

Description

Hermetic flatpack aluminum case resistor

Mechanical characteristics

IP54, Wire wound on mica plate coated with cement filled with quartzite sand and sealed with silicone plug

Applications

Dynamic braking,
Charge/discharge capacitor

Market

Industrial automation, Energy

Special version

Ohmic values out of range, Special tolerance on resistance (2%, 1%), Different cable length, Thermal switch, Low inductance, Heat sink mounting

RFD



50W ÷ 550W
(1000 W with heat - sink)



ELECTRICAL CHARACTERISTICS

refers to room temperature 25°C

ID	Max Power	Rated Power	Min Resistance	Max Resistance	Limit voltage	Dielectric strength
Unit	W	W	Ω	Ω	V	V
RFD 50	50	50	0.25	2k2	1000	3000
RFD 100	100	75	0.56	4k7	1500	4000
RFD 150	150	100	0.62	9k1	1500	4000
RFD 200	200	140	1.3	18k	1500	4000
RFD 300	300	180	2.4	33k	1500	4000
RFD 550	550	240	2.7	39k	1500	4000
RFDHS 300	360	300	2.4	33k	1500	4000
RFDHS 550	1000	550	2.7	39k	1500	4000

Insulation resistance (1000 VDC) $\geq 1000 \text{ M}\Omega$

Thermal time constant 750 s (RFD 550 800 s)

Active materials: calculation for min ohmic value are made considering wire material CuNi44, whereas max ohmic value refers to wire material FeCrAl. Resistors can be made also with NiCr alloys. Temp. Coefficient Resistance depends on the used alloy, typically it is between 20 and 240 $10^{-6}/^{\circ}\text{C}$.

The standard version cable is single core with flexible conductor silicone rubber insulated with fiberglass braid.

For cross section AWG14 and AWG16 the cable is classified 200°C – 600 V and made according to UL Style 3071.

For cross section 1 mm², 4 mm² and 6 mm² the cable is classified 180°C – 500 V and made according to IEC EN 60228 cl. 5 /CEI EN 50363-5.

The tolerance on cable length is $\pm 5 \text{ mm}$. The choice of cross section to be used depends on the current that flows in the resistor.

Internal thermal switch 160 $\pm 5^{\circ}\text{C}$ (rated voltage: 250 V; rated current: 2,5 A; leads single core conductor silicone rubber insulated cross section 0,25 mm² length 300 mm), it is an option and must be specified in the order.

Thermal switch is not available on RFD 50 and RFDV 50.

Housing is aluminum extrude, normally it is oxidized to prevent corrosion.

Standard tolerance on ohmic value is $\pm 5\%$.

Max power can be supplied to the resistor for not more than 60 minutes.

Picture above refers to model RFDV 550.

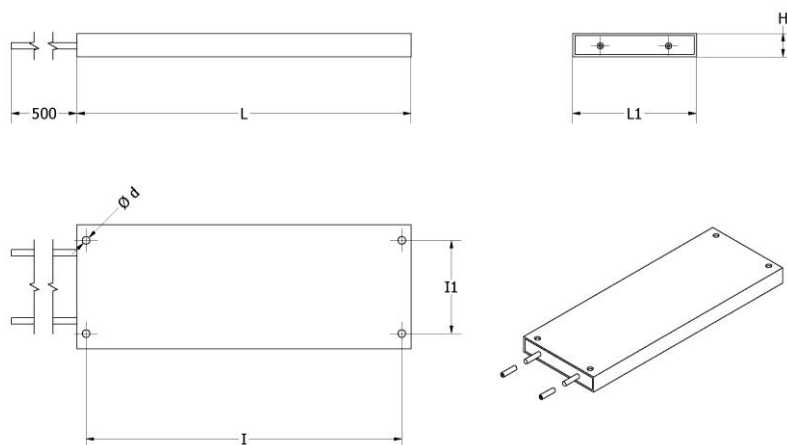
MECHANICAL DATA

RFD

Dimensions [mm]	L	L1	I	I1	H	d	Weight [g]
RFD 50	100	40	No holes	No holes	15	No holes	160
RFD 100	100	60	88	40	15	5	220
RFD 150	110	80	98	60	15	5	320
RFD 200	160	80	148	60	15	5	500
RFD 300	216	80	204	60	15	5	630
RFD 550	220	100	180	83,5	20	6.3	980

Unless otherwise specified, applicable standard of general tolerances for linear and angular dimensions is ISO 2768-1 class c; applicable standard for aluminum profile is EN 755-9:2008.

