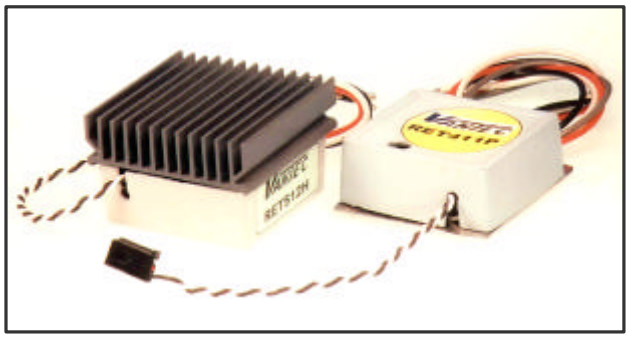
VANTEC

Orders: **(800)882-6832**

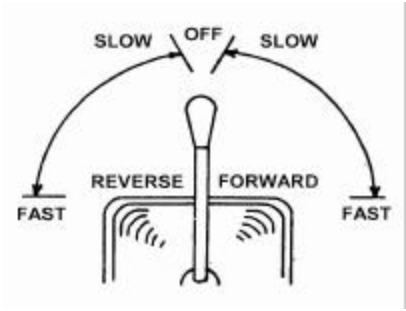
FORWARD & REVERSE PROPORTIONAL SPEED CONTROLS

MANUAL



- **CAPTAIN LOW COST R/C MODEL CONTROLLERS**
- **MOSFET FULL H-BRIDGE OUTPUTS** ***NO RELAYS TO STICK***
- **VERY WIDE VOLTAGE RANGE & VERSIONS FOR 1-33 AMPERES**
- **OPTICALLY ISOLATED**
- **RET411W IMMERSIBLE for R/C COMBAT**
- **TRIED & TRUE CIRCUIT DESIGN with IMPROVED VOLTAGE RATINGS**

This low cost **CAPTAIN** series of **R**eversing **E**lectronic **T**hrottles totally replace the mechanical throttle servos, cumbersome rheostats and switches that were formerly required to control **DC P**ermanent **M**agnet motors in **R**adio/**C**ontrol models. **All** of these units are *fully proportional in reverse* as well as forward from one **R/C** channel. For the **P**late mounted version they are a compact 1.8 X 1.97 X .82" and weigh about 2.5 ounces.



These units are optically isolated to eliminate noise "glitch" coupling and plug into your receiver like a servo but draw no receiver power. Available with connectors for Futaba "J" for FM or PCM, & Futaba "G" for older AM sets, Airtronics, Hitec, JR, Ace/Deans and Cannon/Deans. Compatible with many other radios as well.

Power MOSFET technology combines with moderate rate **P**ulse **W**idth **M**odulation so you get smooth low speed operation, precise intermediate speeds and efficient full speed without the annoying "singing" of model car controllers. The solid state H-bridge design uses no relays, extra modules, nor are *special* heat sinks required. Unlike most hobby controllers with exposed transistors that can short out, these **VANTEC** units are fully enclosed and the critical MOSFETs that conduct your motor current are properly thermally mounted to a metal heat conducting plate or heatsink with special insulating washers. The case is electrically neutral.

The **CAPTAIN** type **RET411P,** pictured above, is a ideal replacement for hot mechanical Dumas controllers and inferior units with sticky relays. With both proportional reverse and proportional forward it is perfect for R/C scale boats, small subs, tanks and auxiliary robots functions. It controls Dumas, Mabuchi 540, Astroflight 02 through 10 motors, gear reduced Astro 15 or 25 on 12VDC and most other motors rated 4.8 to 26 Volt DC at 12 genuine American Amperes continuous duty or 30 Amperes starting surge. See the sidebar on Ampere ratings on page 2. The **RET411P** features the tried and true circuit design of our venerable **RET44** but with an increased voltage rating and MOSFET ratings totaling 155 amps. An optional heatsink version is now available, specify the **RET411H.** For *R/C combatants* order the slightly larger and higher cost immersible **RET411W** (not illustrated).

