

LA3 Installation Guide

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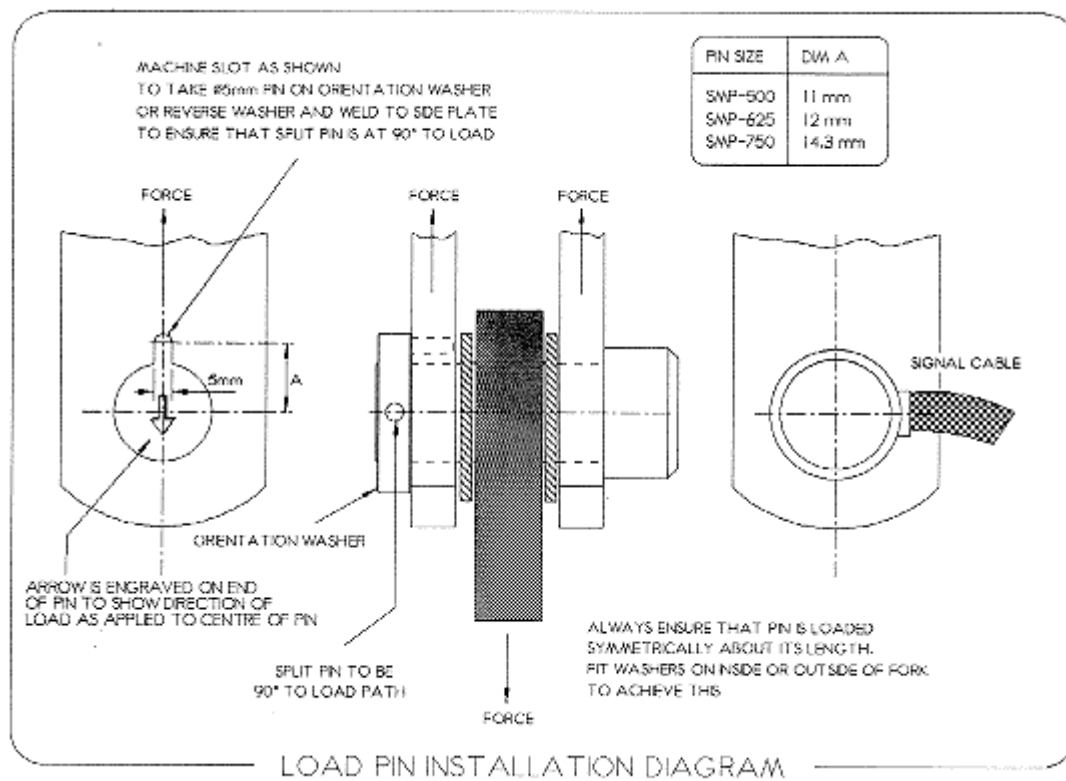
Load Cell Installation

The load cell is a totally sealed unit, constructed from the most suitable stainless steels available to withstand the loads and conditions of the marine environment. To ensure a long life to the load cell, careful installation is recommended especially with regard to the electrical output from the load cell.

Install the Shear Monitoring Pin (SMP) so that the split pin will be 90° to the load path as shown in the next sketch. The SMP should be a close fit in its associated holes. The SMP is provided with two Delrin washers, which should be used to keep the eye in the centre of the fork, as shown on the sketch. Before final installation fit the SMP in its associated assembly, as above, so that the bush lies against an outside cheek of the fork. **MAKE SURE THE SPLIT PIN IS SQUARE TO THE LOAD**, then tack weld the bush to the fork. Route the output cable from the cell to the deck carefully, to prevent it from being snagged or chafed in service.

For forstay load cells it is recommended to take the cable over the bow and then into the hull so as to keep the cable safe from damage. The load cell is supplied with a cable protection hose and should be measured for length (with a suitable loop for load cell flexing) and cut before feeding over the cable. Push and twist the hose onto the load cell anchorage. If possible, take the protection hose into the hull through a 14mm hole and seal as necessary. The route of the cable, below deck, should be kept away from any high power transmitting cables such as those associated with radar or radio.

