YAMAHA 6VM GAUGE by Veratron

USER MANUAL
rev. 03

EN



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INTRODUCTION

The Yamaha 6Y8 round display is an OE instrument derived from the Veratron platform VMH 35 Marine Display. It’s standalone device which features a hybrid display composed of a 1.44” TFT display, and a colored IBN display bonded with a black glass surface. Everything designed into an 85mm housing.

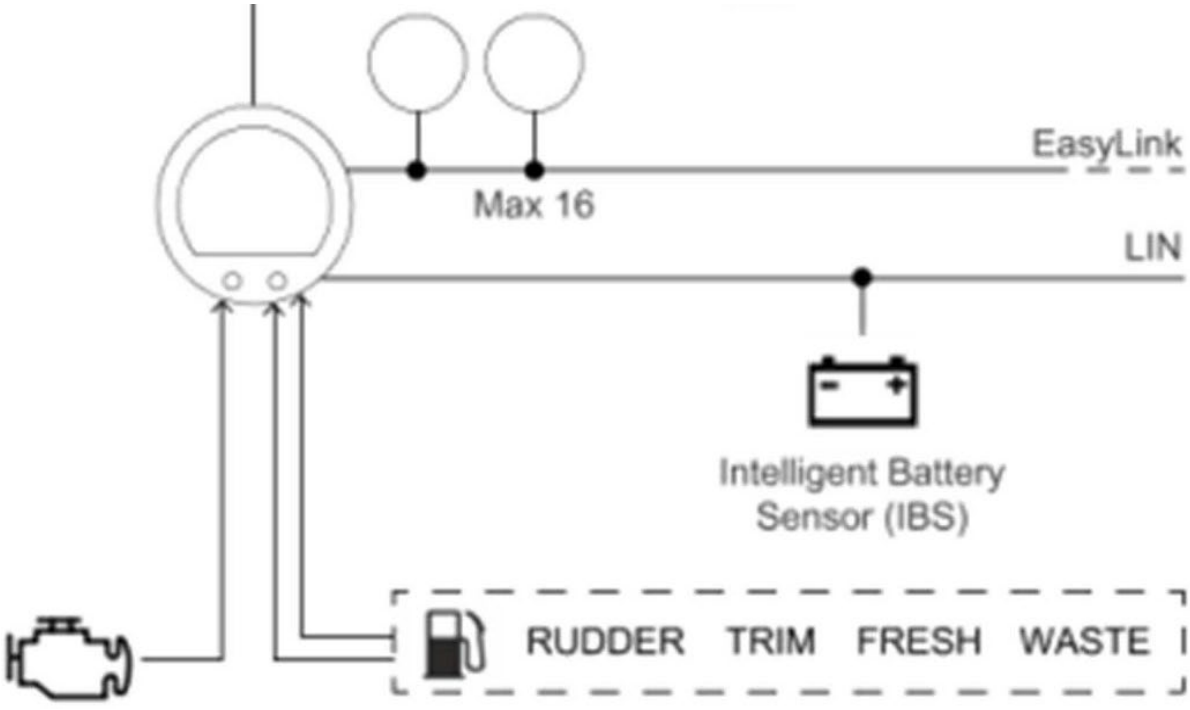
6VM is a Command link certified device designed for monitoring outboard engines.

Equipped with analogue inputs it is also well suited to refitting older engines allowing the direct connection of various sensors such as fuel, trim and tachometer.

Its sleek black glass design is complemented by a stainless-steel frame crimped onto the mineral glass front where the sunlight-readable hybrid display is glued.
The 6VM has an IP X7 protection rating from the front and back to ensure the best performance in outdoor environments.

The built-in GPS makes the 6VM the perfect standalone solution by integrating speed, compass, and position data with engine information, while the dedicated IBS input allows you to interface an external 12V smart battery sensor to keep your boat's energy supply under control at all times.

ARCHITECTURE



SAFETY INFORMATION

⚠ WARNING

- No smoking! No open fire or heat sources!

- The product was developed, manufactured and inspected according to the basic safety requirements of EC Guidelines and state-of-the-art technology.
- The instrument is designed for use in grounded vehicles and machines as well as in pleasure boats, including non-classified commercial shipping.
- Use our product only as intended. Use of the product for reasons other than its intended use may lead to personal injury, property damage or environmental damage. Before installation, check the vehicle documentation for vehicle type and any possible special features!
- Use the assembly plan to learn the location of the fuel/hydraulic/compressed air and electrical lines!
- Note possible modifications to the vehicle, which must be considered during installation!
- To prevent personal injury, property damage or environmental damage, basic knowledge of motor vehicle/shipbuilding electronics and mechanics is required.
- Make sure that the engine cannot start unintentionally during installation!
- Modifications or manipulations to Veratron products can affect safety. Consequently, you may not modify or manipulate the product!
- When removing/installing seats, covers, etc., ensure that lines are not damaged, and plug-in connections are not loosened!
- Note all data from other installed instruments with volatile electronic memories.

SAFETY DURING INSTALLATION

- During installation, ensure that the product's components do not affect or limit vehicle functions. Avoid damaging these components!
- Only install undamaged parts in a vehicle!
- During installation, ensure that the product does not impair the field of vision and that it cannot impact the driver's or passenger's head!
- A specialized technician should install the product. If you install the product yourself, wear appropriate work clothing. Do not wear loose clothing, as it may get caught in moving parts. Protect long hair with a hair net.
- When working on the on-board electronics, do not wear metallic or conductive jewelry such as necklaces, bracelets, rings, etc.
- If work on a running engine is required, exercise extreme caution. Wear only appropriate work clothing as you are at risk of personal injury, resulting from being crushed or burned.
- Before beginning, disconnect the negative terminal on the battery, otherwise you risk a short circuit. If the vehicle is supplied by auxiliary batteries, you must also disconnect the negative terminals on these batteries! Short circuits can cause fires, battery explosions and damages to other electronic systems. Please note that when you disconnect the battery, all volatile electronic memories lose their input values and must be reprogrammed.
- If working on gasoline boat motors, let the motor compartment fan run before beginning work.
- Pay attention to how lines and cable harnesses are laid so that you do not drill or saw through them!
- Do not install the product in the mechanical and electrical airbag area!
- Do not drill holes or ports in load-bearing or stabilizing stays or tie bars!

