



**HELLENIC GAS  
TRANSMISSION  
SYSTEM OPERATOR**

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**TECHNICAL JOB  
SPECIFICATION**

**624/1**

**REVISION 0**

**DATE 05-04-2011**

# **HIGH PRESSURE (HP) TRANSMISSION SYSTEMS**

## **GAS REGULATOR VALVES**

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**QUALITY ASSURANCE PAGE**

CHANGES LOG

REVISIONS LOG

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| 0       | 05-04-2011 | FIRST ISSUE       | PQ DPT. | VG          |
| Rev. No | Rev. Date  | REASON FOR CHANGE | Made By | Approved By |



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REFERENCE DOCUMENTS

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### 1.0 SCOPE

#### 1.1 ITEM

Regulator valves (Pressure Control Valves).

#### 1.2 SERVICE

Non corrosive gas.

#### 1.3 APPLICATION

Maintain an outlet pressure set point, along with flow override function (Flow control overrides pressure control). Alternatively, maintain an outlet flow rate set point, along with pressure override function (Pressure control overrides flow control).

### 2.0 GENERAL REQUIREMENTS

#### 2.1 LEGISLATION AND STANDARDS

- ELOT EN 334
- EU DIRECTIVE 97/23/EC PED
- EU DIRECTIVE 94/9/EC ATEX

#### 2.2 UNITS

Metric.

#### 2.3 PATTERN

Manufacturer's standard.

Valve body shall be provided with an indication of the flow direction.

#### 2.4 CONSTRUCTION

##### 2.4.1 GENERAL

The regulator valve consists of the regulator body, actuator, casing of actuator, control member, set point controller and the pilot assembly (only in pilot controlled regulators). Indirect acting, pilot controlled gas pressure regulators shall preferably be used, according to **ELOT EN 334**.

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The regulator valve shall be gas operated. It shall be self-actuated according to a set point value using the pipeline gas as a source of control energy unassisted by any external power source.

Gas used in normal operation shall be returned to the piping downstream of the regulator. The gas shall pass a filter before entering the pilot assembly. At the regulator's pilot impulse lines, a suitable preheating device must be installed so that ice formation (due to Joule-Thomson effect) in these lines is avoided and the regulators could be operating at its design temperature range.

In case of breakdown of a diaphragm etc. the design shall ensure that gas does not enter the room in which the regulator is installed.

### **2.4.2 MAIN CONTROL VALVE DESIGN**

Internal valve assemblies shall be exchangeable to allow uprating / downrating of the flow range.

The regulator shall be equipped with a position transmitter / local travel indicator.

### **2.4.3 SILENCER**

The regulator valve shall be designed to minimize the sound pressure level emitted, e.g. by using an integral silencer or otherwise to a maximum of 85 dBA.

Depending on the area type a lower noise figure may be required.

### **2.4.4 FLANGES**

Flanges shall conform to the relevant piping specifications (**Job Specification No 500/5**).

### **2.4.5 SEAT SEALING**

Soft seats.

### **2.4.4 ACTUATOR/PILOT ASSEMBLY/EXTERNAL CONNECTIONS**

Shall be designed for at least the same pressure rating as the valve body.

### **2.4.7 SETPOINT CONTROLLER WITH AUXILIARY DEVICES**

The controller and the main control valve may be of two separate units.

The controller shall facilitate the adjustment of the set point of the controlled variable, i.e. the outlet pressure. A diaphragm may be used as a detective element for the controlled variable.

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It shall be possible to adjust the set point during operation.

The regulator shall be equipped with a facility for remote adjustment of the pressure set point and the flow set point.

### **2.4.8 AUXILIARY PIPING AND CONNECTIONS**

Auxiliary piping and fittings shall be made of stainless steel. Fittings shall conform to **DIN 2353** and **ELOT EN ISO 8434**.

If the specified fittings are not supplied, then adaptor fittings shall be delivered.

