

Designation: TA.W.29.06.15

TECHNICAL AND DELIEVRY CONDITIONS

Valve actuators for DN 300 – DN 1400 high-pressure gas pipelines

	Name	Signature	Date
Author			
Technician	Bc. DUŠAN FABIANKOVIČ		
Principal author			
Pipeline Technology Manager	Ing. JAROSLAV ZLATÝ		
Supervisor			
Head of Pipeline Systems	Ing. LÍVIUS LISÝ		
Approved by			
Asset Management Director	Ing. TOMÁŠ MATULA		

Effective from:	
The document cancels:	TA.W.29.05.15 Actuators for ball valves for DN 300 – DN 1400 high-pressure gas pipelines

CONTENTS

1. PURPOSE	3
2. SCOPE OF APPLICABILITY	3
3. TERMS AND ABBREVIATIONS.....	3
4. DESCRIPTION.....	3
4.1 DEFINITION OF THE BASIC OPERATING CONDITIONS OF ACTUATORS.....	3
4.1.1 Operating temperatures	3
4.1.2 Transported medium	3
4.1.3 Pressures.....	4
4.1.4 Environment.....	4
4.1.5 Safety factors	4
4.2 TECHNICAL DESIGN OF ACTUATORS.....	4
4.2.1 Electro-hydraulic actuators	5
4.2.2 Electric actuators.....	6
4.3 ACCEPTANCE OF THE ACTUATOR AT THE MANUFACTURING PLANT BY THE CUSTOMER OR THE CUSTOMER'S AUTHORIZED REPRESENTATIVE.....	7
4.3.1 Rules for the participation of the customer's authorized representatives	7
4.3.2 Function tests of actuators	7
4.3.3 Dimension check.....	7
4.3.4 Visual check.....	8
4.3.5 Documentation check.....	8
4.4 ACTUATOR LABELING	8
4.5 PACKAGING.....	9
5. RELATED EXTERNAL REGULATIONS.....	9
6. DISTRIBUTION LIST	9
7. ANNEXES.....	9

1. PURPOSE

The purpose of the working document is to define the basic technical and delivery conditions for suppliers of actuators for BV/CV DN 300 to DN 1400 for eustream, a.s.

When supplying actuators for BV/CV DN 300 to DN 1400, we prefer actuators from manufacturers who have previously supplied our pipeline systems.

In the case of using actuator types from manufacturers other than those whose actuators we already use, it is necessary to ensure the following before the delivery of the actuators:

- training of eustream, a.s. employees in the operation and maintenance of the actuators, confirmed by eustream, a.s. in writing.

2. SCOPE OF APPLICABILITY

These technical and delivery conditions apply to all suppliers of actuators for eustream, a.s. and pertain to actuators for ball valves and cone valves from DN 300 to DN 1400 (12" to 56") inclusive and pressure levels PN 63 to PN 100 (ANSI Class 400 to 600) for high-pressure gas pipelines.

3. TERMS AND ABBREVIATIONS

Abbreviation	Abbreviation description
DN	Nominal diameter
EHO	Electro-hydraulic control
EO	Electric control
ESD	System for safe shutdown of the technological unit
FC	Fail close
FL	Fail lock
FO	Fail open
BV/CV	Ball valve, cone valve
PN	Nominal pressure
NG	Natural gas

4. DESCRIPTION

4.1 DEFINITION OF THE BASIC OPERATING CONDITIONS OF ACTUATORS

4.1.1 Operating temperatures

- transported gas temperature: maximum +59°C, higher for special requirements
- ambient temperature: from -29° C to +59° C

4.1.2 Transported medium

The transported medium is natural gas (including liquefied natural gas, biomethane, gas produced from biomass, as well as other types of gas, provided these gases meet the conditions for gas transport in accordance with the Technical Conditions and relevant interconnection agreements).

The solid particle content is up to 100 g/m³, with particle sizes up to 5 mm in the volume sample of natural gas.

Additives:

- | | | |
|-----------------------------|-----------|-------------------|
| a) hydrogen sulfide content | ≤ 5 | mg/m ³ |
| b) total sulfur content | ≤ 50 | mg/m ³ |
| c) total methyl mercaptan | ≤ 10 | mg/m ³ |
| d) nitrogen content | ≤ 5 | mol % |
| e) hydrogen content | ≤ 10 | mol % |

4.1.3 Pressures

The Maximum Operating Pressure (MOP) or Nominal Pressure (PN) is specified in the order.

4.1.4 Environment

4.1.4.1 The actuator will operate in the environment - ATEX Zone 2 according to STN EN IEC 60079-10-1.

4.1.4.2 The actuator must be fully reliable and safe even during vibration of the pipeline system which it will be a part of. The effective vibration velocity measured in the frequency range of 6 - 50 Hz is a maximum of 4 mm/s.

4.1.5 Safety factors

- line section $s = 2.00$ ($f_0 = 1/s$)
- compressor stations: $s = 2.15$ ($f_0 = 1/s$)

4.2 TECHNICAL DESIGN OF ACTUATORS

The actuator manufacturer must have a quality management system in accordance with EN ISO 9001.

