

GENERAL SPECIFICATION

ROTATING MACHINERY

GS EP MEC 101

Driver Power Sizing

10	10/2012	Update
09	01/2012	Rewriting
08	01/2011	Update
07	10/2009	Rewriting
00	02/2001	First issue
Rev.	Date	Purpose of the revision

Owning entity: DEV/TEC

Managing entity: DEV/TEC/MTH

General Specification		GS EP MEC 101
Driver Power Sizing		
Rev.: 10	Effective date: 10/2012	Page: 2 of 12

Contents

1. Scope	3
1.1 Purpose of the specification	3
1.2 Limits of application	3
2. Reference documents.....	3
3. Definitions.....	4
4. Calculation of Driven Machines Absorbed Power.....	5
4.1 Electric Generators	5
4.2 Other Driven Machines	5
5. Calculation of the Driver Power Sizing.....	6
5.1 General Rules.....	6
5.2 Special rules	7
Appendix 1 Driven Machines Absorbed Power Table and Driver Power Sizing Tables	8
Appendix 2 Power Calculations Applicable to Centrifugal Compressor Driven by Gas Turbine.....	11
Appendix 3 Gas Turbine Sizing and Electrical Generator Rating.....	12

General Specification		GS EP MEC 101
Driver Power Sizing		
Rev.: 10	Effective date: 10/2012	Page: 3 of 12

1. Scope

1.1 Purpose of the specification

To define the minimum required power to be delivered by the drivers (output shaft power) with regard to the power absorbed by the driven machines.

1.2 Limits of application

This specification applies to the following driven machines, whether or not covered by a professional document or a standard:

- Centrifugal compressors as per [API Std 617](#)
- Axial compressors as per [API Std 617](#)
- Volumetric compressors as per [API Std 618](#), [API Std 619](#) and or [ISO 13631](#)
- Centrifugal as per [API Std 610](#) or [ISO 5199](#), or axial or helico-axial pumps
- Volumetric pumps as per [API Std 674](#)
- Electric generators as per [IEC 60034-1](#).

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 supplements, is the latest revision published at the effective date of this document.

Reference	Title
API Std 610	Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries
API Std 617	Axial and Centrifugal Compressors and Expander-compressor for Petroleum, Chemical and Gas Industry Services
API Std 618	Reciprocating Compressors for Petroleum, Petrochemical and Natural Gas Industries
API Std 619	Rotary-type Positive Displacement Compressors for Petroleum, Petrochemical and Natural Gas Industries
API Std 674	Positive Displacement Pumps - Reciprocating
IEC 60034-1	Rotating electrical machines - Part 1: Rating and performance
ISO 5199	Technical specifications for centrifugal pumps - Class II
ISO 13631	Packaged reciprocating gas compressors

General Specification		GS EP MEC 101
Driver Power Sizing		
Rev.: 10	Effective date: 10/2012	Page: 4 of 12

Total General Specifications

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published in the applicable yearly collection.

Reference	Title
GS EP ELE 001	Electrical design criteria
GS EP ELE 111	Induction motors

3. Definitions

- **Absorbed Power (P_{Absorbed}):** Power absorbed by the driven machine at any of the specified operating points provided by Company including all losses and all applicable standard tolerances of the driven machine.
- **Company:** Total E&P or any Total E&P subsidiary
- **Driven Machine Degradation ($K_{\text{Driven Machine Degradation}}$):** Percentage of the power corresponding to the fouling and the wearing of the driven machine.
- **Driven Machine Mechanical Losses ($P_{\text{Driven Machine Mechanical Losses}}$):** Mechanical losses generated by the driven machine in order to produce the required hydraulic or thermodynamic power P_{Fluid} .
- **Driven Machine Tolerance according to API or ISO standard ($K_{\text{Tolerance API/ISO}}$):** Tolerance in power of the driven machine allowed by the API, ISO or IEC standard.
- **Driver Machine Degradation ($K_{\text{Driver Degradation}}$):** Percentage of driver output power loss due to the driver ageing and fouling.
- **Driver Power (P_{Driver}):** Required power to be delivered at the driver shaft output.
- **Driver Speed Correction ($K_{\text{Speed Correction}}$):** Percentage of driver power correcting the driver site power at optimum running speed in order to obtain the driver site power at the actual running speed.
- **Fluid Power (P_{Fluid}):** Maximum required hydraulic or thermodynamic power from any of the Specified Operating Points.
- **Required Percentage of Power according to API or ISO standard ($K_{\text{Standards Required Power}}$):** percentage of power required by API or ISO in order to define the minimum Driver Power. Since API or ISO do not cover all driver types, the percentages of power required by API or ISO have been extended to those drivers on which standards are silent.
- **Site conditions:**
 - **Best Site Conditions:** Site Conditions at which driver delivers its highest shaft output power (e.g. minimum site temperature)
 - **Worst Site Conditions:** Site Conditions at which driver delivers its lowest shaft output power (e.g. maximum site temperature)