Zitron Energy

The company

- *The Zitron group*
- *Zitron Nederland B.V.*
- *Talleres Zitron SA*
- *The Test Bench*
- *The Market*
- *The Produkt*
- *The Components*

The Zitron group

- *Talleres Zitron S.A. – Gijón – Spain*
- *Zitron Turkey*
- *Zitron Russia*
- *Zitron Iran*
- *Zitron Australia*
- *Zitron Mexico*
- *Zitron Netherlands*
- *Zitron India*
- *Zitron Chile*

Zitron Spain

ZITRON
Poligono de Porceyo
33280 Gijon - Asturias
Tel: 00 34 985 168 132
Fax: 00 34 985 168 047
E-mail: zitron@zitron.nl
Web: www.zitron.com

Zitron Netherlands

ZITRON NEDERLAND B.V.
Droogdokstraat 6
7553 GW Hengelo
Tel: +31 (0)74 240 8260
Fax: +31 (0)74 240 8266
E-mail: info@zitron.nl
Web: www.zitron.nl

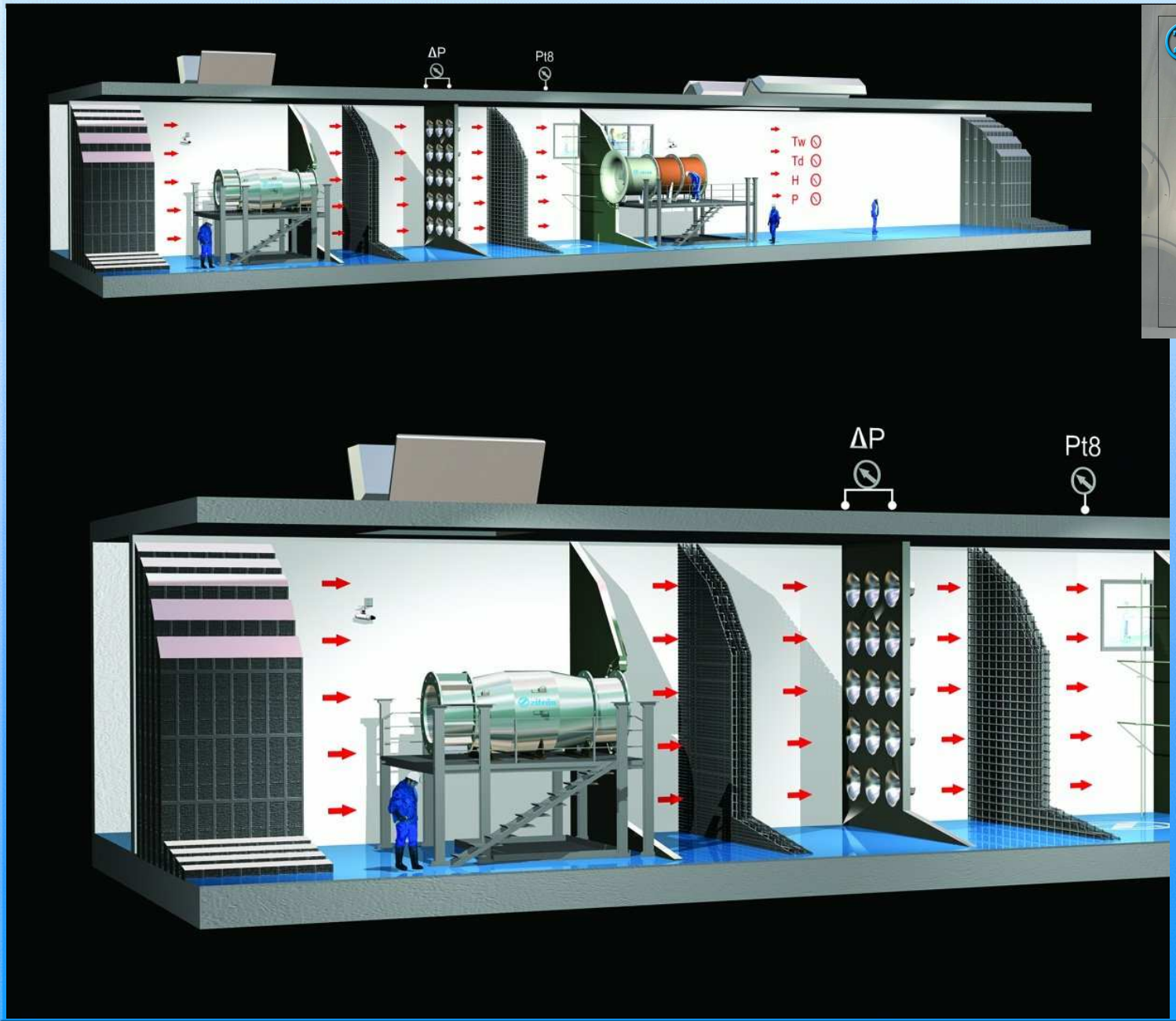
Talleres Zitron SA

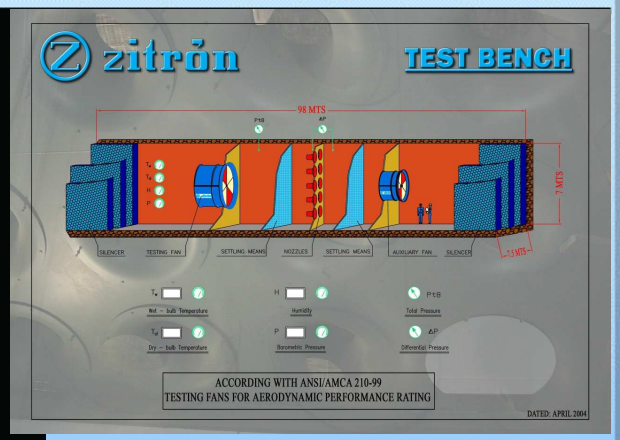
275 Employees, world wide

Hengelo Office

Zitron Netherlands B.V.
Droogdokstraat 6
7553 GW
The Netherlands
Tel +31 74 240 8260
Fax +31 74 240 8266
www.zitron.nl

Test bench

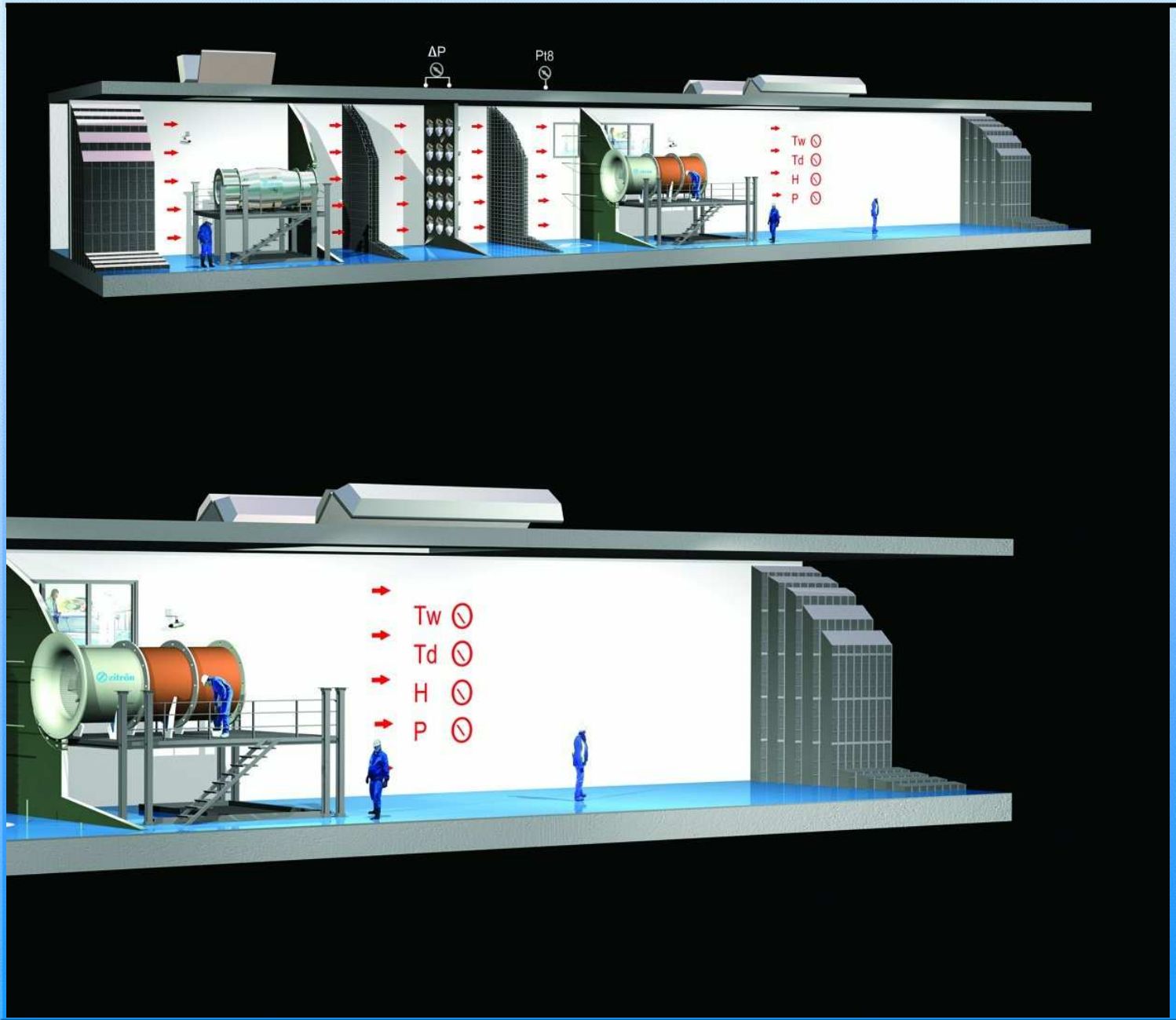




Dimensions:

- **L = 97,0 m.**
- **B = 7,5 m.**
- **H = 7,0 m.**

Test bench



Dimensions:

- **L = 97,0 m.**
- **B = 7,5 m.**
- **H = 7,0 m.**

The Market

Fans and Services for Power Stations

Ventilation systems for Tunnels

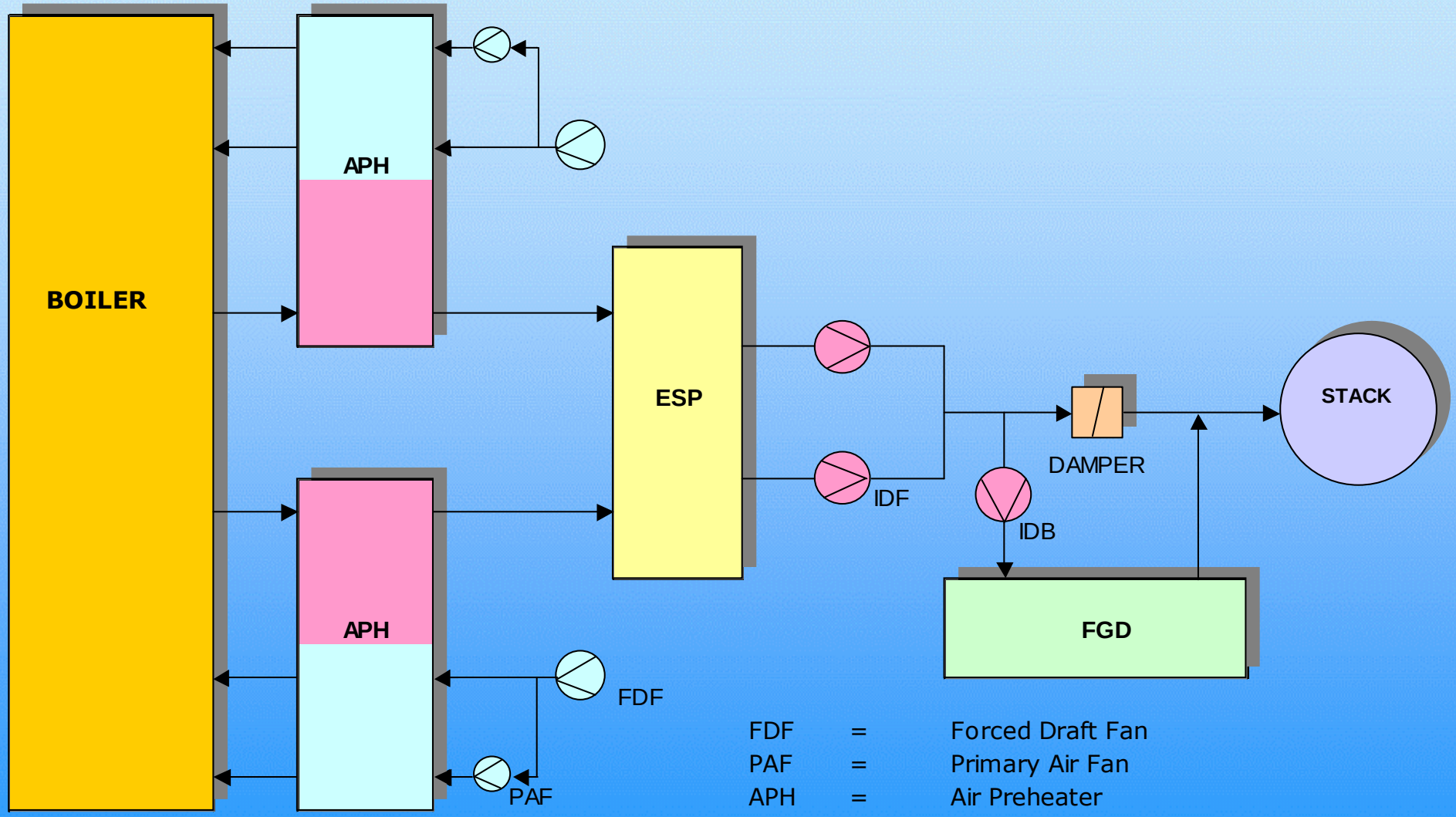
The scope of supply

- System-Pressure drop- and Noise calculations
- Selection of fans and duct lay-out
- Engineering of Fan-components
- The complete manufacturing in our workshops and at well experienced sub-contractors.
- The supply of all components
- The Project management
- Transportation to the site
- Installation and Commissioning
- Participation in site system testing.
- Service and Maintenance
- Spare parts

The Fantypes

- Axial flow fans with hydraulically adjustable blades, during operation.
- Mixed flow fans with inlet vane control (IVC).
- Centrifugal fans with and without IVC.
- Noise attenuators.

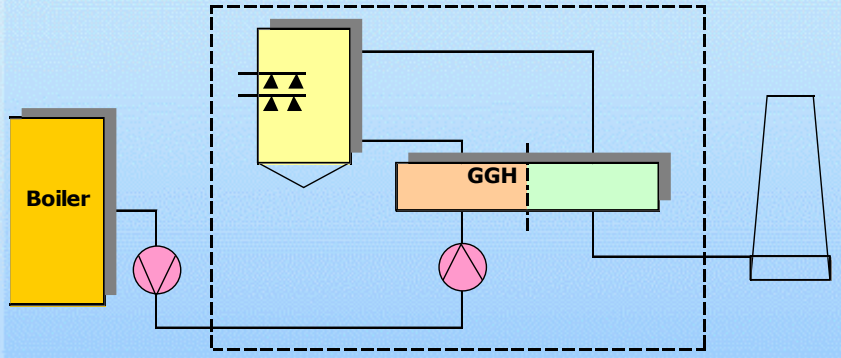
Boiler Scheme



FDF	=	Forced Draft Fan
PAF	=	Primary Air Fan
APH	=	Air Preheater
ESP	=	Electrostatic Precipitator
IDF	=	Induced Draft Fan
IDB	=	Induced Draft Boosterfan
FGD	=	Flue Gas Desulpherisation Unit (Scrubber)

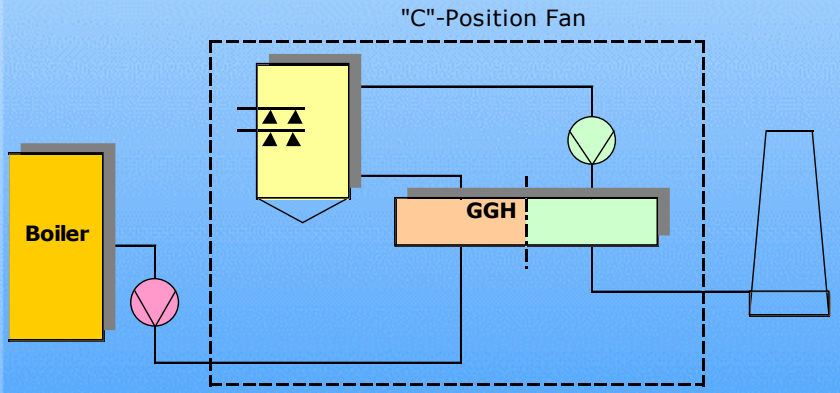
FGD De-Sox

"A"-Position Fan



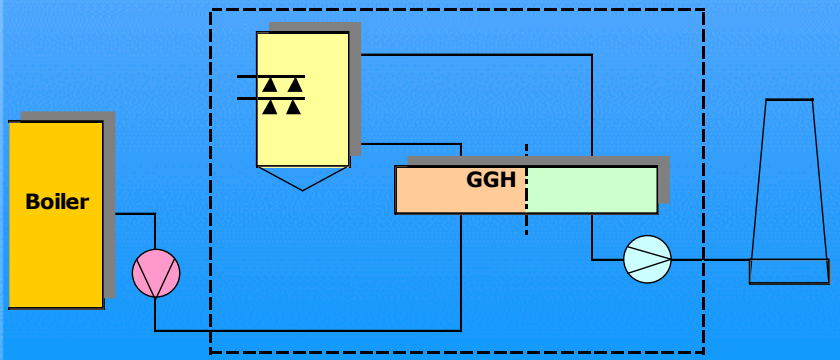
"A"-Position Boosterfan
- Fan is installed in the hot untreated flue gases (>120°C)
- High leakage in GGH from untreated- to treated gas-side
- Larger fan dimensions, standard materials

"C"-Position Fan



"C"-Position Boosterfan
- Fan is installed in the cold "wet" treated flue gases (<50°C)
- Lowest leakage in GGH from treated- to untreated gas-side
- Smaller fan dimensions
- Because of the corrosive nature of the medium, washing facility and rubber lining of the internal fan parts are necessary

