Marine Electronics Products 2012

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• Design and specifications are subject to change without notice.

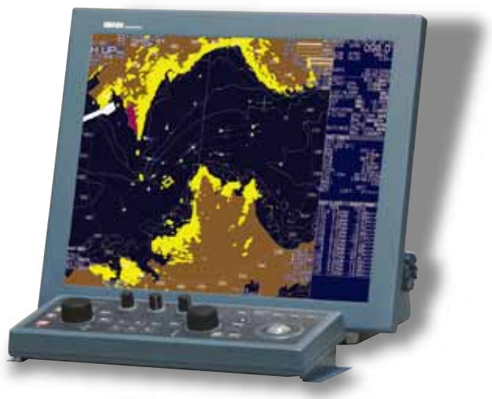
Safety precaution To ensure proper and safe use of the equipment, please carefully read and follow the instructions in the Operation Manual.

www.koden-electronics.co.jp

12/02 PDF

Marine Radar 19"

ARPA



MDC-2900 / 2900P series

MDC-2900BB / 2900PBB series

Expand your professional world

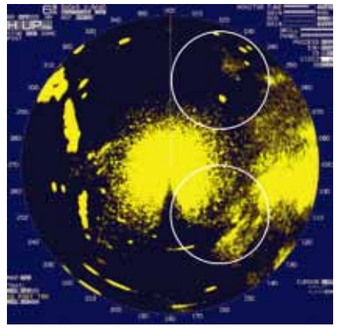
MDC-2900P/2900 series feature sophisticated new signal processing technology which provides superior target discrimination, a steady image even for unstable targets, thus supporting safer navigation.

Features

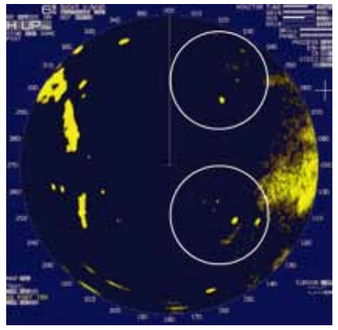
- MDC-2900P series complies with IMO regulation and meets SOLAS carriage requirements for ships up to 10,000 GT.
- MDC-2900 series has MAP overlay with C-Map NT+ or NT MAX chart (Chart: owner supplied).

For both series

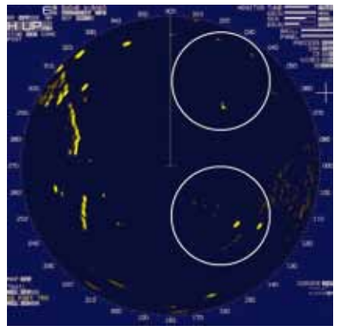
- Full ARPA functions including trial manoeuvre are provided.
- 19" high-resolution SXGA color LCD with anti-reflective coating.
- CFAR , function of new clutter suppression to provide clear target image (Check CFAR function image).
- Real-time smooth head-up.
- True Trail function clearly identifies moving targets from stationary targets like land or buoys.
- Built-in AIS (Automatic Identification System) interface displays up to 254 AIS targets.
- Built-in TT (ARPA) tracks up to 60 targets.
- Black Box models also available.



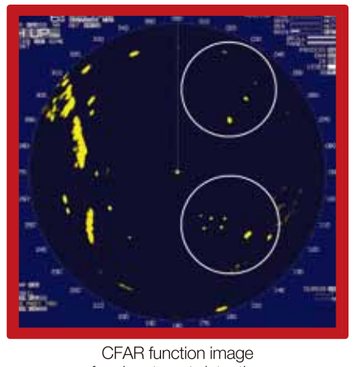
SEA and RAIN clutter on Radar image



SEA anti-clutter function image



SEA anti-clutter and RAIN anti-clutter function image



CFAR function image for clear target detection

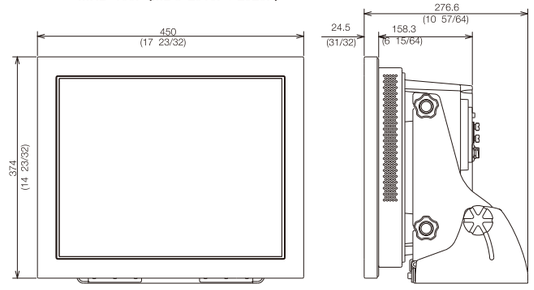
	MDC-2900P series		MDC-2900 series		
Model	MDC-2910P / MDC-2910PBB	MDC-2920P / MDC-2920PBB	MDC-2960 / MDC-2960BB	MDC-2910 / MDC-2910BB	MDC-2920 / MDC-2920BB
Specifications & Functions:					
Output power (Peak)	12 kW	25 kW	6 kW	12 kW	25 kW
Display unit	MRD-105P / MRM-105P (Processor unit)		MRD-105 / MRM-105 (Processor unit)		
Operation unit	MRO-105				
Display size and type	19" color LCD / 19" IMO approved display made by Hatteland or North Invent (owner supplied)		19" color LCD / Any monitor with SXGA or higher grade resolution		
Effective diameter	278mm				
Display resolution	1280 x 1024 pixels				
Off-centering	Max. 72%				
Echo area	1 type (Inside of effective diameter)		2 types (Full screen, Inside of effective diameter)		
Basic range	0.125 to 72 NM	0.125 to 96 NM	0.125 to 72 NM		0.125 to 96 NM
Presentation modes	Head-up, North-up (True motion)*, North-up (Relative motion)*, Course-up (True motion)*, Course-up (Relative motion)*				
Indication system	PPI				
Video level	8				
Alarms	Echo (IN / OUT), TT / AIS (CPA / TCPA), Guard zone etc.				
Functions	CFAR (Clutter rejection), Interference rejection, Target expansion, Process (Averaging), VRM, EBL, Parallel index, ERBL, Cursor position, Bearing (true* / relative), Trail (true / relative)*, Own ship past track*, MAP (Event mark*, etc), Analog RGB Monitor output, Trial Manoeuvre*		C-Map chart, CFAR (Clutter rejection), Interference rejection, Target expansion, Process (Averaging), VRM, EBL, Parallel index, ERBL, Cursor position, Bearing (true* / relative), Trail (true / relative)*, Own ship past track*, MAP (Event mark*, etc), Analog RGB Monitor output, Trial Manoeuvre*		
Input data formats and sentences	IEC61162-1/-2 (BWC, DBT, DPT, DTM, GGA, GLC, GLL, GNS, HDT, MTW, RMB, RMC, RTE, THS, VBW, VDR, VHW, VTG, WPL, XTE, ZDA)		IEC61162-1/-2 (BWC, DBT, DPT, DTM, GGA, GLC, GLL, GNS, HDG, HDT, HDM, MTW, RMA, RMB, RMC, ROT, RTE, THS, VBW, VDR, VHW, VTG, WPL, XTE, ZDA)		
Output data formats and sentences	IEC61162-1/-2 (RSD, OSD, TLB, TTD, TTM)		IEC61162-1/-2 (RSD, OSD, TLB, TTD, TTM, TLL, DTM, GLL, HDT, ROT, VBW, VDR, VHW, VTG, ZDA)		
NMEA ports	4 (input 2, input / output 2)				
AIS interface*	254 Targets (Standard)				
TT (ARPA)*	Auto/Manual 60 Targets (Standard)				
Map overlay	-		C-Map NT+ / NT MAX (Owner supplied)		
Power supply	21.6 to 41.6 VDC				
Power consumption (at 24 VDC)	150 W or less	200 W or less	130 W or less	150 W or less	200 W or less
Environmental:					
Operating temperature	-25°C to +55°C (Antenna-scanner unit), -15°C to +55°C (Display unit / Processor unit)		-25°C to +55°C (Antenna-scanner unit), -15°C to +55°C (Display unit / Processor unit)		
Water protection	-		-		
Antenna-scanner connections: (See page xx for details)					
6kW, Open antenna	-	-	RB717A	-	-
12kW, Open antenna	RB718BP	-	-	RB718A	-
25kW, Open antenna	-	RB719BP	-	-	RB719A
Antenna-scanner unit cable 15, 20 or 30 m	242J159098				
Max. length (m)	65m		100m		

*Requires heading, speed, and / or position signal input from external equipment including GPS Compass depending on application of user.

Display unit:

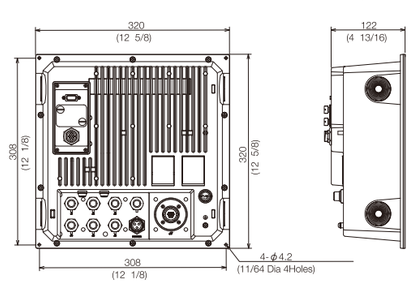
Unit: mm (inch)

Display unit: MRD-105 (MDC-2960 /2910 / 2920)
MRD-105P (MDC-2910P / 2920P)



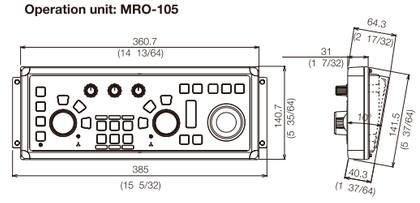
Weight : 15.0 kg (33 lb)

Processor unit: MRM-105 (MDC-2960BB / 2910BB / 2920BB)
MRM-105P (MDC-2910PBB / 2920PBB)



Weight : 5.1 kg (11.2 lb)

Operation unit: MRO-105



Weight : 1.8 kg (4 lb)

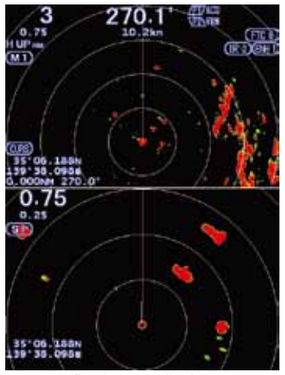
Marine Radar 8.4", 10.4"

MDC-900 series

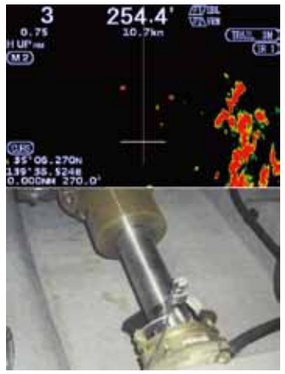
MDC-2000 series

Smart selection for safe navigation

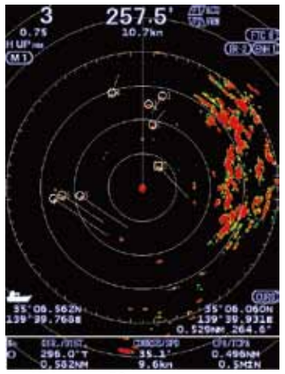
Marine radar MDC-900 series and MDC-2000 series present larger professional grade radar performance and functions.
The series features sophisticated **Hyper Digital Processing (HDP™)** technology for real-time presentation and superior target discrimination.
The real - time presentation offers smooth movement as bearing changes.
The superior target discrimination virtually eliminates unwanted noise to provide a clearer detailed image of targets and enhances the detection of smaller targets.
Also various functions on the compact body are of considerable utility for both fishing and pleasure boats.



