

DATASHEET

Product Name **Power Alloy Wire-wound Resistors**

Part Name **QL、QR、QRZG Series**

File No. **DIP-SP-050**

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1. Scope

- 1.1 This datasheet is the characteristics of power alloy wire-wound Resistors manufactured by UNI-ROYAL.
- 1.2 Multi-terminal type & variable types available
- 1.3 Small in size but capable of carrying high power load
- 1.4 Resistance value unchanged after long use , good resistivity to short time overload
- 1.5 High resistivity to heat, small resistance temperature coefficient and the change in resistance with temperature being linear
- 1.6 Too low or high ohmic value can be supplied case to case basis
- 1.7 Adjustable & Multi-Resistor type is available
- 1.8 Non-inductive type is available
- 1.9 Compliant with RoHS directive.
- 1.10 Halogen free requirement.

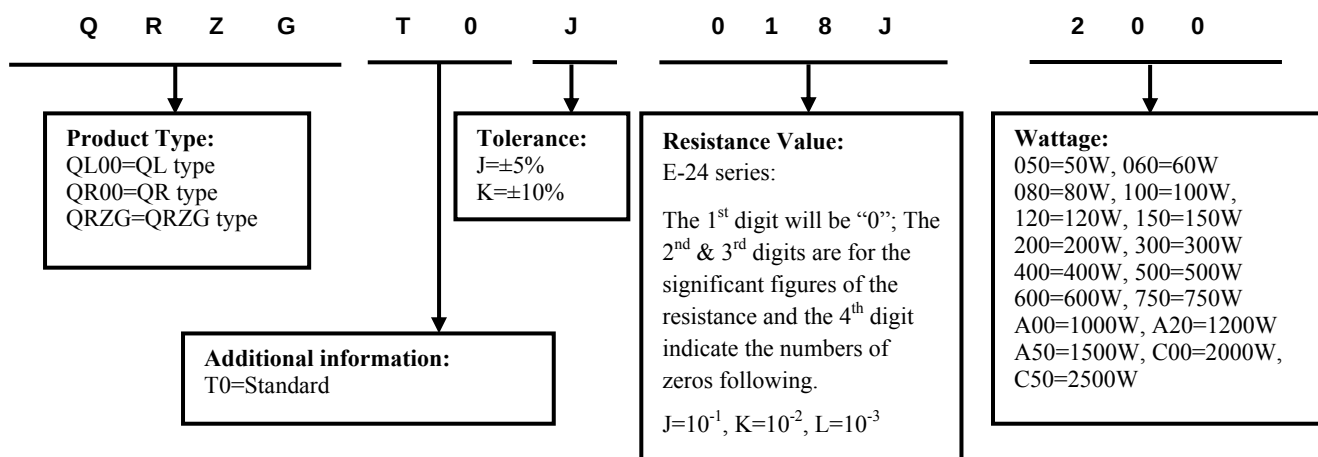
2. Part No. System

The standard Part No. includes 14 digits with the following explanation:

- 2.1 For Cement Fixed Resistors, these 4 digits are to indicate the product type but if the product type has only 3 digits, the 4th digit will be "0"
Example: QL00=QL type ; QR00=QR Type; QRZG=QRZG Type
- 2.2 5th~6th digits: T0= Standard
- 2.3 The 7th digit is to denote the Resistance Tolerance. The following letter code is to be used for indicating the standard Resistance Tolerance.
J=±5% K= ±10%
- 2.4 The 8th to 11th digits is to denote the Resistance Value.
2.4.1 For the standard resistance values of E-24 series, the 8th digit is "0", the 9th & 10th digit are to denote the significant figures of the resistance and the 11th digit is the numbers of zeros following.
Example:
0120=12Ω 0273=27KΩ
- 2.5 The 12th, 13th & 14th digits.
2.5.1 The 12th to the 14th digits are to denote the actual wattage of the products.
Example: 050=50W 100 = 100W A00=1000W

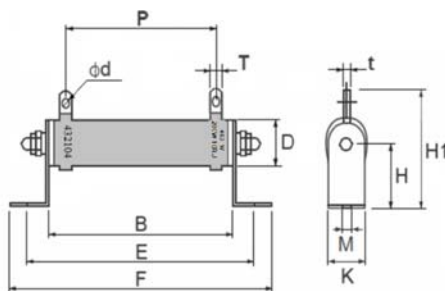
3. Ordering Procedure

(Example: QRZG 200W ±5% 1.8Ω B/B)