"D"-Position Fan

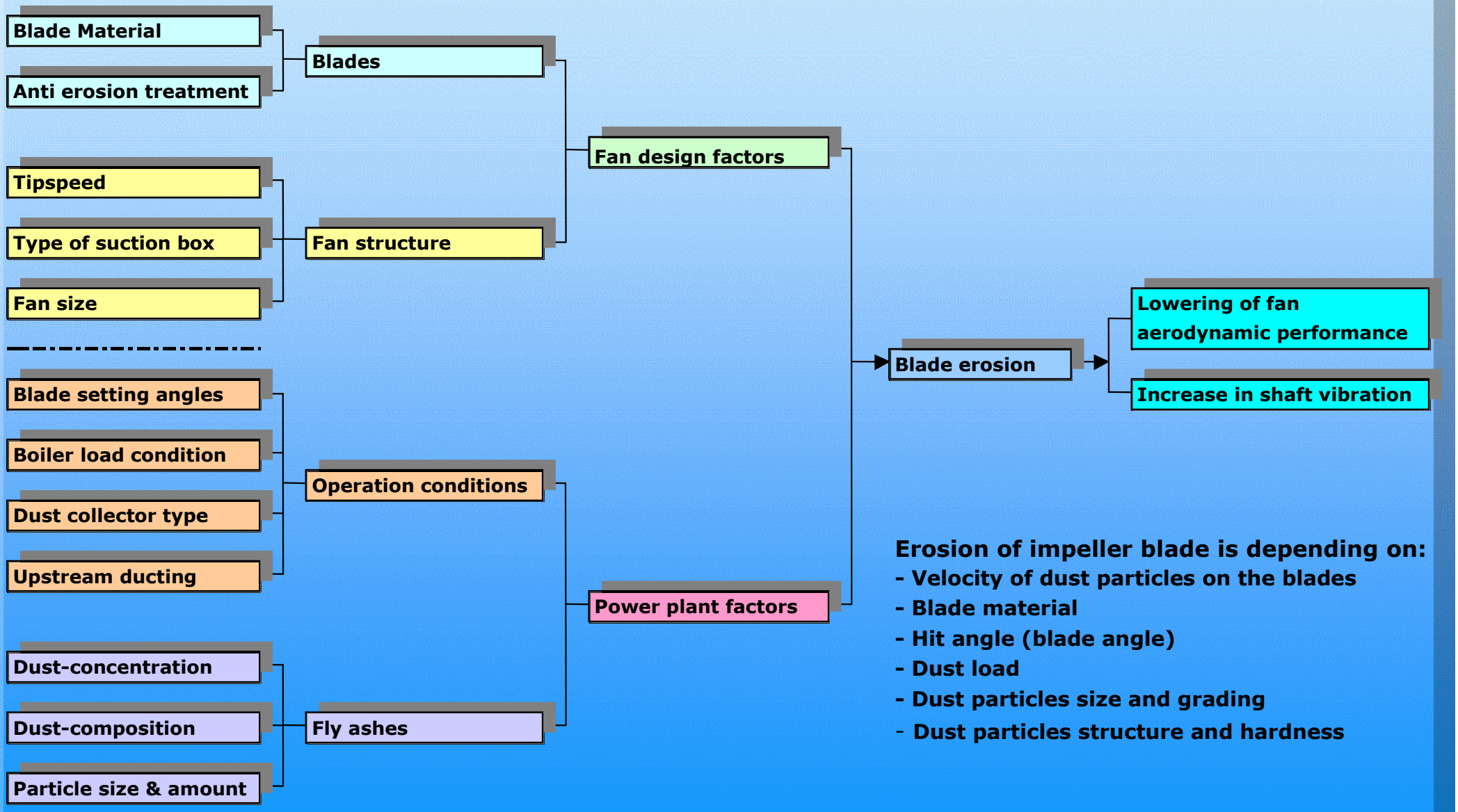


"D"-Position Boosterfan
- Fan is installed in the "dry" treated flue gases (>80°C)
- Low leakage in GGH from treated- to untreated gas-side
- Normal fan dimensions, no erosion

Erosion Factors

zitrón

Factors in Fan Blade Erosion

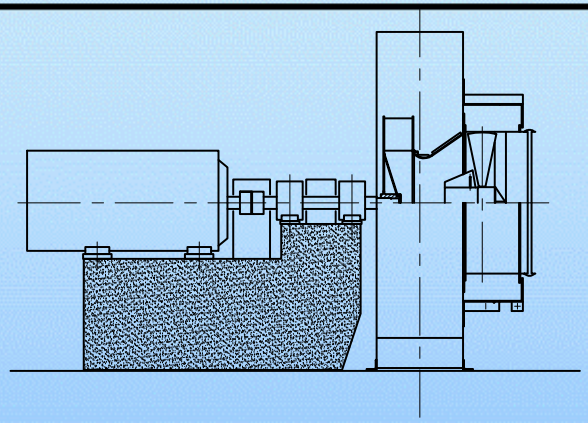


Erosion of impeller blade is depending on:

- Velocity of dust particles on the blades
- Blade material
- Hit angle (blade angle)
- Dust load
- Dust particles size and grading
- Dust particles structure and hardness

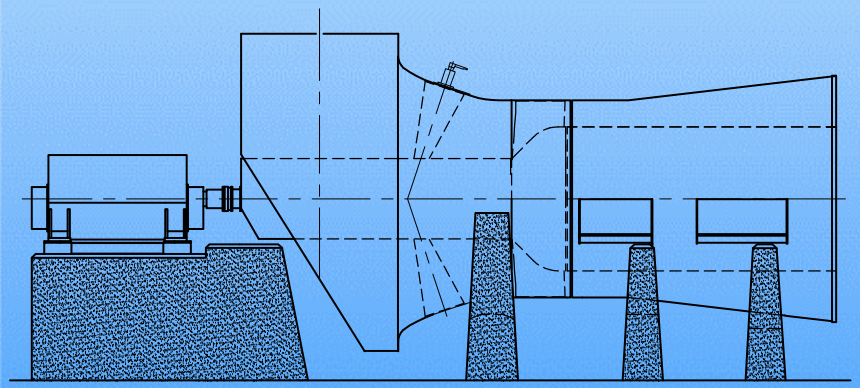
Fans for Power stations

zitrón



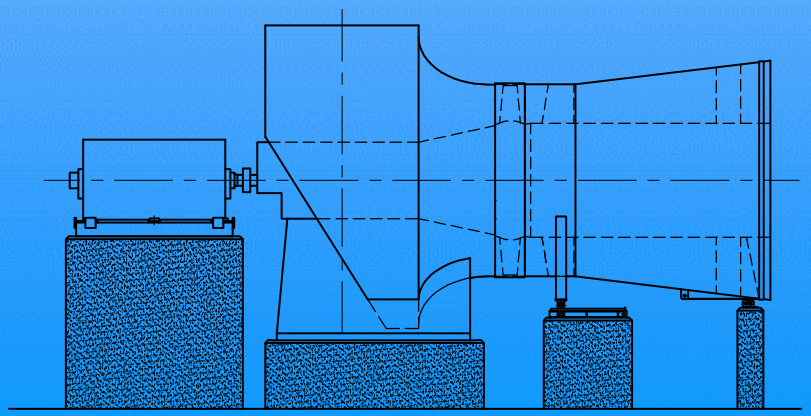
Centrifugal Fan

- Flow control by means of IVC (Inlet Vane Control)
- Low specific speed (ns = f x Q/H)