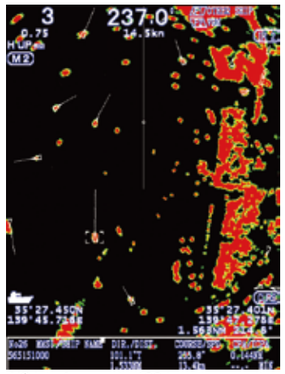
Dual range display



CCD camera input



ATA up to 50 targets as option



AIS interface up to 100 targets as option

Features

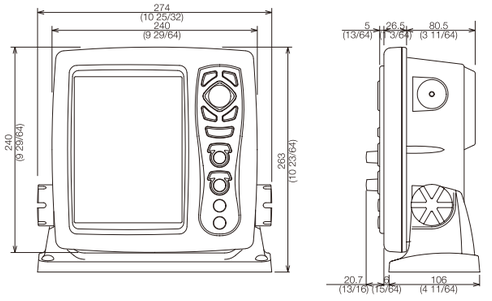
- True Trail function clearly identifies moving targets from stationary targets like land or buoys.
- Exclusive dual range radar function lets you have split-screen display of both long and short-range simultaneously. It is like having two radars in one.
- The LCD and acrylic sheet with Anti-Reflection coated filter are bonded directly. It increases visibility in direct sunlight and prevents condensation.
- ATA (Automatic Tracking Aid) tracks up to 50 targets (Option).
- AIS (Automatic Identification System) interface displays up to 100 AIS targets (Option).
- Accepts CCD camera input, with which you can watch above or below deck any time you are steering.

							
Model	MDC-921	MDC-941	MDC-940	MDC-2041	MDC-2040	MDC-2060	MDC-2010
Specifications & Functions:							
Output power (Peak)	2 kW	4 kW		4 kW		6 kW	12 kW
Display unit	MRD-103			MRD-104			
Display size and type	8.4" color LCD			10.4" color LCD			
Effective diameter	127.4 mm			157.4 mm			
Display resolution	480 x 640 pixels			480 x 640 pixels			
Off-centering	Max. 66%						
Echo area	2 types (Full screen, Inside of effective diameter)						
Basic ranges	0.0625 to 24 NM	0.0625 to 32 NM	0.0625 to 48 NM	0.0625 to 32 NM	0.0625 to 48 NM	0.0625 to 64 NM	0.0625 to 72 NM
Presentation modes	Head-up, North-up (True motion)***, North-up (Relative motion)*, Course-up (True motion) ***, Course-up (Relative motion)*, WPT-up**						
Indication system	PPI, PPI/PPI, PPI/NAV						
Video levels	8						
Alarms	Echo (IN / OUT), ATA (CPA / TCPA) etc.						
Functions	Interference rejection, Target expansion, VRM, EBL (true* / relative), Parallel index, Cursor position (Lat / Lon)***, Bearing (true* / relative), Trail***, RGB Monitor output, External Buzzer output, Slave display monitor input / output, Accepts CCD camera input						
Input data format and sentences	NMEA 0183 (BEC, BWC, BWR, DPT, DBT, GGA, GLL, GNS, HDG, HDM, HDT, MTW, MWD, MWV, RMA, RMB, RMC, VHW, VTG, XTE)						
Output data format and sentences	NMEA 0183 (TTM, TLL)						
NMEA ports	2 (input/output 2)						
AIS interface ***	100 Targets (Option)						
ATA ***	50 Targets (Option)						
Power supply	10.8 to 31.2 VDC						
Power consumption (at 24 VDC)	45 W or less	55 W or less	70 W or less	65 W or less	80 W or less	110 W or less	130 W or less
Environmental :							
Operating temperature	-25°C to +55°C (Antenna-scanner unit), -15°C to +55°C (Display unit)						
Water protection	CFR46 (Antenna-scanner unit), IPX5 (Display unit)	IPX6 (Antenna-scanner unit), IPX5 (Display unit)					
Antenna-scanner connections: (See page 9 for details)							
2 kW, Radome	RB714A	-	-	-	-	-	-
4 kW, Radome	-	RB715A	-	RB715A	-	-	-
4 kW, Open antenna	-	-	RB716A	-	RB716A	-	-
6 kW, Open antenna	-	-	-	-	-	RB717A	-
12 kW, Open antenna	-	-	-	-	-	-	RB718A
Antenna-scanner unit cable 10, 15, 20 or 30 m	242J160680	242J158055	242J159098	242J158055	242J159098	242J159098	242J159098
Max. length (m)	30	100		100			

* Requires bearing data input.
** Requires waypoint data input.
*** Requires bearing data, ship's speed data and latitude / longitude data input.

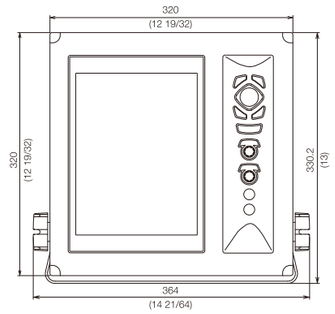
Unit: mm (inch)

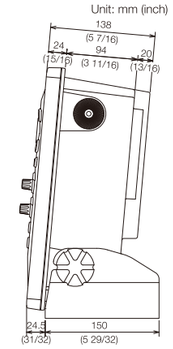
Display unit:
MRD-103



Weight : 3.7 kg (8.2 lb)

MRD-104





Weight: 8.1 kg (17.9 lb)

Marine Radar 12", 15"

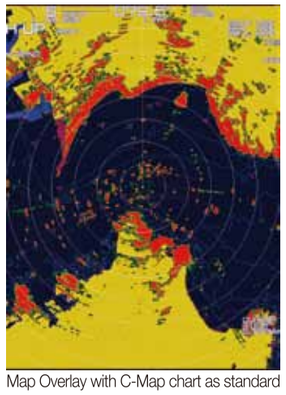
MDC-2200 series MDC-2500 series MDC-2500BB series

Superb performance for confidence at sea

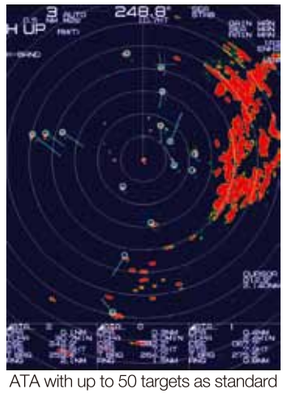
MDC-2200 / 2500 series are high performance and multi-function radars with the essence of Koden's advanced technology.
Our new signal processing technology enables to display constantly even small targets.
The radars are especially recommended for proffesional users such as work boats, fishing boats and commercial vessels.
Its superb detection capability and solid performance support safe and efficient navigation.
Separate operation unit of MDC-2500 series allows flexible installation.
Both series have high–resolution XGA (1024 x 768) grade LCD providing a clear picture, which is extraordinary for 12-inch LCD display.
Black Box type is also available for owner-supplied XGA / UXGA monitor in landscape position (MDC-2500BB series).

Features

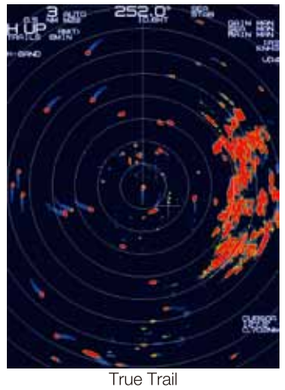
- MAP overlay with C-Map NT+ or NT MAX chart as standard (Chart: owner supplied).
- Real - time smooth head - up.
- True Trail function clearly identifies moving targets from stationary targets like land or buoys.
- Built-in ATA (Automatic Tracking Aid) tracks up to 50 targets.
- AIS (Automatic Identification System) interface displays up to 200 AIS targets (option).
- Two-speed antenna rotation 24 or 48 rpm.
- 48 rpm can track fast moving and close-in targets.



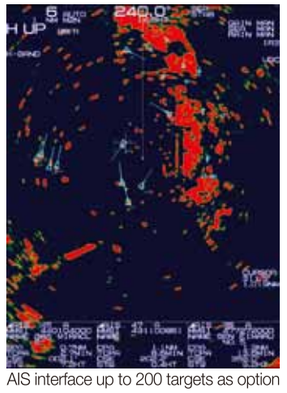
Map Overlay with C-Map chart as standard



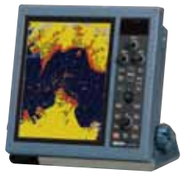
ATA with up to 50 targets as standard



True Trail



AIS interface up to 200 targets as option



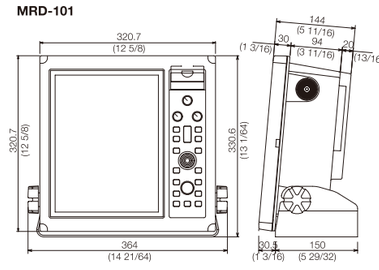
MDC-2500 series

Model	MDC-2240	MDC-2260	MDC-2210	MDC-2220	MDC-2540/MDC-2540BB	MDC-2560/MDC-2560BB	MDC-2510/MDC-2510BB	MDC-2520/MDC-2520BB
Specifications & Functions:								
Output power (Peak)	4 kW	6 kW	12 kW	25 kW	4 kW	6 kW	12 kW	25 kW
Display unit	MRD-101				MRD-102 / MRM-102 (Processor unit)			
Operation unit	-				MRO-102			
Display size and type	12.1" color LCD				15" color LCD / Any monitor with XGA or UXGA resolution (Owner supplied)			
Effective diameter	184 mm				228 mm			
Display resolution	1024 x 768 pixels (XGA)							
Off-centering	Max. 66%							
Echo area	2 types (Full screen, Inside of effective diameter)							
Basic ranges	0.125 to 48 NM	0.125 to 72 NM		0.125 to 96 NM	0.125 to 48 NM	0.125 to 72 NM		0.125 to 96 NM
Presentation modes	Head-up, North-up (True motion)***, North-up (Relative motion)*, Course-up (True motion)***, Course-up (Relative motion)*							
Indication system	PPI							
Video level	8							
Alarms	Echo (IN / OUT), ATA / AIS (CPA / TCPA), Guard zone etc.							
Functions	Interference rejection, Target expansion, Zoom, 2 VRMs, 2 EBLs (true* / relative), Floating EBL / VRM, Cursor position (Lat / Lon**), Parallel cursor, Bearing (true* / relative), Day / Night mode, Trail**, Past cursor**, Mark**, Route**, RGB Monitor output, Slave display monitor input / output, External buzzer output							
Input data format and sentences	NMEA 0183 (BWC, DBT, DPT, DTM, GGA, GLC, GLL, GNS, HDG, HDM, HDT, MTW, RMA, RMB, RMC, RTE, VBW, VDH, VHW, VTG, WPL, ZDA)							
Output data format and sentences	NMEA 0183 (HDT, VHW, VTG, GLL, VDR, RSD, OSD, TTM, TLL)							
NMEA ports	3 (input 1, input /output 2)							
AIS interface **	200 Targets (Option)							
ATA **	50 Targets							
Map overlay **	C-Map NT+ / NT MAX (Owner supplied)							
Power supply	10.8 to 41.6 VDC							
Power consumption (at 24 VDC)	80 W or less	110 W or less	130 W or less	170 W or less	110W or less / 80 W or less	130 W or less / 110 W or less	150 W or less / 130 W or less	200 W or less / 180 W or less
Environmental:								
Operating temperature	-25°C to +55°C (Antenna-scanner unit), -15°C to +55°C (Display unit / Processor unit)							
Water protection	IPX6 (Antenna-scanner unit), IPX5 (Display unit)				IPX6 (Antenna-scanner unit), IPX5 (Display unit / BB type with optional water protection RGB cable)			
Antenna-scanner connections: (See page 9 for details)								
4 kW, Open antenna	RB716A	-	-	-	RB716A	-	-	
6 kW, Open antenna	-	RB717A	-	-	-	RB717A	-	-
12 kW, Open antenna	-	-	RB718A	-	-	-	RB718A	-
25 kW, Open antenna	-	-	-	RB719A	-	-	-	RB719A
Antenna-scanner unit cable 15, 20 or 30 m	242J159098							
Max. length (m)	100 m							

* Requires bearing data input.
** Requires bearing data, ship's speed data and latitude / longitude data input.
*** Requires bearing data and ship's speed data input.
Above specifications are standard model. For IEC approved model, please contact your nearest distributor.

