

# Evolution™

Adaptive Autopilot Systems



INNOVATION • QUALITY • TRUST

# Raymarine®



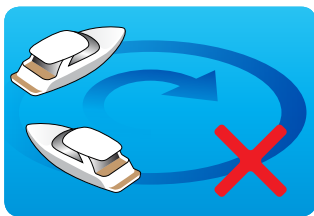
## Evolution Technology

The culmination of Raymarine autopilot expertise, FLIR Systems' R&D, and advanced aerospace guidance technology, Evolution Ai control algorithms deliver a new level of accurate autopilot control.

## Evolution Ai

Evolution autopilots perceive their environment and instantly calculate and evolve steering commands to maximize performance. The result is precise and confident course keeping, regardless of vessel speed or sea conditions.

## Why you need Evolution... Race, cruise, or fish, Evolution will



### No Fuss

- No lengthy calibration procedures to perform
- No compass calibration required
- 9-axis precision monitoring of pitch, roll, yaw and heading



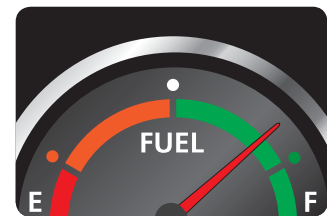
### Easy to install

- Freedom from the restrictions of conventional heading sensors;
  - EV sensor core can be installed above or below deck
  - Install upsidedown or off the vessels centerline
- Plug and play connections



### Rugged

Enclosure is fully sealed and built to IPX6 waterproofing standards



### Fuel Efficient

Evolution autopilots steer so accurately they will save fuel and get you to your destination faster





# take command

Easily selectable performance modes



### Race Performance

When only the best will do. Razor sharp course keeping. Fine-tuned for racers!



### Cruising Performance

Superb course keeping and crisp turns in all conditions – the Raymarine skippers choice



### Leisure Performance

For relaxed boating when soaking up the sun is more attractive than precise course keeping



For more information about Evolution, visit our website [www.raymarine.com](http://www.raymarine.com) or contact your Raymarine dealer

## Evolution perfect on all points of sail



Downwind with kite up



Beam reach with quartering sea



Upwind in short chop



## Evolution Cockpit and Below Deck Autopilots

EV-1 autopilots consist of a Control Head, EV-1 Sensor, Actuator Control Unit (ACU) and drive unit. The drive unit (inboard mechanical/hydraulic or cockpit mounted), and correct ACU for your vessel is dependent on the steering system and displacement of the vessel itself.

## Evolution Drive-by-Wire Propulsion

EV-2 has been designed for the latest drive-by-wire steering systems and connects directly to Raymarine's SeaTalk<sup>ng</sup> bus. EV-2 also has a dedicated CAN Bus port for direct connection to steer-by-wire steering systems – such as ZF Pod Drives, Yamaha Helm Master, Volvo IPS<sup>\*\*</sup> and Seastar Solutions Optimus systems.

A single CAN Bus connection to the EV-2 eliminates the need for an Actuator Control Unit (ACU), further simplifying installation.

