

# PRECISION ELECTRONIC COMPONENTS MFG. CO.

## WIREWOUND RESISTORS/DATA SHEET



COMMITTED TO QUALITY

### PPR SERIES

PROFESSIONAL, POWER AND MILITARY APPLICATIONS.  
SILICONE COATED. RADIAL.

- \* HIGHLY STABLE
- \* MEETS DEFENCE STANDARDS
- \* TAPPED, ADJUSTABLE, NON-INDUCTIVE AND INSULATED TYPES

- \* REFERENCE STANDARDS
- IS 8909
- JSS 50402 [RFHT-2]
- MIL-R-26 [CHARACTERISTIC V]

PPR Series wirewound resistors are designed to stringent Defence requirements. Insulated types can also be supplied if required. They are rated to a maximum hot spot temperature of 350°C and fully meet the requirements of the specifications listed. Tapped, Adjustable and Non-Inductive resistors can be supplied on request. The stability of the resistors in this series far exceeds the specification request.

### SPECIFICATIONS

**TOLERANCE** : FOR VALUES > 1R0 - ±5%  
FOR VALUES < 1R0 - ±10% OR ±0R05 OR WHICHEVER IS GREATER  
FOR TAPPED/ADJUSTABLE/NON-INDUCTIVE VALUES - ±10%  
OTHER TOLERANCES ON REQUEST

**TEMP. COEFF. OF RESISTANCE [TCR]** : ±50PPM/°C - JSS LIMIT = ±200PPM/°C : MIL LIMIT = ±260PPM/°C  
[IN LOWER VALUES HIGHER TCR WIRES MAY BE USED]

**POWER RATING** : RATED AT 70°C AMBIENT AND DERATED LINEARLY TO ZERO AT 350°C IN HORIZONTAL OR VERTICAL MOUNTING WITH BLOCKED ENDS(Fig.4).  
MAX. VOLTAGE APPLICABLE AS PER SPECIFICATION OR  $\sqrt{PR}$  WHICH EVER IS LOWER.

IN TAPPED RESISTORS, THE POWER HANDLING CAPACITY IS REDUCED BY APPROXIMATELY 10% PER TAP.  
THE POWER PER TAPPED RESISTOR WILL BE IN PROPORTION TO THE LENGTH OF THE TAP AND THE OVERALL LENGTH OF THE RESISTOR.  
IN ADJUSTABLE RESISTORS, POWER IS PROPORTIONAL TO THE SETTING.

DESIGN ENGINEERS SHOULD ENSURE THAT THE DISSIPATION DOES NOT EXCEED THE RATINGS. THE BEST METHOD IS TO TREAT THE FULL RESISTOR AS A CURRENT LIMITED DEVICE AND ARRIVE AT THE MAXIMUM POWER FOR THE VALUE SET.

TEMP. RISE FOR HIGH WATTAGE RESISTORS : A GRAPH OF RISE IN TEMPERATURE WITH INCREASING POWER DISSIPATION IS GIVEN FOR PPR200 (FIG.1). ALSO SHOWN IN FIG.2 IS A TYPICAL TEMPERATURE DISTRIBUTION OVER THE LENGTH OF THE RESISTOR (269MM FOR PPR200) AFTER ONE HOUR OF STABILIZED CURRENT FLOW AT AN AMBIENT OF 40°C.

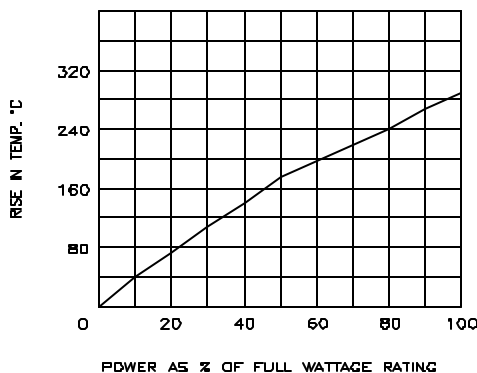


FIG.1

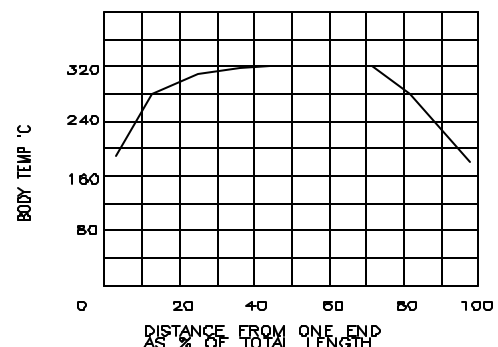


FIG.2

LOAD LIFE STABILITY : < ±3%  
MOISTURE RESISTANCE : < ±2%  
CLIMATIC SEVERITY : H13  
STEADY STATE ACCELERATION : A12 1000 M/S<sup>2</sup>