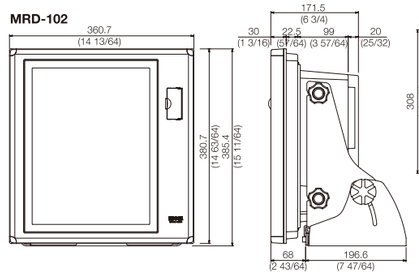
Display unit:

MRD-101



Weight: 8.2 kg (18 lb)

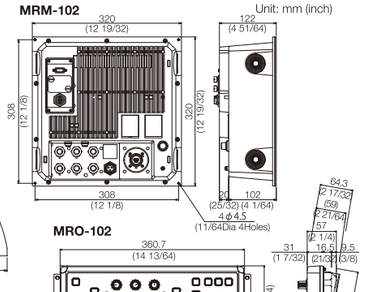
MRD-102



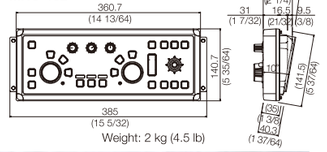
Weight: 12.5 kg (27.5 lb)

MRM-102

Unit: mm (inch)



MRO-102



Weight: 2 kg (4.5 lb)

RADARpc®

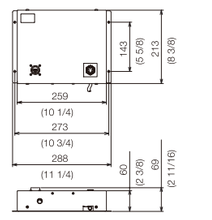
Antenna-scanner unit

Control box

Your computer

Control box:
MDS-5R/MDS-6R

Unit: mm (inch)



Weight:MDS-5R: 1.5 kg (3.3 lb)
MDS-6R: 1.9 kg (4.2 lb)

Full performance on the compatible software

Variety of RADAR*pc* compatible software gives you stand alone, side by side or overlay radar image with full radar control in addition to their advanced charting capability.
Software is available from following companies and more.

- Nobeltec http://www.nobeltec.com/
- Euronav http://www.euronav.co.uk/
- P-Sea http://www.p-sea.com/
- Rose point http://www.rosepointnav.com/
- Sodena http://w3.sodena.eu/en/

Full range of radar variation

A combination of the MDS-5R or MDS-6R control box and any Koden antenna –scanner unit covers full range of radar variety selection.

High speed data communication

Ethernet data communication gives interface ability with almost every PC.
Multi PC network system can be constructed.

Model		MDS-50R	MDS-51R	MDS-52R	MDS-61R	MDS-62R	MDS-63R
Specifications & Functions:							
Antenna-scanner unit		RB714A	RB715A	RB716A	RB717A	RB718A	RB719A
Antenna specifications		See page 9					
Control box		MDS-5R			MDS-6R		
Presentation modes		Head up, North up*, Course up*					
Range scales		0.125 to 24 NM	0.125 to 36 NM	0.125 to 48 NM	0.125 to 64 NM	0.125 to 72 NM	0.125 to 96 NM
Echo trail interval **		OFF, 15, 30 sec, 1, 3, 6 min, Continuous					
Transfer data size	Real time image transfer	256 / 512 / 680 dots / sweep (1024 / 2048 / 4096 sweeps per antenna rotation) Level: 3 bits					
	Full image transfer	240 x 240 / 480 x 480 dots Level: 2 bits					
	Quadrant image transfer	120 x 120 / 240 x 240 dots Level: 2 bits					
Functions		Interference rejection, Target expansion, Serial number output : Yes, Preheat times output (by 5 sec step) : 115 sec to 5 sec (MDS-50R, MDS-51R, MDS-52R, MDS-61R, MDS-62R), 175 sec to 5 sec (MDS-63R) Error output : SHF, System, AZI, RAM, ROM, DHCP server					
Interface:							
Mode of communication		Ethernet (10BASE-T / 100BASE-TX)					
TCP / IP layer	Application layer	Communication command and radar image transfer					
	Internet layer	ARP (Address Resolution Protocol), ICMP (Internet Control Message Protocol)					
	Transport layer	UDP (User Datagram Protocol)					
Network Interface		Shielded UTP (Unshielded Twisted Pair Cable) with cross style, 2 m (standard)					
Transmission speed		10 Mbps / 100 Mbps					
Input data protocol		Radar control by proprietary protocol					
Output data protocol		Radar image video by proprietary protocol					
Antenna-scanner unit cable		10 m (standard)				15 m (standard)	
Power supply		10.2 to 41.6 VDC					21.6 to 41.6 VDC
Power consumption		45 W or less	55 W or less	70 W or less	80 W or less	90 W or less	130 W or less
Environmental:							
Operating temperature		-25°C to +55°C (Antenna-scanner unit), -15°C to +55°C (Control box)					
Water Protection		IPX 6 (Antenna-scanner unit, CFR-46 for RB714A), IPX 0 (Control box)					

* Requires bearing data **Unavailable on Real time image transfer mode

Marine Radar Antenna-Scanner

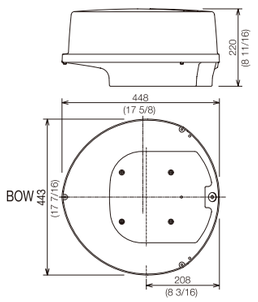
								
Type	RB714A	RB715A	RB716A	RB717A	RB718A	RB719A	RB718BP	RB719BP
Specifications:								
Antenna type	Radome		Open antenna					
Antenna length	1.2 feet	2 feet	3 or 4 feet	4 or 6 feet		4, 6 or 9 feet**	4, 6 or 9 feet**	
Output power (Peak)	2 kW	4 kW		6 kW	12 kW	25 kW	12 kW	25 kW
Output frequency	9445 ±30 MHz	9410 ±30 MHz						
Horizontal beam width	6.0°	3.9°	3 ft: 2.5°, 4 ft: 1.8°	4 ft: 1.8°, 6 ft: 1.2°		4 ft: 1.8°, 6 ft: 1.2°, 9 ft: 0.8°	4 ft: 1.8°, 6 ft: 1.2°, 9 ft: 0.8°	
Vertical beam width	25°	25°	22°	22°		4 ft: 22°, 6 ft: 22°, 9 ft: 25°	4 ft: 22°, 6 ft: 22°, 9 ft: 25°	
Rotation	24 rpm	24 or 48 rpm					24 rpm	
IF center frequency	60 MHz							
Environmental:								
Operating temperature	-25°C to + 55°C							
Water protection	CFR-46	IPX6 (IEC 60529)						
Display / processor connections for marine Radar:								
8.4" color LCD: MRD-103	MDC-921	MDC-941	MDC-940*	-	-	-	-	-
10.4" color LCD: MRD-104	-	MDC-2041	MDC-2040	MDC-2060	MDC-2010	-	-	-
12" color LCD: MRD-101	-	-	MDC-2240	MDC-2260	MDC-2210	MDC-2220	-	-
15" color LCD: MRD-102	-	-	MDC-2540	MDC-2560	MDC-2510	MDC-2520	-	-
19" color LCD: MRD-105	-	-	-	MDC-2960	MDC-2910	MDC-2920	-	-
19" color LCD: MRD-105P	-	-	-	-	-	-	MDC-2910P	MDC-2920P
Processor unit for XGA / UXGA LCD Display: MRM-102	-	-	MDC-2540BB	MDC-2560BB	MDC-2510BB	MDC-2520BB	-	-
Processor unit for SXGA LCD Display: MRM-105	-	-	-	MDC-2960BB	MDC-2910BB	MDC-2920BB	-	-
Processor unit for SXGA LCD IMO Display: MRM-105P	-	-	-	-	-	-	MDC-2910PBB	MDC-2920PBB

* 48 rpm requires for input voltage of 24 VDC or more **9ft antenna is available for MDC-2220, 2520, 2520BB, 2910P, 2920P, 2910PBB and 2920PBB

Antenna - scanner unit:

Unit: mm (inch)

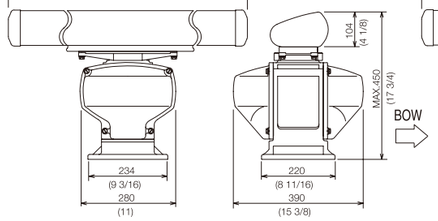
RB714A



Weight: 6 kg (13.5 lb)

RB716A/RB717A and RB718A with RW701A-03/04/06

3 feet: 1034 (40 11/16) :RW701A-03
4 feet: 1346 (53) :RW701A-04
6 feet: 1970 (77 9/16) :RW701A-06

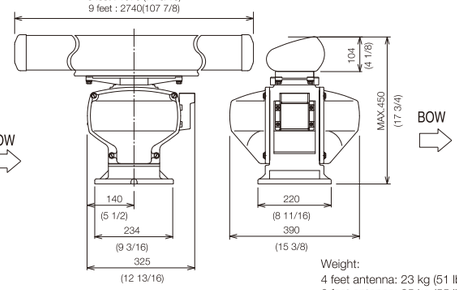


Weight for RB716A
:21 kg (46 lb) 3 feet
:22 kg (49 lb) 4 feet

Weight for RB717A / 718A
:23 kg (51 lb) 4 feet
:25 kg (56 lb) 6 feet

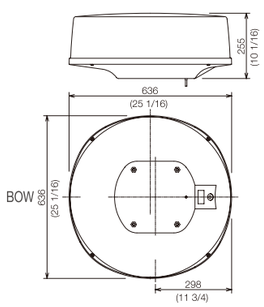
RB718BP with RW 701A-04 / 06 / 09

4 feet : 1346 (53)
6 feet : 1970 (77 9/16)
9 feet : 2740(107 7/8)



