

COMPRESSED AIR DRYERS



(ISO 9001 : 2008 CERTIFIED COMPANY)



SAM GAS PROJECTS is ISO 9001:2008 certified, Professionally Managed Engineering Organization, Specialized in Design , Manufacture , Supply & commissioning of ‘State of the Art’ Nitrogen, Oxygen, Hydrogen Gas Plants, Ammonia Crackers, Gas Purification Systems, Compressed Air Dryers and Gas storage systems.

SAM GAS PROJECTS has supplied more than **550** Systems, which are working satisfactorily all over India & across the Globe in more than 40 countries.

RANGE OF PRODUCTS :

- ✓ **Nitrogen Gas Plants – PSA Based**
- ✓ **Oxygen Gas Plants**
 - PSA Based
 - VPSA Based
- ✓ **Hydrogen Gas Plants**
 - Ammonia Cracker Based
 - Water Electrolysis Based
- ✓ **Ammonia Cracker Units**
 - Electrically Heated Type
 - Gas Fired Type
- ✓ **Compressed Air Dryers**
 - Heat of Compression Type
 - Internally Heat Re-activated type
 - No Purge Loss, Split flow Type
 - Blower Re-activated type
 - Heatless Type
 - Refrigerated Type air dryer
- ✓ **Gas Purifications Systems.**
- ✓ **Ammonia Storage Systems.**
- ✓ **Exo / Endo Gas Generators**

Requirement of Dry Air :

In any Industry or application compressed air requirement is there for operation of the process or instruments & it should be free from moisture. In absence of which moisture can affect the process / products or instruments. To achieve the desired quality of products and to avoid corrosion of instruments and tools being used in industry or different application , we need to ensure dryness requirements. Dryness of air or gas is always being defined in terms of Dew Point and same can be monitored online with Dew point meters available.

Methods for Air Drying :

Broadly there are three methods to achieve the dryness requirement of Air / gas :-

- ✓ Temperature of air / gas is brought down, condensed moisture is removed and then air / gas is reheated.
- ✓ Air / gas is compressed and at reduced temperature condensate is drained out.
- ✓ The water is adsorbed from the air with a desiccants and dry is taken out.

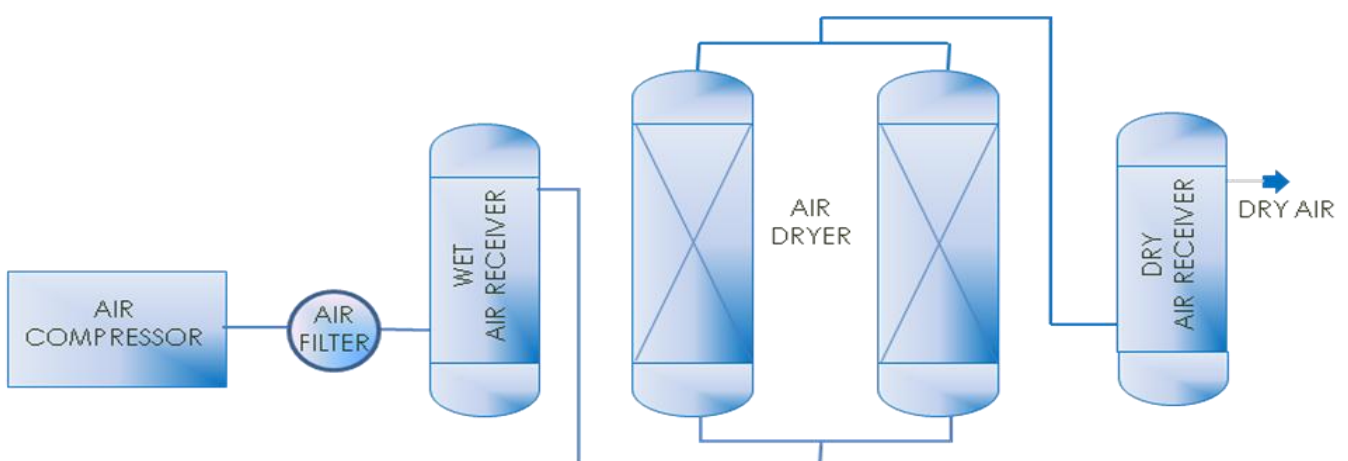
Definition of Dew Point :

Basically , Dew point is the temperature of air / gas , below which condensation of moisture starts. Dryness will be better at lower temperature.

