

RC MODEL ELECTRONICS

RECOMMENDATIONS & TIPS



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DC ELECTRONIC SPEED CONTROLLER AND MOTOR

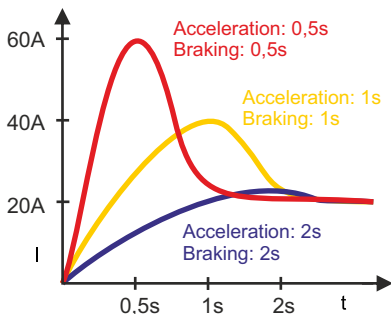
To select a proper ESC is necessary to consider motor's stall current. (Tab.1, pg.3, 4). The stall current (the car crashed into an obstacle, plant wrapped around the boat propeller and etc.) is usually much higher than current at a maximum efficiency.

Example: Motor with current at its maximum efficiency 20A when accelerating or stalling the current can rise over 80A.

Be aware that the same situation happens when accelerating/decelerating rapidly (short acceleration time).

If you select the ESC just according the motor current at maximum efficiency than when the motor will stall or accelerate/decelerate rapidly the ESC could be damaged.

For powerful motors set the acceleration and deceleration time at minimum 2s and the power at maximum 80%.



ESC's BEC

BEC supplies the power voltage for receiver and servos.

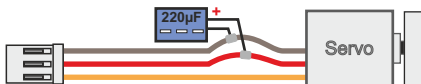
Make the servos selection according the servo current consumption (Attention: some high speed and high power servos consume much higher current than standard servos).

When overloading, the BEC providing power is limited. When using higher loads ensure proper cooling with flowing air, cooler and etc.

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The current load rating depends on power losses (the higher accumulator voltage the shorter allowable time of maximum current provided from BEC).

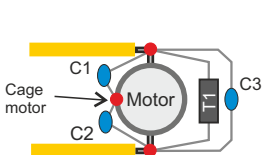
If the connected servo has high pulsed power consumption than connect LOW ESR capacitor C5, 220uF/10V to the servo cable.



For high current consumption, high voltage accumulators or when using more powerful servos, use external BEC.

POSSIBLE NOISE SOURCES

Insufficiently suppressed Motor. Motor's grounding If the motor is not sufficiently suppressed, provide the suppression by soldering capacitors C1-C3, 10nF/100V/X7R and bipolar transistor T1. (P6KE15CA).



Dirty motor brushes. Clean the brushes and motor inside.

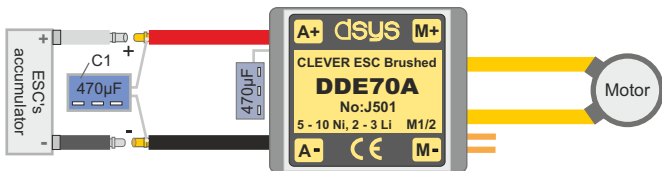
Worn motor brushes, change the brushes for new and run in the motor for about 5 hours without load connected directly to accumulators (without using ESC).

Dirt in motor, dry bearings. Clean and grease regularly.

Vibrations. Prevent vibration of rotated parts.

Power source under-voltage. To power the ESC select the low inner resistance accumulator to prevent the voltage drop which could cause improper motor running or ESC functionality.

If you experience the voltage drops or if you need to extend the power cables than solder C4 Low ESR 470-2200uF capacitor to the ESC's power input leads.



Mechanical parts quivering. Isolate and grease touching parts.

Low quality connectors. Use high quality connectors suitable to stand the maximum current.

Small cross section power cables. Use strong enough cables as short as possible.

Unsuitable antenna location. Secure the antenna at least 3 cm from motor, Esc, servos and all metal parts.

Improper Wiring. The cables located in the RC model can be acting as a undesirable antenna causing the receiver interference. Try to change cables location and avoid an close configuration. Separate the power cables from the other wires.

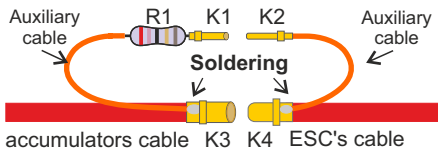
For galvanic (OPTO) isolation we recommend to use dsys DOP1C opto-isolator.

ELECTRIC SPARK

When the ESC with high value filter capacitor is connected to the battery pack a sparking commonly occurs. The electric spark reduces the connectors and capacitors reliability and lifetime.

Anti-spark protection using resistor.

