IGS-M-IN-302(2)	Feb. 2020
Approved	مصوب

شرکت ملی گاز ایران

مدیریت پژوهش و فنآوری

امور تدوین استانداردها

IGS

مشخصات فنی خرید

شیر تخلیه اطمینان برای فشارورودی تا ۱۰۰ بار

Safety Relief Valves for Inlet Pressure upto 100 bar (1450 psi)

دفترمدیرعامل

شرکت ملی گازایران

تاریخ : ۱۳۹۹/۰۷/۰۹

شماره :گ۰/دب۰/۴۰۵-۱۹۸۰۴

ابلاغ مصوبه هیأت مدیره

مدیر محترم پژوهش و فناوری

باسلام،

به استحضار می‌رساند در جلسه ۱۸۹۰ مورخ ۱۳۹۹/۰۶/۲۳ هیات مدیره، نامه شماره گ۹/۰۰۰/۶۹۴۵۸ مورخ ۱۳۹۹/۰۶/۱۶ آن مدیریت درمورد تصویب نهایی مقررات فنی شرکت ملی گاز ایران به شرح زیر مطرح و مورد تصویب قرار گرفت.

۱- کنترل کیفیت عملیات آماده سازی سطوح و فرآیند اجرای رنگ های صنعتی IGS-I-TP-033(0)

۲- سیستم پوششی اپوکسی پودری برای سطوح خارجی خطوط لوله گاز طبیعی IGS-C-TP-026-1(1)

۳-محفظه دفنی باتری ایستگاه های مخابراتی IGS-M-IT-011(0)

۴- رک های مخابراتی IGS-M-IT-010(0)

۵- شیر تخلیه اطمینان برای فشار ورودی تا ۱۰۰ بار IGS-M-IN-302(2)

این مصوبه در حکم مصوبه مجمع عمومی شرکت‌های تابعه محسوب و برای کلیه شرکت‌های تابعه لازم الاجرا می‌باشد.

الهام ملکی

دبیر هیات مدیره

رونوشت : مدیرعامل محترم شرکت ملی گاز ایران و رئیس هیات مدیره
اعضای محترم هیات مدیره
رئیس دفتر محترم مدیرعامل
رئیس محترم امور حقوقی
رئیس محترم حسابرسی داخلی

Foreword

This technical 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 technical specification 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 technical specification, and may revise this document accordingly based on the received feedbacks.

General Definitions

Throughout this technical specification 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 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: igs@nigc.ir

Contents

1. Scope

This specification together with the appendices there to covers the minimum requirements for design , fabrication , testing , inspection , marking , packing and packaging of gas safety relief valves to be installed at the measuring and reducing stations:

- for nominal inlet pressures up to 100 bar
- used at an ambient temperature range from -29^{0}C to +60^{0}C which operate with natural gas composition mixture specified in IGS-M-CH-033(1)

2. References (Normative)

Throughout this technical specification the following standards, codes and reports are referred to. The edition of these standards and codes that are in effect at the time of publication of this technical specification (2020) shall to the extent specified herein, form a part of this technical specification. The applicability of changes in standards and codes that occur after the date of this technical specification shall be mutually agreed upon by the purchaser and supplier / manufacturer.

2.1. API 520- 1
Sizing, Selection, and Installation of pressure-relieving devices.

2.2. API 526
Flanged steel pressure relief valves

2.3. API 527
Seat tightness of pressure relief valves

2.4. IGS -CH-033(1)
Pipeline quality natural gas

2.5. ASME section VIII – div.1
Boiler and pressure vessel code

2.6. ASTM A 105/A 105 M-05
Standard specification for carbon steel forgings for piping applications.

2.7. ASTM A 193/A 193M -08 b
Standard specification for alloy – steel and stainless steel bolting materials for high temperature or high pressure service and other special purpose applications.

2.8. ASTM A 194/A 194 M-09
Standard specification for carbon and alloy steel nuts for bolts for high pressure or high temperature service, or both.

