

# JB

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Replace JB/T 8862-2000

Electric actuator lifetime test procedure

阀门电动装置寿命试验规程

(English Translation)

(报批稿)

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## Foreword

SAC/TC188 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 replaces JB/T 8862-2000 "Electric actuators -lifetime test procedure". Compared with JB/T 8862-2000, except for editorial changes, the main technical changes are as follows:

- Revised the scope;
- Modified the definition of operating torque;
- Modified the load characteristics and operation time;
- Revised the performance requirements of the electric device after its life test;
- Revised the test items;
- Revised the test method.

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 standard was proposed by China Machinery Industry Federation.

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# Electric actuator lifetime test procedure

## 1 Scope

This standard specifies the terms and definitions, test requirements, test items, test methods, test reports and test records for the lifetime test of valve electric actuator.

This standard is applicable to the lifetime test of valve electric actuator (hereinafter referred to as electric actuator).

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 24923 Technical specifications of basic version electric valve actuators

GB/T 28270 Intelligent valve electric actuator

## 3 Terms and definitions

For the purpose of this standard, the following terms and definitions as well as given in GB/T 24923 and GB/T 28270 apply.

### 3.1

#### Lifetime

The electric actuator simulates the change of the opening and closing torque of the valve to carry out the cycle operation, one cycle of operating the valve consists of opening and closing once, operated the valve until the electric actuator lost the specified performance, the total cycle is the lifetime of electric actuator.

### 3.2

#### Operating torque

A reference value for the lifetime test of an electric actuator, which is one third of the nominal torque of the electric actuator.

## 4 Test requirements

### 4.1 Load characteristic

During the lifetime test of the electric actuator, run with operating torque and close with nominal torque. If expressed as thrust, i.e. operation with one third of nominal thrust and close at nominal thrust, the load characteristics are shown in Figure 1.

The maximum error of operating torque during the lifetime test shall not be greater than  $\pm 5\%$  of nominal torque.

#### 4.2 Operation time

For electric actuator which fully travel time is more than 10s, each cycle operation time is 80s. Including opening for 10s, stopping for 30s, closing for 10s, stopping for 30s.

For electric actuator which fully travel time is less than 10s, the fully travel time of opening and closing to open-close is operation time, and the interval time is 30s.

Operation time characteristic is shown in Figure 2.

