Gaspure Chamber Gas Recovery System

Introduction

The Gaspure Chamber Gas Recovery System purifies contaminated diving chamber or habitat gases and allows chamber gas recovery during operations and decompression rather than venting to atmosphere.

The basic package comprises a Purifier System, a Gas Bag, a Gas Bag Controller and an Alarm Panel. A Gas Transfer Compressor is not supplied as part of this system but will also be required.

The Purification System comprises four towers and three filters, manufactured in stainless steel. Disposable cartridges which process 2,834m^3 (100,000 ft^3) of gas are available in pre-packed pallet packs.

The Purifier comprises eight stages of purification:-
1. Pre filter F1
2. CO_2 scrubber
3. Second stage filter F2
4. Molecular sieve bed
5. Purification bed
6. Activated carbon bed
7. Catalyst bed
8. Final filter F3

Some clients may already have a gas transfer compressor. The Gaspure Control/Alarm Panel is easily interfaced to existing compressor systems.

The Gas Transfer compressor is not supplied by JFD, but we recommend the CompAir H5437 Heliox Compressor for use with the Gaspure system. This is a single acting, four stage water cooled HeO$_2$ compressor capable of flow rates of 130m^3/hour and can be supplied by JFD if required.

The Gas Bag may be manufactured in a variety of sizes and shapes to meet clients' specific needs as determined by chamber complex size and vessel accommodation. The standard bag has 23.8m^3 (840ft^3) capacity and is equipped with relief valve set at 1psi.

The Gaspure Alarm Panel, normally situated in sat control, indicates power supply status to the compressor, gas bag full and indicates when to change the disposable cartridges. The cartridge change indicator light is illuminated via a predetermining hour meter which must be fitted within the Gas Bag Compressor Control System.

Gas is routed from chambers, locks and trunks via piping to a three-way valve. This valve routes the gas to atmosphere or to the gas bag. When routed to the gas bag the bag is inflated until the level controller starts the gas compressor. The photo-electric gas bag level controller stops the gas compressor after deflating the gas bag to a predetermined level.

The gas bag is protected from over-inflation by relief valves which JFD recommend are connected to discharge overboard. The compressor draws from the gas bag and discharges into the Gaspure Purification System. The pressure maintaining valve at the outlet of the Gaspure Purification System maintains the minimum system pressure at approximately 138 bar (2,000psi) ensuring efficient operation of each element.

The Gaspure removes most reactive contaminants such as water and oil vapour, CO_2, CO, H_2S, SO_2, NO_2. The gas can then be stored or passed through a Helipure membrane purifier to remove nitrogen and argon and reduce the oxygen concentration as necessary.

Cost Saving Analysis

The helium used in diving operations represents a significant cost when all factors are considered. These costs can be broken down into five major areas:

1. The cost of helium itself.
2. The cost of logistics, transporting gas to the work site.
3. The cost of deck space onboard the vessel or platform.
4. The cost of weight onboard the vessel or platform.
5. The cost of gas cylinders, rented or purchased.

The following is an example taking into account only the cost of helium, for an average size diving system complex, operating 120 day contract at 100 msw.

	Volume (m³)	Cycles Per Day	Cycles Per Contract	Contract Gas Used (p/m³)
Chamber 1	25.00	-	8	2,200
Chamber 2	20.00	-	8	1,760
Chamber 3	20.00	-	8	1,760
Medical Locks	0.16	18	2160	3,802
Equipment Locks	0.64	4	480	3,379
Bell Mating Trunk	0.40	3	360	1,584
Bell	6.00	-	8	528
				15,013

Total gas cost £11 p/m3 = £165,140.80
with typically 95% overall recovery the equipment usually pays for itself in one contract.

Specification

Gaspure Purification System	
Width	1,487mm
Depth	186mm
Height	879mm
Weight	219 Kg

Gas Bag
Standard Size 23.8m³ (other sizes available on request)

Order Codes

Gaspure Chamber Gas Recovery	Gaspure Pallet Pack (10 Boxes of Cartridges and Catalyst)	Gaspure Disposable Cartridge Set (100,000 Cu ft Gas)	Gaspure Co Catalyst (1,000,000 Cu Ft Gas)
A1328A	**A17790**	**B1591A**	**B1592A**