E120 12.1” MULTI-FUNCTION NETWORK DISPLAY

- General: 440x368 pixels, 1224x978 pixels, 1024x768 pixels
- Display options: not applicable
- Bezel options: not applicable
- Mounting methods: not applicable
- Power: 12V and 24V systems
- USB KEYPAD

M1500 MARINE MONITOR

- General: 15” TFT LCD, 1280x1024 60Hz SXGA
- Display options: not applicable
- Bezel options: grey or black
- Mounting methods: bracket or panel
- Power: 10.7 – 32 volts

USB KEYPAD

- General: 3.5” LCD, 480x272 pixels, 16:9 aspect ratio
- Display options: standard
- Power: 5V USB
- USB KEYPAD

E120 12.1” MARINE DISPLAY

- General: 440x368 pixels, 1224x978 pixels, 1024x768 pixels
- Display options: not applicable
- Bezel options: grey or black
- Mounting methods: bracket or panel
- Power: 10.7 – 32 volts

USB KEYPAD
ALPHANUMERIC KEYPAD

**GENERAL**

- **Function**:
  - IEEE 802.3af PoE
  - Wired Ethernet 10/100 Mbit (RJ45)
  - Ethernet Passive 802.3af Power Delivery
  - 802.1X (MAC authentication)
  - PoE+ 15.4 Watt

- **Physical**:
  - Mounting: Wall/flush/bracket
  - Dimensions: 89x41x124
  - Weight: 79mm

**Specifications**

- **Product weight kg (lbs)**
  - 79mm

**Approvals**

- **CE Mark**
- **Storage Temperature**
- **Operating Temperature**
- **Operating Voltage**
- **Video Connection**
- **Min Illumination**
- **LED Spectrum**
- **Video Output**
- **Imager**

**CAM100 DAY & NIGHT VISION MARINE VIDEO CAMERA**

**Features**

- **C Series Alphanumeric Keypad**
  - **Product weight kg (lbs)**
  - 79mm

**Specifications**

- **Product weight kg (lbs)**
  - 79mm

**C Series Part Numbers**

- **E06017**
- **E03006**
- **CAM100 PART NUMBERS**
  - 5m camera extension cable
  - CAM100 (PAL) camera

**Common C120/C80/C120 Features**

- **Distance scales/options**: 1/32 to 4000nm
- **Multiple chart windows on screen at independent ranges**
- **Chart presentation**: full, full in quarter, bar/page option
- **Auto range**
- **Off centre function** (in relative motion)
- **Chart offset**
- **GOTO/follow functions**: waypoint/cursor/route
- **Sunrise/sunset predictions via cartography**
- **Tidal information supported via cartography**
- **Track storage database**
- **Tracks 10**
- **Smart Route (track to route)**
- **Waypoints per route up to 50**

**Smart Route Features**

- **Data loss/temp**

**GPS Features**

- **Cartography/archiving**: Navionics Gold charts
- **Radar input**
- **Beacon differential control**
- **Gain/tune**
- **Electronic bearing line (EBL)**
- **Variable range marker (VRM)**
- **Multiple radar windows on screen**

**Radar Features (requires radar interface)**

- **Selectible target vectors**
- **Target tracking 10 targets**
- **Cartography set up control layers/objects on/off**
- **Chart object information**
- **Auto range**
- **Off centre function**
- **Guard zone 2**

**Chartplotter Features**

- **Range scales/options**: 1/32 to 4000nm
- **Multiple chart windows on screen at independent ranges**
- **Chart presentation**: full, full in quarter, bar/page option
- **Auto range**
- **Off centre function** (in relative motion)
- **Chart offset**
- **GOTO/follow functions**: waypoint/cursor/route
- **Sunrise/sunset predictions via cartography**
- **Tidal information supported via cartography**
- **Track storage database**
- **Tracks 10**
- **Smart Route (track to route)**
- **Waypoints per route up to 50**

**Smart Route Features**

- **Data loss/temp**

**GPS Features**

- **Cartography/archiving**: Navionics Gold charts
- **Radar input**
- **Beacon differential control**
- **Gain/tune**
- **Electronic bearing line (EBL)**
- **Variable range marker (VRM)**
- **Multiple radar windows on screen**

**Radar Features (requires radar interface)**

- **Selectible target vectors**
- **Target tracking 10 targets**
- **Cartography set up control layers/objects on/off**
- **Chart object information**
- **Auto range**
- **Off centre function** (in relative motion)
- **Chart offset**
- **GOTO/follow functions**: waypoint/cursor/route
- **Sunrise/sunset predictions via cartography**
- **Tidal information supported via cartography**
- **Track storage database**
- **Tracks 10**
- **Smart Route (track to route)**
- **Waypoints per route up to 50**

**Smart Route Features**

- **Data loss/temp**
**A65 DUAL FUNCTION CHARTPLOTTER/FISHFINDER**

**GENERAL**

- **Power source:** 12V (11-16V)
- **GPS:** 10Hz, 12/3/0.7/0.5MHz
- **Depth:** 1800 fathoms
- **Temp:** -20°C to +70°C
- **Humidity:** up to 95%

**Display**

- **Size:** 6.5”
- **Resolution:** 640 x 480 pixels (VGA)

**Charting**

- **Cartography:** Head up, Course up or North up (selectable true or magnetic), relative or true motion
- **Screen functions:** full and half screens available dependent on function
- **Function options:** chart, fishfinder and data

**Interfaces**

- **Power:** 12V, 24V, 32V systems
- **NMEA:** 0183, receive and transmit
- **Aux:** NMEA 0183, receive and transmit

**Specifications**

- **Resolution:** 12/3/0.7/0.5MHz
- **Bandwidth:** 60MHz
- **Receive:** 24rpm
- **Transmit:**<2.5kHz
- **IF:** <-25dB
- **Beam width:** vertical 25°
- **Beam width:** horizontal 1.15°
- **Warm up time:** <2.5 seconds
- **Pulse length/PRF:** 70 seconds
- **Peak power output:** 8 (auto/target expand)
- **Side lobes:** horizontal <2.2dB
- **Gain:**<2.5 kHz
- **Gain:** 700W
- **Gain:**<2.5 kHz
- **Gain:**<2.5 kHz
- **Gain:**<2.5 kHz
- **Gain:**<2.5 kHz

**Cable length:**

- **4’:** 1306mm
- **6’:** 1918mm

**Beam:**

- **Beam:** 427mm
- **Beam:** 427mm
- **Beam:** 427mm

**Power save option:**

- **Power:**<2.5 kHz
- **Power:**<2.5 kHz
- **Power:**<2.5 kHz
- **Power:**<2.5 kHz

**Power consumption:**

- **Power:**<2.5 kHz
- **Power:**<2.5 kHz
- **Power:**<2.5 kHz
- **Power:**<2.5 kHz

**Nominal voltage:**

- **Voltage:** 10.7 - 44 volts
- **Voltage:** 12V, 24V, 32V systems
- **Voltage:** 12V, 24V, 32V systems
- **Voltage:** 12V, 24V, 32V systems

**Mounting methods:**

- **Mounting:** pedestal, 6’ array and 15m cable (24v DC only)
- **Mounting:** pedestal, 4’ array and 15m cable (24v DC only)
- **Mounting:** 4kW 6’ open array

**OPEN ARRAY RADAR SCANNERS**

**GENERAL**

- **Power:** 12V, 24V, 32V systems
- **NMEA:** 0183, receive and transmit
- **Aux:** NMEA 0183, receive and transmit

**Specifications**

- **Resolution:** 12/3/0.7/0.5MHz
- **Bandwidth:** 60MHz
- **Receive:** 24rpm
- **Transmit:**<2.5kHz
- **IF:** <-25dB
- **Beam width:** vertical 25°
- **Beam width:** horizontal 1.15°
- **Warm up time:** <2.5 seconds
- **Pulse length/PRF:** 70 seconds
- **Peak power output:** 8 (auto/target expand)
- **Side lobes:** horizontal <2.2dB
- **Gain:**<2.5 kHz
- **Gain:** 700W
- **Gain:**<2.5 kHz
- **Gain:**<2.5 kHz
- **Gain:**<2.5 kHz
- **Gain:**<2.5 kHz

**Cable length:**

- **4’:** 1306mm
- **6’:** 1918mm

**Beam:**

- **Beam:** 427mm
- **Beam:** 427mm
- **Beam:** 427mm

**Power save option:**

- **Power:**<2.5 kHz
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**Power consumption:**

- **Power:**<2.5 kHz
- **Power:**<2.5 kHz
- **Power:**<2.5 kHz
- **Power:**<2.5 kHz

**Nominal voltage:**

- **Voltage:** 10.7 - 44 volts
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- **Mounting:** pedestal, 6’ array and 15m cable (24v DC only)
- **Mounting:** pedestal, 4’ array and 15m cable (24v DC only)
- **Mounting:** 4kW 6’ open array

