VALEPORT LIMITED

Model 108MkIII/308 Current Meters

Installation & 8008 CDU
Operation Manual

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1   INTRODUCTION

This document covers the installation and operation of the Model 108 MkIII Direct Reading and Model 308 Self Recording and Direct Reading Current Meters, when used with the 8008 Control Display Unit.

It also covers general maintenance procedures, and the calibration data of the unit. Operation of the Current Meters with Visual Basic and Windows PC software is covered in the supplementary software manuals.

1.1   General Description

The Model 108MkIII and 308 are impeller based current meters measuring speed and direction, which can also have Conductivity, Temperature and Pressure parameters fitted. From these additional parameters Salinity, Density and Speed of Sound are calculated. The system is modular and instruments can be upgraded if desired.

The Model 108MkIII is a direct reading only instrument. The Model 308 is a self recording instrument, which can also be used simultaneously for real time measurements. Both units can be used directly with a PC or with the optional Model 8008 Control Display Unit. This unit has 3 data communication methods built in which offer considerable flexibility for configuration and use with a wide number of cable types and lengths.

Sampling and averaging periods are set up using a PC or 8008 CDU, and the set up is retained until overwritten. Calibration for all sensors is held within the instrument and data is provided in engineering units.

Power may be taken from its internal batteries [308 only], from the 8008 CDU or from a surface battery or power supply.

Self recording units have 128 kbyte memory as standard [1Mbyte optional]. The 128 kbyte memory can store 30,000 speed and direction records [or 12,000 speed/direction plus CTD records].

2   SYSTEM DESCRIPTION

A general overview of the system and the different hardware options which are available are shown in Figure 1(Appendix 2), and general specifications are given in Appendix 1.

2.1   Instrument

The instruments contain all of the measurement sensors and electronics. The current meter works on a basic 5 second cycle, during which the impeller counts are taken and a single compass heading reading is made. From this, East and North velocity vectors are calculated, which are then summed over the averaging period. The optional additional parameters are sampled once every sample period. Figure 5 (Appendix 2) is a schematic of the sampling method.   Note that at very low flow speeds (of the order of a few centimetres per second), it will be necessary to set a reasonably long averaging period to improve the resolution and accuracy of the flow measurements.

The data acquisition micro-controller enables 15 bit [14 bit + sign] resolution of the additional parameters. This equates to a 1:20,000 resolution for the CTD parameters. The CTD operates on a basic 16 Hz sampling rate and the samples are sequential.

The self recording units log raw data. In real time mode, the calibration constants are used to calculate the actual conductivity, temperature and pressure readings within the instrument, and this data is read by the PC which then calculates the derived parameters of Salinity, Density Anomaly and Speed of Sound. When logged data is extracted, the raw data is transferred to the PC and then a translate program is used to convert the data to engineering units and calculate the derived parameters. This is done automatically by the Windows software, and via the additional 308_TRAN.EXE program with Visual Basic software. These operations are covered in the supplementary software manuals.

The additional optional sensors fitted are a Valeport inductive coil conductivity sensor, thermistor or platinum resistance thermometer and strain gauge pressure transducer. The type and range of transducer actually fitted is defined in the calibration sheet [Appendix 4].

2.2   Cables

For direct reading applications, a variety of different cables can be fitted, using the appropriate interface unit at the surface for RS485 or Digital Current Loop operation. Direct RS232 communications can be achieved over short cable lengths [e.g. 50 metres].

2.3   Surface units

The RS485 adaptor enables half duplex operation over long cable lengths, with separate power being supplied on a separate pair of conductors. The DCL adaptor enables data on power communications over a single pair of conductors. With RS485 operation, the instrument has a link removed and an IC fitted, which disables down link RS232 communications. This means that for an instrument which has been set up for RS485 (see calibration sheet to determine set up for instrument supplied) the RS485 adaptor is always needed for data extraction of logged data from the instrument.

The 8008 CDU has the three communications methods built in, with selection defined by the cable connections.

2.4   Equipment supplied

The equipment supplied is defined in the equipment checklist, Appendix 5.

2.5   Customer Supply

The customer will need to supply the computer for data capture of 308 recorded data. If using Windows software, an IBM compatible computer fitted with 386SX processor or above, Windows version 3.1 or above, and at least 4Mbyte RAM (preferably 8Mbyte) will be required. If using visual basic software, an IBM compatible computer fitted with 286 processor or above, DOS version 3.3 or above and at least 640kbyte RAM will be required. In both cases it is also necessary to have a single 3.5" floppy disk drive and an RS232C serial port, and a mouse will enable more convenient control of the software.

3 INSTALLATION

3.1 Mechanical Installation

The instruments are provided with a suspension assembly for users to attach to a suspension or mooring line. If the Valeport polyurethane covered multi-core cable is being used, then this has a maximum working load of 100kgf, and if a sinker weight is being used, it is important that this load is not exceeded.

The Model 108MkIII must be suspended with the connector downwards, and the 308 with the connector upwards (see data sheet in Appendix 1).

For correct operation of the impeller, the inner part of the impeller should be filled with clean water. This is achieved by unscrewing the impeller nose cap, and submerging the impeller to allow water to fill the inside. While it is still underwater, refit the nose cap to seal the water inside.

3.2 Electrical Connections

See also Figure 1 (Appendix 2) for equipment interconnections, and Appendix 3 for cable wiring details.

a] Direct RS232

Over short lengths of cable and for setting up recording scenario and replay of data the instrument RS232 communications can be used. With the Model 308 the 3m data/power lead can be used for setting up.

If external power is being used it must be in the range of 11.5 to 14VDC and the consumption is approximately 50 - 60mA depending on the parameters. The red lead should be connected to the +ve terminal and the black lead should be connected to the -ve terminal of the power supply or external battery.

The data lead should be plugged into a serial port on the PC (9-way D type connector).

NOTE: Some older PCs have 25 way serial ports, in which case it will be necessary to use a 9 to 25 way adaptor.

