SKIPPER ED165

Navigation Echo Sounder
Operation And Installation Manual

Edition: 20050203SW1.0

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1.Introduction and Operation 2
1.1 SOUNDER INTRODUCTION 2
1.2 PANEL INTRODUCTION 3
Front panel 3
Inner panel 3
1.3 POWER 4
Power supply 4
Power on/off 4
System off 4
1.4 SECOND FUNCTION 4
1.5 SECOND FUNCTION SETTINGS TABLE 4
1.6 FUNCTION SETTINGS SAVE (ON THE 2ND MODE) 5
1.7 BASIC OPERATION 5
Dim control 5
Lighting control 5
Range 5
Gain control knob 5
TVG control 5
TVG preset 5
1.8 ALARM 6
Shallow alarm setting 6
Buzzer, Relay and Display 6
Buzzer switch 6
1.9 RECORDING 6
Recorder stop 6
Recorder start and paper speed 7
Paper speed adjustment 7
Recording darkness 7
Bottom line 7
Mark 8
Recording period calibration 8
5 minute time mark (time line) 8
Replacement of recording paper 9
Zero line adjustment 10
Recording stylus adjustment 11
Feed stylus adjustment 12
1.10 ADDITIONAL FUNCTION 12
Transmitter power 12
Default recall 12
NMEA 13
2. Operator Unit Installation 13
2.1 POWER SUPPLY 13
2.2 LOCATION AND MOUNTING OF THE CONTROL/RECORDING CABINET 13
2.3 CONNECTION DIAGRAM 13
2.4 OUTLINE DIMENSIONS 14
3.Specifications Dimensions 15
3.1 FUNCTIONAL PROPERTIES 15
3.2 PERFORMANCE 15
3.3 ENVIRONMENTAL 15
Operator unit cabinet 15

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Caution:

Factory setting uses 220V AC jumper on the rectifier board (RCTF board).
When you use 110V, please change to the supplied 110VAC jumper.
Wrong usage of the 110VAC jumper on 220VAC will damage the ED 165.

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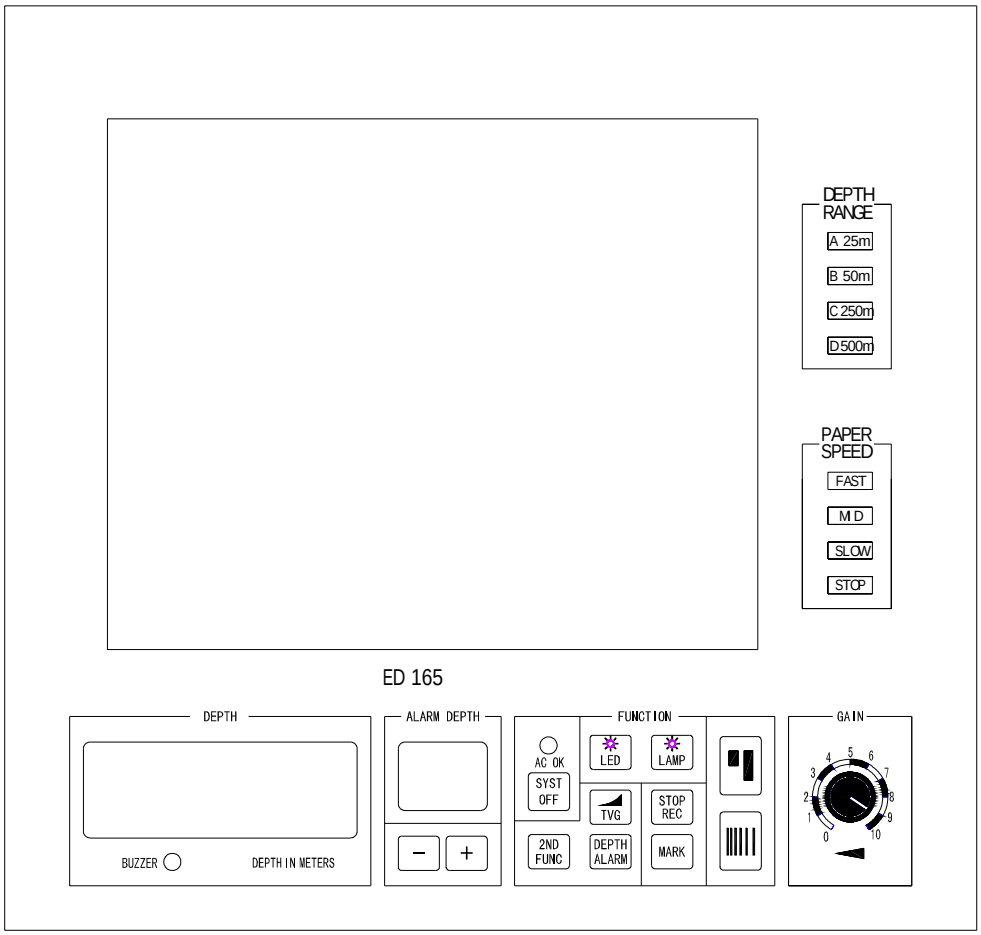
1.Introduction and Operation