- When working underneath the vehicle, secure it according to the specifications from the vehicle manufacturer.
- Note the necessary clearance behind the drill hole or port at the installation location. Required mounting depth: 65 mm.
- Drill small ports; enlarge and complete them, if necessary, using taper milling tools, saber saws, keyhole saws or files. Deburr edges. Follow the safety instructions of the tool manufacturer.
- Use only insulated tools, if work is necessary on live parts.
- Use only the multimeter or diode test lamps provided, to measure voltages and currents in the vehicle/machine or boat. Use of conventional test lamps can cause damage to control units or other electronic systems.
- The electrical indicator outputs and cables connected to them must be protected from direct contact and damage. The cables in use must have enough insulation and electric strength and the contact points must be safe from touch.
- Use appropriate measures to also protect the electrically conductive parts on the connected consumer from direct contact. Laying metallic, uninsulated cables and contacts is prohibited.

SAFETY AFTER INSTALLATION

- Connect the ground cable tightly to the negative terminal of the battery.
- Reenter/reprogram the volatile electronic memory values.
- Check all functions.
- Use only clean water to clean the components. Note the Ingress Protection (IP) ratings (IEC 60529).

ELECTRICAL CONNECTION

- Note cable cross-sectional area!
- Reducing the cable cross-sectional area leads to higher current density, which can cause the cable cross-sectional area in question to heat up!
- When installing electrical cables, use the provided cable ducts and harnesses; however, do not run cables parallel to ignition cables or to cables that lead to large electricity consumers.
- Fasten cables with cable ties or adhesive tape. Do not run cables over moving parts. Do not attach cables to the steering column!
- Ensure that cables are not subject to tensile, compressive or shearing forces.
- If cables are run through drill holes, protect them using rubber sleeves or the like.
- Use only one cable stripper to strip the cable. Adjust the stripper so that stranded wires are not damaged or separated.
- Use only a soft soldering process or commercially available crimp connector to solder new cable connections!
- Make crimp connections with cable crimping pliers only. Follow the safety instructions of the tool manufacturer.
- Insulate exposed stranded wires to prevent short circuits.
- Caution: Risk of short circuit if junctions are faulty or cables are damaged.
- Short circuits in the vehicle network can cause fires, battery explosions and damages to other electronic systems. Consequently, all power supply cable connections must be provided with weldable connectors and be sufficiently insulated.
- Ensure ground connections are sound.
- Faulty connections can cause short circuits. Only connect cables according to the electrical wiring diagram.
- If operating the instrument on power supply units, note that the power supply unit must be stabilized and it must comply with the following standard: DIN EN 61000, Parts 6-1 to 6-4.

6VM INSTALLATION

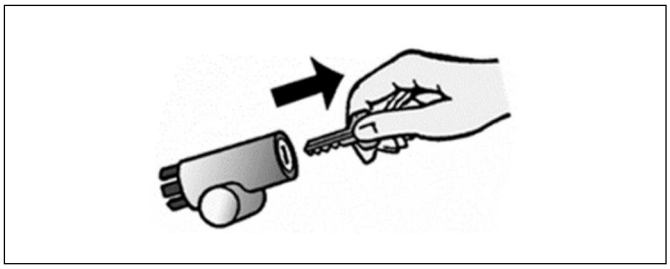
⚠ WARNING

Before starting work, disconnect the ground terminal of the battery to avoid the risk of a short circuit. If the vehicle is equipped with additional batteries, the negative terminal of all batteries must also be disconnected if necessary. Short circuits can burn cables, explode batteries and cause damage to other electronic systems. Remember that by disconnecting the battery, all data entered in the temporary electronic memory will be lost and will have to be reprogrammed.

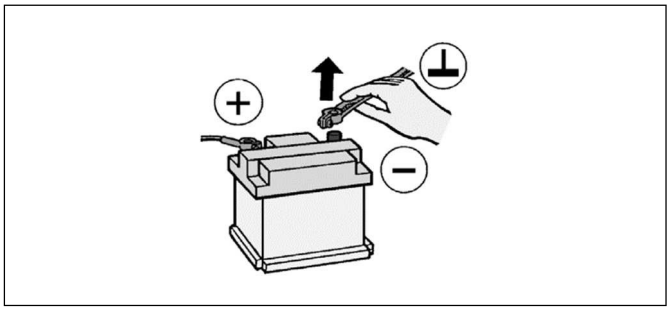
BEFORE THE ASSEMBLY

1. Before starting work, switch off the ignition and remove the ignition key.

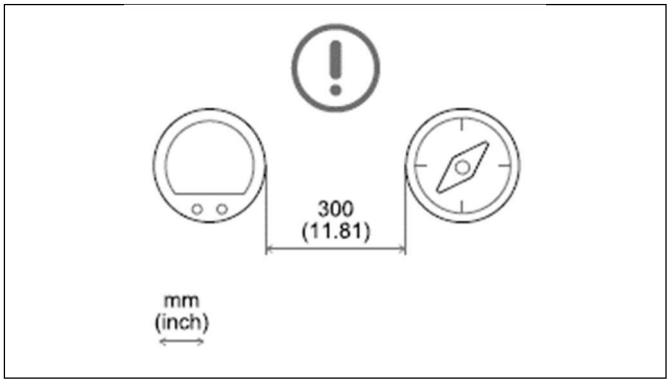
   If necessary, remove the main power switch.



2. Disconnect the negative terminal of the battery. Do not allow the battery to be reconnected by mistake.



3. When mounting the device in the vicinity of a magnetic compass, maintain a protective distance from the compass.



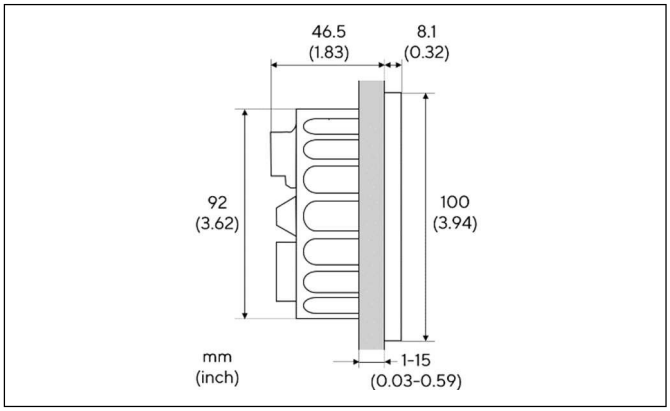
SPINLOCK MOUNTING

The panel thickness may be within a range of 2 to 15 mm.
The drill hole must have a diameter of 86 mm.