**OPEN ARRAY PART NUMBERS**

- **PART NUMBER:** 12/3/0.7/0.5MHz
- **PART NUMBER:**<2.5kHz
- **PART NUMBER:**<2.5 kHz
- **PART NUMBER:**<2.5 kHz

**OPEN ARRAY CABLE PART NUMBERS**

- **PART NUMBER:**<2.5 kHz
- **PART NUMBER:**<2.5 kHz
- **PART NUMBER:**<2.5 kHz
- **PART NUMBER:**<2.5 kHz

**OPEN ARRAY CABLE PART NUMBERS**

- **PART NUMBER:**<2.5 kHz
- **PART NUMBER:**<2.5 kHz
- **PART NUMBER:**<2.5 kHz
- **PART NUMBER:**<2.5 kHz
**RAYSTAR 125 SDGPS ANTENNA**

**GENERAL**
- **Power**
  - Antenna: 12V, 24V systems
  - Power consumption: 28W
  - Nominal voltage: 10.7–16 V DC
- **Performance**
  - Channel: 12ch. parallel (C/A code)
  - WAAS/EGNOS/MSAS
  - Satellite: active antenna

**ENVIRONMENTAL**
- **Storage temperature range**
  - -20°C to 70°C
- **Operating temperature range**
  - -10°C to 70°C

**GPS FEATURES**
- **Signal acquisition**
  - 12ch. parallel (C/A code)
- **Signal accuracy**
  - WAAS/EGNOS/MSAS
- **Connections**
  - SeaTalk version
  - NMEA version
  - NMEA version

**SPECIFICATIONS**

**GENERAL**
- **Power**
  - Antenna: 12V, 24V systems
  - Power consumption: 28W
  - Nominal voltage: 10.7–16 V DC

**PERFORMANCE**
- **Accuracy**
  - Position accuracy (RMS): <2.5m
  - Time to first fix (after initial cold start): <2.5min (<45sec)

**ENVIRONMENTAL**
- **Storage temperature range**
  - -20°C to 70°C
- **Operating temperature range**
  - -10°C to 70°C

**GPS SENSOR**
- **Model**
  - SeaTalk
  - NMEA version

**45 STV SATELLITE TV ANTENNA SYSTEM**

**GENERAL**
- **Size**
  - R: 18” Radome x 500mm
  - T: 24” Radome x 500mm

**SPECIFICATIONS**

**GENERAL**
- **Size**
  - R: 18” Radome x 500mm
  - T: 24” Radome x 500mm

**PERFORMANCE**
- **Accuracy**
  - Position accuracy (RMS): <2.5m
  - Time to first fix (after initial cold start): <2.5min (<45sec)

**ENVIRONMENTAL**
- **Storage temperature range**
  - -20°C to 70°C
- **Operating temperature range**
  - -10°C to 70°C

**GPS SENSOR**
- **Model**
  - SeaTalk
  - NMEA version
DSM300 HD DIGITAL FISHFINDER MODULE

GENERAL
- Power: 100W – 300W RMS
- Frequency: 200kHz/50kHz
- Display: 320 x 240 (1/4 VGA)
- Curves: auto/manual x2, x3, x4
- Zoom size: ±20%
- Fish symbol feature: ✓
- Volts data: ✓
- Speed data: ✓
- Nominal output power: 1000W ±20%
- Trip & log data: ✓
- Bottom coverage indicator: ✓
- Digital/analogue: ✓
- Water: ✓
- Non-operating temperature range: -10ºC to +50ºC
- Approvals: NMEA input (0183), IPX6

A SERIES STANDALONE FISHFINDERS WITH HD DIGITAL

GENERAL
- Power: 150W – 600W RMS
- Frequency: 200kHz/50kHz
- Display: 320 x 240 (1/4 VGA)
- Curves: auto/manual x2, x3, x4
- Zoom size: ±20%
- Fish symbol feature: ✓
- Volts data: ✓
- Speed data: ✓
- Nominal output power: 1000W ±20%
- Trip & log data: ✓
- Bottom coverage indicator: ✓
- Digital/analogue: ✓
- Water: ✓
- Non-operating temperature range: -10ºC to +50ºC
- Approvals: NMEA input (0183), IPX6

FISHFINDERS WITH HD DIGITAL MODULE PART NUMBER
- DSM300: DSM300 HD Digital Fishfinder Module

TRANSDUCER ACCESSORIES
- Transducer adaptor cable / A-Series to DSM300/hsb 2
- Flush-mount kit/DSM300

DSM300 HD DIGITAL FISHFINDER MODULE

- Power: 300W – 500W RMS
- Frequency: 200kHz/50kHz
- Display: 320 x 240 (1/4 VGA)
- Curves: auto/manual x2, x3, x4
- Zoom size: ±20%
- Fish symbol feature: ✓
- Volts data: ✓
- Speed data: ✓
- Nominal output power: 1000W ±20%
- Trip & log data: ✓
- Bottom coverage indicator: ✓
- Digital/analogue: ✓
- Water: ✓
- Non-operating temperature range: -10ºC to +50ºC
- Approvals: NMEA input (0183), IPX6

A SERIES FISHFINDERS

- Power: 150W – 600W RMS
- Frequency: 200kHz/50kHz
- Display: 320 x 240 (1/4 VGA)
- Curves: auto/manual x2, x3, x4
- Zoom size: ±20%
- Fish symbol feature: ✓
- Volts data: ✓
- Speed data: ✓
- Nominal output power: 1000W ±20%
- Trip & log data: ✓
- Bottom coverage indicator: ✓
- Digital/analogue: ✓
- Water: ✓
- Non-operating temperature range: -10ºC to +50ºC
- Approvals: NMEA input (0183), IPX6

Note: Display dependence on installed module and selected configuration.

DSM300 HD DIGITAL FISHFINDER MODULE

- Power: 300W – 500W RMS
- Frequency: 200kHz/50kHz
- Display: 320 x 240 (1/4 VGA)
- Curves: auto/manual x2, x3, x4
- Zoom size: ±20%
- Fish symbol feature: ✓
- Volts data: ✓
- Speed data: ✓
- Nominal output power: 1000W ±20%
- Trip & log data: ✓
- Bottom coverage indicator: ✓
- Digital/analogue: ✓
- Water: ✓
- Non-operating temperature range: -10ºC to +50ºC
- Approvals: NMEA input (0183), IPX6

A SERIES FISHFINDERS

- Power: 150W – 600W RMS
- Frequency: 200kHz/50kHz
- Display: 320 x 240 (1/4 VGA)
- Curves: auto/manual x2, x3, x4
- Zoom size: ±20%
- Fish symbol feature: ✓
- Volts data: ✓
- Speed data: ✓
- Nominal output power: 1000W ±20%
- Trip & log data: ✓
- Bottom coverage indicator: ✓
- Digital/analogue: ✓
- Water: ✓
- Non-operating temperature range: -10ºC to +50ºC
- Approvals: NMEA input (0183), IPX6

Note: Display dependence on installed module and selected configuration.

DSM25 HD DIGITAL SOUNDER MODULE

GENERAL
- Power: 0.386 (0.85) W
- Frequency: 200kHz/50kHz
- Display: 5” TFT colour LCD
- Curves: auto/manual x2, x3, x4
- Zoom size: ±20%
- Fish symbol feature: ✓
- Volts data: ✓
- Speed data: ✓
- Nominal output power: 500W ±20%
- Trip & log data: ✓
- Bottom coverage indicator: ✓
- Digital/analogue: ✓
- Water: ✓
- Non-operating temperature range: -20ºC to +70ºC

A SERIES FISHFINDERS

- Power: 150W – 600W RMS
- Frequency: 200kHz/50kHz
- Display: 320 x 240 (1/4 VGA)
- Curves: auto/manual x2, x3, x4
- Zoom size: ±20%
- Fish symbol feature: ✓
- Volts data: ✓
- Speed data: ✓
- Nominal output power: 1000W ±20%
- Trip & log data: ✓
- Bottom coverage indicator: ✓
- Digital/analogue: ✓
- Water: ✓
- Non-operating temperature range: -20ºC to +70ºC

Note: Display dependence on installed module and selected configuration.

