

GENERAL SPECIFICATION

INSTRUMENTATION

GS EP INS 125

Safety Relief Valves and Rupture Discs

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1. Scope

This specification describes the minimum requirements for the design, sizing, selection and installation of:

- Pressure Relief Valves
- Thermal Relief Valves
- Rupture Discs
- Tank pressure / Vacuum systems
- Valves/Discs Maintenance Facilities.

2. Reference documents

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

The equipment shall satisfy the requirements of the country of installation and specific standards referred to in this specification.

Where national regulations exist, their provisions and those of standards and codes they refer shall apply, supplementing or amending the provisions 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 576	Inspection of Pressure-Relieving Devices
API SPEC 6D	Specification for Pipeline and Piping Valves
API STD 2000	Venting Atmospheric and Low-pressure Storage Tanks
API STD 520	Sizing, Selection, and Installation of Pressure-relieving Devices
API STD 526	Flanged Steel Pressure-relief Valves
API STD 527	Seat Tightness of Pressure Relief Valves
ASME B16.34	Valves - Flanged Threaded and Welding End
ASME B16.5	Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard
ASME BPVC Section I	Rules for Construction of Power Boilers
ASME BPVC Section VIII Div 1	Rules for construction of Pressure Vessels
ASTM A703/A703M	Standard Specification for Steel Castings, General Requirements for Pressure Containing Parts

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Reference	Title
Class Society Rules	Particular design rules as per selected Class Society may be applicable for equipment installed on the hull of floating facilities and may require Class Society type approval
EN 10204	Metallic product - Types of Inspection Documents
European Directive 2014/34/UE	European Directive 2014/34/UE (26/02/2014) on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres
European Directive 2014/68/EU	Directive of the European Parliament and of the Council on the harmonisation of the laws of Member States relating to the making available on the market of pressure equipment
IECEX	International Electrotechnical Commission System for Certification to Standards relating to Equipment for Use in Explosive Atmospheres (IECEX System)
ISO 4126-10	Safety devices for protection against excessive pressure - Part 10: Sizing of safety valves for gas/liquid two-phase flow
MSS SP-53	Quality Standard for Steel Castings and Forgings for Valves, Flanges, Fittings, and Other Piping Components - Magnetic Particle Examination Method
MSS SP-54	Quality Standard for Steel Castings for Valves, Flanges, Fittings, and Other Piping Components - Radiographic Examination Method
MSS SP-55	Quality Standard for Steel Castings for Valves, Flanges, Fittings, and Other Piping Components - Visual Method for Evaluation of Surface Irregularities
MSS SP-93	Quality Standard for Steel Castings and Forgings for Valves, Flanges, Fittings, and Other Piping Components - Liquid Penetrant Examination Method
NACE MR 0175 / ISO 15156	Petroleum and natural gas industries - Materials for use in H ₂ S-containing environments in oil and gas production

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Reference	Title
GS EP COR 350	External protection of offshore and coastal structures and equipment by painting
GS EP COR 351	External protection of structures and equipment by painting. Floating structures
GS EP COR 354	External protection of onshore structures and equipment by painting
GS EP ECP 103	Process sizing criteria
GS EP INS 101	Instrumentation Design
GS EP INS 114	Instrument Tubing and Fittings
GS EP PVV 112	Piping material classes
GS EP PVV 145	Flanges
GS EP PVV 150	Valves in cryogenic service
GS EP PVV 154	Ball valves
GS EP PVV 611	Welding of pressure containing piping and equipment
GS EP PVV 612	Piping and equipment subject to severe sour service. Metallurgical and welding requirements
GS EP PVV 613	Valve materials requirements for use in sour service
GS EP PVV 622	Piping and equipment subject to mild and intermediate sour service. Metallurgical and welding requirements
GS EP SAF 262	Pressure protection relief and hydrocarbon disposal systems
GS EP SAF 341	Location and protection of onshore hydrocarbon storage

3. Terminology and Definitions

There are five types of statements in this specification, the “shall”, “should”, “may”, “can” and “must” statements. They are to be understood as follows:

Shall	Is to be understood as mandatory. Deviating from a “shall” statement requires derogation approved by Company.
Should	Is to be understood as strongly recommended to comply with the requirements of the specification. Alternatives shall provide a similar level of protection and this shall be documented.
May	Is to be understood as permission.

