

CHAPTER 8. PRODUCT SPECIFICATIONS

8.1 General

Type:	RA51, RA52, RA53, RA54 and RA55
Power supply voltage and power consumption	
Power supply voltage:	24Vdc (nominal)(10.2 to 41.6 Vdc)
Power consumption:	75 W or less (RA51) 90 W or less (RA52) 100 W or less (RA53) 110 W or less (RA54)
Power supply voltage:	24Vdc (nominal)(18.0 to 41.6 Vdc)
Power consumption:	200 W or less (RA55)
Distance range:	0.125 to 36 NM, 10 ranges (RA51) 0.125 to 48 NM, 10 ranges (RA52) 0.125 to 64 NM, 11 ranges (RA53) 0.125 to 72 NM, 11 ranges (RA54) 0.125 to 120 NM, 12 ranges (RA55) (Continual variable range also possible)
Distance resolution:	Within 25 m
Distance accuracy:	Better than 0.9% of maximum range of the scale in use, or 8m, whichever is the greater
Minimum detecting distance:	Within 25 m
Bearing resolution:	Within 4.5° (RA51) Within 3.0° (RA52 with 3 ft antenna) Within 2.5° (RA52/53/54/55 with 4 ft antenna) Within 1.8° (RA53/54/55 with 6 ft antenna)
Bearing accuracy:	1° or less
Warm-up time:	2 minutes
Environment conditions	
Ambient temperature range	(S/U): -25 to 55°C (D/U): 0 to 55°C
Humidity:	93% RH at +40°C
Vibration:	(S/U): 3 mm(300 to 500 rpm) 1.2 mm(500 to 1500 rpm) 0.3 mm(1500 to 3000 rpm) 14.7m/s ² (1.5G) Resonance test (D/U): 3 mm(300 to 500 rpm) 0.75 mm(500 to 1500 rpm) 0.2 mm(1500 to 3000 rpm)
Wind resistance:	100 knots (max.)
Waterproof standard:	(D/U): IPX-5 (S/U): IPX-6

Interconnecting cable: 100 m in max.
 Noise: (D/U): 65 dB or less
 (S/U): 65 dB or less (RA51)
 (S/U): 70 dB or less (RA52/53/54/55)

8.2 Scanner Unit

Type: RB715A (RA51)
 RB716A (RA52)
 RB717A (RA53)
 RB718A (RA54)
 RB719A (RA55)

Antenna type: Slotted-array

Antenna characteristics

Beam width (horizontal): 3.9° (RA51)
 2.5° ± 0.3° (RA52 with 3ft antenna)
 1.8° ± 0.2° (RA52/53/54/55 with 4ft antenna)
 1.2° ± 0.2° (RA53/54/55 with 6ft antenna)

Beam width (vertical): 25° (typ.) (RA51)
 22° (typ.) (RA52 with 3/4ft antenna)
 22° (typ.) (RA53/54/55 with 4/6ft antenna)

Pulse width and peak power output:

RA51/52		RA53	
Pulse width (μsec)	Peak Power (kW)	Pulse width (μsec)	Peak Power (kW)
0.08	4 (-50% to +20%)	0.08	6 (-50% to +20%)
0.25	4 (-50% to +20%)	0.3	6 (-50% to +20%)
0.8	4 (-50% to +20%)	0.6	6 (-50% to +20%)
		1.0	6 (-50% to +20%)
RA54		RA55	
Pulse width (μsec)	Peak Power (kW)	Pulse width (μsec)	Pulse Power (kW)
0.08	12 (-50% to +20%)	0.08	25 (-50% to +20%)
0.3	12 (-50% to +20%)	0.3	25 (-50% to +20%)
0.6	12 (-50% to +20%)	0.6	25 (-50% to +20%)
1.0	12 (-50% to +20%)	1.2	25 (-50% to +20%)

Radio wave type and frequency: P0N, 9410 ± 30 MHz

Antenna revolution: 24 rpm or 48rpm (RA51)
 24 rpm or 48rpm (24Vdc or more) (RA52)
 24 rpm or 48rpm (RA53/54/55)

Transmit/receive switching: Circulator and limiter type

Intermediate frequency: 60 MHz (logarithmic amplifier)

