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National Iranian Gas Co.

مدیریت پژوهش و فناوری

Research and Technology Management

امور تدوین استانداردها

Standardization Division

IGS

Iranian Gas Standards

Specification for :

مشخصات فنی :

Domestic 2-PSI Regulators

رگولاتور گاز-خانگی مناسب برای فشاردوپوند

APPROVED

FOREWORD

This standard is intended to be mainly used by **NIGC** and contractors and has been prepared on interpretation of recognized standards , technical documents , knowledge ,backgrounds and experiences in gas industries at national and international levels.

Iranian Gas Standards (**IGS**) are prepared , reviewed and ammended by technical standard committees within NIGC Standardization Div. and submitted to the **NIGC's "STANDARDS COUNCIL"** for approval .

IGS Standards are subject to revision , amendment or withdrawal , if required , thus the latest edition of **IGS** shall be checked/inquired by **NIGC** users .

This standard must not be modified or altered by the end users within **NIGC** and her contractors. Any deviation from normative references and/or well known manufacturers specifications must be reported to Standardization div.

Any comments from concerned parties on **NIGC** distributed **IGS** are welcome to technical standards committees and will receive serious attention and consideration should a revision to standards is recommended .

GENERAL DEFINITIONS :

Throughout this standard the following definitions , where applicable , should be followed :

1- "**STANDARDIZATION DIV.**" has been organized to deal with all aspects of industrial standards in NIGC . Therefore , all queries for clarification or amendments are requested to be directed to the mentioned div.

2- "**COMPANY**" : refers to national iranian gas company .

3- "**SUPLIER**" : refers to a firm who will supply the service , equipment or material to igs specification whether as the prime producer or manufacturer or a trading firm .

4- "**SHALL**" : is used where a provision is mandatory.

5- "**SHOULD**" : is used where a provision is advised only.

6- "**MAY**" : is used where a provision is completely discretionary.

Website : <http://igs.nigc.ir>

E-mail : nigcigs@nigc.org

پیشگفتار

- ۱- این استاندارد/دستورالعمل بمنظور استفاده اختصاصی در شرکت ملی گاز ایران و شرکتهای فرعی وابسته تهیه شده است.
- ۲- شرکت ملی گاز ایران در مورد نیازهای عمومی از استانداردهای وزارت نفت (IPS) و در مورد نیازهای اختصاصی از استانداردهای اختصاصی خود (IGS) استفاده می نماید.
- ۳- استانداردهای شرکت ملی گاز ایران (IGS) توسط کمیته های تخصصی استاندارد متشکل از کارشناسان بخش های مختلف و یا مشاور تهیه می شود و توسط شورای استاندارد (منتخب هیئت مدیره شرکت ملی گاز ایران) به تصویب میرسند.
- ۴- در تنظیم متن استانداردهای (IGS) از کلیه منابع شناخته شده استاندارد، اطلاعات فنی - تخصصی مربوط به صنایع گاز دنیا، مشخصات فنی تولیدات سازندگان معتبر جهانی و نیز از نتیجه تحقیقات و تجربیات کارشناسان و متخصصان داخلی بر حسب مورد استفاده می شود. همچنین بمنظور استفاده هر چه بیشتر از تولیدات داخلی قابلیت های سازندگان داخلی نیز مورد توجه قرار میگیرد.
- ۵- استانداردها از طریق پایگاه اینترنتی شرکت * ویا لوح فشرده (CD) در اختیار واحدها و کاربران قرار می گیرد .
- ۶- استانداردها بطور متوسط هر ۵ سال یکبار و یا در صورت ضرورت زودتر، مورد بازنگری و بروزرسانی قرار میگیرند. بنابراین کاربران باید همیشه آخرین نگارش را مورد استفاده قرار دهند.
- ۷- هرگونه نظر و یا پیشنهاد اصلاح در مورد استانداردها مورد استقبال و بررسی قرار خواهد گرفت و در صورت تأیید، استاندارد مربوطه نیز مورد تجدید نظر قرار خواهد گرفت .

تعاریف عمومی

در متن استانداردهای (IGS) از تعاریف و اصطلاحات زیر استفاده میشود.

- ۱- "شرکت" (COMPANY): منظور از شرکت "شرکت ملی گاز ایران" و یا شرکتهای فرعی وابسته میباشد.
- ۲- "فروشنده" (SUPPLIER/VENDOR): به فرد یا موسسه ای اطلاق میگردد که تعهدی را نسبت به شرکت تقبل نموده است.
- ۳- "خریدار" (PURCHASER): منظور از خریدار "شرکت ملی گاز ایران" و یا شرکتهای فرعی وابسته میباشد.
- ۴- "SHALL": در مواردی بکاربرده میشود که انجام خواسته مورد نظر اجباری است
- ۵- "SHOULD": در مواردی بکاربرده میشود که انجام خواسته مورد نظر ترجیحی و درعین حال اختیاری است
- ۶- "MAY": در مواردی بکاربرده میشود که انجام کار به شکل مورد بحث نیز قابل قبول میباشد

* آدرس پایگاه اینترنتی (<http://igs.nigc.ir>) ، آدرس الکترونیکی (nigcigs@nigc.ir)

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1. SCOPE

This Specification covers the minimum design, material, fabrication , testing , marking and packing requirements of gas pressure regulators for commercial and industrial usages with inlet pressure 1.03-7 BAR (15-100 PSIG) outlet pressure range 103-172 MBAR (1.5-2.5 PSIG), sizes 1½ inches and maximum capacities of 160 SCM/H. For specific requirements see appendix “A”.