Table for Moisture contents at different Dew points / temperatures as under :

Dew Point °C	g/Nm ³	PPM Volume
- 80 °C	0.000434	0.54
- 70 °C	0.00207	2.57
- 60 °C	0.00857	10.70
- 40 °C	0.102	126.90
- 20 °C	0.816	1015
+ 0 °C	4.84	6020
+ 5°C	6.91	8595
+ 10°C	9.74	12114
+ 20°C	18.50	23020
+ 30°C	33.60	41791
+ 35°C	44.60	55472
+ 40°C	58.50	71761
+ 45°C	76.00	94527
+ 50°C	97.80	120398
+ 60°C	158.0	196517
+ 70°C	247.0	307212
+ 80°C	376.0	467662
+ 90°C	556.0	691542

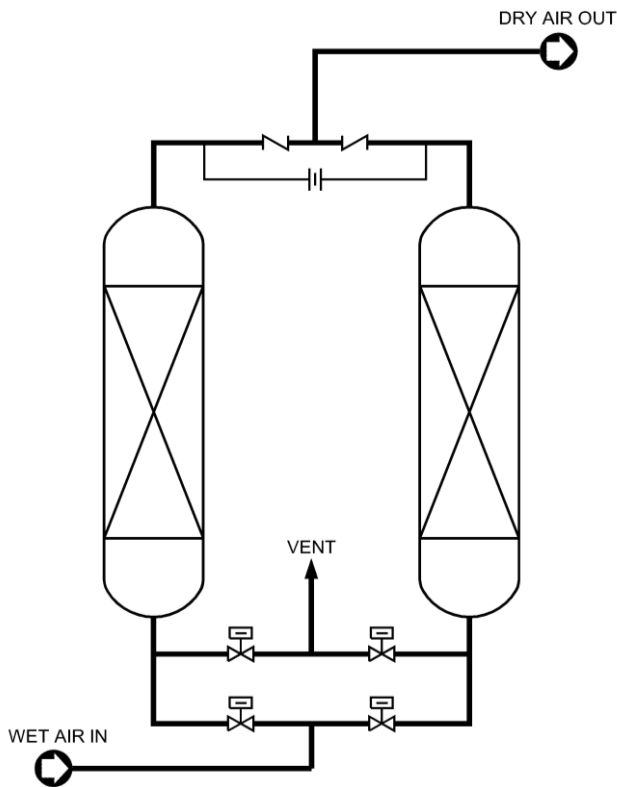
Flow Diagram for Compressed Air System



HEATLESS TYPE AIR DRYER

A heatless compressed air dryer is the simplest form of gas or air dryer for achieving a dew point of (-) 40°C.

Wet compressed air after passing through filters, passes through the changeover valve and is directed towards adsorber tower under generation cycle in upward direction through desiccant. Compressed air drying takes place by adsorption & dry air is taken out through dry air after filter to the application. Whereas other tower goes under regeneration cycle. A portion of the dry compressed air passes through the needle valve / orifice plate through the desiccant and purge out the desorbed moisture. Average purge loss in this type of Dryers is 10 to 12% and Standard cycle time for this type of dryer is 5 + 5 Minutes.