1.1 Sounder introduction

ED165 is a navigation sounder with big LED readout and 6 inch paper recording. It is a fully microcontroller controlled equipment, gives simple operation and high performance. Soft touch keys and their 2nd function cover most of the calibration work such as transmit power, recording darkness, paper speed preset, recording accuracy calibration. ED165 has high sensitive receiver and advanced bottom detection software, brings out stable and accurate depth readout.
Work on 24VDC and 110/220VAC independently or simultaneously, it transmits 500W power of 50kHz or 200kHz while typically consumes only 15W at 24VDC besides the mark time. It has 2 NMEA 0183 depth outputs and a alarm relay output.

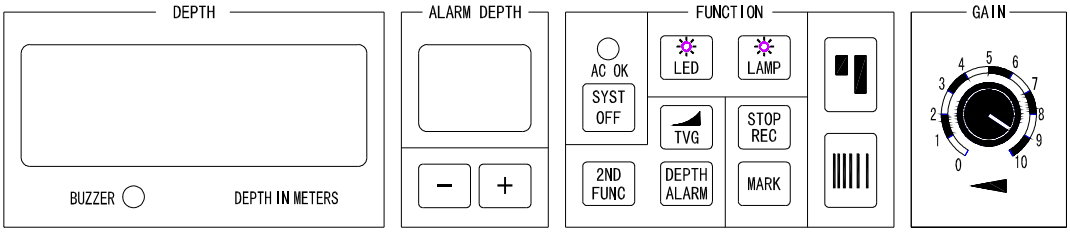
1.2 Panel introduction

It includes recording window, depth range and paper speed indicators, front panel.



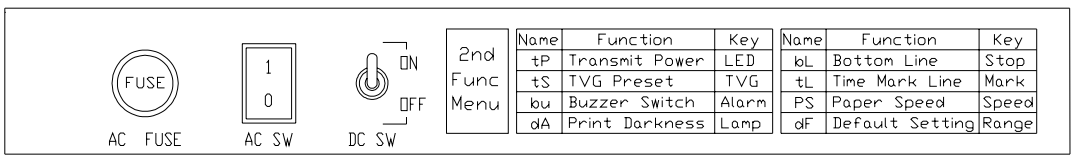
Front panel

It includes LED windows, buzzer and AC ok indicators, keyboard and gain knob.
In darkness external light is needed to operate the keyboard.



Inner panel

There are AC fuse holder, AC power switch and DC power switch.



Name	Function	Key
tP	Transmit Power	LED
tS	TVG Preset	TVG
bu	Buzzer Switch	Alarm
dA	Print Darkness	Lamp

Name	Function	Key
bL	Bottom Line	Stop
tL	Time Mark Line	Mark
PS	Paper Speed	Speed
dF	Default Setting	Range

1.3 Power

Power supply
(Caution: Factory setting uses 220V AC jumper on RCTF board)

The sounder operates on both AC and DC power supply. It is possible to connect both at the same time where one will be backup or optional for the other.
DC supply: 24V; AC supply: 220V or 110V.
(Note: Please use the supplied 110VAC jumper when work on 110V.)

Power on/off
(Inner panel operation)

Put on the AC or DC switches under the cover makes the machine work.
The AC-ok indicator shows the AC supply ok. Paper recording is stopped.
It will work after the LED shows soft version “U1.0 ED”.

System off

SYS OFF

Make unit into sleep mode, the LEDs show “off” and 5 to 1 seconds.
Within the 5 seconds counting, pressing any key will stop the action.
At system off (sleep) state, press any key will awake it.

1.4 Second function

2nd FUNC

Enter the 2nd function mode.
The LEDs show 2nd FU. Press again will exit this mode.
The unit will automatically exit this mode after 7 seconds.