### **2.4.9 PRESSURE GAUGES**

Locally mounted, pressure gauges for inlet, loading and downstream pressures shall be in accordance with **Job Specification No. 610/1**.

### **2.4.10 ELECTRICAL PARTS**

All electrical devices [position transmitter, electro-pneumatic pilot, (if used)], shall be suitable for use in a hazardous area and in accordance with its classification study. The applicable norm shall be the EU Directive **94/9/EC ATEX**. Connections and enclosures shall have a minimum protection class of IP 65 (**ELOT EN 60529**), as far as outdoor installations are concerned. For indoor installations, IP 54 protection class can be accepted.

## **2.5 MATERIALS**

### **2.5.1 GENERAL**

Only materials conforming to recognised material standards shall be used. Attention is drawn to **Job Specification No. 970/2** for shop inspection of Equipment and Material for the Project, where the material certification requirements are specified.

### **2.5.2 VALVE ACTUATOR AND SILENCER BODY**

Normalized carbon steel, e.g.:

- Castings to grade GP240GH according to **ELOT EN 10222** or equivalent.
- Forging to grade P280GH according to **ELOT EN 10213** or equivalent.

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### 2.5.3 CONTROLLER AND AUXILIARY DEVICES

Steel or Stainless Steel.

### 2.5.4 SOFT SEATS, SEALS, DIAPHRAGMS

Suitable elastomers.

### 2.5.5 SURFACE TREATMENT

Refer to Job Specification No. 830/1.

## 2.6 NON DESTRUCTIVE EXAMINATION

### 2.6.1 BODY AND COVER

All exterior and accessible interior surfaces of bodies and covers shall be magnetic particle examined according to ELOT EN 1290.

### 2.6.2 WELDS (IF ANY)

All joints shall be radiographed and found acceptable in accordance with ELOT EN 1435. However, where radiography is unfit for detection of defects, joints shall be ultrasonically examined according to ELOT EN 583-1.

Where both radiography and ultrasonic examinations are unfit for detection then magnetic particle examination may be used.

## 2.7 TYPE TEST

The type test according to ELOT EN 334 clause 7.3.

## 2.8 FACTORY TEST

Each regulator valve shall pass a series of factory tests conforming to ELOT EN 334.

### 2.8.1 STRENGTH TEST

As per ELOT EN 334.



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### 2.8.2 EXTERNAL TIGHTNESS TEST

As per ELOT EN 334.

### 2.8.3 INTERNAL SEALING AND SET POINT TESTS

Check of internal sealing, setting and lock-up pressures in accordance with ELOT EN 334.

### 2.8.4 FUNCTIONAL TEST

The characteristic line for outlet pressure and valve stroke shall be determined by recording outlet pressure as a function of valve stroke for opening and closing movements, respectively.

Graphic representation of the outlet pressure as a function of the volumetric flow rate (performance curve) will also be considered, including a family of performance curves, depicting the effect of the variation of the inlet pressure to the performance curve.

The functional test method and the evaluation criteria shall be those described in ELOT EN 334.

### 2.9 MARKING

Each item shall be fitted with a stainless steel marker plate, indicating all relevant technical data, as per ELOT EN 334 section 9. The item shall additionally be marked with the contract and item tag numbers.

### 2.10 DELIVERY

The regulator valves shall be delivered completely assembled. All outlets shall be capped and protected against corrosion.

### 2.11 INSPECTION AND CERTIFICATION

Inspection will be performed by an Accredited Inspection Body appointed by Owner. Inspection requirements are defined in the following documents:

- a. Material Requisition.
- b. Job Specification No. 970/2.
- c. Relevant project specifications.
- d. Inspection clauses of applicable codes.

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### 2.12 COMPLIANCE WITH THE EU DIRECTIVES

All parts that comply with the "New Approach" directives shall be provided with:

- a. A physical CE marking and other information as required by the relevant EU directives.
- b. A declaration of conformity, which lists all the directives with which the product complies.
- c. Any other information specified by the directive, e.g. user instructions.