\*\* Optional Volvo IPS gateway required plus additional cabling

### Evolution Typical System



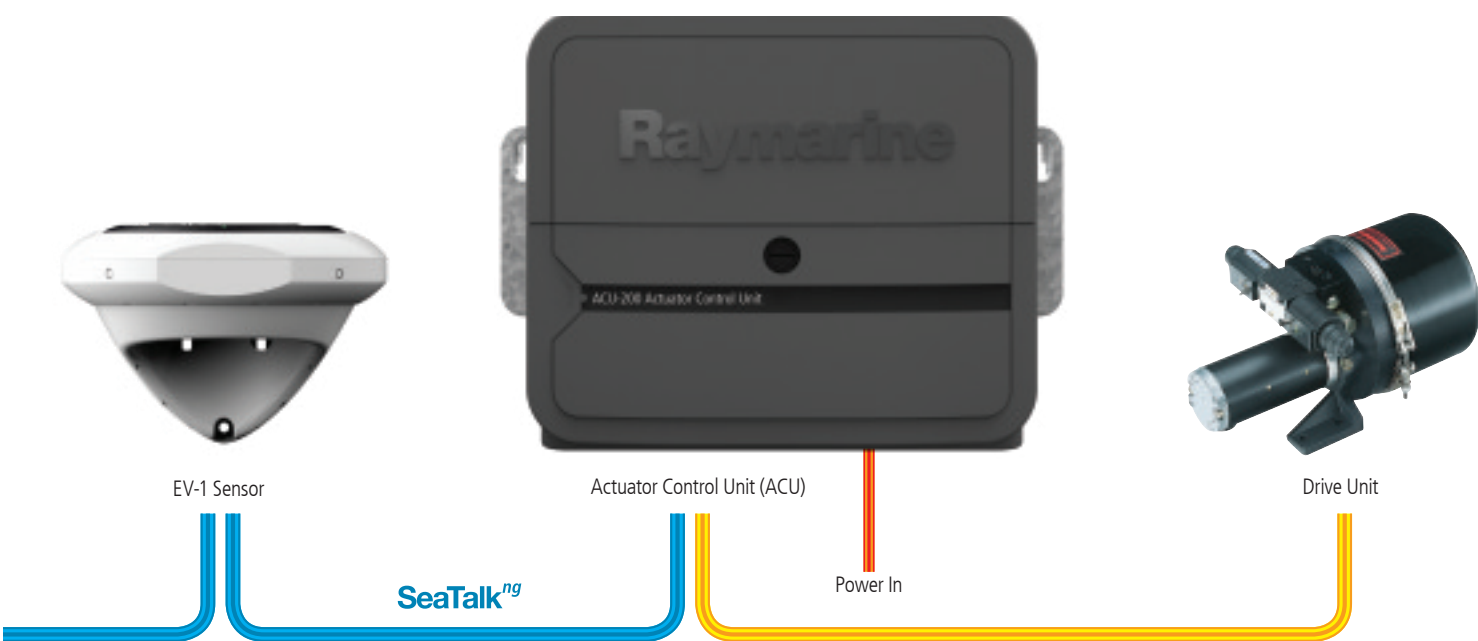
p70 or p70R Control Heads

SeaTalk<sup>ng</sup>

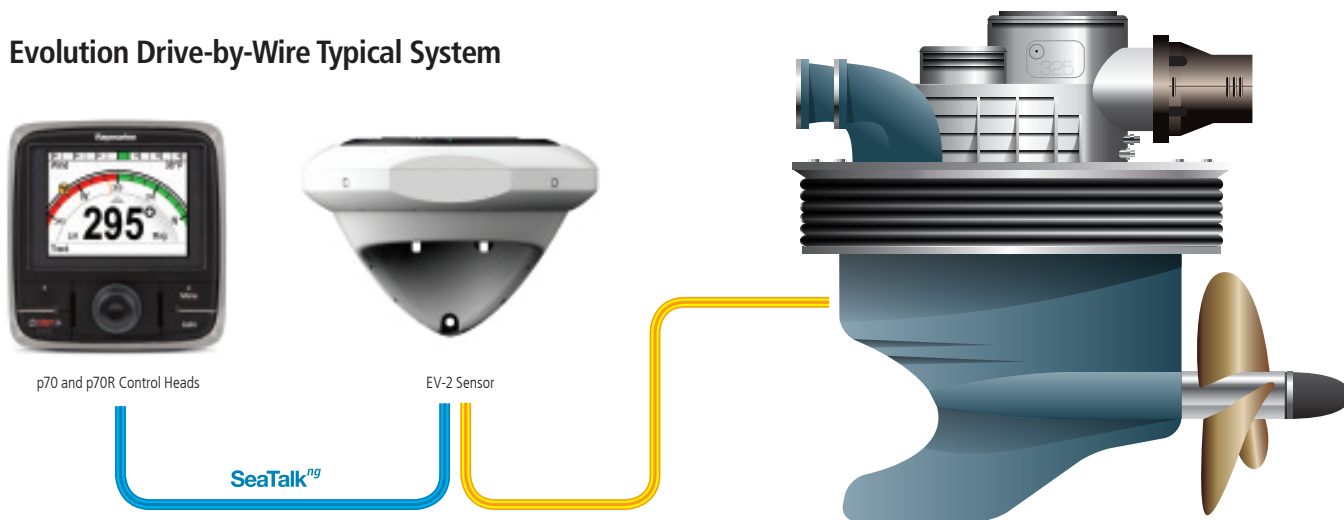
## Evolution System Packs

Part Number	Inboard Pilot Pack Description	Typical Vessel Type	Pack Contents				
			EV	ACU	Rudder Ref*	Control Head	Drive
T70155	EV-200 Sail	Mid-size sail	EV-1	200	●	p70	–
T70156	EV-200 Power	Mid-size power	EV-1	200	●	p70R	–
T70157	EV-200 Hydraulic	Mid-size power	EV-1	200	●	p70R	Type 1 Hydraulic Pump
T70158	EV-200 Linear	Mid-size sail	EV-1	200	●	p70	Type 1 Mechanical Linear
T70159	EV-200 Sport	Sport runabouts	EV-1	200	●	p70R	Helm Mounted Sport Drive
T70160	EV-300 Solenoid	Vessels with solenoid controlled steering	EV-1	300	●	p70R	–
T70161	EV-400 Sail	Large sail	EV-1	400	●	p70	–
T70162	EV-400 Power	Large Power	EV-1	400	●	p70R	–
T70164	EV-Drive by Wire	Drive-by-wire	EV-2	–		p70R	–