2.9. ASTM A216/A 216 M-08
Standard specification for steel castings, carbon, suitable for fusion welding, for high – temperature service

2.10. ASTM B 16.5
Pipe flange and flanged fittings

2.11. ASTM B 117-07
Standard practice operating salt spray (FOG) apparatus

2.12. ASNI/ASME B 1.20.1
Pipe threads, general purpose (Inch)

2.13. BS 381 C
Specification for colors for identification, coding and special purposes

2.14. BS EN ISO 2409:2007, BS 3900- E 6
Paints and varnishes. Cross – cut test
(BS EN ISO 2409: 2007 replaces BS EN ISO 2409:1995, BS 3900- E 6:1992 , Which has withdraw) .

2.15. ISO 1817
Rubber, vulcanized – determination of the effect of liquids

2.16. ISO 48
Rubber, vulcanized or thermoplastic determination of hardness (hardness between 10 IRHD and 100 IRHD)

2.17. ISO 37
Rubber, vulcanized or thermoplastic – determination of tensile stress strain properties

2.18. ISO 815
Rubber, vulcanized or thermoplastic determination of compression set at ambient, elevated or low temperatures

2.19. ISO 1431-1
Rubber, vulcanized or thermoplastic – resistance to ozone cracking

2.20. IGS-O-CH-042
Painting procedure of natural gas equipment and utilities.

3. Definitions

For the purpose of this standard specification, the following terms and definitions apply:

3.1. Safety / safety relief valve
Valve which automatically, without the assistance of any energy other than of the fluid concerned, discharges a quantity of the fluid so as to prevent a predetermined safe pressure being exceeded, and which is designed to re- close and prevent further flow of fluid after normal pressure conditions of service have been restored.
Note: the valve can be characterized either by pop action (rapid opening) or by opening in proportion (not necessarily linear) to the increase in pressure over the set pressure.

3.2. Spring loaded safety valve
Safety valve in which the loading due to the fluid pressure underneath the valve disc is opposed only by a spring loading device.

3.3. Pilot operated safety valve
Safety valve, the operation of which is initiated and controlled by the fluid discharged from a pilot valve which is itself a direct loaded safety valve subject to the requirement of this technical specification.

3.4. Pressure
Pressure unit used in this technical specification is bar (psi), quoted as gauge (relative to atmospheric pressure) or absolute as appropriate.

3.5. Set pressure
Predetermined pressure at which a safety valve under operating conditions commences to open.

Note: It is the gauge pressure measured at the valve inlet at which the pressure forces tending to open the valve for the specific service conditions are in equilibrium with the forces retaining the valve disc on its seat.

3.6. Maximum allowable pressure
Maximum pressure for which the equipment is designed as specified by the manufacturer.

3.7. Over pressure
Pressure increases over the set pressure, at which the safety valve attains the lift specified by the manufacturer, usually expressed as a percentage of the set pressure.
Note: This is the over pressure used to certify the safety valve.

3.8. Reseating pressure
Inlet static pressure at which the disc re-establishes contact with the seat or at which the lift becomes zero.

3.9. Cold differential test pressure
Inlet static pressure at which a safety valve is set to commence to open on the test bench.
Note: This test pressure includes corrections for service condition, e.g. back pressure and/ or temperature.

3.10. Relieving pressure
Pressure used for the designing of a safety valve which is greater than or equal to the set pressure plus over pressure.

3.11. Blow down
Difference between set pressure and reseating pressure, normally stated as a percentage of set pressure except for pressures of less than 3 bar (psi) when the blow down is expressed in bar (psi)

3.12. Lift
Actual travel of the valve disc away from the closed position.

3.13. Flow area
Minimum cross- sectional flow area (but not the curtain area) between inlet and seat which is used to calculate the theoretical flow capacity, with no deduction for any obstruction.

3.14. Flow diameter
Diameter corresponding to the flow area

3.15 Theoretical discharge capacity
Calculated capacity expressed in mass or volumetric units of a theoretically perfect nozzle having cross –sectional flow area equal to the flow area of a safety valve .