1.5 Second function settings table

Name	Function	Settings	Default	Key
tP (A)	Transmit Power	10,20,30,40,50,60,70,80,90,100	20	LED
tP (B)	Transmit Power	10,20,30,40,50,60,70,80,90,100	30	
tP (C)	Transmit Power	10,20,30,40,50,60,70,80,90,100	40	
tP (D)	Transmit Power	10,20,30,40,50,60,70,80,90,100	100	
TS	TVG Preset	5,10,15.....,100	80	TVG
BU	Buzzer Switch	OFF,ON	OFF	ALARM
DA	Printint Darkness	10,20,30,40,50,60,70,80,90,100	50	LAMP
BL	Bottom Line	OFF,ON	OFF	STOP
TL	Time Mark Line	OFF,5'	5'	MARK
PS (1)	Paper Speed on AB	SLOW: 5~200	(10mm/5min)	PAPER SPEED
PS (2)	(6-60mm/5min)	MID: 5~200	(20mm/5min)	
PS (3)		FAST : 5~200	(30mm/5min)	
PS (4)	Paper Speed on CD	SLOW : 5~200	(8mm/5min)	
PS (5)	(6-60mm/5min)	MID: 5~200	(16mm/5min)	
PS (6)		FAST : 5~200	(24mm/5min)	
(Note:All above settings are saved only when press SYS OFF key in the 2nd function mode.)				
DF	Default Setting	OFF,ON	OFF	RANGE

1.6 Function settings save (on the 2nd mode)

SYS OFF

In the 2nd mode, press the key will save the settings you just set.
The red LEDs show SET.
If you do not save it, the unit will exit the 2nd mode without saving.

1.7 Basic operation

Dim control

☼ LED

To change the brightness of LEDs and indicators (range, paper speed, AC OK).
There are 7 steps.

Lighting control

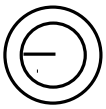
☼ LAMP

To change the brightness of lamp for the recording paper.
There are 7 steps including off state.

Range

To change the range. Indicators of range will change correspondingly.
It will make a vertical mark on paper and reset the timer in recording state.

Gain control knob



Turn the Gain knob to change the receiver sensitivity.
Please turn it from min position toward max position, preventing the echo detecting software locking on the secondary bottom echo.

TVG control

TVG

To change the current TVG. The green LED shows TG.

− +

Press the keys to change TVG value from 0 to 100 with step 5.

TVG preset

2nd FUNC

Enter the 2nd function mode. The LEDs show 2nd FU.

TVG

Go to the TVG preset function. The green LED shows TS.
This is to preset a TVG value for default use, even after turned off.

− +

Press the keys to change preset TVG from 0 to 100 with step 5.

SYS OFF

Press this key to save it.

1.8 Alarm

Shallow alarm setting

[DEPTH ALARM] Go to the shallow depth alarm setting function.
The green ten digit LED flashes.

[−] [+] Press the keys to set the alarm depth from 1x-9x.

[DEPTH ALARM] The green single digit LED flashes.

[−] [+] Press the keys to set the alarm depth from x1-x9.

[DEPTH ALARM] Stop flashing. The value is alarm depth.

[2nd FUNC] [SYS OFF] If need to save it, press the two keys, the red LEDs show SET.

Buzzer, Relay and Display

Shallow alarm is active when the depth is continuously less than alarm setting for more than 5 seconds (D range 10 seconds), the red LEDs flash.
Shallow alarm also enables the Alarm Relay. When alarm is active, the action of the Alarm Relay is that the NO (Normal opened) terminals will be closed and the NC (Normal Closed) terminals will be open.
The Alarm Relay also alarms when the power is off.
The buzzer will sound when the buzzer indicator is on and alarm is active.
When an alarm is trigged, a manual pressing any key is needed to stop alarm.

Buzzer switch

[2nd FUNC] Enter the 2nd function mode. The LEDs show 2nd Fu.

[DEPTH ALARM] Go to the buzzer and relay function. The green LEDs show bu.
Note: When alarm is active, can not turn on the buzzer and relay.

[−] [+] Press the keys to switch on or off, the red LEDs show on or oFF.
The buzzer indicator turns on when you select on.

[SYS OFF] Press this key to save it.

1.9 Recording

Recorder stop

[STOP REC] Stop paper recording.
The paper speed indicators show stop state.

Recorder start and paper speed

Start paper recording.
Press again change the paper speed (Slow, Mid and Fast).
The paper speed indicators change correspondingly.

Paper speed adjustment

A/B/C ranges have the same speed settings, range D uses another speed settings.

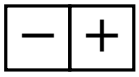
Select the range which you want to adjust.

Select the speed which you want to adjust.

2nd FUNC

Enter the 2nd function mode. The LEDs show 2nd Fu.

Go to the paper speed adjust function. The green LEDs show FS.



Press the keys to change the speed value on the red LEDs show

SYS OFF

Press this key to save it.
Note: You can use a ruler to check the 5' time mark distance.

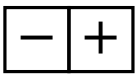
Recording darkness

2nd FUNC

Enter the 2nd function mode.The LEDs show 2nd Fu.

LAMP

Go to the recording darkness function. The green LEDs show dA.



Press the keys to change the value on the red LEDs show.
From 10 to 100, step 10.

