3- TECHNICAL DESCRIPTION

3.1- Name

The involved machine has the following name:

INDUSTRIAL FAN

3.2- Description of the machine

The industrial fan (hereinafter referred to as fan) is a turbo operating machine receiving mechanical energy and using it, by means of a bladed impeller, to keep a continuous flow of air or other gases passing through the same, providing a work per mass unit not greater than 25 kJ/kg (UNI EN ISO 13349).

- **Radial fan (centrifugal)**: fan where the fluid meets the impeller in the axial direction with it and the leaves it in a direction perpendicular to the axis. The blades: **negative** where the fluid is processed with the rear and convex part (EU-EUM-MPR-TR-BT-BPRD-APR.-APR.D); **positive** where the fluid is processed with the front and concave part (BP-TPA-TQ-TF-TG-AP.); **radial** or straight: where the fluid is processed indistinctly with the rear or front part, if there are no blade reinforcements on one or the other part (TTRC-TH) **(s. FIG. 3)**.
- **Axial fan**: fan where the fluid meets and leaves the impeller along cylindrical surfaces coaxial with it.
  The blades: **WITH WINGED PROFILE** obtained by aluminum die casting (EVF-EVP-EVC-EVL-EVT).
  Air Flow A: Which means that the Air flow goes from the motor (support) to the impeller.
  Air Flow B: Which means that the Air flow goes from the impeller to the motor (support).
  Air Flow U: Which means that the Air Flow goes down up.
  Air Flow D: Which means that the Air Flow goes top down **(s. par. 3.6.5)**.

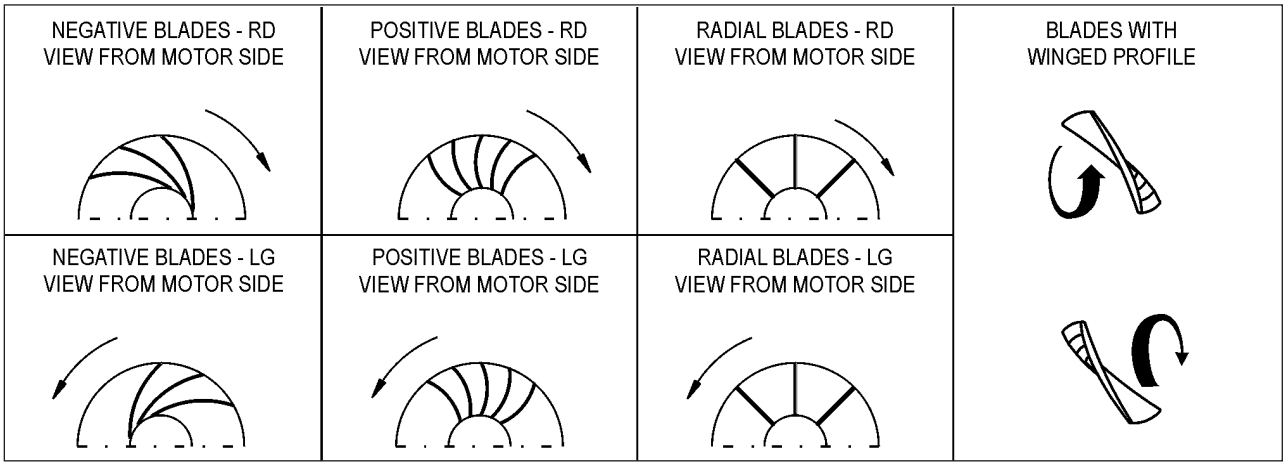

FIG. 3 *(Description of the machine)*

3.3- Classification (TAB. 4)

Fans are classified based on the maximum deliverable pressure trend, the flow in the impeller, and the drive system.

Based on the maximum deliverable **pressure**, fans are classified as **high pressure, medium pressure** and **low pressure** fans.

Considering the **trend of the flow** in the impeller, they can be classified as **centrifugal** or **axial**.
Centrifugal fans are fans in which air enters the impeller with a direction that is essentially axial and leaves the same with a direction that is perpendicular to the axis. A specific configuration is the **double stage** one.
Axial fans are fans in which air enters and leaves the impeller along essentially cylindrical surfaces coaxial with the fan itself.

Based on the drive system, fans can be subdivided into fans with **belt drive** and fans **directly coupled with an internal electric motor**. A specific direct coupling system is the one with flexible joint (**N8**).

