



Exploration & Production

GENERAL SPECIFICATION

HVAC

GS EP HVA 205

FAN UNIT(s)

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1. Scope

The purpose of this document is to define the minimum requirements for design and construction of *FAN(s)* and *FAN UNIT(s)* used for onshore and offshore *HVAC* installations.

The words and expressions in CAPITAL CHARACTERS and *italic* are defined inside the General Specification **GS EP HVA 801**.

When other words require a definition only to be used in the present document, then the definition is given in a dedicated paragraph of the present document and the defined word, when used, is marked in small and *italic* characters.

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.

Equipment and installations shall be in accordance with (by order of precedence):

1. The country local regulations where equipment and/or installations shall be operated ;
2. Total General Specifications as listed in **GS EP HVA 000** ;
3. The International Standards ;
4. The French Regulation (when Country local regulation does not exist).

International System of Units (SI) shall be used.

Notes:

- In case of discrepancy between documents (whatever the documents and / or whatever origins), the most expensive solution must be quoted by *BIDDER*. During the studies (Basic Engineering and / or Detailed Engineering) *CONTRACTOR(s)* shall raise the discrepancy in question to COMPANY's *HVAC SPECIALIST* who will then review and advise which document(s) is (are) to be specified for the project.
- *HVAC VENDOR* or *CONTRACTOR* may propose proven improvements to the reference documents but must obtain written approval of COMPANY prior to implementation.
- An International Standard is a good "engineering practice" which shall be recognised and taken into consideration by *VENDOR*, *SUPPLIER*, *MANUFACTURER* and/or *CONTRACTOR*. If required, the translation of the standards must be included into *HVAC* scope.
- The latest revision of standards, codes, regulations and the published errata if any must be used and applied by *VENDOR*, *SUPPLIER*, *MANUFACTURER* and *CONTRACTOR*.

All pictures and figures within this specification are indicated for illustration and example purposes only.

Standards

Reference	Title
ISO 1940-1	Mechanical vibration – Balance quality requirements for rotors in a constant (rigid) state – Part 1: Specification and verification of balance tolerances
NF EN 1127-1	Explosion prevention and protection, basic concepts and Methodology – Part 1: Basic concepts and methodology.
NF EN 13053	Ventilation for buildings – Air handling units – Rating and performance for units, components and sections.
NF EN 13463 (Parts 1; 5)	Non-electrical equipment for potentially explosive atmospheres. Basic method and requirements – (Parts 1; 5)
NF EN 14986	Design of fans working in potentially explosive atmospheres
NF EN 60034-30	Rotating electrical machines – - Part 30: efficiency classes of single-speed, three-phase, cage-induction motors (IE-code)
NF EN ISO 12499	Industrial fans – Mechanical safety of fans – Guarding
NF EN ISO 13349	Fans – Vocabulary and definitions of categories
NF EN ISO 4628	Evaluation of degradation of coatings – Designation of quantity and size of defects, and of intensity of uniform changes in appearance
NF ISO 14694	Industrial Fans – Specifications for balance quality and vibration levels

Professional Documents

Reference	Title
ASHRAE	2008 ASHRAE Handbook
CEMEP	European committee of manufacturers of electrical machines and power electronics.
Fan Manufacturers Association	Position statement on fans intended for use in potentially explosive atmospheres – Conformity with the ATEX Directive 94/9/EC – 3rd edition – 04/07/2003.



Regulations

Reference	Title
Directive 2005/32/EC	Directive of the European Parliament and of the Council with regard to ecodesign requirements for electric motors
Directive 94/9/EC, referred to a ATEX 100a/95	Directive of the European Parliament and the Council on the approximation of the laws of the member states concerning equipment and protective systems intended for use in potentially explosive atmospheres.

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
Not applicable	

Total General Specifications

Reference	Title
GS EP COR 350	External protection of offshore and coastal structures and equipment by painting
GS EP ELE 031	Design of earthing and bonding systems
GS EP ELE 111	Induction motors
GS EP HVA 000	List of HVAC specifications
GS EP HVA 010	Selection of stainless steel grade for HVAC Equipment
GS EP HVA 100	HVAC Basis of design
GS EP HVA 202	Air handling unit(s) (AHU)
GS EP HVA 223	Kitchen Hood(s)
GS EP HVA 301	HVAC plant room
GS EP HVA 400	Ducts and accessories for HVAC systems
GS EP HVA 410	HVAC Equipment equipment FACTORY COMPLIANCE TESTS
GS EP HVA 801	Terminology, definitions, abbreviations
GS EP HVA 830	Typicals HVAC P&ID – D&ID

3. Definitions and abbreviations

Definitions of the two following terms, *FAN(s)* and *FAN UNIT(s)* are indicated within [GS EP HVA 801](#).

Definitions of verbs "shall", "should", "may", "can" and "must" are indicated within [GS EP HVA 801](#).

Additional definitions for type and associated components of *FAN(s)* and *FAN UNIT(s)* are indicated within [NF EN ISO 13349](#).

Note: The term "casing" written in *italic* character shall be understood as the *FAN casing* (volute), whereas casing (not in *italic* character) shall be understood as the *AHU casing*.

