KODEN

BUILT-IN BEACON RECEIVER
Differential GPS NAVIGATOR

KGP-931D

Versatile functions including track plotting are integrated into a compact design.

High quality
Space-saving
Easy-to-see
Easy-to-use navigator

KGP-931: GPS navigator without beacon receiver

FEATURES

• Differential GPS
Neatly housed combination of GPS and built-in beacon receiver gives extremely accurate position and navigation information. Beacon stations all over the world are pre-installed (In countries where differential beacons are located). Automatically locks on the best DGPS signal for continuous, pinpoint data at all times -- even when moving from one beacon zone to another.

• Easy-to-see navigational information display
The large LCD displays navigational information in easy-to-read characters. Graphic display of navigational information makes steering to waypoints easy.

• Plotter function
The professional track plotting function (with 2,000-points capacity) allows tracks, courses and mark positions to be displayed visually.

• Position memory and comment
Up to 100 event points can be stored by one-touch operation.
Up to 400 points of any position can be stored together with a mark and comment.

• Route navigation and boundary setting
Stored positions can be used to create routes (travelling course of the vessel) or boundaries. Up to 50 route and boundary points can be used per group. If a route is set, the navigator directs the vessel to the final waypoint while automatically renewing each passing point. Using the route reverse function, a safe return course can be ensured.

• Selection of Mercator or great circle sailing
Mercator or great circle sailing can be selected (automatic route calculation). The navigator permits sailing to a distant waypoint via a great circle path, and passing points along the path (50 points) to be automatically stored.

• Loran C or Decca LOP display
The latitude/longitude data obtained using the GPS can be converted into and displayed in Loran C LOP or Decca LOP values. Data can be stored in latitude/longitude or LOPs.

• MOB (Man Over Board) display function
In case of emergency, the bearing and distance to the emergency point can be displayed in graphic form by simply pressing the MOB (emergency) key.

• Tide speed and bearing display
Using speed and bearing data obtained via the GRA-20A gyro log interface, the speed and bearing of deviations due to the tide or other factors are calculated and displayed.

• Hard copy of position data (optional)
Important position data can be printed out on the KGP-9001A printer (optional).

SPECIFICATIONS

GPS receiver Section

Receiving frequency	1575.42 MHz ± 1 MHz
Receiving channel	Digital 11-channel parallel/sequential
Receiving code	C/A code
Sensitivity	Better than -130 dBm (elevation angle: 5° or over)
Tracking speed	200 knots maximum
Accuracy Position	15 meters RMS (without SA), 100 m 2DRMS (with SA)
(PDOPÅÖ3) Velocity	0.1 knot RMS (without SA)

Note: Accuracy is subject to change in accordance with DoD civil GPS user policy.

Beacon receiver section

Receiving frequency	283.5 to 325.0 kHz
Channel separation	500 Hz step
Modulation	MSK: 50, 100, 200 bit/second
Sensitivity	5 µV/m
Signal detection (S/N)	6 dB or more
Dynamic range	92 dB