The software sets up the serial port of the PC to 4800 baud, 8 data, 1 stop, no parity.

b] DCL

Connection is via the DCL surface unit [or 8008 CDU] and leads. The unit requires 12-24VDC, and takes approximately 120 mA.

c] RS485

Connection is via the RS485 surface unit [or 8008 CDU] and leads. The unit requires 12-24VDC, and takes approximately 150 mA.

3.3   Batteries

3.3.1   308

The internal battery containing 7 "C" cells, has a capacity of 7.75 Ah if high grade alkali cells are used. For non RS485 set up instruments, the overall current consumption depends on the sampling set up. The basic average current drain for the speed/direction part of the system is 1mA, and each burst of CTD takes 11mA for 0.4Secs. The battery life is therefore approximately:

Sample Period	5secs	30 secs	60 secs
Speed/Direction	284 days	377 days	389 days
Speed/Direction +CTD	190 days	340 days	369 days

3.3.2   8008 - CDU

The 8008 contains 8 "C" cells, giving an operating life time for the batteries in excess of 40 hours continuous use.

4   OPERATION USING 8008 CDU

The 8008 CDU is of ABS construction with graphics LCD and back light, membrane keys and integral battery compartment. The unit is sealed to IP67 (10 seconds at 0.3 metres).

The 8008 CDU is designed to allow real time display of data from an underwater unit, and to enable the setting of parameters for Direct Reading and Logging Modes. It is possible to connect the 8008 to a printer for a permanent record of the data, and it has an optional logging facility of its own. However, this does not allow uploading of logged data from the memory of a Model 308. A PC is therefore required to strip logged data from a Model 308.

4.1   Operating Procedure

Connect the CDU to the Current Meter using the Deck Lead and cable for Direct Reading (108 MkIII or 308) or Both (308 only) modes, or the 3m 'Y' Lead for Self Recording (308 only) mode. Then follow the procedure laid out below:

Press ON	Unit switches on with introductory display
Press any key to continue	Unit displays **RUN, SETUP, TOGGLE B'LIGHT, SET TIME/DATE, CDU MEMORY**
Set TIME/DATE	Probably the most important as all timing references are made from this including the setting of fish time when in 308 mode. Use **INCREASE/DECREASE** keys to alter figures and **NEXT** key to move on to next figure. **EXIT** will set and escape to previous menu.
TOGGLE B'LIGHT	Switches back light on or off.
CDU MEMORY	Controls the optional logging facility on the 8008 CDU. Pressing this key reveals the CDU LOGGING MENU. Full details of this menu are covered later, but the most important function in this menu is turning the logging facility ON and OFF. This function is completely independent of the fish; i.e it is possible to have the CDU logging but not the fish, or vice versa, or both or neither.
SET UP	Allows set up of sample and averaging periods. Press **SETUP** key. PLEASE WAIT RESETTING FISH!! is displayed followed by INTERRUPTING FISH - PLEASE WAIT. Display will now show instrument type and serial number and prompts you to acknowledge by pressing O.K. key.

The following is revealed:

SET SAMPLE PERIOD	Sample frequency is set using the **CHANGE** key to alter figures and **TOGGLE** key to move to next figure. The sample period can be incremented in periods of 5 seconds, to a maximum of 20:55 minutes. **EXIT** to set and return to previous menu.
SET AVERAGING PERIOD	Averaging period is set as multiples of sample period. Use **INCREASE/DECREASE** keys to change as required. **EXIT** to set and return to previous menu.
SET TARE VALUE	Used to take reading at surface of pressure before deployment and subtracts figure from readings when instrument is in use to show correct depth. Upon pressing key the statement "press any key when transducer is at surface level" is revealed. Press any key. Tare value is automatically set.

SET FISH TIME

308 use only.
Pressing **FISH TIME** sets fish to surface unit time already pre-set. Press O.K. key to set and return to previous menu.

CLR MEM

Resets memory to zero. Press **O.K.** key to set and return to previous menu.

RUN

108 MkIII Use:
Unit will now be operational when **RUN** key is pressed.

RUN

308 Use
The user is presented with the option to select **DIR, BOTH** or **LOG** modes. Select **DIR** for direct reading, **LOG** for logging or **BOTH** for direct reading and logging, using **NEXT** key. **RUN** key will set. It should be emphsised that selecting **LOG** or **BOTH** sets the fish only to log data. If it is required that the CDU also logs data, this must be set independently using the optional CDU MEMORY function in the opening menu.

When is **RUN** mode, **EXIT** key will allow return to main menu.

DISPLAY

A full display will show:-

> **SPEED** in M/S
> **DIR** [direction] in Deg
> **TEMP** [temperature] in Deg C
> **PR** [pressure] in dBar
> **SAL** [salininty] in PSS78
> **DENS** [density] in Kg/M^3
> **COND** [conductivity] in Ms/cm
> **SOS** [speed of sound] in M/S

CDU MEMORY

Pressing this key in the opening menu reveals the CDU LOGGING MENU, which contains: **FILE TABLE, LOGGING ON/OFF, MEMORY FREE, EXTRACT CDU DATA, ERASE MEMORY, EXIT**.

FILE TABLE

This key reveals a display showing the total number of files stored (maximum 100), the size of each file, the sample and averaging period of the data, and the time/date of the first record in each file. A new file is created each time the unit is set to Run. To move between files, use the NEXT and LAST keys. Press EXIT to return to the previous menu.

LOGGING ON/OFF

As stated previously, this key toggles between loggnig on and off, for the CDU only.

MEMORY FREE

Displays the total unused memory space in bytes, and the number of files currently stored. Press EXIT to return to previous menu.

ERASE MEMORY

Clears CDU memory. This will not affect the fish memory.

