OPERATING AND MAINTENANCE MANUAL

for the

TWO DIVER, SURFACE CONTROL, HP/LP AIR IN TRANSIT CASE, HINGED LID

(Part No: PP033AA)

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APPROVAL SHEET

DIVEX	
MANUAL NUMBER:	OM338
ADVITIUM NUMBER:	PP-OM-794
DOCUMENT TITLE:	Two Diver, Surface Control, HP/LP Air in Transit Case, Hinged Lid

REV	DATE	BY	CHECK	APP	COMMENTS
0	11 October 2006	Christine Bain			Original Issue
1	28 August 2012	Debbie Allan	Simon Bryce	Mark Stevens	ECN:15335
2					
3					
4					
5					
6					
7					

ORIGINAL ISSUE DATE:	11 October 2006
ORIGINAL DOCUMENT BY:	Christine Bain
CHECKED BY:	
APPROVED BY:	

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CHAPTER 1 SAFETY NOTICE

1.1 This unit must only be operated by suitably qualified personnel.

1.2 Read the instructions thoroughly before operating this equipment.

1.3 Only genuine manufacturer's spare parts may be used and the substitution of parts from other manufacturers will invalidate the warranty and may cause damage to the equipment. When ordering spare parts, please quote the serial number of the assembly and the part numbers required.

1.4 This panel has been designed to supply air to breathing apparatus, for diving, and the manufacturers will not be responsible for its use for any other purpose.

1.5 The user must make him/herself familiar with and observe national legal requirements concerning the safe use and maintenance of the equipment. The manufacturers ensure that the equipment complies with such regulations on delivery but it remains the responsibility of the user to comply with the legal requirements in use.

1.6 It is the responsibility of the user to establish the flow and pressure of air required for the breathing apparatus to be employed and to ensure that the supply is adequate for the use envisaged. This responsibility includes the provision of an adequate reserve air supply.

CAUTION

COMPRESSED AIR IS POTENTIALLY DANGEROUS THIS EQUIPMENT MUST BE USED CORRECTLY MISUSE COULD CAUSE SERIOUS INJURY.

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CHAPTER 2 TECHNICAL SPECIFICATION

Inlet Pressure	L.P. 15 BAR maximum (220 psi)	
	H.P. 350 BAR maximum (5075 psi)	
Hose Connections	LP inlet 3/8" BSP male	
	HP inlet 1/4" BSP male	
	Diver supply 3/8" BSP male	
	Pneumo 1/4" BSP male	
Overall External Dimensions	Length	730mm (29”)
	Width	610 mm (24”)
	Height	380 mm (16”)
	Weight approximately 40 kg (88lbs)	
Pipework	H.P. 8mm x 1mm stainless steel	
	L.P. 10mm x 1mm stainless steel	

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CHAPTER 3 GENERAL DESCRIPTION

3.1 The DIVEX two-diver, Surface Control, H.P./L.P. air panel will supply low pressure breathing air to two divers working simultaneously, to a depth of 60 metres in fresh or salt water.

3.2 The panel contains four completely separate high pressure lines, two for each diver. Non-return valves ensure that the air to one diver cannot be diverted to the other. As a back-up, one L.P. inlet line is fitted, which can supply either diver with air.

3.3 Each diver's depth can be monitored using the pneumo gauges which measure the hydrostatic pressure in an open ended hose from the panel to each diver.

3.4 The controls are packaged within a strong plastic transit case.

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CHAPTER 4 INSTALLATION

(Refer to Drawing PP33110S1

Using a high pressure air supply.

4.1 Ensure all on/off valves are in the OFF position.

4.2 Ensure the H.P. / L.P. regulator controls are turned fully anti-clockwise.

4.3 Connect the H.P. hose assembly to the high pressure air cylinders, ensuring that the cylinder valves remain in the OFF position.

4.4 Connect the diver's air line from the umbilical to the diver’s L.P. outlet on the panel.

4.5 Connect the diver's Pneumo hose from the umbilical to the panel pneumo connection.

4.6 Connect the diver's end of the umbilical to the appropriate breathing apparatus.

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CHAPTER 5 PRE-DIVE CHECK

5.1 With all lines connected and the diver dressed in all his equipment but holding the face/mask helmet, turn on the H.P. cylinder.

5.2 Turn on the H.P. inlet valve slowly (3).

5.3 Read the H.P. inlet pressure (4). Ensure that there is adequate cylinder pressure.

5.4 Use the H.P./ L.P. regulator (1) to set the correct L.P. pressure for the diver's breathing apparatus.

5.5 Slowly open the 1/4 turn diver supply outlet valve (2).

5.6 Confirm with the diver that an adequate air supply is being received at the mask/helmet.

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CHAPTER 6 OPERATION

6.1 The panel works automatically but the operator should continuously monitor the H.P. / L.P. air supply and the L.P. supply to the diver (s).

6.2 When the diver is descending and ascending, the control panel operator may have to adjust the H.P. / L.P. regulator (1) depending on the mask/helmet configuration.

6.3 Under conditions of very low ambient temperature or when using inadequately filtered "wet" air, icing could occur within the H.P./L.P. regulator. This could be indicated by fluctuating or falling low pressure as shown on the LP gauge (5). If any signs of icing are noticed diving should be terminated immediately.

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CHAPTER 7 PNEUMO OPERATION

7.1 The divers' depths can be read from the pneumo gauges (13).

7.2 Turn on the pneumo valve (6) to supply air to the pneumo hose in the umbilical and allow the air to flow for enough time to ensure it is bubbling out of the open, diver end.

7.3 When the air has bubbled out of the hose end, close off the supply valve (6) and read the hydrostatic pressure (shown as diver depth) on the pneumo gauge (13).