TEMPERATURE CATEGORY : T 55/200  
THERMAL SHOCK : -60°C TO +350°C  
LOW AIR PRESSURE : P19, 1 KPA  
VIBRATION : V11, 10 TO 500HZ; 100 M/S<sup>2</sup>

0894/RA03/DS/1-4

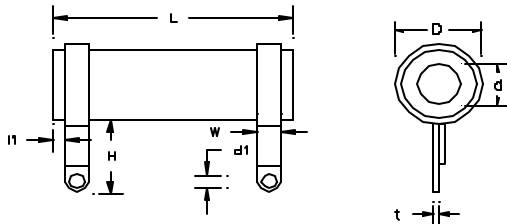


Fig.3A

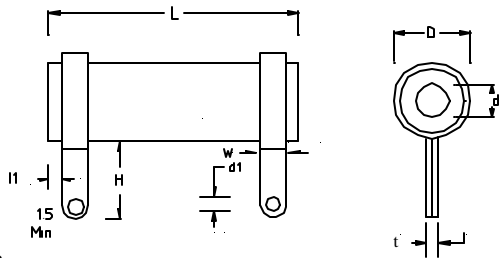


Fig.3B

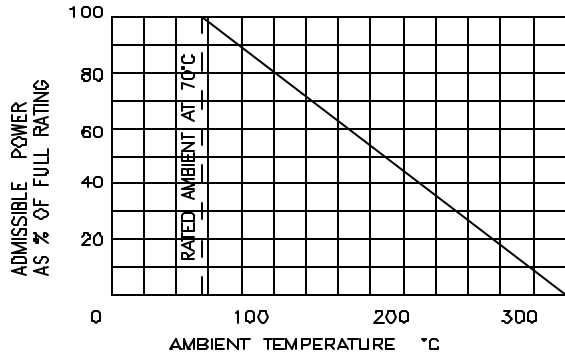


Fig.4

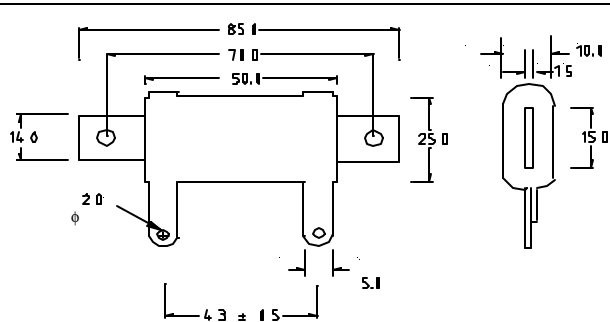


Fig.5

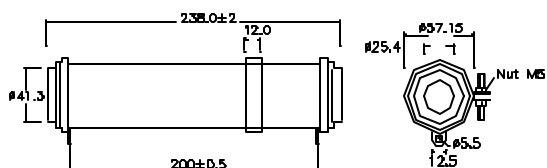


Fig.6

THREADED RESISTORS:

A HEAVY DUTY RESISTOR CAPABLE OF 300W DISSIPATION SPECIALLY DESIGNED FOR TRACTION APPLICATIONS IS AVAILABLE.

