

IGS-M-PM-109(0)

Jan.2024

Approved

مصوب



شرکت ملی گاز ایران

مدیریت پژوهش و فناوری

امور تدوین استانداردها

IGS

مشخصات فنی خرید

ایستگاه های تقلیل فشار / اندازه گیری از نوع کابینتی با حداکثر ظرفیت ۱۰۰۰۰
مترمکعب استاندارد بر ساعت

Specification for Pressure Reducing/ Measuring Cabinet Type
Stations with Max. Capacity up to 10000 SCMh



تاریخ: ۱۴۰۳/۰۱/۰۷

شماره: گ/دب/۰/۲۵-۲۱۸۳۹



شرکت ملی گاز ایران



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ابلاغ مصوبه هیأت مدیره



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باسلام،



به استحضار می‌رساند در جلسه ۲۰۴۹ مورخ ۱۴۰۲/۱۲/۱۳ هیأت مدیره، نامه شماره ۲۲۰۳۶۷ مورخ ۱۴۰۲/۱۲/۰۷ آن مدیریت درمورد تصویب نهایی مقررات فنی شرکت ملی گاز ایران به شرح زیر مطرح و مورد تصویب قرار گرفت.



۱- مشخصات فنی خرید ایستگاه های تقلیل فشار/ اندازه گیری از نوع کابینتی با حداکثر ظرفیت ۱۰۰۰۰ متر مکعب استاندارد بر ساعت



IGS-M-PM-109(0)



۲- مشخصات فنی خرید سه راهی انشعاب و یا تخلیه گاز



IGS-M-PL-004(2)



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FOREWORD

This standard specification is intended to be mainly used by N.I.G.C. and contractors, and has been prepared base on interpretation of recognized standards and technical documents, as well as knowledge, backgrounds and experiences in gas industries at national and international levels.

Iranian Gas Specification (IGS)* are prepared, reviewed and amended by technical standard committees within NIGC standardization division of research and technology management and submitted to "the standards council of NIGC" for approval.

IGSs are subjected to revision, amendment or withdrawal, if required, and thus the latest edition of IGS shall be checked / inquired by NIGC's users.

This standard must not be modified or altered by NIGC employees or its contractors. Any deviation or conflicts between this specification and other applicable standards, codes, procedure or well-known manufacturer's specifications must be resolved in writing by the user or its representative through Manager, Engineering Department or standardization division of NIGC.

The technical standard committee welcomes comments and feedbacks from concerned or interested corporate and individuals about this standard, and may revise this document accordingly based on the received feedbacks.

General Definitions

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

- 1- "STANDARDIZATION DIV." is organized to deal with all aspects of industry standards in NIGC. Therefore, all enquiries for clarification or amendments are requested to be directed to mentioned division.
- 2- "COMPANY": refers to National Iranian Gas Company (NIGC).
- 3- "SUPPLIER": refers to a firm who will supply the service, equipment or material according 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: <https://igs.nigc.ir>

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1. SCOPE

This specification contains the minimum requirements for design, materials, construction, functioning, testing, inspection, painting, marking, packing and shipment of cabinet type stations to be used for measuring and pressure reducing of sweet natural gas (as per composition mentioned in latest edition of (IGS-M-CH-033)) with maximum inlet working pressure of (3-24) bar or (45-350) psig and maximum capacity of 10000 SCMH which is used in gas distribution networks. In this specification, cabinet type station will be referred as station.

The cabinet type stations with capacities upper than 2500 SCMH shall not be used instead of flat type stations, except in case of restrictions on land acquisition.

2. REFERENCES

Throughout this standard the following dated and undated standards/codes are referred to. These referenced documents shall, to the extent specified herein, form a part of this standard. For dated references, the edition cited applies. For undated references, the latest edition of the referenced documents shall be applied.