Mixed Flow (Radax) Fan

- Flow control by means of IVC (Inlet Vane Control)
- Medium specific speed

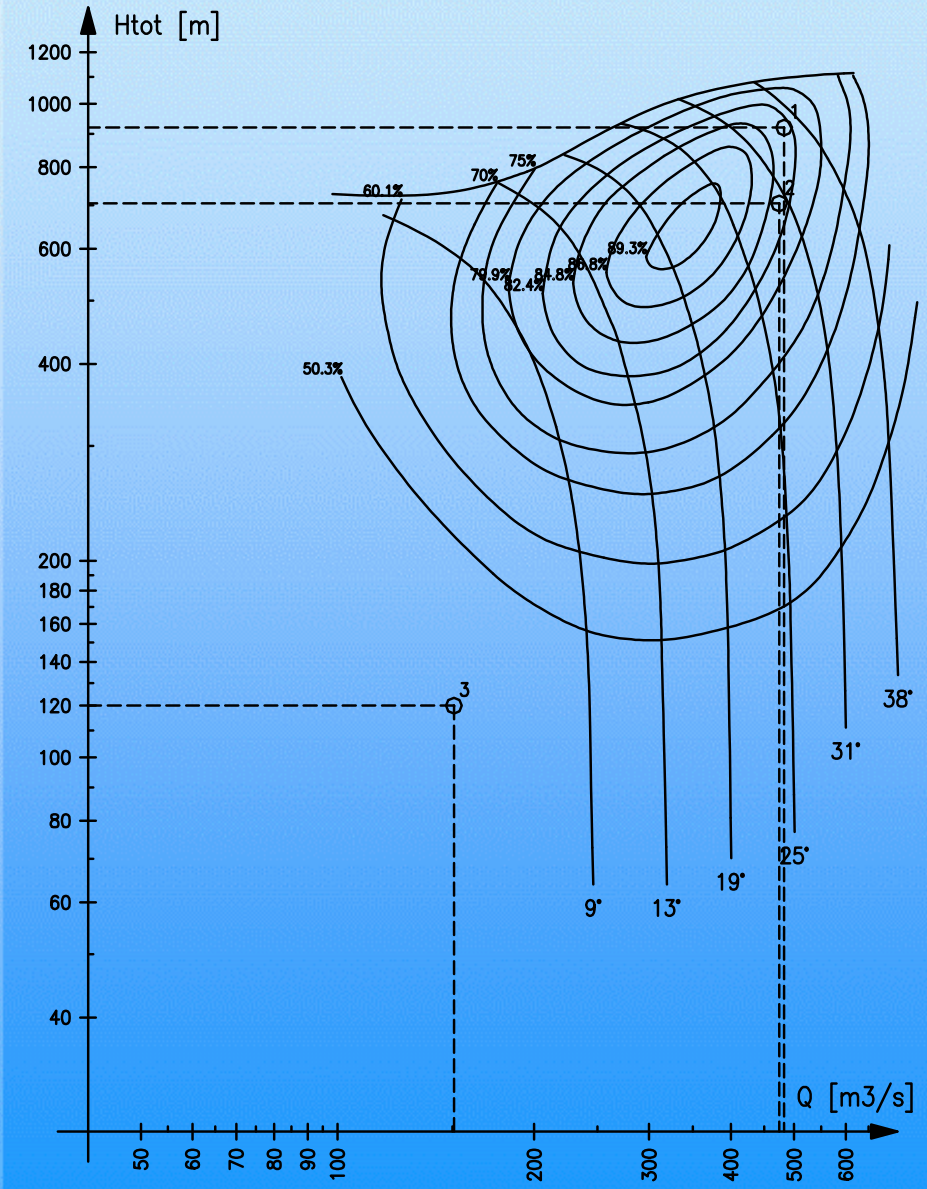


Axial Flow Fan

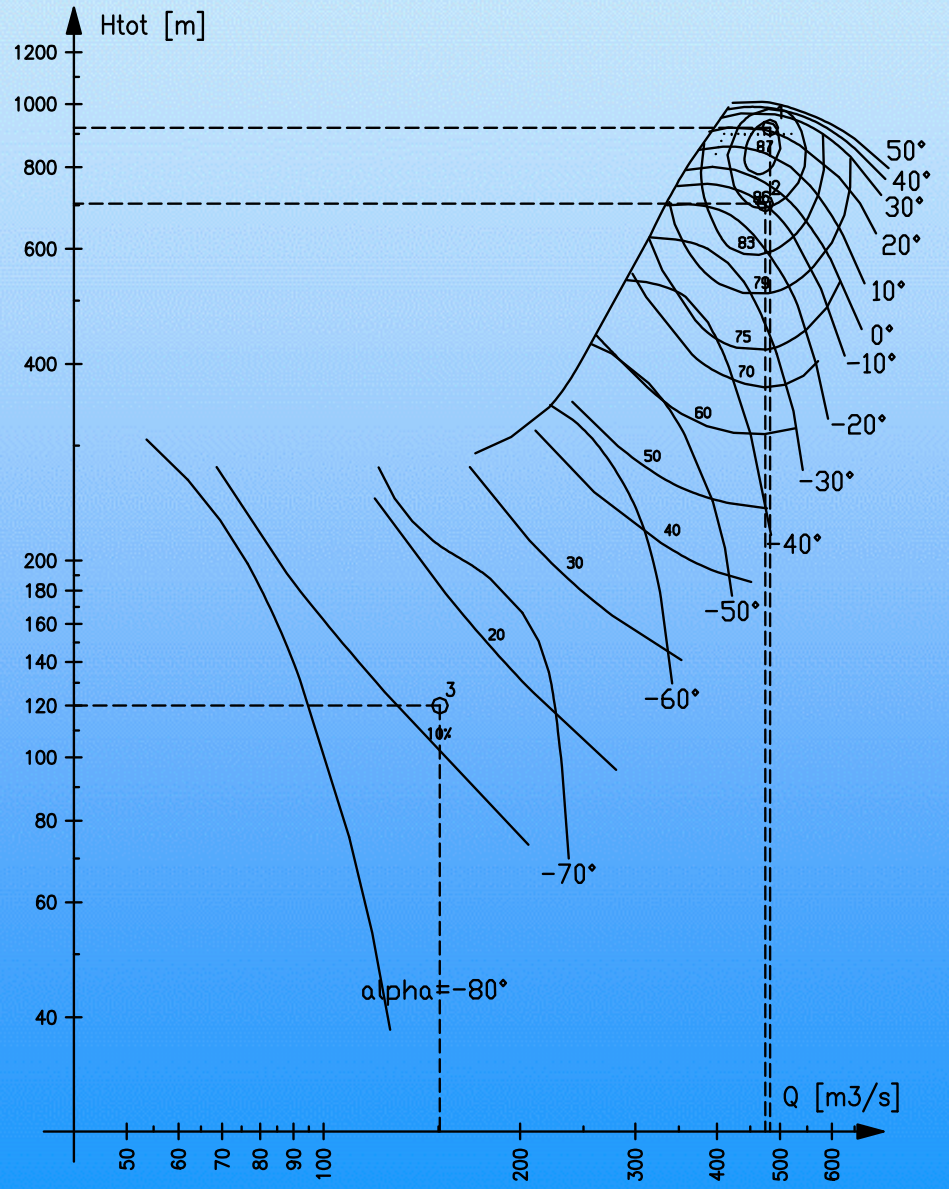
- Flow control by means of hydraulic blade adjustment
- High specific speed