TABLE 2 : PPR SERIES - ALTERNATE TERMINATIONS AVAILABLE

DIMENSIONS IN MM [IN]  
[ PLEASE SEE TABLE 1 FOR DETAILS.]

| ALL PPR TYPES FOR WHICH "D" = | CLAMP WIDTH W     | HOLE DIA. d1      | CLAMP THICKNESS t | TOL. [MM] | TOL. [IN] |
|-------------------------------|-------------------|-------------------|-------------------|-----------|-----------|
| ±0.50<br>[±0.020]             | ±0.20<br>[±0.008] | ±0.10<br>[±0.004] | ±0.10<br>[±0.004] |           |           |
| 19.00<br>[0.748]              | 4.00<br>[0.157]   | 2.20<br>[0.086]   | 0.55<br>[0.022]   |           |           |
| 19.00<br>[0.748]              | 10.00<br>[0.394]  | 5.00<br>[0.197]   | 1.20<br>[0.047]   |           |           |
| 33.00<br>[1.299]              | 12.70<br>[0.500]  | 5.50<br>[0.217]   | 1.20<br>[0.047]   |           |           |

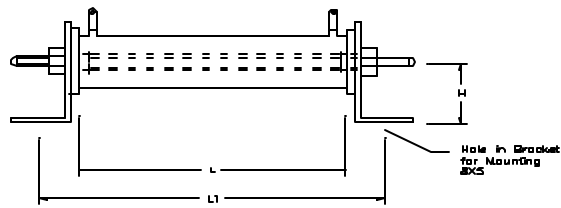


Fig.7

NOTE ON MOUNTING

The recommended method of mounting is shown in the Figure. PEC supplies mounting hardware for use with resistors of various wattages and for mounting from one to six resistors in a single frame.

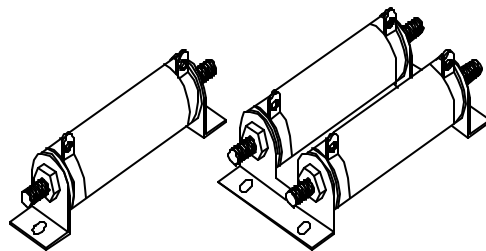
FOR ALL PPR TYPES EXCEPT PPR500.

$$L1 = L + 26.00 \text{ MM} / 1.024 \text{ IN} \quad ; \quad H = 22.50 \text{ MM} / 0.886 \text{ IN}$$

FOR PPR500.

$$L1 = L + 40.00 \text{ MM} / 1.575 \text{ IN} \quad ; \quad H = 70.00 \text{ MM} / 2.756 \text{ IN}$$

