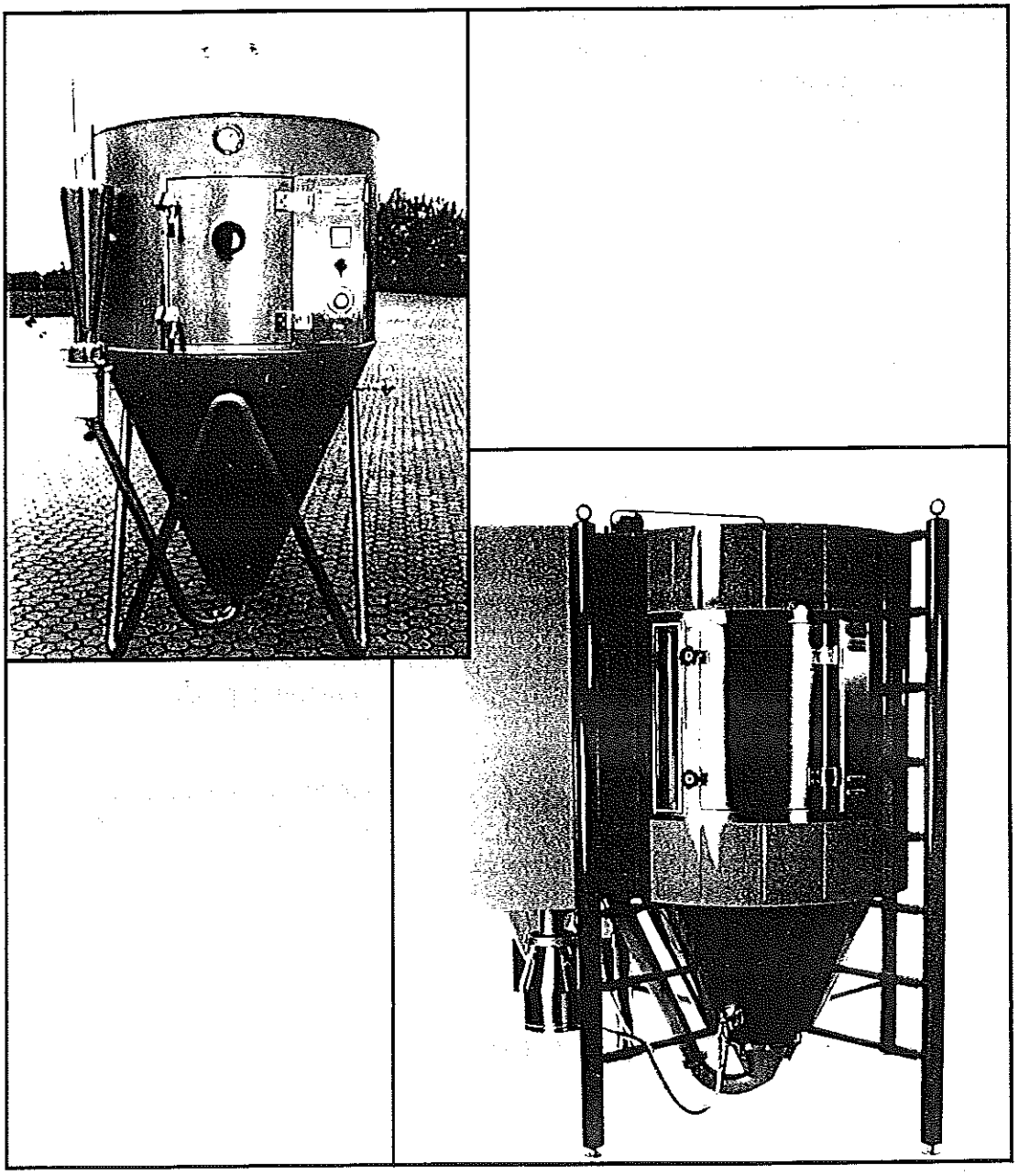
APV

The Anhydro Pilot Spray Drying Plants



APV Anhydro AS

Applications

In the Spray Dryer, a liquid feed is converted into a uniform powder in a continuous operation. Within seconds, the liquid is dried and the powder collected without any intermediate handling. Anhydro Laboratory and Compact Spray Dryers are especially suitable for scientific test work, industrial research and development, as well as small-scale production.

