

**PT405 Pulse Tube Cryorefrigerator**

**TEMPERATURE RANGE: <2.8 K-350 K**



**Description**

A Pulse Tube Cryorefrigerator produces cryogenic temperatures below 2.8 K without the use of displacers. Because there are no displacers, there are no displacer seals, no moving cold parts, and no vibration. All of the above lead to higher reliability and longer mean time between maintenance than what is now available in other 4.2 K Cryorefrigerators.

The Pulse Tube, as developed by Cryomech, Inc., looks very much like other closed cycle cryorefrigerators. The rotary valve in the cold head directs the helium gas in and out of the expansion tubes dropping the temperature to 2.8 K. A first stage is available for shield and lead cooling from 35-80 K. The compressor package supplies the cold head with pressurized helium through flexible metal hoses. The object to be cooled is attached to the heat exchanger at the end of the cold head. The heat is then carried to the compressor by the expanding helium where it is discharged into the cooling air or water.

**Instrumentation**

Due to the diversity of applications for the PT405 Cryorefrigerator, no standard instrumentation is attached. An accessory package of an instrumentation flange with temperature sensors, etc. is available on customer request.

**Maintenance**

The Pulse Tube Cold Head requires maintenance only after there is obvious sign of loss of low temperature. Because there are no moving parts, no damage to the cold head can occur while operating. Routine maintenance is recommended on the compressor package every 15,000 hours. This consists of replacing the absorber, a simple 30 minute procedure.

**Warranty**

The PT405 Cryorefrigerator is covered by a warranty for parts and labor for 3 years or 10,000 hours, whichever comes first.

**Mechanical Vibration Level: < 1X10<sup>-2</sup> g**

**Specifications**

**Cold head**

Capacity.....2<sup>nd</sup> Stage ..... 0.50 W @ 4.2 K  
 with.....1<sup>st</sup> Stage..... 25 W @ 65 K  
Cooling time to 4 K ..... < 60 minutes  
Ultimate low temperature..... < 2.8 K  
Weight ..... 31 lbs. (14 kg.)  
Orientation .....The Pulse Tube must be operated with the cold end down. At an offset of no greater than 20°.

**Model CP950 Compressor**

Weight ..... water cooled: 262 lbs. (102 kg.)  
Dimensions (l x w x h)..... 23 x 21 x 26 in.  
 ..... 58 x 53 x 66 cm.  
Power .....5 kW @  
 .....220/230 or 460 VAC, 3 phase, 60 Hz  
 .....200/220 or 380/420 VAC, 3 phase, 50 Hz  
Cooling ..... 6 liters/minute

