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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 :

Indirect Water Bath Heater

دستگاه گرم کننده گاز (آبی)

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.

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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 * و یالوح فشرده (CD) در اختیار واحدها و کاربران قرار می گیرد .
- ۶- استانداردها بطور متوسط هر ۵ سال یکبار و یادر 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 تجدیدنظر 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 رانسبت 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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INDIRECT WATER BATH HEATER

<u>SECTION</u>	<u>DESCRIPTION</u>
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APPENDICES

APPENDIX A- HEATER NOMINAL CAPACITY AND DUTY

APPENDIX B- GAS SPECTIFICATION

APPENDIX C- P & I DIAGRAM

APPENDIX D – DATA SHEET

A. SCOPE

This specification covers the requirements for design , material , fabrication , testing , inspection , marking , packing , and shipping of packaged natural draft indirect-fired water bath heaters to be used in natural gas pressure reducing stations . In case of any deviation from this specification , it shall be clearly stated on the technical information submitted by the manufacturer.

The manufacturer shall furnish complete unit including all necessary parts to insure satisfactory , economical and safe operation .

B. CODES AND STANDARDS

All heaters shall be in compliance with this specification and the latest editions of the following standards and codes.

- Fabrication by welding : ASME section VIII Div. 1 .
- Steel pipe , flanges and flanged fittings : ANSI – B16.5
- Forged steel fittings , socket welding and thread :
ANSI –B16.11
- Instrumentation : ISA
- Electrical : IEC

C. MATERIAL

Material for the following parts shall comply with the specified standards as shown :

- Coil and headers : ASTM A-53 Grade B seamless sch.
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Or ASTM A-106 Grade B “ “ “
Or API 5L Grade B “ “ “
- Fittings : ASTM A-234 Grade wp B seamless
- Flanges : ASTM A-105 or ASTM A-181
- Shell , expansion tank , stack , supports , skid and other structural parts:
ASTM SA-36 (or any other material recommended by manufacturer).
- Fire tube : ASTM A-53 wall thickness 0.250 inch for 24 inch diameter and smaller and 0.312 inch for 26 inch diameter and larger.

D. ATTACHMENTS

All attachments such as data sheet and drawings are a part of this specification and shall be considered in all respects.

E. GENERAL NOTES

1. The heater shall be self-contained and skid – mounted.
2. The heater shall be designed for unattended operation.
3. Structural strength of skid shall be sufficient to withstand forces due to shipping and handling as well as support the vessel and equipment . skid shall be self supporting rigid steel assemblies having adequately sized members to permit handling of the unit without deformation of the skid members.
4. Lifting lugs shall be provided on the skid with sufficient strength to allow to lift the entire assembly without causing any damage to the shell and the other parts.
5. Relief valve discharge must be directed away from the firebox.
6. The firebox shall be equipped with a flame arrestor.
7. All piping and instruments shall be adequately supported.
8. Construction of heater shall be such that the removal of the coil and firebox shall be from opposite ends of the shell.
9. Fuel gas piping shall include a dry type filter with 3 micron cleaning capability and necessary drain valve.
10. Electrical devices shall be rain and dust proof.
11. Average heat flux for fire tube shall not exceed 33,000 Kcal/hr per square meter .
12. Inlet and outlet flanges shall be welding neck , raised face, ANSI class 600 .

F. HEATER SHELL

1. An expansion tank shall be provided on top of heater shell complete with low level alarm and filling connection .
2. A 2 inch ball valve with blind flange shall be provided at the bottom of shell for drain purposes.

3. The shell must be insulated with 50mm thickness fiber glass insulation having an aluminum cladding (heads are not included).

G. COIL

1. Coil shall be field removable .
2. All coil tubes shall be supported having allowances for thermal expansion.
3. Maximum allowable gas velocity in coil shall not exceed 20 m/sec.

H. BURNERS

1. Each burner shall be furnished with separate pilot and control system.
2. Burner and pilot shall use preheated natural gas.
3. An opening shall be provided on the fire tube for easy access so that each burner and pilot could be manually adjusted while installed.
4. peephole(s) shall be provided and located such that burner and pilot flames could be observed during adjustment and operation.
5. provisions shall be included so that the burner could be cleaned with a minimum of disassembly.
6. Automatic fuel gas shutoff for pilot flame failure shall be supplied with manual reset. The shut – off shall be fail safe type .
7. Burner and pilot shall be field removable .

8. Pilot shall be removable as complete assembly together with ignition electrode and flame detection probe to facilitate maintenance.
9. The gas velocity in the fuel line and burner manifold shall not exceeds 20 m/ sec.
10. Fuel line regulator shall be equipped with high pressure shut-off device and shall be factory adjusted within working pressure range of the main burner.
11. Suitable burner flame arrestor for protection against abnormal operation shall be provided. The flame arrestor shall be made of light weight non corrosive material.
12. Pilot burner must ensure smooth ignition of the main burner during all modes of operation and furthermore the pilot shall remain stable under varying combustion chamber condition and flue way pressure.
13. Battery operated ignition system shall be provided for each burner.
14. Each pilot shall be furnished with a flame detection ionization rod.
15. The high voltage ignition electrode shall be separate from sensing rod.

I. INSTRUMENTS AND CONTROLS

1. All the instruments such as relays , contactors , controllers , switches and indicators shall be separately assembled , tested , calibrated and made ready in every respect for field installation. The relays , contactors , micro switches , indicating lamp , alarms and all necessary equipment related to the control system shall be assembled in a lockable box, easily installable in the field . All electrical connections shall be made with screw lock terminals and firmly secured using good quality terminal blocks.