3.16. Coefficient of discharge
Value of actual flowing capacity (from tests) divided by the theoretical flowing capacity (from calculation) .

3.17. Certified (discharge) capacity
That portion of the measured capacity permitted to be used as a basis for the application of a safety valve.

Note: It may, for example, equal the:
a) Measured capacity times the derating factor: or
b) Theoretical capacity times the coefficient of discharge times the derating factor: or
c) Theoretical capacity times the certified derated coefficient of discharge.

3.18. Type test
Testing performed on typical samples to prove that material, design, manufacturing etc, are complying with the specification's requirements. Type test certificate is valid until the materials, designation and production methods remain unchanged.

4. Requirements

4.1. Design & Service Conditions

4.1.1. The safety relief valve 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.

4.1.2. The ambient temperature range should be -29^0C to $+60^0$C(-20^{0F} to $+140^{0F}$).

4.1.3. Standard volume measured at 1.01325 bara (14.696 psia) and 15.56^0C (60^{0F}).

4.1.4. All pressure relief valves shall be designed and built in accordance with the requirements of ASME section VIII – DIV.I, API 526 and API520-1.

4.1.5. Relief valve shall be flanged end connections, serrated finished, raised face according to ANSI B 16.5. Class rating according to data sheet. For smaller than 1", the end connection can be screwed (NPT) according to ANSI B 1.20.1

4.1.6. Relief valves shall be suitable for handling natural gas according to IGS-M-CH-033(0) 2004

4.1.7. Safety relief valves shall be pilot operated type .For sizes 1" and smaller, it can be spring loaded according to data sheet.

4.1.8. For pilot operated safety relief valves, the main valve shall open automatically and discharge its full capacity, if any essential parts of the pilot fails.

4.1.9. The safety relief valve shall discharge its full capacity at a pressure not more than 10% of the set pressure.

4.1.10. The safety relief valve shall have a maximum blow down not more than 5% of set pressure.

4.1.11. The safety relief valve set pressure tolerance shall be 138 mbar (2 psig) for up to 4.8 bar (70 psig) and 3% for above 4.8 bar (70 psig).

4.1.12. The safety relief valve shall not seep or leak unless set pressure is reached:
a. No simmer shall occur at set pressure.

b. After blow down shall reseat in a complete bubble tight position.
c. During blow down, the seat and valve shall act in manner to avoid pulsation and vibration.

4.1.13. Back pressure shall be considered negligible.

4.1.14. Means shall be provided to seal all external adjustments as to prevent unauthorized adjustments at the safety relief valve.

4.2. Materials

4.2.1. Internal metallic parts shall durably be constructed of a corrosion resistant material such as stainless or corrosion resistant plated steel. The material of the nozzle, seat disc and disc holder shall be stainless steel type 316. All metallic parts shall met the requirement of salt spray test (Item 5.2.11 "C").

4.2.2. Material of relief valve body and bonnet shall be cast carbon steel according to ASTM A 216 grade WCB or forged carbon steel according to ASTM A 105 suitable for -29^0C to $+60^0$C ambient temperature .

4.2.3. Nuts, bolts and screws shall be steel according to ASTM A 194 grade 2 H, ASTM A 193 grade B7 and ANSI B 1.1 respectively or equivalent.

4.2.4. All tubes sensing lines shall be stainless steel type 316 or 304.

4.2.5. Non – metallic parts material of relief valve such as diaphragm, "o" rings, etc shall be resistant to odorized natural gas and not to reduce its service life or result in sluggish operation of unit at maximum and minimum temperature and pressure specified. Test requirements for these materials shall be according to item no. 5.2.12 of inspection, test and certification section.

5. Inspection, Tests & Certificates

5.1. Inspection documents

Prior to the shipment of each relief valve to the designer or the operator, the manufacturer shall perform all the relief valve tests and checks. The results of all tests and checks which have been performed shall be documented and the report shall include the following items as a minimum:
a. The name and address of the manufacturer
b. The name and address of the test facility
c. The model and serial number
d. The date (s) of the test
e. The name and title of the person (s) who has conducted the tests
f. A written description of the test procedures
g. A descriptions of any variations or deviations from the required test conditions

At least one copy of the complete report in form of electronic file with pdf format or hard copy shall be sent to the designer or the operator and one copy retained in the manufacturer's files. The manufacturer shall ensure that the complete report is available to the operator for 10 years.