VANTEC RET411-713

The type **RET512P** is like a Novak controller that is rated to 26 volts and gives proportional reverse as well as proportional forward. Great for cars and trucks, and for smaller performance boats or larger scale hulls. The **RET512P** handles most '05 Hot Winds, Mabuchi 540, Astroflight ferrite motors operated at 14 cells or less, and most other motors operated at 18 Amperes continuous duty or 50 Amperes starting surge. Over 310 amps worth of MOSFETransistors. To order the heatsink version, also pictured, ask for the **RET512H.** The 32nd Parallel type 7 sub runs nicely with the **RET512** controllers.

The **CAPTAIN** type **RET713P** employs the highest rated MOSFETs available today to pack a reversing 33 amp continuous duty 85 amp starting surge controller in a miniscule box. MOSFET ratings total 480 amps. For your bigger toys like off-road trucks and dragsters and up to 26 VDC! It will handle up to Astro40 marine cobalt. Like the others this unit can be ordered as the **RET713H** with a heatsink. Or as the **RET713P** plate mount and bolted on your machines metal heat dissipating frame to save space and expense.

	CONTINUOUS AMPS tested @ 12 VDC				
RET model number	**H**eat Sink types	**P**late type with plate mount-ed	**P**late type with Plate *Un--mount-ed*	Motor Start-ing Surge for 5 sec-onds	MOS FET total cumul ative rat-ings
RET411P		**12A**	8A	30A	155A
RET411H	**12A**			30A	155A
RET411W	**12A immersible**			30A	300A
RET512P		**18A**	13A	50A	310A
RET512H	**18A**			50A	310A
RET713P		**33A**	23A	85A	480A
RET713H	**33A**			85A	480A

INSTALLATION: Don't locate the unit directly adjacent to servos, the R/C receiver, or any components that run hot. Small models like scale boats will not require any special attention for cooling. Simply mount the unit securely so that the aluminum base plate or optional heatsink is exposed to the air. Closed hulls, like submarines, that contain other devices that may run warm such as batteries should purchase the next better rated model.

ABOUT THOSE AMPERES

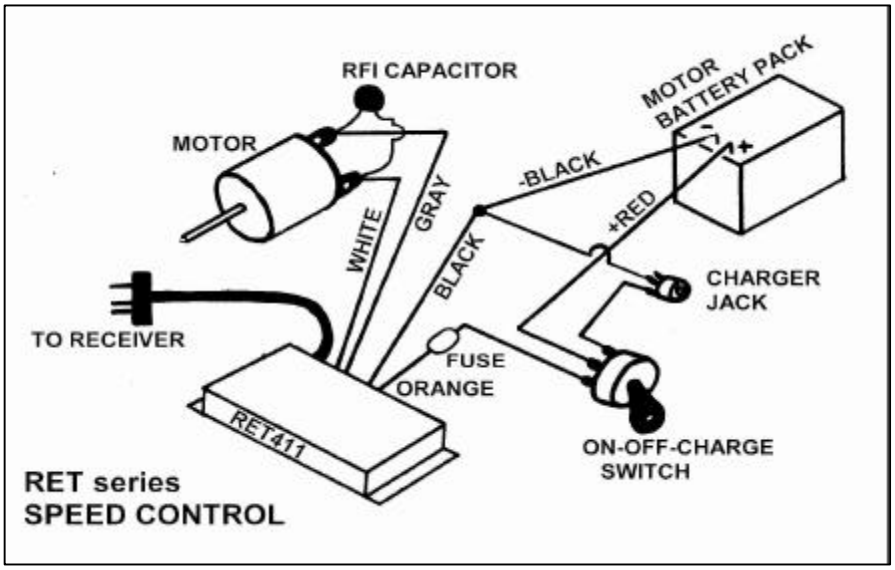
One major type of R/C controller is designed for R/C car racing employing 7.2 volt Nicad battery packs. Because winning is so important some manufacturers or importers of controllers for the R/C car market feverishly out-advertise each other with outlandish claims s-t-r-e-t-c-h-ing the ampere capacity of their controller. Hundreds of amps is not an uncommon claim; the connecting wire alone will not handle it. A "Continuous" rating to these manufactures means the duration of a 3 minute race. Often there is n o means for heatsinking the MOSFETransistors that carry the amps.

VANTEC Continuous current ratings represent the amount of current that the controller can safely conduct at 100% duty cycle for hours with a near infinite heat sink. This makes sense because VANTEC controllers provide a proper thermal mount or, like the RET411H, a suitable heatsink to meet ratings. Amps as American as Apple Pie! Plate mount style controllers like the RET411P can operate continuously without any additional heatsinking at 70% of their Continuous rating. VANTEC Starting Surge current ratings are the amount of current safely conducted for a useful 5 second period.