Weight:
4 feet antenna: 23 kg (51 lb)
6 feet antenna: 25 kg (55 lb)
9 feet antenna : 33kg(73lB)

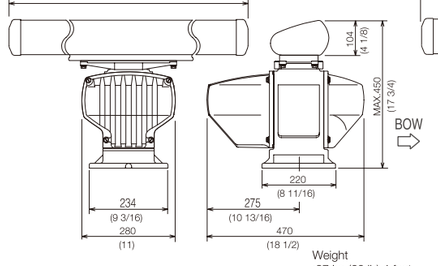
RB715A



Weight: 10 kg (22.5 lb)

RB719A with RW701A-04/06/09

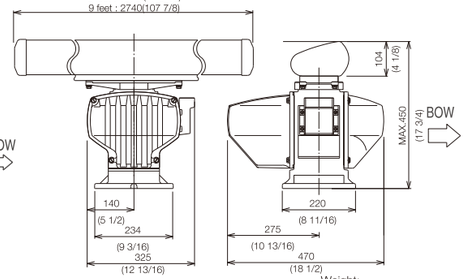
4 feet: 1346 (53) :RW701A-04
6 feet: 1970 (77 9/16) :RW701A-06
9 feet: 2740 (107 7/8) :RW701B-09



Weight
:27 kg (60 lb) 4 feet
:29 kg (64 lb) 6 feet
:33 kg (73 lb) 9 feet

RB719BP with RW 701A-04 / 06 / 09

4 feet : 1346 (53)
6 feet : 1970 (77 9/16)
9 feet : 2740(107 7/8)

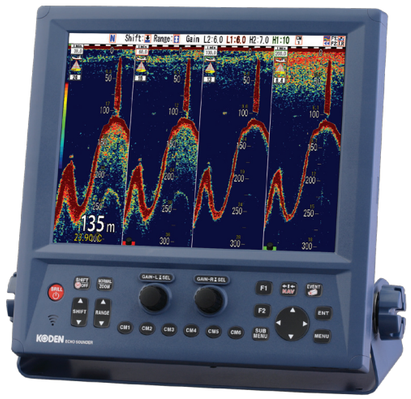


Weight:
4 feet antenna: 27 kg (60 lb)
6 feet antenna: 29 kg (64 lb)
9 feet antenna : 33kg(73lB)

Echo Sounder

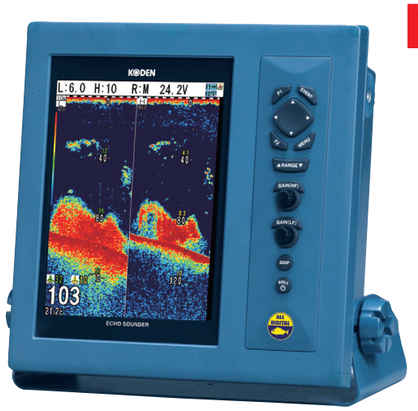
Broadband

NEW



CVS-FX1

NEW



CVS-1410B

Ultimate broadband sounder with digital processing

Broadband Digital Echo Sounders are designed to satisfy demanding professionals.
These innovative sounders are equipped with the capability of selecting frequencies within the range of broadband transducers.
Flexible selection of frequencies enables the user to stay away from interference with the sounders on the other vessels.

Features

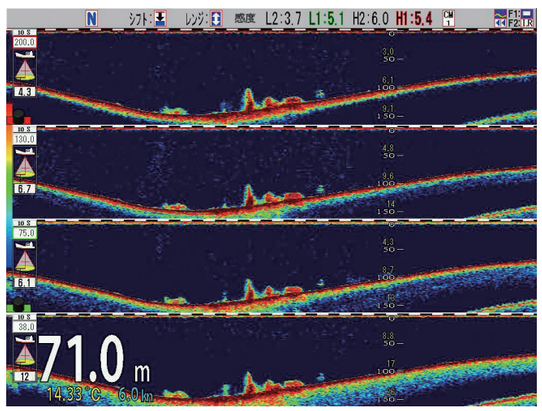
- Extremely high resolution and low noise.
- Bright and clear screen images by Koden Digital Filtering (KDF™) technology.

For CVS-FX1, CVS-FX2, CVS-FX2BB

- World' s first simultaneous and variable quad frequency sounder enables discrimination of targets.
- Up to six settings can be stored in the Condition Memory (CM).
  The user can recall each setting quickly by simply pushing a CM key.
- 500 screen shots can be stored.

For CVS-1410B

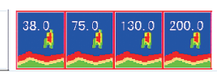
- Two frequencies can be selected and changed in 1 kHz interval.



CVS-FX1 Horizontal split of screen

	Low Frequency2	Low Frequency1	High Frequency2	High Frequency1
Standard Echo Display	▶Normal	▶Normal	▶Normal	▶Normal
		Mix	Mix	
	OFF	OFF	OFF	OFF
Frequency	38.0kHz	75.0kHz	130.0kHz	200.0kHz
Pulse Length	Short	Short	Short	Short
	▶Middle	▶Middle	▶Middle	▶Middle
	Long	Long	Long	Long
	Fix	Fix	Fix	Fix
Band Width	Super narrow	Super narrow	Super narrow	Super narrow
	▶Narrow	▶Narrow	▶Narrow	▶Narrow
	Middle	Middle	Middle	Middle
	Fix	Fix	Fix	Fix
Zoom Display	▶OFF	▶OFF	▶OFF	▶OFF
	B.T.M.	B.T.M.	B.T.M.	B.T.M.
	B.D.	B.D.	B.D.	B.D.
	Zoom	Zoom	Zoom	Zoom
	B.Z.	B.Z.	B.Z.	B.Z.
	B.F.Z.	B.F.Z.	B.F.Z.	B.F.Z.
Gain	▶Individual			
	Synchronize			

Guide
ENT :Enter
▲▼◀▶ :Cursor
SUBMENU:Return
MENU :End



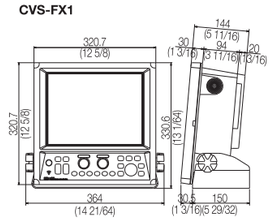
CVS-FX1 Individual setting menu

	CVS-FX1	CVS-FX2	CVS-FX2BB	CVS-1410B
Model	CVS-FX1	CVS-FX2	CVS-FX2BB	CVS-1410B
Specifications & Functions:				
Output power (RMS)	3 kW			1 kW
Transducer	TDM-052 / TDM-062	TDM-052 / TDM-062	TDM-052 / TDM-062	TDM-071 / TDM-091D
Output frequency (Transducer)	38 to75 kHz and 130 to 210 kHz / 38 to 75 kHz and 85 to135 kHz	38 to75 kHz and 130 to 210 kHz / 38 to 75 kHz and 85 to135 kHz	38 to75 kHz and 130 to 210 kHz / 38 to 75 kHz and 85 to135 kHz	38 to 75 kHz / 42 to 65 kHz and 130 to 210 kHz
Selectable frequency range	24 to 240 kHz 0.1kHz step			24 to 210kHz 0.1kHz step
Display size and type	12.1 inch color XGA LCD	15 inch color XGA LCD	Any monitor with XGA resolution (Owner supplied)	10.4 inch color TFT LCD
Display resolution	1024 × 768 pixels (XGA)		-	640 x 480 pixels (VGA)
Basic ranges	1 to 3000 (m), 5 to 8000 (ft), 1 to 1700 (fm), 1 to 2000 (l. fm) (8 ranges can be set to users choice)			2.5 to 2000 (m), 10 to 6000 (ft), 2.5 to 1100 (fm / l. fm) (8 ranges can be set to users choice)
Range units	m, ft, fm, l.fm			
Presentation modes	High frequency, Low frequency, 1 to 4 frequency, Zoom image (Bottom lock, Bottom discrimination, Bottom zoom, Zoom, Bottom follow zoom), Nav mode, Vertical split, Horizontal split, Mix A-scope can be displayed at all above modes			High frequency, Low frequency, Dual frequency, Zoom image (Bottom lock, Bottom discrimination,Bottom zoom, Zoom, Bottom follow zoom), Nav mode, Vertical split, Horizontal split A-scope can be displayed at all above modes
Presentation colors	64 colors,16 colors, 8 colors, Monochrome			
Alarms	Bottom, Fish, Temperature*, Speed**, Arrival***, XTE***			
Image speed	9 steps & stop			
Functions	Interference rejection, Color rejection, VRM, Noise reduction, White line, Draft correct, Water temperature correct, Boat speed correct, Store image (500 images), Sona-Tone™, Fishing Hot Spot, Event memory, Simple plotter, Panel illumination, Power reduction, External trigger, Detection area display, CM key, Water Temp.graph, Individual range operation, Individual shift operation			Interference rejection, Color rejection, VRM, Noise rejection, White line, Draft correct, Water temperature correct, Boat speed correct, Store image (10 images), Sona-Tone™ , Fishing Hot Spot, Event memory, Simple plotter, Panel illumination, Power reduction, External trigger, Fish information, Detection area display
Auto functions	Range, Shift, TVG, TX Power, White Line			Range, Shift, TVG
Input data format and sentences	NMEA0183 Ver.1.5 / 2.0 / 3.0 GGA, GLL, HDT, MTW, MWV, MWD, RMC, VHW, VTG, ZDA			NMEA0183 Ver.1.5 / 2.0 / 3.0 GGA, GLL, HDT, MTW, MWV, RMC, VHW, VTG, ZDA
Output data format and sentences	NMEA0183 Ver.2.0 (DBT : Ver.1.5) DBT, DPT, GGA, GLL, HDT, MTW, MWV, RMC, TLL, VHW, VTG, ZDA			
NMEA ports	2 (input / output 2)			1 (input / output 1)
Power supply	10.8 to 31.2 VDC	21.6 to 31.2 VDC		10.8 to 31.2 VDC
Power consumption	60 W or less (24VDC)	70 W or less (24VDC)	55 W or less (24VDC)	30 W or less (24VDC)
Environmental:				
Operating temperature	-15°C to +55°C			
Water protection	IPX5		-	IPX5

* Requires data from Temp sensor ** Requires speed data from Speed sensor or GPS sensor *** Requires data from GPS sensor

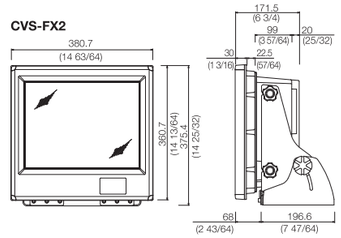
Display unit: Unit: mm (inch)

CVS-FX1



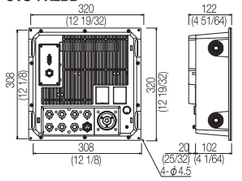
Weight : 9.1kg (20.1lb)

CVS-FX2



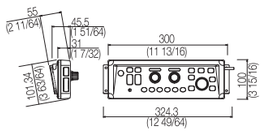
Weight : 13kg (29lb)

CVS-FX2BB



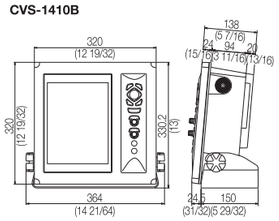
Weight : 5.6kg (12.32lb)

CVS-FX2 / CVS-FX2BB Operation unit



Weight : 0.7kg (1.54lb)

CVS-1410B



Weight : 7.5kg (16.6lb)

Echo Sounder

CVS-126

CVS-128

CVS-1410 /1410HS

Wide range, wide variety of uses

Echo sounder is the most popular item of marine electronics and there are many different features available.
Koden offers a wide range of echo sounders which are designed for a variety of fishing styles from shallow to deep sea applications.

