
Industrijski ventili - Pogoni - 2. del: Električni pogoni za industrijske ventile - Osnovne zahteve

Industrial valves - Actuators - Part 2: Electric actuators for industrial valves - Basic requirements

Industriearmaturen - Antriebe - Teil 2: Elektrische Antriebe für Industriearmaturen - Grundanforderungen

Robinetterie industrielle - Actionneurs - Partie 2 : Actionneurs électriques pour robinetterie industrielle - Prescriptions de base

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 15714-2:2011
<https://standards.iteh.ai/catalog/standards/sist/1c0fc13c-112b-4544-846d-ebabb1739b87/sist-en-15714-2-2011>

Ta slovenski standard je istoveten z: EN 15714-2:2009

ICS:

23.060.20	Zapirni ventili (kroglasti in pipe)	Ball and plug valves
-----------	-------------------------------------	----------------------

SIST EN 15714-2:2011**en,fr,de**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 15714-2:2011

<https://standards.iteh.ai/catalog/standards/sist/1c0fc13c-112b-4544-846d-ebabb1739b87/sist-en-15714-2-2011>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 15714-2

October 2009

ICS 23.060.20

English Version

**Industrial valves - Actuators - Part 2: Electric actuators for
industrial valves - Basic requirements**

Robinetterie industrielle - Actionneurs - Partie 2:
Actionneurs électriques pour robinetterie industrielle -
Prescriptions de base

Industriearmaturen - Antriebe - Teil 2: Elektrische Antriebe
für Industriearmaturen - Grundanforderungen

This European Standard was approved by CEN on 12 September 2009.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

[SIST EN 15714-2:2011](https://standards.iteh.ai/catalog/standards/sist/1c0fc13c-112b-4544-846d-cbabb1739b87/sist-en-15714-2-2011)

<https://standards.iteh.ai/catalog/standards/sist/1c0fc13c-112b-4544-846d-cbabb1739b87/sist-en-15714-2-2011>



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	4
1 Scope	5
2 Normative references	5
3 Classification/Designation	5
3.1 General.....	5
3.2 Type: Part-turn, multi-turn or linear	5
3.3 Actuator duty classification.....	6
3.3.1 General.....	6
3.3.2 Class A: On-off.....	6
3.3.3 Class B: Inching/positioning	6
3.3.4 Class C: Modulating	6
3.3.5 Class D: Continuous modulating	6
3.4 Action on loss of external electric power	6
3.4.1 Standard action.....	6
3.4.2 Fail safe action	6
4 Design requirements	6
4.1 Endurance	6
4.1.1 General.....	6
4.1.2 Part turn actuators.....	7
4.1.3 Multi-turn actuators	7
4.1.4 Linear actuators	8
4.2 Environmental conditions	8
4.2.1 General.....	8
4.2.2 Ambient temperature and humidity	8
4.2.3 Altitude.....	8
4.2.4 Enclosure protection	8
4.2.5 Hazardous areas	8
4.2.6 External corrosion protection	9
4.2.7 Vibrations, shock and seismic conditions	9
4.3 Actuator attachment.....	9
4.3.1 Part-turn actuators.....	9
4.3.2 Multi-turn actuators	10
4.3.3 Linear actuators	10
4.4 Standard closing direction	11
4.5 Fail safe direction	11
4.6 Electrical connections — cable entries	12
4.7 Performance.....	12
4.7.1 Power supply tolerances	12
4.7.2 Actuator duty performances.....	12
4.7.3 Operating time and speed.....	14
4.8 Basic requirements.....	14
4.8.1 Motors	14
4.8.2 Gearing and lubrication	14
4.8.3 Manual operation	15
4.8.4 Travel limitation	15
4.8.5 Torque/Thrust limitation	15
4.8.6 End stop adjustment for part-turn and linear actuators	15
4.8.7 Local position indication	15
5 Optional equipment	16