SYS OFF

Press this key to save it.

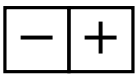
Bottom line

2nd FUNC

Enter the 2nd function mode.The LEDs show 2nd Fu.

STOP REC

Go to the bottom line function. The green LEDs show bL.
The bottom line function means that the recorder only prints the echoes from zero line to the bottom front edge.



Press the keys to switch on or off, the red LEDs show on or oFF.

SYS OFF

Press this key to save it.

Mark

MARK Press to make a vertical mark line on paper and reset the time-mark timer.

Recording period calibration

The recording period is 250ms at A/B range, 500 ms at C range, 1s at D range.
The ED165 has a easy calibration operation, to guarantee the precise of depth readout.
You need to do it after the unit be heavy shocked or after a long time use when you see the recording does not meet the scale.

MARK Press 20 times or more will calibrate the recording period.

2nd FUNC **SYS OFF** You must save it, press the two keys, the red LEDs show SET.

5 minute time mark (time line)

When recording, there is a vertical dash line on paper every 5 minute.
The timer is reset by range key or mark key.

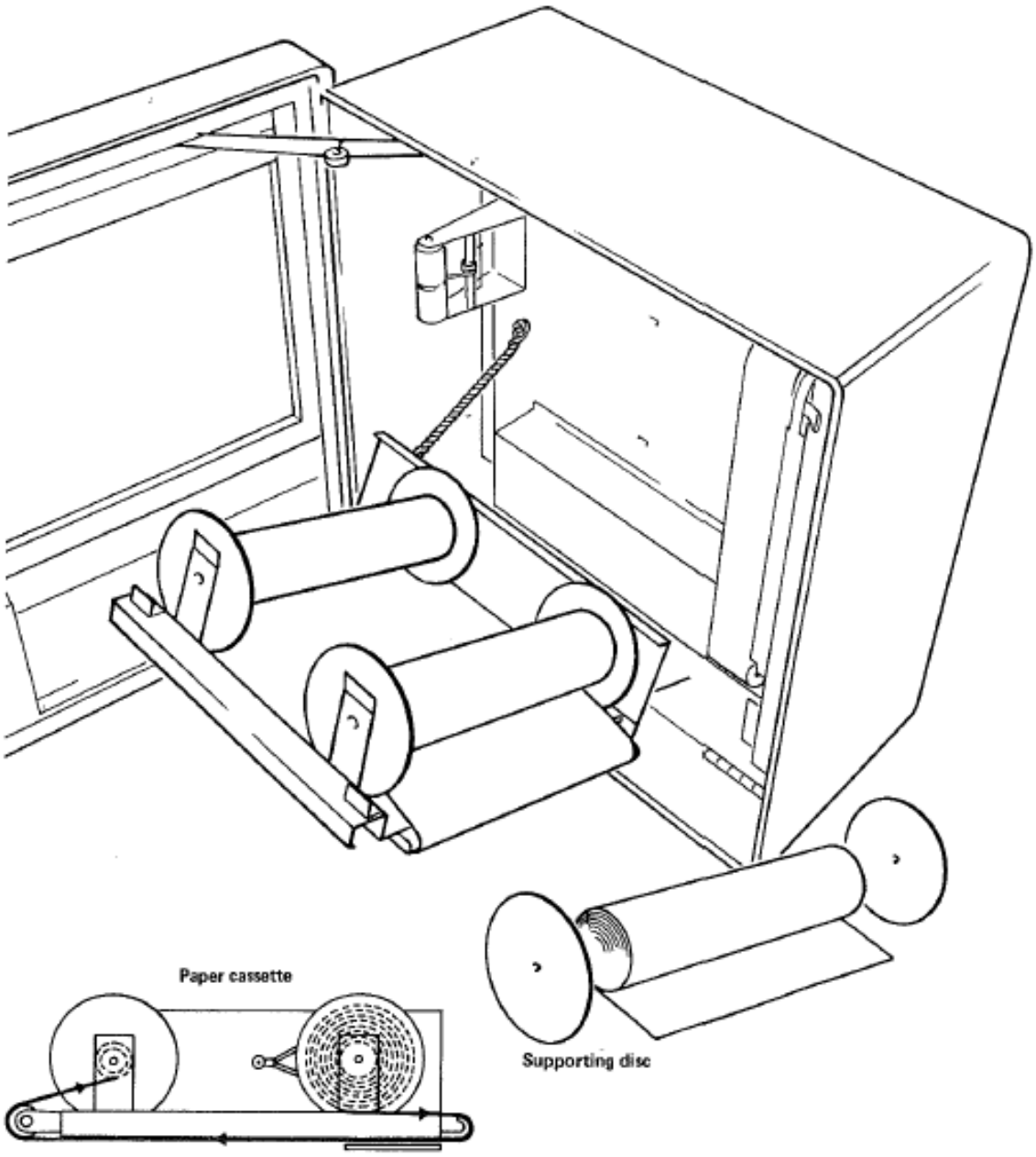
2nd FUNC Enter the 2nd function mode.The LEDs show 2nd Fu.