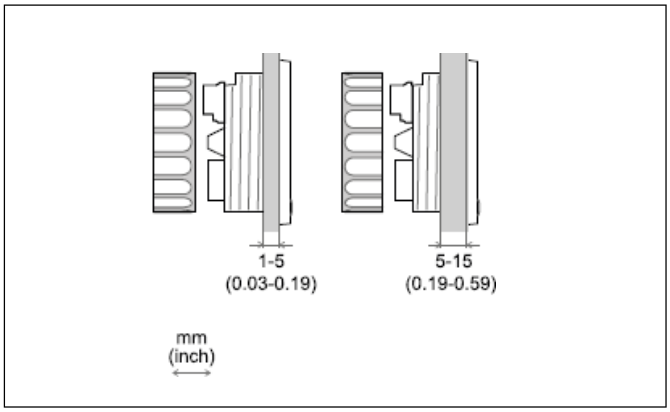
⚠WARNING

- Do not drill holes or installation openings in supporting or stabilizing beams!
- The mounting location must have sufficient clearance behind the mounting holes or openings. The required mounting depth is 65 mm.
- Drill small holes with the drill, if necessary, enlarge them using a conical cutter, scroll saw, tail saw or file and finish them. Deburr the edges. It is essential to observe the safety instructions of the tool manufacturer.

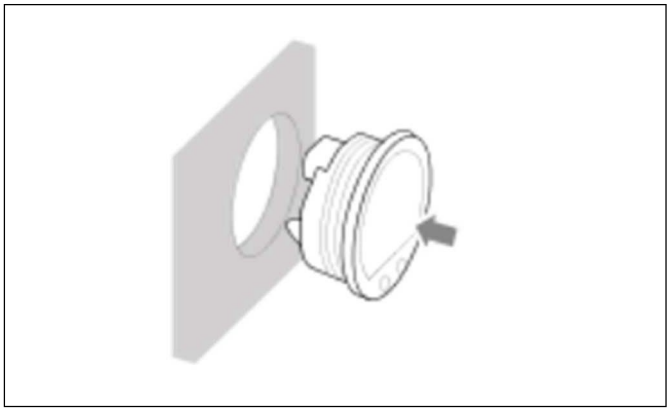
1. Create a circular hole in the panel considering the footprint of the device.



2. Remove the spinlock and insert the device from the front.
3. Orient the spinlock as shown according to the panel thickness.



4. Feed the cables through the spinlock and carefully screw it in for at least two turns.
5. Install the connector.



OUTBOARD ENGINE KIT INSTALLATION

⚠ WARNING

Before beginning, disconnect the negative terminal on the battery, otherwise you risk a short circuit.
If the vehicle is supplied by auxiliary batteries, you must also disconnect the negative terminals on these batteries! Short circuits can cause fires, battery explosions and damages to other electronic systems.
Please note that when you disconnect the battery, all volatile electronic memories lose their input values and must be reprogrammed.

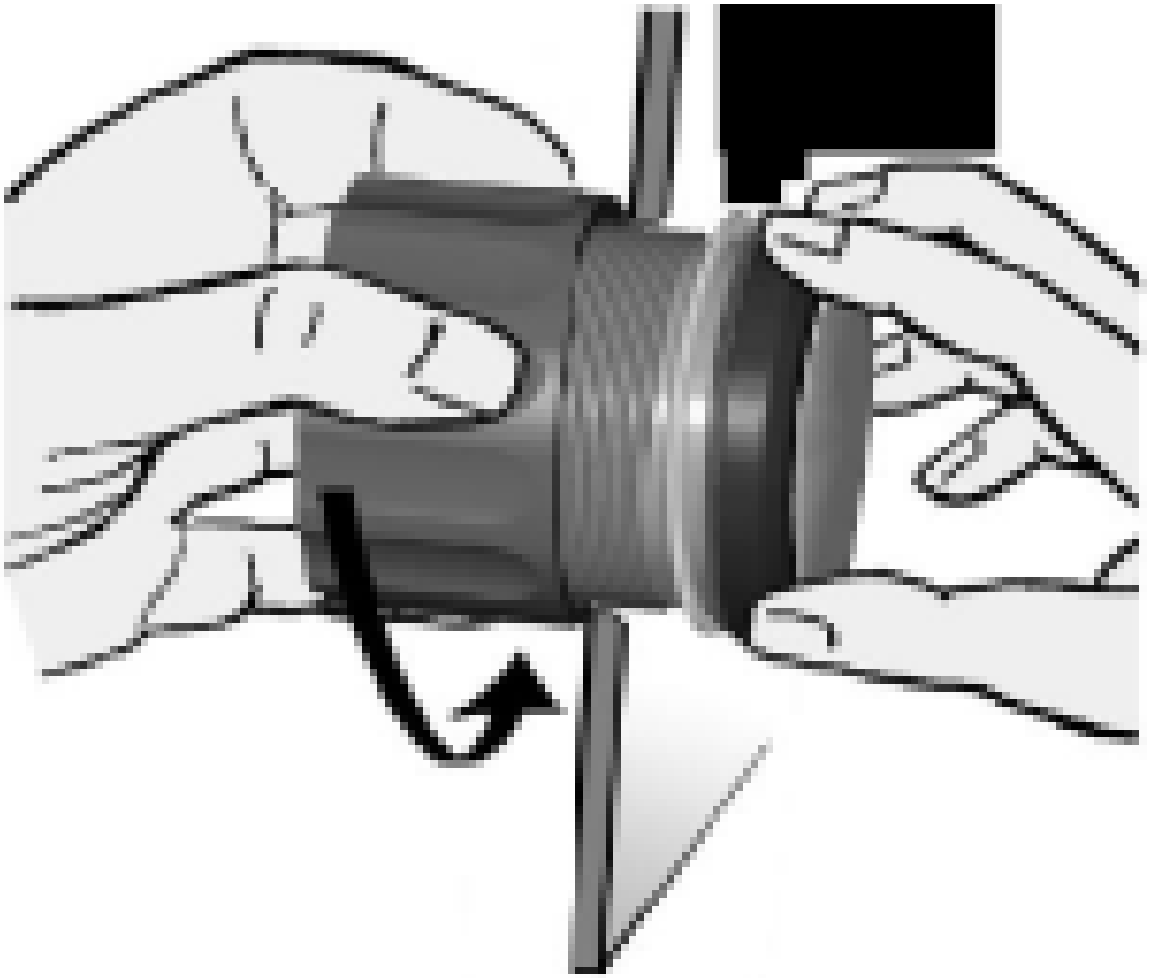
- The IBS must be mounted and handled in an ESD protected area
- The IBS may not be contaminated with foreign particles (e.g., oil, silicon, grease, coolant, etc.)
- The IBS may not be damaged
- The pole clamp may only be torqued to the battery pole