5.1	General	16
5.2	Anti-condensation heater	16
5.3	Local position indication (for multi-turn or linear actuators)	16
5.4	Position transmitter	16
5.5	Actuator running transmitter	16
5.6	Additional position and/or torque signalling	16
5.7	Local control station	16
5.8	Actuator electrical controls	16
5.8.1	General	16
5.8.2	Positioner	17
5.8.3	Controller	17
5.8.4	Speed Control	17
5.8.5	Field Bus system interface	17
5.8.6	Torque transmitter (analogue or digital)	17
5.8.7	Actuator performance data logger	17
6	Conformity assessment	17
6.1	General	17
6.2	Type tests	18
6.3	Control of production process and quality system	18
7	Marking	19
8	Documentation	20
Annex A	(normative) Endurance test procedure	21
A.1	General	21
A.2	Test equipment	21
A.3	Test conditions	21
A.4	Test procedure	21
A.5	Acceptance criteria	21
Annex B	(informative) Actuator selection guidelines	22
B.1	General	22
B.2	Selection parameters	22
B.2.1	General	22
B.2.2	Valve Questions	22
B.2.3	Actuator Questions	23
B.3	Ancillary Questions	23
B.4	Environmental conditions (as indicated in 4.2)	23
B.5	Actuator selection	23
Bibliography	24

Foreword

This document (EN 15714-2:2009) has been prepared by Technical Committee CEN/TC 69 “Industrial valves”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2010, and conflicting national standards shall be withdrawn at the latest by April 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 15714-2:2011](https://standards.iteh.ai/catalog/standards/sist/1c0fc13c-112b-4544-846d-ebabb1739b87/sist-en-15714-2-2011)

<https://standards.iteh.ai/catalog/standards/sist/1c0fc13c-112b-4544-846d-ebabb1739b87/sist-en-15714-2-2011>

1 Scope

This document provides basic requirements for electric valve actuators, used for on-off and control valves. It includes guidelines for classification, design, enclosure and corrosion protection, and methods for conformity assessment.

Combinations of electric multi-turn actuators and gearboxes supplied by the actuator manufacturer are within the scope of this document. In all other cases this European Standard applies to the electric actuator only.

It does not cover: solenoid actuators, electro-hydraulic actuators and electric actuators which are integral in the design of valves.

Other requirements or conditions of use different from those indicated in this document should be agreed between the purchaser and the manufacturer/supplier, prior to order.

The terms and definitions applicable to this European Standard are given in EN 15714-1.

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.

EN 12570, *Industrial valves — Method for sizing the operating element*

EN 60529, *Degrees of protection provided by enclosures (IP Code)* (IEC 60529:1989)

EN ISO 5210:1996, *Industrial valves — Multi-turn valve actuator attachments* (ISO 5210:1991)

EN ISO 5211, *Industrial valves — Part-turn valve actuator attachments* (ISO 5211:2001)

3 Classification/Designation

3.1 General

Electric valve actuators are classified per type, duty and action as detailed below.

3.2 Type: Part-turn, multi-turn or linear

3.2.1 Part-turn: An actuator which transmits torque to the valve for less than one revolution. It does not have to be capable of withstanding thrust. A combination of a multi-turn actuator plus a part-turn gearbox can be considered, for the sake of this European Standard, a part-turn actuator.

3.2.2 Multi-turn actuator: An actuator which transmits torque to the valve/gearbox for at least one revolution. It may be capable of withstanding thrust. A combination of a multi-turn actuator plus a multi-turn gearbox can be considered, for the sake of this European Standard, a multi-turn actuator.

3.2.3 Linear actuator: An actuator which transmits thrust to the valve for a defined linear stroke. A combination of a multi-turn actuator plus a linear drive can be considered, for the sake of this European Standard, a linear actuator.

EN 15714-2:2009 (E)**3.3 Actuator duty classification****3.3.1 General**

Basic design requirements for actuator duty classification are given in 4.1 and 4.7.2.