MARK Go to the time line (time mark) function. The green LEDs show tL.

− **+** Press the keys to switch on or off, the red LEDs show 5' or oFF.

SYS OFF Press this key to save it.

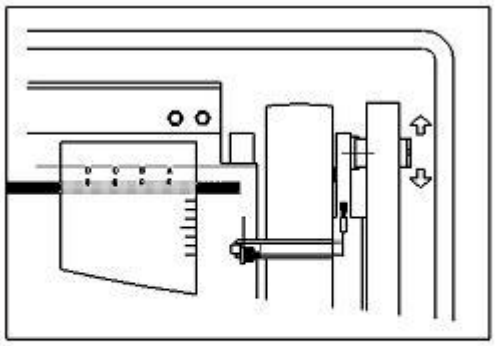
Replacement of recording paper



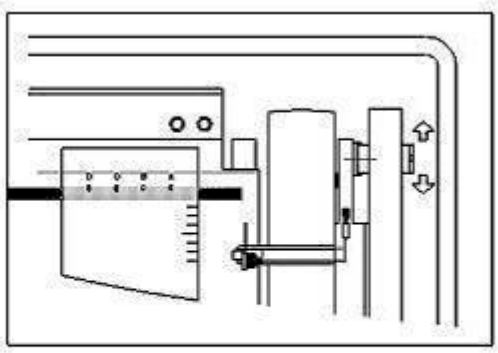
1.Switch off the echo sounder.
2.Rotate the stylus belt so that the recording stylus is Located at the back.
3.Take hold of the top front of the paper cassette, pull it out and let it swing down carefully.
4.Pull out the end disc knob for the magazine and remove the used paper roll.
5.Transfer the empty spool from right to left side and make sure that the end supporting disc enter the spool.
6.Insert a new roll of recording the figure.
7.Thread the end of the paper into the slot in the paper spool and turn the spool to tighten the roll.
8. Lift and lock the paper cassette in the recorder.

Zero line adjustment

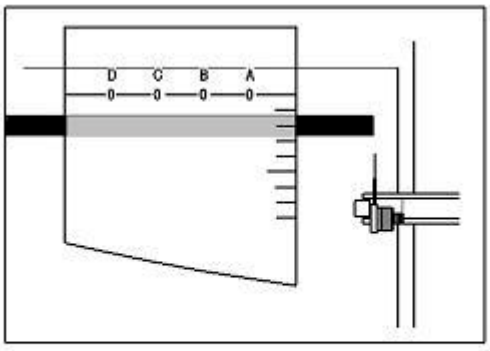
Move the handle of the hall board will adjust the zero line to meet the scale zero.



Zero Line Adjustment



Zero Line of Depth below
the Transducer

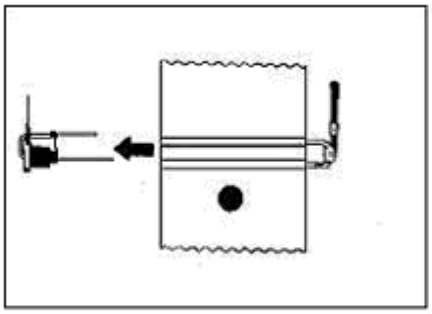


Zero Line of Depth below Surfac

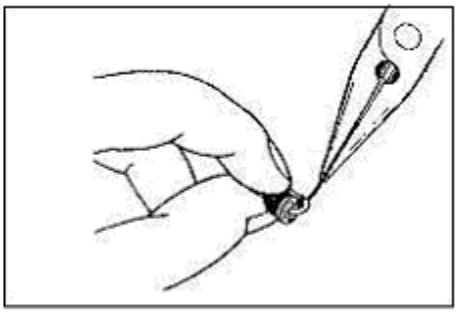
Recording stylus adjustment

The recording stylus has a magazine of thin steel wire which must be pulled out when the tip is worn down. This is usually done every time a new roll of paper is inserted.