Pressure	**HIGH PRESSURE**				**MEDIUM PRESSURE**		**LOW PRESSURE**			
Drive system	Direct		Belt	Direct N8	Direct	Belt	Direct		Belt	
Executions	4/5		1/9/12	8	4/5	1/9/12	4	4/5	1/9	1/9/12
Flow trend	Centrifugal	Double stage	Centrifugal		Centrifugal		Axial	Centrifugal	Axial	Centrifugal
Series	APE	APRED	APEc	APRF/N8	EU	EUc	EVP	BP	EVc	BPRc
	APF	APRFD	APFc	APRG/N8	EUM	EUMc	EVF	BPR		BPc
	APG	APRGD	APGc	APRH/N8	MPR	TRc	EVL	BT		BPRDc (*)
	APRF		APRFc	APRI/N8	TR	TTRc	EVT			
	APRG		APRGc	APRL/N8	TPA	TFc				
	APRH		APRHc		TQ	TGc				
	APRI		APRIc		TF	THc				
	APRL		APRLc		TG	MPRc				
					TH					
(*) Arrangement 6, 19, 18										

TAB. 4 *(Fan classification)*

3.4- Model Identification

Identify one's own model is very important since it allows searching for the related instructions and information in this manual.
The abbreviation of the model is given on the CE marking plate applied on the fan and/or stated on the Declaration of CE Conformity.

⚠ DANGER

MODEL IDENTIFICATION OF FANS COMPLYING WITH THE ATEX 94/9/EC DIRECTIVE IS GIVEN ON THE CE MARKING PLATE (FIG. 2) APPLIED ON THE FAN AND STATED ON THE DECLARATION OF CE CONFORMITY AND IS CHARACTERIZED BY THE "EX" SYMBOL.

3.5- Technical data

Data on air noise and the weight of the main components of the fan are given also in **chap. 13**.
All other technical data concerning each fan model are given on the "paper catalogs" (that can be requested to the Manufacturer or to the Authorized Dealer) and on the "technical data sheets" that can be displayed and printed from the website **www.euroventilatori-int.it**.
To display and print the technical data sheet related to a specific fan model, proceed as follows:

1) Connect to the website mentioned above;
2) Select the wished language;
3) Select the item "products";
4) Select the "category" and the "series"; the following will appear:
- V (m^3/h)
- Pt (kg/m^2)
- Drive type (direct or indirect)
- Use (detailed description of the drawn in fluid type and of the destination of use)
- Temperature of the drawn in fluid (°C)
- Fan and impeller image

5) Select the "model" - the following will appear:

- Flow rate (m^3/min. or m^3/s or m^3/h)
- Suction pressure Pa (kg/m^2)
- Pressing pressure Pa (kg/m^2)
- Installed electric motor (type)
- Installed power (kW)
- Rotation speed (rpm)
- Fluid type
- Suction flange (Ø mm)
- Pressing flange (Ø mm)
- Weight with electric motor (kg)
- PD2 (kgm^2)
- Any other data (e.g. swinging)
- Interactive graph (diagram with load curves)
- Specific technical drawing with overall dimensions in DWG and DXF digital formats (Password Protected Area).

3.5.1- Characteristic data

The basic data characterizing the fan are the following ones:

- **Volumetric flow rate**: This is the fluid volume that passes through the fan in a given period of time, in a second (m^3/s), in one minute (m^3/min), in an hour (m^3/h);
- **Static pressure**: This is the energy that the impeller supplies to overcome the resistance opposed by the circuit to the passage of fluid (it is measured in mm water column or Pascal = Pa);
- **Dynamic pressure**: This is the energy featured by the fluid due to the speed impressed by the impeller at the outlet of the discharge end of the fan (it is measured in mm water column or Pascal);
- **Total pressure**: This is the algebraic sum of the static pressure and of the dynamic pressure (it is measured in mm water column or Pascal);
- **Rotation speed**: This is the speed of the impeller and is measured in revolutions per minute (rpm);
- **Yield**: This is the percentage ratio between the energy that the fan is able to convey to the fluid and the energy supplied by the motor to the impeller, depending on the impeller shape;
- **Absorbed power**: This is the required power (supplied by the motor) to the fan for its operation - it is measured in kW;
- **Motor rating plate power**: This is the rated power that the motor can provide; it must always be greater than the power absorbed by the fan - it is measured in kW;
- **Sound Pressure Level**: This is the energy which propagates in the ear that generates the vibration of the eardrum, in other words it is the noise level of the fan and is assessed in dB(A) (decibel) according to scale A (scale that allows assessing the impact of noise on human ear in relation to the frequency of the same);
- **Sound power:** This is the index of the emission ofacoustic energy and it is an inherent and invariant feature of a sound source. Sound power is expressed in Watts.