SLOVAK GAS TSO

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TECHNICAL – DELIVERY CONDITIONS

The Actuators for Ball Valve for high pressure gas pipelines DN 300 - DN 1400

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CONTENTS

1. PURPOSE

The purpose of the working document is to define basic technical-delivery conditions for suppliers of actuators for ball valves to eustream a.s.

2. AREA OF APPLICATION

These technical-delivery conditions apply to all suppliers of actuators to eustream a.s. and applies to actuators for ball valves.

The technical-delivery conditions for delivery of actuators for ball valves determined for gas pipelines and transportation of natural gas follow the standards STN EN 1594 with the following deviations and complements.

3. TERMS AND ABBREVIATIONS

Abbreviation	Description of abbreviation
DN	Nominal diameter
HPO	Hydro-pneumatic actuators
EHO	Electro-hydraulic actuators
EO	Electric actuators
BV	Ball valve
PN	Design pressure
NG	Natural gas

4. DESCRIPTION

4.1 DEFINING OF BASIC OPERATING CONDITIONS FOR ACTUATORS FOR BALL VALVES

4.1.1 Operating temperatures

- temperature of transported gas: maximum + 59^{o} C, under special requirements higher
- temperature of ambient environment: from -29 ^{O}C to +59 ^{O}C

4.1.2 Transported medium

Transported medium is natural gas with content of mechanical minor constituents max. 100g/m^3, with max. size of particles up to 5 mm in voluminous sample of NG.

Minor constituents:

a) content of carbon disulphide ≤ 5 mg/m^3

b) content of total sulphur ≤ 100 mg/m^3

c) total mercaptan ≤ 15 mg/m^3

d) content of nitrogen dioxide ≤ 2 %

4.1.3 Pressures

Maximum operating pressure and design pressure (PN) are determined in the order.

4.1.4 Environment

The actuator will work in environment - Zone 1 according to STN EN 60079-10 (actuator to explosion environment – explosive gases).

The actuator must be fully reliable and safe also during vibrations of pipeline system the part of which it ill be. Effective value of speed of vibrations measured in frequency range 6 - 50 Hz is maximum 4 mm/s.

4.2 TECHNICAL CONSTRUCTION

The actuators manufacturer must have quality management system according to EN ISO 9001.

Prior beginning the proces of calling for tender the actuator has to be certified in the European Union

Technical construction of actuator is determined in the order.

3 types of actuator construction are used:

- hydro-pneumatic actuators (HPO);
- electro-hydraulic actuators (EHO);
- electric actuators (EO).

4.2.1 Hydro-pneumatic Actuators

4.2.1.1 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;

4.2.1.2 Design

- According to API SPEC 6D;
- Actuator fixed on the body of Ball Valve
- According to the customer's specification with remote control;
- With remote alert of the BV position, especially of the end position of the valve and line break ;
- With the mechanical alert of the BV position on the axis of the control pin;
- with the possibility to reset the ball by help of the manual pump
- According to the requirement „high pilot, low pilot (value will be specified by the buyer)
- According to the requirement "line break" (value will be specified by the buyer)
- According to the requirement the reserve pressure tank (s) – reserve for three emergency re-settings of the ball

- Without a need of maintenance (at maximum oil quality check, 1 x annually)
- Simple technical solution for setting the end positions by the position of the ball
- Separate hydraulic circuit from the pneumatic circuit – separate hydro-cylinder and air cylinder with the exclusion of the possibility to mix both media
- well-arranged connection scheme;
- Use of biologically removable oil
- Device allowing the control of the torque of BV;
- actuator designed as modular system with the possibility of additional equipment for driving-in and driving-out the seats;
- the usual value of the operating pressure necessary for functioning of the actuator is approx. 30 to 35 bar
- construction solution must be approved by BV manufacturer and must have certificate about actuator certification in EU.
- pressure vessels that are part of the actuator must be designed, built, tested and certified in accordance with PED 97/23 / EC. The documentation must be included.

4.2.1.3 Connection size

The connection size shall be chosen according to the ball valve type. In case of hydro-pneumatic control, the off take of gas will be from the body of BV, tubing is part of the delivery

4.2.1.4 Control voltage

According to the requirement: 220 V dc, or 24 V dc

4.2.1.5 Local control

In all constructions have possibility of local control by mechanical impulse.

4.2.1.6 Drive medium - natural gas

- Operating pressure max. 7,35 MPa;
- Operating temperature from 10° C to 70° C;
- The content of mechanical impurities max. 100g/m3 with the maximum size of particles up to 5 mm in the volume sample of natural gas.

4.2.1.7 Anti-corrosion protection

Actuators will have protected surface against corrosion by protective paint with guaranteed service life at least 15 years.

Selection of the of the kind of the paint must be agreed by the buyer on the basis of the offer from the producer. Colour shade of the of the covering paint of the ball valve will be specified by the buyer.