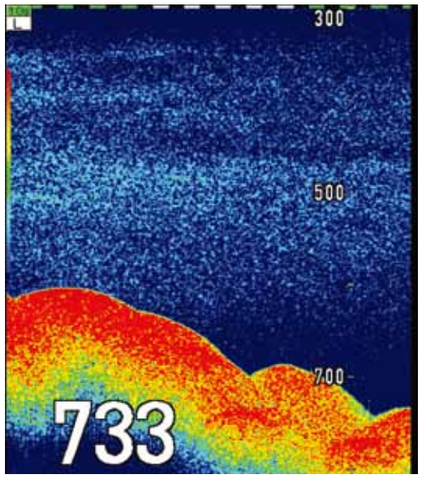
Koden Echo Sounders have a unique signal processing system which aids in finding of weak schools of fish in any ocean conditions.

Features

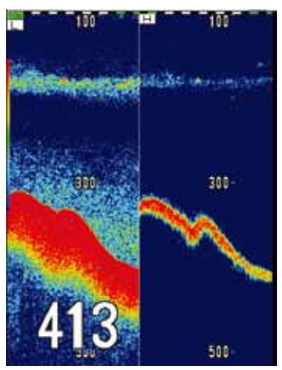
- Preferable color selection for daytime and nighttime operations.
- Reliable A-scope display for precise fish detection image.
- Many presentation modes lead you the best suitable image.
- Greatly enhanced echo detectability.

For CVS-126, CVS-128, CVS-1410 / 1410HS (Digital)

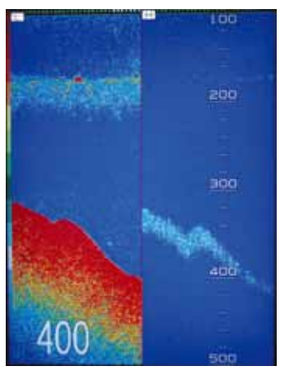
- The **Koden Digital Filtering (KDF™)** feature eliminates clutter by filtering out the noise to provide a clear detailed image that enhances fish targets in shallow and deep sea.
- Stores up to 10 screen images in built-in memory for recalling later by a single touch.
- Exclusive audio **Sona-Tone™** identifies what is under your boat with different sounds for a single or schools of fish.
- With input from external GPS sensor, it can lead you back to your favorite fishing spots or other previously saved positions in memory. = **Fishing Hot Spot**
- Fish information of size and depth for reference.
- The digital echo sounders have superior detection capability with lower power consumption than conventional analog sounders.



CVS-1410HS



Digital



Analog

Model	CVS-126	CVS-128	CVS-1410	CVS-1410HS	CVS-841C	CVS-841P
Specifications & Functions:						
Output power (RMS)	600 W	600W or 1kW	1 kW		1 kW	3 kW
Output frequency	50 kHz and 200 kHz		50 kHz and 200 kHz ****	50 kHz and 200 kHz	Dual combination selected from 28, 38, 50, 75, 200 kHz	
Display size and type	5.7 inch color TFT LCD	8.4 inch color TFT LCD	10.4 inch color TFT LCD			
Display resolution	320 x 240 pixels (QVGA)	640 x 480 pixels (VGA)				
Basic ranges	2.5 to 800 (m) 10 to 2800 (ft) 2.5 to 600 (fm / l. fm) (8 ranges can be set to users choice)	2.5 to 1200 (m) 10 to 3600 (ft) 2.5 to 700 (fm / l. fm) (8 ranges can be set to users choice)	2.5 to 2000 (m) 10 to 6000 (ft) 2.5 to 1100 (fm / l. fm) (8 ranges can be set to users choice)		2.5 to 1200 (m) 10 to 4000 (ft) 2.5 to 1200 (fm / l. fm) (8 ranges can be set to users choice)	2.5 to 3000 (m) 10 to 8000 (ft) 2.5 to 3000 (fm / l. fm) (8 ranges can be set to users choice)
Range units	m, ft, fm, l.fm					
Presentation modes	High frequency, Low frequency, Dual frequency, Zoom image (Bottom lock, Bottom discrimination, Bottom zoom, Zoom, Bottom follow zoom), Nav mode, Vertical sprit, Horizontal split, A-scope can be displayed at all above modes				High frequency, Low frequency, Dual frequency, Zoom image (Bottom lock, Bottom discrimination, Bottom zoom, Zoom, Vertical sprit, Horizontal split, 3 vertical divided A-scope can be displayed at all above modes	
Presentation colors	64 colors,16 colors, 8 colors, Monochrome				16 colors, 8 colors	
Alarms	Bottom, Fish, Temperature*, Speed**, Arrival***, XTE***				Bottom, Fish, Depth	
Image speed	9 steps & stop				12 steps & stop	
Functions	Interference rejection, Color rejection, VRM, Noise rejection, White line, Draft correct, Water temperature correct, Boat speed correct, Store image (10 images), Sona-Tone™, Fishing Hot Spot, Event memory, Simple plotter, Panel illumination, Power reduction, Fish information, Detection area display, External trigger (CVS-1410 / CVS-1410HS) etc.				Interference rejection, Color rejection, VRM, Whit line, Draft correct, Water temperature correct, Boat speed correct etc.	
Auto functions	Range, Shift , Gain		Range, Shift, TVG		Range, Shift	
Input data formats and sentences	NMEA0183 Ver.1.5 / 2.0 / 3.0 (GGA, GLL, HDT, MTW, MWV, RMC, VHW, VTG, ZDA)				NMEA 0183 (GGA, GLL, GTD, MTW, RMC, VTG)	
Output data formats and sentences	NMEA0183 Ver.2.0 (DBT : Ver.1.5) (DBT, DPT, GGA, GLL, HDT, MTW, MWV, RMC, TLL, VHW, VTG, ZDA)				NMEA 0183 (DBS, DBT, DPT, MTW, TLL)	
NMEA ports	1 (input / output 1)				2 (input 1, input / output 1)	
Power supply	10.8 to 31.2 VDC					
Power consumption	10 W or less (12VDC)	25 W or less (12VDC)	30 W or less (12VDC)		45 W or less (12VDC)	
Environmental:						
Operating temperature	-15°C to +55°C					
Water protection	IPX5					

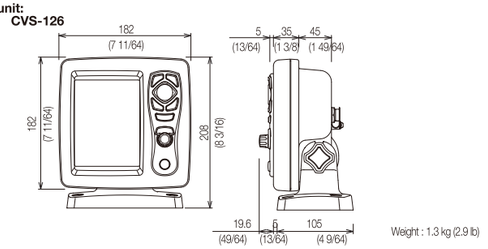
* Requires data from Temp sensor ** Requires speed data from Speed sensor or GPS sensor *** Requires data from GPS sensor

**** Installed single frequency transducer of 50 and 200 kHz can be also used. For details, please contact your nearest distributor.

Display unit:

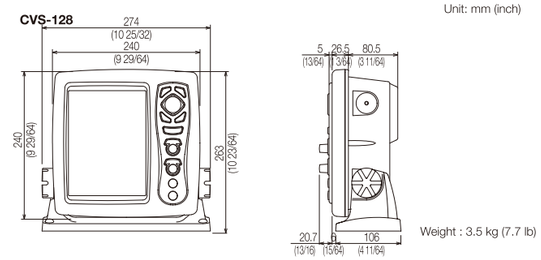
Unit: mm (inch)

CVS-126



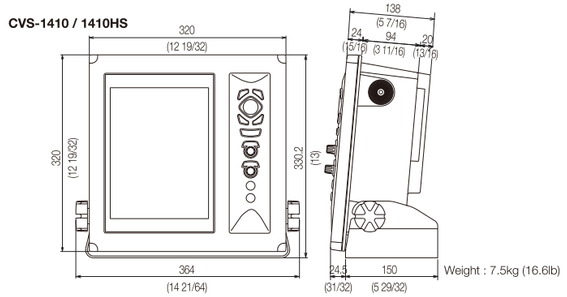
Weight : 1.3 kg (2.9 lb)

CVS-128



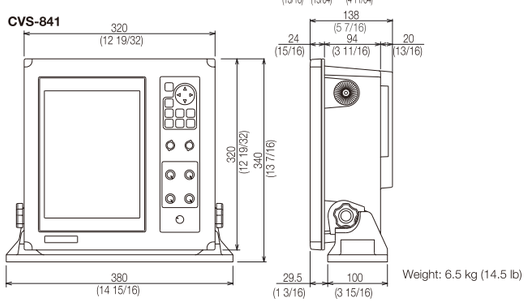
Weight : 3.5 kg (7.7 lb)

CVS-1410 / 1410HS



Weight : 7.5kg (16.6lb)

CVS-841



Weight: 6.5 kg (14.5 lb)

Plotter Sounder

CVG-80

CVG-200

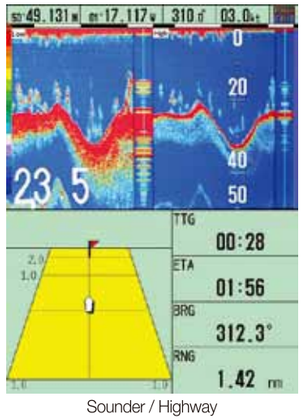
Chart plotter and echo sounder come together in one unit with easy operation

CVG-80 / 200 are one solution for vessels with limited installation space.
Full function of chart plotter and echo sounder are here in your hands with almost the same performance as GTD-110 and CVS-841 on one compact display.
They can be used on a wider variety of vessels, ranging from pleasure boats to small and mid-size commercial vessels, providing a powerful navigation aid to users.
CVG-80 boasts the best performance in the 8-inch class of Plotter Sounders.

Features

- Parallel line drawing function.
- Dedicated keys for all frequently used functions ensure ease of operation.
- Track color variation on water depth and water temperature.
- Clear and vivid images of charts and fish are shown on the display.
- Easy-to-view LCD even under direct sunlight with special filter (CVG-80).
- External monitor (VGA) output is available (CVG-200).
- DGPS WAAS / EGNOS is available with optional DGPS / GPS Sensor.
- Tracks of the targets on the display when connected with ATA equipped Radar.
- Head-up even when the vessel is at rest when equipped with GPS Compass.
- Dual frequency 50 / 200kHz, 600W or 1kw Echo Sounder.
- Multi-language as standard, including English, French, Greek, Italian, Korean and Spanish.