2.1 Normative References

ANSI/ASME B1.20.1 "Pipe Threads, General Purpose"

ANSI/ASME B16.5 "Pipe Flanges and Flanged Fittings NPS ½ through NPS 24"

API 5L "Standard Specification for Line Pipe"

API RP 500 "Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2"

API RP 551 "Process measurement instrumentation"

ASME B31.3 "Process Piping"

ASME B31.8 "Gas Transmission and Distribution Piping Systems"

ASME Sec VIII div. 1&2 "Rules for Construction of Pressure Vessels"

ASTM A 53 "Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless"

ASTM A 105/A 105M "Standard Specification for Carbon Steel Forgings for Piping Applications"

ASTM A 106/A 106 M "Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service"

ASTM A 193 "Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose"

ASTM A194 "Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or both"

ASTM A 216/ A216 M "Standard Specification for Steel Casting, Carbon, Suitable for Fusion Welding, for High Temperature Service"

ASTM A 283 "Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates"

ASTM A 403 "Standard Specification for Wrought Austenitic Stainless Steel Piping, Fittings"

ASTM B 117 "Standard Practice for Operating Salt Spray (FOG) Apparatus"

AWS A5.1/A5.1M "Specification for Carbon Steel Electrodes for Shielded Metal Arc Welding"

BS 381 C (1996) "Specification for Colors for Identification, Coding and Special Purposes"

BS 4368-1 (1998) "Metallic Tube Connectors for Fluid Power and General Use Split Collect Compression Fittings"

BS 4800 (1994) "Paint Colors for Building Purpose"

BS EN 837-1 "Pressure gauges, Bourdon tube pressure gauges $\varnothing$ Dimensions, metrology, requirements and testing"

BS EN 1776 (2015) "Gas infrastructure - Gas measuring systems- Functional Requirements"

BS EN 12186 (2015) "Gas Supply Systems - Gas Pressure Regulating Stations for Transmission and Distribution - Functional Requirements"

EN 837-1 "Pressure Gauges - Bourdon Tube, Pressure Gauge - Dimensions, Metrology, Requirements and Testing"

EN 50154 "Electrical Installations in Explosive Gas Atmospheres (other than Mines)"

EN 60079-10 "Electrical Apparatus for Explosive Gas Atmospheres– Part 10: Classification of Hazardous Areas"

IGS-E-EL-029 "Requirements for Protection against Lightning"

IGS-E-EL-030 "Requirements for earthing systems"

IGS-E-EL-032 "Explosion Proof Electrical Equipment Layout in Risk Areas for Pressure Reduction Stations (TBS, CGS) and MRS"

- IGS-M-CH-033** "Specification for Iranian Natural Gas Quality"
- IGS-M-CH-041** "Specification for Painting Procedure for Gas Pressure Reducing Stations"
- IGS-M-IN-102** "Specification for Turbine Meters"
- IGS-M-IN-106** "Gas meters, gas volume electronic conversion device"
- IGS-M-IN-202** "Specification for Gas Pressure Regulators for Nominal Inlet Pressure 5 to 100 bar"
- IGS-M-IN-301** "Specification for Safety Shut-off Valves"
- IGS-M-IN-302** "Specification for Safety Relief Valves for Inlet Pressure up to 100 bar"
- IGS-M-PL-002-1** "Specification for Plug Valves Size 2" to 24" Part (1)"
- IGS-M-PL-002-3** "Flanged/Welded End ball valves size 2" to 56" Class Rating 150, 300 and 600"
- IGS-M-PL-003** "Specification for Needle and Gauge Valves"
- IGS-M-PL-005** "Specification for Sensing Tube Lines"
- IGS-M-PL-006** "Specification for Insulating Joints"
- IGS-M-PL-010-5** "Ball Valves, flanged ends, class Rating: 150,300,600 size:1/2 to 1,1/2 in."
- IGS-M-PL-018** "Specification for Covered Electrodes, Series (60 up to 120) for Shield Metal Arc Welding"
- IGS-M-PL-022** "Carbon Steel Butt Welding Fittings in Size NPS 1/2 through NPS 56"
- IGS-M-PL-035** "Specification for Spiral Wound Gasket (Class Rating 150,300,600)"
- IGS-M-PM-105** "Specification for Dry Gas Filter"
- IGS-M-PM-111** "Dry Gas Filter Cartridge"
- IGS-O-CH- 042** "Painting-procedure for Gas Industry Installation"
- IGS-R-PM-112** "Acoustical Designing of Reducing and Metering Gas Stations"
- IPS-G-GN-210** "General standard for Packing and Packaging"
- ISO 9000** "Quality Management and Quality Assurance Standards Guidelines for Selection and Use"

3. DEFINITIONS

For the purpose of this standard, the following definitions apply:

3.1 Measuring Station

An installation comprising all the equipment including the inlet and outlet pipework as far as the isolating valves and any structure within which the equipment is housed, used for gas measurement in custody transfer.