EXTRACT CDU DATA   Use this key to upload data stored in the CDU to a PC. Connect the 8008 CDU to a PC using the interface lead provided. Before pressing UPLOAD, run the data extraction program DATEXT.EXE that is provided on floppy disk. Do this by inserting the disk to the PC's A drive and typing a:\datext<cr>. Enter the correct Comms port, and then press UPLOAD on the CDU. Immediately afterwards, press any key on the PC keyboard. The data will now be uploaded. This process happens at 19200 baud, compared to the default 4800 baud at which the rest of the software operates.

Once the data has been uploaded to PC, the DATEXT software will ask if the data is to be translated into calibrated data, as opposed to the binary data that the unit stores. The user must select the number of lines that the data will be stored in, from 100 to 16360. This is because the data will be stored in a format that can be imported in to Spreadsheet packages for analysis, and 16360 is the maximum number of lines in most packages (Microsoft Excel will only produce graphs if the number of lines is 4090 or less).

The data files will be stored in the local directory, and will be named ?DATA.BIN (original binary data) or ?DATA.??? (calibrated data), where ? signifies the file number, and ??? the number of calibrated files for each file. For example, if the user sets the number of lines to be 100, but the file contains 700 records, 7 data files will be created for that original file, i.e. ?DATA.000 to ?DATA.006

4.2   POINTS TO NOTE ABOUT CDU LOGGING

1.   Only 100 files can be stored, but each file can contain as many records as space will allow.

2.   A new file will be created every time the unit is set to Run, and will be given an index 1 more than the last file stored.

3.   Setting the CDU to log will not affect the logging facility of the fish itself.

4.   It is not possible to Upload data from the fish to the CDU. To upload data from the fish, the user must use the DATALOG Windows software supplied, or the 308.EXE program.

5.   When uploading CDU logged data, the DATEXT.EXE program will automatically name the files as above, and will overwrite any existing files of the same name.

Press **ON** key to toggle unit off when finished operations.

4.3   Data Replay [308 only]

A PC is required to recover data stored in the instrument following deployment. Refer to Section 5 for Windows software operation, and to Section 6 for Visual Basic software operation.

Note that all data in a file has to be extracted for that file to be read.

4.4   External Connections

The 8008 CDU has three external connections

EXT DC IN   3 WAY
DATA INTERFACE   4 WAY
FISH CONNECTION   10 WAY

External DC in requires a 10 to 24v DC input. Valeport cables, part numbers 0300-014 or 0300-013 are used for this purpose.

Data interface provides an RS232 output for printer use. Output is always transmitted and displays surface unit data. Valeport cable, part number 0300-012 is used.

Fish connection, for direct connection or via cable reel to fish. Valeport cable, part number 0300-010-03 is used.

5 MAINTENANCE

5.1 Battery replacement [308 only]

The batteries are housed within the instrument at the front end. The procedure to replace the batteries is as follows:

1. Remove the three M5 aluminium bronze socket countersunk screws in the side of the battery housing, using a 3mm hexagonal key.

2. Withdraw the battery cover from the meter, revealing the battery assembly

3. The battery cage accepts 7 "C" cells [LR14 or equivalent]. It is advisable to use alkaline cells as these give increased life and leakage protection. The batteries should be inserted -ve [negative] end first against the spring and then clipped into place.

   NOTE: The battery pack contains a dummy cell which is fixed in position and should not be removed.

4. Before replacing the battery cover, check the condition of the O-rings, which should be free of cuts or perishing. Also check the condition of the sealing bores of the battery cover which should be free of scratches. Finally smear a light coating of silicon grease on the O-rings and battery cover sealing bores to aid refitting and subsequent removal.

5. Further reassembly is a reversal of the disassembly process.

Should any of the M5 socket countersunk screws be lost it is imperative that they are only replaced with titanium M5 x 10 socket countersunk screws, otherwise there is a risk that galvanic corrosion will occur which could seriously damage the housing.

5.2 Battery replacement - 8008 CDU

The batteries are housed within the CDU under the battery cover. The

1. Remove the battery cover.

2. Remove the top pcb by undoing the retaining screw to reveal the battery cells.

3. The battery accepts 8 "C" cells [LR14 or equivalent]. It is advisable to use alkaline cells as these give increased life and leakage protection. The batteries should be inserted -ve end against the spring and the top pcb then screwed back into place.

4. Before replacing the battery cover, check the condition of the O-rings, which should be free of cuts or perishing. Also check the condition of the sealing bores of the battery cover which should be free of scratches. Finally smear a light coating of silicon grease on the O-rings and battery cover sealing bores to aid refitting and subsequent removal.

5.3   Impeller

The impeller should be free to rotate. This can be tested by positioning the instrument vertically and spinning the impeller. Note that when the instrument is horizontal and not in water, the bearings are dry and the impeller is not neutrally buoyant, the impeller may not rotate freely.

To remove the impeller:

1. remove the impeller nose cap [yellow]
2. remove the two M3 nuts from the impeller shaft
3. unscrew the instrument/guard nose cone and at the same timeslide the impeller off the shaft
4. remove the impeller from the guard

Cleaning:

Wash the inside of the impeller, and clean any residue from the impeller shaft.

Impeller shaft:

If it is required to reset the impeller shaft, it is necessary to set its position to ensure correct operation:

1. Position the instrument with the shaft pointing upwards with the shaft in approximately the correct position
2. Without the guard fitted, replace the impeller on the shaft with the nose cone fitted
3. Unscrew the nose cone to allow the impeller to rest against the instrument body hub face
4. Lightly hold down the impeller down against the hub face, and slowly screw down the nose cone until it tightens and thereby wants to lift the impeller away from the hub face
5. Check the clearance between nose cone and impeller end face and adjust the shaft so that the clearance is 0.5 to 0.75mm. Ensure the shaft and lock nut are tightened and recheck the gap.
6. Remove the nose cone and impeller.

Refitting impeller

1. With the impeller body held within the guard, screw the guard on to the instrument with the impeller sliding over the shaft.
2. Fit the washer and nuts on to the shaft, and set their position so that the gap between the washer and impeller body is approx 2mm.