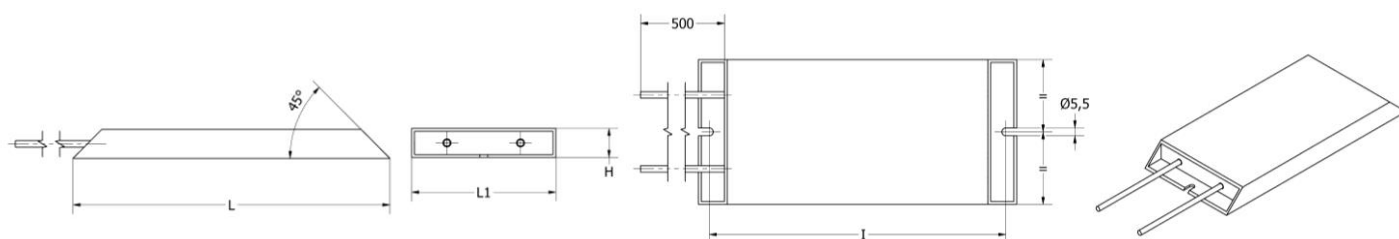
DRAWING



RFDV

Dimensions [mm]	L	L1	I	H	Weight [g]
RFDV 50	100	40	85	15	150
RFDV 100	100	60	85	15	200
RFDV 150	110	80	95	15	300
RFDV 200	160	80	145	15	450
RFDV 300	220	80	205	15	600
RFDV 550	220	100	205	20	900

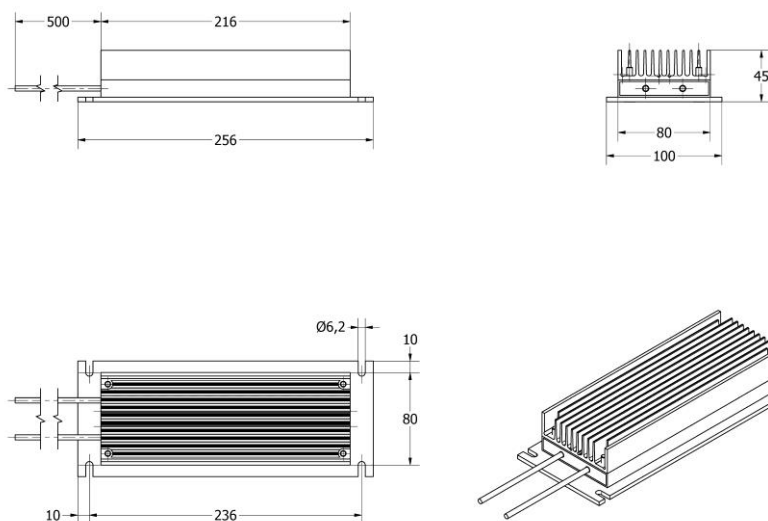
DRAWING



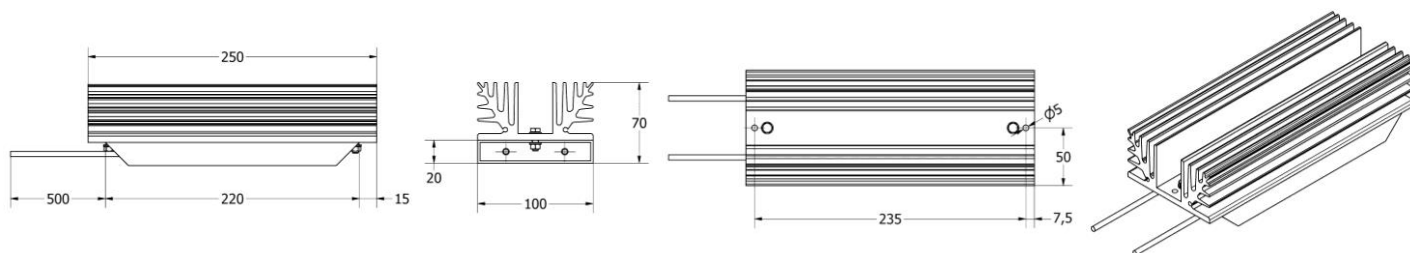
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DRAWING RFDHS 300



DRAWING RFDHS TREE HEAT SINK 550



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Overload conditions

Case resistors are mostly used for overload operation, such as precharge of capacitors, dynamic braking of VFD, crowbar operations.