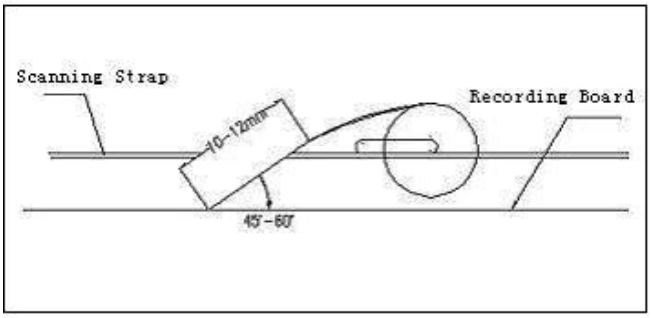
1. Switch off the echo sounder, Open the cabinet door and rotate the stylus belt till the stylus is in front.
2. Remove the stylus from its belt holder.
3. Hold the stylus as shown with a pair of pliers. Pull the wire slowly out from the thin guiding tube. Be careful not to damage the tube. Total length of wire outside the tube should be 10-12mm (3/8-1/2in). If the wire has been pulled out too far, cut to correct length.
4. Straighten the wire as an extent of the guiding tube. The stylus should be bent slightly to the left.



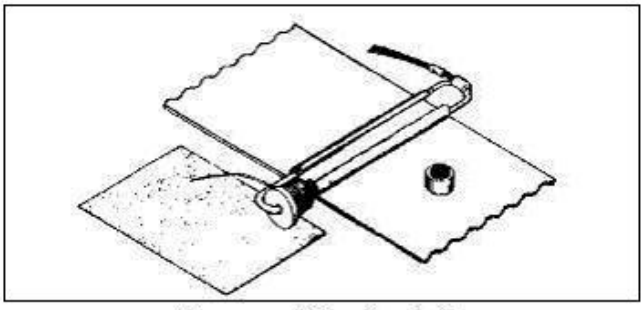
Remove the Pen



Pull out the Wire



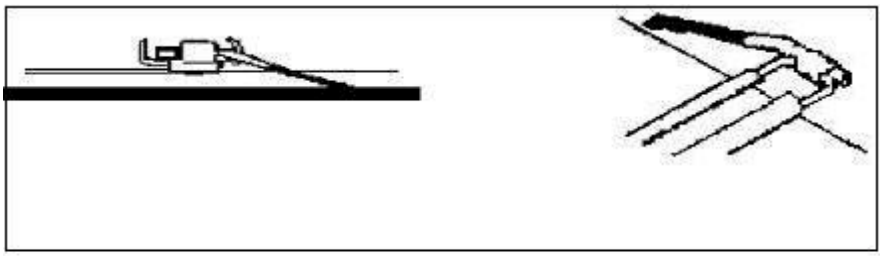
Pressure Adjustment 1



Pressure Adjustment 2

Feed stylus adjustment

If the feed stylus doesn't touch the board very well, the recording work may be off. Switch off the echo sounder and check the touch between the feed stylus and the board. If only a small quantity of steel thread touch the board or absolutely no touch, the feed stylus should be bent with a pair of pliers.



Adjusting the Brush

1.10 Additional function

Transmitter power

▮▌	Select a range.
2nd FUNC	Enter the 2nd function mode.The LEDs show 2nd Fu.
☼ **LED**	Go to the transmitter power function. The green LEDs show tP. Note: When alarm is active, can not turn on the buzzer and relay.
− +	Press the keys to change the value on the red LEDs show. From 10 to 100, step 10.
SYS OFF	Press this key to save it.

Default recall

2nd FUNC	Enter the 2nd function mode.The LEDs show 2nd Fu.
▮▌	Go to the default recall function. The green LEDs show dF. This function is to recall the factory default settings.
− +	Press the keys to switch on or off, the red LEDs show on or oFF.

NMEA

There are 2 separately driven NMEA output ports with RS422 interface format.
Two kinds of message will be included:

1) $SDDPT, x.x, x.x, x.x*hh<CR><LF>
Parameters:
Maximum range scale in use.
Offset from transducer, in metres.(offset always zero.)
Water depth relative to the transducer, in metres.

2)$SDDBT, x.x, f, x.x, M, x.x, F*hh<CR><LF>
Parameters:
Water depth, feet.
Water depth, m .
Water depth, fathoms.