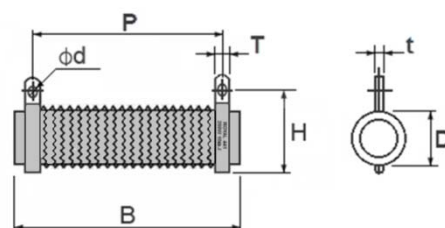
4. Ratings & Dimension

4.1 QL Type:



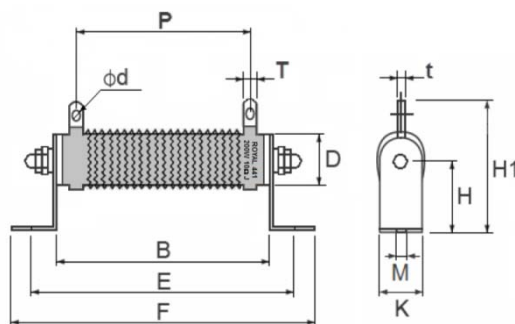
Rate Power (W)	B±2	E±5	F±3	D±2	H±1	H1±3	M±0.5	K±1	P±3	T±0.5	t±0.5	Ød±0.5	Resistance Range	Tolerance
QL 50W	102	124	146	28	28	61	6.5	28	76	8	1.8	4.5	0.1Ω~25KΩ	± 5% ± 10%
QL 60W	102	124	146	28	28	61	6.5	28	76	8	1.8	4.5	0.1Ω~30KΩ	
QL 80W	152	174	196	28	28	61	6.5	28	126	8	1.8	4.5	0.1Ω~40KΩ	
QL 100W	182	204	226	28	28	61	6.5	28	156	8	1.8	4.5	1Ω~50KΩ	
QL 120W	182	204	226	28	28	61	6.5	28	156	8	1.8	4.5	1Ω~60KΩ	
QL 150W	195	217	239	40	41	81	8	40	179	10	1.8	5.5	1Ω~70KΩ	
QL 200W	195	217	239	40	41	81	8	40	179	10	1.8	5.5	10Ω~100KΩ	
QL 300W	282	304	326	40	41	81	8	40	266	10	1.8	5.5	10Ω~150KΩ	
QL 400W	282	304	326	40	41	81	8	40	266	10	1.8	5.5	16Ω~150KΩ	
QL 500W	316	338	360	50	45	101	8	50	294	16	1.8	6.5	21Ω~150KΩ	
QL 600W	345	367	389	40	41	81	8	40	329	10	1.8	5.5	21Ω~150KΩ	
QL 750W	316	338	360	50	45	101	8	50	294	16	1.8	6.5	76Ω~180KΩ	
QL 1,000W	300	325	350	60	60	119	8.5	60	279	15	2	6.5	101Ω~200KΩ	
QL 1,200W	415	440	465	60	60	119	8.5	60	394	15	2	6.5	101Ω~250KΩ	
QL 1,500W	415	440	465	60	60	119	8.5	60	394	15	2	6.5	121Ω~250KΩ	
QL 2,000W	510	535	560	60	60	119	8.5	60	489	15	2	6.5	121Ω~300KΩ	
QL 2,500W	600	625	650	60	60	119	8.5	60	577	15	2	6.5	121Ω~360KΩ	

4.2 QR Type:



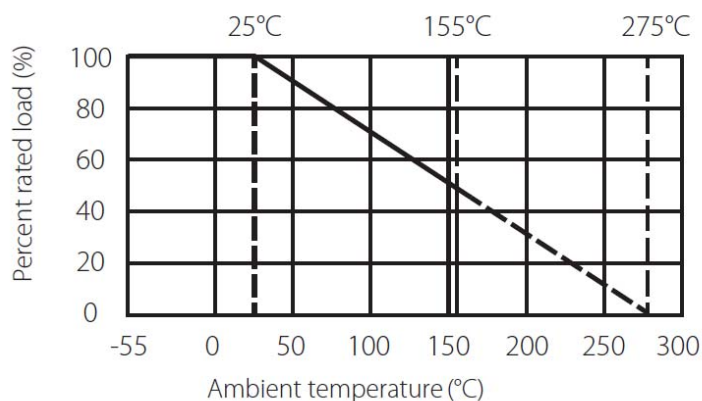
Rate Power (W)	B±2	D±2	H±1	P±3	T±0.5	t±0.5	Ød±0.5	Resistance Range	Tolerance
QR 200W	195	40	62	179	10	1.8	5.5	0.4Ω~9.1Ω	± 5% ± 10%
QR 300W	282	40	62	266	10	1.8	5.5	0.5Ω~9.1Ω	
QR 400W	282	40	62	266	10	1.8	5.5	0.8Ω~15Ω	
QR 500W	316	50	82	294	16	1.8	6.5	1Ω~20Ω	
QR 600W	345	40	62	329	10	1.8	5.5	1Ω~20Ω	
QR 750W	316	50	82	294	16	1.8	6.5	1Ω~75Ω	
QR 1,000W	300	60	94	279	15	2.0	6.5	1Ω~100Ω	
QR 1,200W	415	60	94	394	15	2.0	6.5	1Ω~100Ω	
QR 1,500W	415	60	94	394	15	2.0	6.5	1Ω~120Ω	
QR 2,000W	510	60	94	489	15	2.0	6.5	1Ω~120Ω	
QR 2,500W	600	60	94	577	15	2.0	6.5	1Ω~120Ω	