We can distinguish between 3 typical overload conditions: one is the isolated single pulse (emergency braking, precharge in case of short circuit or abnormal duty), the second one is the cyclic work load (i.e. braking of a lift), and the third one is a long overload (i.e. due to a fault in the system).

In all 3 cases, we can state that for pulses of duration less than 60 s, the mass of the wire must be taken in account to define the admissible overload. The mass of the wire depends on the ohmic value.

Unless the pulse is very short (<0,5 s), the mass of the quartzite sand inside plays an important role for the calculation of the global thermal capacity. The longer is the duration of pulse, the higher is the multiplier of the thermal capacity of the wire.

Fairfield technical office is at your disposal for further detailed information.

As far the operation in the **cyclic work load** condition, we can easily calculate the admissible braking power in respect off the duty cycle (ton / total time): Braking power = Rated power * (1 / Duty cycle)

This is valid only if the period does not exceed 240 s.

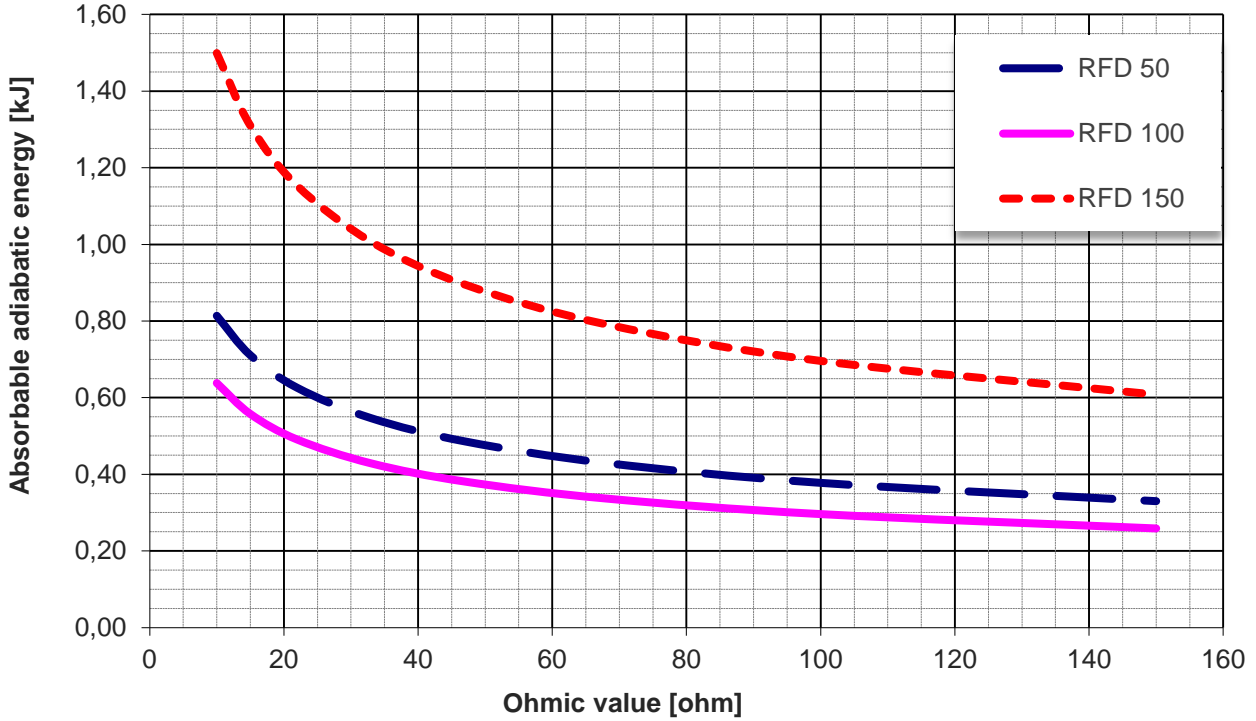
In the following table is shown the max power that is possible to supply for different duty cycle and period.