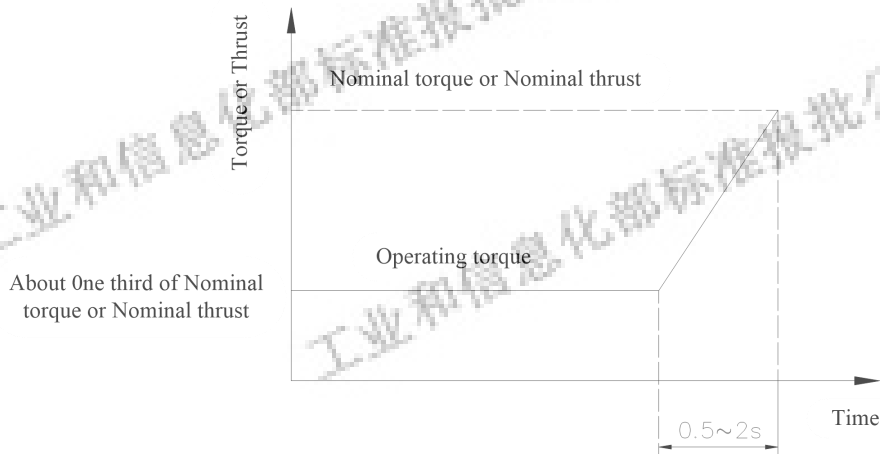


Figure 1 Load characteristic

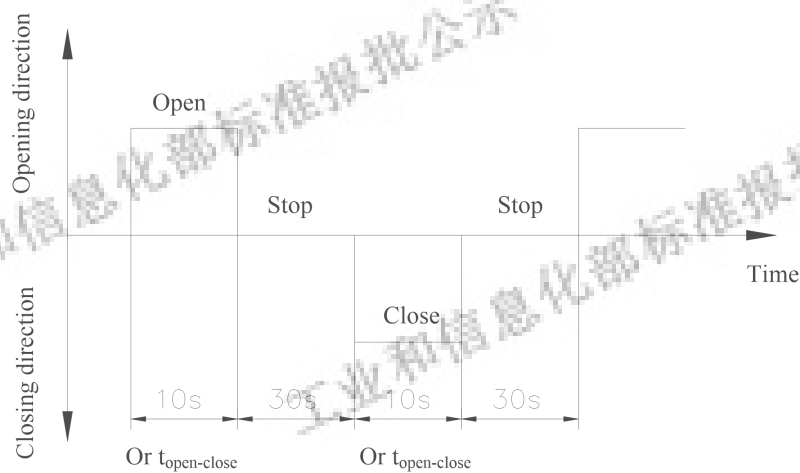


Figure 2 Operation time characteristic

#### 4.3 On-off control

In the lifetime test of the electric actuator, the open position is controlled by travel limitation mechanism, and the close position is controlled by torque limitation mechanism.

### 5 Test items and requirements

#### 5.1 General requirement

The factory test of electric actuator is carried out in accordance with the provisions of GB/T 24923 and GB/T 28270 before lifetime test, torque test and position control precision test are carried out after lifetime test.

#### 5.2 Lifetime

Numbers of lifetime test shall meet the requirements specified in GB/T 24923 and GB/T 28270.

#### 5.3 Torque

Test of torque deviation shall meet the requirement specified in GB/T 24923 and GB/T 28270 and carry out after lifetime test.

#### 5.4 Position control precision

Travel position deviation test shall meet the requirement specified in GB/T 24923 and GB/T 28270 and carry out after lifetime test.

### 6 Test method

#### 6.1 Lifetime test

The test environment temperature test of electric actuator is  $-10^{\circ}\text{C}$  to  $+35^{\circ}\text{C}$ .

Install the electric actuator on test bench, nominal torque and position control precision test of electric actuator shall be carried out before lifetime test. The test results of basic version electric valve actuator shall meet the provisions of GB/T 24923 and intelligent electric valve actuator shall meet the provisions of GB/T 28270. Adjust the load according to the requirement of 4.1, use time relay to control on and off according to the requirements of 4.2 and 4.3, and use counter to record the number of test. During the test, the electric actuator can pause when the motor heats up (the surface temperature is higher than  $85^{\circ}\text{C}$ ), and the test will be conducted after the motor cooling down. The motor can also be cooled by circulating water in order to continue the test. Other test requirements shall meet the technical agreement signed between the end user and manufactory.

The lifetime test of electric actuator shall be terminated when the following situation occurs:

- a) any part of the electric actuator is failure;
- b) abnormal phenomena such as jamming and abnormal noise during the test.

## 6.2 Torque test

6.2.1 For basic version electric valve actuator, nominal torque shall be measured without adjusting the torque switch position, and the result shall meet the requirements of GB/T 24923 after lifetime test.

6.2.2 For intelligent electric valve actuator, the result of torque test shall meet the requirements of GB/T 28270 after lifetime test.

## 6.3 Position control precision test

Install the electric actuator on test bench before lifetime test, set fully-open and fully-closed position (equivalent to the fully-open and fully-closed position of the valve). Start electric actuator, load until to achieve operating torque, to stop in the fully open and fully closed position by travel limitation control mechanism, use the open and close position as the reference position. After the lifetime test, start the electric actuator with the same load, and run it three times to fully-open and fully-closed position separately. The deviation between stop position and the reference position for each time shall meet GB/T 24923 for basic version electric actuator and meet GB/T 28270 for intelligent electric actuator.

## 7 Test report

The test report shall include the following items:

- a) schematic structural diagram of electric actuator;
- b) main technical parameters of electric actuator (including motor);
- c) performance changes of the electric actuator before and after the test according to table 1;
- d) load characteristic curve of test device;
- e) schematic diagram of test device.

## 8 Test records

Refer to Table 1 for lifetime test records of electric actuator .

Table 1 Test Records

Entrust unit	Manufactory				
Name of production	Model and specification				
Inspection item	Visual inspection				
	Check for electric wiring and lead wires				
	Creepage distance and electric gap				
	Handwheel(handle) check				
	Check of insulating resistance				
	Function check				
	Position indication check				
	Check of output position signal				
	Manual\electric switching check				
	Torque check				
	Repetitive precision check of torque				
	Check of position repeatability deviation				
	Intrinsic error test				
	Hysteresis plus dead band test				
dead band test					
Measurement Parameters after lifetime test		Measurement result			
		Before lifetime test		After lifetime test	
		Open	Close	Open	Close
Torque N·m	1				
	2				
	3				
Position control precision					