NCAR MEDUSA Flask Sampler

The Multiple Enclosure Device for Unfractionated Sampling of Air (MEDUSA) is an automated sampler that collects cryogenically dried air into 16 1.5 L glass flasks under actively controlled flow and pressure conditions. The MEDUSA system was designed to sample for laboratory measurements of O_2/N_2 , Ar/N_2 , $^{13}CO_2$, and $C^{18}OO$, but may also be suitable for other species. An earlier version of MEDUSA flew on the UND Citation II in the COBRA-2000 and COBRA-2003 campaigns, and on the NCAR C130 during the ACME-2004 campaign. The MEDUSA system has since been repackaged to fly on the NCAR GV during the START-08 and HIPPO campaigns, and on a Brazilian Lear Jet in BARCA-2009. An integrated control and data acquisition system logs housekeeping variables (flows, tempereatures, pressures, and uncalibrated CO_2 concentration) every second. The nominal flow rate is 3.3 SLPM and the flask volume is 1.5 L, resulting in a 30-second quasi-integrated sample. At 250 kts or 2000 fpm, this corresponds to a horizontal resolution of 3 km and a vertical resolution of 250 m. The MEDUSA sampler consists of a pump module, a flask module, and a dewar.

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Dimensions :	19" rack wide X 27 " high X 18 " deep, plus a 6" diameter X 14" high dewar
Weight :	100 lbs.
Power :	28 VDC
Hazmat :	4 kg of solid CO ₂ (dry ice)
Inlet :	dedicated forward facing 3/8" inlet, unheated stainless steel or Synflex
Number of operators :	1 (can be shared)
Altitude requirements :	max. alt 52,000 feet
Ground requirements :	30 minute preflight
Limitations :	if liquid water anticipated, inlet must be reversed, and max alt. decreased