Fig.8



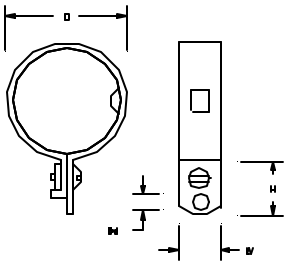
PPR SERIES

**TABLE 1 : PPRS SERIES - DIMENSION DETAILS - RESISTANCE RANGE (PLEASE REFER FIG.3<sup>5</sup>, FIG.3A & 3B.)**

| PEC TYPE | RATING | DIMENSIONS IN MM [IN.]                           |  |  |   |                        |                 |                        | RESISTANCE RANGE |      | JSS           | MIL  | IS           |
|----------|--------|--|--|--|---|------------------------|-----------------|------------------------|------------------|------|---------------|------|--------------|
|          |        | L<br>±3.00 <sup>4</sup><br>[±0.118] <sup>4</sup> | D<br>±1.00<br>[±0.039]                     | d<br>±1.00 <sup>4</sup><br>[±0.039] <sup>4</sup> | W<br>±0.20<br>[±0.008]                    | H<br>±3.00<br>[±0.118] | t<br>MAX.       | d <sup>1</sup><br>MIN. | OHMS<br>MIN.     | MAX. |               |      |              |
| PPR04    | 4W     | 20.00<br>[0.787]                                 | 9.50<br>[0.374]                            | 4.50<br>[0.177]                                  | 4.00<br>[0.157]                           | 8.00<br>[0.315]        | 0.55<br>[0.022] | 2.20<br>[0.086]        | OR1              | 1K5  |               |      |              |
| PPR05    | 5W     | 25.00<br>[0.984]                                 | 9.50<br>[0.374]                            | 4.50<br>[0.177]                                  | 4.00<br>[0.157]                           | 8.00<br>[0.315]        | 0.55<br>[0.022] | 2.20<br>[0.086]        | OR1              | 2K0  |               |      |              |
| PPR08    | 8W     | 35.00<br>[1.378]                                 | 9.50<br>[0.374]                            | 4.50<br>[0.177]                                  | 4.00<br>[0.157]                           | 8.00<br>[0.315]        | 0.55<br>[0.022] | 2.20<br>[0.086]        | OR1              | 3K3  |               |      |              |
| PPR10    | 10W    | 45.00<br>[1.772]                                 | 9.50<br>[0.374]                            | 4.50<br>[0.177]                                  | 4.00<br>[0.157]                           | 8.00<br>[0.315]        | 0.55<br>[0.022] | 2.20<br>[0.086]        | OR1              | 3K9  |               | RW29 |              |
| PPR10A   | 10W    | 27.00 <sup>1</sup><br>[1.063] <sup>1</sup>       | 15.00 <sup>1</sup><br>[0.591] <sup>1</sup> | 7.70 <sup>2</sup><br>[0.303] <sup>2</sup>        | 4.00 <sup>2</sup><br>[0.157] <sup>2</sup> | 10.00<br>[0.394]       | 0.55<br>[0.022] | 2.20<br>[0.086]        | OR1              | 2K7  | RFHT2-<br>10  | RW30 | FRP2-<br>10  |
| PPR15    | 15W    | 40.00 <sup>1</sup><br>[1.575] <sup>1</sup>       | 15.00 <sup>1</sup><br>[0.591] <sup>1</sup> | 7.70 <sup>2</sup><br>[0.303] <sup>2</sup>        | 4.00 <sup>2</sup><br>[0.157] <sup>2</sup> | 10.00<br>[0.394]       | 0.55<br>[0.022] | 2.20<br>[0.086]        | OR1              | 6K2  | RFHT2-<br>15  | RW31 | FRP2-<br>15  |
| PPR17    | 17W    | 51.00<br>[2.007]                                 | 15.00<br>[0.591]                           | 7.00<br>[0.276]                                  | 4.00<br>[0.157]                           | 10.00<br>[0.394]       | 0.55<br>[0.022] | 2.20<br>[0.086]        | OR1              | 6K8  |               | RW32 |              |
| PPR20    | 20W    | 62.00<br>[2.441]                                 | 15.00<br>[0.591]                           | 7.00<br>[0.276]                                  | 4.00<br>[0.157]                           | 10.00<br>[0.394]       | 0.55<br>[0.022] | 2.20<br>[0.086]        | OR1              | 10K  |               |      |              |
| PPR25    | 25W    | 78.00 <sup>1</sup><br>[3.070] <sup>1</sup>       | 15.00 <sup>1</sup><br>[0.591] <sup>1</sup> | 7.70 <sup>2</sup><br>[0.303] <sup>2</sup>        | 4.00 <sup>2</sup><br>[0.157] <sup>2</sup> | 10.00<br>[0.394]       | 0.55<br>[0.022] | 2.20<br>[0.086]        | OR1              | 18K  | RFHT2-<br>25  | RW33 | FRP2-<br>25  |
| PPR25A   | 25W    | 62.00<br>[2.441]                                 | 19.00<br>[0.748]                           | 9.00<br>[0.354]                                  | 8.00<br>[0.315]                           | 12.00<br>[0.472]       | 1.20<br>[0.047] | 4.50<br>[0.177]        | OR1              | 12K  |               |      |              |