5.4   General

The external parts of the meter are manufactured from titanium and polymers and are therefore corrosion resistant. If fitted, the conductivity sensor end should be kept clean from mud and debris as the sensor is measuring the conductivity of the water within the sensor. Washing off with clean water is therefore advised after use. If the sensor is not washed off in fresh water after use, then salt crystals may form and on re-immersion, the concentrated salt content will temporariliy effect the readings. After use the impeller should be washed, and it is recommended that the impeller assembly is removed and washed through to prevent the creation of salt deposits which will effect the subsequent performance of the impeller.

Should problems be encountered with the instrument, then Valeport Limited should be contacted immediately. Valeport will then be pleased to advise on the correct course of action.

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5.5   O-Ring Sizes

Line connector	1 * 200-020-4470
Bulkhead Connector/Housing	2 * 200-121-4470
End Cap, sensor end	2 * 200-141-4470 plus 2 * 141 anti-extrusion rings
Centre section/housings	4 * 200-143-4470 [2 only on 108]

Note that anti-extrusion backing rings are used on the sensor end O-rings, and the O-rings should be placed on the pressure [sea water] side of the anti-extrusion ring.

The Dowty seals used in the sensor end are:

Pressure sensor,	type 010
Temperature sensor,	type 310

5.6   Lithium Battery [308 only]

The memory back-up lithium battery, (Type T327BA9, 3.7V), should be replaced at least every 5 years. If the memory and or clock settings are lost then the battery should be replaced. It is recommended that the instrument be returned to Valeport Limited for replacement of this battery, however if urgent renewal is required then the replacement procedure is as follows:

The battery is housed within the signal conditioning electronics housing.

1. Access to the electronics section of the instrument is achieved by removing the lock ring at the tube end, and removing the 2 countersunk M5 titanium screws holding the tailfin in position. Remove the 6 countersunk M5 titanium screws in the rearmost section of the body.

2. The main tube can now be withdrawn from the instrument, revealing the printed circuit boards. The black plastic assembly at the rear of the instrument is supposed to be a loose fit to allow for differences in expansion between the different materials as temperature changes.

3. The battery is on board 0300508 and can be un-soldered in-situ. Do not remove the board.

4. Fit the new battery and solder to the board.

5. Before replacing the rear tube, check the condition of the O-rings, which should be free of cuts or perishing. Also check the condition of the sealing bores of the main tube which should be free of scratches. Finally smear a light coating of silicon grease on the O-rings and rear tube sealing bores to aid refitting and subsequent removal.

6. Further reassembly is a reversal of the disassembly process.

6   CALIBRATION

The instruments are calibrated at the factory using industry standard methods, and the calibration certificate is in Appendix 5.

The impellers are group calibrated at HR Wallingford, allowing impellers to be changed at any time without the need for recalibration. Refer to Section 7.3 for details of how to do this.

The following is the seventh order polynomial used for the group calibration of the 108 MkIII/308 impeller current meter:

$$y = a_7x^7 + a_6x^6 + a_5x^5 + a_4x^4 + a_3x^3 + a_2x^2 + a_1x^1 + a_0$$

where

a7=+1.41438531299371e-13
a6=-3.54883097668022e-11
a5=+2.46207254143838e-9
a4=-5.52869698460072e-10
a3=-4.83450673040379e-6
a2=0.00016050162840545
a1=0.0561659448135938
a0=0.0172164197365799

If users require to recalibrate the instrument, then the calibration constants held within the instrument can be changed. Please refer to the factory regarding the method of carrying out this procedure.

7   TROUBLESHOOTING

The following table is designed to assist the user with problems commonly experienced wile using the instrument.

SYMPTOM	PROBABLE CAUSE	REMEDY
Unable to break in to unit after switch on	Left too long after switch on	Unit must be interrogated within 30 seconds of switch on, or at the end of an averaging period. Either: a: Switch off/on and try again, or b: Wait until end of averaging period.
	Incorrectly fitted cable	Check connections and try again.
LED won't flash in logging mode		Check LED Pro-Cap is correctly fitted.
		Check batteries, and replace if necessary.
Spurious Readings: Speed	Non horizontal deployment	Check balance in water, and adjust using tailfin weight.
	Fouled/damaged impeller or bearings.	Check impeller and bearings, and replace if necessary.
Compass	Non horizontal deployment	Check balance in water, and adjust using tailfin weight.
	Electromagnetic Interference	Move meter somewhere away from power cables and big metal ships.
Conductivity	Salt deposits around sensor	Remember to clean meter in fresh water after each use.

Most faults are due to:

1. Failure to succesfully interrupt unit operation. Switch off/on and try again.
2. Incorrectly connected leads.
3. Low battery power (if applicable).

If in any doubt about the performance of the unit, please contact the factory at the address shown on the front page of this manual.