3.3.2 Class A: On-off

The actuator is required to drive the valve through its entire travel from the fully open position to the fully closed position or vice-versa.

3.3.3 Class B: Inching/positioning

The actuator is required to occasionally drive the valve to any position (fully open, intermediate and fully closed).

3.3.4 Class C: Modulating

The actuator is required to frequently drive the valve to any position between fully open and fully closed.

3.3.5 Class D: Continuous modulating

The actuator is required to continuously drive the valve to any position between fully open and fully closed.

3.4 Action on loss of external electric power**3.4.1 Standard action**

On loss of external power, the actuator remains in the position achieved before loss of power.

3.4.2 Fail safe action

On loss of external power, the actuator is able to operate the valve to a pre-defined safe position.

4 Design requirements**4.1 Endurance****4.1.1 General**

The actuator shall be designed to meet the life endurance criteria as defined in Annex A.

The endurance of modulating and continuous modulating actuators shall be based on consecutive starts spread over an intermediate stroking span of maximum 30 % of full travel.

4.1.2 Part turn actuators

Table 1 — Part-turn actuator endurance test requirements (see Annex A)

Rated torque ranges ^a Nm	Class A and B On-Off Inching (number of cycles) ^b	Class C Modulating (number of starts) ^c	Class D Continuous modulating (number of starts) ^c
Up to 125	10 000	1 800 000	10 000 000
126 — 1 000	10 000	1 200 000	10 000 000
1 001 — 4 000	5 000	500 000	5 000 000
4 001 — 32 000	2 500	250 000	T.B.A. ^d
Above 32 000	1 000	T.B.A. ^d	T.B.A. ^d

^a Based on EN ISO 5211.

^b One cycle consists of nominal 90° angular travel in both directions (i.e. 90° to open + 90° to close), based on an average load of at least 30 % of the rated torque with the ability to transmit 100 % of the rated torque for at least 5 % at each end of travel. For angular travel other than 90°, the endurance shall be agreed between the purchaser and the manufacturer/supplier.

^c One start consists of a movement of at least 1 % in either direction, with a load of at least 30 % of the rated torque.

^d To be agreed between manufacturer / supplier and purchaser.

4.1.3 Multi-turn actuators

SIST EN 15714-2:2011

[https://standards.iteh.ai/catalog/standards/sist/1c0fc13c-112b-4544-846d-](https://standards.iteh.ai/catalog/standards/sist/1c0fc13c-112b-4544-846d-e6abb1739b87/sist-en-15714-2-2011)

e6abb1739b87/sist-en-15714-2-2011

Table 2 — Multi-turn actuator endurance test requirements (see Annex A)

Rated torque ranges ^a Nm	Maximum allowable thrust ^a kN	Class A and B On-Off Inching (number of cycles) ^b	Class C Modulating (number of starts) ^c	Class D Continuous modulating (number of starts) ^c
Up to 100	≤ to 40	10 000	1 800 000	10 000 000
101 — 700	≤ 150	10 000	1 200 000	10 000 000
701 — 2 500	≤ 325	5 000	500 000	5 000 000
2 501 — 10 000	≤ 1 100	2 500	250 000	T.B.A. ^d
Above 10 000	> 1 100	1 000	T.B.A. ^d	T.B.A. ^d

^a Based on EN ISO 5210.

^b One cycle consists of 25 turns in both directions (i.e. 25 turns to open + 25 turns to close), based on an average load of at least 30 % of the rated torque with the ability to transmit 100 % of the rated torque for at least 10 % of the travel.

^c One start consists of a movement of at least 1 % of travel in either direction, with a load of at least 30 % of the rated torque.

^d To be agreed between manufacturer/supplier and purchaser.