PACKAGING CONTENT

YME Part No	Veratron P/N	Description	Q'ty
6Y8-81920-01		Multi-hub	1
6Y8-81920-11		Single-hub	1
6Y8-82521-11		Pigtail bus wire, 0.6m (2ft)	2
6Y8-82553-21		Main bus wire, 6.1m (20ft)	1
6Y8-82582-11		4-pin waterproof cap	2
6Y8-83553-02		PWR supply wire, 2.4m (8ft)	1
		Safety Manual (QR code Owner's Manual)	1
	B001752	Sun cover	
	B001350	Gauge to pigtail harness (inc. fuel - 2 tanks)	1
		Packaging materials, labels and activities	1
	B001353	Instrument, Spin-lock and gasket	1
6VM-H35Y0-00		**VMH35Y KIT**	**1**

INSTALLATION CONCEPT

The device shall be front mounted on the panel and fixed by means of a spinlock.

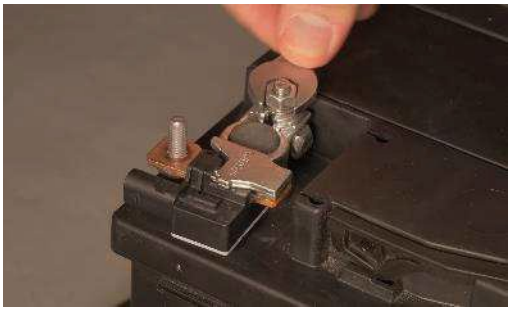


KIT INSTALLATION

Cable installation
Pull in the cables ends through the boat's cable channels. Refer to the wire harness description in the previous section to see which end must lead to which place.



IBS installation
Remove the connection to the negative pole of the battery and attach the Intelligent Battery Sensor (IBS) onto the terminal instead. Use a torque key to adjust the tightening force to 5±1 Nm.



Connect the red ring type connector to the positive pole of the battery.



Plug in the dedicated IBS connector into the sensor. Make sure, the contacts lock audibly into place to preserve the water tightness.



Fuel Level Sensor Connection
Connect the resistive output to the fuel level sensor.
The plug installed on the wire harness matches the Veratron Fuel Level Sensors.
In case your sensor doesn't fit cut of the connector and crimp the fitting connection to the wires ends.
(The black wire is the sensor ground connection while the green is the sensor signal.)



Mount the 6VM
Install the 6VM into the hole in the dashboard.
Please refer to the section “6VM installation” to get more information about the installation requirements.



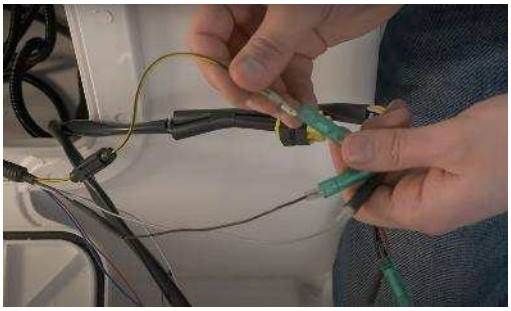
EasyLink Satellites
If you have additional VMH 14 satellite gauges, install them on the dashboard as well and connect them to the EasyLink connector.

The EasyLink standard allows up to 16 satellites in one daisy chain. The length of the chain may not exceed 20 meters.



Further cable connections
Make the connections with the bullet terminals beneath the dashboard to the ignition, ground, the tachometer signal and the trim sensor.
In addition, you can connect the remaining wire ends of the harness to an alarm and a light switch.

Stick to the pinout described in the previous section.



Reattach Power
Connect the systems main ground connection, that has previously been attached to the negative pole of the battery, onto the IBS using the pole adapter.



Configure Settings
In order to see all the data on the display you will have to do the following 6VM configurations.
Define Analog Input 1 as trim.
Define Analog Input 2 as the fuel level input.
Activate the IBS and define the according battery instance.

For further instructions on how to make those configurations refer to section “General Settings”.



IBS SYSTEM REQUIREMENTS

The IBS supports batteries with a capacity of up to 249Ah.
The permanent current may not surpass 155A. For short periods of time (500ms) current peaks of up to 1500A are allowed. The operating voltage range lays between 6 and 16.5V.

ELECTRICAL CONNECTIONS

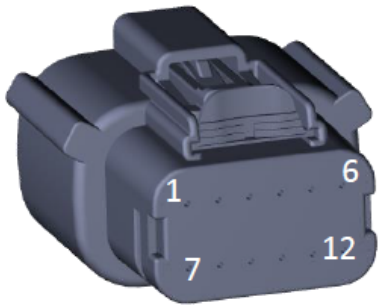
⚠ WARNING

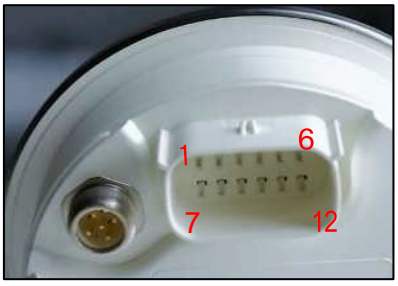
- Refer to the safety rules described in the electrical connections section of the safety information chapter of this document!

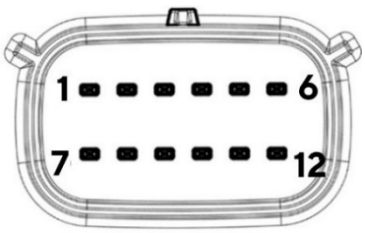
PINOUT

Molex MX150 pinout

Pin	Description	Wire color
1	N.C.	-
2	GND (Term.31)	Black
3	Alarm out 500mA – active low	Green
4	N.C.	-
5	CAN Lo (6Y8 and 6Y9)	Blue
6	CAN Hi (6Y8 and 6Y9)	White
7	Power/Ignition (Term.30/15)	Red
8	Fuel 1 (Resistive input – 0-400ohm)	Pink
9	Fuel 2 (Resistive input – 0-400ohm)	Orange
10	N.C.	-
11	Easy-Link Power	Red
12	Easy Link Data	Yellow







6VM rear view
Molex MX150 12-poles connector
and DeviceNet 5-poles

SWITCHING ON AND OFF

The on/off mode depends on the ignition signal on terminal 15 (Molex-connector pin 7). High level to turn the device on low level or open connection to turn it off.
At power up, the tachometer and warning lights come on briefly, the Yamaha logo appears and then the last data page displayed before powering off.