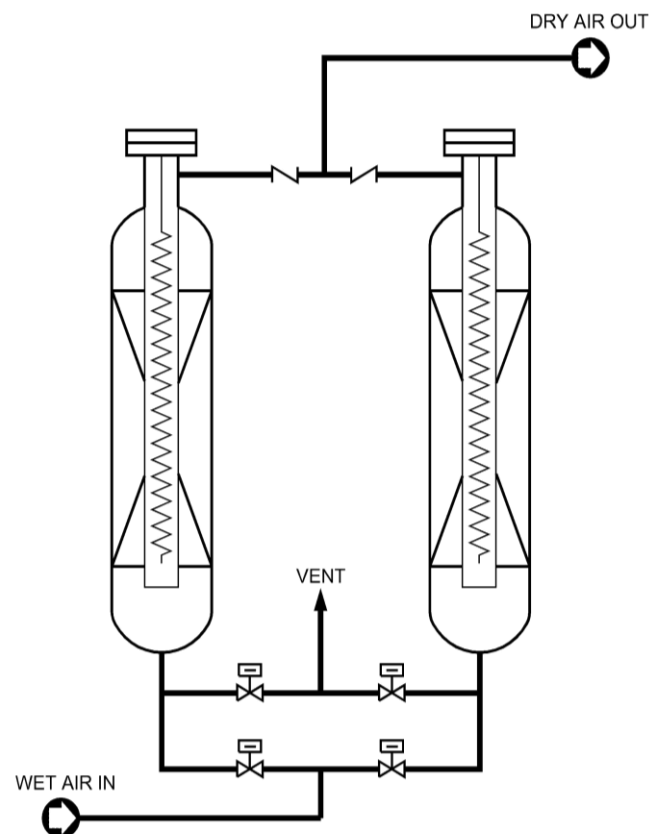


- ✓ Capacity : 5 to 5000 NM³/Hr.
- ✓ Dew Point : (-) 40°C or better
- ✓ Pressure : 7.0 Kg/cm²g or higher

HEAT REACTIVATED TYPE AIR DRYER

Heat Reactivated Type Air Dryers are used to meet dew point requirement from (-) 40°C to (-) 80°C. In this design, the desiccant is regenerated at higher temperature, along with small quantity of Dry air purge. Due to purging with Dry air and thermal regeneration, residual moisture loading on desiccant becomes low and this gives very low Dew point. It is twin tower system, filled with Activated Alumina or Molecular sieves desiccant. One tower remains in drying cycle for 4 hours, while other tower is simultaneously regenerated at atmospheric pressure. Purge flow of 3 to 7.5% is used for regeneration depending on dew point requirements. Heating cycle is for 2 hours & for rest of the cycle time bed goes under cooling.

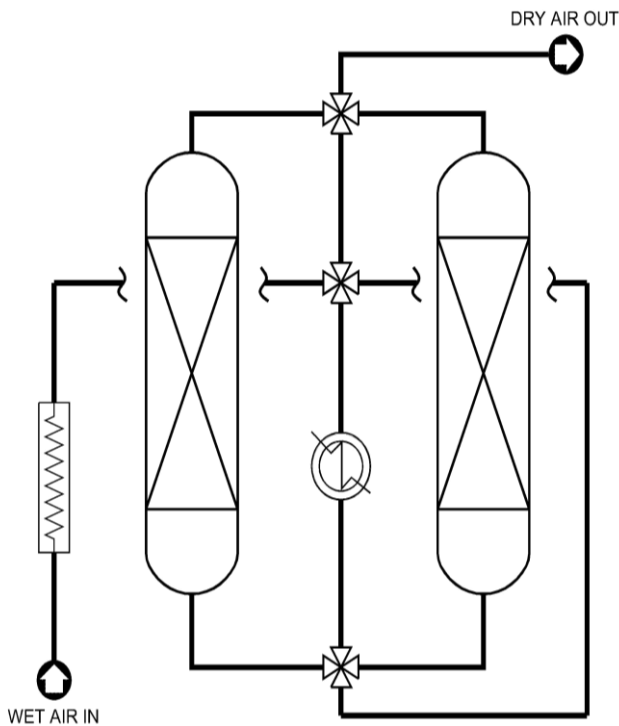
- ✓ Capacity : 5 to 3000 NM³/Hr.
- ✓ Dew Point : (-) 40°C to (-) 80°C
- ✓ Pressure : 2.0 Kg/cm²g or higher



HOC TYPE AIR DRYER

In Heat of compression type air dryers, heat generated during compression in air compressor is utilized for regeneration process and hence saves energy.

