



**SLOVENSKI STANDARD**  
**oSIST prEN 15714-6:2021**

**01-november-2021**

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**Industrijski ventili - Pogoni - 6. del: Hidravlični linearni pogoni za industrijske ventile - Osnovne zahteve**

Industrial valves - Actuators - Part 6: Hydraulic linear actuators for industrial valves - Basic requirements

Industriearmaturen - Stellantriebe - Teil 6: Hydraulische Linearantriebe - Grundlegende Anforderungen

Robinetterie industrielle - Actionneurs - Partie 6: Actionneurs linéaires hydrauliques - Prescriptions de base

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**Ta slovenski standard je istoveten z: prEN 15714-6**

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**ICS:**

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

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 15714-6**

September 2021

ICS 23.060.20

English Version

## Industrial valves - Actuators - Part 6: Hydraulic linear actuators for industrial valves - Basic requirements

Robinetterie industrielle - Actionneurs - Partie 6:  
Actionneurs linéaires hydrauliques - Prescriptions de  
base

Industriearmaturen - Stellantriebe - Teil 6:  
Hydraulische Linearantriebe - Grundlegende  
Anforderungen

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**prEN 15714-6:2021 (E)**

## **European foreword**

This document (prEN 15714-6:2021) has been prepared by Technical Committee CEN/TC 69 “Industrial valves”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

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## 1 Scope

This document provides basic requirements for piston type hydraulic linear actuators for industrial valve, both double acting and single acting, used for on-off and modulating control duties. It includes criteria, method and guidelines for design, qualification, corrosion protection, control and testing.

It does not apply to hydraulic actuators which are integral parts of control valves. Other requirements, or conditions of use, different from those indicated in this document, are expected to be subject to negotiations, 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.

EN ISO 5210:2017, *Industrial valves - Multi-turn valve actuator attachments (ISO 5210:2017)*

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

EN 15714-1, *Industrial valves - Actuators - Part 1: Terminology and definitions*

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

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15714-1 and the following 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 <https://www.electropedia.org/>

### 3.1

#### **stroke**

single and complete movement from one end of travel to the other

### 3.2

#### **end stop**

mechanical part designed to stop the actuator drive train at an end position

Note 1 to entry: End stop can be fixed or adjustable.

### 3.3

#### **output thrust**

minimum guaranteed output thrust capability of the actuator, in both directions, at specified supply pressures conditions as provided by the manufacturer/supplier

Note 1 to entry: Where the output thrust varies with the stroke, in a linear or nonlinear relationship with pressure, tabulated data and/or thrust versus stroke diagram shall be provided at significant pressure values for each direction of movement.

**prEN 15714-6:2021 (E)****3.3.1 Nominal thrust****3.3.1.1****double acting version**

minimum guaranteed output thrust of the actuator, at any point of the stroke, with nominal supply pressure

Note 1 to entry: See 4.2.1.

**3.3.1.2****single acting version**

guaranteed output thrust of the actuator with hydraulic nominal supply at the beginning of the stroke in the direction to compress the spring

Note 1 to entry: See 4.2.2

**3.3.2****start thrust**

actuator output thrust at the beginning of the stroke in the direction of movement

**3.4 Single acting version****3.4.1****Fluid Starting Thrust****AST**

output thrust, at defined pressure value, at the beginning of the stroke in opposition to the spring

**3.4.2****Fluid Ending Thrust****AET**

output thrust, at defined pressure value, at the end of the stroke when spring is at its maximum compression

**3.4.3****Spring Ending Thrust****SET**

output thrust generated by the spring at the end of its stroke with no fluid in the cylinder

**3.4.4****Spring Starting Thrust****SST**

output thrust generated by the spring at its maximum compression with no fluid in the cylinder

**3.4.5****Spring Running Thrust****SRT**

any output thrust value between SST and SET

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## 4 Classification/Designation

### 4.1 Duty classification

#### 4.1.1 General

According to their intended function, two versions of linear valve actuators are defined by this document: on-off duty and modulating duty.

#### 4.1.2 On-off duty

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.

#### 4.1.3 Modulating duty

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

### 4.2 Action

#### 4.2.1 Double Acting (DA)

Actuator which requires the supply of motive energy to operate in both travel directions.

#### 4.2.2 Single Acting (SA)

Actuator which requires external power to operate the valve in one direction only, the return stroke being powered by an alternative form of stored energy (Fail-Safe actuators).

For the purpose of this document, the stored energy shall be supplied by a mechanical spring.

Drive the valve to any position between fully open and fully closed.