Load Cell Diagram



Amplifier Installation

The amplifier should be sited in a convenient position below deck so that adjustments can be made if necessary. A voltage between 12 and 24V DC is required by the unit, which should be switched and fused at the control panel in the yacht. Display illumination can be provided by a 9V DC lighting supply from the amplifier. The load cell and remote display(s) cables should be led straight to the amplifier together with power and illumination cable. All cables are wired into the box via compression glands and terminated according to the connection diagram.

Repeater Installation

To install the display repeater unit is an easy and straightforward procedure:-
Choose a suitable location in an area without obstructions, but with less chance of physical damage from winch handles, other equipment and people. Also check that access is available from behind the location so that the cable can be passed through a drilled hole for connection.

To install the display in the chosen location use the supplied Drill Template and fix to the bulkhead so that the indicated holes may be drilled through. Drill four 5mm diameter holes through the template and bulkhead for the studs in the indicated position, and one 8mm diameter hole for the cable. Pull the screened multi-cable through the hole, and fit the display to the bulkhead. Connect in accordance with the connection diagram. Place four fibre washers onto the studs projecting from the display and secure firmly with the four M4 stainless nuts provided. Do not over tighten the nuts.

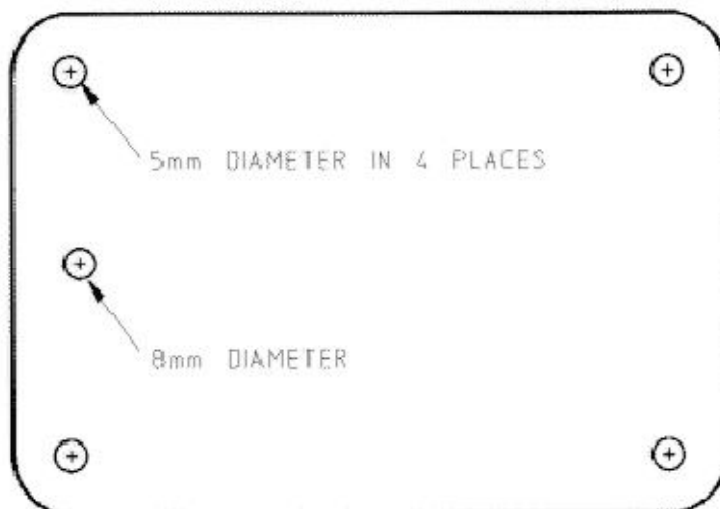
The illumination on these displays is controlled automatically by means of a light sensor. This turns the illumination on or off depending on the light conditions - the illumination supply is integral with the DC supply for both the analogue amplifier and the SPA digital amplifier.

ALTERNATE REPEATER INSTALLATION (If Supplied) The amplifier incorporates two outputs for driving type SGD 35B and/or DFM-1047-A repeaters, as well as an auxilliary (0 - 5V DC input) display system - for example: B&G. A 4-20mA output is also available as an option.

TYPE DFM-1047-A FLUSH MOUNTING DISPLAY An aperture 120mm wide by 80 mm tall, corners radiused to 6mm is required - see gasket supplied. The fixing holes have a diameter of 5mm, the pitch of which is 1 27mm (5") by 82.6mm (3.25") as per gasket. Use the rubber gasket between the front bulkhead mounting flange and the bulkhead itself on installation. The decimal point will normally be set, but can be changed by altering the position of the links that are to be found on the back of the display.

The illumination on these displays is controlled automatically by a light sensor. This turns the illumination on/off depending on prevailing light conditions - the illumination power supply is connected to the amplifier.

Drill Template



Setting Up

With no mechanical load on the load cell, switch on the voltage supply to the amplifier and leave for 15 minutes before attempting adjustments. If necessary, adjust the ZERO potentiometer for 0V DC across terminals 19 and 20. This should correspond to a reading of zero on the display(s).

Slide the CAL switch ON (towards the edge of the board) and note the reading on the display after the internal damping has decayed. The reading should match the figure obtained at calibration and found on the calibration details and the amplifier lid.