DSM25 HD DIGITAL SOUNDER MODULE

- Power: 0.386 (0.85) W
- Frequency: 200kHz/50kHz
- Display: 5” TFT colour LCD
- Curves: auto/manual x2, x3, x4
- Zoom size: ±20%
- Fish symbol feature: ✓
- Volts data: ✓
- Speed data: ✓
- Nominal output power: 500W ±20%
- Trip & log data: ✓
- Bottom coverage indicator: ✓
- Digital/analogue: ✓
- Water: ✓
- Non-operating temperature range: -20ºC to +70ºC

A SERIES FISHFINDERS

- Power: 150W – 600W RMS
- Frequency: 200kHz/50kHz
- Display: 320 x 240 (1/4 VGA)
- Curves: auto/manual x2, x3, x4
- Zoom size: ±20%
- Fish symbol feature: ✓
- Volts data: ✓
- Speed data: ✓
- Nominal output power: 1000W ±20%
- Trip & log data: ✓
- Bottom coverage indicator: ✓
- Digital/analogue: ✓
- Water: ✓
- Non-operating temperature range: -20ºC to +70ºC

Note: Display dependence on installed module and selected configuration.
**GPS STANDALONE CHARTPLOTTERS**

### GENERAL

<table>
<thead>
<tr>
<th>Model</th>
<th>RC400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame</td>
<td>LCD display, 2.8&quot; (71.1mm)</td>
</tr>
<tr>
<td>Voltage Range</td>
<td>10 V to 16 V</td>
</tr>
<tr>
<td>Current Consumption</td>
<td>Typical: 0.5 A, Max: 1.0 A</td>
</tr>
</tbody>
</table>

### Physical

<table>
<thead>
<tr>
<th>Model</th>
<th>RC400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>630 g (22 oz)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>W: 11.9 cm (4.7 in) H: 7.1 cm (2.8 in) D: 3.0 cm (1.2 in)</td>
</tr>
<tr>
<td>Display Size</td>
<td>2.8&quot; (71.1mm)</td>
</tr>
</tbody>
</table>
| Screen Resolution | 262,144 pixels (RGB)

### Key Features

- **Data Pages**: Bearing and distance indicator, Position correction, Geodetic datum, Time to first fix from cold start, Filters
- **Position Accuracy**: 10 cm (3.9 in) with SDGPS (RMS), 12 cm (4.7 in) with SDGPS (RMS)
- **Differential Acquisition**: WAAS/EGNOS/MSAS
- **Signal Acquisition**: 12 ch. parallel (C/A code)
- **Navigation Predictions**: Sunrise/sunset, GOTO/follow functions
- **Alarms**: Navigation predictions
- **Timers**: 1000
- **Waypoints**: 8 character
- **Waypoint Name**: 8 character
- **Points per Track**: 1000
- **Tracks**: Unlimited
- **Routes**: 500
- **Waypoints per Route**: Unlimited
- **Route Name**: Unlimited
- **PC Waypoint Transfer**: Via NMEA WPL sentence
- **Manual Waypoint Entry**: Via NMEA WPL sentence

### Specifications

- **Operating System**: Windows or Windows CE
- **Interfaces**: Compass input, Video, Processor
- **RAM Memory**: 256MB or higher
- **Recommended System Requirements**: E85001 PC/SeaTalk interface
- **Inputs**: GPS NMEA or SeaTalk
- **External Display**: Echosounder display
- **Data Boxes**: VRM (Variable Range Marker), Bottom lock, A-Scope, Zoom size, Range Control, Gain

### Cartography

- **Cartography supplied**: RNS mode, PC Windows or customisable via hsb2 (hsb2 interface kit required) or SeaTalkhs
- **Cartography available**: C-MAP NT/PC, C-MAP NT+/PC, C-MAP Gold/Platinum
- **C-Map NT/PC charts with hsb2 Raycharts, hsb2 radars, share cartography from C-MAP C-Cards or MapTech, Softchart, NDI, and others
- **SeaTalk**
- **SeaTalk or NMEA compass input recommended for target tracking, MARPA, target expansion, wakes short, medium, long, off, interference rejection, rain clutter, and tune
- **Echosounder**
- **Danger alarms, Target risk assessment, Selectable target vectors, Target tracking, MARPA, Target expansion, Wakes short, medium, long, off, Interference rejection, Rain clutter, Tune, EBL (Electronic bearing line), VRM (Variable range marker)
- **Outputs**: Echo sounder display, Data boxes

### Additional Features & Display Options

- **VRM (Variable Range Marker)**
- **Bottom lock**
- **A-Scope**
- **Zoom size**
- **Range control**
- **Gain**
- **Echo sounder**
  - Danger alarms
  - Target risk assessment
  - Selectable target vectors
  - Target tracking
  - MARPA
  - Target expansion
  - Wakes short, medium, long, off
  - Interference rejection
  - Rain clutter
  - Tune
  - EBL (Electronic bearing line)
  - VRM (Variable range marker)

### Software

<table>
<thead>
<tr>
<th>Model</th>
<th>RNS V6</th>
</tr>
</thead>
</table>
| System Requirements
  - Processor: Pentium 4 (1.4 GHz) or equivalent
  - RAM: 1 GB minimum
  - Hard Drive: 10 GB minimum
| RNS V6
  - Processor: Pentium 4 (1.4 GHz) or equivalent
  - RAM: 1 GB minimum
  - Hard Drive: 10 GB minimum

### Water Resistant Standard

- **IPX7 certified**, 1 meter of depth for 30 minutes

### Operating and Non-Operating Temperature Ranges

- **Operating**: -20ºC to +70ºC
- **Non-Operating**: -20ºC to +80ºC

### Physical

- **Overall Dimensions**: W: 96 mm (3.8 in) H: 176 mm (6.9 in) D: 91 mm (3.6 in)
- **Overall Weight**: 1.2 kg (2.6 lbs)
- **Absolute Voltage Range**: 10 - 18 volts
- **Nominal Voltage**: 12v system
- **Power Consumption**: 10W (fully backlit and GPS)

### Connectors

- **Video**: Optional
- **RS-232**: Optional
- **Audio**: Optional
- **USB**: Optional

### Additional Features

- **User Defined Databoxes**: Unlimited
- **Dedicated Compass Input**: Recommended
- **Beamsteering**: On/off
- **Rain clutter suppression**: On/off
- **Range options**: 256 nm with overzoom
- **Range Scales**: Up to 95%
- **Without Backlight**: 1000, 1000
- **Software**: C-MAP Gold charts compact flash cards

### Interfaces

- **Compass Input**: SeaTalk, NMEA, SeaTalkhs, hsb2
- **Video**: Optional
- **Audio**: Optional
- **USB**: Optional

### Recommended System Requirements

- **Processor**: Pentium 4 (1.4 GHz) or equivalent
- **RAM**: 1 GB minimum
- **Hard Drive**: 10 GB minimum
- **Operating System**: Windows XP, Windows Vista, Windows 7
- **System Requirements**: 128MB minimum

---

**RAYTECH RNS V6 SOFTWARE**

**RAYTECH RNS V6 PART NUMBERS**

- **E85001**: PC/SeaTalk interface box
- **E83040**: RayTech RNS V6 navigation software upgrade from V5.0
- **E83041**: RayTech RNS V6 navigation software
- **E85001**: PC/SeaTalk interface box
- **C-MAP USB chart reader**: Echosounder display
- **C-MAP USB chart reader**: Data boxes
- **USB keyboard**: Additional features & display options
- **USB mouse**: Additional features & display options
- **CD Rom drive**: Additional features & display options
**ST290 INSTRUMENTS**

### GENERAL
- **Power:**
  - 12VDC nominal, 10-16VDC non-operating
  - Max. current: 1A (illumination on)
  - Standby current: 65mA (illumination off)

### DATA DISPLAY
- **Temperature:**
  - 3.2" backlit display
  - 5 backlit buttons
  - Three levels plus off

### GRAPHIC DISPLAY
- **Temperature:**
  - 3.4" segmented LCD
  - 4 backlit buttons
  - Three levels plus off

### SYSTEM OPTIONS
- **Connections:**
  - SeaTalk2 in/out (NMEA2000 via DPU)
  - NMEA input (0183)
  - SeaTalk
  - PC (RS232) and RayTech interface option (via E85001)
  - SeaTalk
  - NMEA output (0183)

### SPECIFICATIONS
- **Non-operating temperature range:**
  - -20°C to +70°C
  - -10°C to +70°C

### COMPASS AND RUDDER DISPLAYS
- **Dimensions:**
  - 124 x 124 x 39 mm

### ANALOGUE CH WIND
- **Dimensions:**
  - 10 - 16 volts
  - 12V systems
  - IPX6 & CFR46

### ANALOGUE Rudder
- **Dimensions:**
  - 3 levels plus off

### ANALOGUE WIND
- **Dimensions:**
  - 3 levels plus off

### CUSTOM KEY FEATURES
- **Winds:**
  - For use with autopilot keypad

### SYSTEM OPTIONS
- **Winds:**
  - For use with autopilot keypad

**ST290 SYSTEM PACK**
- **ST290W:**
  - ST290 graphic display, data processing with DPU, speed/depth pod, system manual. Requires compatible speed/depth transducer.
  - GoTo 8mm, 35mm minimum, ordered separately.