- connect K3 accumulator connector K(+) pole to the auxiliary cable with resistor R1(27R/0,6W) and K1 connector.
- to the ESC's power cable connector K4 solder other cable with K2 connector.
- Insulate all connectors and the resistor by a heat shrink tubing.



Connecting the ESC to accumulator. Connect the accumulator negative pole connectors with ESC's negative pole. Connect the auxiliary cables using K1 and K2 connectors. Wait 1s and connect the power positive cable using connectors K3 and K4.

Disconnecting the ESC. Unplug the K1, K2 connectors and than K3, K4 connectors. Disconnect the negative power cable.

Using Anti-sparking Connector

Connect Anti-Spark connector to the K(+) accumulator pole. The Anti-spark connector uses inbuilt resistors to reduce the charging current.

Insulate the connectors by a heat shrink tubing.



Tab.1 DC Motors Current Ratings

Motor	nominal voltage [U]	max. efficiency current [A]	stall current [A]	length [mm]	diam. [mm]
Speed 280	6	1,6	6,8	31	24
Speed 300	6	5	28	31	24
Speed 400 Race	4,8	7	40	38	28
Speed 400	6	4	25	38	28
Speed 400 Plus	6	4	25	38	28
Speed 400	7,2	3,3	21	38	28
Speed 400 Plus	7,2	3,3	21	38	28
Speed 480	7,2	5	31	47	29
Speed 480 Race	7,2	11	58	47	29
Speed 480 BB Race	7,2	8,5	60	47	29
Speed 500	7,2	9	59	50	35
Speed 500 eco-Race	7,2	18	90	57	36
Speed 500 Race	7,2	14	96	50	39
Speed 500 BB Race VS	7,2	17	112	50	36
Speed 500 BB Race	7,2	9	110	52	36
Speed 500 BB Race 2W	7,2	18	190	52	36
Speed 500 SP	8,4	7	44	50	36
Speed 500 SP Race	8,4	18	85	50	36
Speed 500 E	12	2	10	50	36
Speed 600 ECO	7,2	7,5	50	57	37
Speed 600	7,2	12	85	57	36
Speed 600 Race	7,2	18	130	57	38
Speed 600 BB SP	7,2	90	57	57	38
Speed 600	8,4	11	70	57	37
Speed 600 Race	8,4	12	90	57	36
Speed 600 BB SP	8,4	10	88	57	36
Speed 600	9,6	7	58	57	36
Speed 600 BB SP	9,6	6,6	55	57	36
Speed 650 BB Race	9,6	12	89	65	38
Speed 600 BB Turbo	12	7	40	57	37
Speed 600 BB Turbo	14	5	33	57	37

Motor	nominal voltage [U]	max. efficiency current [A]	stall current [A]	length [mm]	diam. [mm]
Speed 700 BB Turbo	8,4	15	75	67	44
Speed 700 BBTurbo N	9,6	16	117	66	45
Speed 700 Race	9,6	18	90	66	45
Speed 700 BB Turbo	12	13	43	67	44
Speed 720 BB Torque	12	3	14	72	44
Speed 820 BB T Race	20	21	166	68	48
Speed 900 BB Torque	12	8	54	85	52
CARSON POISON T	8,1	-	19	50	36
SATURN HP 35T RACE	8,1	-	65	50	36
MABUCHI RS-540SH T	8,1	-	78	50	36
RC4WD crawler 80Turn	8,1	-	13	50	36
RALLY MONTECARLO	8,1	-	91	50	36
HIMOTO RC540	8,1	-	120	50	36
NOVAK55T TERRA CT	8,1	-	33	50	36
Himoto 70T High Torque	8,1	-	18	50	36
Novak Fivtyfive 55T-20z	8,1	-	40	50	36
Novak Hi torque E45T	8,1	-	38	50	36
Rob. Rock Crawler 55T	7,4	-	32	50	36
Axial, Racing 55T	7,4	-	32	50	36
27SINGLE BLACK cor	7,7	-	32	50	36
AXIAL 27T	8,1	-	84	50	36
AXIAL 55T	8,1	-	37	50	36
55T Crawler	8,1	-	31	50	36
Maverick 21 Hi torque	8,1	-	49	32	25
Saturn 35T	8,1	-	51	50	36
Saturn 27T	8,1	-	58	50	36
Robbe power 755/40	12	-	25	-	-
JIN DING JD 550	12	-	>105	50	36
hpi-Racing GT550 14,4V	8,1	-	>120	57	3

Some information used from <http://www.mo-na-ko.net/ruzne-SPEED.htm>



For more information about our products for hobbyist please visit www.dsys.cz (Products).

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