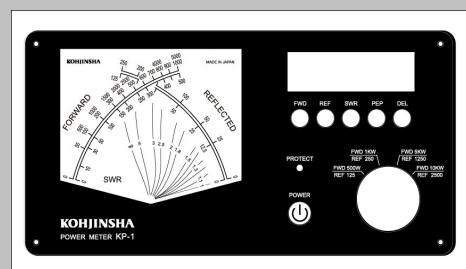


Instruction Manual
DIGITAL
POWER METER
KP-1



Thank you for purchasing KP-1.

In addition to the conventional power meter features KP-1 has some new features that are large cross meter, digital display, and protection circuit to prevent your antenna and/or amplifier from getting trouble.

Please read this manual carefully before you start using KP-1. We would like you to use KP-1 as long as possible.

■Features

- KP-1 is SWR/POWER meter using current transformer to pick up RF of ranging from 1.8MHz to 30MHz.
- KP-1 has a large analog cross meter and 7 segment blue LEDs that help your easy reading power & SWR.
- KP-1 has four positions of power range. You can choose a proper range for your output power.
- Digital display can show not only power but SWR.
- You can read PEP with pressing the PEP button when you operate SSB. You may not lose your voice with this function. You can setup hold time as you like.
- Protection circuit works when the SWR becomes higher than the level you set. You can set this threshold level between SWR 1.4 and 2.5.

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■ Functional Overview- Front Panel

1. Cross Meter

You can read FWD/ REF power and SWR with this analog meter. The crossing point of needles shows the SWR value.

2. Digital Display

You can select functions with the buttons below the display. When the function is selected, the button shines blue.

3. FWD Button

Digital display shows FWD power when this button is pressed.

4. REF Button

Digital display shows REF power when this button is pressed.

5. SWR Button

Digital display shows SWR when this button is pressed.

6. PEP Button

This switch toggles between average power and PEP power. When it is showing PEP, it lights blue.

7. DEL Button

Digital display shows the power going into your antenna FWD-(minus)REF when this button is pressed.

8. PROTECT Lamp

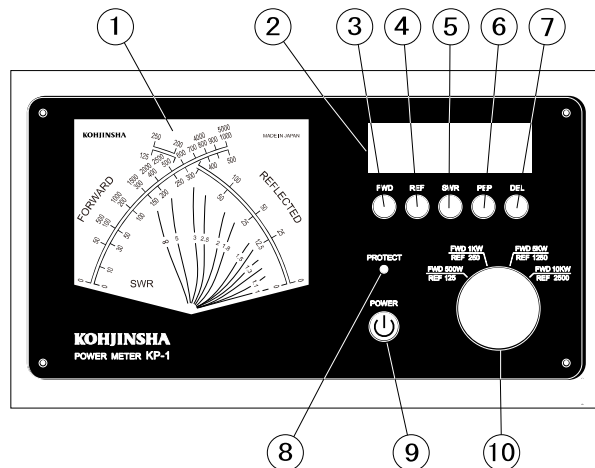
When the SWR becomes higher than the value you set up, it is activated. When activated, the connection between 12 TX GND and 13 RELAY IN is disconnected inside of KP-1.

9. POWER Switch

This switch is used to turn on the KP-1. The button shines red when the power supply is on.

10. Range Select

You need to choose the proper range in order for the analog meter needles not to jump off scale. You don't have to think about power range for digital display.



■Rear Panel

11. Power jack

For DC12V adaptor plug.

12. TX GND Terminal

To be connected with TRX TX GND.

13. RELAY Terminal

Connect with RELAY IN of your amplifier.

12 and 13 are normally connected inside of KP-1.

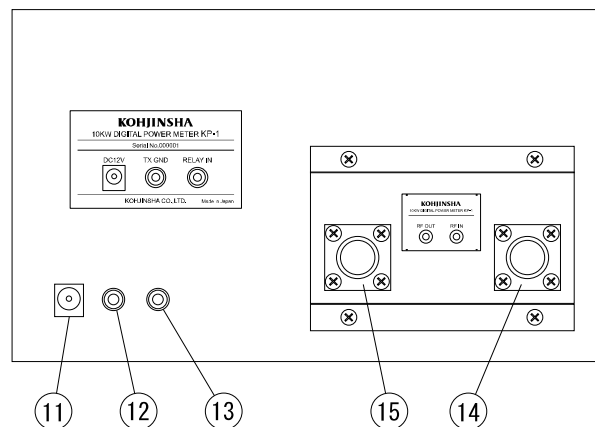
When the SWR accidentally gets higher than the threshold value, KP-1 automatically cuts off the line to protect your amplifier and/or antenna. (Go to page 6 for how to set up)

14. RF IN Connector

SO-239 to connect with your TRX

15. RF OUT Connector

SO-239 to connect your antenna



■Preparation Before Start Using

- Connect DC adaptor supplied with KP-1. You can use your own DC power supply, however please don't apply more than 16 volts. We strongly recommend using our products.
- Connect IN connector to your TRX with 50ohm coax cable with SO239 on both sides. Connect OUT connector to your ANT with 50 ohm coax cable with SO239 on both sides.