**ST290 DISPLAYS**
- **ST290W:**
  - ST290 graphic display
  - ST290 analogue display

**ST290 WIND AND DEPTH**
- **ST290W:**
  - ST290 analogue wind display
  - ST290 analogue depth display

**ST290 INSTRUMENTS**

**GENERAL**
- **Power:**
  - 12VDC nominal, 10-16VDC non-operating
  - Max. current: 1A (illumination on)
  - Standby current: 65mA (illumination off)

**DATA DISPLAY**
- **Temperature:**
  - 3.2" backlit display
  - 5 backlit buttons
  - Three levels plus off

**GRAPHIC DISPLAY**
- **Temperature:**
  - 3.4" segmented LCD
  - 4 backlit buttons
  - Three levels plus off

**SYSTEM OPTIONS**
- **Connections:**
  - SeaTalk2 in/out (NMEA2000 via DPU)
  - NMEA input (0183)
  - SeaTalk
  - PC (RS232) and RayTech interface option (via E85001)
  - SeaTalk
  - NMEA output (0183)

**SPECIFICATIONS**
- **Non-operating temperature range:**
  - -20°C to +70°C
  - -10°C to +70°C

**COMPASS AND RUDDER DISPLAYS**
- **Dimensions:**
  - 124 x 124 x 39 mm

**ANALOGUE CH WIND**
- **Dimensions:**
  - 10 - 16 volts
  - 12V systems
  - IPX6 & CFR46

**ANALOGUE Rudder**
- **Dimensions:**
  - 3 levels plus off

**ANALOGUE WIND**
- **Dimensions:**
  - 3 levels plus off

**CUSTOM KEY FEATURES**
- **Winds:**
  - For use with autopilot keypad

**SYSTEM OPTIONS**
- **Winds:**
  - For use with autopilot keypad

**ST290 SYSTEM PACK**
- **ST290W:**
  - ST290 graphic display, data processing with DPU, speed/depth pod, system manual. Requires compatible speed/depth transducer.

**ST290 DISPLAYS**
- **ST290W:**
  - ST290 graphic display
  - ST290 analogue display

**ST290 WIND AND DEPTH**
- **ST290W:**
  - ST290 analogue wind display
  - ST290 analogue depth display

For product information.
ST290 INSTRUMENTS

**GENERAL**
- Power consumption: 60mA
- Absolute voltage range: 10 - 16 volts
- Power: 12v systems

**KEYPADS**
- Power consumption: 45mA
- Absolute voltage range: 10 - 16 volts
- Power: 12v systems

**DATA PROCESSING UNIT**
- Power consumption: 65mA
- Absolute voltage range: 10 - 16 volts
- Power: 12v systems

**TRANSDUCER PODS**
- Power consumption: 130mA
- Absolute voltage range: 10 - 32 volts
- Power: 12v, 24v systems

**SMART HEADING SENSOR**
- Power consumption: 120mA
- Absolute voltage range: 10 - 16 volts
- Power: 12v systems

**PHYSICAL**
- Dimensions: 78.5x124x41mm
- Weight: 511g

**SYSTEM OPTIONS**
- Remote keypad/telegram options: standard
- Remote keypad: standard
- Remote keypad: standard
- Remote keypad: standard

**SMART HEADING SENSOR DATA PROCESSING UNIT (DPU)**
- Dimensions: 78.5x124x41mm
- Weight: 511g

**ST290 KEYPADS**
- Dimensions: 51mm x 78.5mm x 124mm
- Weight: 110g

**ST290 TRANSDUCERS**
- Dimensions: 66mm x 117mm x 36mm
- Weight: 150g

**ST290 SMART HEADING SENSOR**
- Dimensions: 66mm x 117mm x 36mm
- Weight: 150g

**ADDITIONAL FEATURES**
- Heading offset and variation
- Depth units
- Speed units
- Depth max
- Speed max
- Wind units
- Wind max
- Wind data
- Depth data
- Display lighting
- Maximum character size
- Display size and type
- Mounting methods
- Overall dimensions (WxHxD) mm (standard bezel)

**SPEED AND DEPTH TRANSDUCERS**
- Dimensions: 124mm x 117mm x 36mm
- Weight: 150g

**SPEED AND DEPTH TRANSDUCERS (ST60+ AND ST290)**
- Dimensions: 124mm x 117mm x 36mm
- Weight: 150g

---

ST60+ INSTRUMENTS

**GENERAL**
- Power consumption: 130mA
- Absolute voltage range: 10 - 32 volts
- Power: 12v, 24v systems

**SPEED**
- Power consumption: 120mA
- Absolute voltage range: 10 - 16 volts
- Power: 12v systems

**DEPTH**
- Power consumption: 120mA
- Absolute voltage range: 10 - 16 volts
- Power: 12v systems

**WIND AND CH WIND**
- Power consumption: 120mA
- Absolute voltage range: 10 - 16 volts
- Power: 12v systems

**COMPASS**
- Power consumption: 120mA
- Absolute voltage range: 10 - 16 volts
- Power: 12v systems

**PHYSICAL**
- Dimensions: 110x115x39mm
- Weight: 110g

**SYSTEM OPTIONS**
- Remote keypad/telegram options: standard
- Remote keypad: standard
- Remote keypad: standard
- Remote keypad: standard

**ST60+ KEYPADS**
- Dimensions: 51mm x 78.5mm x 124mm
- Weight: 110g

**ST60+ TRANSDUCERS**
- Dimensions: 66mm x 117mm x 36mm
- Weight: 150g

**ST60+ SMART HEADING SENSOR**
- Dimensions: 66mm x 117mm x 36mm
- Weight: 150g

**ADDITIONAL FEATURES**
- Heading offset and variation
- Depth units
- Speed units
- Depth max
- Speed max
- Wind units
- Wind max
- Wind data
- Depth data
- Display lighting
- Maximum character size
- Display size and type
- Mounting methods
- Overall dimensions (WxHxD) mm (standard bezel)

**DISPLAY OPTIONS**
- No power indication
- Display lighting: surface and flush
- Speed and distance
- Nautical or metric
- Keel/waterline/transducer
- Keel/waterline/transducer
- Keel/waterline/transducer

---

For product information.
**ST60+ INSTRUMENTS**

**GENERAL**
- Display size and type
- Control type(s)
- Overall dimensions (WxHxD) mm
- Power consumption (typical) mA
- Absolute voltage range (volts DC)
- Display lighting
- Display size and type
- Control type(s)
- Overall dimensions (WxHxD) mm
- Power consumption (typical) mA
- Absolute voltage range (volts DC)
- Display lighting
- Display size and type
- Control type(s)
- Overall dimensions (WxHxD) mm
- Power consumption (typical) mA
- Absolute voltage range (volts DC)
- Display lighting
- Display size and type

**RUDDER ANGLE**
- Multiline data formats
- Graphs
- Rudder angle indication
- Man Over Board (MOB) repeater
- Timers
- Locked compass heading option
- Heading alarms
- Heading offset and variation
- Wind units (wind only)
- Wind alarms
- Wind speed range (knots)
- Depth range (m)
- Depth data
- Trip range (nm)
- Waterproofing standard
- EMC (Europe and FCC)
- Approvals:
  - NMEA input and output (0183)
  - Display lighting
  - Display size and type
  - Control type(s)
  - Overall dimensions (WxHxD) mm
  - Power consumption (typical) mA
  - Absolute voltage range (volts DC)

**TRIDATA**
- Adjustable display response time
- Low power indication
- Waypoint data
- GPS data
- Trends
- Velocity made good (VMG)
- Multi-line data formats
- Graphs
- Rudder angle indication
- Man Over Board (MOB) repeater
- Timers
- Locked compass heading option
- Heading alarms
- Heading offset and variation
- Wind units (wind only)
- Wind alarms
- Wind speed range (knots)
- Depth range (m)
- Depth data
- Trip range (nm)
- Waterproofing standard
- EMC (Europe and FCC)
- Approvals:
  - NMEA input and output (0183)
  - Display lighting
  - Display size and type
  - Control type(s)
  - Overall dimensions (WxHxD) mm
  - Power consumption (typical) mA
  - Absolute voltage range (volts DC)

**GRAPHIC REPEATER**
- System option supplied with transducer
- Adjustable display response time
- Low power indication
- Waypoint data
- GPS data
- Trends
- Velocity made good (VMG)
- Multi-line data formats
- Graphs
- Rudder angle indication
- Man Over Board (MOB) repeater
- Timers
- Locked compass heading option
- Heading alarms
- Heading offset and variation
- Wind units (wind only)
- Wind alarms
- Wind speed range (knots)
- Depth range (m)
- Depth data
- Trip range (nm)
- Waterproofing standard
- EMC (Europe and FCC)
- Approvals:
  - NMEA input and output (0183)
  - Display lighting
  - Display size and type
  - Control type(s)
  - Overall dimensions (WxHxD) mm
  - Power consumption (typical) mA
  - Absolute voltage range (volts DC)

**ST40 INSTRUMENTS**

**GENERAL**
- Display size and type
- Control type(s)
- Overall dimensions (WxHxD) mm
- Power consumption (typical) mA
- Absolute voltage range (volts DC)
- Display lighting
- Display size and type
- Control type(s)
- Overall dimensions (WxHxD) mm
- Power consumption (typical) mA
- Absolute voltage range (volts DC)
- Display lighting
- Display size and type
- Control type(s)
- Overall dimensions (WxHxD) mm
- Power consumption (typical) mA
- Absolute voltage range (volts DC)
- Display lighting
- Display size and type

**SPEED**
- Multiline data formats
- Graphs
- Speed data
- Waterproofing standard
- EMC (Europe and FCC)
- Approvals:
  - NMEA input and output (0183)
  - Display lighting
  - Display size and type
  - Control type(s)
  - Overall dimensions (WxHxD) mm
  - Power consumption (typical) mA
  - Absolute voltage range (volts DC)

