



Exploration & Production

GENERAL SPECIFICATION

INSTRUMENTATION

GS INS 104

Design of the generation of instrument air or gas

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1. Scope

This Standard Specification defines the principles of generation, treatment and distribution of instrument air and/or gas.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Standards

Reference	Title
Not applicable	

Professional Documents

Reference	Title
API RP 552	Transmission Systems
ANSI/ISA-7.0.01	Quality Standard for Instrument Air

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
Not applicable	

Total General Specifications

Reference	Title
GS MEC 291	Air compressor package
GS INS 900	Instrument hook-up diagrams

3. Design

Design, manufacture and shop testing of an air compressor unit for instrument and service air supply shall be as per **GS MEC 291**.

4. Deviations from reference documents

The services provided shall comply with the reference documents, amended by the differences and/or choice of options specified below. The recommendations in chapter 21 of **RP 552** must be applied. In particular, the installation arrangements stipulated in the diagrams in **RP 552** must be applied (connection points along the top generatrix of manifolds, shut-off valves, pressure reducing valve filters, etc.).

However, the regulations or directives applicable in the country of destination of the construction shall be taken into consideration when they are stricter than the reference documents.

4.1 Generation and treatment of instrument air and/or gas

The use of instrument gas may be envisaged subject to the agreement of the OWNER.

To maintain the independence of the instrument air and/or gas generation and treatment plant from the other plants of the installation, its operation must not under any circumstances depend on the operation of any other equipment of the installation not critical compared to generation.

4.1.1 Instrument air generation and treatment

There shall be a minimum of two redundant air compressors, each being sized for 100 % of the expected air consumption of the plant.

In the same way, a minimum of two 100 % capacity air dryers, with automatic regeneration, shall also be installed.

The pressure dew point shall be 20°C below the minimum ambient temperature, with a maximum of 5°C. Dew point analysers for remote monitoring shall be installed at the outlet of each dryer.

Reserve vessels shall be installed to provide air autonomy consistent with the autonomy of the UPS for the plant control system, with a minimum of 20 minutes at full consumption rate.

Compressors, vessels and instrument air header shall be such designed that the normal pressure shall be 7 barg at instruments supply points.

4.1.2 Instrument gas generation and treatment

The instrument gas generation and treatment plant shall be designed according to the specifications of the available gas (cleanliness, dew point, pressure and flow rate). The quality of the instrument gas must be equivalent to the quality defined for the instrument air by **ISA-7.0.01**. The treatment plant shall comply with the recommendations of chapter 1 of **API RP 552**.

The instrument gas storage system shall be designed to provide instrument gas supply for the same duration as UPS autonomy in the event of shutdown, with a minimum of 20 minutes at full consumption rate.

4.2 Distribution

The size of the distribution network shall be designed to ensure a pressure loss of no more than 0.5 bar (10 psi) at maximum flow.

The low points and end points of all the distribution manifolds (main and sub-manifolds) shall all be fitted with drain valves.

Air/gas-using equipment shall be fed from distribution manifolds distributed throughout the installation. Each outlet to an air/gas-using instrument shall be fitted with a shut-off valve.

These distribution manifolds shall be provisioned with 30 % spare, and all fitted with shut-off valves. The distribution points shall be fitted with a drain valve at a low point. Each manifold outlet shall be tagged with the name of the consumer.

The piping class used for the network of main manifolds and sub-manifolds shall comply with the piping class of the installation.

The distribution of instrument air and/or gas from the distribution manifold to the air/gas using instrument shall be via stainless steel (316L for onshore; 904L for offshore) pipe with a minimum diameter of 6-8 mm (5/16" OD) or 8-10 mm (3/8" OD).

Instrument air distribution typical drawings can be found in **GS INS 900**.

4.2.1 Limits of use of the instrument air

The supply of a service air system from the instrument air system shall be subject to the approval of the OWNER.

4.2.2 Instrument gas distribution

The entry of instrument gas into technical rooms is strictly prohibited.

The route of the distribution network shall be designed in such a way as to create, by gravity, constant drainage of each manifold of the system towards a low point fitted with a drain vessel and drain valve connected to the closed drain system.