Plotter / Sounder



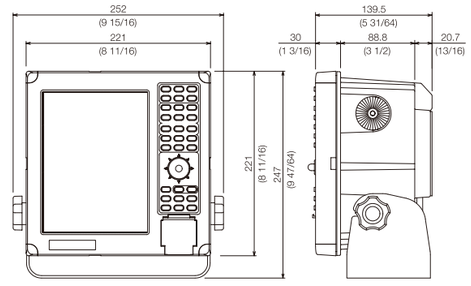
Sounder / Highway

		CVG-80	CVG-200
Model		CVG-80	CVG-200
Specifications & Functions:			
Display size and type		8" color LCD	10.4" color LCD
Display resolution		480 x 640 pixels	
Input data format and sentences		NMEA 0183 (GGA, GLL, HDT, MSK, MSS, MTW, PKODA, PKODG, RMC, TLL, TTM, VTG, ZDA)	
Output data format and sentences		NMEA 0183 (APB, BWC, GGA, GLL, GTD, RMB, VTG, WPL, XTE, ZDA, BOD, DBT, DPT, MTW)	
NMEA ports		2 (input / output 2)	
Plotter:			
Presentation modes		Head-up, North-up, South-up, East-up, West-up, Course-up, Own ship center fixed mode	
Alarms		Arrival, POB, Cross track error, Grounding, Depth, Routing	
Range scale		0.01 to 3600 NM	
Plotting interval	Time	1 to 600 sec	
	Distance	0.01 to 10 NM	
Memory capacity		Track: 2000, 4000, 7000 x 7 blocks, Mark (way point): 8300 points, Route: 50 routes with 50 points Drawing: 500 points x 7 blocks, Other ship's plot (with ATA): 1000 points x 10 targets*	
Chart		C-Map NT / NT+/ NT MAX	
Echo sounder:			
Output power (RMS)		600 W or 1 kW	
Basic range m, ft, fa, l.fa can be selectable in the menu		5 to 1200m / 15 to 4000ft	
Presentation colors		16 colors (Color pallet can be changed) / background: 9 colors	
Ouput frequency		Dual 50/200 kHz	
Image shift		Auto or Manual, 0 to 3000 m, 0 to 8000 ft	
Presentation modes		Normal, Bottom lock, Bottom discrimination, Zoom, Bottom zoom	
Alarms		Fish, Depth	
Image speed		Fixed 11 steps (4/1, 3/1, 2/1, 1/1, 1/2, 1/3, 1/4, 1/6, 1/8, 1/12, 1/16) and stop	
Auto functions		Depth range, Shift, Gain	
Power supply		10.8 to 31.2 VDC	
Power consumption (at 24 VDC)		40 W or less	45 W or less
Environmental:			
Operating temperature		-15°C to +55°C	
Water protection		IPX5	
*Requires other ship's position data (TTM) from ATA equipped Radar			

Display unit:

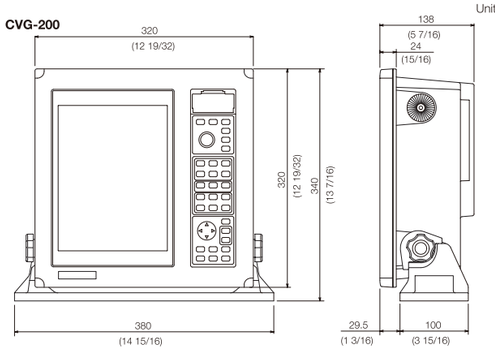
Unit: mm (inch)

CVG-80



Weight: 4.0 kg (8.8 lb)

CVG-200



Weight: 6.8 kg (15 lb)

Chart Plotter

GTD-110

GTD-150

The best choice for safe navigation and effective fishing

The GTD-110 / 150 is a GPS based color electronic chart plotter, designed to provide navigational aids for professional small and medium size vessels.
Easy operation is one of the best features.
Rotary controls and keypads are easy and straightforward to use. Further, symbol marking, track plotting and picture setting functions are individually grouped on the operation panel, giving quick and effective operations.

C-Map NT MAX compatible

Combination of GTD-110 / 150 and enhanced chart C-Map NT MAX improves utilization revolutionarily. C-Map NT MAX provides a wide variety of navigation information such as lighthouses, buoys, contours, tides, currents and so on.

Features

- Brilliant, high-resolution LCD display with wide-viewing angle for steady and crisp images.
- Various marks and greater numbers of ship's track.
- All stored memory is securely protected with double layer memory.
- The GTD-110 / 150 support C-Map NT, NT+ and NT MAX.
- Radar Plotting function is available with ATA equipped Radar.
- Multi-language as standard, including Chinese, English, French, Italian, Japanese, Korean and Spanish.

Radar Plotting

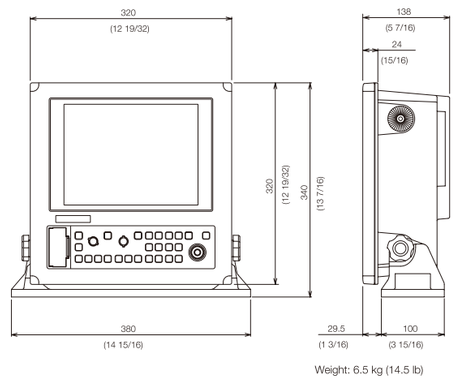
This picture shows the tracks of own ship with ship's profile mark and other ships in different colors.

Operation panel for quick and effective operations

		GTD-110	GTD-150
Model		GTD-110	GTD-150
Specifications & Functions:			
Display size and type		10.4" color LCD	15" color LCD
Display resolution		640 x 480 pixels	
Presentation modes		North-up, East-up, South-up, West-up, Course-up (Waypoint) Head-up, Centered North-up	
Range scale		0.01 to 3600 NM	
Plotting interval	Time	1 to 600 sec. (10 steps)	
	Distance	0.01 to 10.0 NM (10 steps)	
Memory Capacity		Track : 2000, 4000, 7000 points x 7 blocks, Mark : 8300 points Route: 50 routes with 50 points, Drawing: 500 points x 7 blocks Other ship's plot (with ATA): 1000 points x 10 targets*	
Alarms		Arrival, POB, Cross track error, Grounding, Depth, Routing	
Chart		C-Map NT / NT+ / NT MAX	
Input data format and sentences		NMEA 0183 (GGA, GLL, VTG, ZDA, RMC, MSS, MTW, TTM, DBT, DPT, TLL)	
Output data format and sentences		NMEA 0183 (APB, GGA, GLL, VTG, XTE, ZDA, GTD, BOD, BWC, RMB, WPL)	
NMEA port		1 (input / output 1)	
Functions		Loran C LOP, Ring markers	
Power supply		10.8 to 31.2 VDC	
Power consumption (at 24 VDC)		30 W or less	40 W or less
Environmental:			
Operating temperature		-15°C to +55°C	
Water protection		IPX5	

*Requires other ship's position data (TTM) from ATA equipped Radar

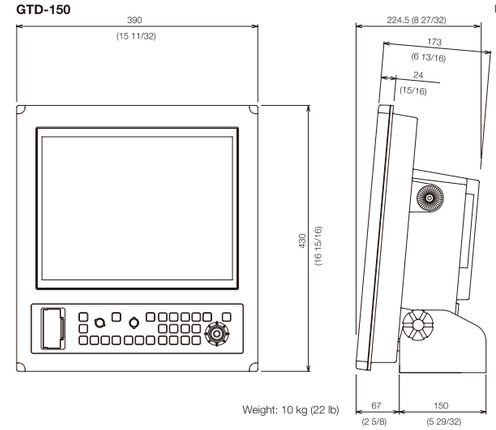
Display unit:
GTD-110



Weight: 6.5 kg (14.5 lb)

GTD-150

Unit: mm (inch)



Weight: 10 kg (22 lb)

Sonar

ESR-140MkII

ESR-160

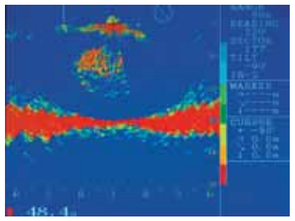
ESR-180

Koden high-speed searchlight Sonar line-up

Color Sonar is a multi-directional Echo Sounder with a revolving and tilting transducer emitting and receiving ultrasonic waves in various directions.The sonar can locate schools of fish in wider areas with the transducer tilting itself to change the angle of transmission from parallel to vertical.
Koden high-speed searchlight Sonar products have been loved by fishing vessels world widely.
Frequency is selective depending on the method, type of fish like low frequency in Squid Jigging and high frequency in Trawling and Purse Seining for Cod, Anchovy, Sardine and Tuna.

Features

- Brilliant, excellent visibility, compact and light weight color LCD gives flexible installation.
- High-speed searchlight system offer reduction of detecting time and prevention of search failure for efficient fish finding operation.
- Markers and a cross cursor provide accurate distance measurement to the target.
- Stabilizing function automatically adjust the direction of transducer swayed by pitching and rolling movement of the boat.
- Target lock function on schools of fish can help to increase fish catches.
- Hoist/Lower unit is automatically loaded to prevent damages when the boat travels faster than the preset speed.
- Echo Sounder display mode effective for finding schools of fish.
- Three types of frequency 180kHz, 200kHz or 220kHz are available for ESR-140MkII and two types 80kHz and 180 kHz for ESR-160 / 180.
- Remote controller, Audio kit and speaker are available as option.