| PPR25B   | 25W    | 50.00<br>[1.969]                                 | 19.00<br>[0.748]                           | 9.00<br>[0.354]                                  | 8.00<br>[0.315]                           | 12.00<br>[0.472]       | 1.20<br>[0.047] | 4.50<br>[0.177]        | OR1              | 10K  |               |      |              |
| PPR35    | 35W    | 75.00<br>[2.953]                                 | 19.00<br>[0.748]                           | 9.00<br>[0.354]                                  | 8.00<br>[0.315]                           | 12.00<br>[0.472]       | 1.20<br>[0.047] | 4.50<br>[0.177]        | OR1              | 18K  |               |      |              |
| PPR40    | 40W    | 100.00<br>[3.937]                                | 19.00<br>[0.748]                           | 9.00<br>[0.354]                                  | 8.00<br>[0.315]                           | 12.00<br>[0.472]       | 1.20<br>[0.047] | 4.50<br>[0.177]        | OR1              | 22K  |               |      |              |
| PPR40A   | 40W    | 83.00<br>[3.268]                                 | 24.00<br>[0.945]                           | 14.50<br>[0.571]                                 | 8.00<br>[0.315]                           | 15.00<br>[0.591]       | 1.20<br>[0.047] | 4.50<br>[0.177]        | OR1              | 18K  |               |      |              |
| PPR50    | 50W    | 104.00 <sup>1</sup><br>[4.094] <sup>1</sup>      | 29.10 <sup>1</sup><br>[1.146] <sup>1</sup> | 14.30 <sup>2</sup><br>[0.563] <sup>2</sup>       | 8.00<br>[0.315]                           | 15.00<br>[0.591]       | 1.20<br>[0.047] | 4.50<br>[0.177]        | OR1              | 39K  | RFHT2-<br>50  | RW35 | FRP2-<br>50  |
| PPR60    | 60W    | 123.00<br>[4.842]                                | 24.00<br>[0.945]                           | 14.50<br>[0.571]                                 | 8.00<br>[0.315]                           | 15.00<br>[0.591]       | 1.20<br>[0.047] | 4.50<br>[0.177]        | OR1              | 39K  |               |      |              |
| PPR75    | 75W    | 100.00<br>[3.937]                                | 33.00<br>[1.299]                           | 18.00 <sup>3</sup><br>[0.709] <sup>3</sup>       | 8.00<br>[0.315]                           | 15.00<br>[0.591]       | 1.20<br>[0.047] | 4.50<br>[0.177]        | OR1              | 39K  |               | RW36 |              |
| PPR100   | 100W   | 155.00 <sup>1</sup><br>[6.102] <sup>1</sup>      | 33.00 <sup>1</sup><br>[1.299] <sup>1</sup> | 19.10 <sup>2</sup><br>[0.752] <sup>2</sup>       | 8.00<br>[0.315]                           | 15.00<br>[0.591]       | 1.20<br>[0.047] | 4.50<br>[0.177]        | OR1              | 91K  | RFHT2-<br>100 | RW37 | FRP2-<br>100 |
| PPR100A  | 100W   | 165.00<br>[6.496]                                | 33.00<br>[1.299]                           | 19.50<br>[0.768]                                 | 8.00<br>[0.315]                           | 15.00<br>[0.591]       | 1.20<br>[0.047] | 4.50<br>[0.177]        | OR1              | 91K  |               |      |              |
| PPR150   | 150W   | 205.00 <sup>1</sup><br>[8.071] <sup>1</sup>      | 33.00 <sup>1</sup><br>[1.299] <sup>1</sup> | 19.10 <sup>2</sup><br>[0.752] <sup>2</sup>       | 8.00<br>[0.315]                           | 15.00<br>[0.591]       | 1.20<br>[0.047] | 4.50<br>[0.177]        | OR1              | 100K | RFHT2-<br>140 | RW38 | FRP2-<br>140 |
| PPR200   | 200W   | 269.00 <sup>1</sup><br>[10.59] <sup>1</sup>      | 33.00 <sup>1</sup><br>[1.299] <sup>1</sup> | 19.10 <sup>2</sup><br>[0.752] <sup>2</sup>       | 8.00<br>[0.315]                           | 15.00<br>[0.591]       | 1.20<br>[0.047] | 4.50<br>[0.177]        | OR1              | 100K | RFHT2-<br>180 |      | FRP2-<br>180 |
| PPR300   | 300W   | 310.00 <sup>1</sup><br>[12.20] <sup>1</sup>      | 33.00 <sup>1</sup><br>[1.299] <sup>1</sup> | 19.10 <sup>2</sup><br>[0.752] <sup>2</sup>       | 8.00<br>[0.315]                           | 15.00<br>[0.591]       | 1.20<br>[0.047] | 4.50<br>[0.177]        | OR1              | 100K |               | RW39 |              |
| PPR500   | 500W   | 335.00 <sup>1</sup><br>[13.19] <sup>1</sup>      | 58.00 <sup>1</sup><br>[2.283] <sup>1</sup> | 35.00 <sup>2</sup><br>[1.378] <sup>2</sup>       | 12.70<br>[0.500]                          | 20.00<br>[0.787]       | 2.50<br>[0.098] | 5.50<br>[0.217]        | OR1              | 100K |               |      |              |