Compressed air at elevated temperature taken to Air dryer inlet & first passes thru tower under regeneration first. After picking up moisture from desiccant bed, the air is cooled in an intermediate cooler. Here moisture is condensed and removed by auto drain valve. Cooled to 40°C, this air passes through the second drying tower where balance moisture gets adsorbed and Dry air comes out. Cycle time is 4 hours regeneration & 4 hours drying. After 4 hours the changeover of vessels takes place automatically. These type dryers are preferred for high flow rates.



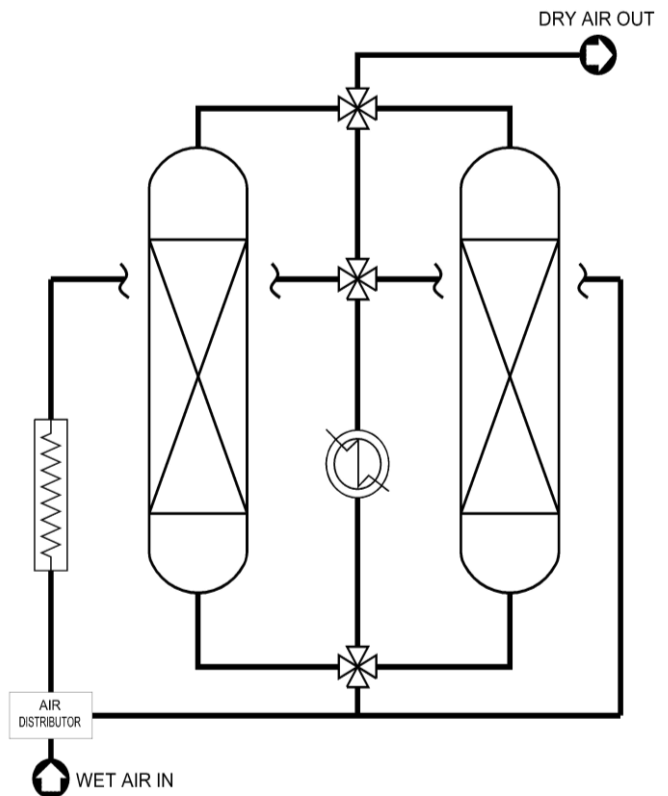
- ✓ Capacity : 500 to 6000 NM³/Hr.
- ✓ Dew Point : Upto (-) 60°C or better

NO PURGE LOSS SPLIT FLOW TYPE AIR DRYER

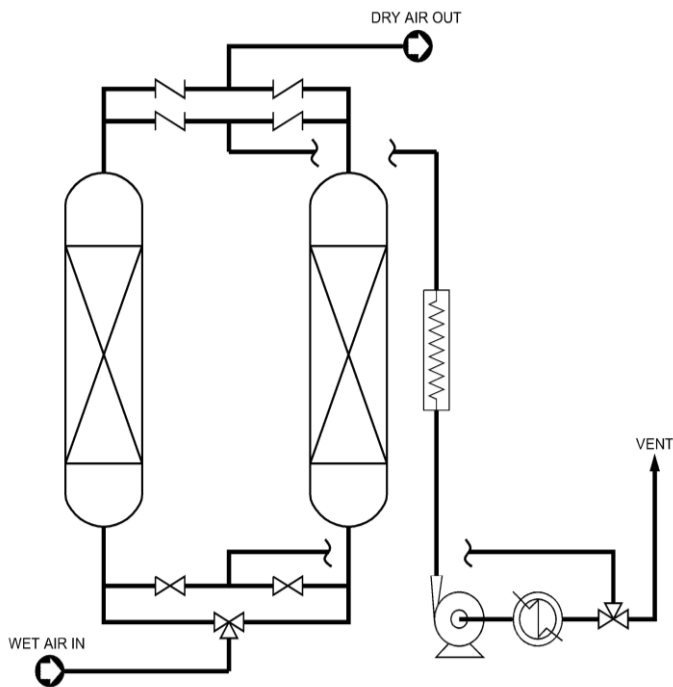
No Purge loss split flow type air dryer is preferred generally for higher flow rates. Wherein compressed air at inlet of dryer is taken at ambient temperature. Inlet air is divided into 2 streams. Major part of flow is taken directly for drying operation and partial flow is heated by line heater & is used for regeneration. By splitting the incoming air only that much flow of air is heated, which is required for regeneration and at the same time there is no purge loss, which makes the dryer feasible for higher capacities.

