USER MANUAL
PPV-RZ3 PROGRAMMABLE POWER VALVE CONTROLLER
(PROGRAMMABLE EXHAUST VALVE CONTROLLER)

PPV-RZ3 is designed to work with 5 wire PV servo motors. Servo motor must have potentiometer position sensor.
For reading revs it has universal input, which can accept wide range of signals.

TECHNICAL DATA

Limit values:
minimum supply voltage	8 Volts
maximum supply voltage	20 Volts
max. supply voltage for 1 minute	40 Volts

Circuit is protected against reverse supply voltage (wrong connection).

Features:
- two custom programmable curves
- PV map switch for switching PV curve while riding
- easy and fast programming on the field, via hand held programmer, or PC
- programming while machine running - you can immediately see effects
- each curve can be set in 2 to 8 curve points
- programmable deviation
- programmable max close and max open positions
- instant monitoring of valve position, via LCD(handheld programmer)
- fast processing for high accuracy
- self test on power-up
- error detecting (position sensor failure, servo motor failure)
- protection for short connection on servo motor output

Very important!
Resistor spark plugs must be used, because they produce less electromagnetic disturbances.

<u>Very important!</u>
PPV is protected against static discharge, but too high static charge can damage PPV.
Be careful when using programmer on the dyno, because static charge can build up on the bike and static discharge can damage PPV unit, or programmer. Make ground connection between dyno and bike frame to prevent static discharge.

1.   HOW TO ENTER MENU

⇨ Connect **programmer** to **PPV** and wait few seconds for activation of **programmer** and press `ENTER` .
⇨ Move through menu with pressing `+` , or `-` and select with pressing `ENTER` .
⇨ Exit menu with selecting *Exit.*

2.   MENU ORGANISATION

Load Settings	- load previously saved curve (from #1 to #2)
Save Settings	- save new curve (from #1 to #2)
Set PV Curve	- valve curve parameters
Deviation +-	- deviation of valve position
Close Position	- max close valve position
Open Position	- max open valve position
Pulses Per Rev	- number pulses per rev
PV test	- valve position test
PV Map Switch #1	- PV map switch
Power-up Test	- enable/disable power up test
Exit	

3.   Load Settings

⇨ Enter menu and move to *Load Settings* with pressing `+` , or `-` and press `ENTER` to confirm.
⇨ Select number of previously saved PV curve, with pressing `+` , or `-` and press `ENTER` to confirm.

4.   Save Settings

⇨ Enter menu and move to *Save Settings* with pressing `+` , or `-` and press `ENTER` to confirm.
⇨ Select number to which you want to save your PV curve, with pressing `+` , or `-` and press `ENTER` to confirm.

5. Set PV Curve

⇨ Enter menu and move to **Set PV Curve** with pressing `+`, or `-` and press `ENTER` to confirm.
You entered submenu for setting PV curve.

Submenu organisation:
Nr. of Points	- number of PV curve points (from 2 to 8)
1)	- first PV curve point
2)	- second PV curve point
...	...
...	...
Exit Curve	- exit submenu

Important!
To avoid wrong processing, don't make unreasonable curve course.
Every time you make any changes to valve curve, it is automatically saved to #0 position. Later you can save it to any other position number #1, or #2.

5.1. Change Number of Curve Points

⇨ Move to **Nr. of Points** with pressing `+`, or `-` and press `ENTER` to confirm.
⇨ Select number of ignition points, with pressing `+`, or `-` and press `ENTER` to confirm.

5.2. Change Parameters of Valve Position Curve Points

⇨ Move to point you want to change, with pressing `+`, or `-` and then press `ENTER` to confirm.
⇨ Change rev point with pressing `+`, or `-` (in 100 rpm steps) and then press `ENTER` to confirm.
⇨ Change valve position from 0% to 100%, with pressing `+`, or `-` (in 1% steps) and then press `ENTER` to confirm.

6. Deviation

Deviation means how accurate valve is moved to calculated position. If deviation is too low then servo motor won't be stabile – it will always search for calculated position in small movements. Default setting is +-5% and should meet in most cases.

⇨ Enter menu and move to **Deviation** with pressing `+`, or `-` and then press `ENTER` to confirm.
⇨ Change deviation from 2% to 20% with pressing `+`, or `-` (in 1% steps) and then press `ENTER` to confirm.

7.   Max Close Position

Max close position is when curve is set to 0%. This close position can be moved to any desired position. For RZ350 default close position is 240. Max close position can be moved to deeply closed, or less closed position.

⇨ Enter menu and move to **Close Position** with pressing `+`, or `-` and then press `ENTER` to confirm.

⇨ Set close position with pressing `+` , or `-` and then press `ENTER` to confirm.

8.   Max Open Position

Max open position is when curve is set to 100%. This open position can be moved to any desired position. For RZ350 default open position is 512. Max open position can be moved to more open, or less open position.

⇨ Enter menu and move to **Open Position** with pressing `+`, or `-` and then press `ENTER` to confirm.

⇨ Set open position with pressing `+`, or `-` and then press `ENTER` to confirm.

9.   PULSES PER REV

It is number of pulses per rev of rev input signal and is important for correct rev reading. Setting is 2 for all twins with wasted spark ignition system, otherwise setting is 1.

⇨ Enter menu and move to **Pulses Per Rev** with pressing `+`, or `-` and then press `ENTER` to confirm.

⇨ Change nr. of pulses per rev with pressing `+`, or `-` and then press `ENTER` to confirm.

10.   PV Test

PV test can be used for testing, or measuring valve position. Valve can be moved to any position from 0% to 100% without motor running.

⇨ Enter menu and move to **PV Test** with pressing `+`, or `-` and then press `ENTER` to confirm.

⇨ Set valve position with pressing `+`, or `-` and then press `ENTER` to confirm.

11.   Power-up Test

Enabling or disabling test cycle of PV servo at power-up.

⇨ Enter menu and move to *Power-up Test* with pressing `+`, or `-` and then press `ENTER` to confirm.
⇨ Enable, or disable power-up test with pressing `+`, or `-` and then press `ENTER` to confirm.

12.   PV Curve Switch

Enabling, or disabling PV curve switch for changing PV curves while riding.

⇨ Enter menu and move to *PV Curve Switch* with pressing `+`,or `-` and then press `ENTER` to confirm.
⇨ Enable, or disable *PV Curve* switch with pressing `+`, or `-` and then press `ENTER` to confirm.

13.   MONITORING

Connect **PPV** unit to **handheld programmer** and wait few seconds for activation**.**
Fist information displayed is software version.

With **handheld programmer** you can watch revs and calculated valve position.

<u>Information!</u>
You can connect, or disconnect **handheld programmer** from **PPV** unit any time you want, without any harm. It is not important, if motor running or not and if power supply is connected, or not.

<u>Important!</u>
Do not use too much force when connecting, or disconnecting!

14.   ERROR REPORTS

Two errors can be displayed:
error 1 – disconnected, or damaged position sensor, or servo motor
error 2 – servo motor error (short connection)