NOTES :

1. MAXIMUM DIMENSION. 2. MINIMUM DIMENSION. 3. TOLERANCE = 2 MM [0.079 IN.] 4. EXCEPT WHERE SPECIFIED OTHERWISE.
5. FIG 3A WHERE t = 0.55, FIG 3B FOR OTHER THICKNESSES.



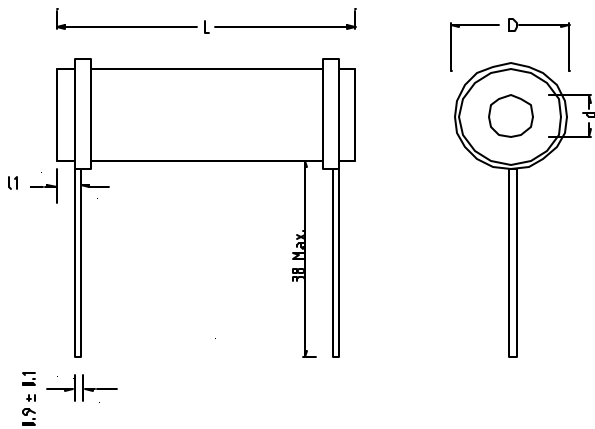
**FIG.9**

**TABLE 3 : PPR SERIES - ADJUSTABLE TERMINATIONS [FIG.7]**

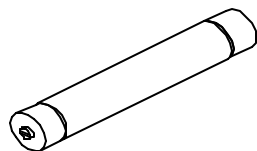
DIMENSIONS IN MM [IN]  
[ PLEASE SEE TABLE 1 FOR DETAILS.]

ALL PPR  
TYPES FOR

| WHICH "D" = | W        | H        | d        | TOL. [MM] | TOL. [IN] |
|-------------|----------|----------|----------|-----------|-----------|
| ±0.50       | ±0.20    | ±3.00    | ±0.10    |           |           |
| [±0.020]    | [±0.008] | [±0.118] | [±0.004] |           |           |
| 9.50        | 5.00     | 12.00    | 2.20     |           |           |
| [0.374]     | [0.197]  | [0.472]  | [0.086]  |           |           |
| 15.00       | 5.00     | 12.00    | 2.20     |           |           |
| [0.591]     | [0.197]  | [0.472]  | [0.086]  |           |           |
| 19.00       | 5.00     | 12.00    | 2.20     |           |           |
| [0.748]     | [0.197]  | [0.472]  | [0.086]  |           |           |
| 26.00       | 8.00     | 23.00    | 4.50     |           |           |
| [1.024]     | [0.315]  | [0.906]  | [0.177]  |           |           |
| 33.00       | 10.00    | 23.00    | 5.50     |           |           |
| [1.299]     | [0.394]  | [0.906]  | [0.217]  |           |           |



**FIG.10 WIRE TYPE**



**FIG.11 FERRULE TERMINATION**

**General Notes [See Tables 1, 2 and 3]**

1. Ref. Fig. 3: Table 1 indicates resistors with end clamps of standard width "W". Alternate clamps are also available : please refer Table 2.
2. "H": The height can be changed to customer requirements on prior request.
3. Normally end clamps of brass are used. Stainless steel clamps can be supplied on prior request.
4. Minimum Value: Specifications of some Standards impose minimum value restrictions. PEC supplies down to 0R1 in the normal course, and below this on request.
5. Maximum Value: The maximum value is based on the limitations imposed by the Standards for Fixed and Adjustable Resistors. Values higher than the Standards' maximum can be supplied on request.
6. Flat Resistors on elliptical formers can be supplied on request. They are useful where space is at a premium. They are supplied with mounting strip (Ref. Fig. 5)
7. Non-Inductive resistors are available. The maximum value normally possible in each range is half of the maximum specified for the resistance range.
8. Adjustable terminals available. Please refer Fig.9 Table 3.
9. Dimensions shown in Table 1 are applicable to normal fixed resistor and may vary for tapped, adjustable, Non inductive and some Mil. style resistors as well as those of alternate shapes and termination.
10. Alternate termination available on specific request are :  
i) Wire type (Fig. 10) ii) Push-fit type and  
III) Ferrule type (Fig. 11)
11. These resistors are not normally intended for PCB mounting. In case mounting on a PCB, please ask for special instruction.
12. For low values larger size terminals than indicated in Table 1.