

# **OPERATION MANUAL**

for the

# THREE DIVER, THREE REDUCER HP/LP AIR SUPPLY PANEL WITH LOW H.P. WARNING IN TRANSIT CASE

Part No. DD310019

DIVEX LTD						
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		P2106-DG-002 P2016-SL-002	Fit-Out Schematic Spare Parts List
		P2106-DG-003	H.P. Control Valve Spare Parts
		U1011	H.P. Control Valve Spare Parts
		U1323	Low H.P. Warning Electrical Schematic

#### 1.0 SAFETY NOTICE

- 1.1 This unit must only be operated by suitable qualified personnel.
- 1.2 Before operating this equipment, read the instructions thoroughly.
- 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 It 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 himself 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.

COMPRESSED AIR IS POTENTIALLY DANGEROUS

THIS EQUIPMENT MUST BE USED CORRECTLY

MISUSE COULD CAUSE INJURY

#### **Hose Connections**

- 2.18 LP inlet 3/8" BSP male
- 2.19 HP inlet 1/4" BSP male
- 2.20 Diver supply 3/8" BSP male
- 2.21 Pneumo 1/4" BSP male

#### **Dimensions**

2.22 Length 770 mm (30") Width 250 mm (10") Height 550 mm (21.5")

#### 3.0 GENERAL DESCRIPTION

- 3.1 The DIVEX three-diver, three reducer, H.P./L.P. air control panel will supply low pressure breathing air to three divers working simultaneously, to a diving depth of 50 meters in fresh or salt water.
- 3.2 The box contains six completely separate high-pressure lines, two for each diver. As a back up, one L.P. inlet line is fitted, which can supply each diver with air. Non-return valves ensure that the air to one diver cannot be diverted to the other. Because there is a common air supply serving each of the divers when using the L.P. supply, the supply is not independent to each diver in this mode.
- 3.3 Each divers depth can be monitored using a pressure gauge, which measures the hydrostatic pressure in an open-ended hose from the panel to the diver.
- 3.4 The controls are packaged within a strong, non-corrosive transit case, which may be, used upright or lying flat. Handles are provided to carry the case and can be utilised to secure it as required.

# 4.0 INSTALLATION

Using high-pressure air supply. (Refer to Drawing P2106-DG-001)

- 4.1 Ensure all on/off valves are in the OFF position.
- 4.2 Ensure H.P./L.P. reducer controls are turned fully Anti-Clockwise (1).

#### 7.0 PNEUMO OPERATION

- 7.1 Divers depth can be read from the pneumo gauges (2).
- 7.2 Turn on the pneumo valve (10) to supply air to the pneumo hose in the umbilical and allow the air to flow for sufficient time to ensure it is bubbling out of the open, diver end. (Usually confirmed by the diver via the comms).
- 7.3 When the air diver has bubbled out of the hose end, close off the supply valve (10) and read the hydrostatic pressure (shown as diver depth) on the pneumo gauge (2).
- 7.4 The depth must be checked periodically, as required, using the above method, particularly if the diver is changing his depth whilst working. When his work is completed and the diver is returning to the surface, the gauge will automatically read his ascending pressure without the necessity to supply more air to the pneumo hose.

#### 8.0 CYLINDER CHANGE OVER

- 8.1 Turn on the reserve air supply slowly via H.P. inlet valve (9). Confirm increase in pressure as noted on H.P. gauge (3).
- 8.2 Turn off the original air supply at H.P. inlet valve (9).
- 8.3 Purge H.P. hose to cylinder to be removed. Disconnect the cylinder and replace it with a charged H.P. air cylinder.
- 8.4 Slowly turn on the air cylinder at its valve.

#### 9.0 LOW PRESSURE INLET

9.1 The panel has the facility for an inlet from a low-pressure air supply. This low-pressure air supply must not exceed 15 bar. Connect the supply hose to the L.P. inlet and open valve (12) slowly. This supply is connected to all diver outlets. However, it is recommended that for safety reasons when using the L.P. inlet, to supply only one diver from the panel.

11.5 All other valves must be replaced completely if damaged.

Depressurise system. Remove panel from case. Undo nut unions and remove relevant pipes. Remove damaged valve and refit new valve, re-using fittings. Remake all screwed joints using Locite 542 or equivalent. Ensure that all mating surfaces on olives are clean. Reassemble ensuring that nut unions are not over tightened. Test for leaks and free movement of valve. Return panel to case.