CYCLIC WORK LOAD

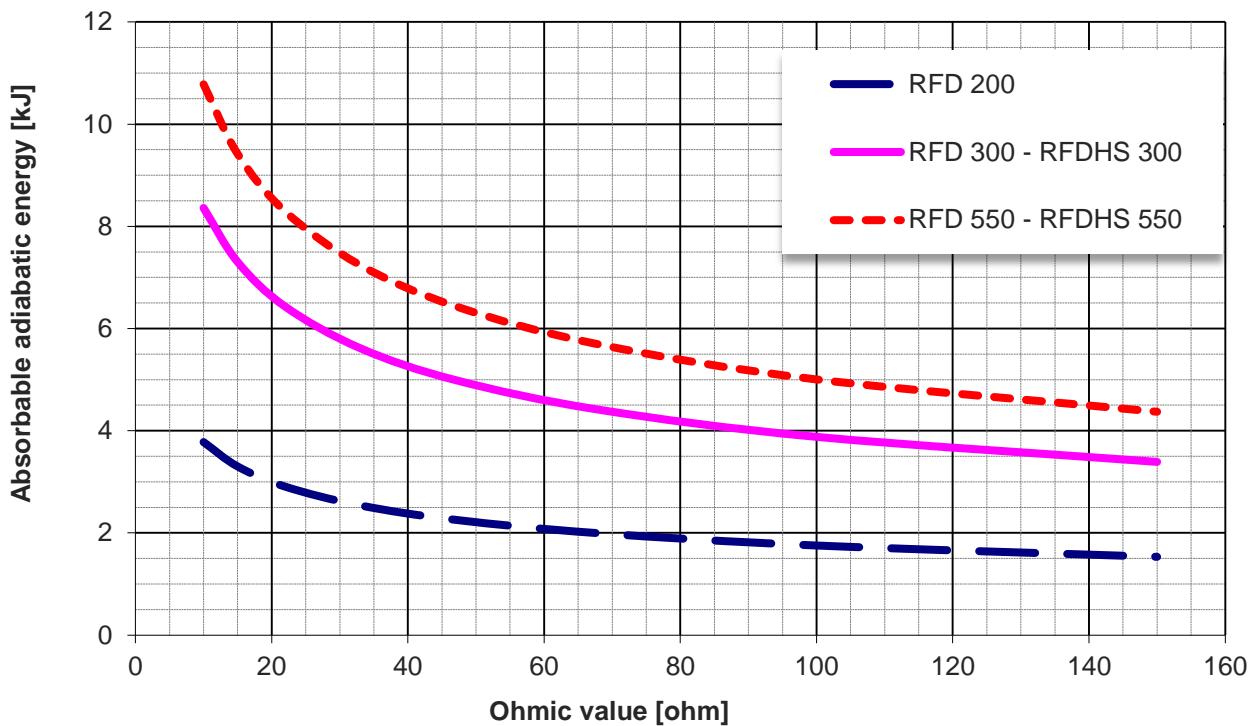
Model	Pulse load period 120s			
	ED 2.5%	ED 10%	ED 25%	ED 50%
	kW	kW	kW	kW
RFD 50	1.0	0.25	0.10	0.05
RFD 100	1.8	0.45	0.18	0.09
RFD 150	3.0	0.8	0.30	0.15
RFD 200	4.0	1.0	0.40	0.20
RFD 300	6.0	1.5	0.60	0.30
RFD 550	12.0	3.0	1.2	0.60
RFDHS 300	12.0	3.0	1.2	0.60
RFDHS 550	14.0	3.5	1.4	0.70

PULSE LOAD GRAPH (RFD 50,100,150)

In the following graph is shown, for ohmic value range between 10 Ω and 150 Ω, the maximum **pulse energy** of max 1 second that is possible to supply to the resistor in a cyclic load. In case of isolated pulse, the value can be multiplied times 2.