7.4 The depth must be checked periodically using the above method, particularly if the diver is changing depth whilst working. When his work is completed and the diver is returning to the surface, the gauge will automatically read his decreasing depth without the operator supplying more air to the pneumo hose.

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CHAPTER 8 CYLINDER CHANGE OVER

8.1 Slowly turn on the reserve air supply via the H.P. inlet valve (7). Confirm there is an increase in pressure on the H.P. gauge (4).

8.2 Turn off the original air supply at the H.P. inlet valve (3).

8.3 Purge the H.P. hose to the cylinder to be removed. Disconnect the cylinder and replace it with a charged H.P. air cylinder.

8.4 Slowly turn on the new air cylinder.

NOTE

Items 3 and 7 are identical and serve the same purpose. They are separately identified here only to illustrate the cylinder changing procedure.

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CHAPTER 9 AUXILIARY LOW PRESSURE INLET

9.1 The panel has the facility for an auxiliary low pressure inlet. This low pressure air supply must not exceed 15 Bar. To use, connect the supply hose to the L.P. inlet and direct the supply to the appropriate diver using one of the red-handled auxiliary valves (8).

NOTE

It is not advisable to use the L.P. supply for both divers at once as the deeper diver could experience a shortage of gas.

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CHAPTER 10 LOW H.P. WARNING

10.1 The system comprises a battery pack (9), pressure switch, warning On/Off switch (10), red warning LED (11) and a high frequency buzzer (12). During normal operation, the On/Off switch (10) must be in the on position. The pressure switch is set to operate when the H.P. supply pressure falls below 50 Bar. When this occurs, the pressure switch illuminates the warning LED (11) and the buzzer (12) sounds continuously. The panel operator will establish which H.P. supply is low by finding the illuminated LED (11). The buzzer (12) may then be cancelled by switching the warning switch (10) Off while supply cylinders are changed over. It is important that the warning switch (10) is returned to the on position after completion of the cylinder change.

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CHAPTER 11 MAINTENANCE

11.1 Very little maintenance is required and with the exception of the H.P. inlet valves (3 & 7) all components are factory assembled with no user serviceable parts.

11.2 Periodically inspect the panel for damage or signs of wear.

11.3 Check for air leaks by listening or by pressurising the panel, closing the valves and observing any pressure drop on the gauges. If a leak is suspected, remove the panel from its case and test for the leak with a liquid soap and water solution. Tighten any pipe connections only with the panel de-pressurised.

11.4 General Instructions for the Removal of any Component

Depressurise the system. Remove panel from case. Undo nut unions and remove the relevant piping. Remove the component. Repair or replace component. Remake all threaded joints using Locite 542 Hydraulic Seal or equivalent. Ensure that all mating surfaces and olives are clean. Do not over tighten the nut unions. Test for leaks. Return panel to case.

11.5 H.P. Panel Valve. Refer to drawing U1011.

These can be serviced in situ. Remove rubber handle by releasing the retaining nut. Unscrew the spindle nut and retract the spindle complete. Remove and inspect the valve seat. If it is undamaged, refit, If damaged, renew. Clean all items with a high quality industrial wiper. Re-assemble the valve, fitting a new Teflon spindle seal, O Ring and Copper Washer. Lubricate with light a smear of Molybdenum-Disulphide grease or any acceptable breathing air quality grease (e.g. Vaseline).

H.P. valve recommended spares (Service kit DD051201)

11.6 H.P. Non-Return Valve. Refer to drawing PP33004S1.

Test the HP non-return valves by pressurising the panel then disconnecting one H.P. hose at a time and opening the corresponding valve checking for air loss from the inlet connection. If there is any air escaping, the faulty non-return valve should be replaced.

11.7 H.P. Regulator

Servicing must be carried out by an approved engineer, trained by the manufacturer in the correct maintenance of the regulator (4). If no local approved engineer is available, the units must be returned to DIVEX for service.

The only permissible routine service is to clean the filter, located between the regulator and the H.P. inlet.

Remove the panel from the case. Locate and remove the filter. Unscrew the end pieces and remove the filter element. Clean and replace all items in reverse order.

Ensure spill valve exhaust port is kept open.

11.8 Gauges

These should be inspected on a regular basis to check for fluid loss. Also ensure that the pointer returns to zero when the pressure is released. The gauges should be calibrated in accordance with national regulations.

Damaged gauges should be replaced.

CAUTION

When replacing any components ensure that the previously noted procedures regarding cleanliness, sealants and re-assembly of nut unions are adhered to.

CHAPTER 12 MAINTENANCE SCHEDULE - 6 MONTHLY

12.1 Inspect lid and outer casing for damage. Check hinges and catches for correct operation.

12.2 Remove H.P. Panel Valve. Disassemble as described in Section 11.5 Inspect. Wipe clean with a high quality industrial wiper, lubricate with approved grease and re-assemble.

12.3 Check for free movement of 90° Diver Outlet Valves, Pneumo Valves and L.P. Isolator Valve. Section 11 for replacement.

12.4 Test H.P. Regulator by pressurising the system until the safety relief valve "blows" at 300 PSI. When reducing pressure (turning valve anti-clockwise) listen for the release of air through the Spill Valve.

12.5 Inspect all gauges for leakage of fluid and check that the needle returns to zero when the system is depressurized.

12.6 Pressurise complete system and listen for leaks.

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CHAPTER 13 APPENDICES

Drawing:	PP33004S1	Fit-Out Schematic
	PP33110S1	Diver Air Panel Assembly
	U1011	H.P. Control Valve spare parts

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H.P. SUPPLY
H.P. SUPPLY PRESSURE
ON DIVER 1
ON DIVER 2
H.P. SUPPLY PRESSURE
H.P. SUPPLY