



**ابنیه پایدار سبز**

**ABNIE PAIDAR SABZ**

[www.abpsoil.com](http://www.abpsoil.com)

محاسبه بلوئر

اردیبهشت 99

# How to Select the Proper Root Blower and Data Required for Ordering

## 1) Usage and Use Conditions

Specify your usage, location, and running conditions such as continuous or intermittent.

## 2) Air-Capacity

Specify the required air-capacity is based on the standard conditions (1 Atm., 20° C, relative humidity 65%) or on the referential conditions. Unless otherwise specified, air-capacity is indicated in the inlet conditions rather than the outlet conditions.

## 3) Pressure

Please specify whether the pressure is constant or variant. In the variant case, please specify the corresponding relationship between the air-capacity and pressure, such as air-capacity increases when the pressure decreases, and vice versa. Please also provide the range of variation and specify whether the pressure

specified is the static pressure at the outlet or the differential pressure between the inlet and outlet. Specify whether the inlet pressure is at 1Atm. If not, the differential pressure between the inlet and outlet should be provided.

## 4) Type and Specific Weight of the Gas Transported

**Please Specify the Following Items:**

- ❖ Gas type and its ingredients
- ❖ Portion and size of other ingredients
- ❖ The Specific weight
- ❖ Chemical characteristics
- ❖ Suggested materials
- ❖ Whether the gas is explosive or toxic

Ordinary air shall be used if none of the above items is provided.

## 5) Temperature of the Gas

The standard Trun-Dean Blower is for transporting a gas of normal inlet temperature. If the inlet temperature is high, the rotor of the blower may seize due to thermal expansion. Let us know if the inlet temperature is higher than the normal temperature, so we can incorporate special design for the high-temperature conditions.

## 6) Electric Motor

For a motor driven unit, please advise the voltage, frequency, phase, etc. of your electricity.

## Model Selection Process

### 1) Convert the Operation Specifications into Nominal (Catalog) Specifications

Nominal Air-Capacity: It means the volumetric air-capacity converted into the inlet pressure and temperature.

Nominal Static Air-Capacity: In the TH Type, it means the outlet pressure (the inlet pressure is 1 Atm.).  
In the TV Type, it means the inlet pressure (the outlet pressure is 1 Atm.).

For operating requirements different from the above conditions, convert as follows:

(1) The air-capacity  $Q_N$ , in the standard conditions. ( $0^\circ\text{C}$ , absolute pressure 10332 mmAq, relative humidity 0%, also known as NTP, the specific weight of air in these conditions is 1.293kg/m<sup>3</sup>), can be calculated with the following formula:

$$Q = Q_N \times \frac{P_1}{P_2} \times \frac{T_2}{T_1}$$

$Q$  (m<sup>3</sup>/min): Air-capacity shown in the catalog

$Q_N$  (m<sup>3</sup>/min): Air-capacity in the standard conditions

$T_1$  ( $^\circ\text{C}$ ): Root blower inlet air temperature

$PS$  (mmAq): Nominal static pressure

$P_1$  (mmAq): Inlet operation pressure

$P_2$  (mmAq): Outlet operation pressure

$$Q = Q_N \times \frac{10332}{10332+P_1} \times \frac{273+T_1}{10332+P_1} \text{ (m}^3\text{/min)}$$

(2) When TH Type inlet pressure  $\neq$  1Atm.

$$PS = \left( \frac{10332+P_2}{10332+P_1} - 1 \right) \times 10332 \text{ (mmAq)}$$

(3) When TH Type outlet pressure  $\neq$  1Atm.

$$PS = \left( \frac{10332+P_1}{10332+P_2} - 1 \right) \times 10332 \text{ (mmAq)}$$

### 2) Select Proper Model According to the Converted Specifications

Select the proper horsepower and RPM from the performance chart according to the converted air-capacity and static pressure.

#### ❖ Example 1

Operation specification:

Air-capacity: 3.87 m<sup>3</sup>/min

Static pressure: 5000 mmAq (at 30 $^\circ\text{C}$ )

- (1) Since the inlet condition is 1atm., the air-capacity and static pressure require no conversion.
- (2) According to the above specifications, we find from page 5, TH-80 performance chart, that 1150 rpm and 10HP are what we need.

❖ **Example 2**

Operation specification:

Air-capacity: 20N m<sup>3</sup>/min

Static pressure:  $\frac{-1000}{+3515}$  mmAq (at 40°C)

- (1) Since the inlet condition is  $\neq$  1atm for the standard of air-capacity, the air-capacity and static pressure require the following conversion:

$$Q = 20 \times \frac{101325}{101325 - 1000} = 25.38758 \text{ (m}^3\text{/min)}$$

$$PS = (-1000 / 3515) \times 10332 = 5000 \text{ (mmAq)}$$

- (2) According to the conversion, we find 1300rpm and 40 HP on page 5, the performance chart of TH-150.

❖ **Example 3**

Operation specification:

Air-capacity: 10.35 m<sup>3</sup>/min

Static pressure: -4000 mmAq (at 40°C)

- (1) Since the inlet condition is 1 atm., the air-capacity and static pressure require no conversion.
- (2) According to the above specifications, we find from page 6, THV-125 performance chart, that 1150 rpm and 20HP are what we need.