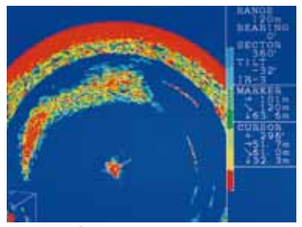


Bottm scan mode

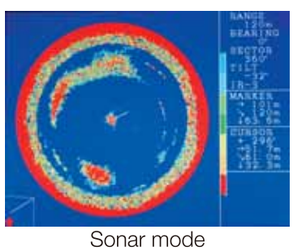
Hoist / Lower unit

For ESR-140MkII

For ESR-160 / 180



Off-center mode



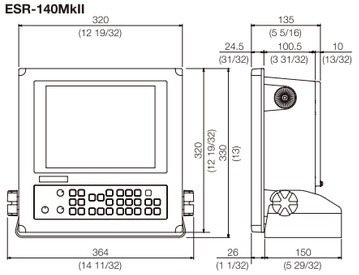
Sonar mode

				
Model		ESR-140MkII	ESR-160	ESR-180
Specifications & Functions:				
Output power (RMS)		800 W	1.5 kW	
Ouput frequency		180 kHz , 200 kHz , 220 kHz	80 kHz, 180 kHz	
Display size and type		10.4" color LCD		15" color LCD
Display resolution		640 x 480 pixels		
Presentation colors		8 image colors (selectable from 4096 colors on color palette)		
Presentation modes		Sonar, Off-center, Bottom scan, Echo sounder		
Off-centering		Fore, Back, Left, Right (Movable 50% of radius from the center of effective screen)		
Target lock		Automatic track, Automatic track with tilt control, Horizontal, Horizontal + vertical		
Hoist stroke		120 to 200 mm	200 to 400 mm	
Tilt angle		+5° to -90° (1° step)		
Beam angle		16°(180 kHz), 12°(200 kHz), 11°(220 kHz)	17°(80 kHz) , 8°(180 kHz)	
Scanning ranges m, ft, fm, l.fm can be selectable in the menu		10 to 300 m 50 to 1000 ft	20 to 2000 m 80 to 6000 ft	
Scanning sector angles	Sonar modes	10° step: 10°, 30°, 50°, 90°, 130°, 170°, 210°, 360° 5° step: 5°, 25°, 45°, 85°, 125°, 165°, 205°, 360°		
	Bottom scan modes	5° step: 5°, 25°, 45°, 65°, 95°, 115°, 145°, 175° 3° step: 3°, 27°, 45°, 63°, 93°, 117°, 147°, 177°		
360° Scanning time (extracts)	Scanning range (m)	10, 40, 80, 100, 160, 200, 300	20, 40, 80, 100, 160, 200, 240, 320, 400, 600, 800, 1000, 1200, 1600, 2000	
	Scanning time (sec.) 5° step	4.2, 7.1, 10.9, 12.8, 18.6, 22.4, 32.0	6.4, 8.4, 12.2, 14.1, 19.9, 23.8, 27.6, 35.4, 43.2, 62.5, 81.9, 101, 121, 153, 198	
	Scanning time (sec.) 10° step	3.7, 5.1, 7.0, 7.0, 10.9, 12.8, 17.6	4.3, 5.1, 7.0, 7.0, 10.9, 12.8, 14.8, 18.6, 22.5, 32.2, 41.9, 51.5, 61.2, 80.6, 99.9	
VGA Monitor terminal		1	Option	1
Audio monitor		Option (Audio kit, Outer speaker)	Option (Outer speaker)	
Input data format and sentences		NMEA 0183 (GGA, GLL, VTG, MTW)	Option (NMEA 0183 - GLL, GGA, VTG)	
Output data format and sentences		-	Option (NMEA 0183 - TLL, DBT, MTW)	
NMEA ports		1 (input 1)	Option : 2 (input 1, output 1)	
Functions		TVG (5 types), Pulse selection (4 types), Color rejection Dynamic range (3 levels), Compass display, Interference rejection, Bow compensation	TVG (4 types), Pulse selection (3 types), Color rejection Dynamic range (3 levels), Compass display, Interference rejection, Bow compensation	
Power supply	Display unit	20 to 30 VDC	10.8 to 31.2 VDC	20 to 30 VDC
	Hoist / lower unit	-	10.5 to 30 VDC	
Power consumption	Display unit (24 VDC)	80 W	30 W	38 W
	Hoist / lower unit (24 VDC)	-	110 W	
Enviromental:				
Operating temperature		0°C to 50°C		
Water protection		IPX 2		IPX 1

Display unit:

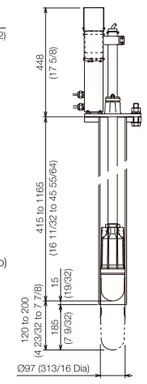
Unit: mm (inch)

ESR-140MkII



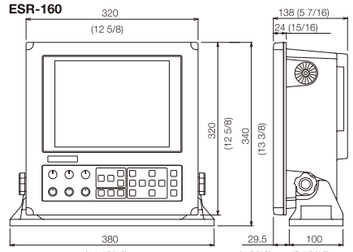
Weight: 8.5 kg (18.7 lb)

Hoist / lower unit



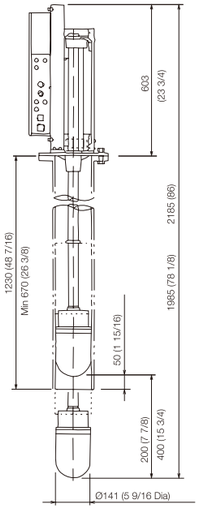
Weight: 24.5 kg (53.9 lb)

ESR-160



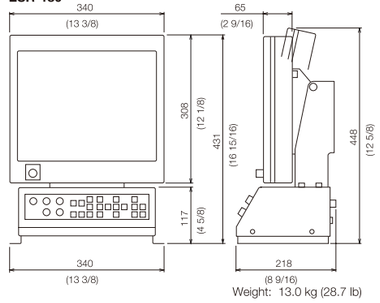
Weight: 7.0 kg (15.5 lb)

Hoist / lower unit



Weight: 44.0 kg (97 lb)

ESR-180



Weight: 13.0 kg (28.7 lb)

GPS Navigator / Compass / Sensor

GPS Navigator, Compass, and Sensor for highly-accurate positioning

Koden GPS products support you in various fields like Fishing, Pleasure, and Ocean Races.
They output accurate position or heading information to your Radar, Echo Sounder, Plotter, and Autopilot for safer and smoother navigation by the differential information from the Satellite Based Augmentation System (SBAS), WAAS in the North America and EGNOS in Europe.
SBAS is very effective for pinpoint fishing, harbor approaching, and narrow channel running.

GPS Navigator KGP-920 / KGP-913MkII / KGP-913MkIID

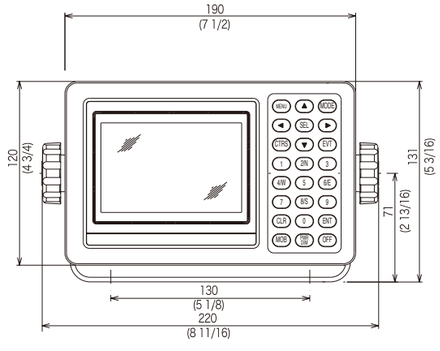
Features

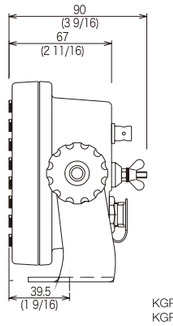
- Two types of graphic displays.
- Beacon receiver built-in for a highly-accurate differential system where beacon stations are located (KGP-913MkIID / KGP-920 option).
- IMO type approved MSC.112 [73] and IEC 61108-1 Ed. 2 for SOLAS carriage requirements (KGP-920).
- Can be used as a GNSS sensor of AIS (KGP-920).

Model	KGP-920	KGP-913MkII	KGP-913MkIID
Specifications & Functions:			
Display size and type	4.2" LCD		
Display resolution	128 x 64 pixels		
Receiving channels	Parallel 18-channel		
Instant (Event) memory	200 points (Incl. one MOB point)		
Waypoint memory	200 points		
Route memory	20 routes (max.400 waypoints) reverse trail possible		
Alarms	Arrival Proximity, Cross track error, CDI, Anchor watch		
Position data display	Latitude / longitude in increments of 0.0001 minute converted Loran C LOPs converted Loran A LOPs, converted Decca LOPs		
Differential	Built-in beacon receiver at option	Ready by RTCM SC-104 format	Built-in beacon receiver
Input data formats and sentences	RTCM SC104 Ver.2.0	RTCM SC104 Ver. 2.0, NMEA 0183 *	
Output data formats and sentences	IEC61162-1, NMEA0183 Ver1.5	NMEA0183 Ver.2.0/1.5	
	GBS, GGA, GLL, VTG, ZDA, DTM etc.	GGA, GLL, RMC, VTG, ZDA etc.	
	CIF / SHIPMATE0183 are also available		
NMEA ports	2 (input/output 2)	1 (input/output 1)	
Power supply	10.8 to 31.2 VDC		
Power consumption (at 24 VDC)	4.5 W or less	4.5 W or less	6.0 W or less
Environmental:			
Operating temperature	-15°C to +55°C (Display unit), -25°C to +55°C (Antenna unit)		
Water protection	IPX4 (Display unit), IPX6 (Antenna unit)		
* When GPS source is selected as EXT			

Display unit:
KGP-920 / 913MkII / 913MkIID

Unit: mm (inch)



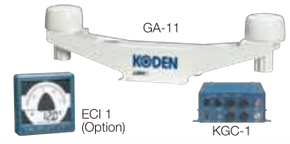


KGP-920: 0.86 kg (1.9 lb)
KGP-913MkII: 0.86 kg (1.9 lb)
KGP-913MkIID: 0.96 kg (2.1 lb)

GPS Compass KGC-1

Features

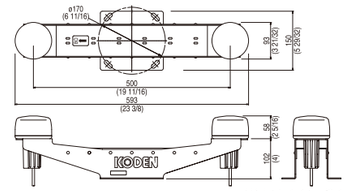
- Heading and positioning data output to Radar, Sonar, Plotter and AIS.
- High speed heading data output (38.4 kbps) fits to Koden MDC-900 / 2200 / 2500 / 2900 Radar series.
- SBAS (WAAS / EGNOS) enabled.
- Indicator ECI1 as an option for heading presentation in analog and digital formats.



Model	KGC-1
Specifications & Functions:	
Receiving channels	Parallel 9 channel
Time to heading fix	2 min (at standard hot-start time)
Heading accuracy	1° (RMS PDOP≦3)
Heading resolution	0.1°
Positioning accuracy Position	GPS: 15 m (2DRMS, SA=OFF, PDOP≦3)
Positioning accuracy Velocity	1 m / sec (RMS, SA=OFF, PDOP≦3)
Output data level	RS-422
Output data formats and sentences	IEC61162-1/ NMEA 0183 (HDT, ROT, GGA VTG, GLL ZDA, GSA, GSV, RMC, PKODA PKODG1, PKODG7)
NMEA output data ports	Heading data output: 2 (50 ms to 1 s) Navigation data output: 2 (1 s)
Power supply	10.8 to 31.2 VDC
Power consumption (at 24 VDC)	8 W or less
Environmental:	
Operating temperature GPS Antenna	-25°C to +55°C
Operating temperature Processor Unit	-15°C to +55°C
Water protection GPS Antenna	IPX6
Water protection Processor Unit	IPX0

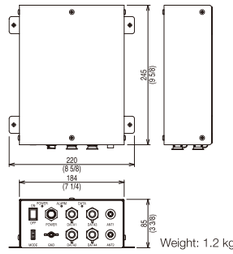
GPS antenna GA-11

Unit: mm (inch)



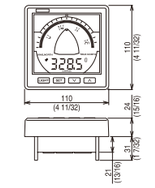
Weight: 1.4 kg (3.1 lb)

Processor unit KGC-1



Weight: 1.2 kg (2.6 lb)

Indicator ECI 1 (Option)



Weight: 0.27 kg (0.6 lb)

DGPS Sensor / GPS Sensor KBG-3 / GPS-20A

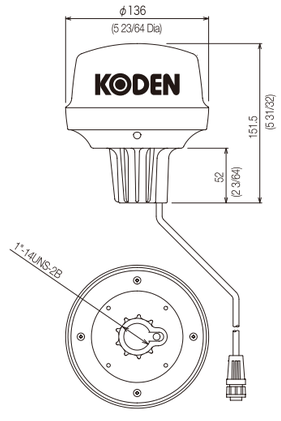
Features

- Parallel 18-channel.
- SBAS (WAAS / EGNOS) enabled.
- Beacon receiver built-in for a highly-accurate differential system where beacon stations are located (KBG-3).