APPENDIX 1   SPECIFICATION

APPENDIX 2 FIGURES

FIGURE 1:   Model 108 MkIII Interconnections

108 MkIII Current meter

FIGURE 2:   Model 308 Interconnections
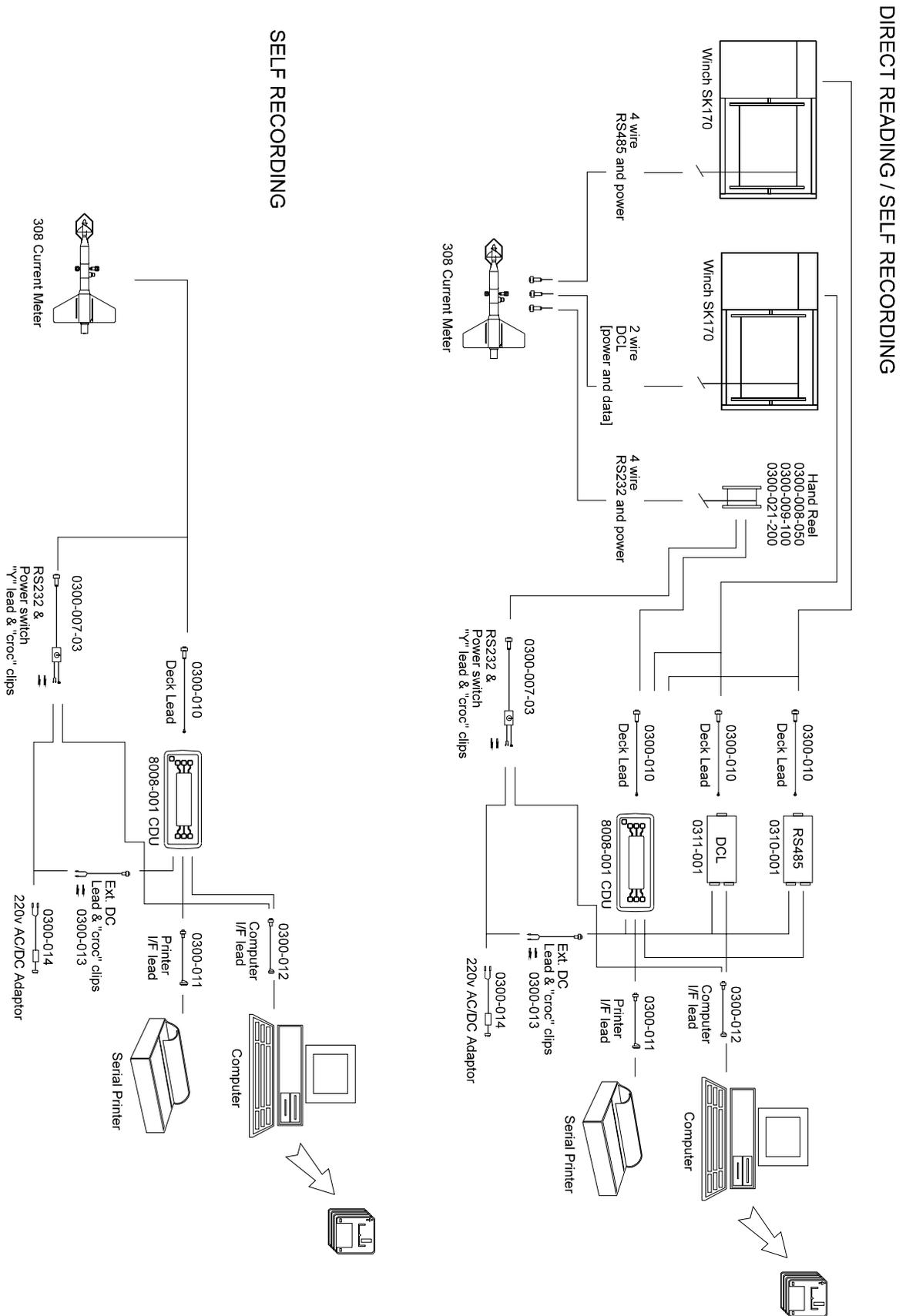
FIGURE 3:   Model 108MkIII Sensor Layout
