

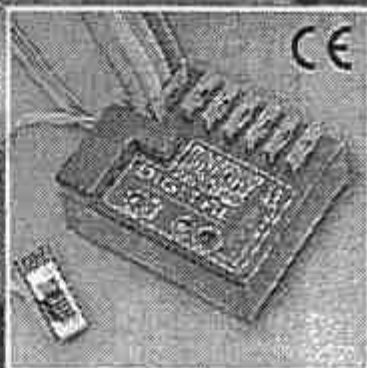
SPEED CONTROL USER'S GUIDE



INDY200
DIGITAL

No. 8346

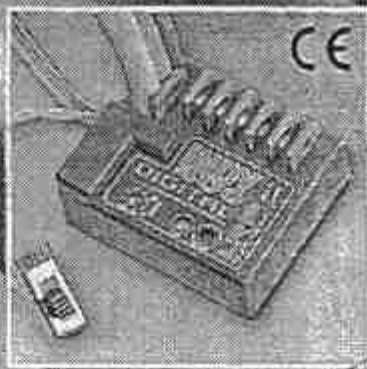
Sport



INDY400
DIGITAL

No. 8357

*Super
Sport*

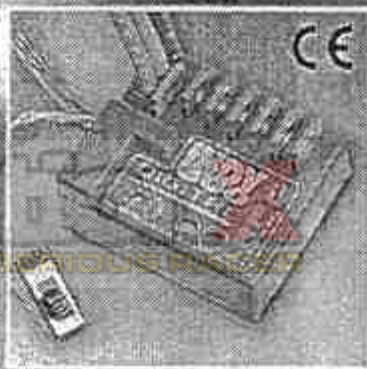


INDY600
DIGITAL

No. 8361

Pro Sports

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DEAR CUSTOMER,

you purchased one of the most sophisticated electronic speed controls in the world. Due to the use of latest digital technology the performance and reliability of the well known Indy-Series was increased again.

A great deal of the superior performance of the Indy-Digital-Series is based on the following all new features (to be described in detail on the following pages):

- Adjustable Power Control
- Intelligent Temperature Protection (ITP)

Even on the race track the Indy speed controls are natural born winners.

GENERAL INFORMATION

Even though installation and setup of the Indy is pretty simple, please follow the instructions carefully step by step. By doing so you will achieve greatest performance. Especially read the topics 'Mounting', 'To avoid danger or damage', 'Installation' and 'Connection of Wires' to avoid any kind of misuse and damage.

The installation and setup of Indy 200, Indy 400 and Indy 600 is identical except the topics 'Connection of Wires' and 'Tuning Motors'. Therefore only one Indy type is shown in picture.

This speed control is designed to be used in battery powered RC-Models only.

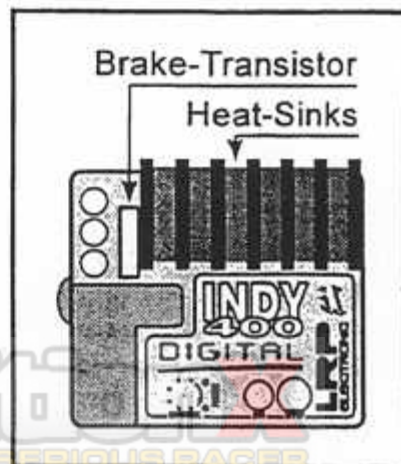
USE BY CHILDREN

Not recommended for children under 14 years - No toy

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MOUNTING

- Mount controller with double-sided servo tape.
- A little airflow inside the body shell is absolutely necessary, improves performance and increases lifetime of all electronic components.
- Mount speed control in a place where it can't be harmed by a crash.
- The speed control should be mounted in a way allowing easy access to the on/off switch, setup button and current limiter pot (APC).
- Keep some distance (3 cm, 2 inches) between the speed control, all power wires and the receiver. Especially avoid contact between receiver, antenna and any power wire. This could cause radio glitches. In case of radio glitches, put the components to another place inside the car.
- Keep the power wires as short as possible to avoid radio glitches.
- The receiver antenna should go straight up out off the receiver. Avoid contact with carbon fibre or metal parts. If the antenna is too long, cut it to a length of about 35 cm/14 inches but never coil it. (See also instructions of your radio)
- **Heat Sinks** (available as accessory No. 8155):
Improve the performance of the Indy speed control. Only use original LRP heat sinks.
The 6 forward transistors should never get in contact with the single brake transistor which is not in line - short circuit.
Therefore no additional heat sink should be put on the brake transistor.