ANALOG SENSORS (RES, 0-5V, RPM)

Any sensor connected to an analog input (RES 1, RES 2, 0-5V, RPM) of the display must be connected as shown in the schematic.
It is advisable to use sensors with isolated ground, and it is necessary to ensure that the sensor ground is connected to the display ground to avoid incorrect readings.

EXTERNAL BUZZER (B1)

The display supports the connection of an external buzzer (B1) via the dedicated alarm output.
This buzzer can be powered at different voltages (consult the buzzer manufacturer's manual) as the output steers the alarms ground connection (Open Collector Output).
It is important to note that the maximum current supported is 500mA.

DAY / NIGHT MODE SELECTOR SWITCH (S1)

The display allows you to set two display illumination levels for day and night.
it is possible to switch from day mode to night mode (and vice versa) by means of a switch external to the display (S1) connected to the power supply (KL.30), or by connecting to the lights signal onboard KL.58, if present.

CONNECTING THE INTELLIGENT BATTERY SENSOR

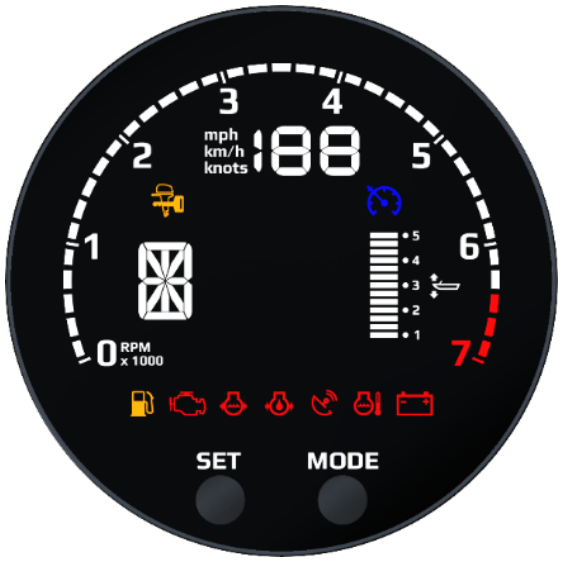
The display supports direct connection of a 12V Intelligent Battery Sensor.
This connection can be made via the Outboard Engine Kit harness, or via an optional adapter cable (B00090601).

See the maximum battery values supported by the sensor in the chapter “IBS System Requirements” of this document.

DESCRIPTION

DISPLAY SEGMENTS

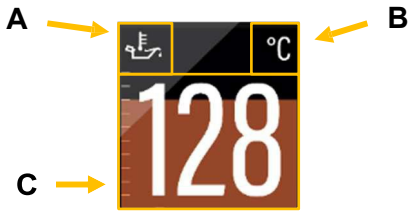
Part	Description
A	Area to show data pages and menu
B	Gear position
C	Current speed according to the selected unit of measurement
D	Engine speed
E	Alarm telltales
SET / MODE	Buttons to interact with the data pages and the menu



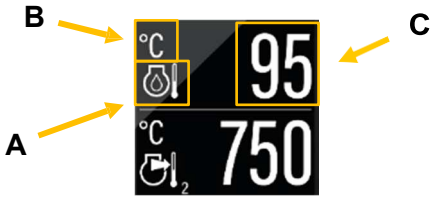
DATA PAGES

Data pages are the templates, that can be displayed on the center part of the device. There are single-layout screens, displaying only one value at a time and dual-layout screens, showing two.
Each of the pages can be hidden, as described in the section "Select the Pages to Display". By default, all pages are enabled.

Single layout



Dual layout



A: Data symbol
Indicates, which data type is displayed right now.

For the data types which support this function, there is also the instance indicated here.

B: Unit of measured value
Shows the unit of the currently displayed data.
The three “units” segments shall be in this order (top to bottom): “mph”, “km/h”, and “knots”.

C: Current value
This shows the numeric value of the dedicated measured data. If there aren’t any values received for this data type or they are out of range, the display will show “- - -“.

Coloured Graph
The coloured graphic in the background of the single layout screen is a bar diagram that puts the measured value in perspective. This function isn’t supported for all data types.
The white lines on the left side show the scalation.

MANAGED DATA

Icon	Information	Unit						
		Internal	Frequency	Resistive	0-5V	LIN	EasyLink	
	Clock	x*	-	-	-	-	-	hh:mm
-	GPS position	x*	-	-	-	-	-	
COG	Course over ground (COG)	x*	-	-	-	-	-	°
TRIM	Trim	-	-	x	x	-	x	°
RUDDER	Rudder angle	-	-	x	x	-	x	°
	Fuel level - tank no. #	-	-	x	x	-	x	% / L / Gal
TTL	Total fuel used	x	-	-	-	-	-	L / gal.
	Fuel flow	-	-	-	-	-	-	L per h / gph
	Voltmeter	x	-	-	-	x	x	V
	Engine coolant temperature	-	-	x	x	-	x	°C / °F
	Engine coolant pressure	-	-	-	-	-	-	bar / psi
	Engine oil temperature	-	-	x	x	-	x	°C / °F
	Engine oil pressure	-	-	x	x	-	x	bar / psi
	Total engine hours	-	x	-	-	-	-	h
TRIP	Trip hours counter	x	-	-	-	-	-	h
TRIP	Trip Distance	x	-	-	-	-	-	Mi / km / nm
	Engine speed	-	x	-	-	-	-	rpm
-	Speed through water (STW)	-	-	-	-	-	-	km/h / mph / kn
-	GPS speed (SOG)	x*	-	-	-	-	-	km/h / mph / kn

Note*: data received from integrated GPS module.

DISTANCE TRAVELED

The indicator internally calculates the distance travelled based on the speed value set in **Sensors > Speed**.

ENGINE HOURS

The indicator considers the internally calculated data. Time is count when the engine speed exceeds 300 RPM. When a higher engine hours value is received this number gets stored internally and the gauge will count on from that value.