The spray drying process is applicable to a wide range of products:

- Ceramic materials
- Inorganic chemicals
- Amino acid, proteins
- Carbohydrates, starches
- Aromatics
- Pharmaceutical products
- Dyestuffs, pigments
- Detergents
- Plastics
- Pesticides
- Microbiological products
- Plant extracts
- Dairy products
- Animal feed products
- Food products/additives
- Catalysts

Anhydro Laboratory and Compact Spray Drying Plants are designed with special consideration to easy operation and process control.

The Principle of Spray Drying

The feed product, a solution, slurry or pasty material is lead to the atomizer system and dispersed into a mist of fine droplets in the drying chamber.

Two atomization and drying principles can be applied:

Atomization by means of compressed air in **a two-fluid nozzle** placed in the chamber cone. Drying takes place in **mixed product-air flow**. This principle is applied in the basic version.

Centrifugal atomization where the liquid product is dispersed **co-current to the drying air** by the rotating disc of a centrifugal atomizer placed in the chamber top. This principle is optional.

In both cases, the drying air is heated in an electric air heater and introduced into the chamber through a top-mounted air distributor. In the drying chamber, the atomized liquid is efficiently mixed with the drying air, and the droplets dry out quickly. The powder particles and drying air are ducted to a cyclone collector for separation and the powder is collected in a container. The drying air is conveyed through the plant by means of a fan.

All relevant plant components are easily accessible and can be dismantled for cleaning and maintenance. Installation and commissioning on location is easily performed by the end-user as the plant is tested mechanically and electrically before shipment. The plant is delivered in a few easy-to-assemble parts and a detailed instruction manual is included.

Basic Plant and Options

The Laboratory Spray Dryer is delivered in two basic versions with pressure (fig. 1) and suction fan (fig. 2), respectively. The Compact Spray Dryer (fig. 3) is equipped with suction fan. The basic versions fullfill the specified performance. To meet further customer requirements, various optional modules can be supplied. These are shown in boxes on the flow charts.

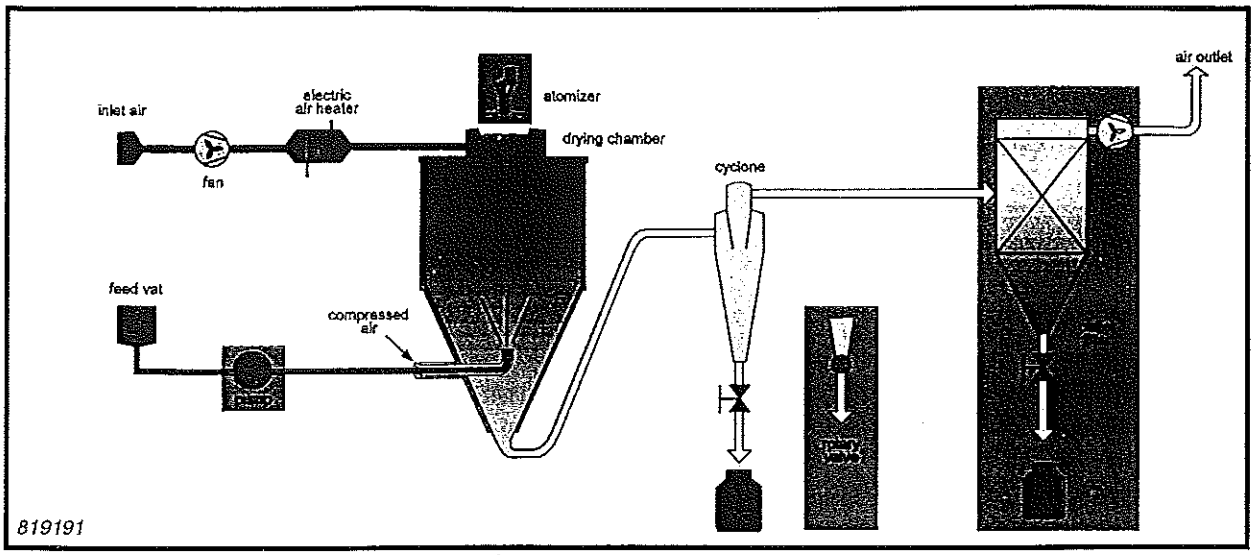


Fig. 1: Laboratory Spray Dryer with pressure fan.