5.2. Tests

5.2.1. Visual inspection

Visual inspection including checking of workmanship, painting, connection, internal parts, nameplate, packing, etc.

No apparent imperfection shall be observed.

5.2.2. Dimensional check

The dimensional checks are including the compliance of the relief valve construction with the pertinent assembly drawing and the dimensional conformity of pressure containing parts with the manufacturing drawings.

5.2.3. Materials check

The verification of the material used shall be carried out by the review of material certificates and test reports (if requested by inspector) in compliance with this specification (section 4.2).

5.2.4. Hydrostatic test

All pressure containing parts of each relief valve including those parts that may become pressure containing parts in the event of a failure, shall be pressure tested. The test shall be carried out according to the following table for 5 minutes. No leakage or permanent deformation shall be observed.

Table 1: pressure values for the strength test

Pressure class	Test pressure (PSI)
150	425
300	1100
600	2175

5.2.5. Set pressure test

All pressure relief valves shall be adjusted to the specified set pressure in accordance with the API 526 section 9.2. All set pressure adjustments shall be sealed.

Set pressure test shall be done at least 3 times accordance with the API 576 section 6.2.9.8.

Table 2: Pressure Test Allowable Error

Pressure	Allowable Error Pressure
Less than or equal to 70 psi	+/- 2psi
Greater than 70 psi	+/-3%

5.2.6. Set pressure range test

Relief valve set pressure range shall be checked in accordance with data sheet (appendix)

5.2.7. Seat tightness test

All pressure relief valves shall be seat leakage tested with air in accordance with API 527.

5.2.8. Operational and capacity test

The test shall be conducted to UG- 131 of ASME SEC XIII div.1

5.2.9. Blow down test

During the set pressure test, the reseating pressure shall be measured and the blow down shall not be more than 5%.

5.2.10. Ambient temperature test

Each type of safety relief valve shall operationally tested at minimum and maximum ambient temperature (-29^0C and 60^0C). In each condition the set pressure and blow down pressure of the safety relief valves shall meet this technical specification.

5.2.11. Painting test

Painting of relief valve shall be checked as follows:

A: Thickness

Thickness of paint shall be measured at five points on different sides of relief valve. Difference between minimum and maximum measured values shall not exceed 20% of minimum of measured value.

B: Paint adhesion

The test shall be done in accordance with BS3900 part E6 (2007) equivalent to ISO 2409(1992).

C: Salt spray test

The coating shall withstand 500 hours salt spray test in accordance with ASTM B 117 without blistering, peeling or under film corrosion, carried out and certified by a national bureau of test and standard of the country of manufacturer. Salt spray test shall also be carried out for all metallic parts of relief valve such as body, levers, springs, pins, nuts, bolts, etc.

5.2.12. Non-metallic parts testing requirements (diaphragms, "O" rings,…)

5.2.12.1. General

The non-metallic parts or components shall be homogeneous, free from porosity, inclusions, grit, blisters and surface imperfections visible with the naked eye, even after cutting.

5.2.12.2. Identification

The manufacturer name or trade marks, batch number and date of manufacture shall be indicated on the diaphragms, and prepared for "O" rings by manufacturer.

5.2.12.3. Hardness

When measured by the method described in ISO 48, the hardness of the test sample shall be within ±5 IRHD (International Rubber Hardness Degrees) of the nominal hardness declared by the manufacturer.

5.2.12.4. Tensile strength

The tensile strength shall be at least 9 MPa when tested according to ISO 37.

5.2.12.5. Elongation at break

The test shall be carried out according to ISO 37 and the result shall be minimum 200%.