2. Operator Unit Installation

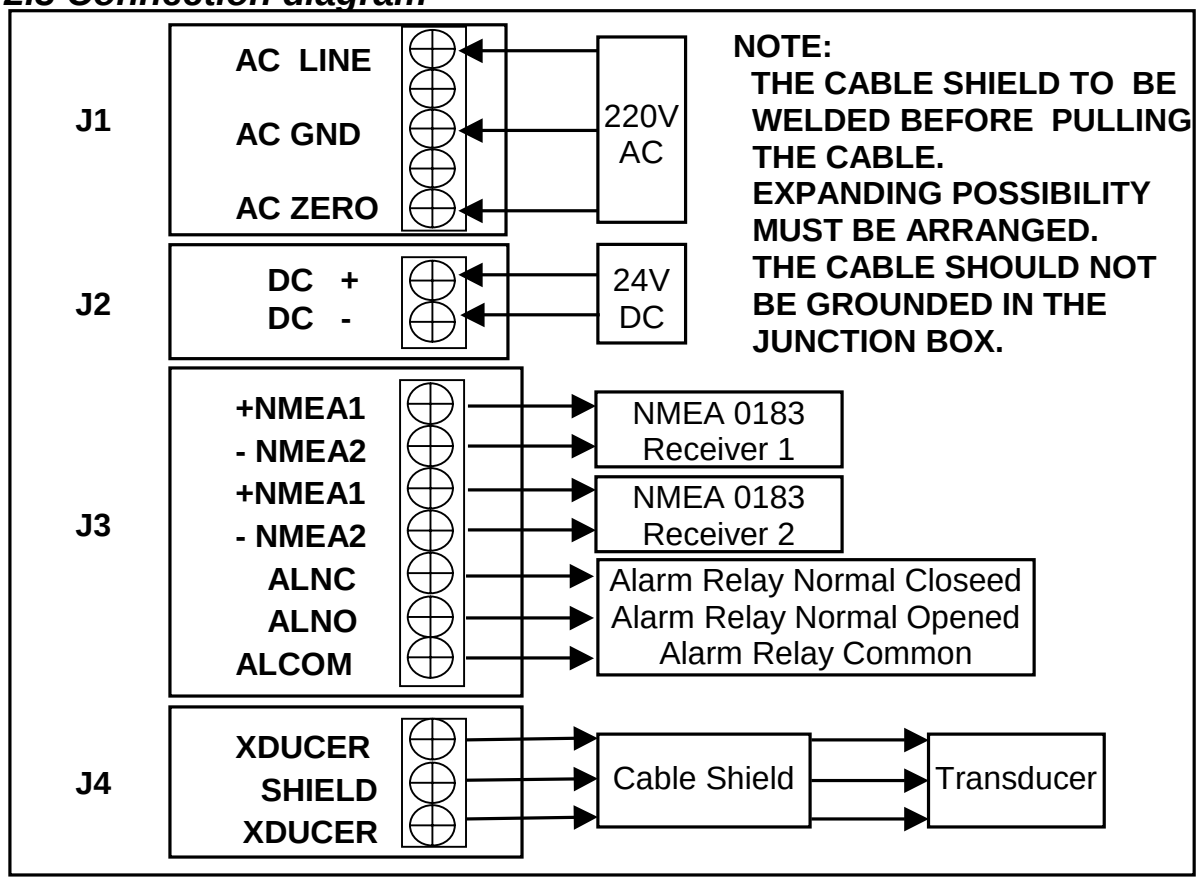
2.1 Power supply

ED165 is designed for operation from 110/220VAC 50/60 Hz and 20-32VDC.
The power consumption is approximately 40 Watt.

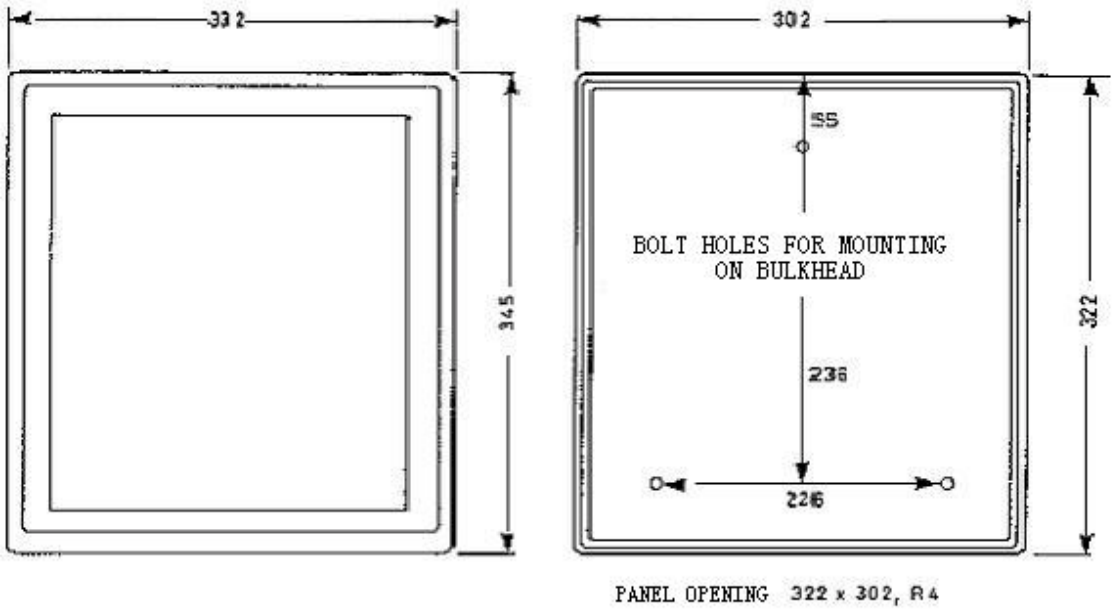
2.2 Location and mounting of the control/Recording cabinet

