



Ebsray Pumps Pty. Ltd.  
Brookvale, NSW 2100  
Australia



Engineering Report: ER04001  
Date: 05/04/04

## **ENGINEERING REPORT**

### **Ebsray Models C860200, C860201 and C860202 Diaphragm Replacement Instructions**

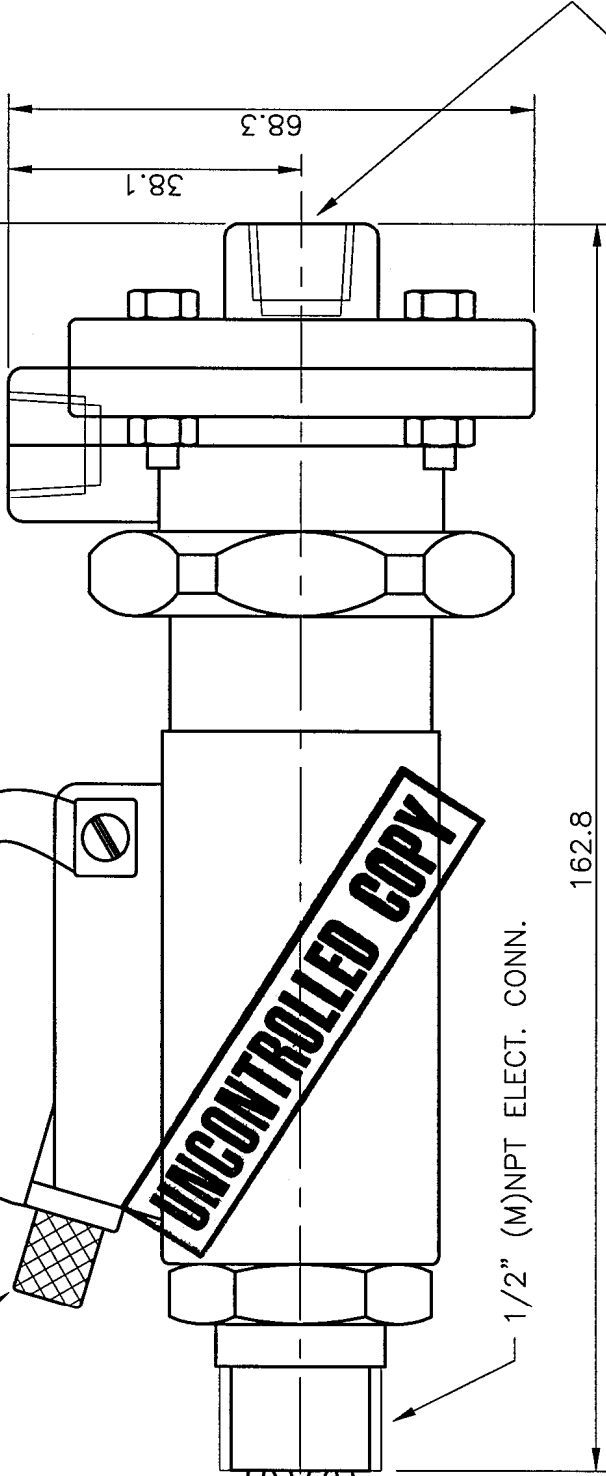
**WARNING: Carefully read these instructions *BEFORE* attempting to replace diaphragms. If this procedure is not followed or the same type diaphragm and o-ring are not installed, the warranty is voided.**