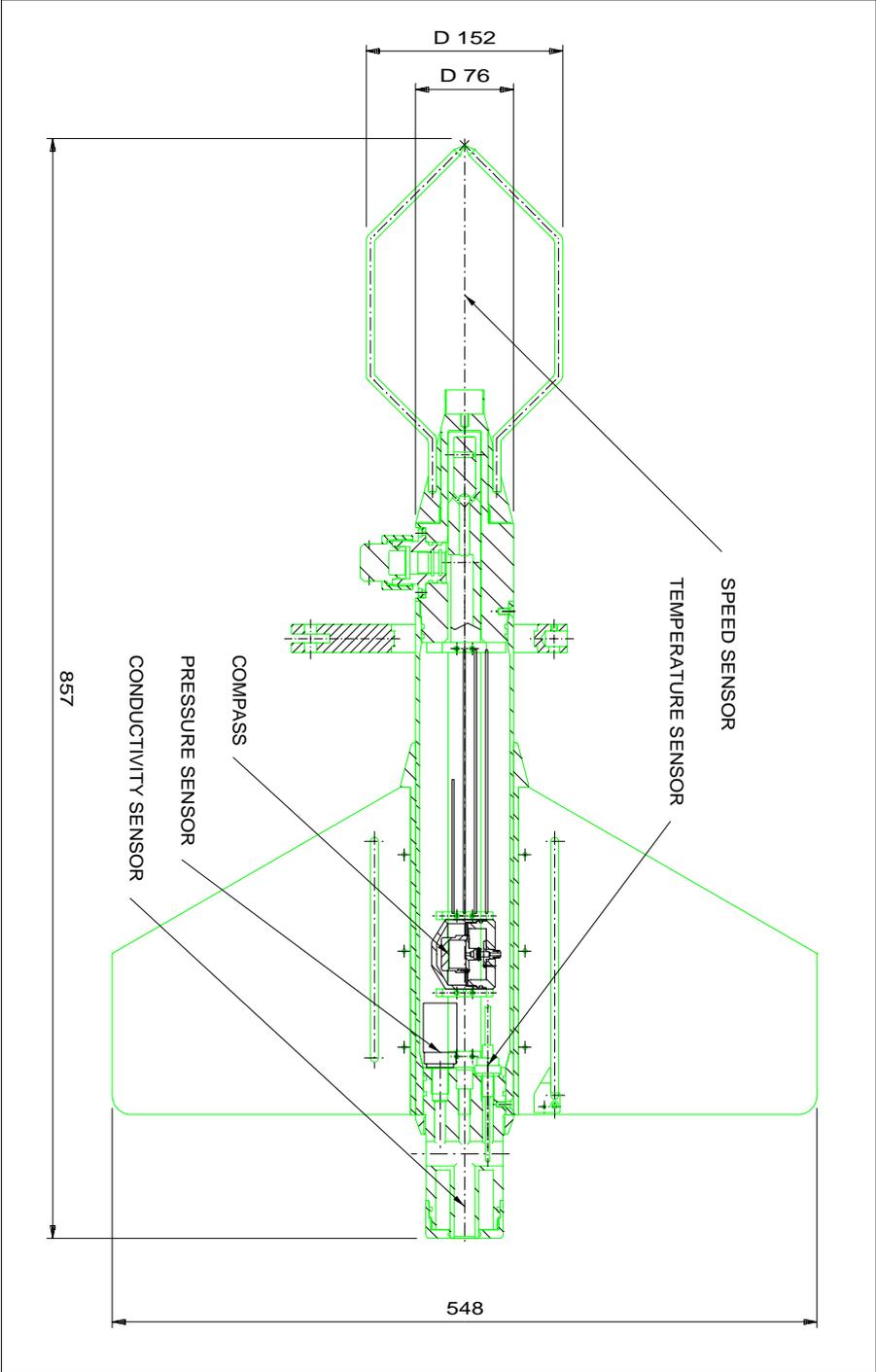
FIGURE 4:   Model 308 Sensor Layout
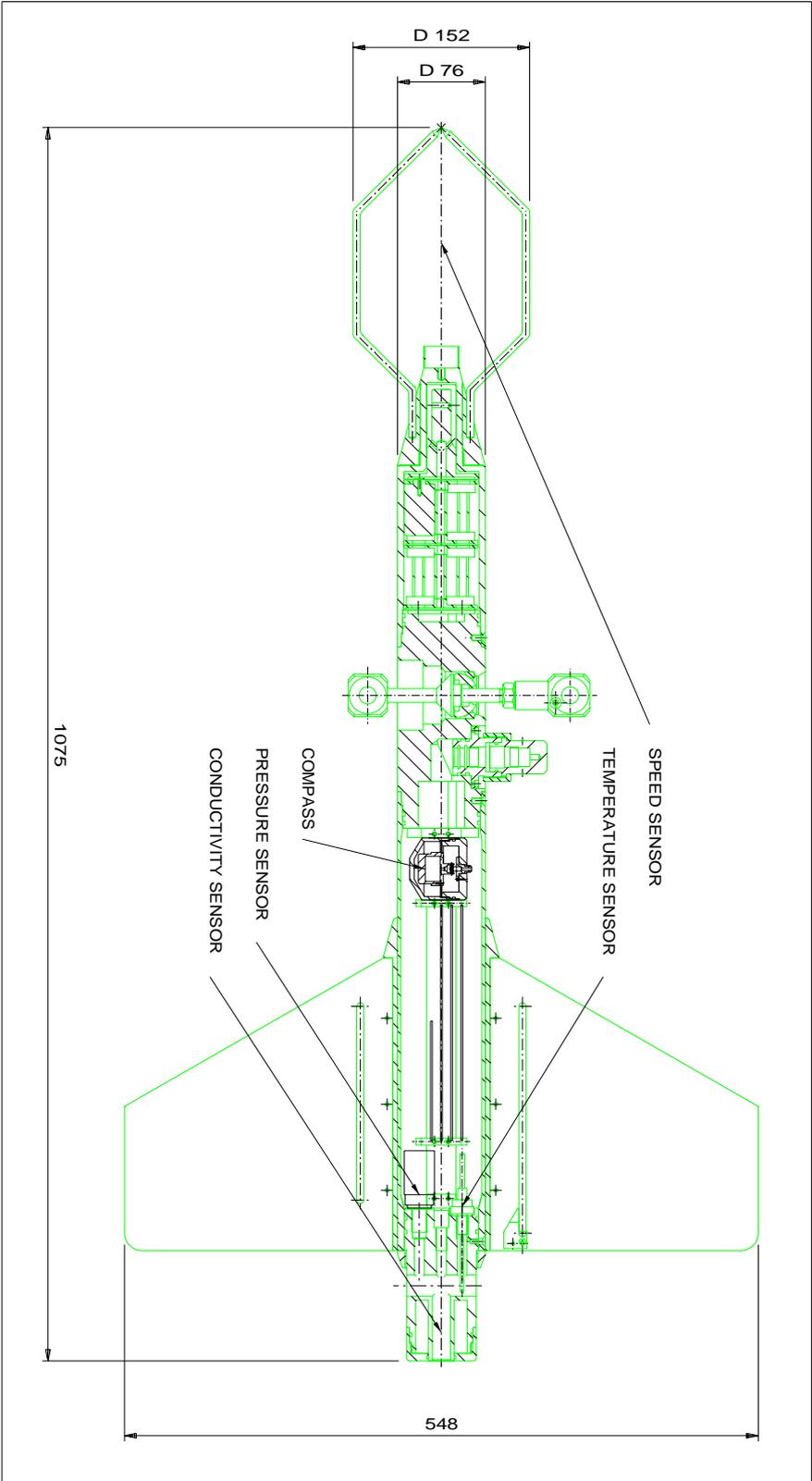
FIGURE 5:   Model 108 MkIII and 308 Sampling Pattern
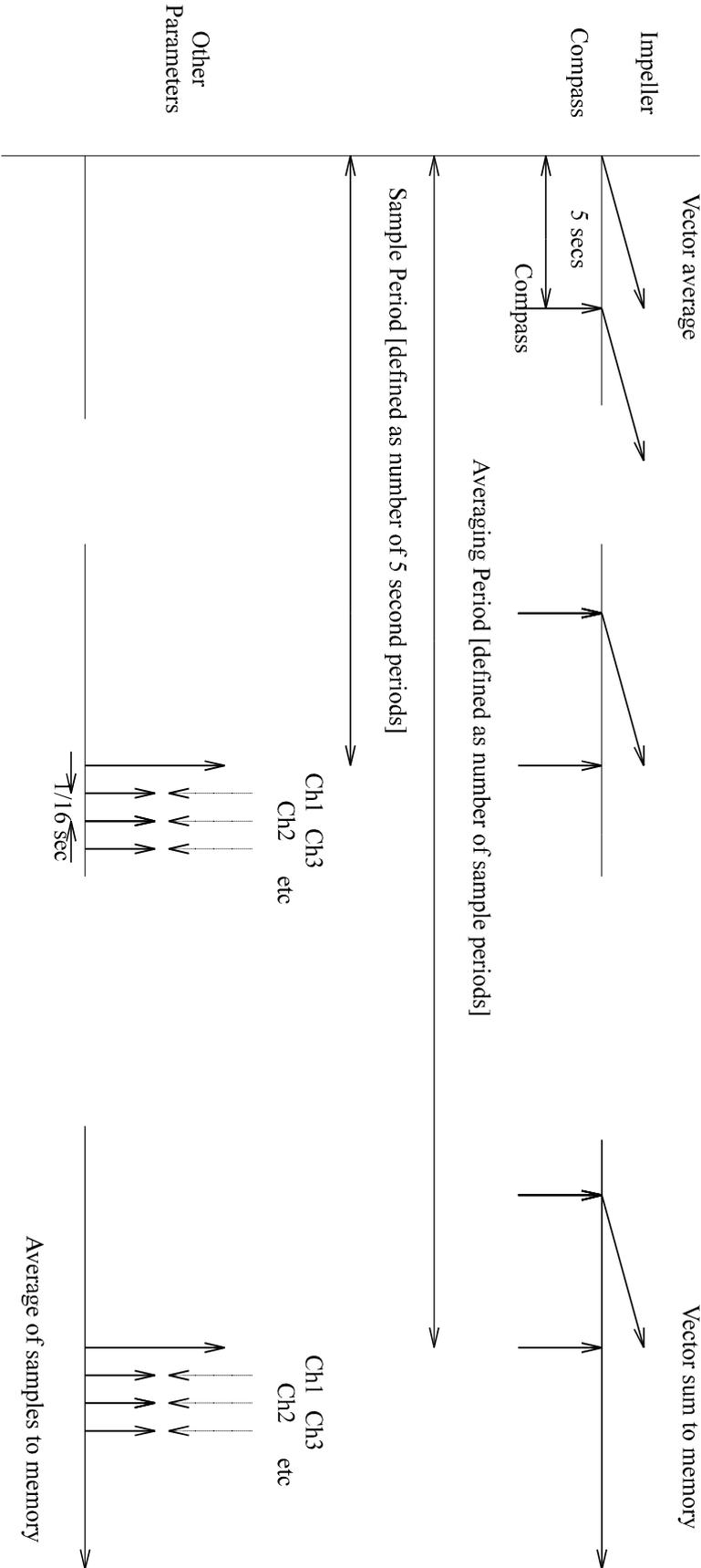
APPENDIX 3 CABLE WIRING SCHEMES