TO AVOID DANGER OR DAMAGE

- *Important:* never leave your RC-Model unattended when the battery is plugged in or the speed control is switched on. In case the speed control was damaged before, this could cause fire to your model or worse.
- *Never* get your speed control or other electronic parts in touch with *water*. Avoid racing in the wet. If you have to, the best protection will be given by paper tissues (Kleenex).
- As long as the motor is connected to the speed control, never let it run directly with a separate battery; this causes destruction of the speed control and loss of warranty.
- Never cut off the original connectors and switch - this definitely will cause the loss of any warranty
- *Avoid cross connection, short circuits or reverse polarity* to prevent damage to the speed control. In case you prefer another connector system, use reverse polarity proof connectors with male/female like LRP Hi-Amp (No. 6280) or Reedy Power (No. 652).
- Never put any kind of metal or wire in touch with the FET Heat Sinks.
- Never cover your speed control with any kind of material - in contrary, airflow increases performance!
- Always look for good isolation of all wires. Wrong handling or cross connection causes fatal damage of your high tech product.
- Never change the polarity of your receiver plug (see detailed instructions).
- Connect the included Schottky diode onto the motor. The Schottky diode increases the performance and reliability of every forward only speed control.

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INSTALLATION

Always follow the order of the following steps. Each step is described in full detail on the following pages.

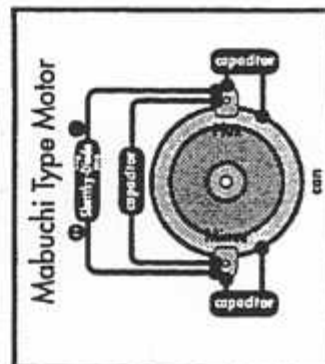
- Solder the included Schottky diode and capacitors to the motor.
- Take off the motor pinion or make sure, that the wheels of your car can move free.
- Connect speed control to motor and receiver (channel 2), watch out for right polarity.
- Make sure your speed control switch is in off position.
- Finally check all the connections BEFORE connecting the speed control to the battery!

Attention wrong or cross connection will definitely destroy the speed control !!!

SOLDERING OF SCHOTTKY DIODE AND CAPACITORS TO THE MOTOR



Motors with insufficient or without capacitors can damage your speed control. Therefore you definitely should solder the included capacitors to your motor as shown in the picture.



SCHOTTKY-DIODE:

The Schottky Diode improves the efficiency of the motor-speed control system and is an additional protection for the brake FETs. Solder it to the motor as shown in the picture, make sure that the white ring is at plus. Schottky diodes are only to be used with *Forward/Brake* speed controls like the LRP Indy.

RECEIVER PLUG

Due to technical reasons, F1 controls can be equipped with different receiver plugs.

EQUIPPED WITH FUTABA PLUG

(wire: black, red, white)

Fits into Graupner/JR receivers if the 'plastic nose' is cut off. Some units are supplied with an additional Graupner/JR plugs for polarity see the following figures.

EQUIPPED WITH GRAUPNER/JR PLUG

(wire: brown, red, orange)