Noise figure: 6.5 dB or less

8.3 Display Unit

Type:	RF720A /720B
Indication system:	PPI, PPI+semi-3D, Split radar range
Indicator:	15-inch TFT color LCD 640 x 480 dots Four (4) levels
Cursor Control:	Analog cursor key and rotary encoder
VRM:	2 lines (One line can be offset.) Unit of distance can be selected from NM, KM, and SM.
EBL:	2 lines (One line can be offset.)
Display modes:	HU, HS, NU, CU, and TM
Off-center:	Can be 100% off-centered over the full range.
Guard zone:	Can be set at any desired distance and angle in any desired width. IN and OUT modes are available.
Stretch:	2 modes
Echo track:	15, 30 sec, 1, 3, 6 min. and continuous.
Other functions:	Interference rejection, Zoom, Sleep mode, Hold mode, Course error display, Parallel cursors, Stern marker, and Navigation data display mode
Panel brightness:	Four (4) levels
Language support:	Chinese, Danish, English, French, German, Greek, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, Swedish, Turkish, and Thai

8.4 External Interface

NMEA0183:	2 channels
	(One standard channel; Optional cable is required for 2nd-channel connections)
L / L	GGA, GLL, RMA, RMC
Heading	HDT, HDG, HDM, HCC, VHW, VTG
Speed	VHW, VTG, RMA, RMC
Way point	RMB, BEC, BWC, BWR, BER, BPI
Depth	DBT, DPT
Course error	RMB, XTE
Seawater temperature	MTW
Magnetic compass variation	RMA, RMC, HDG, HVD, HVM

Others (using optional cable):

External buzzer control output, Auxiliary indicator connecting signal output and input, Bow direction signal input(SIN/COS signals), and compass interface (10/12 bits serial)

8.5 Standard set

Display unit	1	
Scanner unit	1	
Display cover	1	
Fuse	1 set	
Interconnecting cable	1	(10m for RA51/52/53/54, 15m for RA55)
Power supply cable	1	(2m)
M10 hexagonal bolt	4 sets	(for RA51)
M12 hexagonal bolt	4 sets	(for RA52/53/54/55)

8.6 Options

Interconnecting cable	(15, 20, and 30 m)
Flush-mount installation kit	
Junction box for external connection	(with cable 1.5m)
Option connector kit	249J153058

8.7 External dimensions and weight

See APPENDIX

8.8 External Connection and function

X1 Connector for Option

Pin No.	Name	function
1	NMEA2-A	NMEA ch2 data input (A)
19	NMEA2-B	NMEA ch2 data input (B)
2	GND	
20	EXBUZ+	Output for External Buzzer
3	EXBUZ-	Output for External Buzzer
		Controlled ship's power output
21	VIDEO_IN	Video input for Monitor operation 0 to -1V negative video, Zi = 50ohm
4	VIDEO_OUT	Video output for External Monitor 0 to -1V negative video, Zo = 50ohm
22	GND	
5	TRIG_IN	Trigger signal input for Monitor operation 0 to 5V positive pulse, rising edge
23	TRIG_OUT	Trigger output for External Monitor 0 to 5V positive pulse, rising edge
6	SHF_IN	Heading signal input for Monitor operation 0 to 5V negative pulse, falling edge
24	SHF_OUT	Heading signal output for External Monitor 0 to 5V negative pulse, falling edge
7	AZI_IN	Bearing Pulse input for Monitor operation 0 to 5V positive pulse, rising edge
25	AZI_OUT	Bearing Pulse output for External Monitor 0 to 5V positive pulse, rising edge
8	GND	
26	GYRCK+	Gyro Interface clock (+) input
9	GYRCK-	Gyro Interface clock (-) input apply 5V pulse between (+) and (-), isolated
27	GYRDT+	Gyro Interface data (+) input
10	GYRDT-	Gyro Interface data (-) input apply 5V pulse between (+) and (-), isolated
28	GND	
11	MARK_I	External Marker signal input, ex) Radar Buoy negative video, 0 to -1V Zi = 50ohm
29	+12V	External interface power, 100mA max.
12	SIN	Compass Interface for SIN/COS type
30	COS	Compass Interface for SIN/COS type
13	REF	Compass Interface for SIN/COS type SIN/COS signal: SIN = REF±1V, COS = REF±1V
31	LOG	Dry contact log pulse input
14	GND	
32	NMEA_OUT	NMEA data output, ex) MOB data, TARGET data