5.2.12.6. Compression set

The compression set tests are carried out according to ISO 815 (type B test piece) under the following conditions and the results shall be expressed in percentage as specified :

- After 24 hour at 70 ^{0}C : 25%
- After 24 hour at -10 ^{0}C : 40%
- After 24 hour at -20 ^{0}C : 50%

5.2.12.7. Resistance to lubricants

The test shall be carried out according to ISO 1817:1999 clause 7.2 concerning the gravimetric method but the duration of immersion shall be (168±2) hr in oil No. 2 (IRM 902) (ISO 1817:1999) at the 70 ± 2^{0}C to determine the relative change of hardness and mass (△M) .
After this test, the change of hardness and mass shall be ±10 IRHD and between -10% and +15% respectively.

Calculate △M by using the following formula:

$$\triangle M = \frac{M_1 - M_0}{M_0} \times 100$$

Where:
M_0 is the initial mass of the test piece in air,
M_1 is the mass of the test piece in air after immersion
The test piece shall not show any sign of delamination, blistering or significant deterioration.

5.2.12.8. Hydrocarbon mixture test:

A- For diaphragms:
When a test piece is immersed and allowed to swell freely in a mixture of toluene and heptane in the proportion 1:1 by volume at 20 ± 5^{0}C for 7 days, the change in area shall not be greater than 5% of the original area. After immersion and drying to constant mass at room temperature, the extracted material shall not exceed 12% by mass of the original mass of the test piece, and the area shall not differ from the original area by more than 5%. The material shall not show any sign of delamination or blistering or significant deterioration.
Note 1: The volume ratio of liquid to test piece should be not less than 50:1.
Note 2: To measure the change in area, it is recommended that the liquid – soaked test piece be placed quickly between two microscope slides.
B- For other rubber parts (such as "O" rings, …) :
The tests shall be carried out according to 8.2 of ISO 1817:1999 concerning the gravimetric method and clause 9 concerning the determination of extracted soluble matter, but under the following conditions:

(A) The duration of immersion shall be (72 ±2) hr at (23 ±2) ^{0}C in n-pentane (minimum 98% by mass of n-pentane, estimated by gas chromatography).

(B) Dry the test pieces for a period of (168±2) hr in an oven at (40±2) ^{0}C atmospheric pressure
(C) Determine the relative change of mass, △M, with reference to the initial mass of the test piece, using the following formula:

$$\triangle M1 = \frac{M2-M1}{M1} \times 100$$

$$\triangle M2 = \frac{M3-M1}{M1} \times 100$$

Where:
M1 is the initial mass of the test piece in air,

M2 is the mass of test piece after immersion

M3 is the mass of the test piece in air after drying
After this test the change of mass (△M1, △M2) shall be as followings:

After this test the change of mass (△M1, △M2) shall be as followings:

$(\triangle M1)\% = {}^{+10}_{-5}$ and $(\triangle M2)\% = {}^{+5}_{-8}$

The test piece shall not show any sign of delamination, blistering or significant deterioration.

5.2.12.9. Water test (for diaphragms):
When the test piece is immersed in distilled or deionized water and allowed to swell freely at 20 ±5^{0}C for 7 days, the change in area of the material shall not be greater than 5% of the original area of the test piece.

After immersion and drying to constant mass in air at room temperature, the extracted material shall not exceed 12% by mass of the original mass of the test piece and the area shall not differ from the original area by more than 5%.
The difference in relative humidity between taking the original and final mass and area measurements shall not exceed ± 10%.
The material shall not show any sign of delamination or blistering or significant deterioration.

5.2.12.10. Accelerated ageing test:
The stiffness of the test piece of diaphragms shall be measured at 20 ±5^{0}C, by torsion apparatus (APP. "F" of BS 4161: part 5:1996). The stiffness when remeasured at 20 ±5^{0}C shall not have increased by more than 25% after the test piece has been subjected to a temperature of 70±2^{0}C in an air- circulating oven for 4 weeks. In addition, the test piece shall not show any sign of delamination, blistering of significant deterioration.