DISPLAY PRIORITY

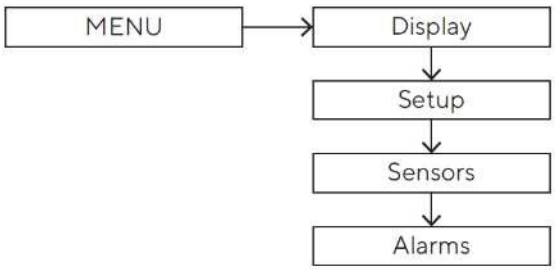
In case more than one source is defined for a certain data, the display priority shall be given as follows:

- For GPS data, the display priority shall be given to CAN (it is assumed that an external dedicated GPS antenna is installed).
- For Fuel data, if the resistive fuel sensor is not set to in the ”Sensors” menu, the display shall show the CAN value, if available.

If not available, Fuel 1 shall show dashes and Fuel 2 screen shall disappear.

GENERAL SETTINGS

SETTINGS MENU STRUCTURE



OPERATE THE SETTINGS MENU

To...	Then...
enter the settings menu	Press the **SET** button until the first menu item appears.
scroll through the settings menu items and possible values	• To go to the previous item/value, briefly press the **MODE** button. • To go to the next item/value, briefly press the **SET** button.
confirm	Press the **SET** button until the data is confirmed.
come back	briefly press the **MODE** button
undo the change	Press the **MODE** button until the previous data appears.
exit the settings menu	press the **SET** and **MODE** buttons until the pop-up disappears, or the previous data page appears
delete an alarm pop-up	press any button

PUSH-BUTTON OPERATION

The push-buttons allow the user to interact with the device.

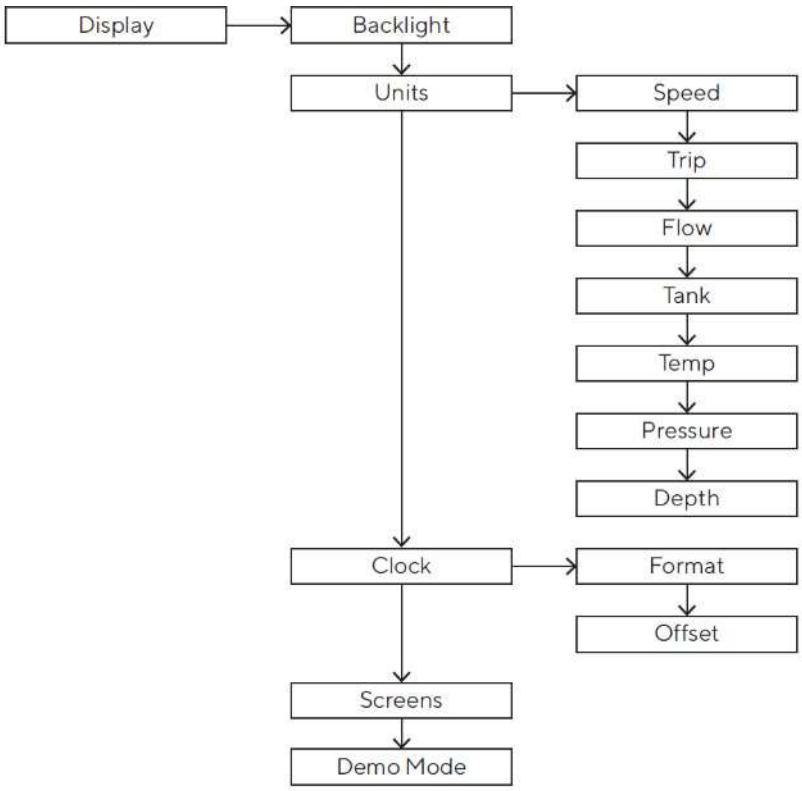
Two different press types shall be defined: short and long press.
Press means that the pushbutton has been pressed for 1 second or more.

A debounce algorithm shall be applied via SW.

Stuck pushbuttons shall be detected when a press is measured for more than 30 seconds.
If a button is stuck, nothing should happen (it shall be implemented, that a button action is only triggered after the button is released). Time for button stuck is when button is pressed longer than 10sec.

	Normal operation	Menu	Troll Mode	Alarm popup
SET short	Scroll display data right	Scroll right / down	Speed adjust +	Snooze
MODE short	Scroll display data left	Scroll left / up	Speed adjust -	Snooze
SET long	Access Menu	Enter / Confirm	Exit Troll	Snooze
MODE long	Troll mode	Back / Discard	-	Snooze
SET+MODE short	Backlight adjust	-	-	Snooze
SET+MODE long	-	Exit menu		Snooze

DISPLAY MENU STRUCTURE



CHANGE THE BRIGHTNESS OF THE DISPLAY

The backlight intensity shall be in white colour, and dimmable in 8 levels (0 to 7) through either:

✓ Menu
✓ Pushbutton press (shortcut)

Backlight adjustment shortcut

1) Press MODE+SET simultaneously to adjust the backlight intensity.
2) The central TFT shall show the “backlight” screen where the actual illumination level is shown
3) Use MODE and SET for respectively increase and decrease the illumination
4) Press again MODE+SET simultaneously to exit the Backlight Adjustment Mode

The Backlight Adjustment Mode shall also automatically quit if no pushbutton is pressed for more than 5 seconds.

The display shall show the illumination level while setting up.

UNITS

Setting	**Description**	**Possible values/commands***
Speed	Speed units	km/h , mph, kts
Trip	Unit of measurement of distance travelled	km , mile , nm
Flow	Flow measurement units	L/h , gph
Tank	Unit of measurement for the liquid in the tank	L , US gal
Temperatures	Temperature units	°C , °F
Pressure	Pressure units	bar , PSI
Depth	Depth measurement units	m , ft

Note*: the underlined value/command is the default.

CLOCK

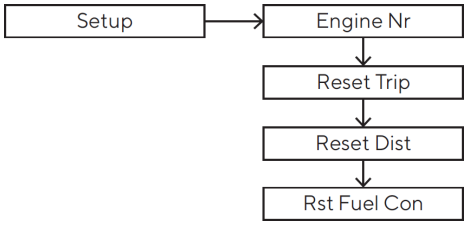
The time is only received via GNSS, it cannot be counted internally.

The clock settings can be found in the menu **Display > Clock** .
To adapt the time to your current time zone, choose the according value in the submenu **Offset**.
To switch between the 12h and 24h time format, make the selection in the submenu **Format**.

SELECT THE PAGES TO DISPLAY

By default, all pages are displayed.
You can choose which pages to hide/show in the menu under **Display > Screens**.