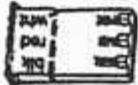


Fits perfect into Futaba receivers, just watch out for right polarity

CONVERSION TO SANWA RECEIVERS

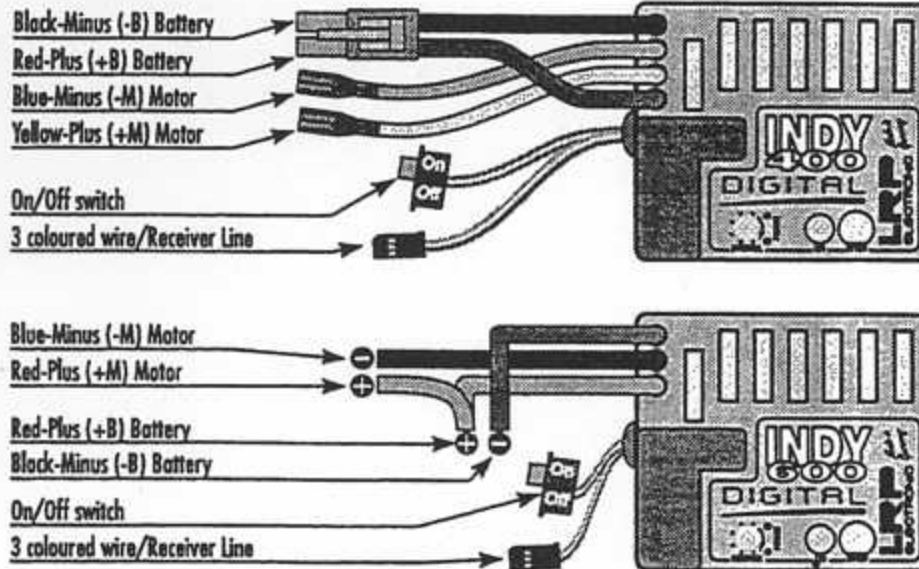
Use the included Sanwa plug, watch out for correct polarity (Plus and Minus have to be switched)
(For Spain Sanwa connector with wire black, black, red might be mounted)

EXCHANGE OF PLUGS

Press the metal nose of the plug down with a small screwdriver, pull the connectors carefully out of the plug, bent the nose up again and press the connectors into the proper plug. Avoid wrong polarity.

PLUG	WIRE:	FUTABA	GRAUPNER/JR	
Graupner/JR		white red black	orange red brown	= Signal = Plus = Minus
Futaba		black red white	brown red orange	= Minus = Plus = Signal
Sanwa		white black red	orange brown red	= Signal = Minus = Plus

CONNECTION OF WIRES



Attention: Never connect the motor wires (yellow/blue) to the battery, this causes damage.

THIN BLUE WIRE - CONNECTION OF A FET SERVO

FET-Servos like KO 1001/1002 are very powerful servos. Since they draw very high amps from the BEC, they are equipped with an extra wire (normally blue) to avoid BEC-overload. Connect this extra wire to the thin blue controller wire.

Always use the small choke which comes with servo to avoid radio glitches.

If you use a normal servo and not a FET-Servo, the thin blue wire has no function. Leave the wire isolated and don't connect it to other wires or parts of the speedo. A short circuit will definitely destroy the speed control.

ADJUSTING THE SPEED CONTROL TO YOUR TRANSMITTER NEUTRAL/FULL THROTTLE/BRAKE

The basic adjustment is very simple. Just follow the instructions step by step. There is no time limit for all the adjustments.

Each step is completed when you freeze/save the setting by pressing the setup button. (Different to other manufacturers). The setup adjustments stay memorized even when no battery is connected.

If you make an error while setting up, don't worry, switch off your speed control for about 10 seconds and start again.

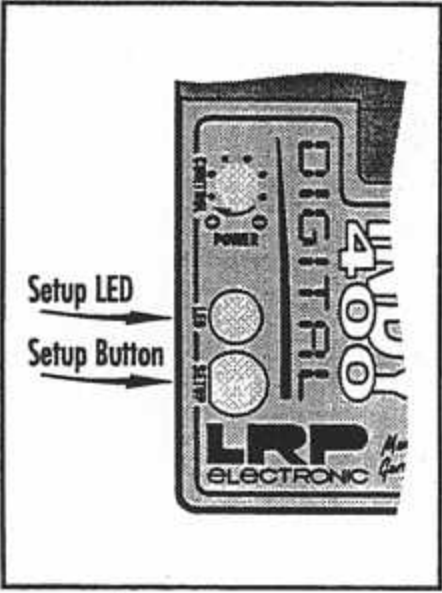
PREPARATIONS TO START SET UP

- Make sure the speed control is switched off.
- Take off the motor pinion or make sure, that the wheels of your car can move free
- Turn on the transmitter.
- Adjust your transmitter to the following (if these functions are available):
 - High ATV, EPA - maximum setting
 - Low ATV, EPA, ATL - maximum setting
 - EXP, EXPO - start with zero
 - SUB Trim, Neutral - middle setting
 - TH Trim, Coast Brake - middle setting
 - Throttle Reverse Switch - any way, don't change after speed control setup.