EN 15714-2:2009 (E)

4.1.4 Linear actuators

Table 3 — Linear actuator endurance test requirements (see Annex A)

Rated thrust ranges ^a kN	Class A and B On-Off Inching (number of cycles) ^b	Class C Modulating (number of starts) ^c	Class D Continuous modulating (number of starts) ^c
Up to 20	10 000	1 800 000	10 000 000
21 — 70	10 000	1 200 000	10 000 000
71 — 150	5 000	500 000	5 000 000
151 — 325	2 500	250 000	T.B.A. ^d
Above 325	1 000	T.B.A. ^d	T.B.A. ^d

^a Based on EN ISO 5210.

^b One cycle consists in a stroke of 40 mm, or in a minimum stroke (H) given in Table 5, in both directions (i.e. 40 mm to open + 40 mm to close), based on an average load of at least 30 % of the rated thrust with the ability to transmit 100 % of the rated thrust for at least 10 % of the travel.

^c One start consists of a movement of at least 1 % of the stroke in either direction, with a load of at least 30 % of the rated thrust.

^d To be agreed between manufacturer/supplier and purchaser.

ITC STANDARD PREVIEW
(standards.iteh.ai)

4.2 Environmental conditions

SIST EN 15714-2:2011

4.2.1 General

<https://standards.iteh.ai/catalog/standards/sist/1c0fc13c-112b-4544-846d-ebabb1739b87/sist-en-15714-2-2011>

The following environmental conditions shall apply, unless otherwise agreed between the manufacturer/supplier and purchaser:

4.2.2 Ambient temperature and humidity

The actuator shall be designed for operation at an ambient temperature range between – 20 °C and + 60 °C with relative humidity up to 80 %.

4.2.3 Altitude

The actuator shall be designed for operation at an altitude up to 1 000 m above sea level.

4.2.4 Enclosure protection

Electric actuators shall have at least enclosure protection type IP 65 to EN 60529.

4.2.5 Hazardous areas

Electric actuators intended for use in hazardous areas shall be designed and certified in accordance with the requirements of the applicable regulations.

4.2.6 External corrosion protection

Electric actuators shall be protected against external corrosion by proper material selection and/or surface treatment. The actuator manufacturer's technical documentation shall specify the corrosion protection category according to Table 4.

Table 4 — Environmental corrosion categories

Corrosion category	Typical environments	
	Exterior	Interior
C2 (low)	Atmospheres with low level of pollution. Mostly rural areas.	Unheated buildings where condensation may occur, e.g. depots, sport halls.
C3 (medium)	Urban and industrial atmospheres, moderate sulphur dioxide pollution. Coastal areas with low salinity.	Production rooms with high humidity and some air pollution, e.g. food-processing plants, laundries, breweries.
C4 (high)	Industrial areas and coastal areas with moderate salinity.	Chemical plants, swimming pools, coastal shipyards.
C5-I (very high — industrial)	Industrial areas with high humidity and aggressive atmosphere.	Buildings or areas with almost permanent condensation and with high pollution.
C5-M (very high — marine)	Coastal and offshore areas with high salinity.	Buildings or areas with almost permanent condensation and with high pollution.
Immersed in water ^a		
Im 1 (Immersed in fresh water)	River installations, hydro-electric power plants.	
Im 2 (Immersed in sea or brackish water)	Harbour areas and offshore structures.	
NOTE This table is taken, for reference purposes only, from EN ISO 12944-2. The actuator corrosion protection may also be achieved by systems/methods which deviate from those specified in EN ISO 12944-5.		
^a Electric actuators covered by this European Standard are not designed for permanent immersion unless otherwise specified.		

NOTE This table may be used to define the corrosion category in order to help the actuator manufacturers to define the surface treatment for corrosion protection. Test assessment and test procedures are the responsibility of the manufacturer.

4.2.7 Vibrations, shock and seismic conditions

Actuators complying with this European Standard are designed without any specific reference to vibrations, shock and/or seismic conditions. If some of these conditions apply they shall be agreed upon between the manufacturer/supplier and the purchaser.

4.3 Actuator attachment

4.3.1 Part-turn actuators

The attachment for part-turn actuators shall comply with EN ISO 5211.