#### 11.6 L.P. Safety Valve

This has been factory set at 14 BAR (200 psi). Service is by replacement only.

#### 11.7 L.P. Non-Return Valve

These are factory-sealed units and must be replaced with new if failure occurs. Remove the panel in the approved manner. Disassemble the non-return valve and replace with the new unit. Ensure that previously noted procedures regarding cleanliness, sealants and re-assembly of nut unions are adhered to.

#### 11.8 H.P. Regulator

Servicing must be carried out by an approved engineer, trained by the manufacturer in the correct maintenance of the regulator. 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 gauze filter, located behind the large hexagonal plugs at the rear of the regulator.

Remove the panel in the approved manner. Locate and remove the grub screws on the rear of the regulator. Remove plugs and take out gauze filter. Clean and replace all items in reverse order.

\*Ensure spill valve exhaust port is kept open.

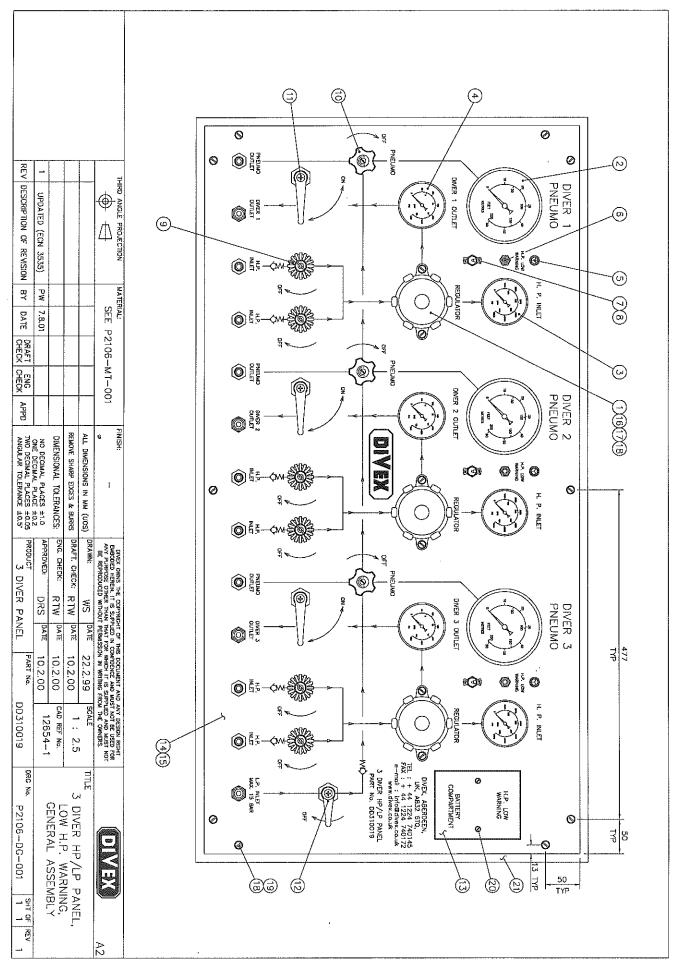
11.9 Regulator GLD 15 Mk1 recommended spares

Panel valve recommended spares (Service Kit DD051201)

Part Number	Description	Qty.
DD051311	Handle retaining nut	1
DD051310	Spring	1
DD051322	Rubber Handle	1
DD051309	Nylon Washer	1
DD051323	Spindle nut	1
DD051307	Teflon spindle seal	1
DD051308	O Ring	1
DD051306	Spindle	1
DD051305	Valve seat assembly	1
DD051312	Copper washer	1
DD310302	Panel mounting nut	2
DD310307	Stainless Steel washer	1
DD310301	Valve body	1

