

Regenerative CO₂ Reduction System



Continuous high quality diving or emergency breathing air

During extended periods of operation, the living and working environment on a submarine can become contaminated with excessive amounts of carbon dioxide, exhaled during personnel respiration.

Compressing this contaminated air to fill diving bottles can consequently pose a serious problem for naval divers.

The regenerative CO₂ reduction system from Parker domnick hunter can provide a continuous supply of high quality diving or emergency breathing air from a high pressure compressed air supply. The five stage filtration process can reduce CO₂ levels from 10,000ppm (1%) to a safe level of less than 500ppm (0.05%).

Various safety features and overrides provide total security and protection, while an integral detection system is fitted as standard to monitor inlet and outlet air quality.

The system exceeds Royal Navy performance, shock and EMC test requirements and has been in service with the Royal Navy since 2000.



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Benefits:

- Continuous supply of high quality breathing air
- Fully automatic regenerative operation
- Integral CO₂ detection system as standard
- Pressure/Temperature Swing Adsorption technology
- High efficiency inlet and outlet filtration
- PLC controls as standard
- Fully corrosion protected inside and out
- 30G shock tested
- Compact modular design
- Easy to install and maintain
- Proven and in-service

Technical Data

Delivered Air Quality

Particulate removal down to	1 micron
Maximum remaining oil content	0.003 mg/m ³ (0.003ppm/wt)
Dewpoint	better than -64°C (-84°F) adp @ 1 bar g
CO ₂ levels (av.)	< 500ppm (with max 10,000ppm (inlet))
CO levels	<5ppm

Weights and Dimensions

Height		Width		Depth		Weight	
mm	ins	mm	ins	mm	ins	kg	lbs
1420	55.9	670	26.4	625	24.6	365	803

Normal Operation

Flowrate @ 276 bar g (outlet)	23m ³ /hr (14cfm)
Maximum operating pressure	276 bar g (4000 psi g)
Inlet/outlet connections	3/8" BSPP female
Voltage	115Vac 50/60Hz (230 Vac optional)
Mean loads	350 Watts

Materials

Adsorption column	EN24 steel
Valves	Nickel bronze
Filter vessels	316 stainless steel

Operation – HP CO₂ Reduction Unit

Stage 1

A high efficiency water separator removes bulk contamination from the air stream by vortex action. 90% condensate and aerosol removal at 21°C. 80% particulate removal of 10 microns and above. An automatic drain removes any condensate present.

Stage 2

A high efficiency coalescing filter removes oil/water aerosols down to 0.01 mg/m³ at 21°C and dirt particulate down to 0.01 micron. An automatic drain removes any condensate remaining.

Stage 3

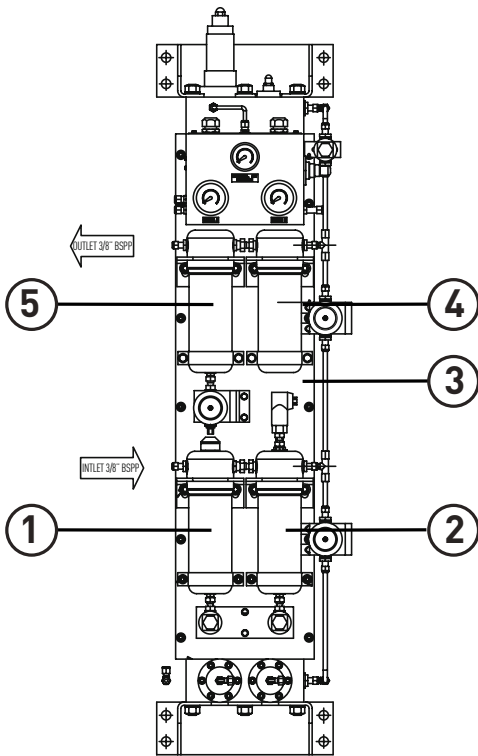
A high pressure regenerative carbon dioxide reduction system utilising the pressure/temperature swing adsorption principle that is controlled by a PLC controller. An integral carbon dioxide analyser system monitors both the inlet and outlet CO₂ levels.

Stage 4

Any remaining oil vapour and hydrocarbon odours (down to 0.003 mg/m³ at 21°C) are removed by a combination activated carbon / catalyst element. This element also provides protection against carbon monoxide by oxidation to CO₂ through chemisorption and catalysis (typically > 99.5% removal)

Stage 5

A final filter removes any traces of particulate carried over from the fourth stage. A pressure maintaining valve is fitted to the outlet to ensure that a minimum operating pressure of 240 bar g is maintained.



DESIGN CONFIGURATIONS OTHER THAN DESCRIBED ARE ALSO AVAILABLE. PLEASE ASK FOR DETAILS.