Model	KBG-3	GPS-20A
Specifications & Functions:		
Receiving channels	Parallel 18-channel	
Receiving frequency	Receiving frequency 1575.42 MHz ± 1 MHz	
Position accuracy GPS	10 m (2 drms, SA=OFF, PDOP≦3)	
Position accuracy DGPS(Beacon)	5 m (2 drms, SA=OFF, PDOP≦3)	-
Position accuracy SBAS	8 m (2 drms, SA=OFF, PDOP≦3)	
Position accuracy Velocity	0.1 kt (rms, SA=OFF, PDOP≦3)	
Time to position fix Cold start	50 seconds (typical)	
Time to position fix Warm start	45 seconds (typical)	
Time to position fix Hot start	25 seconds (typical)	
Differential GPS Receiver input	SBAS (WAAS, EGNOS, MSAS)	
Differential GPS External input	-	RTCM SC-104
Data communication	Asynchronous data communication with RS-422	
Output data formats and sentence	NMEA 0183 (GGA, GLL, VTG RMC, ZDA, GSA, GSV, MSS)	NMEA 0183 (GGA, GLL, VTG RMC, ZDA, GSA, GSV)
Input data	Parameter setting, Beacon setting	Parameter setting
Output data level	RS-422	
Output current	20 mA or less	40 mA or less
Power supply	10.8 to 31.2 VDC	
Power consumption	2.5 W or less	1.3 W or less
Environmental:		
Operating temperature	-25°C to +55°C	
Water protection	IPX6	

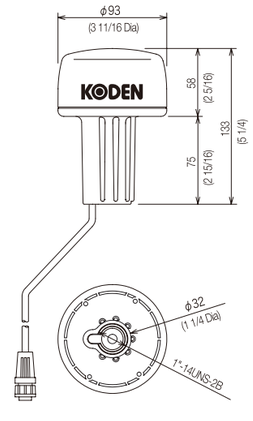
Unit: mm (inch)

KBG-3



Weight:0.76 kg (1.68 lb)
(without cable)

GPS-20A



Weight:0.25 kg (0.55 lb)
(without cable)

AIS Transceiver / Navigational Echo Sounder

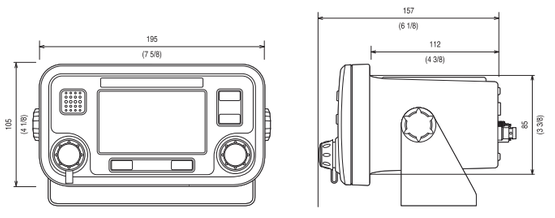
Class A AIS Transceiver KAT-100

The marine Automatic Identification System (AIS) is a location and vessel information reporting system.
It allows vessels equipped with AIS to automatically and dynamically share and regularly update their position, speed, course and other information.
KAT-100 is a combined Class A / Inland AIS transceiver, designed to be fittedto commercial vessels.

Features

- Meets IMO Standard MSC.74 (69) Annex 4, EU Marine Equipment Directive (MED).
- Meets FCC, USCG, IC, TC, CCNR (Inland AIS).
- High accuracy and reliability.
- Simple and easy installation.

KAT-100 Unit: mm (inch)



Weight : 1.65kg (3.63 lb)

		
Model		KAT-100
Specifications & Functions:		
Output power		1 W or 12.5 W (automatic selection)
Display size and type		4 inch, monochrome LCD
Display resolution		248 x 128 pixels
TX / RX frequency		156.025 MHz to 162.025 MHz
Impedance		50Ω
DSC receiver		156.525MHz(CH70), 1200bps
Chanel bandwidth		25 kHz
Presentation modes		Target list, Own vessel & Voyage data, Own dynamic data, Received messages, Alarms, Target plot
Alarms		Transmitter malfunction, Antenna VSWR limit, Receiver malfunction, External EFPS lost, No sensor position in use, No valid COG, No valid SOG, Heading lost or invalid, No valid ROT
PC		RS-232C
Receiver channels*		16 channels
Frequency*		1575.42MHz, L1 band
Sensitivity*		Acquisition -138dBm, Tracking -146dBm
Position fixing system*		GPS
Time to position fix (Cold start)*		Typically 36 seconds
Accuracy*		GPS 2.5m CEP / 5.0m SEP DGPS 20.m CEP / 3.0m SEP
Differential GPS		RTCM SC-104, AIS message #17
Input data formats and sentences		IEC6162-1/2 (DTM, GBS, GGA, GLL, GNS, HDT, RMC, ROT, VBW, VTG, ABM, ACA, ACK, AIR, BBM, DTM, GBS, GGA, GLL, GNS, HDT, LRF, LRI, RMC, ROT, SSD, VBW, VSD, VTG)
Output data formats and sentence		IEC6162-1/2 (ABK, ACA, ALR, LR1, LR2, LR3, LRF, LRI, TXT, VDM, VDO)
NMEA ports		Sensor data input ports (input) IEC61162-1/2 3ports 4800 or 38400 baud Bidirectional data ports (input / output) IEC61162-1/2 3ports 4800 or 38400 baud
Power supply		10.8V to 31.2V
Power Consumption		12W typical, 4.0A peak at 12VDC
Environmental:		
Operating temperature	Display unit	-15°C to +55°C
	GPS Antenna	-30°C to +80°C
Water protection	Display unit	IP52
	GPS Antenna	IEC60945 Exposed category
* Internal GPS		

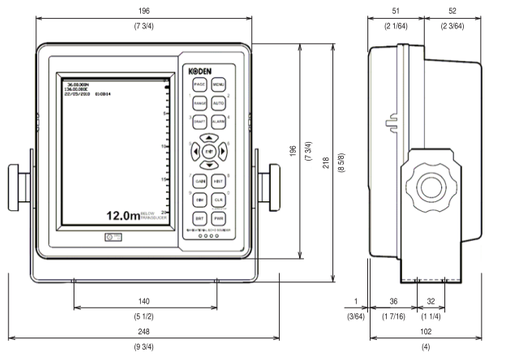
Navigational Echo Sounder CVR-010

CVR-010 is a single-channel navigational echo sounder.
Featuring a 5.7-inch daylight-viewing, LED backlight color TFT LCD screen, the equipment displays the echogram.

Features

- Meets IMO standard MSC.74 (69) Annex 4 and EU Marine Equipment Directive (MED).
- High accuracy and reliability.
- Sounding data storage for the last 12 hours.
- Password protection for keeping the menu settings.

CVR-010 Unit: mm (inch)



Weight : 2.2kg (4.8 lb)

			
Model		CVR-010	
Specifications & Functions:			
Output power (RMS)		600 W	
Transducer		TGM 60-50-20L (TD-26/20L)	TGM 80-200-20L (TD-65/20L)
Output frequency		50 kHz	200 kHz
Display size and type		5.7 inch color TFT LCD, LED-backlight	
Display resolution		240 x 320 pixels (QVGA)	
Basic ranges		5 to 800 (m), 2.5 to 400 (fm), 20 to 4000 (ft)	
Range units		m, ft, fm	
Accuracy of measurement		Better than ±2.5% of digital depth readout	
Minimum detectable depth		1 m	0.5 m
Range discrimination		20 m range: 5 mm / m, 200 m range: 0.5 mm / m	
Transmit pulse repetition interval		20m ≦: 36 times or more / minute, 20m >: 12 times or more / minute	
Soundings history		Max. 12 hours	
Data storage interval		At 2 second interval	
Presentation colors		8 colors	
Alarms		Depth, Bottom-Missing, Power failure, Power removal / Shutoff	
Image speed		1 step	
Functions		Noise reduction, LOG DATA, White line, VRM, Transducer location, Depth reference, Draft, Date/Time, LAT/LON *	
Auto functions		Range, TVG, GAIN	
Input data format and sentences		NMEA0183 (GGA, VTG, ZDA, RMC, ACK)	
Output data format and sentences		NMEA0183 (DPT, PSKPDPT, DBT, DBK, ALR)	
NMEA ports		3 (input / output 3)	
Power supply		24 VDC (11 to 40 VDC)	
Power consumption		15 W or less (24 VDC)	
Environmental:			
Operating temperature		-15°C to +55°C	
Water protection		-	
* Requires data from GPS sensor			

Direction Finder

Direction Finder KS-5551

KS-5551 is a multi frequency omni-directional automatic direct-view Direction Finder.

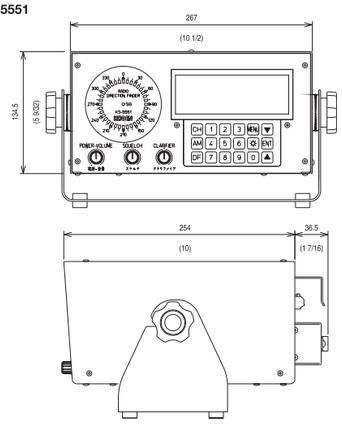
Features

- Wide coverage from MF/HF ranges to 27, 40, 50 MHz.
- Introducing Propelled Goniometric method for higher accuracy.
- Light weight antenna for easy installation.

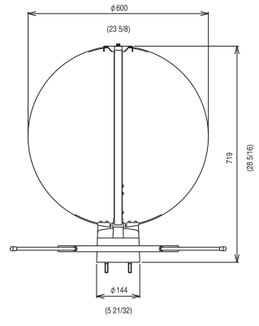
		
Model		KS-5551
Specifications & Functions:		
Receiving system		Double superheterodyne
Bearing indication	10°step	LED Ring with 36 pieces
	1°step	LCD 3-digit
Antenna switching method		Electronic goniometric-switching
Antenna type		Loop antenna 600 mm (diameter)
Receiving frequency ranges	Band 1	1.0000 MHz to 1.9999 MHz
	Band 2	2.0000 MHz to 2.8000 MHz
	Band 3	26.0000 MHz to 26.9999 MHz
	Band 4	27.0000 MHz to 27.9999 MHz
	Band 5	35.5000 MHz to 39.9999 MHz
	Band 6	40.0000 MHz to 44.0000 MHz
	Band 7	50.0000 MHz to 51.9999 MHz
	Band 8	52.0000 MHz to 54.0000 MHz
Measuring receiving frequency ranges		Same as receiving frequency ranges
Modes		A1A, A2A, A3E, J3E, H3E, F3E
Direction finding tolerance		±3° or less at receiving freq.. 2.0MHz
Direction finding speed		0.5sec or less
Audio output		8Ω, 2W (distortion rate: 10% or less)
Spot reception		100 channels
Power supply		21.6 to 31.2VDC
Power consumption (at 24VDC)		2A or less
Environmental:		
Operating temperature		Antenna: -25°C to +55°C, Receiver-Indicator: -10°C to +55°C
Water protection		Antenna : IPX 4, Receiver irdicator : IPX 0

Display unit: Unit: mm (inch)

KS-5551



Weight : 4.0kg (9.0 lb)



Weight : 6.0kg (13.5 lb)