ALUMINIUM HOUSED POWER RESISTOR

TYPE CFH SERIES

INTRODUCTION

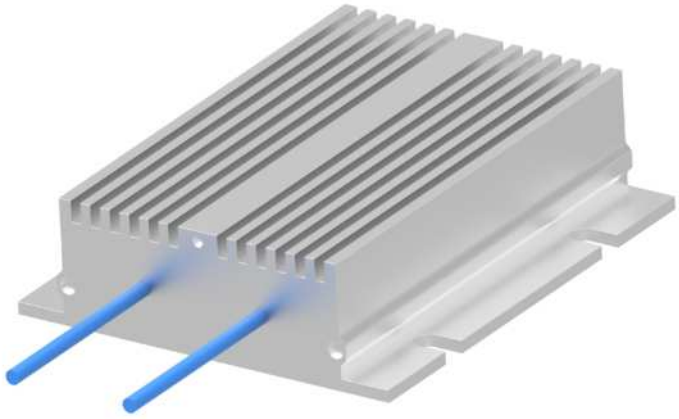
The CFH series is a high quality range of aluminium housed power resistors offering environmental protection to IP65 and 66, elevated dielectric strength, and high impulse withstand capabilities.

The nominal power of the CFH resistors is particularly high. This is obtained with a compact and insulated construction without accessible live parts, and using special inorganic materials that are capable of resisting temperatures above 400°C without damage.

Moreover, the rated power of these resistors may be improved using a suitable additional heat sink.

FEATURES

- Up to 1.35kW in free air
- Environmental protection to IP65 as standard
- High pulse capability
- Slimline casing
- RoHS and REACH compliant



APPLICATIONS

- Dynamic braking
- Capacitor charge/discharge
- Traction general employment
- Inverter
- Snubber

CHARACTERISTICS – ELECTRICAL

Characteristic	CFH350	CFH500	CFH750	CFH1100	CFH1200
Power rating (PR) (W)	330	410	700	1000	1350
Max. surface temperature @PR (°C)	310	320	330	335	390
Pulse load @40°C, duty 5 sec, cycle 120 sec	Up to 7.5 x PR				
Pulse load @40°C, duty 10 sec, cycle 120 sec	Up to 5 x PR				
Pulse load @40°C, duty 20 sec, cycle 120 sec	Up to 2.8 x PR				
Pulse load @40°C, duty 40 sec, cycle 120 sec	Up to 1.7 x PR				
Resistance range (Ω)	0.5 ~ 7.5K	0.5 ~ 10K	0.5 ~ 12K	0.5 ~ 15K	40 ~ 300
Resistance tolerance	±5%				
Voltage limit	√(P*R) OR 1500V whichever is smaller				
Dielectric strength @50Hz x 60sec	4500 V_{rms}				