The actuator manufacturer must hold a certification for actuators in the EU before the call for tenders initiation date in accordance with the "Regulation of the Government of the Slovak Republic on equipment and protective systems intended for use in explosive atmospheres 149/2016 Coll." or the "Directive 2014/34/EU of the European Parliament and of the Council on the harmonization of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres", regarding the suitability of the equipment for use in the defined environment Zone II, and "Act 56/2018 Coll. on the conformity assessment of products, making designated products available on the market, and amending and supplementing certain laws".

The warranty provided by the manufacturer must be at least 3 years.

The technical design of the actuator is specified in the order.

Two types of actuator design are used:

- electro-hydraulic control (EHO);
- electric control (EO).

4.2.1 Electro-hydraulic actuators

4.2.1.1 Basic data

Adjustment time range (s):

- DN 300 – min. 10s. - max. 20 s;
- DN 500 – min. 20s. - max. 60 s;
- DN 700 , DN 900 , DN 1000 – min. 20 s. - max. 90 s;
- DN 1200 , DN 1400 – min. 30s. - max.120 s.

4.2.1.2 Structural design

- according to ISO 12490 (API 6DX);
- actuator mounted directly on the body of the BV/CV
- control elements integrated into the enclosure;
- selection of local/remote control mode with a separate switch;
- ability to operate the BV/CV in the event of a power loss – minimum of three emergency adjustments of BV/CV;
- ability to adjust the BV/CV using a manual pump;
- with remote indication of the BV/CV position - end positions and intermediate position of the valve;
- with visual mechanical indication of the BV/CV position on the control shaft axis;
- maintenance-free (maximum oil quality check once per year);
- simple technical solution for setting the end positions of the BV/CV;
- motor voltage 3 x 400 V AC;
- general diagram of the hydraulic and electrical system connections;
- torque, electrical and thermal motor protection built directly into the actuator in accordance with STN EN 60 204-1;
- use of biodegradable oil;
- drive constructed as a modular system;
- the design of the actuator must comply with the requirements of European Parliament Directive 2014/34/EU and Directive 2006/42/EC

4.2.1.3 Connection shapes

Select connection types and dimensions according to the connection shape of the BV/CV.

4.2.1.4 Control voltage

DC - direct current, depending on the request: 220 V DC or 24 V DC, constant 24 V DC voltage for the ESD system (if required); in the event of a power loss, the valve will move to the defined safety position: FC, FO, FL.

4.2.1.5 Local control

In all versions, an option to select local and remote control with a separate switch.

4.2.1.6 Remote control and remote sensing of BV/CV statuses

- command to open and close the BV/CV (control voltage 24V);
- position indication for open and closed (limit switches);
- mode indication (local/remote);

- BV/CV fault status indication (LBS, HP, LP);
- measurement of other data (oil pressure, oil temperature, etc.) according to customer requirements.

4.2.1.7 Corrosion protection

Coating (RAL shade according to customer requirements).

4.2.1.8 Special arrangements

- after installing the actuator, the supplier's technician is required to commission the actuator and conduct operator training at the delivery site.

4.2.2 Electric actuators

4.2.2.1 Basic data

Closing time (s):

- DN 300 - max. 20 s;
- DN 500 – max. 60 s;
- DN 700 , DN 900 , DN 1000 – max. 90 s;
- DN 1200 , DN 1400 – max. 120 s.

4.2.2.2 Structural design

- according to ISO 12490 (API 6DX);
- actuator mounted on the body of the BV/CV;
- according to customer specifications with remote control;
- selection of local/remote control mode;
- with remote indication of the BV/CV position - end positions and intermediate position of the valve;
- with visual mechanical indication of the BV/CV position on the control shaft axis;
- simple technical solution for setting the end positions of the BV/CV;
- motor voltage 3 x 400 V AC;
- in the event of a power loss, the possibility of adjusting the BV/CV manually using a mechanical gear – handwheel;
- general wiring diagram;
- torque sensors and end position sensors;
- an option to display the immediate position of the BV/CV locally, with the possibility of remote position transmission (as required);
- torque, electrical and thermal motor protection built directly into the actuator in accordance with STN EN 60 204-1;
- the design of the actuator must comply with the requirements of European Parliament Directive 2014/34/EU and Directive 2006/42/EC.

4.2.2.3 Connection shapes

Select connection types and dimensions according to the connection shape of the BV/CV.

4.2.2.4 Local control

In all versions, an option to select local and remote control with a separate switch.

4.2.2.5 Remote control and remote sensing of BV/CV statuses

- command to open and close the BV/CV (control voltage 24V);
- position indication for open and closed (limit switches);
- mode indication (local/remote);
- BV/CV fault status indication.

4.2.2.6 Corrosion protection

Coating (RAL shade according to customer requirements).

4.2.2.7 Special arrangements

- after installing the actuator at the delivery site, the supplier's technician is required to commission the actuator.

4.3 ACCEPTANCE OF THE ACTUATOR AT THE MANUFACTURING PLANT BY THE CUSTOMER OR THE CUSTOMER'S AUTHORIZED REPRESENTATIVE

The customer reserves the right to participate in the final inspection of the actuator.