The control/recording cabinet is designed for bulkhead or panel mounting. The position of the cabinet should provide a free view of operation and service.
For bulkhead mounting the cabinet is fastened with three bolts supplied by SKIPPER.
Hardware for panel mounting is available on request.

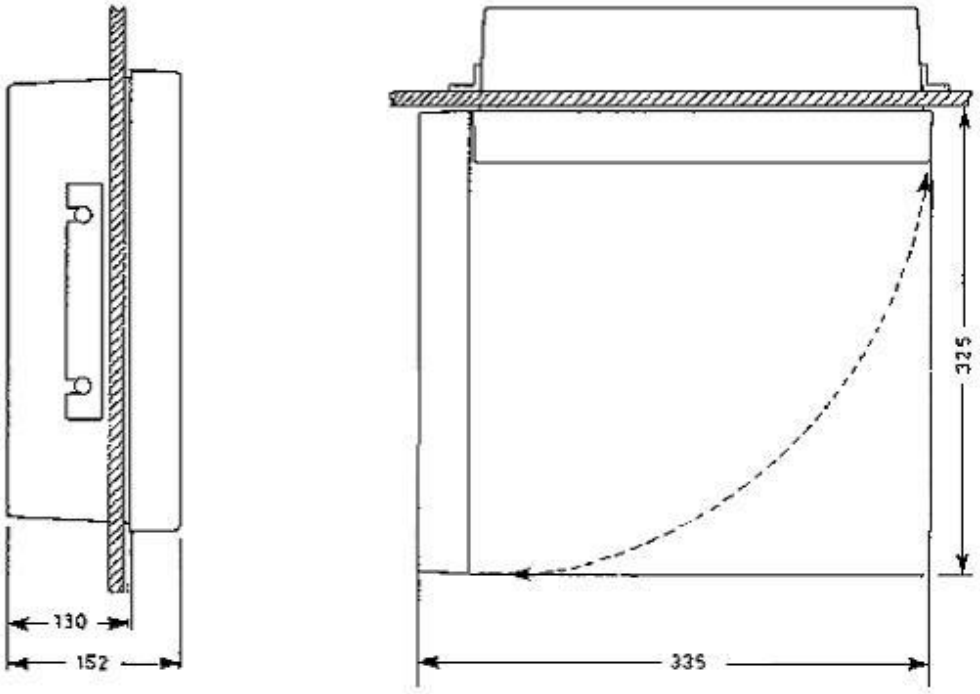
2.3 Connection diagram



2.4 Outline dimensions



PANEL OPENING 322 x 302, R4



DIMENSIONS IN MILLMETERS

3.Specifications Dimensions

Operator Unit Cabinet	Height, front	340mm
	Width	320mm
	Depth	165mm
	Weight	appx. 12kg
Operator Unit Cabinet:		
Cut-out for Flush Mounting	H x W	320 x 300mm
	Corner Radius	4mm

3.1 Functional properties

Display:	3 x 0.8 inch LED depth readout
Recording:	6 inch paper
Depth Alarm:	Adjustable from 1-99m
Outputs:	2 X NMEA 0183，Alarm Relay
Light Adjustment:	Both for lamp and digital readout
Option:	SKIPPER IR301 Remote Depth Repeater

3.2 Performance

Range	Depth	Pulse width	Period
A	25m	0,2ms	250 ms
B	50m	0,4ms	250 ms
C	250m	2.0ms	500 ms
D	500m	4.0 ms	1000 ms

Recording Resolution:	±1% of Range;
Digital Resolution:	A/B Range: 0.1m, C/D Range: 1m;
Accuracy:	± 0,1 m at A/B ranges, ± 1m at C/D range;
Transducer, 50kHz	Max. Power 500W
Transducer, 200kHz	Max. Power 500W

3.3 Environmental

Operator unit cabinet

Power Supply	AC 220/110V (50/60Hz), DC 20-32V;
Power Consumption	40W at 24V, 50W at 220V;
Approval	Wheelmark / IEC 60945;
Alarm Relay:	Change-over contact, max.24V 300mA;
2 X NMEA 0183:	2 Output;
Operating temperature	0-40℃;
Storage temperature	-20-70℃;
Humidity	10-90%relative, no condensation.