**DEPTH**
- Multiline data formats
- Graphs
- Depth data
- Waterproofing standard
- EMC (Europe and FCC)
- Approvals:
  - NMEA input and output (0183)
  - Display lighting
  - Display size and type
  - Control type(s)
  - Overall dimensions (WxHxD) mm
  - Power consumption (typical) mA
  - Absolute voltage range (volts DC)

**WIND**
- Multiline data formats
- Graphs
- Wind data
- Waterproofing standard
- EMC (Europe and FCC)
- Approvals:
  - NMEA input and output (0183)
  - Display lighting
  - Display size and type
  - Control type(s)
  - Overall dimensions (WxHxD) mm
  - Power consumption (typical) mA
  - Absolute voltage range (volts DC)

**COMPASS**
- Multiline data formats
- Graphs
- Trend data
- Waterproofing standard
- EMC (Europe and FCC)
- Approvals:
  - NMEA input and output (0183)
  - Display lighting
  - Display size and type
  - Control type(s)
  - Overall dimensions (WxHxD) mm
  - Power consumption (typical) mA
  - Absolute voltage range (volts DC)

**ST40 INSTRUMENT SYSTEMS**
- E22037 - Wind speed (through hull system supplied with Z236 biducer transducer)
- E22039 - Speed (through hull system supplied with E26009 low profile depth transducer)
- E22041 - Depth (through hull system supplied with E26009 low profile depth transducer)
- E22042 - Depth (through hull system supplied with E26009 low profile depth transducer)
- E22054 - Depth (through hull system supplied with E26009 low profile depth transducer)

**ST40 INSTRUMENT DISPLAYS**
- E22007 - 70mm display
- E22008 - 84mm display
- E22009 - 92mm display
- E22010 - 126mm display
- E22012 - 70mm display
- E22013 - 84mm display
- E22014 - 92mm display
- E22016 - 126mm display
- E22018 - 126mm display
- E22020 - 126mm display

**ST40 PART NUMBERS**
- A22006 - 84mm display
- A22008 - 92mm display
- A22009 - 126mm display
- A22011 - 70mm display
- A22012 - 84mm display
- A22013 - 92mm display
- A22014 - 126mm display
- A22016 - 126mm display
- A22020 - Flush mount display
- A22022 - Surface mount display
- A22024 - Bracket mount display
- A22026 - Bracket mount display
- A22028 - Bracket mount display
- A22030 - Bracket mount display
- A22032 - Bracket mount display
- A22034 - Bracket mount display
- A22036 - Bracket mount display

For product information.
**BIDATA INSTRUMENTS**

**GENERAL**
- Dimensions (W x H x D): 91mm x 115mm x 30mm
- Mounting methods: surface/flush
- Display size: 30mm diagonal
- Display type: 9 backlit buttons & 1 rotary
- Resolution: 0.045 (1.0) arcminute
- Dimensions: 170x115x41mm
- Power: 120mA
- Voltage range: 10 - 16 volts
- Approvals: 11v systems
- Housing: IPX6 & CFR46
- Temperature range (operating): 0ºC to +70ºC
- Temperature range (non-operating): -20ºC to +70ºC
- Certification: CE marked

**OPTIONS**
- Additional features:
  - Sounder activation
  - 3 way data output
  - 5 backlit buttons & 1 rotary
  - 30mm display
  - 3 levels plus off
  - Full backlights
  - 3 levels (9 levels with Gyro)
  - 9999 x 1.00 knots
  - 9999 x 1.00 knots
  - 3 levels plus off

**DISPLAY OPTIONS**
- Plotter interface:
  - Not supported
- Transducer status:
  - Not supported
- Off course/wind/XTE/depth/watch
- Manual:
  - Not supported
- NMEA input:
  - Not supported
- NMEA output:
  - Not supported
- On course
- 1 level (4 levels with Gyro)
- Off course/wind/XTE
- Depth
- Water temperature
- GPS data

**TRANSCLUDER OPTIONS**
- For use on:
  - E26017
  - E26031
  - E26005
  - E26028
  - E26006
  - E25026
  - E26011
  - E26019

**ST40 LOW PROFILE SPEED AND DEPTH TRANSDUCERS**
- (Supplied with 10 metre / 33' cable)
- Display size: 24mm
- Material: aluminium
- Depth range: 0 to 30m
- Transducer size: 51mm
- Display size: 37mm

**ST60S LOAD PROFILE SPEED AND DEPTH TRANSDUCERS**
- (Supplied with 9 metre / 30' cable)
- Display size: 24mm
- Material: aluminium
- Depth range: 0 to 30m
- Transducer size: 51mm
- Display size: 37mm

**ADDITIONAL FEATURES**
- Magnets on display
- NMEA input:
  - Not supported
- NMEA output:
  - Not supported
- On course
- 1 level (4 levels with Gyro)
- Off course/wind/XTE
- Depth
- Water temperature
- GPS data

**ST60S PILOT CONTROL HEAD**
- For use on:
  - E26017
  - E26031
  - E26005
  - E26028
  - E26006
  - E25026
  - E26011
  - E26019

**ST50S BUTTON PILOT CONTROL HEAD**
- For use on:
  - E26017
  - E26031
  - E26005
  - E26028
  - E26006
  - E25026
  - E26011
  - E26019

**ST50S ROTARY PILOT CONTROL HEAD**
- For use on:
  - E26017
  - E26031
  - E26005
  - E26028
  - E26006
  - E25026
  - E26011
  - E26019

**AUTOPilot CONTROL HEADS**

**SPECIFICATIONS**
- 3 levels plus off
- Current consumption (full backlights): 120mA
- Voltage range: 10 - 16 volts
- Power: 12v systems

**ADDITIONAL FEATURES**
- Magnets on display
- NMEA input:
  - Not supported
- NMEA output:
  - Not supported
- On course
- 1 level (4 levels with Gyro)
- Off course/wind/XTE
- Depth
- Water temperature
- GPS data

**ST50S PILOT CONTROL HEAD**
- For use on:
  - E26017
  - E26031
  - E26005
  - E26028
  - E26006
  - E25026
  - E26011
  - E26019

**ST50S BUTTON PILOT CONTROL HEAD**
- For use on:
  - E26017
  - E26031
  - E26005
  - E26028
  - E26006
  - E25026
  - E26011
  - E26019

**ST50S ROTARY PILOT CONTROL HEAD**
- For use on:
  - E26017
  - E26031
  - E26005
  - E26028
  - E26006
  - E25026
  - E26011
  - E26019
### SMARTPILOT COURSE COMPUTERS

<table>
<thead>
<tr>
<th>Feature</th>
<th>SMARTPILOT S1/1G</th>
<th>SMARTPILOT S1/2G</th>
<th>SMARTPILOT S3</th>
<th>SMARTPILOT S3/1G</th>
<th>SMARTPILOT S3/2G</th>
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</thead>
<tbody>
<tr>
<td>Power</td>
<td>12v, 24v</td>
<td>12v, 24v</td>
<td>12v, 24v</td>
<td>12v, 24v</td>
<td>12v, 24v</td>
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<tr>
<td>Physical</td>
<td></td>
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</tr>
<tr>
<td>Centreline (mm)</td>
<td>200 x 120</td>
<td>200 x 120</td>
<td>200 x 120</td>
<td>200 x 120</td>
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<td>Height (mm)</td>
<td>110</td>
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<tr>
<td>Connections</td>
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<td></td>
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<tr>
<td>Remote</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Autopilot with rate gyro</td>
<td>✓</td>
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<tr>
<td>Standard autopilot</td>
<td>✓</td>
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<td>✓</td>
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</tr>
</tbody>
</table>

### PROCESSOR (COURSE COMPUTER) OPTIONS

- Fast heading output for MARPA and overlay
- AutoLearn
- Advanced Steering Technology (AST)

### ADDITIONAL FEATURES

- Direction to steer arrows
- Diagnostic alarms
- Alarms
- Rudder response
- Rudder damping
- Rudder gain
- Compass deviation correction
- Autoadapt (for northerly/southerly environments)
- Autotrim, Seastate
- Selectable tack angle
- Autotack
- Steer to compass

### KEY FEATURES

- Waterproofing standard
- Humidity
- Operating temperature range
- Environmental:
  - CE marked
  - EMC
  - Approvals:
    - SeaTalk
    - NMEA output (0183)
    - NMEA input (0183)

### SPECIFICATIONS

- Connections:
  - Mounting methods
  - Product weight kg (lbs)
  - Overall dimensions (WxHxD) mm

#### DRIVE OPTIONS

- Inboard 1 & 1 x 10k input and output
- Outboard 1 & 1 x 10k input and output
- Inboard 1 & 1 x 10k input and output

