
Electric actuators for industrial valves — General requirements

*Actionneurs électriques pour robinetterie industrielle — Exigences
générales*



This document is a preview generated by ERS



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Classification — Designation	3
4.1 General	3
4.2 Type	4
4.3 Actuator duty classification	4
4.4 Action on loss of external electric power	4
4.4.1 Stay put action	4
4.4.2 Fail-safe action	4
5 Design requirements	4
5.1 Endurance	4
5.1.1 General	4
5.1.2 Part-turn actuators	5
5.1.3 Multi-turn actuators	5
5.1.4 Linear actuators	5
5.2 Environmental conditions	6
5.2.1 General	6
5.2.2 Ambient temperature and humidity	6
5.2.3 Altitude	6
5.2.4 Enclosure protection	6
5.2.5 External corrosion protection	6
5.2.6 Vibrations, shock and seismic conditions	7
5.3 Actuator attachment	7
5.3.1 Part-turn actuators	7
5.3.2 Multi-turn actuators	7
5.3.3 Linear actuators	7
5.4 Primary closing direction	8
5.5 Fail-safe direction	8
5.6 Electrical connections — Cable entries	8
5.7 Self-locking/braking	8
5.8 Performance	9
5.8.1 Power supply tolerances	9
5.8.2 Actuator duty performances	9
5.8.3 Operating time and speed	10
5.9 Basic design requirements	11
5.9.1 Motors	11
5.9.2 Gearing lubricant	11
5.9.3 Manual operation	11
5.9.4 Travel limitation	11
5.9.5 Torque/thrust limitation	12
5.9.6 Structural integrity	12
5.9.7 End stop adjustment for part-turn and linear actuators	12
5.9.8 Noise	12
6 Optional equipment	12
6.1 General	12
6.2 Anti-condensation heater	12
6.3 Position transmitter	13
6.4 Actuator running transmitter	13
6.5 Additional position and/or torque signalling	13
6.6 Local control station	13

6.7	Local position indication	13
6.8	Actuator electrical controls	13
6.8.1	General	13
6.8.2	Positioner	13
6.8.3	Controller	13
6.8.4	Speed control	13
6.8.5	Field bus system interface	14
6.8.6	Torque transmitter (analogue or digital)	14
6.8.7	Actuator performance data logger	14
7	Type and production test	14
7.1	General	14
7.2	Type tests	14
7.3	Control of production process	15
8	Marking	16
8.1	General	16
8.2	Mandatory marking	16
8.3	Optional marking	16
9	Documentation	17
9.1	General	17
9.2	Mandatory documentation	17
9.3	Optional documentation	17
10	Packaging	17
	Annex A (normative) Endurance test procedure	18
	Annex B (informative) Actuator selection guidelines	19
	Annex C (informative) Load profiles	21
	Bibliography	24

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 153, *Valves*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Electric actuators for industrial valves — General requirements

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 actuators and gearboxes when supplied by the actuator manufacturer are within the scope of this document.

This document does not cover solenoid actuators, electro-hydraulic actuators and electric actuators which are integral to the valves.

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

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.

ISO 5210, *Industrial valves — Multi-turn valve actuator attachments*

ISO 5211, *Industrial valves — Part-turn actuator attachments*

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

electric actuator

electrically powered device attached to the valve by bolting for the purpose of applying *torque* (3.5) and/or thrust to open and close and/or control a valve

3.2

part-turn actuator

actuator which transmits *torque* (3.5) to the valve for less than one revolution, and does not need to be capable of withstanding operational thrust

Note 1 to entry: In this document, a combination of a *multi-turn actuator* (3.3) plus a part-turn *gearbox* (3.15) is considered as a part-turn actuator