Asymmetric throttle throw is possible (2/3 forward 1/3 reverse)

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SETUP

- When a motor is connected, it will not run during the setup procedure.
 - Connect the speed control to a fully charged battery.
 - Turn on transmitter and the speed control.
 - Press the setup button for a minimum of 2 seconds by using the included plastic screw driver (thin end). The Setup LED will start to flash orange to indicate setup mode. A connected motor will stop running.
- 
- The diagram shows the LRP Digital Motor Controller (DMC) with two arrows pointing to the Setup LED and the Setup Button. The Setup LED is located above the Setup Button. The DMC has a digital display showing '0000' and the LRP ELECTRONIC logo at the bottom.
- Make sure your transmitter throttle position is at neutral.
 - Press the setup button to freeze/save neutral.
 - If a motor is connected, it will start to peep now to indicate the next step. The Setup-LED is flashing green.
 - Pull and hold full throttle forward on the transmitter and press the setup button to freeze/save full throttle. Release full throttle on the transmitter after you pressed the setup button.
 - The Setup-LED is flashing now red.
 - Push and hold full reverse/brake on the transmitter and press the setup button to freeze/save brake. Release full reverse on the transmitter after you pressed the setup button.
 - The Setup-LED is not lighting up any more.
 - Go back into neutral position of the transmitter throttle. Now the speed control is fully set and you can start to enjoy your LRP Indy.

FUNCTION CHECK

Function		LED status
Neutral		orange
Forward	partial	green
Forward	full	out
Brake	partial	red
Brake	full	out
Temp Protection	activated	flash red/green

Before running for the first time on the road/track, check all functions. Especially take care, that your speed control reaches full throttle position (green light switches off).

NORMAL OPERATION

after you set up your speed control always operate the following way:

Start Operation

1. Turn on your transmitter
2. Plug in your battery
3. Switch on your speed control

End Operation

1. Switch off your speed control
2. Unplug your battery
3. Turn off your transmitter

Important: Never leave your RC-Model unattended when the battery is plugged in or the speed control is switched on. In case the speed control was damaged before, this could cause fire. Always disconnect the battery when not in use.

Attention: After each run battery, let speed control and motor cool down before you race again, especially using very hot tuning motors. Running too often without cooling break could damage motor or activate the temperature protection.

EMK BRAKE

The Indy speed control offers a fully proportional EMK-brake that gives perfect car control even on slippery surfaces.

Due to digital technology, full braking power is always available, even with transmitters that offer only limited throttle throw.

The Advantages: • super responsive brake
• superior brake power

If the braking power is too strong, you can readjust your transmitter's Low ATV, EPA, ATL function.

ITP INTELLIGENT TEMPERATURE PROTECTION

The digital temperature protection and continuous performance control allow using the full potential of the speed control, giving more power and performance.

If the speed control overheats despite that, the motor function is shut off but the steering remains working. The Setup LED flashes red/green. Let the unit cool down some minutes.

If the speed control shuts down too often, the motor being used is too strong or the motor pinion is too large. Use a smaller motor pinion and cut some cooling holes into the body shell.

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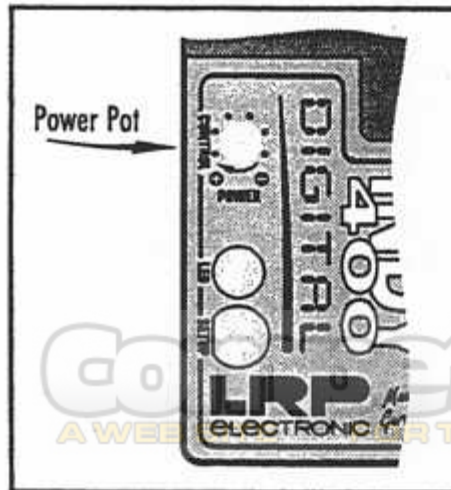
APC (ADJUSTABLE POWER CONTROL) CURRENT LIMITER

Running strong tuning motors or racing on slippery surfaces can be quite difficult. A spinning car is no fun. The Adjustable Power Control is the perfect solution:

- Prevents the car from spinning
- Improves car control and lap times
- Can improve the running time

ADJUSTMENT

- You want full power
Turn the power pot with the included plastic screw driver full to the right (do not turn the pot beyond its mechanical limit)
- Car spins during acceleration - you need less acceleration power
Turn the power pot so far to the left until the car becomes controllable
- Temperature Protection is activated too soon when using a strong tuning motor
Turn the power pot about 1/3 to the left



The Adjustable Power Control has no negative influence on the top speed !! It is worth while experimenting with the Adjustable Power Control. By doing so, operate step by step.