"Y"-LEAD CONNECTION DETAILS FOR MODEL 108 MkIII AND 308 CURRENT METERS

MIL SPEC 10 WAY LINE CONNECTOR PIN No.	FUNCTION	9 WAY 'D' TYPE FEMALE	BLACK BANANA PLUG	RED BANANA PLUG	WIRE COLOUR POWER	WIRE COLOUR COMMS
A (RED)	C/LOOP IN & EXT SUPPLY	N/C	N/C	1	RED	
B (WHITE)	RS232 IN TO FISH (RX 232)	3	N/C	N/C		RED
C (GREEN)	GND & BATT -VE	5	1	N/C	BLACK	GREEN
D (BLUE)	RS232 OUT FROM FISH (TXX232)	2	N/C	N/C		YELLOW
E N/C	RS485 I/O INVERTED	N/C	N/C	N/C		
F N/C	RS485 I/O NON-INV	N/C	N/C	N/C		
G N/C	FLASHING LED +VE CONN	N/C	N/C	N/C		
H (BROWN)	V_UNIT	N/C	N/C	N/C		
J (ORANGE)	CL_UNIT	N/C	N/C	N/C		
K (YELLOW)	INT BATTERY POSITIVE	N/C	N/C	N/C		
	DTR	PIN 4 LINK TO PIN 6&7	N/C	N/C		
	DSR	PIN 6 LINK TO PIN 4&7	N/C	N/C		
	RTS	PIN 7 LINK TO PIN 4&6	N/C	N/C		

DECK LEAD CONNECTION DETAILS FOR MODEL 108 MkIII AND 308 CURRENT METERS

END 1:- 10 WAY SUBSEA ACETAL - MILLSPEC FEMALE 10 WAY CONNECTOR - LMH 00T 12 10 SN			END 2:- INLINE MILLSPEC MALE 10 WAY CONNECTOR - LMH 06F 12 10 PN		
PIN	FUNCTION	WIRE TYPE	WIRE COLOUR	WIRE LENGTH	PIN
A	CURRENT LOOP +VE INPUT	VALEPORT 8 CORE CABLE	RED	3M	A
B	RS 232 IN TO FISH	"	WHITE	"	B
C	GROUND	"	GREEN	"	C
D	RS 232 OUT FROM FISH	"	BLUE	"	D
E	RS 485 I/O (INV)	"	BLACK	"	E
F	RS 485 I/O (NON INV)	"	ORANGE	"	F
G	LED FLASH +VE	"	YELLOW	"	G
H	V UNIT SWITCH LINK TO J	"	BROWN	"	H
J	SWITCH LINK TO H				J
K	N/C				K

DIGITAL CURRENT LOOP / 8008 SURFACE UNIT CONNECTORS

DC INPUT

CONNECTOR TYPE	PIN	WIRE
3 WAY PLUG 0833 MNO	A	RED +V in
	B	GREEN 0V in
	C	N/C

RS232

CONNECTOR TYPE	PIN	WIRE
RS232 OUT 4 WAY SKT	A	N/C
	B	WHITE/RED - RS232 in
	C	GREEN - COMMON
	D	WHITE/BLACK - RS232 out

DECK LEAD

FISH INPUT 12-10-FNO	PIN	WIRE
	A	PINK - EXT POWER IN +VE
	B	N/C
	C	GREEN - EXT POWER IN GND
	D	N/C
	E	N/C
	F	N/C
	G	N/C
	H	LINK TO J
	I	N/C
	J	LINK TO H
	K	N/C