4. Remark concerning *AHU* casing

A *FAN UNIT* included within a casing shall be considered as an *AIR HANDLING UNIT*, as per definition in [GS EP HVA 801](#), and hence, this *AIR HANDLING UNIT* shall be compliant with [GS EP HVA 202](#).

All *FAN UNITs* shall be included within a casing, except the following cases which may be considered, after written agreement from COMPANY HVAC SPECIALIST:

- *FAN UNIT* equipped with a single inlet centrifugal *FAN* installed directly inside ducting
- *FAN UNIT* equipped with an axial *FAN*.

Note: Section 3.9 "Fan" of [GS EP HVA 202](#) shall be cancelled and is replaced by the present specification.

A *FAN UNIT* installed in a casing working as an *EXHAUST* system, shall be so called *EXHAUST* air *AHU* (refer to [GS EP HVA 801](#) and [GS EP HVA 830](#)).

A *FAN UNIT* installed without a casing working as an *EXHAUST* system, shall be so called *EXHAUST* air *FAN UNIT* (refer to [GS EP HVA 801](#) and [GS EP HVA 830](#)).

A *FAN UNIT* installed in a casing working as a *SUPPLY* system, shall be so called *SUPPLY* air *AHU* (refer to [GS EP HVA 801](#) and [GS EP HVA 830](#)).

A *FAN UNIT* installed without a casing working as a *SUPPLY* system, shall be so called *SUPPLY* air *FAN UNIT* (refer to [GS EP HVA 801](#) and [GS EP HVA 830](#)).

A *FAN UNIT* installed in a casing working as a *RECIRCULATION* system, shall be so called *RECIRCULATION* air *AHU* (refer to [GS EP HVA 801](#) and [GS EP HVA 830](#)).

A *FAN UNIT* installed without a casing working as a *RECIRCULATION* system, shall be so called *RECIRCULATION* air *FAN UNIT* (refer to [GS EP HVA 801](#) and [GS EP HVA 830](#)).

5. *FAN UNIT(s)*

Note: the term "*FAN UNIT*" within this section includes the three following types of *FAN UNIT*: *EXHAUST* air *FAN UNIT*, *SUPPLY* air *FAN UNIT* and *RECIRCULATION* air *FAN UNIT*.

All sub-sections of the section 6 "*FAN UNIT(s)* for *AHU(s)*" are applicable. However, the requirements dedicated to double air inlets *FAN(s)* are not applicable.

It shall be noted that only direct driven *FAN(s)* are acceptable for *FAN UNIT(s)* installed without casing.

6. FAN UNIT(s) for AHU(s)

Note: the term "AHU" within this section includes the three following types of AHUs: *EXHAUST* air AHU, *SUPPLY* air AHU and *RECIRCULATION* air AHU.

6.1 Selection

FAN shall be backward or forward centrifugal type, simple or double air inlet.

Selection of *FAN* type shall take into account the performance characteristics and the applications of *FAN*.

FAN shall be selected to operate on the steep part of their pressure/volume curve to enable a minimum volume variation due adverse wind conditions and/or variation in duct operating conditions.

FAN calculations, including operating margins, shall be clearly indicated within the *CONTRACTOR* calculations note.

FAN operating point shall be selected based on the following principle:

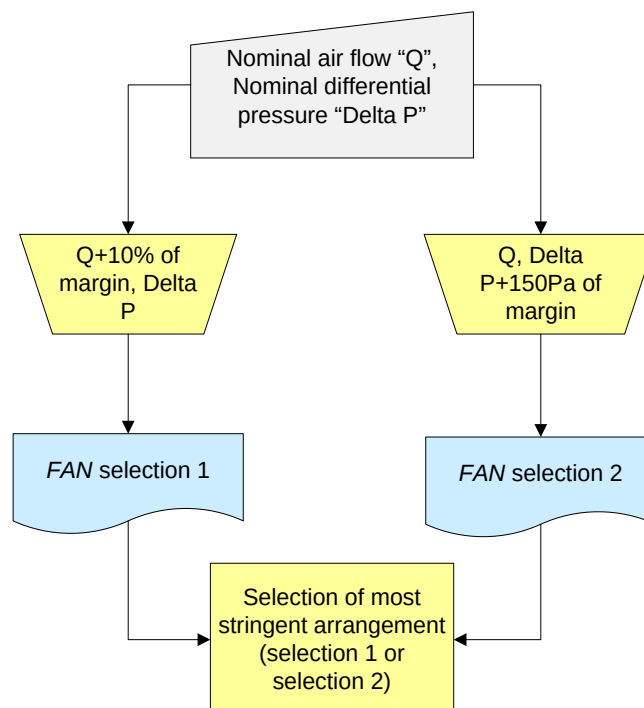


Figure 1 - FAN selection principle

Note: 150 Pa is an arbitrary value which takes into account potential increase of pressure drop in aerualic network on which *FAN UNIT* is connected, in case of modification of network during construction.

6.2 Construction

FAN UNIT for AHU shall be preferably in-house production of AHU MANUFACTURER.

In case the dimensions of the *FAN UNIT* do not permit to enter or remove one or several components of the *FAN UNIT* (particularly the *FAN*) inside or outside the building, where *FAN*