Performance curves

zitrón

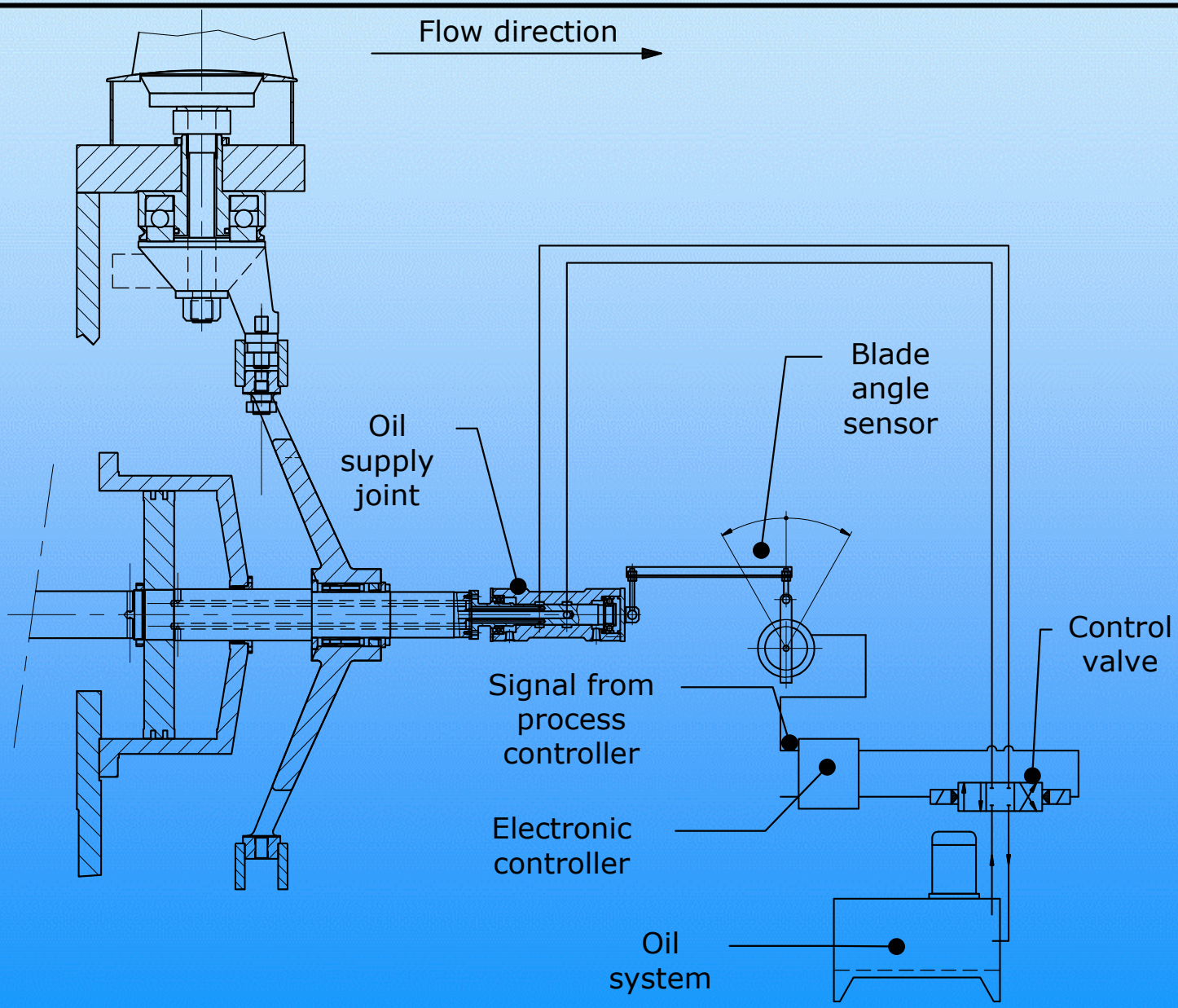


Variable Pitch Fan



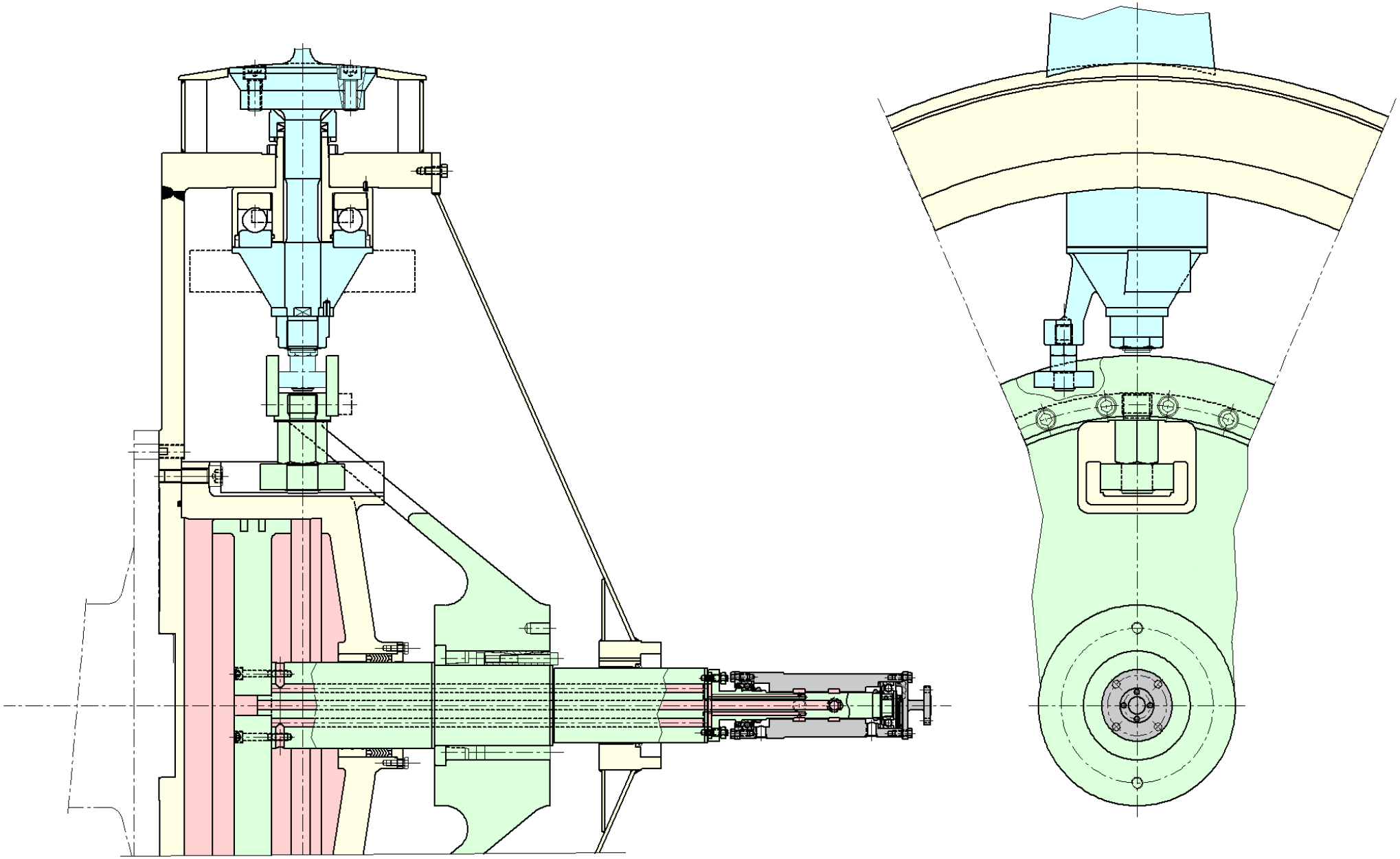
Mixed Flow Fan

Blade adjustment

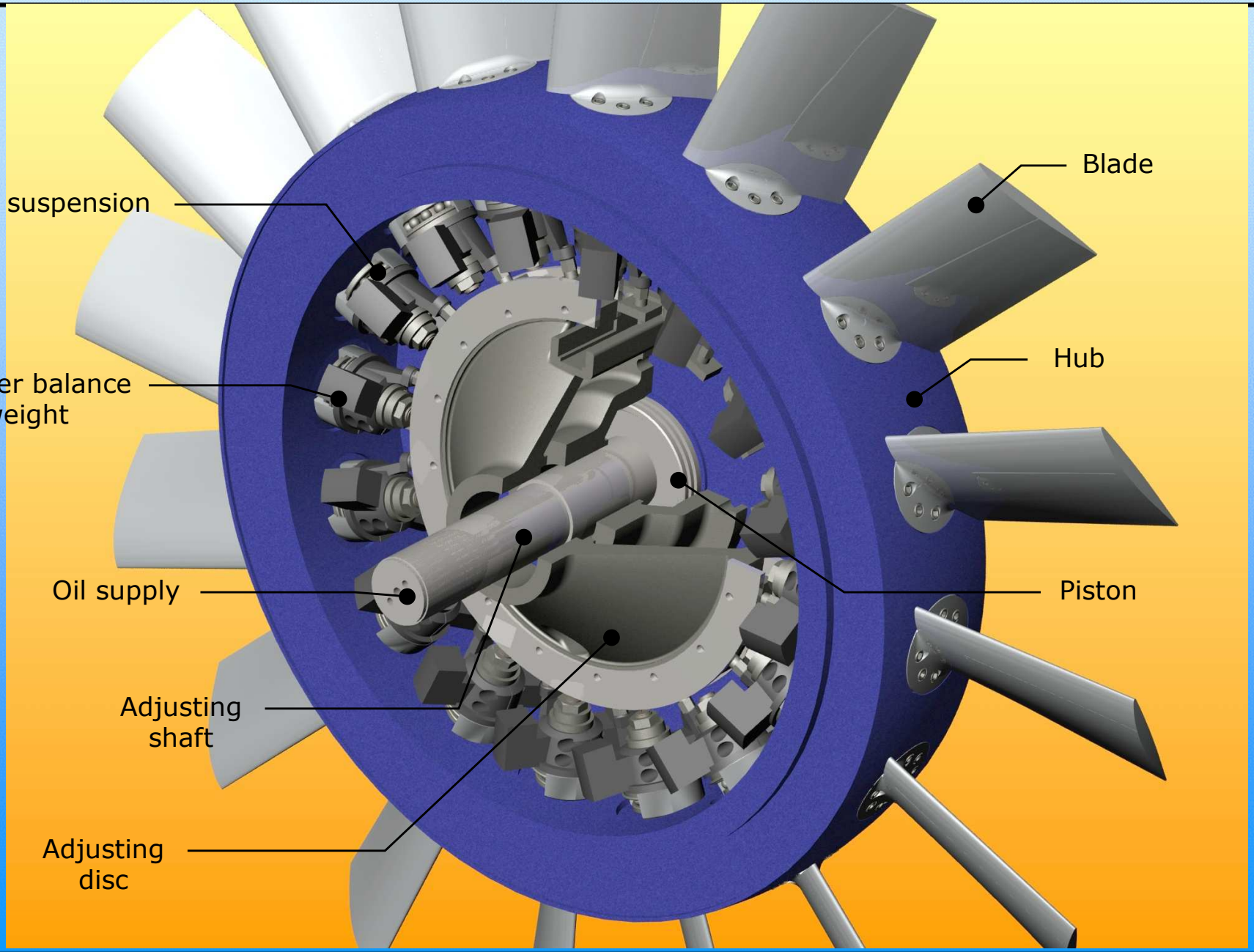


Variable pitch impeller

zitrón

