SPECIFICATIONS OF COLOR SCANNING SONAR
CSH-5L MARK-2

1 TRANSCEIVER UNIT

1.1 Transmitter: High power MOS FET amplifier with 11-step power reduction switch
1.2 Receiver: Low noise superheterodyne, Continuously scanning beam forming
1.3 TX frequency: 55 kHz or 68 kHz
1.4 Range

Basic Range (m)	Range (m)			
	Single		Echo Sounder Combination	
	Offcenter "OFF"	Offcenter "ON"	Offcenter "OFF"	Offcenter "ON"
50	65	80	50	65
85	110	135	85	110
100	130	160	100	130
150	195	240	150	195
200	260	320	200	260
250	325	400	250	325
300	390	480	300	390
350	455	560	350	455
400	520	640	400	520
450	585	720	450	585
500	650	800	500	650
600	780	960	600	780
800	1040	1280	800	1040
1000	1300	1600	1000	1300
1200	1560	1920	1200	1560
1600	2080	2560	1600	2080

Note
1) Ranges shown for off-center "on" are maximum value.
2) Under certain circumstances, a target (fish school) may not be detected due to its nature or because of sea conditions, ever if it is located within the display range.

1.5 Pulse-length: 0.5 to 20 ms, interlocked with range (can be changed in 11 steps)
1.6 Pulse repetition rate: 0.25 to 4.4 s, interlocked with range (can be changed in 11 steps)
External synchronized transmission keying
1.7 Audio search: By external loudspeaker
Frequency: 800 Hz
Sector: 20°, 40°, 80° and 120° selectable
1.8 Gain control: TVG, AGC

2 PROCESSOR UNIT

2.1 Display mode: Single scan, Echo sounder combination, Audio combination
2.2 Colors: Scan/echo: 16 colors, mark: 1 color
2.3 Mark: Own ship's track, Heading line, Direction/distance, Fish school, Event, Target lock
2.4 Alphanumeric data: Range, Tilt, Gain, Trackball mark, Event mark, Bearing/range mark
Own ship's position, Ship's speed, Depth, Water temperature, Current speed and direction (5 layer)

2.5	Unit	Meter, feet, fathom, P/B
2.6	Audio search	±10°, ±20°, ±40° and ±60°
2.7	Features	Interference rejecter, Afterglow, Noise limiter, Numeric indication Automatic tilt scanning, over-voltage warning, Unretracted transducer warning

3 HULL UNIT

3.1	XDCR travel	400 mm or 600 mm, selectable
3.2	Raising/lowering time	400 mm: 14 s, 600 mm: 20 s
3.3	Driving system	Remote electric control
3.4	Allowable ship's speed	18 kn max. (16 kn during raise/lower operation)

4 INTERFACE

4.1	Port number	
	Serial	2 ports, NMEA 0183 Ver1.5/2.0/2.2
	E/S	1 port, Sonde/ sounder, VI-1100A applicable
	Speed log	1 port, contact closure, 200/400 pulse/NM
	Gyrocompass	1 port, AD converter AD-100
	External KP	1 port, Current loop, 0 to 12V
	External audio	1 port, 2 W, 50 ohm, 3.5 mm pin-plug
	Video signal	2 ports, RGB analog, separated synchronization, XGA (VESA) 1024 x 768, 65.0 MHz, Dsub-15P-female
4.2	I/O sentences	
	Input	CUR, DBS, DBT, DPT, GGA*, GLC, GLL*, GTD, HDG, HDM, HDT, MTW, RMA, RMC, VDR, VHW, VTG (*: disabled for NMEA0183 V1.5)
	Output	TLL
4.3	CIF data input	Location, Ship's speed, Bearing, Current data (1 layer), Water depth, Water temperature, Multiple layer current data

5 POWER SUPPLY

5.1	Processor unit	100/115/200/220/240 VAC: 4.0-2.0 A, 1 phase, 50-60 Hz
5.2	DC/AC Inverter (TR-2451, option)	24 VDC

6 ENVIRONMENTAL CONDITION

6.1	Ambient temperature	0°C to +50°C
6.2	Relative humidity	95% or less at 40°C
6.3	Degree of protection	
	Processor/ control unit	IPX2 (w/o connector panel of processor unit)
	Others	IPX0
6.4	Vibration	IEC 60945 Ed.4

7 UNIT COLOR

7.1	Processor unit	2.5GY5/1.5
7.2	Transceiver/hull unit	2.5G7/2
7.3	Control unit	N3.0