4.2.1.8 Documentation

A part of delivery must be an accompanying documentation containing:

- Certificate on quality and completeness of the product;
- Material certificates of components used, mainly of the pressure materials;
- Certificate on suitability of the equipment to be used in the defined environment, for operation with the defined medium

- Hydraulic connection scheme
- Dimensioned sketch
- Electric scheme
- indication of: weight of the actuator, minimum and maximum torque, connection size, period of the actuator operation at the prescribed torque, the volume of oil tank, stroke of the hydraulic cylinder,
- minimum and maximum oil pressure in the system
- list of used parts
- recommended spare parts for 4 years of operation
- the manual for operation and maintenance of the actuator (in Slovak language).

4.2.1.9 Separate covenants

- presence of the technicians of the BV and actuator supplier when commissioning
- presence of the customer´s technicians when acceptance testing of the BV and actuators

4.2.2 Electro-hydraulic 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 Design

- According to API SPEC 6D;
- Actuator fixed direct on the body of BV;
- According to the customer's specification with remote control;
- possibility to select control local/remote;
- possibility to control BV in loss of feeding – three emergency re-settings of ball and possibility to re-set ball by manual pump;
- With remote alert of the BV position, especially of the end position of the valve
- with visual mechanical alert of the BV position on the axis of the control pin;
- Without a need of maintenance (at maximum oil quality check, 1 x annually)
- Simple technical solution for setting the end positions by the position of the ball
- motor-driven voltage 3 x 380 V alternating;
- well-arranged connection scheme of hydraulic and electric system;
- moment, electrical and thermal protections of motor built-in directly in actuator;
- Use of biologically removable oil
- actuator designed as modular system with the possibility of additional equipment;

- device allowing control of BV torque;
- construction solution must be approved by BV manufacturer and must have certificate about actuator certification in EU.
- pressure vessels that are part of the actuator must be designed, built, tested and certified in accordance with PED 97/23 / EC. The documentation must be included.

4.2.2.3 Connection size

Connecting sizes according to BV.

4.2.2.4 Control voltage

According to the requirement: 220 V dc, or 24 V dc

4.2.2.5 Local control

In all constructions have possibility of local control by mechanical impulse.

4.2.2.6 Anti-corrosion protection

The color of the paint according to the requirements of the customer.

4.2.2.7 Documentation

A part of delivery must be an accompanying documentation containing:

- Certificate on quality and completeness of the product;
- Material certificates of components used, mainly of the pressure materials;
- Certificate on suitability of the equipment to be used in the defined environment, for operation with the defined medium
- Hydraulic and electric connection scheme
- Dimensioned sketch
- Electric scheme
- indication of: weight of the actuator, minimum and maximum torque, connection size, period of the actuator operation at the prescribed torque, the volume of oil tank, stroke of the hydraulic cylinder,
- minimum and maximum oil pressure in the system
- list of used parts
- recommended spare parts for 4 years of operation
- the manual for operation and maintenance of the actuator (in Slovak language).

4.2.2.8 Separate covenants

- presence of the technicians of the BV and actuator supplier when commissioning
- presence of the customer's technicians when acceptance testing of the BV and actuators

4.2.3 Electric Actuators

4.2.3.1 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.

4.2.3.2 Design

- According to API SPEC 6D;
- Actuator fixed direct on the body of BV;
- According to the customer's specification with remote control;
- selection of control mode locally/remote;
- With remote alert of the BV position, especially of the end position of the valve
- with visual mechanical alert of the BV position on the axis of the control pin;
- Simple technical solution for setting the end positions by the position of the ball
- motor-driven voltage 3 x 380V alternating;
- in case of loss of feeding, possibility to re-set the ball manually by mechanical gear;
- well-arranged connection scheme;
- moment sensors and end sensors of position;
- possibility of display of instant ball position locally, possibly to have availability of remote transmission of position (according to requirements);
- moment, electrical and thermal protections of motor built-in directly in actuator.
- construction solution must be approved by BV manufacturer and must have certificate about actuator certification in the European Union.

4.2.3.3 Connection size

Connecting sizes select according to BV.

4.2.3.4 Local control

In all constructions have possibility of local control by mechanical impulse – pusher and manually.

4.2.3.5 Anti-corrosion protection

The color of the paint according to the requirements of the customer.

4.2.3.6 Documentation

A part of delivery must be an accompanying documentation containing:

- Certificate on quality and completeness of the product;
- Material certificates of components used, mainly of the pressure materials;
- Certificate on suitability of the equipment to be used in the defined environment, for operation with the defined medium;

- Electric connection scheme
- Dimensioned sketch
- Electric scheme
- indication of: weight of the actuator, minimum and maximum torque, connection size, period of the actuator operation at the prescribed torque;
- list of used parts
- recommended spare parts for 4 years of operation
- the manual for operation and maintenance of the actuator (in Slovak language).

4.2.3.7 Separate covenants

- presence of the technicians of the BV and actuator supplier when commissioning
- presence of the customer's technicians when acceptance testing of the BV and actuators

5. RELATED EXTERNAL REGULATIONS

STN EN 1594 Gas supply systems. Gas pipeline for maximum operating pressure above 16 bar. Operation requirements.

6. DISTRIBUTION LIST

Special: TA,
TT
TU,
TKO,

7. LIST OF ANNEXES

No annexes