Display Section

Display	Dot matrix LCD with backlit (320 x 240 pixels, usual picture area: 112 x 85 mm)
Display mode	NAV1, NAV2, NAV3, PLOT, MOB (Man Over Board), MENU
Track display	
Display range	1/4, 1/2, 1, 2, 5, 10, 20, 50, 100, 200 nm (km, sm)
Usable area	Within 80° in latitude
Plotting interval	OFF, 5, 10, 20, 30 seconds, 1, 2, 3, 4, 5, 10 minutes, 0.1, 0.2, 0.5, 1, 2 (nm, sm, km)
Plotting capacity	2,000 points
Position data display	Latitude/longitude in increments of 0.0001 minute or converted Loran C LOP / Decca LOP
Differential	ON, OFF, AUTO
Beacon station selection	Auto (requires position information) or manual
Beacon station data	User entry (20 stations), beacon almanac data (10 stations), ROM (built-in stations around the world)
Navigational display	Speed, course, velocity made good/course made good/elapsed time, altitude, distance/bearing/cross track error/ course deviation/time to go/arrival time to waypoint, total time to go and distance on route, DOP value, present time (UTC or LTC), satellite status, beacon receiving status, MOB display, bearing/distance between two points, navigational graph, water temperature/depth (by interfacing with external device), drift (by interfacing gyro compass and log via GRA-20A)
Instant (event) memory	100 points (usable as waypoint)
Waypoint memory	400 points (usable as waypoint)
Route memory	20 routes (up to 50 points for each route; commonly used for boundary memory) with reverse trail
Boundary memory	20 routes (up to 50 points for each route; commonly used for route memory)
Alarm	Proximity, cross track error, CDI, anchor watch, boundary line, DGPS
Position compensation	Latitude/longitude, Loran C LOPs, Decca LOPs, Datum
Magnetic compensation	Auto or manual
Parameters	Loran C LOPs conversion, Decca LOPs conversion, tide calculation, memory of position mark and comments (up to 10 letters), selection of measuring unit (km, nm, sm), antenna height, averaging (smooth) factor, position mode (2D or 3D automatic selection), elevation angle mask, DOP mask, beacon station selection and storing
Input data format	KODEN-717, NMEA-0182, NMEA-0183, others
Output data format	KODEN-717, NMEA-0182, NMEA-0183, others
Log pulse output	100, 200, or 400 pulses/mile: effective when positioning.
Memory protection	By built-in battery
Power supply	11 to 40 VDC
Power consumption	10 W or less (at 24 VDC)
Environmental condition	Display unit: -15° to +55°C (5° to 131°F)
	Antenna unit: -30° to +70°C (-22° to 158°F)
	Antenna coupler: -30° to +70°C (-22° to 158°F)

EQUIPMENT LIST

Standard Equipment List

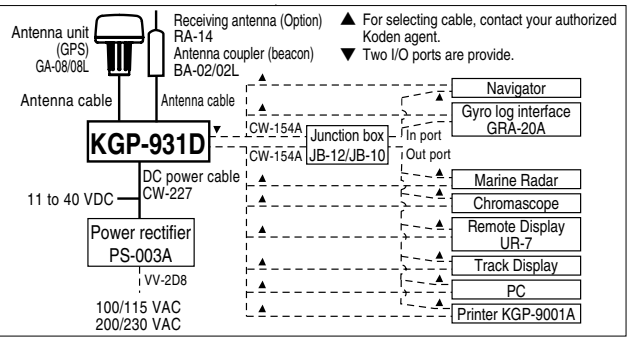
Display unit		With vinyl cover and mounting bracket	1
Antenna unit Antenna cable	GA-08	For GPS receiving, with antenna cable Connected to GA-08/BNC connector	1 * 10 m (32 13/16 ft)
	GA-08 L	For GPS receiving, with antenna cable Connected to GA-08L/BNC connector	1 * 15 m (49 3/16 ft)
Antenna coupler Antenna cable	BA-02-K	For beacon receiving, with antenna cable Connected to BA-02/BNC connector	1 10 m (32 13/16 ft)
	BA-02-KL	For beacon receiving, with antenna cable Connected to BA-02-KL/BNC connector	1 15 m (49 3/16 ft)
DC power cable	CW-227	With a connector	1.8 m (5 15/16 ft)
Fuse	F-7142, 2A	For spare	1
Installation materials			1 set
Operation manual			1

* Antenna cable and antenna GA-03 with more than 15 m (49 3/16 ft) antenna cable are optional.