\* Optional fit rudder reference unit supplied as standard



**Evolution Drive-by-Wire Typical System**



**Drive-by-Wire Partners:** • Seastar Solutions (Optimus 360 and Optimus eps) • Volvo Penta • ZF • Yamaha Helm Master



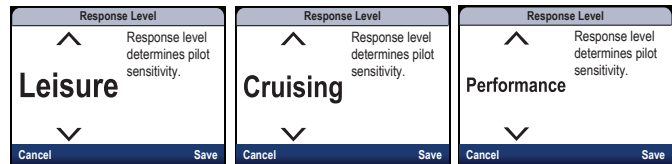
## Autopilot Control

Complete your Evolution autopilot system with a p70 or p70R autopilot control head. The p70 and p70R feature vibrant color displays and are powered by Raymarine's intuitive Light-House user interface. LightHouse organizes all options into a simple menu structure, so with Evolution's quick 3-step setup process you will be up and running in minutes.



### p70R Control Head

Features a rotary dial control for power boaters. Use the rotary dial for menu and course changes or activate power steer mode and steer manually right from the p70R.



### p70 Control Head

Designed for sailing yachts, the p70 offers simple 1 and 10 degree direct course changes at the touch of a button.

## MFD Pilot Control

Evolution pilots can also be controlled from a Series, c Series, e Series and gS Series Raymarine multifunctional displays (MFD).



# THE EVOLUTION AUTOPILOT RANGE

## EV-100 Autopilot Packs

EV-100 autopilots are installed in the cockpit of tiller and wheel steered yachts and smaller power boats. An EV-100 system consists of an EV-1 Sensor, ACU-100 Autopilot Control unit, drive unit and control head. The following table lists the cockpit pilots and their vessel suitability.



Part Number	Cockpit Pilot Description	Maximum Displacement	Vessel Type	Pack Contents			
				EV	ACU	Control Head	Drive
T70152	EV-100 Wheel	7,500kg (16,000lbs)	Sail	EV-1	ACU-100	p70	Wheel Drive
T70153	EV-100 Tiller	6,000kg (13,200lbs)	Sail	EV-1	ACU-100	p70	Tiller Drive
T70154	EV-100 Power	3,181kg (7,000lbs)	Power	EV-1	ACU-100	p70R	0.5L Hydraulic Pump

## EV-200, 300, and 400 Below Deck Autopilots

The Evolution inboard range consists of autopilot packs designed to suit specific vessel types, steering systems and vessel displacements.

A complete Evolution system is determined by:

1. The type of steering system installed on your vessel
2. If the steering system is hydraulic, the size of the ram (in cubic inches); in hydraulic systems the pump has to be matched to the ram

3. The size and displacement of your vessel – always take the fully laden displacement of your vessel into account (often 20% above the designed displacement)

With this information obtained, the correct ACU for your vessel can be selected from the table below in conjunction with your drive.

Drive Units	Hydraulic Ram Capacity (Cubic Inches)	Vessel Displacement (kg)	Evolution ACU			
			EV-100	EV-200	EV-300	EV-400
Type 0.5L Hydraulic Pump	3.1in <sup>3</sup> –6.7in <sup>3</sup> (50-110cc)	NA	●			
Type 1 Hydraulic Pump	4.9in <sup>3</sup> –14in <sup>3</sup> (80cc – 230cc)	NA		●		
Type 1 Mechanical Rotary / Linear Drives		24,000lbs (11,000kg)		●		
Type 1 Universal Stern Drives		NA		●		
Type 2 Hydraulic Pump	14in <sup>3</sup> –21in <sup>3</sup> (230cc – 350cc)	NA				●
Type 3 Hydraulic Pump	21in <sup>3</sup> –30.5in <sup>3</sup> (350cc – 500cc)	NA				●
Type 2 Hydraulic Linear		48,000lbs (22,000kg)				●
Type 3 Hydraulic Linear		77,000lbs (35,000kg)				●
Type 2 Short Mechanical Linear Drives		33,000lbs (15,000kg)				●
Type 2 Long Mechanical Linear Drives		44,000lbs (20,000kg)				●
Type 2 Mechanical Rotary Drives		44,000lbs (20,000kg)				●
Solenoid Drive Units		NA			●	
ZF Saildrive Systems		NA				●