MOTOR CHOICE CARS

When using tuning motors, a motor pinion being 2-5 teeth smaller than the original pinion is recommended to avoid over heating

With a 7 cell battery, you always have to choose a softer motor and a smaller motor pinion. Make sure that your motor is suitable for 7 cells.

Motor/limit	Minimum Turns	
	6 cells	7 cells
Indy 200	13	15
Indy 400	11	13
Indy 600	no limit	no limit

For America we recommend Reedy Stock, Turbo Stock, Sonic and Ultra Sonic with the appropriate winds.

RULE OF THUMB

Less turns give more power but are also harder on the speed control and the batteries (less running time).

Using stronger motors than recommended will not damage the speed control. The temperature protection could be activated sooner. This can be delayed by using a very small motor pinion.

	INDY 200	INDY 400	INDY 600
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	INDY 200	INDY 400	INDY 600
Motor Included kit	●	●	●
Mabuchi 540	●	●	●
Graupner VZ	●	●	●
LRP Truck Puller Nr.5736	●	●	●
LRP Runner 2 Nr.5826	●	●	●
Tamiya Sport Tuned	●	●	●
LRP VB Superprop Nr.5825	●	●	●
LRP VX Turbo Nr.5725	●	●	●
LRP Rallye 23x2 Nr.5823	●	●	●
LRP Rallye 21x2 Nr.5821	●	●	●
LRP Rallye 19x2 Nr.5819	●	●	●
LRP Rallye 17x2 Nr.5817	●	●	●
LRP DTM Special Nr.5718	●	●	●
LRP F1 23x2 Nr.5723	●	●	●
LRP F1 17x2 Nr.5717	●	●	●
LRP F1 15x2 Nr.5715	●	●	●
LRP F1 13x2 Nr.5713	●	●	●
Tamiya Acto Power Black	●	●	●
Tamiya Acto Power Blue	●	●	●
Tamiya Acto Power Pink		●	●
yellow E Nr.5117	●	●	●
red SE Nr.5114	●	●	●
green E Nr.5116	●	●	●
red E Nr.5115	●	●	●
brown E Nr.5411	●	●	●
silver X Nr.5312	●	●	●
white X Nr.5217	●	●	●
gold X Nr.5313	●	●	●
orange X Nr.5219	●	●	●
Truck Torque Nr.5512	●	●	●
blue SX Nr.5216	●	●	●
Diablo Nr.5212	●	●	●
pink X Nr.5231	●	●	●
Bee D Nr.5241		●	●
Viper Nr.5243		●	●
Truck Speed Nr.5514		●	●
Magic Nr.5224		●	●
Killer X Nr.5227		●	●
Truck Stadium Nr.5516			●
Big C Nr.5225			●
Super 400 G Nr.5681	●	●	●
Super 400 E Nr.5692	●	●	●
Super 400 S Nr.5690	●	●	●
LRP Marine Nr.5685	●	●	●

TECHNICAL DATA

Voltage Input with BEC		4-8 cells (4.8 - 9.6 V)
Voltage Input without BEC		4-10 cells (4.8 - 12.0 V)
BEC Output Voltage		5.0 V
max. BEC Current	30 sec.	1.6 A
cont. BEC Current	5 min.	0.6 A

POWER DATA

	INDY 200	INDY400	INDY 600
Rated Current 1 sec. *	150 A	230 A	330 A
max. Current 30 sec.	70 A	85 A	100 A
cont. Current 5 min	35 A	50 A	60 A
Switch-On Impulse Suppression	yes	yes	yes
Temperature Protection ITP	yes	yes	yes
EMK Brake	yes	yes	yes
Regenerative Brake	yes	yes	yes
APC Adjustable Power Control	yes	yes	yes
PWM Frequency	2100 Hz	2300 Hz	2500 Hz
Wight with wires	40 g	40 g	40 g
Size in mm	41x36x19	41x36x19	41x36x19

* transistors rating at 25°C junction temperature

RECEIVER BATTERY

A receiver battery is normally not necessary due to the integrated BEC. For some very special applications (2 servos+7cells) you might have to connect a receiver battery to the 'BAT' slot of the receiver. In that case, please disconnect the red plus from the receiver wire.

