

GENERAL SPECIFICATION

ROTATING MACHINERY

GS EP MEC 292

Rotating Machines Packages Installation Requirements

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1. Scope

This specification defines the minimum requirements for integration of machinery packages within a Plant for the safe, reliable and easy operation and maintenance of such machineries.

These requirements have to be studied and developed on a project basis and included in the scope of supply of the Contractor.

The specification is applicable to any package involving rotating equipment to be installed within the Plant by the Contractor, whatsoever is the Purchaser of the package.

2. Reference documents

The reference documents listed below form an integral part of this General Specification.

External Documents

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and addendums, is the latest revision published at the effective date of this document.

Reference	Title
API RP 686	Recommended Practice for Machinery Installation and Installation Design
API STD 610	Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries
ASME B16.9	Factory-Made Wrought Butt welding Fittings
ASME B31.3	Process Piping
ISO 5167-1	Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full - Part 1 General principles and requirements

Total General Specifications

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and addendums, is the latest revision published.

Reference	Title
GS EP INS 110	Instrumentation for package units
GS EP MEC 214	Fuel Treatment Units
GS EP MEC 251	Supply of Axial and Centrifugal Compressors and Expander-compressors according to API Standard 617
GS EP MEC 253	Anti Surge System for Centrifugal and Axial Compressors
GS EP PVV 175	Cleaning of piping and vessels

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3. Definitions and abbreviations

Company	Total E&P or any Total E&P subsidiary.
Contractor	Any company Total E&P has signed a Contract with for the Engineering, Procurement, Construction and Installation of a part of a Project.
Supplier or Vendor	The package Supplier or Vendor.
Package	Prefabricated process or utility self-contained unit, generally able to operate on its own, supplied fully tested and ready for immediate installation.
ICSS	Integrated Control and Safety System.

4. Compressor anti surge and hot gas bypass systems

Contractor shall install and connect the required field anti-surge instruments, as defined in [GS EP MEC 253](#).

The anti surge loop including the control valve shall comply with the following mandatory requirements:

- Designed and installed in such a way to minimize the volume of gas at the compressor discharge.
- The anti-surge valve shall be installed at the highest point of the recycling loop.
- The anti surge valve upstream and downstream straight piping lengths shall not be less than respectively 5 times and 10 times nominal diameter of downstream pipe.
- The inlet and outlet piping concentric and/or eccentric reducers shall comply with [ASME B16.9](#), and in all cases two subsequent reductions are strictly prohibited.
- The anti-surge valve shall be adequately supported.
- Anti surge loop tie in points shall be located on the top of the compressor discharge and suction lines.
- The compressor anti surge protection loop(s) shall be free of any isolation or check valves.
- Discharge pressure transmitter shall be located upstream compressor discharge check valve.
- Suction and discharge pressure transmitters used for anti-surge control system shall be installed as close as possible to their respective compressor flanges, the suction pressure transmitter being located downstream the temporary suction strainer in all cases.
- The temperature transmitter triggering the compressor shut down in case of high discharge temperature shall be located as close as possible to the compressor discharge flange and in all cases upstream the anti surge line tie in point.

Gas cooler is preferably installed upstream the gas compressor to decrease discharge volumes.

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Furthermore, Contractor shall provide and install check valves of anti slam type at the following locations:

- Downstream each anti surge protection loop high pressure side tie in point such that the compressor discharge volume is minimized. Between each compressor section provided with a dedicated anti surge protection loop for loop isolating purpose.
- At compressor discharge, as close as possible to the compressor discharge flange and downstream the hot bypass loop tie in point, to minimize the compressor discharge volume in case of hot bypass recycle valve.

Contractor shall provide Supplier in due time with isometrics drawings of process compressor lines in order to allow Supplier to perform the dynamic study necessary to determine whether a hot bypass line is required.

The hot bypass line shall be as short as possible. The hot bypass take-off shall be as close as possible to the compressor discharge flange and the tie-in on the suction side shall be as close as possible to the compressor suction flange and in any case downstream the compressor suction scrubber outlet flange.

Refer to Appendix 2 for details.

5. Fuel gas treatment package

Contractor shall design, procure, fabricate, test, paint, install, clean, heat trace and insulate the fuel gas treatment package of the gas turbine or gas engine driven package in accordance with **GS EP MEC 214** and Project specifications.

Design and operating conditions: pressure, temperature, overheating, flow, degree of filtrations shall meet the requirements of the gas turbine or gas engine Supplier based on the fuel gas compositions provided by Company.

6. Piping and Piping accessories

6.1 Interconnecting piping

Contractor shall design, procure, fabricate, test, paint, install, passivate and clean all the interconnecting piping between the main package baseplate and the package auxiliaries located outside of the main baseplate for the following systems, where applicable, in accordance with the Project piping specifications.

Contractor piping design shall comply with Supplier requirements.