Larger applications with continuous motor loads at the controllers maximum ratings may require moderate cooling air or "**P**" plate versions may require mounting by their aluminum plate to additional heat dissipating surfaces. Because the case is electrically isolated you can mount the plate to your metal shelf, tank mechanics, robot frame or a heatsink of your choice when required. If the unit becomes too hot to touch case, cease operation and investigate the cause. Verify motor current under load with an inexpensive automobile amp meter.

POWER & MOTOR WIRING : Observe motor battery polarity when connecting the orange and black heavy gauge wires to the motor battery pack. Anticipate stalled motor conditions like debris stuck in the prop and install an on-off-charge switch and an automotive blade fuse or type 3AG regular-blow glass fuse in series with the heavy gauge orange wire. Select the smallest fuse amperage which will support your normal operation but no larger than rated surge current. Check to be sure the on-off-charge switch controls the plus or red lead from the motor battery pack.

Connect the controller heavy gauge black wire directly to the black wire of the battery pack. If you plan to remove the unit regularly obtain polarized connectors for the battery. Never power the unit from a battery under charge, a charger or power supply.



Connect the motor to the controller's white and gray heavy gauge wires. If throttle stick operation is backwards simply reverse these two motor wires; do *NOT* reverse the battery connections.

If your motor is not already so equipped install a .001ufd - .01ufd ceramic disc capacitor directly across each motor's brushes and between each brush and their motor case to prevent Radio Frequency Interference from your motor's arcing brushes. These are yellowish round parts sometimes labeled "102" - "103 with two leads.

COMMAND INPUT : Keep all motor and motor battery leads separated from receiver and servo leads. Use the full extended length of the supplied receiver antenna and locate it away from all other wires and metal structures. To complete the installation plug the servo connector into the throttle output of the R/C receiver. If it becomes necessary to change servo connectors we suggest an adapter be constructed rather than rewiring the Electronic Throttle. Color coding:

+4.8VDC from R/C receiver	red not used
Ground	black or brown
	(center wire on Airtronics)
Servo Pulse	- white or orange
	(opposite red stripe on Airtronics)

ADJUSTMENTS: The single centering adjustment comes factory preset for your radio. Normally center-stick is neutral-off and the transmitter trim control provides fine adjustment. Some applications call for an offset forward/reverse so the Electronic Throttle can be adjusted with an insulated screwdriver through the small hole in the case. **VANTEC** units don't require any awkward rate adjustment.

TITANIC MODE: If you sink your speed controller; immediately turn off power, thoroughly rinse with clean water, wash in a solution of "409" spray cleaner, rinse again, and force dry with a hair dryer. It *might* work again. Consider the waterproof **RET411W**.

REPAIR: Our one year *limited* warranty covers parts and repair labor for a nominal charge. Units not abused, immersed (excepting the RET411W) or tampered with will be repaired. Return the unit to us with a check or VISA/MC with EXPIRATION date for the current repair deposit amount listed on the price sheet to avoid COD charges or approval delays. Units in warranty will receive a partial refund. Please indicate associated equipment and *briefly* explain the problem. It is not necessary to obtain a "Return Materials Authorization" number but often a telephone call can save you the time, trouble and expense of a repair. We recommend you insure shipment.

NOTES: A single Electronic Throttle may control several motors together if total current and voltage ratings are not exceeded; consider series as well as parallel motor connection. Dual motor systems with mechanically coupled shafts must be wired in series. The **RET411** is **not** for model cars. A *slight* singing hum from the motor at slow speeds is normal. **VANTEC** choose not to eliminate the R/C battery by regulating the motor battery because control reliability is impaired as the motor battery is drained; use a separate Battery Eliminator. Certain receiver decoders will not drive the optical isolator in these units from their channel-4 servo command output; use another channel or call for *free* peanut buffer amplifier. Paralleling Electronic Throttle servo inputs or use with mixers for differential twin screw or tank type steering is not recommended; use our **RDFR** series speed controls made for that purpose. Contact **VANTEC** about professional control systems for commercial applications. These products are ***not safety devices nor for use in life-critical or life support systems.*** Specifications and price subject to change without notice. Patented or patent pending. Some trade names & trademarks owned by others.

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