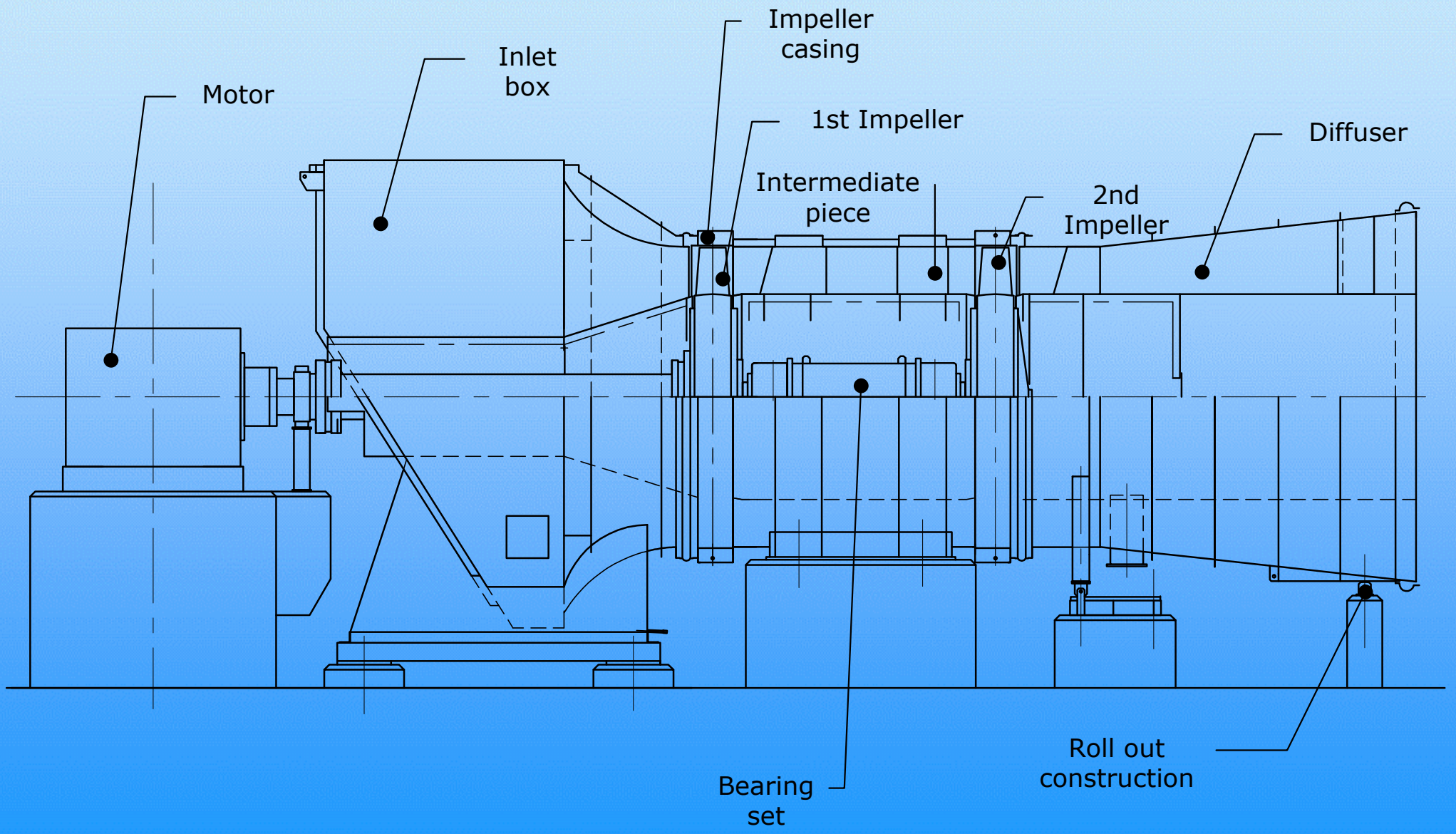


Variable pitch impeller



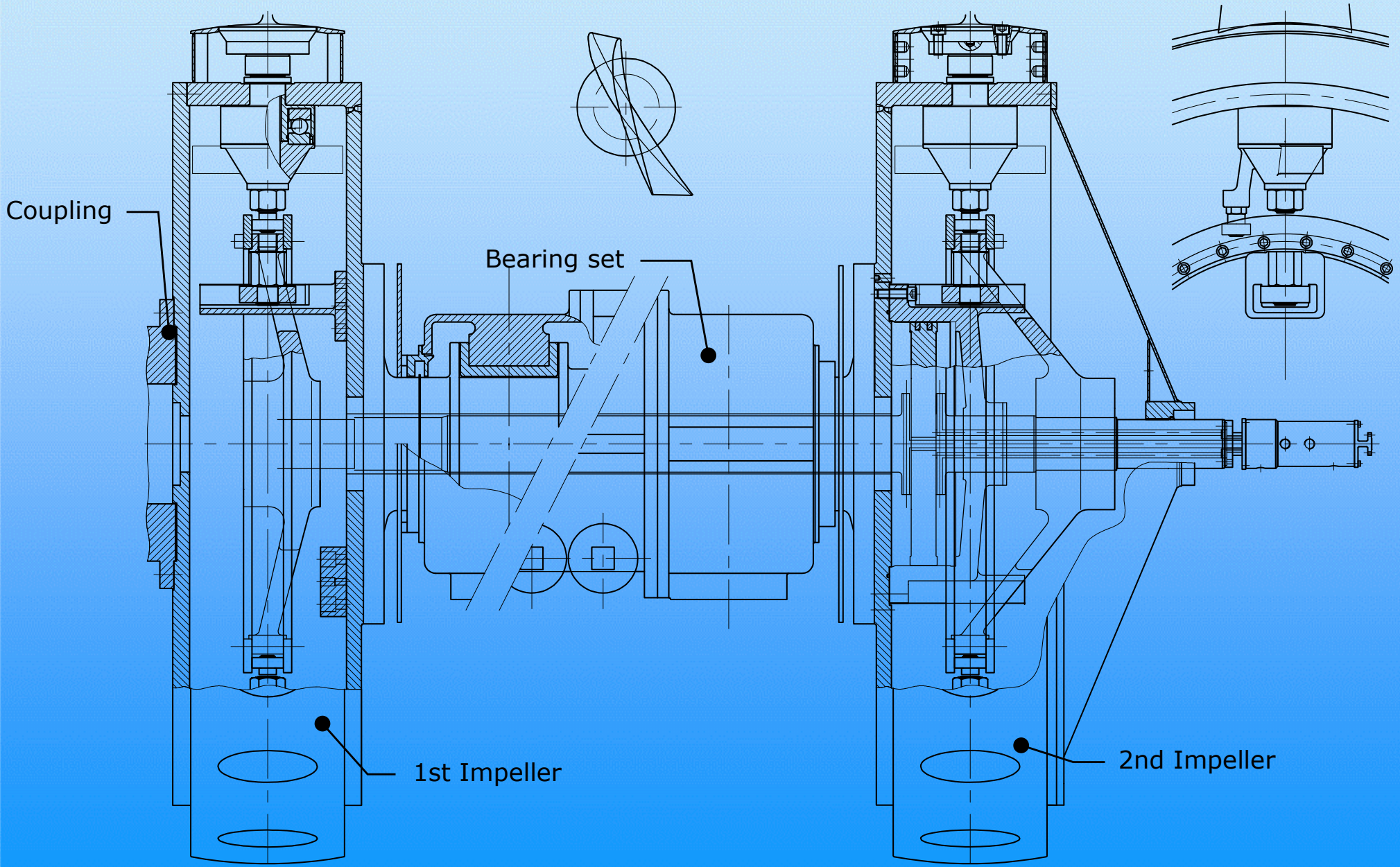
2-Stage Fan

zitrón



2-Stage Impeller

zitrón

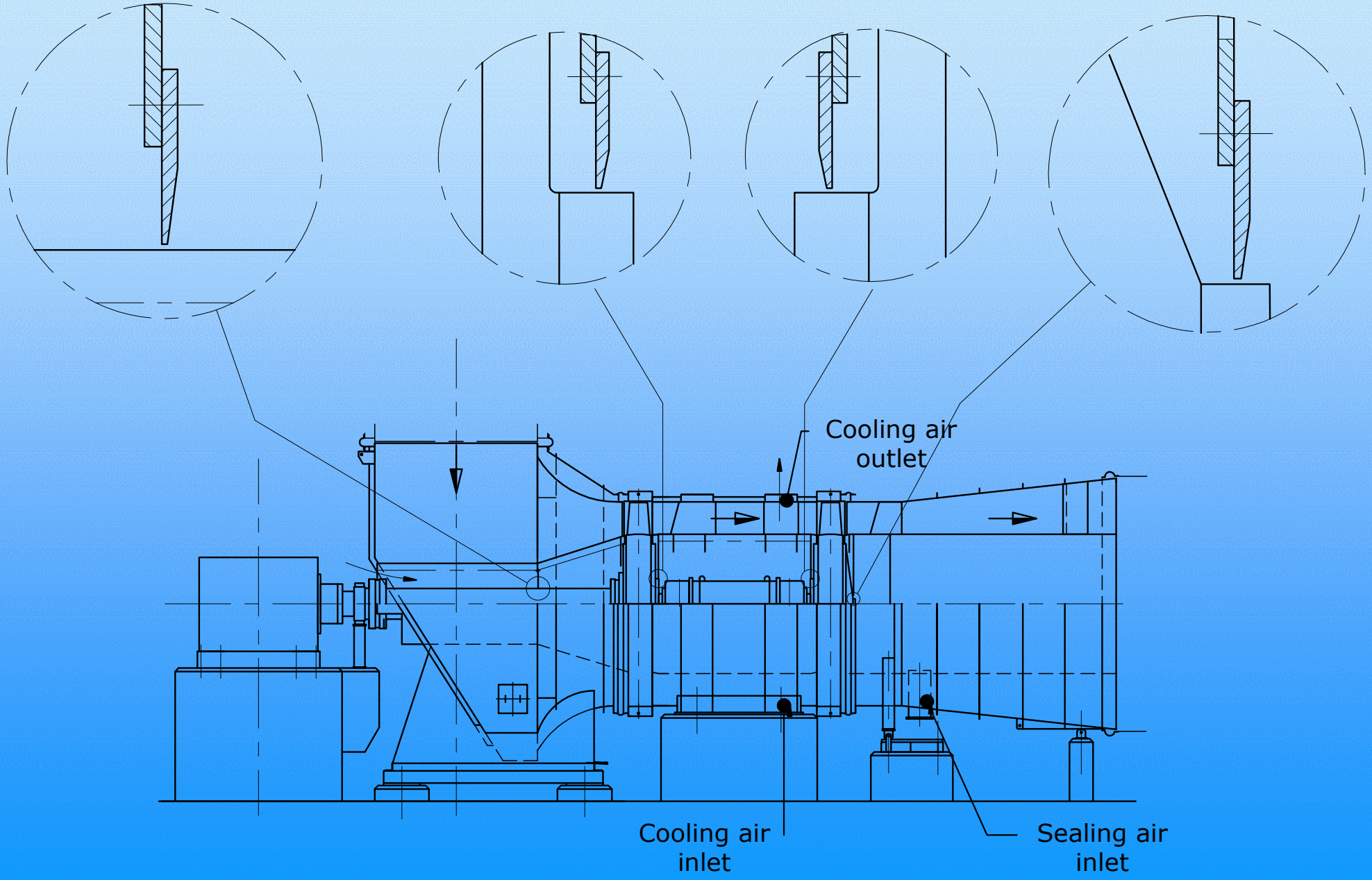


2-Stage Impeller
(min. blade angle)

2-Stage Impeller
(max. blade angle)