1. Remove the weathertight cap and use a 1/8" hex allen wrench to relieve range spring pressure by adjusting the screw counterclockwise (out). *Failure to relieve range spring pressure may cause personal injury to the disassembler.* Failure to relieve range spring pressure before disassembly may also damage internal parts.
2. Position the switch with the high-pressure process connection vertically upward and place in a vise. Loosen the 4 bolts that secure the low-pressure cavity, diaphragm and high-pressure cavity together. Carefully remove the high-pressure port without disturbing the orientation of the high-side diaphragm plate, which rests upon the diaphragm. Mark the exposed surface of this diaphragm plate with a felt tip pen or grease pencil to identify proper orientation for reassembly and set aside.
3. Remove and discard the diaphragm. Mark the exposed surface of the low-side diaphragm plate to identify proper orientation for reassembly and set aside. Inspect the diaphragm and piston sealing o-rings for degradation. Remove the piston sealing o-ring by carefully grasping the piston and extract from the low-pressure cavity. Insert the replacement o-ring into the piston sealing land and reinsert the piston. **CAUTION:** The piston is mechanically linked to the snap switch assembly and its travel is limited by the seating of the low-side diaphragm plate, which has been removed. **DO NOT** apply force to the piston as damage to the linkage may occur.
4. If required, clean the low pressure cavity with a quick drying solvent that leaves no residue and will not chemically attack the Buna-N piston o-ring. Clean and inspect the low-side diaphragm plate for damage. Pay particular attention that there are no nicks or burrs on the circumference of the side that will seat against the diaphragm (previously marked side). Also replace the plate if it shows any indication of over pressurisation (warping, indentations at seating lands, etc.). Reposition the low-side diaphragm plate and a new diaphragm sealing o-ring into the low-side port.
5. Place the new diaphragm with through holes aligned.
6. Clean and inspect the high-side diaphragm plate for damage. Pay particular attention that there are no nicks or burrs on the circumference of the side that will seat against the diaphragm (previously unmarked side). Reposition the high-side diaphragm plate and a new diaphragm sealing o-ring into the high-side port.
7. If required, clean the high-pressure cavity with a quick drying solvent that leaves no residue. Reassemble the high-side pressure port and evenly tighten bolts to 30 in-lbs of torque.
8. Recalibrate the switch by screwing the adjusting nut inward. Follow the calibration procedure from the general instructions that were supplied with the instrument and the attached diagrams.

FLEX RETAINER SEAL 1/4" (F)NPT LO SIDE PRESS. CONN.

PRESS. ADJUST. COVER

28.7



BLUE (C)  
 BLACK (NO)  
 ALL LEADS 450 MIN  
 RED (NC)  
 GREEN (GND)