■Operation

Select the power range the right most (FWD10KW/REF2500W) just in case.

●Measuring FWD Power

1. Press 3 FWD button
2. For SSB Operation
Press 6 PEP button.
For AM, FM, or CW operation you don't have to press this button.
3. If you use analog meter, select the proper range for your transmitting power.

●Measuring REF Power

1. Press 4 REF button
2. For SSB Operation
Press 6 PEP button.
For AM, FM, or CW operation you don't have to pres this button.
3. If you use analog meter, select the proper range for your transmitting power.

●Measuring SWR

1. Press 5 SWR button.
2. Digital display shows SWR calculated by CPU.
The crossing point of needles also shows the SWR.

●PEP Power Measurement

KP-1 can show average power when you operate AM, FM, or CW that has carrier.

Because SSB signals don't have carrier, the signals change its level according to voice evel. For this reason you need to use PEP meter to read the power. KP-1 has a circuit that read peak value of the power when you press 6 PEP button. Needles swing to peak value, too. Factory setting is 0.3second hold time. You can set up this hold time by yourself. See P7 mode.

●Measuring Effective Power

Pressing 7 DEL button let KP-1 to calculate the effective power. Effective power is the power that deducts REF power from FWD power.

■ How to set up parameters

There are SIX user programmable parameters from P1 to P7 except P5.

● How to get to setup mode

You are looking at [P- 1] after you turned on power while pressing both SWR and DEL.

[P- 1 1 1 1]

FWD button works as UP

REF button works as DOWN

DEL button works as Enter

[P- 1 1 1 1] ← Press DEL

[P 1- 0 0]

Here is an example of your setting up P3.

Let the KP-1 setup mode as described first part of this page.

Now you are looking at

P- 1

Pressing FWD button increments the number, which selects mode. Pressing FWD twice should make 1 to 3 like below.

P- 3

You can choose values in P3 mode with FWD and REF buttons.

[P- 1 1 1 1] ← Pressing FWD twice

[P- 1 1 3] ← P3 Mode

● P1 Mode (Protection)

0: Lock Mode

The relay control connection between TRX and amplifier is cut off when SWR accidentally gets higher than the threshold level. The SWR value can be set up by yourself. If you select this mode, KP-1 will keep the cut off status until

you turn off the power. We strongly recommend you to choose this mode.

1: Automatic recovery Mode

If you choose this mode, the KP-1 gets back to normal when the SWR becomes normal for some reason.

● P2 Mode (Threshold)

You can select the threshold value to activate the protection circuit. SWR value can be set between 1.4 and 2.5 with every 0.1 step.

FWD and REF button work 0.1 up or down respectively. You need to press DEL to set.

● P3 Mode (Brightness)

Brightness of LED display can be set with this mode. Pressing DEL button once changes the display as [P3-88]. Then you can choose P3 parameters with FWD and REF buttons.

FWD button makes brighter. REF button makes darker. SWR button resets as factory setup. You need to press DEL to set.

● P4 Mode (Hold Time)

You can select between 100ms and 1000ms with every 100ms step.

Pressing FWD button makes 100ms up.

Pressing REF button makes 100ms down.

You need to press DEL to set.

● P5 Mode (Version)

This mode shows the software version with four digit number. Pressing DEL button brings back to normal.

- **P6 Mode (Factory Setup)**

If you want to reset to factory setup, choose 0 with FWD or REF button, and then press DEL. If you press DEL when 1 was shown, the operation is canceled.

Factory setup values

SWR protection: Lock mode

0

SWR protection threshold value

2.0

FWD and REF offset value

0

A/D calibrate mode voltage display

6 times(0 to 30V)

peak hold time

300ms

- **P7 Mode (For Technician)**

This mode isn't used usually.

Under the calibration mode you can select 1 or 6. 6 means multiply 6 times when displaying A/D input voltage.

Operation Tips

FWD button : up

REF button : down

DEL button : Select/Determine

Power off : Cancel

■ Specification

Frequency Range	1.8MHz to 30MHz
Measuring Power Range	10W to 10KW
Power Range Selection	FWD 500W/1KW/5KW/10KW REF 125W/250W/1250W/2500W Accuracy +/-7% at full scale of each range Minimum power required to measure SWR approximate 8W
Insertion Loss	Less than 0.1dB
Input/Output Impedance	50ohm
Input/Output Connectors	SO239
Dimensions	229W X 136H X 115D(excluding external protrusions)
Weight	Approx. 1.7Kg
Supplied Accessories	Users manual, DC12V adaptor