### SMARTCONTROLLER

- Dimmer operation
- Key locking
- Keypad control

### WIRELESS AUTOPilot REMOTES

<table>
<thead>
<tr>
<th>Feature</th>
<th>S100 WIRELESS AUTOPilot REMOTE</th>
<th>SMARTCONTROLLER</th>
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</thead>
<tbody>
<tr>
<td>Power</td>
<td>12v, 24v</td>
<td>12v, 24v</td>
</tr>
<tr>
<td>Physical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnetic compass</td>
<td>135 x 135</td>
<td>135 x 135</td>
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<tr>
<td>Operating temperature range</td>
<td>10°C to +50°C</td>
<td>10°C to +50°C</td>
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<tr>
<td>Non-operating temperature range</td>
<td>-20°C to +70°C</td>
<td>-20°C to +70°C</td>
</tr>
<tr>
<td>Waterproofing standard</td>
<td>IPX6</td>
<td>IPX6</td>
</tr>
</tbody>
</table>

### KEY FEATURES

- User calibration
- Water resistance
- Non-operating temperature range
- Environmental:
  - CE marked
  - EMC, FCC and IC
  - Approvals:
    - RF transmitter & receiver
    - NMEA output (0183)
    - NMEA input (0183)

### WIRELESS AUTOPILOT REMOTES

- Goto Marine Autopilot remotes with base station X11500
- Goto Marine Autopilot remotes with base station X11510

* Drive unit selection dictated by boat steering system.
**AUTOPILOT WITH WIRELESS REMOTE**

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GENERAL</strong></td>
<td></td>
</tr>
<tr>
<td>Flusher</td>
<td>S1000 COURSE COMPUTER</td>
</tr>
<tr>
<td><strong>PHYSICAL</strong></td>
<td></td>
</tr>
<tr>
<td>Torque/kg (lbs)</td>
<td>ST2000: 84kg (185lbs)</td>
</tr>
<tr>
<td>Voltage/kg (lbs)</td>
<td>ST1000: 84kg (185lbs)</td>
</tr>
<tr>
<td>Stroke/revs</td>
<td>ST2000: 450mm/90rpm</td>
</tr>
<tr>
<td>Peak Flow Rate</td>
<td>ST1000: 80-200cc/min</td>
</tr>
<tr>
<td>Thrust kg (lbs)/torque Nm (Ib.in.)</td>
<td>ST2000: 25 Nm/90rpm</td>
</tr>
<tr>
<td>Throttle kg (lbs)</td>
<td>ST1000: 25 Nm/90rpm</td>
</tr>
<tr>
<td>Rate of Turn</td>
<td>ST2000: 5°/sec</td>
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<tr>
<td>Rate of Steer</td>
<td>ST1000: 5°/sec</td>
</tr>
<tr>
<td><strong>SYSTEM OPTIONS</strong></td>
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</tr>
<tr>
<td>Mounting Methods</td>
<td>Surface or Wall</td>
</tr>
<tr>
<td><strong>ADDITIONAL FEATURES</strong></td>
<td></td>
</tr>
<tr>
<td>Rudder Response</td>
<td>9 levels via control head</td>
</tr>
<tr>
<td>Rudder Damping</td>
<td>9 levels via control head</td>
</tr>
<tr>
<td>Rudder Gain</td>
<td>9 levels via control head</td>
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<tr>
<td><strong>Drive Options</strong></td>
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</tr>
<tr>
<td>Drive Options</td>
<td>ST2000: 3466mm, ST1000: 2999mm, ST4000: 4500mm, ST4000T: 5109mm</td>
</tr>
<tr>
<td><strong>WIRELESS REMOTE</strong></td>
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<tr>
<td><strong>SYSTEM OPTIONS</strong></td>
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</tr>
<tr>
<td>Head Weight kg (lbs)</td>
<td>ST2000: 94kg (209lbs)</td>
</tr>
<tr>
<td>Overall Dimensions (LxWxD) mm</td>
<td>ST2000: 254mm x 214mm x 197mm</td>
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<td><strong>Environment</strong></td>
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<td>Environmental:</td>
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<td>EMC, FCC and IC</td>
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<tr>
<td>RF Transmitter &amp; Receiver</td>
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<tr>
<td>SeaTalk connections</td>
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<tr>
<td>NMEA Output connections (0183)</td>
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<tr>
<td>NMEA Input connections (0183)</td>
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<td>Mounting Methods</td>
<td>Surface or Wall</td>
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<td><strong>KEY FEATURES</strong></td>
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<tr>
<td>Waterproofing standard</td>
<td>Water resistant</td>
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<tr>
<td>Humidity</td>
<td>up to +80%</td>
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<td>Non-operating temperature range</td>
<td>-10ºC to +70ºC</td>
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<td>Operating temperature range</td>
<td>-10ºC to +50ºC</td>
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<tr>
<td><strong>Electrical</strong></td>
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<tr>
<td>Current Consumption (standby)</td>
<td>60mA (drive: 0.7W)</td>
</tr>
<tr>
<td>Absolute Voltage Range (volts DC)</td>
<td>10 - 16 volts</td>
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<tr>
<td>Nominal Voltage (volts DC)</td>
<td>12v systems</td>
</tr>
<tr>
<td>Power</td>
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<tr>
<td><strong>GENERAL</strong></td>
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<tr>
<td>Flusher</td>
<td>S1000 COURSE COMPUTER</td>
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<tr>
<td><strong>PHYSICAL</strong></td>
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<tr>
<td>Torque/kg (lbs)</td>
<td>ST2000: 84kg (185lbs)</td>
</tr>
<tr>
<td>Voltage/kg (lbs)</td>
<td>ST1000: 84kg (185lbs)</td>
</tr>
<tr>
<td>Stroke/revs</td>
<td>ST2000: 450mm/90rpm</td>
</tr>
<tr>
<td>Peak Flow Rate</td>
<td>ST1000: 80-200cc/min</td>
</tr>
<tr>
<td>Thrust kg (lbs)/torque Nm (Ib.in.)</td>
<td>ST2000: 25 Nm/90rpm</td>
</tr>
<tr>
<td>Throttle kg (lbs)</td>
<td>ST1000: 25 Nm/90rpm</td>
</tr>
<tr>
<td>Rate of Turn</td>
<td>ST2000: 5°/sec</td>
</tr>
<tr>
<td>Rate of Steer</td>
<td>ST1000: 5°/sec</td>
</tr>
<tr>
<td><strong>SYSTEM OPTIONS</strong></td>
<td></td>
</tr>
<tr>
<td>Head Weight kg (lbs)</td>
<td>ST2000: 94kg (209lbs)</td>
</tr>
<tr>
<td>Overall Dimensions (LxWxD) mm</td>
<td>ST2000: 254mm x 214mm x 197mm</td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td></td>
</tr>
<tr>
<td>Environmental:</td>
<td></td>
</tr>
<tr>
<td>CE Marked</td>
<td>✓</td>
</tr>
<tr>
<td>EMC, FCC and IC</td>
<td>✓</td>
</tr>
<tr>
<td>RF Transmitter &amp; Receiver</td>
<td>✓</td>
</tr>
<tr>
<td>SeaTalk connections</td>
<td>✓</td>
</tr>
<tr>
<td>NMEA Output connections (0183)</td>
<td>✓</td>
</tr>
<tr>
<td>NMEA Input connections (0183)</td>
<td>✓</td>
</tr>
<tr>
<td>Mounting Methods</td>
<td>Surface or Wall</td>
</tr>
<tr>
<td><strong>KEY FEATURES</strong></td>
<td></td>
</tr>
<tr>
<td>Waterproofing standard</td>
<td>Water resistant</td>
</tr>
<tr>
<td>Humidity</td>
<td>up to +80%</td>
</tr>
<tr>
<td>Non-operating temperature range</td>
<td>-10ºC to +70ºC</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>-10ºC to +50ºC</td>
</tr>
</tbody>
</table>
**SELECTING THE RIGHT AUTOPILOT DRIVE UNIT**

**Drive Units**

Identify the correct drive unit type* for your boat (refer to the table on pages 53 – 56), then use the following information to identify the correct model.

* We recommend that a Raymarine approved dealer confirms your selection and carries out the installation and commissioning. Approved installations carry a 2 YR WORLDWIDE WARRANTY. For more information contact your national distributor (see outside back cover for details) or consult www.raymarine.com

**TYPE 1 AND 2 ROTARY DRIVE**

Drive Units for standard steered sterndrive systems. High performance units include smart heading reference transducer and fluxgate compass.

**STANDARD AND UNIVERSAL STERNDRIVE**

Drive Units for standard steered sterndrive systems. High performance units include smart heading reference transducer and fluxgate compass.

**TYPE 1 AND 2 LINEAR DRIVE**

Drive Units for linear sterndrive systems.