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Can	Is to be understood as a physical possibility.
Must	Expresses a regulatory obligation.
Company	TOTAL E&P or any TOTAL E&P subsidiary.
Contractor	Any Party that has signed a Contract with Company for the Engineering, Procurement, Construction, and Installation in part(s) or in full of a project.
Vendor	The package Vendor sub-contracted by the Contractor or by Company.
Supplier	The Party that manufactures or supplies equipment, either individually or as a Packaged unit for the project.

3.1 Abbreviations

The following terms and abbreviations will be used in this document.

AISI	American Iron and Steel Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
ATEX	Atmosphere and Explosives - European Directive 2014/34/UE
FAT	Factory Acceptance Test
ICSS	Integrated Control and Safety System
IEC	International Electro-technical Commission
NDE	Non-Destructive Examination
NPS	Nominal Pipe Size
PRV	Pressure Relief Valve
UNS	Unified Numbering System

3.2 Definitions

Backpressure: The pressure at the outlet of the relief device, sum of the built-up backpressure and the superimposed backpressure.

Blowdown: The difference between the set pressure and the closing pressure of the relief valve.

Built-up backpressure: The increase in pressure at the outlet of the relief device, as a result of flow after opening.

Closing pressure: The value of decreasing inlet pressure at which the lift of the valve disc becomes zero.

Cold differential test pressure: The pressure the relief valve is adjusted to open at the test bench. It includes corrections for service conditions (backpressure, temperature).

Maximum operating pressure: The maximum pressure expected in normal operating conditions.

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Pressure Relief Valve: Any pressure-relief device designed to open and relieve excess pressure and to reclose and prevent further flow of fluid after normal conditions have been restored. This is the generic term used for safety valves, safety relief valves, pressure safety valves, thermal (or temperature) relief valves, thermal (or temperature) safety valves.

Set pressure: The inlet gauge pressure at which the relief device is set to open under service conditions.

Superimposed backpressure: The static pressure that exists at the outlet of the safety relief device, before opening.

Refer to [API STD 520](#) for more definitions and details.

4. General Requirements

Criteria and requirements for installation of safety relief devices are given in [GS EP ECP 103](#), [GS EP SAF 262](#) and [GS EP SAF 341](#).

Safety relief valves and rupture discs design shall be based on the requirements of the process application, operating and design conditions, piping specification (material, class).

An individual instrument data sheet shall be prepared for each safety relief device. This data sheet shall be based on [API STD 520](#) appendices. The party responsible for the preparation of the data sheet is the party in charge of the engineering of the equipment the relief device will protect.

4.1 Environmental Conditions

Pressure safety valves, thermal relief valves, rupture discs, tank pressure/vacuum systems, and valve/discs maintenance facilities shall be suitably designed for permanent operation under the prevailing environmental conditions of the installation location or as specified by project particular design conditions.

It should be noted that the environmental conditions at the fabrication yard may be different to those of the final site location. Therefore, the fabrication yard storage and installation conditions shall also be taken into account.

4.2 Origin of Materials and Manufacturing

The Supplier shall submit during tender a "Declaration of Materials and Manufacturing Origin" which will be used in the execution of the contract, clearly listing:

- All casting companies and their locations for the supply of cast and forged components
- All companies for machining, assembling and testing
- Valve Supplier's Factory(ies) location(s) used for the order concerned.

This list will be subject to Company written approval.

Supplier shall provide the detailed ASTM, AISI or UNS material code, also clarifying generic trademark names, for all body, bonnet, bolting or trim components, including material details for non-metallic components such as seals, gaskets, etc.