If the CAL reading is in error, first adjust the GAIN potentiometers so that the voltage across terminals 19 and 20 is $5 \times$ calibration figure divided by rated load. This ensures that the amplifier output is 5V at full rated load.

The DISPLAY SET potentiometer can then be adjusted to give a reading on the display equal to the calibration figure.

Switch off the CAL (towards centre of the board) and recheck the zero. Repeat the sequence until all OK. Always leave the CAL switch OFF when setting up is complete. The CAL injects a dummy signal to the readout which simulates an exact amount of load on the cell. The CAL therefore provides an overall function test of the system and can be used to see if all is OK at anytime. Use of the CAL facility, with load on the load cell, will add the CAL reading to the previously displayed load.

If the optional trip relay is fitted, adjust the TRIP SET potentiometer so that the voltage across the test point and terminal 19 is $5 \times$ trip level divided by the rated load, where trip level is the load at which the relay is to activate.

Interfacing

The amplifier has as standard an analogue voltage output in addition to the two repeater outputs. This output ranges from 0 to ± 5 V DC, and can be limited to protect against the overloading of connected instruments. The gain of this output is varied using the FINE and COARSE GAIN controls. Refer to page 6 for details of setting up.

If standard repeater displays are also fitted, then any discrepancy between them and the auxiliary driver output can be compensated using the DISPLAY SET potentiometer. Optionally, an analogue current output may be fitted. This output ranges from 4 to 20ma. Nominally, 0 to 5 Vdc on the analogue voltage output corresponds to 4 to 20ma on the analogue current output. The gain of the current outputs is also set by the FINE and COARSE GAIN controls.

Interfacing To B&G

With No Load on the load pin. LA3 Cal Sw. OFF Set output on terminals 19 and 20 of LA3 Amplifier to 0 Volts, Move Cal Switch to On and set output on 19 and 20 to read LA3 Amplifier Cal Voltage. (From Cal Page)

B&G HYDRA & HERCULES Processors

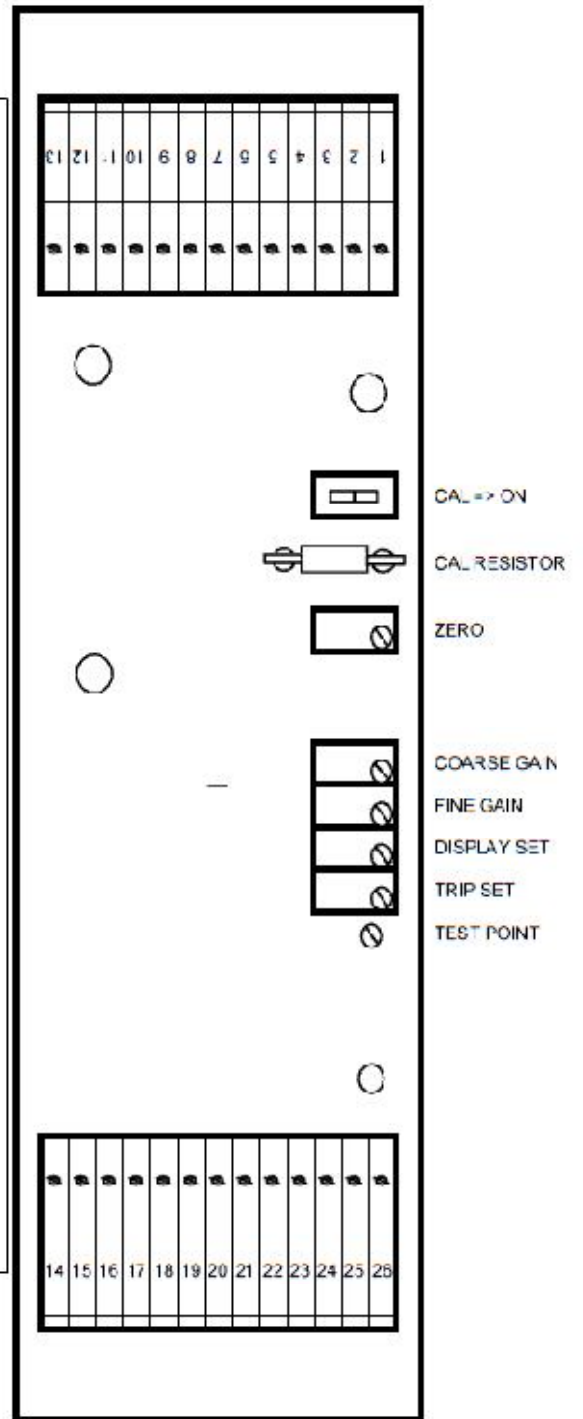
(Can accept 0-5 VDC input from DYS amp) Interface connections:

Cell	DYS Amp	B&G (SIU)	Linear Channel
No 1	TERM 20	TERM 27}	4
	TERM 19	TERM 21}	

B&G Linear 4 Setup

1. Select *MISC* on the top line of an FFD Display.
2. Press Scroll Up or Scroll Down until *LINEAR 4* is flashing
3. Press Enter
4. Press Scroll Down to Select *CALIBRATE* on the FFD Display Bottom Line and press ENTER
5. Scroll Down to *Cal Val 1*
6. Set to -1 or -2 depending on number of decimal places required on Linear 4, Press ENTER
7. Scroll Down to *Cal Val 2* and set to 0, Press ENTER
8. Scroll Down to *Cal Val 3* then Adjust value of CAL VAL 3 until the Cal. Equivalent Number (Either 1000's of Pounds or 1000's of KGs.) is shown on the top line
9. Turn CAL. SWITCH of LA3 OFF
10. Check B&G Linear 4 returns to 00.0 (or 00.00)

Connection Diagram



1	DISPLAY 1	GROUND	BLK
2	DISPLAY 1	SIGNAL	GRN
3	DISPLAY 1	SUPPLY -VE	BLU
4	DISPLAY 1	SUPPLY +VE	RED
5	DISPLAY 1	LAMP +VE	YEL
6	DISPLAY 1	LAMP -VE	WHT
7	LOAD CELL	SUPPLY +VE	RED
8	LOAD CELL	SIGNAL -VE	YEL
9	LOAD CELL	SIGNAL +VE	GRN
10	LOAD CELL	SUPPLY -VE	BLU
11	LOAD CELL	SCREEN	
12	DC SUPPLY		BLK
13	DC SUPPLY	12-24V dc	RED
25	DISPLAY 2	GROUND	BLK
24	DISPLAY 2	SIGNAL	GRN
23	DISPLAY 2	SUPPLY -VE	BLU
22	DISPLAY 2	SUPPLY +VE	RED
21	DISPLAY 2	LAMP +VE	YEL
20	DISPLAY 2	LAMP -VE	WHT
19	VOLTAGE OUTPUT	+/- 5V dc	
18	VOLTAGE OUTPUT	0V dc	
17	CURRENT OUTPUT	4-27mA	
16	CURRENT OUTPUT	RELUM	
15	TRIP RELAY	COMMON	
14	TRIP RELAY	NO	

System Test

Test LOAD CELL:

1. Remove load cell wires from the amplifier.
2. Test insulation resistance all cores to earth- must be greater than 100 MOhms at 50 Volts applied.
3. Test resistance:
 - a. RED to BLUE approx. 350 Ohm
 - b. YELLOW to GREEN approx. 350 Ohm
 - c. BLACK should be isolated from all cores and earth

Test AMPLIFIER:

Connect load cell back into amplifier, if OK :

- a. **TSA**
- b. Pins 8 and 9: approx. 9.0 Volts at all times.
- c. Pins 19 and 20: NO voltage with NO load on loadcell - adjust ZERO pot. to obtain zero
- d. Pins 19 and 20: CAL will produce voltage proportional to load on display.
- e. Pins 1 and 2; also pins 26 and 25: NO voltage with NO load on load cell.
- f. Pins 1 and 2; also pins 26 and 25: CAL will produce voltage proportional to load on display.

Test DISPLAY:

- a. **TSB**
- b. Short pins 5 and 1 for zero on display
- c. Short pins 26 and 25 for same if second repeater fitted
- d. Pins 4 and 3 also 24 and 23 should be approx. 9.0 volts at all times