. The format is shown as follows:

 Name code

 Company code

Industry code

 Movement mode code

 Space code

 Function code

 Design code

Among them, the enterprise code can use the enterprise name or logo, either in Chinese or English, which is determined by the enterprise itself. However, the use of enterprise names shall comply with relevant national laws and regulations.

The name code is represented by the English acronym "TZ" for Special Robot.

The industry code, space code, movement mode code and function code are respectively corresponded to the classification symbols in 5.2, 5.3, 5.4 and 5.5.

The design code consists of product features and design sequence, defined in the corresponding product standards and represented by Chinese pinyin letters and/or Arabic numerals. The product design sequence code is the last two digits, which is represented by Arabic numerals.

6.4 Examples of special robot model, see Annex A.

7Sign

7.1 The special robot sign, see Figure 1. The square edge is not included in the sign. It is only a basis for making the graphic sign.

7.2 Special robots should be marked with the logo (Figure 1) in a prominent position. The sign may be scaled in proportion to the actual size of the product.



Figure 1 　 Special robot sign

Annex A
(annex informative)
Examples of special robot model

* 1. Example of EOD robot model

The EOD robot is used for security. The working space is the ground with crawler movement mode. It is the first improvement design and the company name is Guoan.

The models are listed below：

Guoan TZ AF DM LD PB — 1

Design code

Function code

Movement mode code

Space code

Industry code

Name code

Company code

* 1. Example of flying robot on overhead transmission line model

The flying robot for overhead transmission lines is used for power inspection. The movement mode is flying. It is a design prototype. The company name is State Grid.

State Grid TZ DL FX XJ — A

Dign code

Function code

Movement mode code

Space code

Industry code

Name code

Company code

Bibliography

[1] GB/T 4754-2017 Industrial classification for national economic activities

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