SETUP MENU



Setting	Description	Possible Values / Commands
Engine Nr.	Identification number of the engine whose data should be displayed on the gauge	1 – 4
Reset Trip	Partial hour counter reset (Trip).	Yes / No
Reset Distance	Partial distance counter reset (Trip).	Yes / No
Reset Fuel Consumption	Reset the fuel consumption counter	Yes / No

ENGINE IDENTIFICATION

The designation selected in the **SETUP > Engine No**. menu determines which engine data is to be displayed if more than one engine is present.
Example: In a configuration with two engines and two 6VM displays (one for each engine), one instrument should be set as Engine 1 and the second as Engine 2.
This setting does not affect the battery, fuel level or GPS data.
This setting also determines the designation used to transmit engine data from the 6VM display to the EasyLink networks.

RESET A TRIP VALUE

- Press the **MODE** button until the **DISPLAY** menu appears.
- Briefly press the **MODE** and/or **SET** button to scroll through the pages to the one of interest.
- Press the **MODE** button until the page detail appears.
- Press and hold the **SET** button until the value resets.

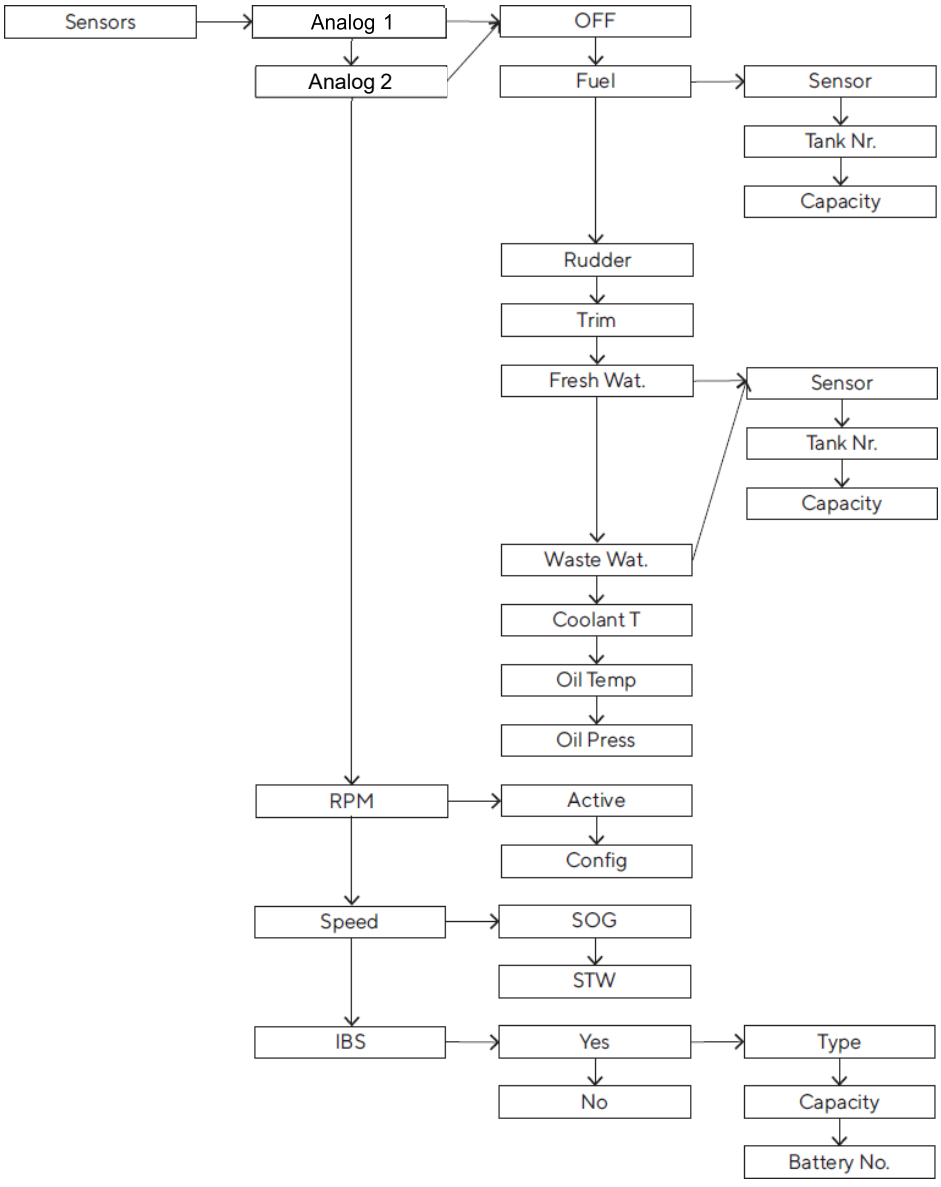
SENSOR CONFIGURATION

TYPES OF CALIBRATION

Calibration of analog sensors can be:

- Standard: only for Veratron sensors. You define the type of sensor, and the device reads with good approximation the value of the sensor without the need of calibration.
- Manual: For non-Veratron sensors or to obtain a more accurate indication from a Veratron sensor. A three- or five-point procedure instructs the system to detect the sensor value.

SENSORS MENU STRUCTURE



CALIBRATE THE SENSORS

FUEL LEVEL SENSOR

- Connect the sensor of interest. See “Connecting an analogue sensor”.
- Under **Sensors** select the resistive or voltage depending input to which the sensor is connected.
- Under **Fuel > Sensor**, choose the desired configuration.
- If you have chosen the **CUSTOM** configuration, follow the wizard on the display to create the sensor curve. (You will have to fill your tank to a certain level and then confirm the current sensor value and repeat that for several points of the curve)
- Under **Sensors** select the resistive or voltage depending input of step 2.
- Under **Fuel > Tank no**., select the ID to be assigned to the tank to which the sensor is connected.

CONFIGURE THE FUEL SENSOR

The device shall support the configuration of different fuel sensor curves by accessing the “Fuel Level 1” or “Fuel Level 2” menu within the SENSORS menu.

Name	Curve
ABYC-US	240-33 Ω
EUROPE	3-180 Ω (factory setting)
YAMAHA	105-5 Ω
CUSTOM	Five steps calibration

Custom calibration



The amount of fuel to be filled shall be calculated from the Tank capacity set by the user.

Instance setting

The Tank Number specified in the menu shall be used to address the level sensor to the correct screen (Fuel 1 …. Fuel2).