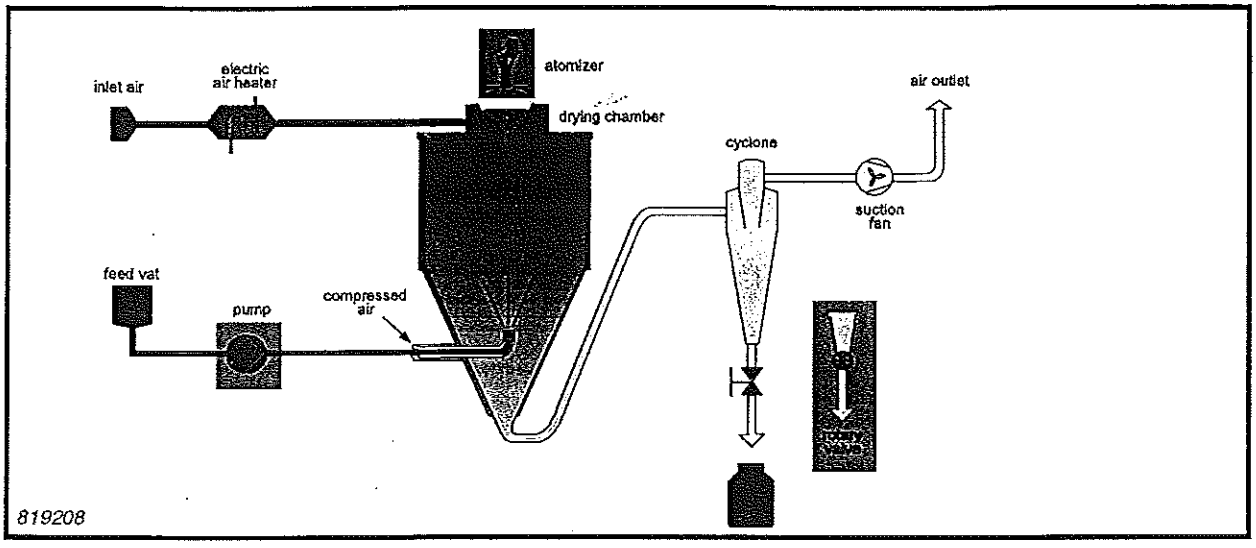


Fig. 2: Laboratory Spray Dryer with suction fan.

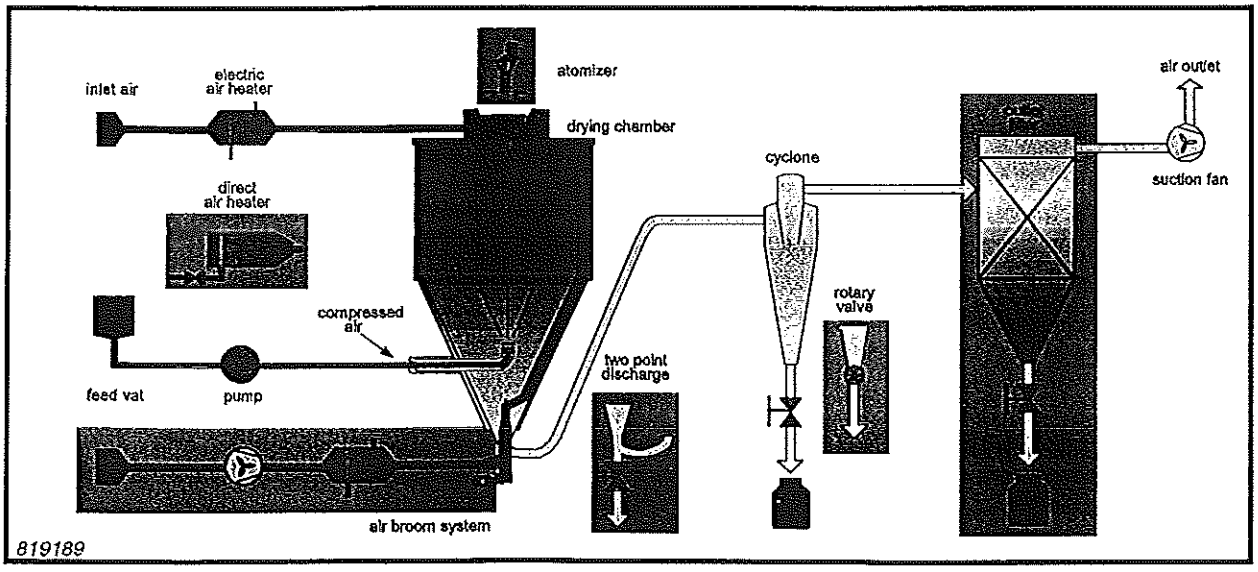


Fig. 3: Compact Spray Dryer with suction fan.

