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DIRECT

Electronics Tech.

(FVR) Rheostat Power Variable Resistor

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▶ Product Introduction

Rheostats power variable resistors control the speed of a motor.

Direct's (FVR) Series is a C-shaped ceramic rod and wound with copper or chromium-alloy wire as a resistance element. Except for the slide contact surface, the entire component is coated with a high-temperature, non-flammable resin. After cooling and drying, insulation is applied through a high-temperature process. Then, a centered rotating adjuster component is installed, which slides along the resistance element and varies the resistance to the desired value.

Adjustable wire wound resistors are often called potentiometers in books and catalogs. Variable (FVR) may be used as a power rheostat with two connections (the wiper and just one end of the track) or as a potentiometer with all three connections in use. The FVR Series is RoHS compliant and lead free. For non-standard technical requirements and custom special applications, please contact us. Or link to Direct official website "[High Power Resistors](#)" to get more information.



Applications:

- Motor controller also use FVR Series as rheostats or potentiometer to control the speed of a motor by limiting the flow of current through them.
- They are used in many small appliances such as blenders, mixers, fans, and power tools.
- FVR Rheostats Series are also used as test instruments to provide an accurate resistance value.
- While FVR can be used to control electric ovens and cooktops, thermostats are preferred because they have additional parts which automatically adjust the current flow to maintain a constant temperature.

The scope of the application also includes educational modeling, load simulations, industrial machinery RPM adjustment, voltage and current adjustment, instruments, and automated control installations.

Features:

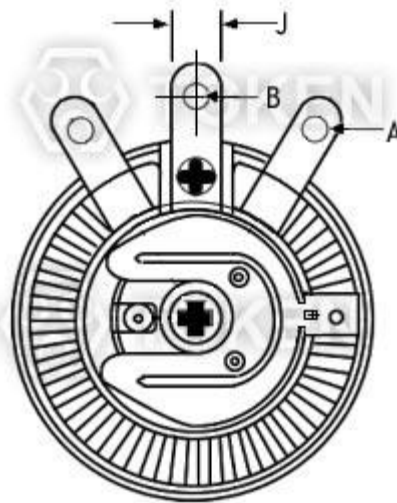
- Standard resistance tolerance is K ($\pm 10\%$). Closer tolerances are available upon request.
- 3 Wattage Rating styles to choose: 25W, 50W, and 100W.
- Wide Max. Resistance range: $5\Omega \sim 5K\Omega$.



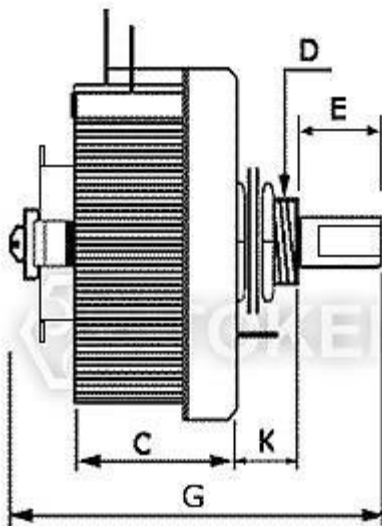
Dimensions

Dimensions (FVR 25W - 100W)

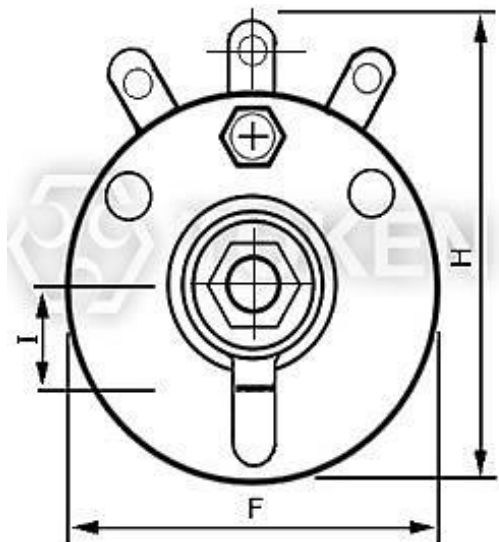
Wattage Rating	Dimensions(mm)												Max. Pickable Resistance Value (Ω)
	A±0.5	B±0.5	C±3.0	D	E±0.5	F±3.0	G±3.0	H±3.0	I±0.5	J±0.5	K±0.5	Weight	
25W	2.5	3.2	22	3/8"	6x12	42	50	50	11	5	10	74/g	5Ω-2KΩ
50W	4.2	4.2	28	3/8"	6x12	64	60	70	11	8	14	160/g	7Ω-3.5KΩ
100W	4.2	4.2	42	3/8"	6x12	85	75	90	11	8	14	372/g	10Ω-5KΩ



Top View (FVR) Dimensions



Side View (FVR) Dimensions



Bottom View (FVR) Dimensions

▶ Application Notes

Application Notes (FVR)

Determination of End Resistance Value of FVR, DQS, DSRA, DSRB, BSR, BSQ:

- Resistance Range means you can choose one maximum resistance value (Max. Pickable Resistance / End resistance value) at one of FVR, DQS, DSRA, DSRB, BSR, BSQ VR (Variable Resistor) type.
- After End Resistance Value confirmed, the minimum resistance (start resistance value) will be determined by depending on resistance of wire and wirewound type.