## 5 Motive energy

### 5.1 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 pressure and to be compatible with internal actuator parts and with lubricant properties.

The flashpoint shall be of not less than 93 °C for pressures below 10 bar and 157 °C for pressures above 10 bar. 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.

### 5.2 Quality

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

When necessary the actuator shall be properly flushed to guarantee an internal cleanliness consistent with the above specified contamination level.

**prEN 15714-6:2021 (E)****5.3 Pressure****5.3.1 General**

As a general information the manufacturer/supplier shall indicate, for each actuator model, the pressure limits including at least the maximum allowable pressure and working pressure range for a specific application. Other pressure values shall be available on demand.

**5.3.2 Maximum allowable pressure (MAP)**

The pressure not to be exceeded for the supply to the hydraulic actuator. Recommended values for maximum allowable pressure are in Table 1.

**Table 1 — Pressure level**

	<b>MPa</b>	<b>bar</b>	<b>psi</b>
<b>PN 50</b>	5,5	55	800
<b>PN 63</b>	10,3	103	1 500
<b>PN 200</b>	20,7	207	3 000
<b>PN 350</b>	34,5	345	5 000

**5.3.3 Design pressure**

At least 1,1 times the maximum allowable pressure.

**5.3.4 Working pressure**

The pressure applied to the actuator to guarantee the performances on a specific application.

**5.3.5 Structural test pressure**

Structural test under pressure value minimum 1,50 times the design pressure for a minimum holding period 5 min after pressure stabilization.

Structural test under pressure is carried out to validate the capability of the pressure retaining parts of the actuator to withstand the pressure without permanent deformations.

**5.3.6 Minimum moving pressure**

The minimum moving pressure required, at ambient temperature, to complete the specified stroke without external load, starting from not pressurized conditions. This data should be available by the manufacturer upon on request.

## 6 Actuator basic performances

### 6.1 Double acting version

Table 2 — Double acting selection chart

Actuator designation <sup>b</sup>	Standard cylinder diameter (mm)	Maximum thrust <sup>a</sup> (KN) for specified maximum allowable pressure (bar)			
		55	103	207	345
L25D	25	2,6	4,9	9,8	16,3
L30D	30	3,7	7,0	14,0	23,4
L40D	40	6,6	12,4	25,0	41,6
L50D	50	10,4	19,4	39,0	65,0
L60D	60	14,9	28,0	56,2	93,6
L70D	70	20,3	38,1	76,5	127,5
L80D	80	26,5	49,7	99,9	166,5
L90D	90	33,6	62,9	126,4	210,7
L100D	100	41,5	77,7	156,1	260,1
L125D	125	64,8	121,3	243,9	406,4
L150D	150	106,2	174,7	351,2	585,3
L200D	200	165,9	310,6	624,3	—
L250D	250	259,2	485,4	—	—
L300D	300	373,2	698,9	—	—
L350D	350	508,0	—	—	—
L400D	400	663,5	—	—	—

<sup>a</sup> Maximum thrust is referred to the net piston size without the effect of stem reduction.

<sup>b</sup> Preferred size of designation (e.g. **L25 D** stands for the L = linear, 25 = Cylinder diameter, D = double acting).

NOTE For further sizing information please see Annex B.

## 6.2 Single acting version

Table 3 — Double acting selection chart

Actuator designation <sup>b</sup>	Standard cylinder diameter (mm)	Basic performances <sup>a</sup>
L25S	25	—
L30S	30	
L40S	40	
L50S	50	
L60S	60	
L70S	70	
L80S	80	
L90S	90	
L100S	100	
L125S	125	
L150S	150	
L200S	200	
L250S	250	
L300S	300	
L350S	350	
L400S	400	
<sup>a</sup> For information regarding basic performances refer to Annex C. <sup>b</sup> Preferred size of designation (e.g. L25D stands for the L = linear, 25 = Cylinder diameter, D = double acting).		

## 6.3 Displacement volume

Internal actuator displaced volumes for each direction, including the dead volumes, for the maximum stroke without any external limitation.

Displacement volume should be expressed in litres.

## 6.4 Operating time

The actuator manufacturer/supplier shall state the minimum operating time in both directions, without external load, at nominal pressure and without any significant external restriction on supply flow rate.

## 7 Basic design requirements

### 7.1 Safety requirements

Actuators shall be designed taking into account the technical principles and specifications for safety. For maintenance purposes the design of the single acting (SA) actuators shall permit the safe disassembly/reassembly of the whole unit including the spring unit or spring cartridge complying with the manufacturer/supplier's instructions.