#### 12.0 MAINTENANCE SCHEDULE - 6 MONTHLY

- 12.1 Inspect lid and other casing for damage. Check hinges and catches for correct operation.
- 12.2 Remove H.P. Panel Valve. Parts as described in Section 11.11. Inspect all parts. Wipe clean with high quality industrial wiper and reassemble. Lubricate with approved grease.
- 12.3 Inspect free movement of 90° Diver Outlet Valves, Pneumo Valves and L.P. Isolator valve. Section 11.5 for replacement.
- 12.4 Test H.P. Regulator by pressurising the system until the safety relieve valve "blows" at 200 PSI. (Should the s/valve not function correctly refer to section 11.3). When reducing pressure (turning valve anticlockwise) listen for the release of air through the Spill Valve. If not audible refer to Section 11.8 & 11.9.
- 12.5 Inspect all gauges for leakage of oil and accuracy of needle return to zero. It may be a localised health and safety requirement that the gauges should be regularly calibrated.
- 12.6 Pressurise complete system and listen for leaks.



# DIVEX LIMITED

tem No	Description	Quantity	Eng Part No
1	REGULATOR, H.HGLD15 MK1	3	DD312004
2	GAUGE, PANEL, PNEUMO, 4", 60m/200'	3	DD320005
3	GAUGE, PANEL, 2 1/2", 400BAR/6000 PSI BK	3	DD320003
4	GAUGE, PANEL, 2 1/2", 21BAR/300PSI BK	3	DD320004
5	BUZZER	3	DD310368
6	L.E.D. RED	3	DD310365
7	SWITCH, TOGGLE	3	DD310369
8	LEGEND, ON-OFF	3	DD310370
9	VALVE, DD ROUND, 2 x 1/4" NPT(F) PORTS	6	DD360135
10	VALVE, PANEL, LP. PNEUMO. 1/4 BSP(F)	3	DD310312
11	VALVE, LP, 1/4 TURN, PAN.MNT., 3/8" BSP	3	VB214
12	VALVE, LP, 1/4 TURN, PAN.MNT., 1/4"BSP	1	VB213
13	COVER,BATTERY COMPARTMENT	1	DD310364
14	PANEL, BACKING PLATE	1	DD310359
15	PANEL, ENGRAVED	1	DD310378
16	WASHER, PLAIN, M6	6	FW037
17	NUT, HEX M6	6	FN035

PROJECT:

TITLE: 3 DIVER PANEL, LOW H.P. WARNING, GENERAL ASSEMBLY

M.T.O.

**REV.DESCRIPTION:** ECN 3535

CLIENT: REV.DATE:

**DIVEX** 13/08/2001 DRAWING No: P2106-SL -001 REV No:

**REVISION BY:** PWREV.DRAW CHECK:

REV.APPROVED:

ORIGINAL BY: WS ORG.DRAWCHK: RTW

**ORIGINAL DATE: 23/02/1999** ORIG.APPROVED: DRS

DD310019

**REV.ENG.CHECK:** 

ORG.ENG.CHK: RTW

PART NO:

#### 06-Dec-04

# DIVEX LIMITED

Item No	Description	Quantity	Eng Part No
18	NUT, CLINCH, M6	10	FN067
19	SCREW, PAN HD, M6 x 15 Lg.	16	FB280
20	SCREW, PAN HD, M4 x 16, SLOTTED PAN	2	FB250
21	CASE (TRANSIT), HP LP, 3 DIVER, BLACK	1	DD310358/BL K
22	HOSE ASSY, CHARGING, 1/4" BSP	6	DD310102
23	CHARGING CLAMP,	6	DD380051

PROJECT:

**REV.DESCRIPTION:** ECN 3535

PW**REVISION BY:** REV.DRAW CHECK: >>

**REV.ENG.CHECK:** 

CLIENT:

REV.DATE:

DIVEX

13/08/2001 REV.APPROVED: المخلاص TITLE: 3 DIVER PANEL, LOW H.P. WARNING, GENERAL ASSEMBLY M.T.O.