5.2.12.11. Low temperature flexibility test:
The stiffness of the test piece of diaphragms shall be measured at 20±5^{0}C by torsion apparatus (App."F" of BS 4161: part 5:1990). The stiffness when measured at -20 ±1^{0}C shall not have increased by more than 25% after the test piece has been subjected to this temperature in an environmental chamber for 20 minutes.

The test piece shall be placed in chamber maintained at -29±1 ^{0}C for 24 hr. The test piece shall have sufficient flexibility for its service and shall not show any sign of delamination, blistering or significant deterioration.
The elastomer material shall be placed in chamber maintained at -29±1 ^{0}C for 1 hr.
The test piece shall have sufficient flexibility for its service and shall not show any sign of delamination, blistering or significant deterioration.

5.2.12.12. Porosity test (for diaphragms):
A test piece shall be located between the two halves of the test chamber and a pressure equal to max. Differential pressure across the diaphragms shall be applied to the under side of the test piece for 1 minute.
No evidence of leakage shall be observed.

5.2.12.13. Pressure test:
For diaphragms, a test piece shall be located between the two halves of the test chambers and a pressure, equal to 60 bar for class 300 and 105 bar for class 600 shall be applied to under side of the test piece for 10 minutes.
No evidence of deformation, rupture shall be observed.

5.2.12.14. Diaphragms thickness:
The thickness variation of diaphragms on the same section shall not be grater than ±10%.

5.2.12.15. Resistance to ozone:
Test sample shall show no cracks when measured in accordance with the method described in ISO 1431-1, with the following test criteria:

- Duration of test 48^{+0}_{-2} h;
- Concentration of ozone: 25 ± 5 pphm (parts per hundred million);
- Test temperature: 40 ± 2 ^{0}C ;
- Relative humidity: 55 ± 10 %
- Elongation of test sample: 20 ± 2 %;
- View with 7 - fold magnification.

5.3. NDE Requirements

5.3.1. VT
All surfaces shall be visually inspected. Examination and acceptance shall be in accordance with ASME BPVC Section VIII, Division 1, UF-45 and UF-46.

5.3.2. MT/ PT on 100% of Exterior Surface and Machined Surface Areas
All exterior surfaces and machined surface areas shall be 100% magnetic particle examined. Examination shall be carried out in accordance with ASME Section V, Article7. Acceptance shall be in accordance with ASME Section VIII, Division 1, and
Appendix 6
If agreed, instead of MT, surface area can be PT examined according to ASME Section V; Article 6.Acceptance shall be in accordance with ASME Section VIII, Division
1, and Appendix 7.

5.4 Inspection & certificates

5.4.1. Prior to delivery of the relief valve , the manufacturer should make the following documents available for inspector's review : material , welding and NDT tests reports and certificates , pressure test reports , performance functional reports and certificates correlated to serial number and commodity compliance certificate (with NIGC purchase order requirements).

5.4.2. The relief valve of each delivery will be inspected according to terms and conditions of purchase order for 5% random samples chosen by inspector of each item (minimum one sample) (unless otherwise specified by mutually agreed inspection procedure base on capacity and quantity of each delivery).

Required tests, inspection & checking at the inspection are as follow:

1. Visual inspection
2. Dimensional check
3. Material check (test reports should be traceable)
4. Hydrostatic test
5. Seat tightness test
6. Set pressure range test
7. Set pressure test
8. Operational and capacity test
9. Blow down test
10. Ambient temperature test
11. painting test
12. Non –metallic parts testing requirements
13. NDE Requirements
14. certificate about compatibility with ASME requirement (approved by ASME or others (acc . to data sheet)).

15- Orifice size, set pressure, set pressure range, operating pressure, type of seat (soft or hard), serial number, blow down pressure and size of the safety valve shall be identified at the manufacturer certificate.

6. Painting

Surface preparation and painting shall be in accordance to IGS-O-CH-042.