In case of any exception to this specification , it shall be clearly stated on the technical quotation submitted by supplier.

2. REFERENCES

Throughout this standard specification the following standards and codes are referred to. The editions of these standards and codes that are in effect at the time of publication of this standard specification (1999) shall , to the extent specified herein , form a part of this standard specification . The applicability of changes in standards and codes that occur after the date of this standard specification shall be mutually agreed upon by the purchaser and supplier and/or manufacturer.

- 1- ASTM B85-1981 standard specification for aluminium alloy DIE castings.
- 2- ASTM B117-1985 standard method of salt spray (fog) testing
- 3- ASTM B16-1985 standard specification for free- cutting brass rod , bar , and shapes for use in screw machines
- 4- ANSI B1.20.1-1983 pipe threads, general purpose
- 5- ANSI B1.1 unified inch screw threads
- 6- ANSI Z 21.15-1992 manually operated gas valves for appliances & appliances connector valves & holes end valves.
- 7- ANSI B16.4-1977 cast iron threaded fittings class 125 and 250
- 8- ANSI B16.33 –1981 manually operated metallic gas valves for use in gas piping system upto 125 PSIG
- 9- BS 3900: part E6:1992 methods of test for paints cross-cut test.

- 10- BS 4161 : part 5 : 1990 specification for diaphragm meters for working pressures up to 7 bar.
- 11- BS-EN- 549: 1995 rubber materials for seals and diaphragms for gas appliances and gas equipment.
- 12- ISO 1817 rubber vulcanized- determination of the effect of liquids.
- 13- ISO 2409 : 1992 methods of test for paints and varnishes.
- 14- American gas association for service regulator specification.

3. DEFINITIONS

PRESSURE REGULATOR: Device which maintains the outlet pressure constant independent of the variation in inlet pressure and/or flow rate within defined limits.

INLET PRESSURE : Pressure at the inlet of the regulator.

OUTLET PRESSURE: Pressure of the outlet of the regulator.

AMBIENT TEMPERATURE: The temperature of the surrounding air, at which the regulator may be operated.

DIAPHRAGM: A flexible member which , under the influence of the forces arising from loading and pressure, operates the valve.

DIAPHRAGM PLATE : A rigid disc in contact with the diaphragm, which transmits the force of fixed weight , fixed spring or adjustable springs to the diaphragm.

VALVE: The part of a gas pressure regulator actuated by the mechanism tending to control the outlet pressure.

VALVE SEAT : The stationary portion of an assembly which , in conjunction with the valve, controls the outlet pressure.

VALVE STEM : A rod which position the valve relative to the diaphragm and seat , directly or through linkage.

ORIFICE : The opening in an orifice cap , orifice spud or other device where by the flow of gas is limited , and through which the gas is discharged.

LOW-PRESSURE SHUT –OFF DEVICE: A device that shuts off the gas supply in the event of the gas pressure falling below a predetermined value, manual resetting of the valve is required.

HIGH-PRESSURE SHUT-OFF DEVICE: A device that shuts off the gas supply in the event of the gas pressure rises above a predetermined value , manual resetting of the valve is required.

RELIEF VALVE: A device used to protect piping and components from overpressure.

VALVE BODY : The part of regulator which the diaphragm casing and shut off device(s) have connected to it.

BASE CONDITION : Fixed conditions to which a volume of gas is converted (i.e base gas temperature 15°C , base gas pressure 1013.25 MBAR)

CAPACITY : The rate of flow through a regulator under stated test condition.

4. REQUIREMENTS

4.1 DESIGN & SERVICE CONDITIONS

The regulator shall have easy moving parts without stresses and be constructed of quality materials in a workmanlike

manner in order to attain gas tightness, stability of performance and sustained accurate regulation over a period of time and over the range of operating conditions with minimum of maintenance , when regulating natural gas . such regulator shall have the general characteristics listed below:

- 4.1.1** The regulator shall be for outdoor installation and all its parts shall be resistant to atmospheric corrosion as well as the continuous attack of odorized natural gas & methanol.
- 4.1.2** The inlet pressure 1.03-7 BAR (15-100 PSIG) , outlet pressure range 103-172 MBAR (1.5-2.5 PSIG).
- 4.1.3** The ambient temperature range for the regulator –29 to 60 DEG.C (-20 to 140 DEG.F)
- 4.1.4** Standard volume measured at 1.013 BAR (14.696 PSIA) and 15.6 DEG.C (60 DEG.F)
- 4.1.5** Regulator performance shall comply with the following :
The outlet pressure of regulator shall not rise above 172 MBAR (2.5 PSIG) or fall below 103 MBAR (1.5 PSIG) with flow variation between zero and full capacity of regulator at 1.03 and 7 BAR (15 and 100 PSIG) inlet pressures.
- 4.1.6** The regulator shall be equipped with low pressure shut off device (L.P.S.O) , high pressure shut off device (H.P.S.O) & full capacity internal relief valve (F.I.R.V). The three safety devices and the regulator itself shall be assembled together and comprise one unit only .
- 4.1.7** The setting of the low and high pressure shut off devices (L.P.S.O and H.P.S.O)and full capacity internal relief valve (F.I.R.V) shall be adjustable and their adjustments shall be