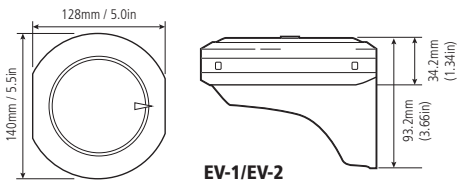


## EV1 / EV2 SPECIFICATIONS

**Nominal Power supply:** 12 V (powered by SeaTalk<sup>ng</sup> system)  
**Operating voltage range:** 10.8 V to 15.6 V dc  
**Power consumption:** 30 mA  
**SeaTalk<sup>ng</sup> LEN (Load Equivalency Number):** 1  
**Waterproofing rating:** IPX 6  
**Operating temperature:** -20 °C to +55 °C (-4 °F to +131 °F)  
**Relative Humidity:** max 93%  
**Sensors:** 3-axis digital accelerometer; 3-axis digital compass and 3-axis gyro digital angular rate sensor  
**Data Connections:** SeaTalk<sup>ng</sup> and NMEA 2000 DeviceNet (EV-2 only; port not used on EV-1 unit)  
**Weight:** 0.29 kg (0.64 lbs)

## ACU 100 SPECIFICATIONS

**Nominal Power supply:** 12 V  
**Operating voltage range:** 10.8 V to 15.6 V dc  
**Drive Current output:** maximum continuous 7 A at supply voltage  
**Power consumption (standby) main power supply:** 300 mA at 12 V  
**Data Connections:** SeaTalk<sup>ng</sup>  
**Operating temperature:** -20 °C to +55 °C (-4 °F to +131 °F)  
**Connections:** Rudder reference sensor; drive motor; ground  
**Waterproof rating:** connector panel IPX2; Drive electronics IPX6

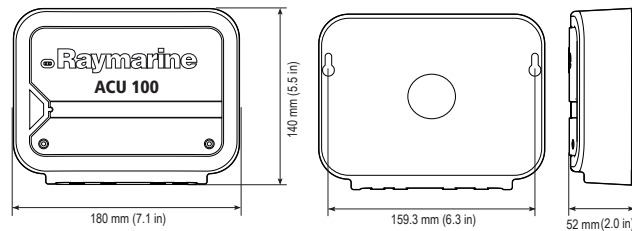


EV-1/EV-2

## ACU 200/300/400 SPECIFICATIONS

**Nominal Power supply:** 12 V or 24 V  
**Operating voltage range:** 10.8 V to 31.2 V dc  
**Power consumption (standby) – main power supply:** 300 mA (12 / 24 V)  
**Power consumption(standby) – SeaTalk<sup>ng</sup> power supply:** 20 mA (12 V)  
**SeaTalk<sup>ng</sup> LEN (Load Equivalency Number):** 1  
**SeaTalk<sup>ng</sup> Power out:** 3 A at 12 V (fuse protected at 3 A)  
**Data connections:** SeaTalk<sup>ng</sup>  
**Connections:** ACU-200: Rudder reference sensor / Sleep switch / Power / Drive motor / Drive clutch / Ground ACU-300: Rudder reference sensor / Sleep switch / Power / Solenoid drive out / Return / Ground ACU-400: Rudder reference sensor / Sleep switch / Power / Drive motor / Drive clutch / Ground / Digital Input / Output (DIO)  
**Drive Current Output:** ACU-200: maximum continuous 15 A at supply voltage; ACU-300: maximum continuous 5 A at supply voltage and ACU-400: maximum continuous 30 A at supply voltage.  
**Drive Clutch Output:** ACU-200: Up to 2.0 A continuous, selectable between 12 / 24 V; ACU-300: No clutch connection and ACU-400: Up to 4 A continuous at 12 V on 12 V systems / Up to 4 A continuous at 24 V on 24 V systems / Up to 4 A continuous at 12 V on 24 V systems.  
**Waterproofing rating:** drip resistant  
**Operating temperature:** -20 °C to +55 °C (-4 °F to +131 °F).  
**Relative Humidity:** max 93%  
**Weight:** 2.2 kg (4.84 lbs)

**Note:** All specifications are subject to change without prior notice.



### Safety Notice

Raymarine products are intended to be used as aids to navigation and must never be used in preference to sound navigational judgement. Their accuracy can be affected by many factors, including environmental conditions, equipment failure or defects, and incorrect installation, handling or use. Only official government charts and Notices to Mariners contain all the current information needed for safe navigation, and the captain is responsible for their prudent use. It is the user's responsibility to use official Government charts, Notices to Mariners, caution and proper navigational skill when operating any Raymarine product.

### Content Note

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### Specifications

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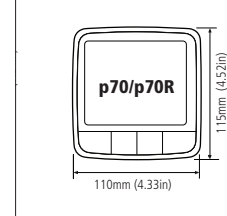
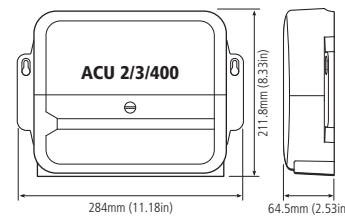
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