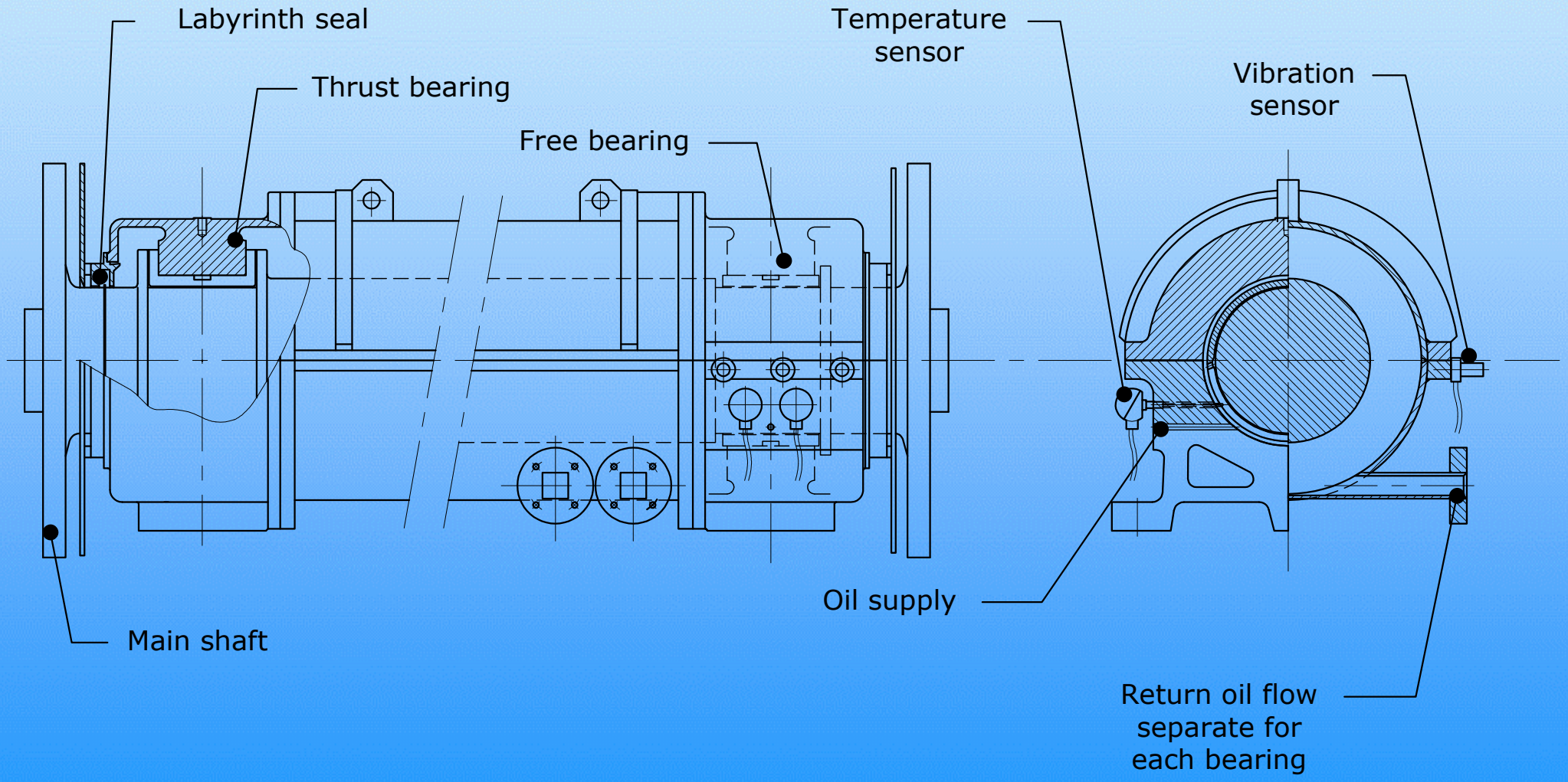
Sealings for
Cooling- and Sealing air

zitrón



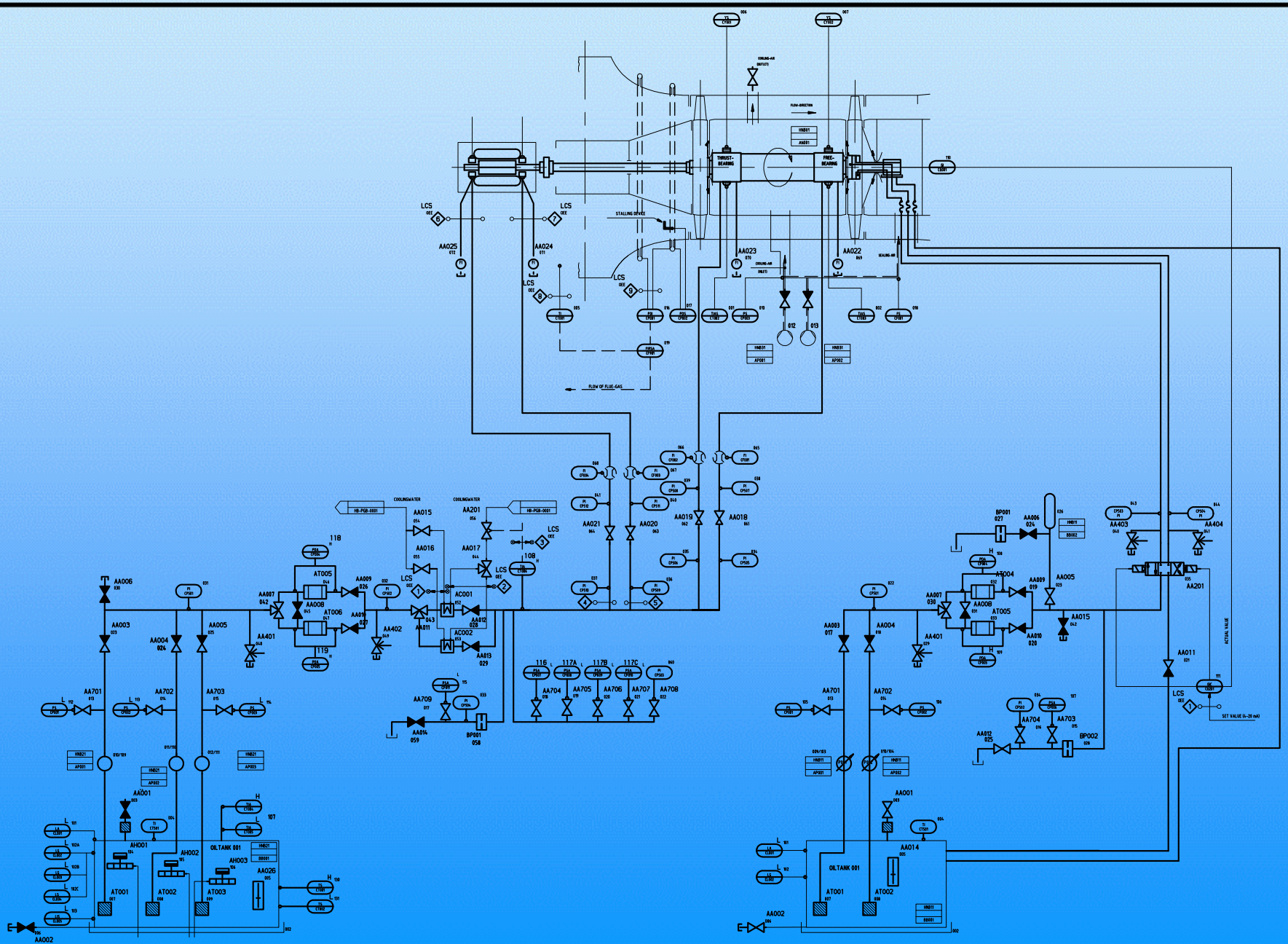
Sleeve Bearing Set

zitrón



P & I Diagram

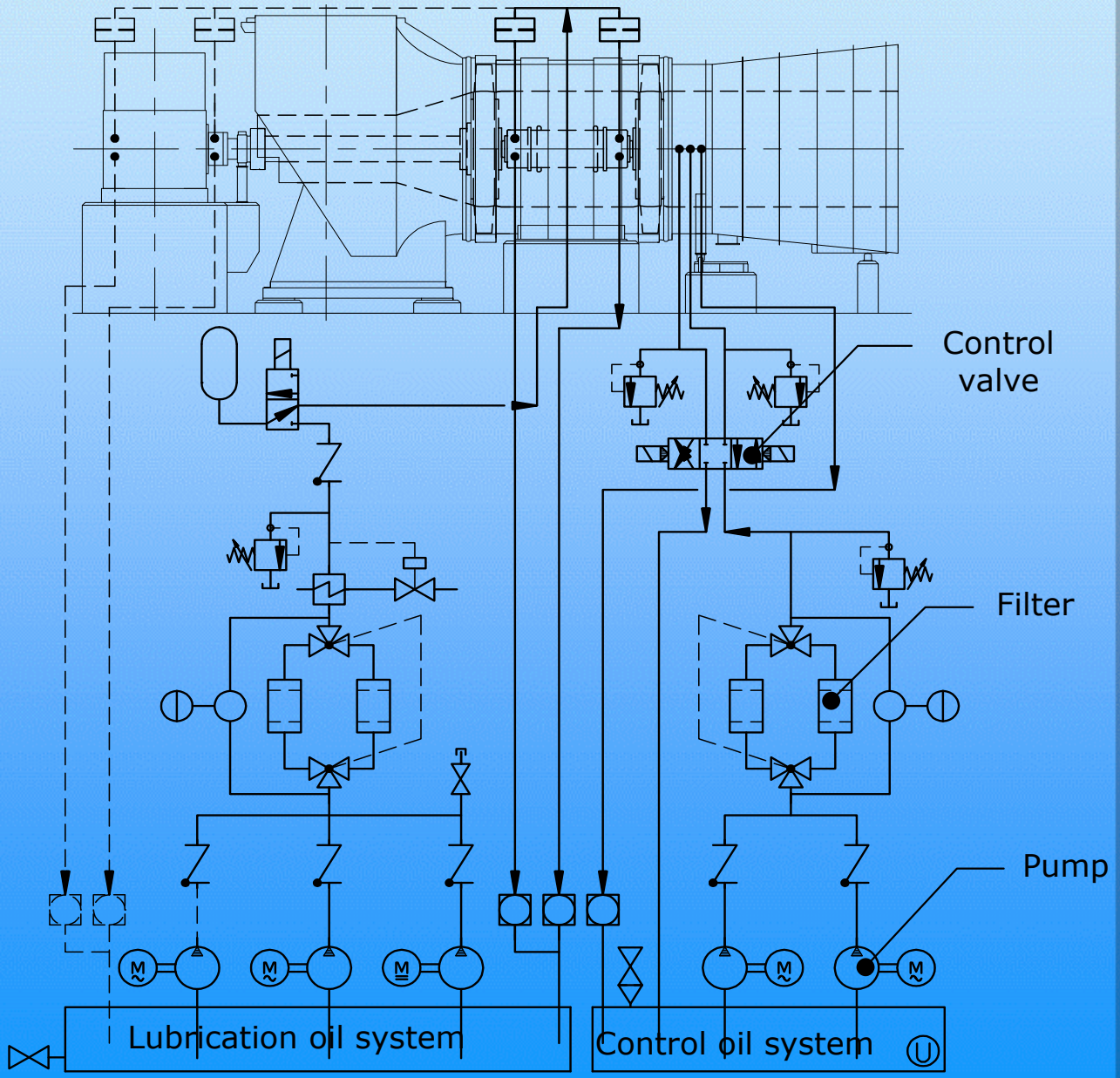
zitrón



Oil System for:

