

Industrial valves — Actuators

Part 4: Hydraulic part-turn actuators for industrial valves — Basic requirements

ICS 23.060.20

National foreword

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The UK participation in its preparation was entrusted to Technical Committee PSE/18/5, Valve actuators.

A list of organizations represented on this committee can be obtained on request to its secretary.

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 November 2009
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ISBN 978 0 580 54844 4

Amendments/corrigenda issued since publication

Date	Comments

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 15714-4

October 2009

ICS 23.060.20

English Version

**Industrial valves - Actuators - Part 4: Hydraulic part-turn
actuators for industrial valves - Basic requirements**

Robinetterie industrielle - Actionneurs - Partie 4:
Actionneurs hydrauliques à fraction de tour pour
robinetterie industrielle - Prescriptions de base

Industriearmaturen - Antriebe - Teil 4: Hydraulische
Schwenkantriebe für Industriearmaturen -
Grundanforderungen

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

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Ref. No. EN 15714-4:2009: E

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Foreword

This document (EN 15714-4:2009) 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of an identical text or by endorsement, at the latest by April 2010, and conflicting national standards shall be withdrawn at the latest by April 2010.

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1 Scope

This document provides basic requirements for hydraulic part-turn valve actuators, both double acting and single acting, used for on-off and modulating control duties. It includes guidelines, recommendations and methods for enclosure and corrosion protection, control and testing.

It does not apply, to hydraulic actuators that are integral parts of control valves or to electro-hydraulic actuators.

Other requirements or conditions of use different from those indicated in this document should be subject to negotiations 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 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*

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

EN ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests (ISO 9227:2006)*

ISO 4406, *Hydraulic fluid power — Fluids — Method for coding the level of contamination by solid particles*

ISO 5599-2, *Pneumatic fluid power — Five-port directional control valves — Part 2: Mounting interface surfaces with optional electrical connector*

ASME B1.20.1:1983, *Pipe Threads, General Purpose (Inch)*

3 Classification and designation

3.1 General

Hydraulic part-turn actuators are designated by function, action and interface as detailed below.

3.2 Action

- a) Double Acting (DA)
- b) Single Acting (SA) with spring action to move clock-wise (CW) or counter clock-wise (CCW), as per 4.10.4

3.3 Valve actuator attachment

As per EN ISO 5211.

3.4 Motive energy

3.4.1 Operating medium

The operating medium shall be hydraulic fluid.

The fluid may be used, on agreement between the manufacturer/supplier and purchaser, ensuring it is designed for both pressure and compatible with internal actuator parts and lubricants.

The flashpoint shall be of not less than 93 °C for pressures below 1 MPa and 157 °C for pressures above 1 MPa.

The chemical and physical properties of the hydraulic fluid shall be suitable for use with the materials used in the design of the actuator and its accessories.

The hydraulic fluid shall be suitable for operation of the hydraulic system through the entire temperature range to which it may be subjected in service.

3.4.2 Quality

The operating medium shall have a contamination level specified to ISO 4406 class 18/16/13 as a maximum.

3.4.3 Pressure

The manufacturer/supplier shall indicate the actuator's operating pressure limits.

The minimum design pressure for pressure retaining parts shall be 1,1 times the maximum allowable pressure selected from the values defined in 4.3.1. The test pressure condition shall be considered in the design of the actuator for pressure containing parts, see 4.10.5.

Working pressure in accordance to manufacturer/supplier indication (as per 4.3.1).

The test pressure applied to the pressure retaining parts shall be a minimum of 1,43 times the design pressure for steel enclosures and a minimum of twice the maximum working pressure for cast steel and spheroidal cast iron enclosures

Hydrostatic testing shall be carried out at testing pressure.

4 Design requirements

4.1 General

The following data shall be provided by the manufacturer/supplier to enable correct actuator selection and performance evaluation.

4.2 Output torques (performance test)

The guaranteed minimum, output torque capability of the actuator, in both directions, at specified operating pressures shall be provided by the manufacturer/supplier.

Where the output torque varies with the rotation, in a non-linear relationship, tabulated data and/or torque curves shall be provided.

4.3 Pressure ratings and endurance

4.3.1 Pressure ratings

Actuators shall be designed to operate with one of the following maximum allowable pressures.

Table 1 — Maximum allowable pressure

Maximum allowable pressure		
MPa	bar	psi
5,5	55	800
10,3	103	1 500
20,7	207	3 000
34,5	345	5 000

4.3.2 Endurance

The actuator shall be designed to have a minimum endurance, without maintenance, in accordance with values given in Table 2. These are based of at least 60 % of the run torque at a rated working pressure supplied by the operating medium defined in 3.4.1 (Motive Energy) and in accordance with the test procedure detailed in Annex A.