REPAIR PROCEDURES/WARRANTY

In case of problems first check the trouble shooting guide or contact your hobby shop or LRP-importer. In case of damage, repair fees are normally far below the recommended retail price of a new unit. Hobby shops are not authorized to replace speed controls thought to be defective.

Warranty can only be accepted if it is claimed by the customer on the warranty sheet and the control sheet and the original sales receipt are included.

For quick repair and return we definitely need your address, detailed description of the malfunction and the original sales receipt. Repair may be refused without sales receipt.

To guarantee a proper repair, cut off or worn receiver plugs, wires and switches will be replaced and charged in any case. Any speed control treated severely with silicone or anything similar inside, might not be repairable.

Speed controls sent in for repair that operate perfect normally will be charged with a service fee. Therefor first check with the trouble shooting guide.

LRP guarantees this speed control to be free from defects in materials or workmanship for 90 days from the original date of purchase verified by sales receipt.

This warranty doesn't cover: suitability for specific operation, incorrect installation, components worn by use, application of reverse or improper voltage, shipping, tampering, misuse like any soldering inside the unit, poor installation, replacing of wires on the board, connection to electrical components not mentioned in the instructions, mechanical damage, immersion of water and cutting off the original wires, plugs, connectors and switches.

Our warranty liability shall be limited to repairing the unit to our original specifications. Because we have no control over the installation or use of this product, in no case shall our liability exceed the original cost of this unit. We can't accept any liability for any damage resulting from using this product. By the act of installing or operation this speed control, the user accepts all resulting liability.

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TROUBLE SHOOTING GUIDE

Symptom	Cause	Action
Servo Works Throttle dead	Set-up problem	Re-run complete set-up, make sure that you pull and hold full throttle on the transmitter when you press the set-up button to freeze the function. Don't forget to put all transmitter settings according to the instructions.
	Speed Control plugged wrong into receiver	Plug into channel 2, check polarity of connector
	Motor broken	Change motor
	Motor brush sticking	Check if brush can move
	Temperature protection active	Let speedo cool down
	Wiring interrupted	Check wires and connectors
	Speed control broken	Send in for repair
Servo + Motor dead	Receiver plug wrong	Check polarity of receiver plug
	Crystal defect Receiver defect Transmitter defect	Change/check component step by step
	Unit is wet, water protection activated	Unplug the battery, let speed control dry out
	BEC defect	Check BEC output voltage or send in for repair
Motor runs backward	Motor wrong connected	Connect motor proper
No brakes	Incorrect set-up	Re-run complete set-up; see 'Servo works - Throttle dead'
	Internal damage	Send in for repair
Insufficient brakes	Incorrect set-up	Set Low ATV, EPA, ATL of the transmitter to maximum or re-run complete set-up procedure. Don't forget to put all transmitter settings according to the instructions.
	Gear ratio far too long	Use smaller motor pinion
Insufficient top speed	Incorrect set-up, Transmitter was readjusted after set-up was completed	Re-run complete set-up procedure. Don't forget to put all transmitter settings according to the instructions
Insufficient acceleration	Power pot set too far left	Turn power pot to the right
Speed Control gets too hot Shuts of too often	Insufficient cooling	Cut some holes into the body shell
	Motor too strong or too high input voltage	Use a softer motor or a battery with less volts/cells
	Gear ratio too long	Use a smaller motor pinion
	Drive train or bearing problem	Check or change components
	Model run too often without cooling break	Let speed control and motor cool down after each run
Motor won't stop, runs at low speed	Moisture in speed control	Disconnect immediately, let speed control dry completely and try again
	Speed control set-up	Re-run complete set-up procedure Don't forget to put all transmitter settings according to the instructions.
	Speed control broken	Send in for repair
Radio Glitches	No capacitors on the motor	Put capacitors to the motor
	Receiver or antenna too near to power wires, motor, battery or speed control	See 'installation'
	Receiver broken, too sensitive Transmitter out of tune Transmitter output too low Servo problem	Change components step by step. Use original crystals only
	FET-Servo like KO 1001 without choke	Use choke that is included to the servo
	Battery connector bad	Check connectors
	Transmitter batteries flat	Recharge or change batteries
	Transmitter antenna too short	Pull out antenna to full length
	Speed control feels strange, unlinear	Transmitter batteries start to dump
You changed transmitter or car programme of the transmitter		Re-run complete set-up procedure