As part of the acceptance procedure, the actuator undergoes inspection according to the order, verification of documentation completeness, and subsequent final testing.

4.3.1 Rules for the participation of the customer's authorized representatives

The following rules apply to the participation of the customer's authorized representatives:

- the manufacturer shall notify the customer of the final test date at least 14 days in advance;
- if, despite timely notification, no authorized representative of the customer attends the final tests, the manufacturer is entitled to dispatch the actuator without acceptance by the customer;
- the presence of the customer's representative during the tests does not affect the manufacturer's responsibility and warranties;
- the manufacturer shall prepare the actuator for testing in the same condition in which it will be dispatched;
- if the actuator fails the tests, the manufacturer is obliged to inform the customer with technical explanation of the defects. after the explanation and the rectification of defects, the manufacturer may prepare the actuator for re-inspection;
- one actuator may undergo final testing a maximum of 2 times. If the actuator fails the final test the first time and also the repeated test, the customer will not accept it, and the manufacturer must replace it with another actuator.

4.3.2 Function tests of actuators

Verification of their functions according to the types of actuators, however, the following as a minimum:

- manual rotation of the actuator position, reverse movement, smoothness of movement during valve adjustment;
- verification of the setting on the LBC system, with a standard pressure drop rate of 5 bar/min, adjustable within a range from 1 to 10 bar/min.

4.3.3 Dimension check

The following dimensions are checked:

- length;

- height;
- actuator connection dimensions.

4.3.4 Visual check

- Inspection of actuator labeling.

4.3.5 Documentation check

The actuator delivery must include documentation that contains at least the following:

- material certificates for pressure parts of the components used;
- actuator drawing with main dimensions and their tolerances approved by the customer;
- electrical wiring diagram, hydraulic diagram (EH actuator);
- data on the actuator's weight, minimum and maximum torque, connection dimensions, and operating time of the actuator at the specified torque;
- a list of parts used, with accompanying certificates for electrical equipment suitable for potentially explosive atmospheres in accordance with ATEX Directive 2014/34/EU;
- inspection certificate 3.2 according to STN EN 10204;
- protocol of successful completion of the final testing procedure, signed by the customer's representatives;
- certificate of suitability for use of the equipment in the defined Zone 2 environment in accordance with the "Regulation of the Government of the Slovak Republic on equipment and protective systems intended for use in explosive atmospheres 149/2016 Coll." or the "Directive 2014/34/EU of the European Parliament and of the Council on the harmonization of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres", regarding the suitability of the equipment for use in the defined Zone II environment, and "Act 56/2018 Coll. on the conformity assessment of products, making designated products available on the market, and amending and supplementing certain laws".
- declaration of incorporation of partially completed machinery in accordance with Directive 2006/42/EC;
- PED certificate 'Pressure Equipment Directive' 2014/68/EU if the actuator contains pressure parts, in accordance with Directive 2014/68/EU of the European Parliament and of the Council on the harmonization of the laws of the Member States concerning the making available of pressure equipment on the market;
- general maintenance and operation manual for the actuator (in the Slovak language) – must also include instructions for safe securing of the actuator in the closed position (safe securing refers to a sequence of actions and procedures that must be performed on the actuator to prevent unintended valve opening or opening due to unauthorized manipulation, disabling control, depressurizing control, disconnecting from electrical power, and making control impossible, even manually, for example, with a hand pump, etc.).

4.4 ACTUATOR LABELING

The actuator must be equipped with a label that includes at least the following information:

- a) manufacturer's trademark;
- b) actuator type;
- c) coil control voltage;
- d) actuator serial number; year of manufacture;
- e) maximum torque of the actuator;

- f) weight.
- g) the labeling of explosion-protected actuators on the identification plate must include the equipment group and category, explosion category and group, and temperature class, as well as the CE-Ex symbol, demonstrating compliance of the equipment with the European Directive 94/9/EC ATEX, Equipment group II, intended for gas Zone 2, protection level IIC according to European Parliament Directive 2014/34/EU and STN EN 60079

4.5 PACKAGING

The actuator must be packed in a non-returnable factory package to prevent damage or loss of functionality during transport. The cost of packaging is included in the price of the actuator.

The connection ends must be wrapped and sealed to prevent dirt from entering the actuator.

5. RELATED EXTERNAL REGULATIONS

STN EN 1594	Gas infrastructure. Pipelines for maximum operating pressure over 16 bar. Operational requirements.
STN EN IEC 60079-10-1: 2022	Explosive atmospheres. Part 10-1: Classification of areas. Explosive gas atmospheres.
STN EN ISO 3183	Petroleum and natural gas industries. Steel pipe for pipeline transportation systems (ISO 3183: 2019)
STN EN 10204-2005	Metallic products. Types of inspection documents.
STN EN ISO 9712-2022	Non-destructive testing. Qualification and certification of NDT personnel (ISO 9712: 2019)

Directive 2014/34/EU of the European Parliament and of the Council on the harmonization of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres (recast)

6. DISTRIBUTION LIST

Special: TA,
TT,
TU,
TKO.

7. ANNEXES

Without annexes.