P2106-SL -001 DRAWING No:

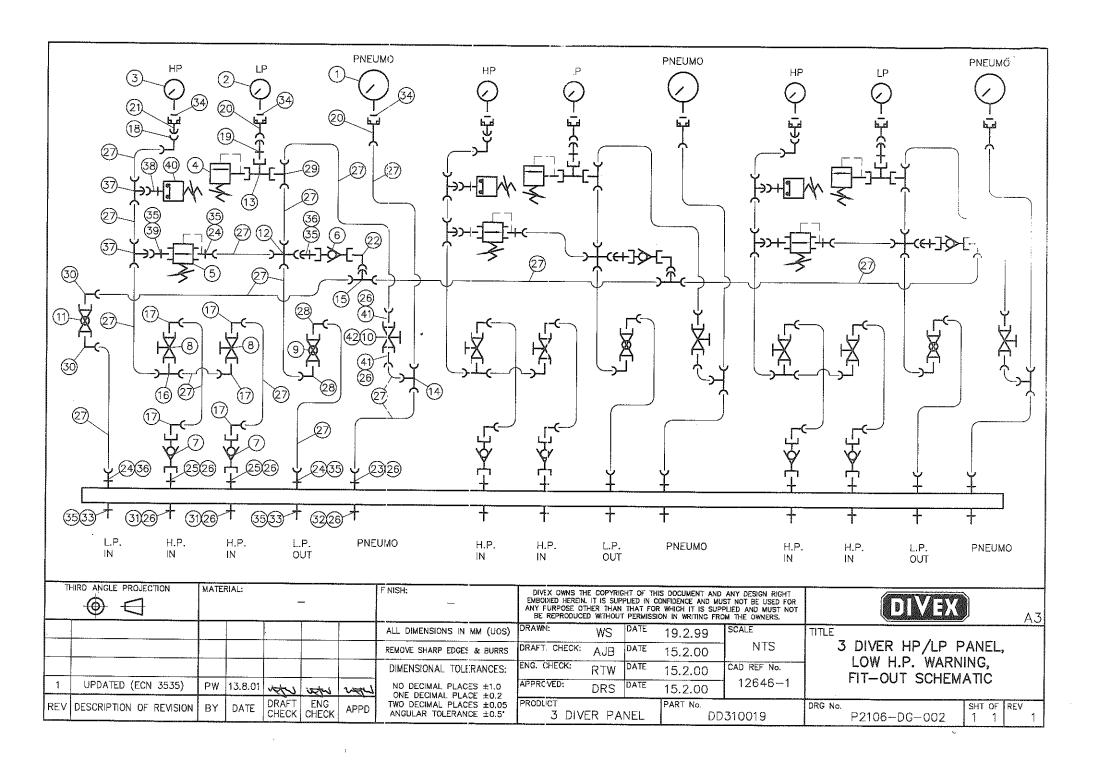
WS ORIGINAL BY:

ORG.DRAWCHK: RTW ORG.ENG.CHK: RTW REV No:

**ORIGINAL DATE: 23/02/1999** 

ORIG.APPROVED: DRS PART NO:

DD310019



PROJECT:

#### DIVEX LIMITED

tem No	Description	Quantity	Eng Part No
1	GAUGE, PANEL, PNEUMO, 4",60m/200', 1/4%	3	DD320031
2	GAUGE, PANEL, 2 1/2", 21BAR/300PSI BK	3	DD320004
3	GAUGE, PANEL, 2 1/2", 400BAR/6000 PSI BK	3	DD320003
4	SAFETY VALVE, 14 BAR, 200 PSI.	3	DD310320
5	REGULATOR, H.HGLD15 MK1	3	DD312004
6	NON-RETURN VALVE, L.P. 3/8	3	DD310321
7	NON-RETURN VALVE, SS, H.P. AIR	6	DD310319
8	VALVE, DD ROUND, 2 x 1/4" NPT(F) PORTS	6	DD360135
9	VALVE, LP, 1/4 TURN, PAN.MNT., 3/8" BSP	3	VB214
10	VALVE, PANEL, LP. PNEUMO. 1/4 BSP(F)	3	DD310312
11	VALVE, LP, 1/4 TURN, PAN.MNT., 1/4"BSP	1	VB213
12	CROSS, EQUAL, SERIES 8L	3	DD400679
13	TEE, BRASS, 1/4 NPT-F/M	3	DD400066
14	TEE, EQUAL, 8L SERIES	3	DD400934
15	TEE, SWIVEL BRANCH, 8L SERIES	2	DD400179
16	TEE, 1/4" NPT, MALE BRANCH, 8S SERIES	3	DD400949
17	ELBOW, 1/4 NPT STUD, SERIES 8S	15	DD401087