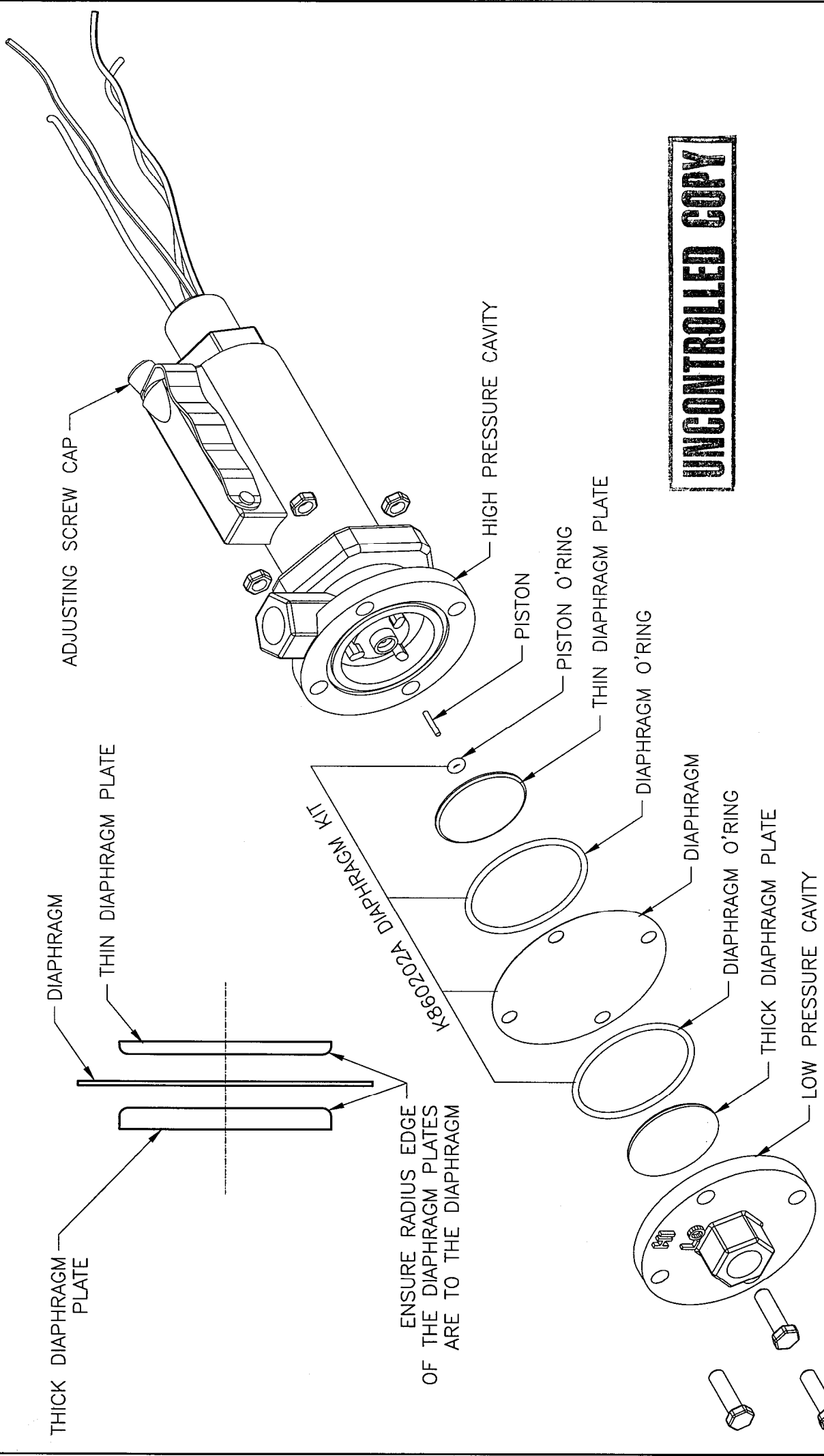
<b>MANUFACTURED FOR</b> <b>EBS-RAY PTY. LTD.</b> AUSTRALIA PHONE (61 2) 9905 0234 FAX (61 2) 9938 3825	
<b>DIFFERENTIAL PRESSURE SWITCH</b> EBSRAY ITEM NUMBER: C860202	
ADJUSTABLE RANGE 70-500 KPA	SERIAL NUMBER [REDACTED]
OVER RANGE 3500 KPA	EQUIP NUMBER [REDACTED]
SET PRESS 420 KPA	PROOF 7000 KPA

EXAMPLE OF NAMEPLATE

NOTES:

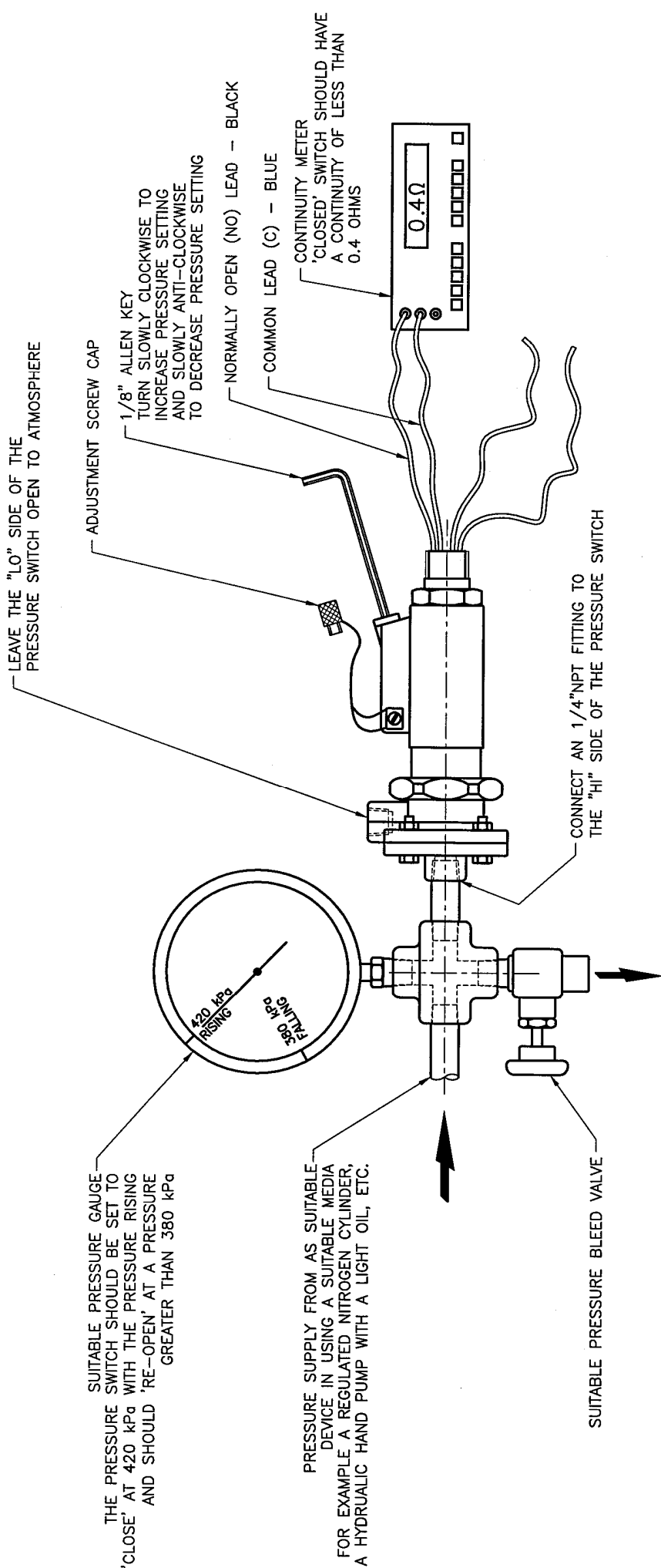
- RANGE 70 - 500 KPA DIFF. (10 - 75 PSID)
- SET PRESSURE 400 KPA (60 PSID) RISING
- SET DEAD BAND 10 KPA (1.5 PSI) FALLING
- OVER RANGE 3500 KPA (500 PSI)
- PROOF PRESSURE 7000 KPA (1000 PSI)
- 1/4" (F)NPT 316L S.S. PRESS. PORTS
- WETTED MATERIALS 316L S.S., NITRILE AND APU (AROMATIC POLYESTER THERMOPLASTIC POLYURETHANE) DIAPHRAGM (B)
- 1/2" (M)NPT CONDUIT CONNECTION WITH LEADS
- ELECTRICAL RATING 5 AMPS, 250VAC
- HERMETICALLY SEALED/EXPLOSION PROOF/WEATHERTIGHT SWITCH HOUSING.
- SAQAS LISTED CLASS 1, ZONE 1, Ex s IIC T6 AUS Ex480-1
- U.L. LISTED/CSA CERTIFIED CLASS 1, GROUPS A, B, C & D, DIVISIONS 1 & 2
- CE 0539 (E) I I 2 G - CLASS 1, ZONE 1, GROUP II 02 ATEX 0245938U EEx m II (C)