Options

Receiving antenna	RA-14	2.45 m whip	0.3 kg (0.67 lb)
Gyro log interface	GRA-20A	With power and connecting cables	2.5 kg (5.6 lb)
Printer	KGP-9001A	With power and connecting cables	1.7 kg (3.8 lb)
Remote display	UR-7	With power and connecting cables	1.3 kg (2.9 lb)
Junction box	JB-12	1-IN/3-OUT, 3-IN/1-OUT	0.4 kg (0.89 lb)
	JB-10	1-IN/3-OUT	0.42 kg (0.93 lb)
Antenna unit	GA-03		0.9 kg (2.0 lb)
H-field loop antenna Antenna cable	BA-03	With antenna cable Connected to BA-03/BNC connector	1.4 kg (3.1 lb) 10 m (32.8 ft)
	BA-03 L	With antenna cable Connected to BA-03L/BNC connector	1.6 kg (3.6 lb) 15 m (49 3/16 ft)
	BA-03S	With antenna cable Connected to BA-03S/BNC connector	0.99 kg (2.2 lb) 0.5 m (1 5/8 ft)
GPS/H-field beacon antenna Antenna cable	GBA-01	With 2 antenna cable Connected to GBA-01/ BNC connector	1.9 kg (4.2 lb) 10 m (32 13/16 ft)
	GBA-01L	With antenna cable Connected to GBA-01L/ BNC connector	2.2 kg (4.9 lb) 15 m (49 3/16 ft)
	GBA-01S	With antenna cable Connected to GBA-01S/ BNC connector	1.1 kg (2.5 lb) 0.5 m (1 5/8 ft)
Antenna cable	CW-826	With N-P/BNC connectors BA-03S/GBA-01S	0.5 m (1 5/8 ft)
	RG-10U/Y	With N-P connectors BA-03S/GBA-01S	20 m or 30 m (66 or 98 7/16 ft)
	RG-10U/Y	Selectable 15 m (49 3/16 ft), 20 m (66 ft), 30 m (98 7/16 ft) GA-03	
	10DFB	Selectable 40 m (131 1/4 ft), 50 m (164 ft), 60 m (197 ft) GA-03	
Connecting cable	CW-60	with BNC connector and lugs	10 m (32 13/16 ft)
	CW-94	with 6-pin and BNC connectors	5 m (16 3/8 ft)
	CW-153A	with 6-pin connectors	5 m (16 3/8 ft)
	CW-154A	with 6-pin connector and one end plain	5 m (16 3/8 ft)
	CW-155	with BNC and 6-pin connectors	5 m (16 3/8 ft)
	CW-157A	with 6-pin and 5-pin connectors	5 m (16 3/8 ft)
	CW-158	with 5-pin and one end plain	5 m (16 3/8 ft)
	CW-311	with 7-pin and one end plain	5 m (16 3/8 ft)
Power rectifier	PS-003A	With two 5A fuses	2.8 kg (6.2 lb)
AC power cable	VV-2D8	both ends plain	3 m (9 13/16 ft)
Antenna holder	RAH-29	Ratchet mount	0.68 kg (1.5 lb)

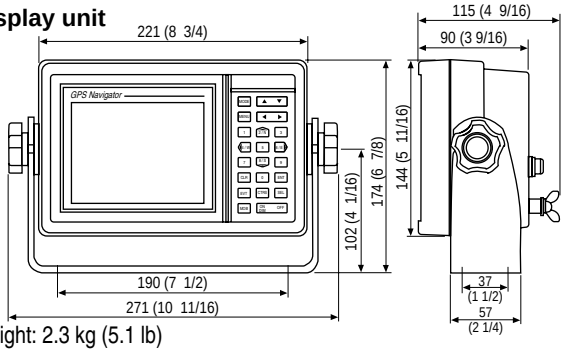
CONNECTION



DIMENSIONS AND WEIGHT

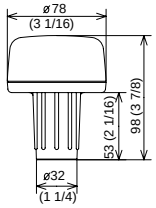
Unit: mm (inch)

Display unit



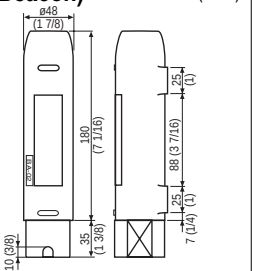
Weight: 2.3 kg (5.1 lb)

Antenna unit (GPS) GA-08/08L



Weight:
0.19 kg (0.42 lb)
0.62 kg (1.4 lb) including cable (10 m)
0.81 kg (1.8 lb) including cable (15 m)

Antenna coupler (Beacon) BA-02/02L



Weight: 0.4 kg (0.89 lb)
0.85 kg (1.9 lb) including cable (10 m)
1.2 kg (2.7 lb) including cable (15 m)

* Specifications subject to change without notice.

KODEN

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Certified to ISO 9001 (TÜV PRODUCT SERVICE)

Safety precaution — **To ensure proper and safe use of the equipment, please carefully read and follow the instructions in the OPERATION MANUAL.**

FOR DETAILS, PLEASE CONTACT:

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