Cycle time is 4 hours regeneration & 4 hours drying. After 4 hours the changeover of vessels takes place automatically. These type dryers are preferred for high flow rates.

- ✓ Capacity : 500 to 6000 NM³/Hr.
- ✓ Dew Point : Upto (-) 60°C



BLOWER RE-ACTIVATED TYPE DRYER



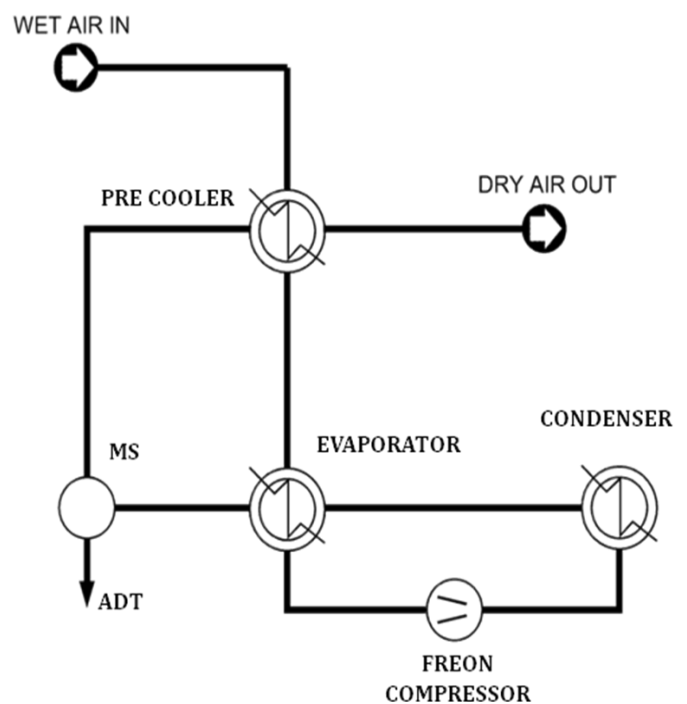
Blower re-activated type of Air dryer units are preferred for high flow rates, wherein instead of using compressed air at higher pressure, separate regeneration blower system is implement. During regeneration compressed air at low pressure but at elevated temperature is required. To meet the low pressure compressed air blower is used and temperature is raised with line heater. With usage of blowers power consumption goes down and there is no purging of compressed air at high pressure. Which make the dryer economical considering running cost.

- ✓ Capacity : 1000 to 10000 NM³/Hr.
- ✓ Dew Point : (-) 40°C or better
- ✓ Pressure : 7.0 Kg/cm²g or higher

REFRIGERATED TYPE AIR DRYER

The Basic principle is the removal of moisture by cooling air to certain temperature. The concept of efficient cooling is removal of heat only. The air first enters into the pre cooler where the incoming hot air is being cooled by outgoing cold air so as to reduce the heat load of evaporator. The air from pre cooler enter into the evaporator where further heat is removed by boiling refrigerant like Freon. Now the air get condensed and this moist air is passed through a moisture separator where moisture is drained out by centrifugal action of air. The moist free air enters into pre cooler to cool the incoming air. This type of air dryers ate preferred for dew points upto (-)23°C.

- ✓ Capacity : 5 to 1000 NM³/Hr.
- ✓ Dew Point : (-) 23°C
- ✓ Pressure : 0.5 to 12.5 Kg/cm²g



APPLICATIONS:

- Pneumatic Tools
- Chemical & Pharma Industry
- Paper & Pulp Industry
- Glass Industry
- Metallurgical Industries
- Lamp Industry
- Hospitals / Medical Applications.
- TV Picture tubes
- Tyre Industry
- Cable Industry
- Painting Applications
- Automobile part Manufacturers.
- POY / PFY Units
- Pet Bottle Manufacturing units
- Rice Mills
- Food Product units.



OUR GLOBAL PRESENCE



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