TITLE: 3 DIVER HP/LP PANEL, LOW H.P. WARNING, FITOUT **SCHEMATIC REV.DESCRIPTION:** ECN 3535 CLIENT: DIVEX DRAWING No: P2106-SL -002 REV No: . 1 **REVISION BY:** 13/08/2001 REV.DATE: ORIGINAL BY: WS **ORIGINAL DATE:** 12/02/1999 REV.DRAW CHECK: ~~~~ REV.APPROVED: ORG.DRAWCHK: RTW ORIG.APPROVED: DRS **REV.ENG.CHECK:** ORG.ENG.CHK: RTW PART NO: DD310019

### DIVEX LIMITED

Item No	Description	Quantity	Eng Part No
18	ELBOW, EQUAL, SERIES 8S	3	DD401034
19	S/PIPESTUD, 1/4 NPT, SERIES 8L	3	DD400127
20	GAUGE COUPLING, 1/4 BSP, SERIES 8L	6	DD400803
21	GAUGE COUPLING, S/PIPE, 1/4 BSP, 8S	3	DD400824
22	ELBOW, 3/8 NPT STUD, SERIES 8L	3	DD401083
23	MALE STUD, CONED, 1/4 BSP SERIES 8L	9	DD400567
24	STUD, 3/8" BSP MALE, 8L	9	DD400570
25	ADAPTOR,1/4 BSP MALE - 1/4 NPT MALE	6	DD400005
26	SEAL, BONDED, 1/4 BSP, SELF CENTRING	15	DD401121
27	TUBE, 8MM x 1.0MM WALL, ST. ST./M	10	DD310389/1
28	ELBOW, 3/8" BSPT STUD, SERIES 8L	6	DD401086
29	TEE, MALE BRANCH, 1/4 NPT-M, SERIES 8L	3	DD400947
30	ELBOW, 1/4"BSPT STUD, SERIES 8L	2	DD401084
31	M/M, 1/4 BSP, H.P. ST.ST.	6	DD400306
32	M/M, 1/4 BSP, L.P. BRASS	3	DD400303
33	M/M, 3/8 BSP, L.P. BRASS	4	DD400304
34	MAV WASHER, 1/4	9	DD400795

PROJECT: TITLE: 3 DIVER HP/LP PANEL, LOW H.P. WARNING, FITOUT **SCHEMATIC** 

**REV.DESCRIPTION:** ECN 3535 REVISION BY: PW REV.DRAW CHECK:

**REV.ENG.CHECK:** 

CLIENT: DIVEX 13/08/2001 REV.DATE: REV.APPROVED: DRAWING No: P2106-SL -002 ORIGINAL BY: ORG.DRAWCHK: RTW ORG.ENG.CHK: RTW

REV No: **ORIGINAL DATE:** 12/02/1999 ORIG.APPROVED: DRS

PART NO:

DD310019

#### 06-Dec-04

# DIVEX LIMITED

Item No	Description	Quantity	Eng Part No
35	SEAL, BONDED, 3/8 BSP, SELF CENTRING	17	DD401122
36	3/8 BSP MALE - S/PIPE SERIES 8L	3	DD400136
37	TEE, SWIVEL BRANCH, SERIES 8S	6	DD400180
38	STUD, MALE, A CONED, 1/4 BSP, SERIES 8S	3	DD400597
39	STUD, MALE, 3/8 BSP, SERIES 8S	3	DD400596
40	SWITCH, PRESSURE, LP, c/w DIN CAP	3	DD360328-1
41	STUD,MALE,1/4"NPT - 8L	6	DD400552
42	LOCKNUT,PANEL,PNEUMO VALVE	3	DD310312- PN

PROJECT:

**REV.DESCRIPTION:** ECN 3535 **REVISION BY:** PW

REV.DRAW CHECK: V REV.ENG.CHECK:

CLIENT:

REV.DATE:

REV.APPROVED: VI

DIVEX

13/08/2001

DRAWING No:

P2106-SL -002

REV No:

ORIGINAL BY: WS ORG.DRAWCHK: RTW

**SCHEMATIC** 

ORIG.APPROVED:

**ORIGINAL DATE: 12/02/1999** DRS

ORG.ENG.CHK: RTW PART NO:

TITLE: 3 DIVER HP/LP PANEL, LOW H.P. WARNING, FITOUT

DD310019