ALARMS

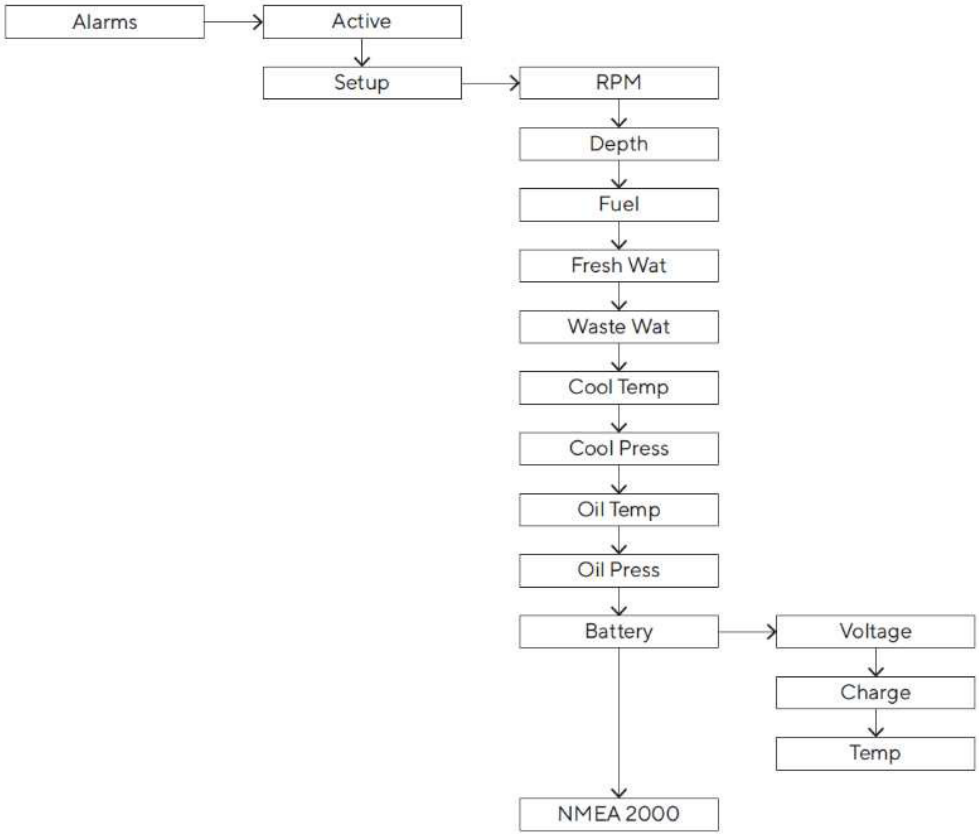
ALARMS NOTIFICATION

The 6VM indicator shows internal active alarms. The **ALARMS** item allows you to set the alarms that can be generated by the indicator and the relative alarm thresholds.

In the event of an alarm, the following appears on the display:

- The alarm popup appears.
- The corresponding alarm lamp will light up if present.
- The buzzer is activated, if connected and set.

ALARMS MENU STRUCTURE



SET AN ALARM

- In **ALARMS > Setup** select the value to activate the alarm and then **Active**.
- Set the desired alarm threshold.

LIST OF MANAGED ALARMS

Local alarms

- Engine Overtemp
- Battery low
- Overvoltage
- Battery low charge
- Low Coolant Pressure
- Low Fuel #
- Engine overspeed

ALARM TELLTALES

Position	Telltale	ISO symbol	ON colour
1	Fuel level		Amber
2	Engine warning indicator (MIL)		Amber
3	Coolant water pressure		Red
4	Oil pressure		Red
5	Lost GPS		Red
6	Coolant water temperature		Red
7	Battery voltage		Red
8	Immobilizer		Amber
9	Troll mode		Blue

Every telltale shall be black and not visible when not active.

TROUBLESHOOTING

DATA DISPLAY

Problem	Root cause	Solution
The values displayed are not as expected.	Incorrect sensor configuration.	Check the configuration in the Sensors menu.
	Sensor connected incorrectly.	Check the connection, refer to the Installation Instructions.
	The ComandLink network backbone has not been created correctly.	Check the connections and that there is a termination at both the beginning and end of the backbone.
The value is not displayed / Only dashes displayed	Not available on the network.	Check that the sensor is functioning correctly.
	Sensor not connected.	Connect the sensor, refer to the *Installation Instructions*.
	The ComandLink network backbone has not been created correctly.	Check the connections and that there is a termination at both the beginning and end of the backbone.
Slow update rate on ComandLink data	The value is expected to be received from the analog input.	Disable the analog inputs when they are not being used.

INTERNAL GPS

Problem	Root cause	Solution
The displayed speed is "- - -"	GPS module in search state (GPS search)	Wait. The search operation takes about one minute, then the GPS is ready (GPS valid).

TECHNICAL DATA

GENERAL FEATURES

Material	Mineral glass front lens Stainless steel frame
Connectors	• Molex MX150 (with EasyLink connector integrated in the pigtail cable)
Input data	• 2 analogue inputs (0-400 Ω) • 1 frequency input (0-4 kHz) • 1 LIN bus
Output data	• EasyLink
Degree of protection (according to IEC 60529)	IP X7
Display	Hybrid with 1.44" central TFT and color IBN
GPS Antenna	Integrated, 10 Hz, 72 channels Supported constellations: GPS, GLONASS, Galileo

ENVIRONMENTAL FEATURES

Operating temperature	From -20 to +60 °C
Storage temperature	From -30 to +80 °C

ELECTRICAL FEATURES

Nominal voltage	12 V
Operating voltage	9–16 V
Current consumption	< 100 mA @ 12 V
Absorption (LEN)	2

COMPLIANCE

Compliance	CE UKCA UL94
Directives	2014/30/EU (Electromagnetic compatibility) 2011/65/EU (Hazardous substances in electrical and electronic equipment)
Reference standards	IEC 60945: 2002-08 (environmental class: exposed)

DISPOSAL RESPONSIBILITY



Dispose of by separate collection through government or local government designated collection facilities.
Proper disposal and recycling will help prevent potentially negative consequences for the environment and people.

SPARE PARTS AND ACCESSORIES

Product	Part Number
Pigtail cable with MX150 connector	A2C14333300
Spin lock	A2C13760900
EasyLink extension cable	A2C59500139
Rubber gasket	A2C14624100
Wiring harness for outboard engines	B00106601
IBS (Intelligent Battery Sensor) 12V Gen. I	B00043901
Adapter cable for IBS	B00090601

For all available accessories, visit http://www.veratron.com.

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