Power Rating of Variable Resistor:

The part Number formation of FVR, DQS, DSRA, DSRB, BSR, and BSQ:

Product type - Rated Wattage - Max. Pickable Resistance (Ω) - Resistance Tolerance

Product type means one of FVR, DQS, DSRA, DSRB, BSR, BSQ.

Rated Wattage means power rating at End Resistance Value.

Resistance Value (Ω) means maximum resistance value (End Resistance Value).

Resistance Tolerance means precision range of End Resistance Value.

1. Power Rating of VR (Variable Resistor) is determined by the maximum resistance value (End Resistance Value).
2. Resistance and Power Rating should be decreased while you are adjusting the screw.

Notes:

- Adjustability is 10% to 90% of full resistance value.
- Wattage is proportional to this adjusted resistance value.

Power Rating:

- Based on 25°C free air rating. The stated wattage rating applies only when the entire resistance is in the circuit.
- Setting the lug at an intermediate point reduces the wattage rating by approximately the same proportion.
- Example: If the lug is set at half resistance, the wattage is reduced by approximately one-half.

If you need current constant type or special specifications, please feel free to contact us.



► Performance Specifications

Performance Specifications (FVR)

Test Item	Test Methods	Characteristics
Resistance tolerance	JIS-C-5261 5-1	Resistance tolerance $\pm 10\%$
Insulation resistance	JIS-C-5261 6-1 500VDC	100M Ω min
Dielectric withstanding voltage	JIS-C-5261 7-1 1000VDC 1 minute Between terminal and axis	Free of appearance or structural irregularity
Terminal strength	JIS-C-5261 6-5 3kg 30 seconds	Free of appearance or structural irregularity $\Delta R/R \leq \pm(2\%+0.1\Omega)$
Vibration	JIS-C-5261 6-6 1.5m/m 10 ~ 50 ~ 10 Hz/min X-Y-Z 2 hours each	Free of appearance or structural irregularity $\Delta R/R \leq \pm(2\%+0.1\Omega)$
Load life	JIS-C-5261 7-7	Free of appearance or structural irregularity $\Delta R/R \leq \pm(5\%+0.1\Omega)$
Full gyration angle	JIS-C-5261 6-1	300 \pm 5 $^{\circ}$ C
Flame retardation	100% - 600% rated wattage load	US UL-94 flame retardation test V-0 grade noncombustible
Remarks	1. Resistance and resistance tolerance were tested in-house with micro resistance meter. 2. Coating refers to UL-certified data provided by supplier.	

► Order Codes

Order Codes (FVR)

FVR	25W	2.5KR	K
Part Number	Rated Power (W)	Resistance Value (Ω)	Resistance Tolerance (%)
FVR	25W 50W 100W	Indicates resistance value in units of ohms.	K $\pm 10\%$

► General Information

Benefits & Features

Providing design engineers with an economical resistor with high quality performance, Direct Electronics offers industry grade power wire wound devices.

Direct provide terminal blocks, thermal switches, fusing, fans, junction boxes, screened or solid bottom plates, conduit knockouts, and customer specified requirements. For large applications a welded frame construction is utilized to provide a robust design for power resistor mounting in both indoor and outdoor environments.

Products range from large capacity metal clad, nonflammable fixed and adjustable, wave ribbon wire-wound, slide, starter, box type, to nonflammable flat type. Direct extends a complete line for both military and commercial applications.

Utilization Notes

1. Smoke emitted from non-flammable resistors on initial use in powered circuits is a normal phenomenon and the component can be safely utilized.
2. All resistors manufactured by Direct Electronics Industry Corporation comply with the U.S. UL-94 non-flammability test, Class V-0, a continuous combustion period of zero seconds.
3. Never use organic solvents to clean non-flammable resistors.
4. Non-flammable resistors cannot be utilized in oil.
5. Non-flammable resistors cannot be used in high frequency machinery because of the inductance produced by the windings. A suitable type of resistor must be selected. Contact us for details.
6. In applications where resistors are subject to intermittent current surges and spikes, be sure in advance that the components selected are capable of withstanding brief durations of increased load.
7. Do not exceed the recommended usable load. Resistors must use within the rated voltage range to prevent the shortening of service life and/or failure of the wound resistance elements.
8. Minimum load. Resistors must be utilized at 1/10 or more of the rated voltage to prevent poor conductance due to oxidation build-up.
9. Although the hardness exceeds that of a 3H pencil lead, do not nick the resistor coating with screw drivers or other pointed objects.
10. Avoid touching non-flammable resistors in operation; the surface temperature ranges from approximately 350°C ~ 400°C when utilized at the full rated value. Maintaining a surface temperature of 200°C or less will extend resistor service life.
11. Keep temperature from rising by choosing a resistor with a higher rated capacity; do not use a component having the exact load value required. For considerations of safety in extended period applications, the resistor rating should be more than four times higher than the actual wattage involved, but never use a resistor at less than 25% of its rated power.
12. Application and Placement: Wire-wound resistors use different gauges of wire as resistance elements. Sometimes the gauge is extremely thin (finer than a strand of human hair) and very susceptible to breakage in environments containing salts, ash, dust and corrosives. Avoid utilization in such environments. Do not install in dusty areas because the accumulation will cause shorts and poor conductance.

