

42. TECHNICAL APPENDIX: STATUS OF THE ISOTHERMAL DECOMPRESSION ANALYSIS SYSTEM (IDAS)¹

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The Isothermal Decompression Analysis System (IDAS) is a device to conduct experimental work on natural gas hydrate specimens as they step-wise dissociate under controlled pressure and temperature conditions. The IDAS originally was designed by G. Brass and M. Kastner. Figure 1 is a schematic of the original system with modifications made by us prior to Leg 164. The IDAS was not used for its intended purpose during Leg 164, because there were insufficient hydrate specimens for such experimental work, although the instrument was used to store a large hydrate sample (Paull, Matsumoto, Wallace, et al., [1996], Fig. 2, p. 60) at high pressure under helium for post-cruise research.

In theory, the IDAS is operated as follows. Gas hydrate samples are placed into a Parr 500-mL pressure vessel equipped with three ports with valves. The vessel is sealed and placed into a constant temperature bath. Pressure in the vessel is raised to a prescribed amount (<400 atm) by injecting helium from a gas booster system through the first port. The reason for using helium is that helium does not form a clathrate. After closing the valve of the first port, pressure in the vessel is lowered by opening the valve of the second port and releasing

gas. Gas hydrate within the vessel will begin to dissociate when the pressure drops below that of the appropriate hydrate-liquid-gas equilibrium curve. Aliquots of gas are released from the valve of the second port through a gas intake system and into a manifold for gas analyses. Aliquots of liquid are released from a tube at the base of the pressure vessel through the valve of the third port and into a closed tube of ~5-cm³ volume. Liquid within this tube then can be released into an ~500-cm³ bottle for water analyses.

REFERENCE

Paull, C.K., Matsumoto, R., Wallace, P.J., et al., 1996. *Proc. ODP, Init. Repts.*, 164: College Station, TX (Ocean Drilling Program).

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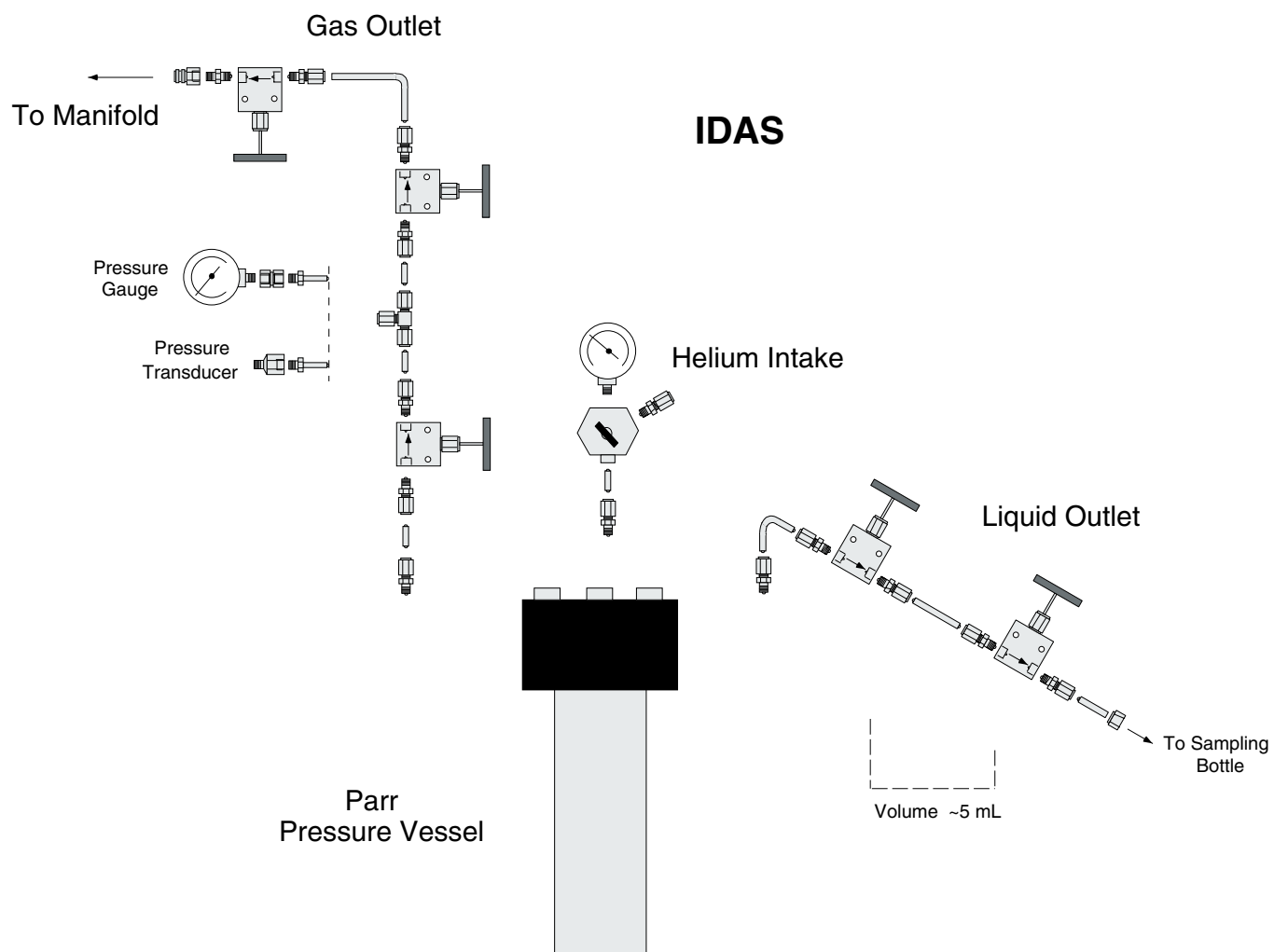


Figure 1. Schematic diagram of the Isothermal Decompression Analysis System (IDAS).