4.3 QRZG Type:



Rate Power (W)	B±2	E±5	F±3	D±2	H±1	H1±3	M±0.5	K±1	P±3	T±0.5	t±0.5	Ød±0.5	Resistance Range	Tolerance
QRZG 200W	195	217	239	40	41	81	8	40	179	10	1.8	5.5	0.4Ω~9.1Ω	± 5% ± 10%
QRZG 300W	282	304	326	40	41	81	8	40	266	10	1.8	5.5	0.5Ω~9.1Ω	
QRZG 400W	282	304	326	40	41	81	8	40	266	10	1.8	5.5	0.8Ω~15Ω	
QRZG 500W	316	338	360	50	45	101	8	50	294	16	1.8	6.5	1Ω~20Ω	
QRZG 600W	345	367	389	40	41	81	8	40	329	10	1.8	5.5	1Ω~20Ω	
QRZG 750W	316	338	360	50	45	101	8	50	294	16	1.8	6.5	1Ω~75Ω	
QRZG 1,000W	300	325	350	60	60	119	8.5	60	279	15	2.0	6.5	1Ω~100Ω	
QRZG 1,200W	415	440	465	60	60	119	8.5	60	394	15	2.0	6.5	1Ω~100Ω	
QRZG 1,500W	415	440	465	60	60	119	8.5	60	394	15	2.0	6.5	1Ω~120Ω	
QRZG 2,000W	510	535	560	60	60	119	8.5	60	489	15	2.0	6.5	1Ω~120Ω	
QRZG 2,500W	600	625	650	60	60	119	8.5	60	577	15	2.0	6.5	1Ω~120Ω	

5. Derating Curve



5.1 Voltage rating:

Resistors shall have a rated direct-current (AC) continuous working voltage or an approximate sine-wave root-mean-square (RMS) alternating-current (AC) continuous working voltage at commercial-line frequency and waveform corresponding to the power rating, as determined from the following formula:

$$RCWV = \sqrt{P \times R}$$

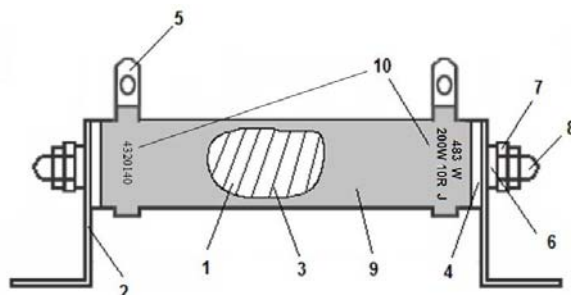
Where: RCWV = rated dc or RMS ac continuous working voltage at commercial-line frequency and waveform (VOLT.)

P = power rating (WATT.)

R = nominal resistance (OHM)

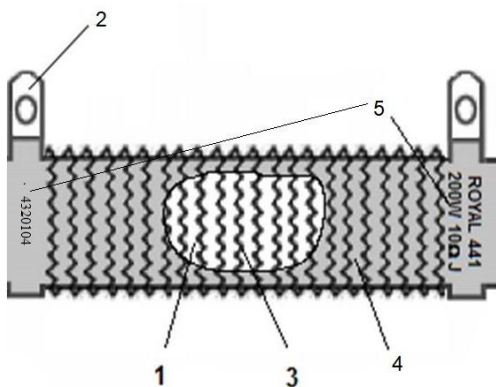
6. Construction :

6.1 QL Type:



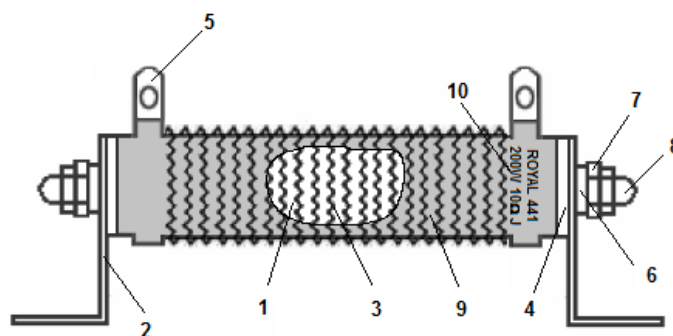
No.	Name	Material
1	Basic Body	Tube Type Ceramic
2	Terminal Support L	Stainless Steel
3	Resistance Wire	Resistance wire Alloy
4	Ceramic/ Mica	50W~120W Ceramic Ring ≥150W Mica
5	Terminal Ring	Stainless Steel
6	Spring Washer	Stainless Steel
7	Hex Nut	Stainless Steel
8	Cap Nut	Stainless Steel
9	Coating	Insulated & Non-Flame paint (Color: Green)
10	Marking	Marking Ink

