

## Microwave/Antenna Air Dryers

The use of dry air to protect wave-guide antenna systems is well documented and this paper discusses the importance of correctly choosing the best size and type of air dryer.

### Sizing:

There are conflicting views regarding sizing dryer units to realize correct wave-guide antenna protection. A large assortment of dryer models to match differing volumetric sizes of wave-guide/coaxial systems is confusing and misleading. A very simple case in point is that the volume of a wave-guide system (measured in SCF, standard cubic feet) does not determine the size of the air dryer. This is a static measurement and since the wave-guide is not hermetically sealed and shouldn't be, the known and potential leak rates control the determination of the size of an air dryer. Various factors are analyzed, including:

1. The known leak rates designed into the system (purge valve, dish, etc.). The normal recommendation is for a designed leak rate of 1 (one) SCF per hour at the end of each waveguide run to exclude any ingress of humidity.
2. A potential leak rate is possible due to uncontrolled factors (such a rifle shot to the dish membrane cover, etc.). This will determine the response time for accessing the unit. In the case of a model P550HTL air dryer with a standard output of 550 SCF per day, a leak rate of 1 SCF per hour allows 20 years of operation before compressor service is required. This unit is capable of producing 750 SCF per day in emergency situations to protect the system if a major leak occurs. The standard maintenance interval of the compressor is 4000-5000 hours of run time. Visual inspections are conducted semi-annually.

### Dryer Types:

Canadian Puregas produces the dryer types.:

1. Membrane technology
2. Pressure swing adsorption (PSA)
3. Heat reactivated
4. Refrigeration
5. Nitrogen generation

Selection of dryer type is determined by economics and geographic location. Membrane type dryers are only recommended for low capacities (150 SCF per day) and/or at remote sites with DC power only. The more efficient pressure swing adsorption types are produced with capacities from 550 to 15,00 SCF per day. For larger capacities heat reactivation/refrigeration systems are produced due to economics of energy.

The membrane and PSA air dryers incorporate high-pressure dry air storage tanks. This is necessary to supply a constant stable air pressure to the wave-guide so that there are no pressure fluctuations, which can damage wave-guide joints and windows. The outlet pressure is controlled by a low pressure self relieving regulator to compensate for any sudden atmospheric pressure changes that could damage the wave-guide system. All Canadian Puregas air dryers are customizable to specific or unique customer requirements, (outside cabinets, discrete alarms, no/nc contact alarms, noise control, etc.)

We have been supplying air dryers to our customers since 1958.