DC LEAD FOR 8008 SURFACE UNIT

CONNECTOR TYPE		
LMH 06F 08 33 SN		TWIN CORE STD CABLE
PIN	FUNCTION	VOLTAGE
A	+VE SUPPLY	12V DC
B	GROUND –VE	12V DC
C	LINK TO PIN B	

TWO PIN SUBCONN CONNECTIONS FOR DEEP WATER MODEL 108MKIII (CURRENT LOOP)

CONNECTOR TYPE	FUNCTION	WIRE
2 PIN SUBCONNN B\HEAD		
PIN		
1	OV GROUND	BLACK
2	+VE COMMON C\LOOP	WHITE

APPENDIX 4   CALIBRATION

Calibration Information is inserted after this page

APPENDIX 5   GUARANTEE CERTIFICATE

The following guarantee periods shall apply:

Pressure Transducers and semiconductors   *12 months from date of despatch*
All other system components   *36 months from date of despatch*

During the above periods, Valeport Limited warrants that (at their option), they will replace or repair any faulty items caused by bad workmanship or materials.

Any such claims must be submitted in writing during the above warranty periods.

Valeport Limited shall be under no liability for:

1)   Any consequential loss or damage of any kind whatsoever.

2)   For any defect or deficiency judged by Valeport Limited to be caused by wear and tear or of improper or unskilled handling of the goods or by any repair or attempted repair or dismantling by any one other than Valeport Limited or persons authorised to do so by Valeport Limited.

3)   Batteries and other consumables supplied with the equipment, which are not covered by this guarantee.

Due to the specialised nature of the instrument it should, if possible, be returned to the factory for repair or servicing. The type and serial numbers of the instrument should always be quoted, together with full details of any fault or the service required.

Equipment returned to Valeport Limited for servicing must be adequately packed, preferably in the special box supplied and shipped with transportation charges prepaid. Return transport charges are also to the account of the customer.

Note: Any items supplied as part of a system which are not manufactured by Valeport Limited are covered by the individual manufacturer's guarantee of the equipment supplied.

MODEL NUMBER ....   SERIAL NUMBER....................................

DATE OF DESPATCH ....   SIGNATURE ....

APPENDIX 6   EQUIPMENT SUPPLIED FOR BFM 108 Mk III DR CURRENT METER

Serial No. ....

Customer: ....

....

....

....

Model No. ....

Con Number:...

Customer Ref: ....

Del. Note:..

Calibration Cert.: ....

ITEM	Items Required		Quantity	Serial Number	Part Number
	YES	NO			
108 MK III DR current meter					
50 metre cable reel option					0108001
100 metre cable reel option					0108002
200 metre cable reel option					0108003
Pressure 0.1% accuracy (dbars)					0300003
Temperature - PRT					0300004
Temperature - Thermistor					0300005
Conductivity					0300006
Control Display Unit					8008001
Deck Lead, 3m long					0300010
CDU\Printer cable					0300011
Interface cable					
CDU/Current loop adaptor to PC					0300012
RS485 adapter to PC					0300012
Memory option for 8008 CDU and replay software					0300031
Deck 'Y' lead to PC and DC supply					0300007
External AC\DC power supply adapter					0300014
PC – RS485					
RS485 Interface adaptor					0300036

EQUIPMENT SUPPLIED FOR BFM 108 MK III DR CURRENT METER (CONT.)

External DC cable					0300013
PC - Digital Current Loop					
Digital Current Loop adaptor					0300037
Accessories					
CDU Batteries (1 set)					
Transit case					
Documentation ( )					
108/8008 Manual					
DataLog manual					
Software					
DataLog (2)					
108 TERM.exe (1)					
Tools and Spares					
Spare set O-rings					
Titanium Grease					
M3 allen key + spare screws + screwdriver					
Cable on Reel […………. Metres]					
Impeller					
Impeller Spanners					

SIGNED …………………………………………..   DATE …………………………………………

APPENDIX 6   EQUIPMENT SUPPLIED FOR BFM 308 DR/SR CURRENT METER

Serial No. ....   Model No. ....

Customer: ....   Con Number:...

....   Customer Ref: ....

....   Del. Note:..

....   Calibration Cert.: ....

ITEM	Items Required	Quantity	Serial Number	Part Number
BFM 308 ( )				
Extended memory option				0300022
Pressure 0.1% accuracy (dbars)				0300003
Temperature - PRT				0300004
Temperature - Thermistor				0300005
Conductivity				0300006
LED Pro-cap				
Control Display Unit				8008001
Deck Lead, 3m long				0300010
CDU\Printer cable				0300011
Interface cable				
CDU/Current loop adapter to PC.				0300012
RS485 adapter to PC				0300012
Memory option for 8008 CDU and replay software				0300031
Deck 'Y' lead to PC and DC supply				0300007
External AC\DC power supply adapter				0300014
PC – RS485				
RS485 Interface adapter				0300036
External DC cable				0300013

APPENDIX 6   EQUIPMENT SUPPLIED FOR BFM 308 DR/SR CURRENT METER (CONT.)

PC - Digital Current Loop					
Digital Current Loop adapter					0300037
Accessories					
CDU Batteries (1 set)					
308 Batteries (7)					
Tail Fin Balance weight					
Documentation ( )					
DataLog manual					
308 manual					
Software					
Term.exe (1)					
DataLog (2)					
Tools and Spares					
Spare set O-rings					
Titanium grease					
Impeller Spanners					
5 mm allen key + spare screws + screwdriver					
(mt) Cable on Reel.					
Impeller					
Impeller Shaft					
Transit Case (meter only)					

SIGNED ……………………………………   DATE…………………………………………