Technical Specifications

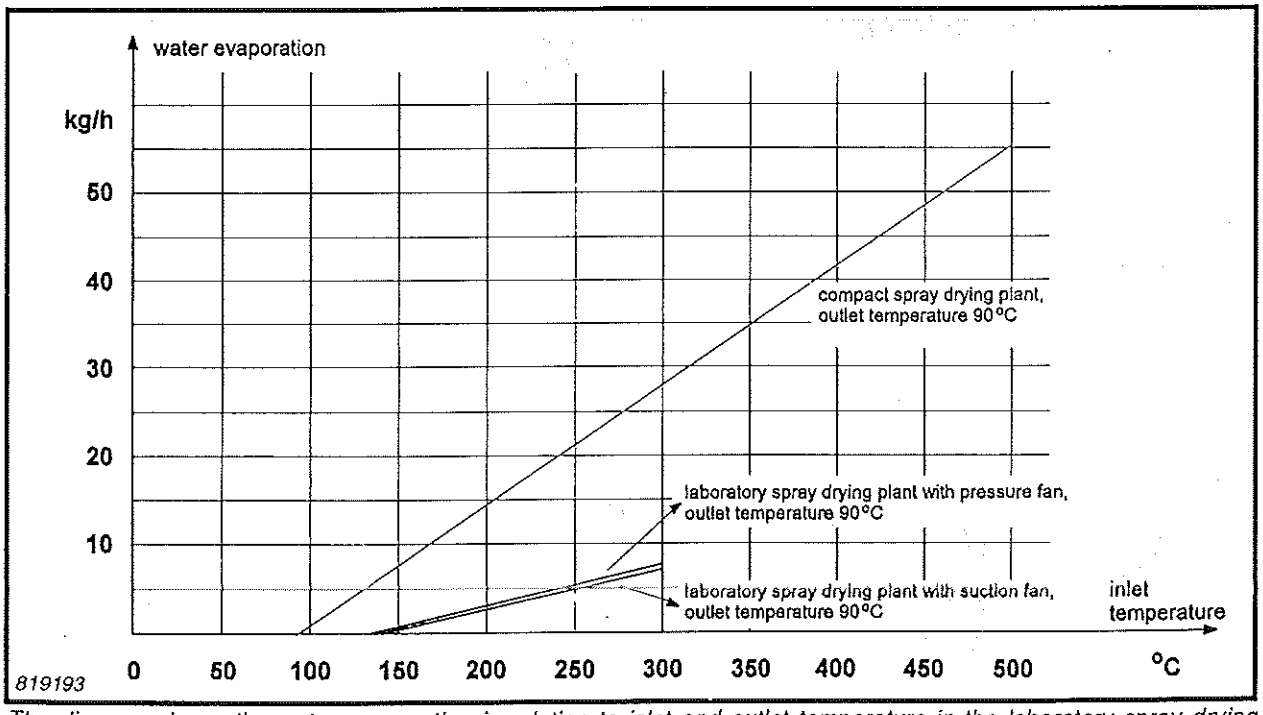
		Laboratory Spray Dryer with pressure fan/ suction fan	Compact Spray Dryer
Max. water evaporation*	(kg/h)	7.5/7.0	28 (50)**
Max. inlet temperature	(°C)	300	300(500)**
Max. comp. air consumption (nozzle atomizer)	(l/min)	120	250
Air pressure	(barg)	4	4
Electrical air heater*	(kW)	9	42
Total installed power*	(kW)	9.7/10.1	46
Chamber diameter	(m)	1.0	1.25
Required space			
Floor space*	(m)	1.3x1.2	1.5x2.0
Height*	(m)	2.6	2.7
Recommended free height*	(m)	3.5	4.0
Shipping volume*	(m^3)	5.2/7.4	12

** Data for basic plant. ** Compact Spray with gas heater*

Material

Surfaces in contact with wet or dry product are made of AISI 316, surfaces in contact with the exhaust air and the cover sheets and the support structure are made of AISI 304. Unless otherwise specified in the proposal.

Water evaporation



The diagram shows the water evaporation in relation to inlet and outlet temperature in the laboratory spray drying plants.

B-15 / 940601 / APV Anhydro / MBD

APV

APV Anhydro AS
Østmarken 7, 2860 Søborg, Copenhagen, Denmark
Tel: +45) 3969 2811. Telex: 27016. Fax :+45) 3969 3880