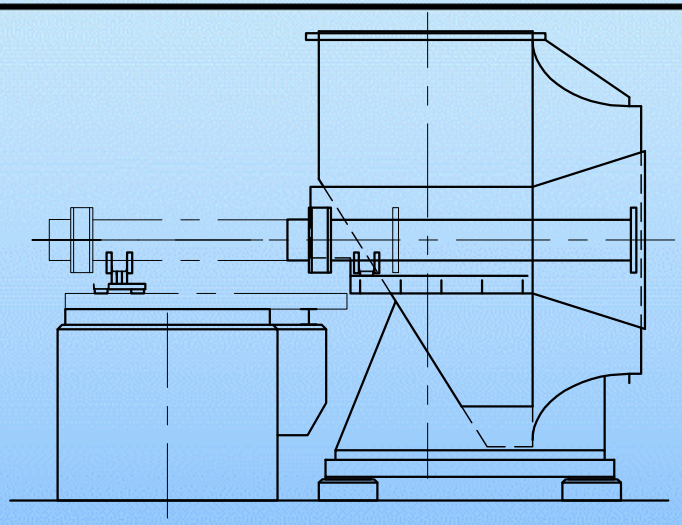
Lubrication and control

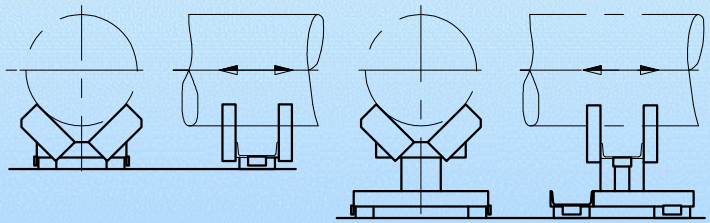
zitrón

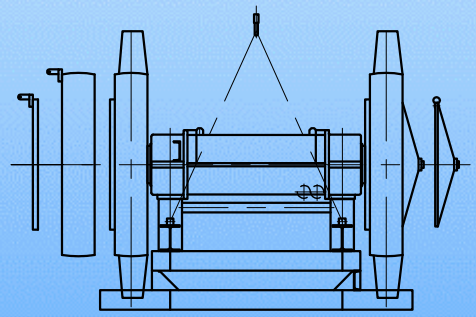


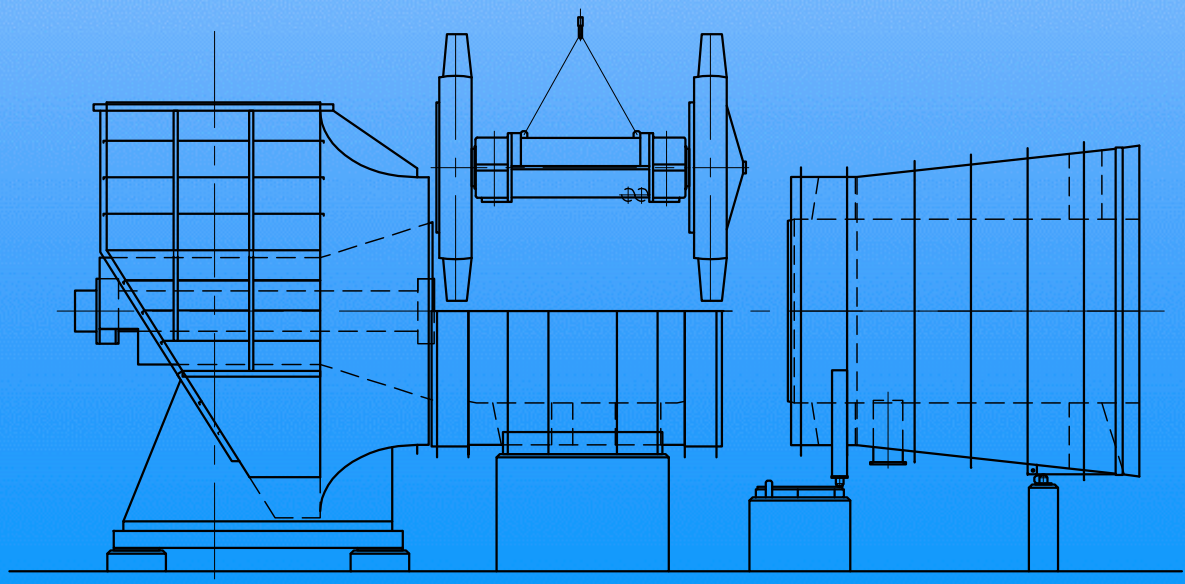
Fan Assembly

zitrón

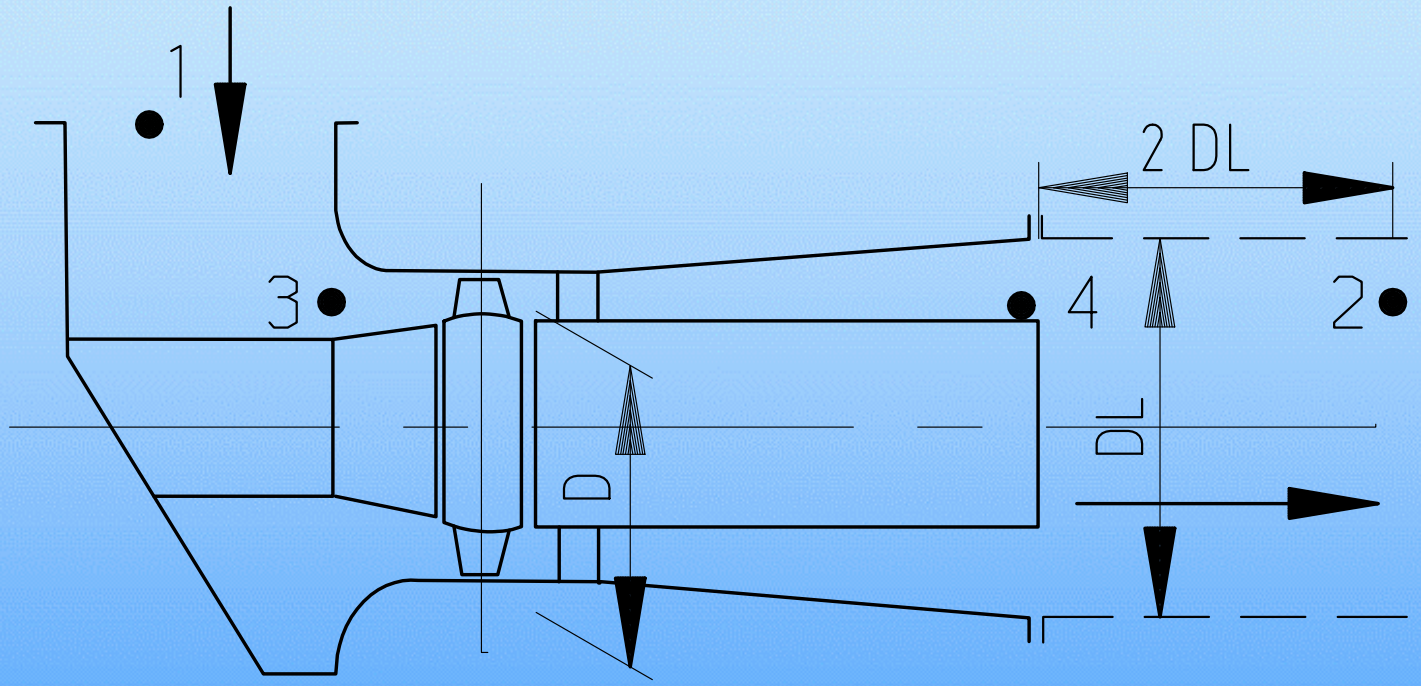








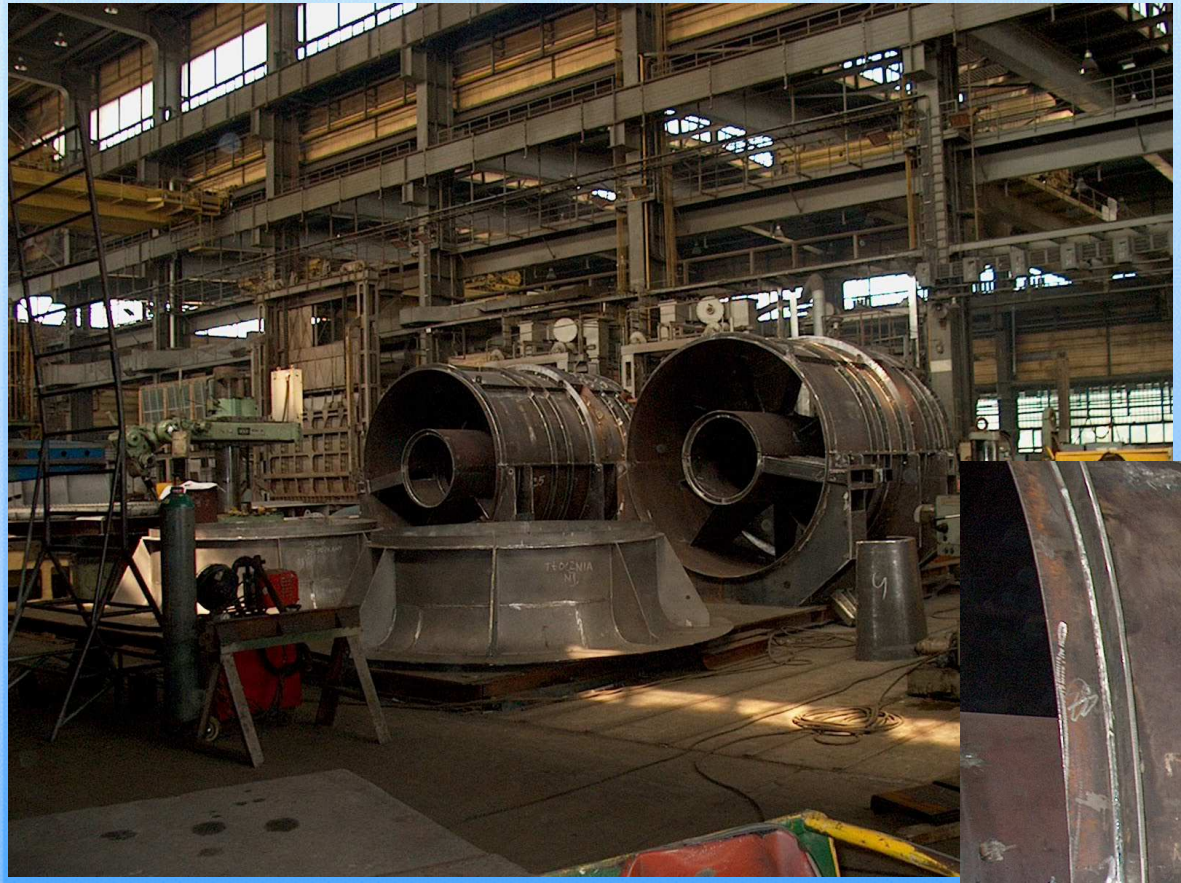
Pressure Definition



Static Pressure Difference SDP = P2 – P1
Fan Differential Pressure FDP = P4 – P3
Htot.= $\frac{FDP \times \alpha}{(g \times \rho)}$
α = compressibility-factor
g = gravity factor
ρ = density

Production

Production



zitrón

zitrón