PULSE LOAD GRAPH (RFD 200,300,550)



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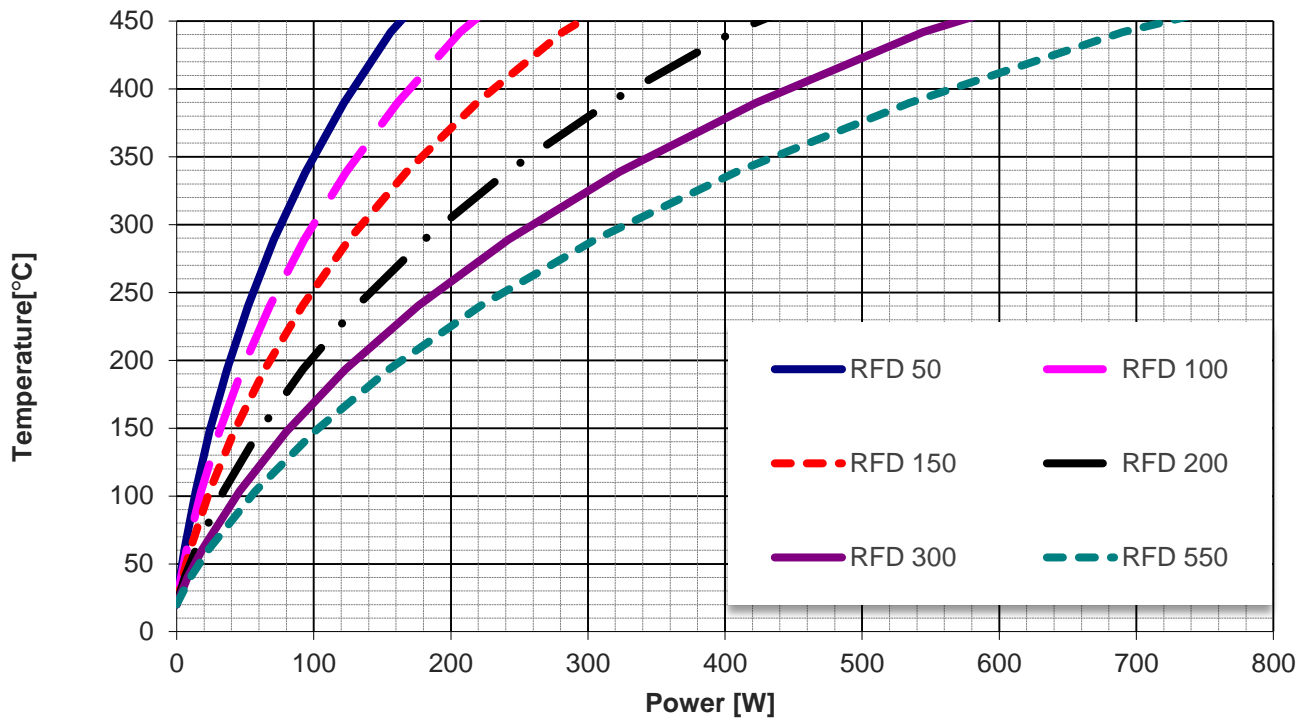
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The rated power stated in this datasheet refers to resistor mounted in horizontal position (with no possibility to exchange heat in the bottom direction) at the ambient temperature of 25°C and 250°C on the external surface. The power dissipation is influenced by:

- Mounting position and arrangement (wall, heat - sink)
- Number of resistors mounted together (grouping)
- Ambient temperature (in free air or inside an enclosure)

Ask the appropriate test reports for more details. See the following graph to know the external temperature corresponding to a certain continuous power (graph of RFDHS 300 and RFDHS 550 are available upon request).

SURFACE TEMPERATURE CHARACTERISTICS



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Marking

The resistor is marked on the housing with indelible ink high temperature
 FAIRFIELD – RFD 550 150R 5% WW/YY (week / year)

Packing

The resistor is packed in a way to preserve incidental damages due to transport. To avoid resistor's break we recommend to never take it from the cables and to handle with care inside the original boxes provided by the factory.

Installation

Warning: Units must never be mounted with the terminals uppermost

Disclaimer

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Ordering information

RFD/T XXX RRRR 5%

Y T : Internal thermal switch 160±5°C (rated voltage: 250 V; rated current: 2,5 A; leads single core conductor silicone rubber insulated cross section 0,25 mm² length 300 mm – not available for RFD 50 and RFDV 50).

V : aluminum case cut 45°

T V : aluminum case cut 45° and Internal thermal switch 160±5°C as above

HS : with heat sink (only for 300 and 550)

XXX Model 50, 100, 150, 200, 300, 550

RRRR Resistance value (nominal at 20°C)

Example

RFD 550 150R 5%

RFD is the name of the product

550 is the model

150R means 150 Ω that is the nominal ohmic value at 20°C

5% is the tolerance on the ohmic value, in this case the value of the resistor is accepted when is within 142.5 Ω + 157.5 Ω