7. Marking

Each pressure relief valve shall have a corrosion resistant nameplate permanently attached to the body or bonnet. This nameplate shall be stamped as following:

- Manufacturer's name or identifying trademark.
- Size (in×out)
- Type, style, model or figure numbers
- Orifice size
- Capacity at 10% overpressure
- Serial number
- Set pressure, bar (Psig)
- Code or standard of manufacturing
- Blow down, bar (Psig)

Valves shall have an additional nameplate permanently attached to the pilot. The pilot nameplate shall be stamped with the manufacturer's name, pilot type, set pressure, and serial number.
Each pressure relief valve shall be tagged with the purchaser's valve number or other identification as specified on the purchase order. The data may be stamped on the nameplate or on a separate corrosion resistant tag that is permanently attached to the valve.

8. Packing and packaging

A- Each relief valve shall be put in a plastic bag with all openings covered by plastic caps.
B- Each relief valve in plastic bag shall be housed in wooden support.
C- The wooden supports shall be housed in wooden cases according to NIGC packing instructions.

9. Documentation

9.1 With technical quotation:

Two sets of The following documentations shall be presented by manufacturer for the technical quotations.
All documentation should be dated.
9.1.1. A description of the relief valve, giving the technical characteristics and the principles of its operation.
9.1.2. A perspective drawing or photograph of the relief valve
9.1.3. A nomenclature of parts with a description of constituent materials of such parts.
9.1.4. An assembly drawing with identification of the component parts listed in the nomenclature.
9.1.5. A dimensional drawing
9.1.6. A drawing showing the location of verification marks and seals
9.1.7. A dimensional drawing of metrologically important components
9.1.8. A drawing of the data plate or face plate and of the arrangements for inscriptions
9.1.9. Instructions for installation, operation, periodic maintenance and trouble –shooting
9.1.10. Maintenance documentation including third–party drawings for any filed repairable components.
9.1.11. Documentations about that the designs and constructions comply with applicable safety codes and regulations
9.1.12. A list of the documents submitted
9.1.13. Recommended two years parts list
9.1.14. Manufacturer standard (informative)
9.1.15. Completed, signed and submitted attached data sheet

Note: All the documents should be dated.

9.2. After receipt of order

The manufacturer should furnish specific relief valve outline drawings, including overall flange face – to – face dimensions & inside diameter.
The manufacturer should provide a recommended list of spare parts giving manufacturers name, type / model, serial number, realistic part numbers and parts descriptions on the complete spare parts interchangeability record (SPIR) form

10. Guarantee

10.1. Manufacturer shall guarantee the compliance of material and performance of the supplied equipment with this specification.

10.2. The guarantee period shall be one year after equipment goes on stream or 24 months from date of shipment, whichever occurs first.

10.3. Supplier should agree to repair on site or replace any part, equipment or unit which proves to be defective during the above mentioned period free of charge.

11 Appendix

Data sheet (1)

To be filled by purchaser	To be filled by manufacturer / supplier
Inquiry No.:	Quotation No.:
Item No:	Item No:
No required :	No. offered :
Inquiry date :	Quotation date :
NIGC Technical Spec: IGS–M-IN-302(2)	Catalogue No:
Code : ASME VIII DIV.1	Yes ❒ No*❒
UV stamp requirements Yes ❒ No❒	Yes ❒ No*❒
The data sheet is provided by	Manufacture ❒ supplier ❒

	Subject	To be filled by purchaser	To be filled by manufacturer /supplier
Operating conditions	Fluid	natural Gas	Yes❒ No❒
	Required capacity (SCM/H)	…….	……
	Operating pressure	……..bar (…….. psig)	……..bar (…….. psig)
	Set pressure	……..bar (…….. psig)	……..bar (…….. psig)
	Set pressure range	……..bar (…….. psig)	……..bar (…….. psig)
	Operating temperature range (^{0}C)..…	…..	…..
	Ambient temperature(C)..…	Min.:-29 Max.: 60	Min. :…… (^{0}C) Max.: ….. (^{0}C)
	Standard condition	1.01325 bara (14.696 psia) & 15.56^{0}C (60^{0}F)	____
	Maximum blow down	5%	Yes ❒ No*❒
	Pilot action	Pop ❒ modulating ❒	Pop❒ modulating ❒