3.2 Pressure Reducing and Measuring Station

The combination of a pressure reducing station and measuring station. It consists of equipment installed for the purpose of automatically reducing and regulating the pressure in the downstream pipeline or main to which it is connected and also measuring it.

3.3 Pressure

The gauge pressure of the fluid inside the system, measured in static conditions.

3.4 Design Pressure (DP)

Design pressure is the maximum pressure permitted by code, as determined by the design procedures applicable to the material and locations involved, on which design calculations are based.

3.5 Operating Pressure (OP)

The pressure which occurs within a system under normal operating conditions.

3.6 Maximum Operating Pressure (MOP)

The maximum pressure at which a system can be operated continuously under normal operating conditions.

Note: Normal operating conditions are: no fault in any device or stream.

3.7 Maximum Allowable Working Pressure (MAWP)

The maximum pressure based on the design code that the weakest component of a pressure vessel at design temperature can handle.

3.8 Maximum Operating Temperature (T_{max})

The maximum temperature at which a system can be operated continuously under normal conditions.

Note: Normal conditions are: no fault in any device or stream.

3.9 Measuring System

Complete set of measuring instruments and other equipment assembled to carry out specified measurements.

3.10 Measuring Instrument

Device intended to be used for measurements, alone or in conjunction with supplementary device(s).

Measuring instruments are e.g. gas meter, pressure sensor.

3.11 Instrumentation

Any system or combination of equipment for measurement and control.

3.12 Accuracy of Measurement

Closeness of the agreement between the result of a measurement and a true value of the measurand.

3.13 Maximum Permissible Error (of a Measuring Instrument)

Extreme values of an error permitted by specifications, regulations, etc. for a given measuring instrument.

3.14 Conversion Device

A device consisting of a flow computer and sensors used for converting the volume (flowrate) at operating conditions into a volume (flowrate) at standard conditions or to mass (flowrate) or to energy (flowrate) at base conditions, based on either pressure, temperature and gas composition, or on density, or on calorific value.

3.15 Installation Effect

Any difference in performance of a measuring instrument or of the measuring system between the calibration under reference and operating conditions.

3.16 Systematic Error

Mean that would result from an infinite number of measurements of the same measurand carried out under repeatability conditions minus a true value of the measurand.

3.17 Fail - Safe

Characteristic of a device to go to a safe operating condition when a failure occurs.

3.18 Overpressure Protection

Overpressure protection is provided by a device or equipment installed for the purpose of preventing the pressure in a pressure vessel, a pipeline, or a distribution system from exceeding a predetermined value. This protection may be obtained by installing a pressure relief device or a pressure shut off device.

3.19 Pressure Relief Device

A device which is installed to vent gas from a system being protected in order to prevent the gas pressure from exceeding a predetermined limit by venting the gas into atmosphere.

3.20 Ambient Temperature

Usually used to refer to the temperature of the air in which a structure or a device operates.

3.21 Block Valve

A plug or ball valve that prevents flow or leakage into the downstream conduit when in the closed position. Valve shall be single or double seated, bidirectional or unidirectional. Unidirectional valve shall be marked with a flow direction arrow.

3.22 Turbine Gas Meter

Measuring device in which the dynamic forces of the flowing gas cause a turbine wheel to rotate with a speed as a function of the volume flowrate. The number or revolutions of the turbine wheel is the basis for the indication of the volume passed through the meter.

3.23 Measured Quantity

Volume in cubic meters, at metering conditions.

3.24 Volume Flow Rate

Volume at metering conditions divided by time.

3.25 Rangeability

The ratio between Q_{min} and Q_{max} , i.e. the minimum and maximum flow rate respectively for which the meter performs within the maximum permissible errors.

3.26 Metering Pressure (PM)

Absolute gas pressure to which the indicated volume of gas is related.