---

**TILLELPLOTS**

- **AT12007** 12V Hydraulic, Type 1
- **AT12008** 24V Hydraulic, Type 1
- **AT12009** 24V Hydraulic, Type 2
- **AT12010** 12V Hydraulic, Type 2

---

**WHEELPILOTS**

- **AT12011** 12V Hydraulic, Type 1
- **AT12012** 12V Hydraulic, Type 2

---

**CORE PACKS**

- **S1G** 12V high performance corepack with built-in gyro
- **S1** 12V corepack
- **S2G** 12V high performance corepack with built-in gyro
- **S3G** 12V/24V high performance corepack with built-in gyro
- **S3** 12V/24V corepack

---

**COMPASS TRANSUCERS**

- **S1G** 12V fluxgate compass
- **S1** fluxgate compass

---

**RUDDER REFERENCE TRANSDUCER**

- **S1G** 12V rudder reference transducer
- **S1** rudder reference transducer

---

**FLUSHGATE COMPASS TRANSUCER**

- **S1G** 12V flushgate compass

---

**JOYSTICK CONTROL**

- **ST8002** 12V joystick control head, flush mount
- **ST7002** 12V joystick control head, surface mount
- **SeaTalk joystick control head, flush mount
- **SeaTalk joystick control head, surface mount
- **SeaTalk joystick interface box only

---

**SUNCOVERS**

- **ST8002** 12V suncover, surface mount
- **ST6002** 12V suncover, flush mount

---

**SELECTING THE RIGHT AUTOPILOT DRIVE UNIT**

**BOAT LADEN DISPLACEMENT (MAXIMUM):**

- Type 1: 12000kg (26,450lb)
- Type 2: 17,000kg (37,000lb)

**MAXIMUM THRUST:**

- Type 1: 8000kg (17,600lb)
- Type 2: 12,000kg (26,400lb)

**HARDCOVER TIME:**

- Type 1: 8.8secs
- Type 2: 8.8secs

**HARDOVER TIME:**

- Type 1: 80kg (175lb)
- Type 2: 80kg (175lb)

**RUDDER TORSION (MAXIMUM):**

- Type 1: 20Nm (180lb.in)
- Type 2: 34Nm (300lb.in)

---

**2 YEAR WORLDWIDE WARRANTY. For more information contact your national distributor (see outside back cover for details) or consult www.raymarine.com**
SELECTING THE RIGHT AUTOPILOT DRIVE UNIT

Corepack selection
Type 1 (12V) drives require S1/S2 or S1G/S2G corepacks.
Type 2 (24V), Type 2 and Type 3 drives require S3 or S3G corepacks.

TYPE 1, 2 AND 3 HYDRAULIC PUMPS

TYPE 2 AND 3 HYDRAULIC LINEAR DRIVE

CONSTANT RUNNING PUMPS

BOAT STEERING RAM CAPACITY:
- Type 1: 4.9in³ – 14in³ (80cc – 230cc)
- Type 2: 14in³ – 21in³ (230cc – 350cc)
- Type 3: 21in³ – 30.5in³ (350cc – 500cc)

MAXIMUM STALL PRESSURE AT 12V:
- Type 1: 750psi (50bar)
- Type 2: 1450psi (100bar)
- Type 3: 1160psi (80bar)

PEAK FLOW RATE (NO LOAD):
- Type 1: 67in³/min (1000cc/min)
- Type 2: 122in³/min (2000cc/min)
- Type 3: 175in³/min (2900cc/min)

BOAT LADEN DISPLACEMENT (MAXIMUM):
- Type 2: 22,000kg (48,500lb), Type 3: 35,000kg (77,000Ib)

PEAK THRUST:
- Type 2: 585kg (1290lb)
- Type 3: 1000kg (2200Ib)

MAXIMUM STROKE:
- Type 2: 254mm (10in)
- Type 3: 300mm (12in)

HARDOVER (NO LOAD):
- Type 2: 10secs
- Type 3: 12secs

MAXIMUM RUDDER TORQUE:
- Type 2: 1270Nm (11,300lb.in)
- Type 3: 2565Nm (23,100Ib.in)

DRIVE UNIT PART NUMBERS:
- Type 1 Drive - SmartPilot S1/S2/S3
- Type 2/3 Drive - SmartPilot S3 only
- All 24V Drives - Use SmartPilot S3

SMARTPILOT FOR VERADO OUTBOARD ENGINES

DRIVE UNIT PART NUMBERS:
- M81120 Type 1 (12V)
- M81119 Type 1 (24V)
- M81121 Type 2 (12V)
- M81123 Type 2 (24V)
- M81122 Type 3 (12V)
- M81124 Type 3 (24V)

DRIVE UNIT PART NUMBERS:
- M81200 Type 2 (12V)
- M81201 Type 2 (24V)
- M81202 Type 3 (12V)
- M81203 Type 3 (24V)

SMARTPILOT FOR VERADO PART NUMBERS

STROKE CONTROL HEAD

Physical:
- Overall dimensions (WxHxD) mm
- Weight kg (lbs)

OTHER FEATURES:
- Control type
- Display lighting
- Display size and type

COURSE COMPUTER

Power:
- Nominal voltage
- Absolute voltage range
- Power consumption (Standby)

Physical:
- Overall dimensions (WxHxD) mm
- Product weight kg (lbs)

Contact product support for information

POWER FOR VERADO OUTBOARD ENGINES

TYPE 1, 2 AND 3 HYDRAULIC (TYPICAL SIZE SHOWN)

** NOT SUPPLIED (CONTACT STEERING MANUFACTURER)
### CLASS D-DSC VHF Radio

**GENERAL**

<table>
<thead>
<tr>
<th>Feature</th>
<th>RAY240E</th>
<th>Ray240E Handset</th>
<th>Ray240E Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>1W</td>
<td>1W</td>
<td>1W</td>
</tr>
<tr>
<td>Frequency</td>
<td>156.025 to 157.425 MHz</td>
<td>156.025 to 157.425 MHz</td>
<td>156.025 to 157.425 MHz</td>
</tr>
<tr>
<td>Channels</td>
<td>55 international VHF marine bands</td>
<td>55 international VHF marine bands</td>
<td>55 international VHF marine bands</td>
</tr>
<tr>
<td>Modulation</td>
<td>FM 16K0G3E, DSC 16K0G2B</td>
<td>FM 16K0G3E, DSC 16K0G2B</td>
<td>FM 16K0G3E, DSC 16K0G2B</td>
</tr>
<tr>
<td>Transmit frequency range</td>
<td>156.025 to 157.425 MHz</td>
<td>156.025 to 157.425 MHz</td>
<td>156.025 to 157.425 MHz</td>
</tr>
<tr>
<td>Transmit power</td>
<td>2W or 1W settings</td>
<td>2W or 1W settings</td>
<td>2W or 1W settings</td>
</tr>
<tr>
<td>Spurious and harmonic emissions</td>
<td>&gt;0.7 microvolts at tight</td>
<td>&gt;0.7 microvolts at tight</td>
<td>&gt;0.7 microvolts at tight</td>
</tr>
<tr>
<td>Squelch sensitivity</td>
<td>70dB</td>
<td>70dB</td>
<td>70dB</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>-20°C to +70°C</td>
<td>-20°C to +70°C</td>
<td>-20°C to +70°C</td>
</tr>
<tr>
<td>Environmental:</td>
<td>IPX7 (submersible)</td>
<td>IPX7 (submersible)</td>
<td>IPX7 (submersible)</td>
</tr>
<tr>
<td>Connections:</td>
<td>Distress button</td>
<td>Distress button</td>
<td>Distress button</td>
</tr>
<tr>
<td>Distress button</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Microphone</td>
<td>4 dedicated buttons</td>
<td>4 dedicated buttons</td>
<td>4 dedicated buttons</td>
</tr>
<tr>
<td>Display lighting</td>
<td>9 brightness and contrast adjustments</td>
<td>9 brightness and contrast adjustments</td>
<td>9 brightness and contrast adjustments</td>
</tr>
<tr>
<td>Distalate:</td>
<td>Not included</td>
<td>Not included</td>
<td>Not included</td>
</tr>
<tr>
<td>Control type (first mike)</td>
<td>2 rotary knobs for squelch &amp; volume</td>
<td>2 rotary knobs for squelch &amp; volume</td>
<td>2 rotary knobs for squelch &amp; volume</td>
</tr>
<tr>
<td>Control types</td>
<td>Handset, belt clip, wrist strap, cradle, flush mount, trunnion mount</td>
<td>Handset, belt clip, wrist strap, cradle, flush mount, trunnion mount</td>
<td>Handset, belt clip, wrist strap, cradle, flush mount, trunnion mount</td>
</tr>
<tr>
<td>Mounting methods</td>
<td>Bracket or flush mount</td>
<td>Bracket or flush mount</td>
<td>Bracket or flush mount</td>
</tr>
<tr>
<td>Product weight</td>
<td>0.36 (0.79) kg</td>
<td>0.36 (0.79) kg</td>
<td>0.36 (0.79) kg</td>
</tr>
<tr>
<td>Overall dimensions (WxHxD) mm</td>
<td>124x124x60</td>
<td>124x124x60</td>
<td>124x124x60</td>
</tr>
</tbody>
</table>