		TITLE: SWITCH-PRES-DIFF-Exs/EExm (CLASS 1, ZONE 1) SCALE: N.T.S. DATE: 23-02-00 DRAWN: J.J.D. CHK.D: J.J.D. APPR: J.J.D. COMP.No: C860202 DRG.No: C860202	
UNLESS STATED OTHERWISE ALL DIMENSIONS IN MILLIMETERS		EBS-RAY PUMPS PTY.LTD A.C.N. 000 061 003 628 Pittwater Road Ph.(02) 9905 0234 Brookvale N.S.W. 2100 Fax(02) 9938 3825	
C	10.04.03	ATEX LISTING WAS DEMKO	J.J.D.
B	19.03.02	DIAPHRAGM WAS TCP	J.J.D.
A	09.05.00	DESCRIPTION WAS SWITCH-PRES-DIFF-Exs/m	J.J.D.
REV	DATE	DESCRIPTION	APPR. BY
			CD. BY
			BY



**UNCONTROLLED COPY**

TITLE: EBSRAY MODEL C860202 DIFFERENTIAL PRESSURE SWITCH-EXPLODED VIEW		SCALE: N.T.S.		DATE: 18-10-01	APPR: <del>EBSRAY</del>	
DRAWN: J.J.D.		CHK.D: J.J.D.		DRG.No		A
COMP.No: A860202L		A860202L		A860202L		A
<p><b>EBSRAY AUSTRALIA</b>  <b>EBS-RAY PUMPS PTY.LTD</b>          A.C.N. 000 061 003          628 Pittwater Road Ph.(02) 9905 0234          Brookvale N.S.W. 2100 Fax(02) 9938 3825</p>						
UNLESS STATED OTHERWISE ALL DIMENSIONS IN MILLIMETRES						
REV	DATE	DESCRIPTION	BY	BY	BY	BY
A	03.05.02	K860202A WAS K860200A	J.J.D.	J.J.D.	J.J.D.	J.J.D.
			REV. CKD.	APPR.		



LEAVE THE "LO" SIDE OF THE PRESSURE SWITCH OPEN TO ATMOSPHERE

ADJUSTMENT SCREW CAP  
1/8" ALLEN KEY  
TURN SLOWLY CLOCKWISE TO INCREASE PRESSURE SETTING AND SLOWLY ANTI-CLOCKWISE TO DECREASE PRESSURE SETTING

NORMALLY OPEN (NO) LEAD - BLACK  
COMMON LEAD (C) - BLUE

CONTINUITY METER  
'CLOSED' SWITCH SHOULD HAVE A CONTINUITY OF LESS THAN 0.4 OHMS

0.4Ω

CONNECT AN 1/4"NPT FITTING TO THE "HI" SIDE OF THE PRESSURE SWITCH

SUITABLE PRESSURE GAUGE  
THE PRESSURE SWITCH SHOULD BE SET TO 'CLOSE' AT 420 kPa WITH THE PRESSURE RISING AND SHOULD 'RE-OPEN' AT A PRESSURE GREATER THAN 380 kPa

PRESSURE SUPPLY FROM AS SUITABLE DEVICE IN USING A SUITABLE MEDIA FOR EXAMPLE A REGULATED NITROGEN CYLINDER, A HYDRAULIC HAND PUMP WITH A LIGHT OIL, ETC.

SUITABLE PRESSURE BLEED VALVE

**UNCONTROLLED COPY**

TITLE: TEST SETUP FOR EBSRAY MODEL C860202 DIFFERENTIAL PRESSURE SWITCH		SCALE: N.T.S.		DATE: 19-03-07	
DRAWN: J.J.D.		CHK.D: J.J.D.		APPR: <del>J.J.D.</del>	
COMP.No: A860202K		DRG.No: A860202K		REV. 0	
 <b>EBS-RAY PUMPS PTY.LTD</b> A.C.N. 000 061 003 628 Pittwater Road Ph.(02) 9905 0234 Brookvale N.S.W. 2100 Fax(02) 9938 3825					
UNLESS STATED OTHERWISE ALL DIMENSIONS IN MILLIMETRES					
REV	DATE	DESCRIPTION	REV. BY	CHK. BY	APPR. BY