	Subject		To be filled by purchaser	To be filled by manufacturer / supplier
Relief valve data	Tag No.		_____	……..
	Application		……..	_____
	Model No.		_____	……..
	Type		Spring loaded❒ pilot operated ❒	Spring loaded ❒ pilot operated ❒
	Nozzle		Full ❒ semi ❒	Full ❒ semi ❒
	Standard Effective Orifice Area(ACC. to Table 1. API 526)		…….	…….
	Inlet	Size (IN)	…….	…….
		End connection	Flanged (RF) ACC. to ANSI B16.5 ❒ Screwed NPT ACC. to ANSI B 1.20.1 ❒	Flanged (RF) ACC. to ANSI B16.5 ❒ Screwed NPT ACC. to ANSI B 1:20.1 ❒
		Rating	Class 150❒ Cl 300 ❒ Class 600❒	Class 150❒ CL 300 ❒ CL 600❒
	Outlet	Size (IN)	…….	……..
		End connection	Flanged (RF) ACC. to ANSI B 16.5 ❒ Screwed NPT ACC. to ANSI B 1.20.1❒	Flanged (RF) ACC. to ANSI B 16.5 ❒ Screwed NPT ACC. to ANSI B 1.20.1 ❒
Malarias	Body and bonnet		Cast carbon steel acc. to ASTM A216 Grade WCB Or Forged carbon steel acc. to ASTM A 105	Yes❒ No*❒
	Nozzle, seat disc and disc holder		stainless steel 316	Yes❒ No*❒
	spring		Stainless steel ❒ Other …..	Yes❒ No*❒
	stem		Stainless steel ❒ Other …..	Yes❒ No*❒
	Painting system acc. to IGS-O-CH-042		…….	Yes❒ No*❒

	Nut , bolt and screws	ASTM A 194 grade 2 H, ASTM A193 grade B7 and ANSI B 1.1 respectively or equivalent	Yes❒	No*❒
	All tubes and sensing lines	stainless steel 316 ❒ stainless steel 304 ❒	Yes❒	No*❒
	Non – metallic parts material such as diaphragm, "O" ring , etc.	Rubber material resistant to odorized natural gas	Yes❒	No❒

Supplier remarks on tests , certificates, Guarantee, acc. to section 5	**Subject**	**To be filled by purchaser**	**To be filled by manufacture /supplier**	
	Visual inspection	For the samples selected by inspector	Yes❒	No❒
	Dimensional check	For the samples selected by inspector	Yes❒	No❒
	Material check : -valve body -pilot body -internal metallic parts -non metallic parts	Test certificates	Yes❒	No❒
	Set pressure range test	For the sample selected by NIGC inspector	Yes❒	No❒
	Set pressure test	For the sample selected by NIGC inspector	Yes❒	No❒
	Hydrostatic test	Required for each relief valve	Yes❒	No❒
	Seat tightness test	Required for each relief valve	Yes❒	No❒
	Back pressure tightness test	Required for each relief valve	Yes❒	No❒
	Blow down test	Required for each relief valve	Yes❒	No❒
	Operational and capacity test	Type test (**)	Yes❒	No❒
	Ambient temperature test	Type test (**)	Yes❒	No❒
	Painting salt spray test	Type test (**)	Yes❒	No❒

	Paint adhesion & thickness test	For the sample selected by NIGC inspector	Yes❒ No❒
	Compatibility with the requirements of ASME Sec. VIII – DIV.1 Approved by :	ASME❒ Others ***❒	Yes❒ No*❒
	Guarantee	24 months after shipment or one. year after putting in service whichever occurs first	Yes❒ No❒
* please specify ** Manufacture shall submit test certificates verified by a national bureau of test and standard institute and NIGC inspector may select the samples for tests *** other approval body shall be DVGW, PTB,TUV,			

Manufacturer signature and stamp:

(1) This data sheet is integrated part of STD.NO.IGS-M0IN-302(1):2018 and should not be used separately.