### VHF Radios

**GENERAL**

<table>
<thead>
<tr>
<th>Feature</th>
<th>RAY510E</th>
<th>RAY510E Handset</th>
<th>RAY510E Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>1W</td>
<td>1W</td>
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</tr>
<tr>
<td>Frequency</td>
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<tr>
<td>Modulation</td>
<td>FM 16K0G3E, DSC 16K0G2B</td>
<td>FM 16K0G3E, DSC 16K0G2B</td>
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<tr>
<td>Transmit frequency range</td>
<td>156.025 to 157.425 MHz</td>
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</tr>
<tr>
<td>Transmit power</td>
<td>2W or 1W settings</td>
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<tr>
<td>Spurious and harmonic emissions</td>
<td>&gt;0.7 microvolts at tight</td>
<td>&gt;0.7 microvolts at tight</td>
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</tr>
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<td>70dB</td>
<td>70dB</td>
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<tr>
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<tr>
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<td>IPX7 (submersible)</td>
<td>IPX7 (submersible)</td>
<td>IPX7 (submersible)</td>
</tr>
<tr>
<td>Connections:</td>
<td>Distress button</td>
<td>Distress button</td>
<td>Distress button</td>
</tr>
<tr>
<td>Distress button</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Microphone</td>
<td>4 dedicated buttons</td>
<td>4 dedicated buttons</td>
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</tr>
<tr>
<td>Display lighting</td>
<td>9 brightness and contrast adjustments</td>
<td>9 brightness and contrast adjustments</td>
<td>9 brightness and contrast adjustments</td>
</tr>
<tr>
<td>Distalate:</td>
<td>Not included</td>
<td>Not included</td>
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<tr>
<td>Control type (first mike)</td>
<td>2 rotary knobs for squelch &amp; volume</td>
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<td>Control types</td>
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<tr>
<td>Mounting methods</td>
<td>Bracket or flush mount</td>
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<tr>
<td>Product weight</td>
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<td>124x124x60</td>
<td>124x124x60</td>
<td>124x124x60</td>
</tr>
</tbody>
</table>

For product information, see Pages 66 – 67.
WORLDWIDE WARRANTY

The Raymarine warranty terms and conditions as described below do not affect the consumer’s legal rights and comply with EU Directive 1999/44/EC.

In order to ensure that the product continues to operate efficiently and reliably, we recommend that, before using the product, the customer carefully reads the Owner’s Handbook and follows the advice on the safe and correct operation and use of the product. We recommend that the Raymarine product, is installed by a Raymarine certified installer. Installation by persons other than a Raymarine certified installer invalidates the warranty.

1. Product warranty
   1.1 Raymarine warrants each new product to be of good materials and workmanship. Raymarine, or its approved agents, will repair or exchange under warranty any parts or product proven to be defective in material or workmanship under normal use, for a period of 2 years (24 months) from date of sale to end user, subject to the limits contained in this warranty document.
   1.2 The Raymarine warranty covers parts and labour associated with any warranty repair as described above, provided that the product is returned to Raymarine or one of its approved agents.
   1.3 Raymarine reserves the right to replace under warranty, not repair, certain Raymarine products subject to the limitations below, provided that they are returned to the nearest Raymarine National Distributor, for details of such products refer to the internet at www.raymarine.com or contact your nearest Raymarine National Distributor.

2. Onboard warranty
   2.1 In addition to the Product warranty, as described above, Raymarine will, at its discretion, offer onboard warranty service to the nearest Raymarine approved service agent, subject to the maximum mileage and other limits referred to in paragraph 4.12 below, on products, proof of installation, or commission by Raymarine certified installer, can be shown.

   2.2 The warranty provides for onboard repair or exchange of the product, by Raymarine or its approved agents, for a period of 2 years (24 months), subject to the limits contained in this warranty document. In the case of a product installed, by a Raymarine certified installer, on a boat that is not currently being used, the warranty begins on the date the boat is first used by the customer, the 2-year period will begin on the date of sale of the boat to the customer. In the case of a product installed, by a Raymarine certified installer, on a boat already in the possession of the customer, the 2-year period will begin on the date of the commissioning of the installed product.

   2.3 Certain Raymarine products are not covered by onboard warranty unless the products are pre-registered and onboard warranty is purchased from the Raymarine certified installer, for details of such products refer to the internet at www.raymarine.com or contact your nearest Raymarine National Distributor.

   2.4 The Purchasable onboard warranty is subject to the limitations below.

   3. Obtaining warranty service
   3.1 In the event of warranty service being required, the customer should contact Raymarine Technical Support or the nearest Raymarine approved service agent – the contact details of Raymarine Technical Support and a full list of the names and details of worldwide service agents are available on the internet at www.raymarine.com and in the Owner’s Handbook.

   3.2 In cases where the customer is requesting warranty service and a Raymarine certified installer has not installed the product, i.e. Product warranty, the affected product must be returned to the customer’s local Raymarine approved service agent or direct to Raymarine, for return.

   3.2.1 proof of purchase showing the date of purchase and the name of the supplier of the product;
   3.2.2 the serial number of the affected product;
   3.2.3 a warranty card completed by the product supplier (which will contain the information required by paragraphs 3.2.1 and 3.2.2).

   Subject to the limitations above, the product will be repaired or replaced (at the discretion of Raymarine or a Raymarine service agent) at no further cost and promptly returned to the customer.

   3.3 In cases where the customer is making a warranty claim and the product has been installed by a Raymarine certified installer, (boat builder, installer, dealer etc.) i.e. Onboard warranty, the nearest Raymarine approved service agent should be contacted and onboard service requested (which will be subject to the limits referred to in paragraph 4.12 below). Before the onboard warranty service is performed, the customer must have available;

   3.3.1 proof of purchase showing the date of purchase and the name of the supplier of the product;
   3.3.2 the serial number of the affected product;
   3.3.3 proof of installation of the product by a Raymarine certified installer;
   3.3.4 a warranty card completed and stamped by the installing agent (which will contain the information required by paragraphs 3.3.1 to 3.3.3).

   3.4 In cases where onboard warranty has been purchased – as described in 2.3, the nearest Raymarine approved service agent should be contacted and onboard service requested, information detailed in 3.3.1 and 3.3.2 is required. Onboard warranty service will only be performed if the product serial number confirms that the onboard warranty service cover has been purchased and is valid.

4. Warranty limitations
   4.1 Raymarine warranty policy does not apply to any product that has been subjected to accident, abuse or misuse, shipping damage, alterations, corrosion, impact and/or non-authorized service, or products on which the serial number has been altered, mutilated or removed.

   4.2 Certain products do not carry the onboard warranty, as described in section above, unless the onboard warranty cover is purchased at the time of installation. The purchasable onboard warranty is only available on products purchased in specific territories, for further details refer to the internet at www.raymarine.com or contact your nearest Raymarine National Distributor.

   4.3 Products purchased outside the country of installation will not be covered by onboard warranty.

   4.4 Raymarine assumes no responsibility for damage incurred during installation or as a result of improper installation.

   4.5 This warranty does not cover routine system checkouts, alignment/calibration, sea-trials or commissioning, unless required by replacement of part(s) in the area being aligned.

   4.6 Raymarine assumes no responsibility for damage caused by or to other equipment, systems or components occasioned by improper or unauthorised connection, use, or use of the product.

   4.7 Consumable items, including, but not limited to: fuses; batteries; drive belts; radar mixer diodes; snap-in impeller carriers; impellers; impeller bearings; and impeller shafts are specifically excluded from this warranty. A complete list of the consumable items relating to each product can be found in the Owner’s Handbook and/or on the internet at www.raymarine.com.

   4.8 All costs associated with transducer replacement, other than the cost of the transducer itself, are specifically excluded from this warranty.

   4.9 Overstressed or labourious work on normal working hours is not covered by this warranty.

   4.10 If repairs are necessary under the warranty, the affected product must be forwarded to a Raymarine facility or a Raymarine approved service agent, at the owner’s expense.

   4.11 The Raymarine warranty does not cover any differences in material, colouring or size between those alluded to in corporate advertising, literature or published on the internet, which are not specifically objected to at the time of delivery.

   4.12 Travel costs other than auto mileage, tolls and two (2) hours travel time, are specifically excluded from the warranty on all products. Costs, which are excluded from the coverage of this warranty, include but are not limited to: taxi fares, launch fees, aircraft rental, subsistence, customs, shipping and communication charges etc.

   4.13 Neither Raymarine nor a Raymarine service agent shall be liable for any incidental, indirect, consequential or special (including punitive or multiple) damages, shall Raymarine or a Raymarine service agent be liable for any loss of profit, business, contracts, opportunity, goodwill or other similar loss. The liability of Raymarine or a Raymarine service agent to a customer under this warranty, whether for breach of contract, tort, breach of statutory duty or otherwise, shall not exceed US$1,000,000.

   4.14 All Raymarine products sold or provided hereunder are merely aids to navigation. It is the user’s responsibility to exercise common prudence and navigational judgment.

   4.15 Raymarine products should not be relied upon as a substitute for such prudence and judgement.

The technical and graphical information contained in this catalogue, to the best of our knowledge, was correct as it went to press. However, the Raymarine policy of continuous improvement and updating may change product specifications without prior notice. Therefore, no reasonable differences between the product and this catalogue may occur from time to time, for which liability cannot be accepted by Raymarine.
### PRODUCT WISH LIST

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<thead>
<tr>
<th>PRODUCT</th>
<th>PART NUMBER</th>
</tr>
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<tbody>
<tr>
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### NOTES

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