6.2 QR Type:



No.	Name	Material
1	Basic Body	Rod Type Ceramics
2	Terminal Rating	Stainless Steel
3	Resistance Wire	Resistance wire Alloy
4	Coating	Insulated & Non-Flame paint (Color: Green)
5	Marking	Marking Ink

6.3 QRZG Type:



No.	Name	Material
1	Basic Body	Tube Type Ceramic
2	Terminal Support L	Stainless Steel
3	Resistance Wire	Resistance wire Alloy
4	Mica	Mica
5	Terminal Ring	Stainless Steel
6	Spring Washer	Stainless Steel
7	Hex Nut	Stainless Steel
8	Cap Nut	Stainless Steel
9	Coating	Insulated & Non-Flame paint (Color: Green)
10	Marking	Marking Ink

7. Performance Specification

Characteristic	Limits	Test Methods (GB/T5729&JIS-C-5201&IEC60115-1)
Temperature Coefficient	$\geq 20\Omega$: $\pm 300\text{PPM}/^\circ\text{C}$ $< 20\Omega$: $\pm 400\text{PPM}/^\circ\text{C}$	4.8 Natural resistance changes per temp. Degree centigrade $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (PPM}/^\circ\text{C})$ R ₁ : Resistance Value at room temperature (t ₁) ; R ₂ : Resistance at test temperature (t ₂) t ₁ : +25°C or specified room temperature t ₂ : Test temperature (+125°C)
Short-time overload	Resistance change rate is: $\pm(2\%+0.05\Omega)\text{Max.}$ With no evidence of mechanical damage.	4.13 Permanent resistance change after the application of a potential of 2.5 times RCWV or Max.Overload Votage whichever less for 5 seconds.
Terminal strength	Resistance change rate is: $\pm(1\%+0.05\Omega)\text{Max.}$ With no evidence of mechanical damage	Ual:45N ,30 seconds
Resistance to soldering heat	Resistance change rate is: $\pm(1\%+0.05\Omega)\text{Max.}$ With no evidence of mechanical damage	4.18 Permanent resistance change when leads immersed to a point 2.0-2.5mm from the body in 260°C $\pm$ 5°C solder for 10 $\pm$ 1 seconds.

Humidity (Steady state)	Resistance change rate is: $\pm(5\%+0.05\Omega)\text{Max.}$ With no evidence of mechanical damage.	4.24 Temporary resistance change after 240 hours exposure in a humidity test chamber controlled at $40\pm 2^{\circ}\text{C}$ and 90~95%RH relative humidity
Load life	Resistance change rate is: $\pm(5\%+0.05\Omega)\text{Max.}$ With no evidence of mechanical damage.	4.25.1 Permanent Resistance change after 1000 hours operating at RCWV or Max. Working Voltage whichever less with duty cycle of 1.5 hours “ON” , 0.5 hour “OFF” at $25\pm 2^{\circ}\text{C}$ ambient.

8. Note

- 8.1. UNI-ROYAL recommend products store in warehouse with temperature between 15 to 35°C under humidity between 25 to 75%RH.
Even under storage conditions recommended above, solder ability of products will be degraded stored over 1 year old.
- 8.2. Cartons must be placed in correct direction which indicated on carton, otherwise the reel or wire will be deformed.
- 8.3. Storage conditions as below are inappropriate:
 - a. Stored in high electrostatic environment
 - b. Stored in direct sunshine, rain, snow or condensation.
 - c. Exposed to sea wind or corrosive gases, such as Cl_2 , H_2S , NH_3 , SO_2 , NO_2 , Br etc.

8. Record

Version	Description	Page	Date	Amended by	Checked by
1	First version	1~6	Mar.20, 2018	Haiyan Chen	Nana Chen
2	Modify characteristic	4~5	Feb.26, 2019	Haiyan Chen	Yuhua Xu
3	Modify characteristic	5	Nov.20,2020	Song Nie	Yuhua Xu
4	Modify the temperature coefficient test conditions	4	Nov.07, 2022	Haiyan Chen	Yuhua Xu
5	Add the QW type	1~6	May.15, 2023	Haiyan Chen	Yuhua Xu
6	Cancel load life in humidity test Modify the load life test conditions	5	Sep.28, 2024	Haiyan Chen	Yuhua Xu
7	1. Modify Ordering Procedure ;Dimension; Derating Curve ;Resistance Range ;Performance Specification 2. Add the Construction	2~4 6~7 5~6	Jul.08, 2025	Haiyan Chen	Yuhua Xu

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