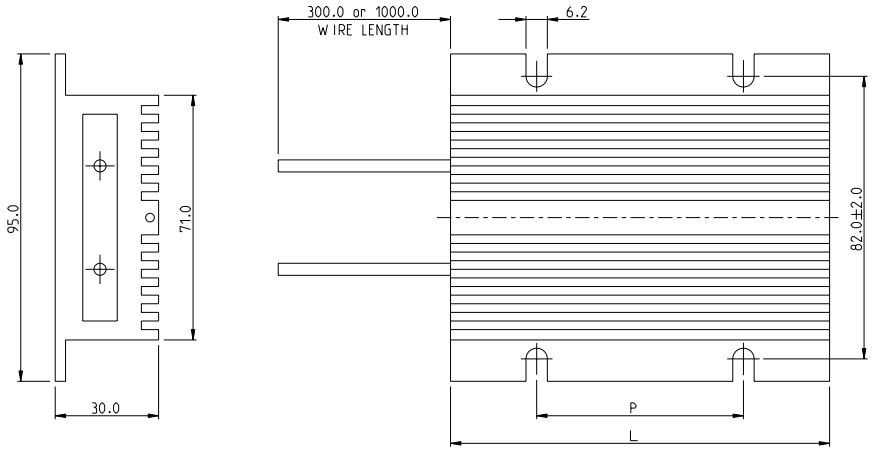
Aluminium Housed Power Resistor

Type CFH Series

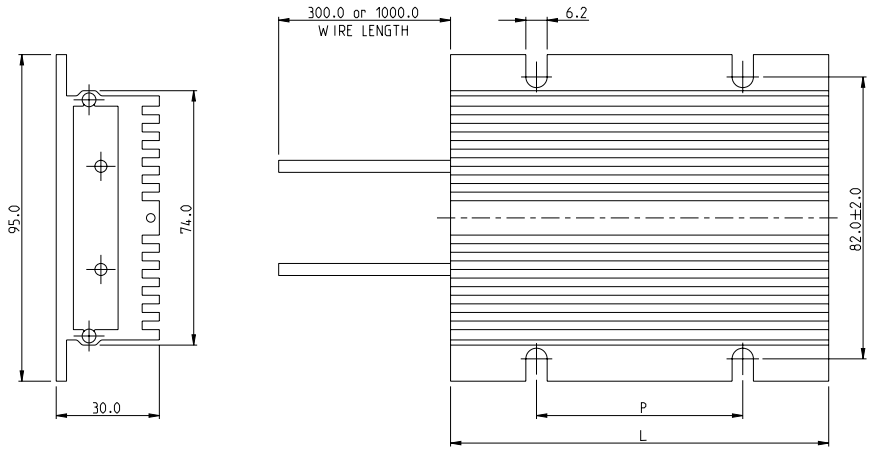
Characteristic	CFH350	CFH500	CFH750	CFH1100	CFH1200
Insulation resistance in dry condition @1000 Vdc x 60 sec	>250MΩ				
Time constant	~ 6.54 min	~ 6.22 min	~ 5.95 min	~ 6.19 min	~ 6.71 min
Time to reach the steady state	~ 30 min	~ 36 min	~ 36 min	~ 27 min	~ 30 min
Thermal capacity (J/K)	~ 405	~ 528	~ 757	~ 1109	~ 1469
Thermal resistance @20°C (K/W)	~0.97	~ 0.71	~ 0.47	~ 0.34	~ 0.27
Specific power (W/cm^2)	~ 0.61	~ 0.53	~ 0.67	~ 0.66	~ 0.68
Absorbed energy @250 KΔT (J)	102000	132000	189200	278000	368000
Operating temperature range	-55 ~ 70°C				
Storage temperature range	-55 ~ 90°C				

DIMENSIONS (UNIT: mm)

Standard



Special



	CFH350	CFH500	CFH750	CFH1100	CFH1200
L±2 (mm)	110	160	220	320	420
P±1.5 (mm)	60	110	140	240	340
Cable type standard	High temp 2,5 mm^2 – Spark test voltage 4,5 kV (for ≤5 Ω 4,0 mm^2)				
Cable type optional	UL AWG 12 – Spark test voltage 6 kV (for ≤5 Ω AWG 11)				
Weight (kg)	0.460	0.600	0.8600	1.260	1.670

Aluminium Housed Power Resistor

Type CFH Series

TWO VERSIONS

Version	Standard (CFH)	Special (CFH/S)
		
Ingress protection	IP 65	IP 66
Special features		Screwed front and rear metallic panels with nickel plated brass PG7 cable glands*

*The special models CFH 350-500-750-1100-1200 have a slightly modified housing for the addition of two longitudinal bulges on the side surfaces to allow the housing of the tightening screws for fixing the metal heads to increase the degree of protection for special uses (IP66, railway sector, cable glands, etc. only if requested by Customer).

OPTIONS

Option	Series Type
Thermo-switch bimetallic disc type	CFHC
Thermostat	CFHT
Thermo-switch bimetallic disc type + Thermostat	CFHC/T
Screwed front and rear metallic panels with nickel plated brass PG7 cable glands	CFH/S

INSTALLATION

- Correct mounting is horizontal with heat sink facing upwards.
- Vertical mounting is permissible, with the accuracy of positioning the cables on the lower side.
- Install away from flammable material.

RATED VOLTAGE

The maximum working voltage ($\sqrt{(P*R)}$) must always be lower than the maximum limit voltage (1500v), consistent with the insulation class of 4.5kV. Therefore, the applicable power must always be evaluated on the basis of the Ohmic value and the limit voltage. High Ohmic values and powers (in the feasibility ranges) can make the working voltage exceed the limit voltage or even exceed the insulation class of the product.

ENERGY LEVEL

The energy level depends on the ohmic value, average power, and application time (the values shown refer to average ohmic values).

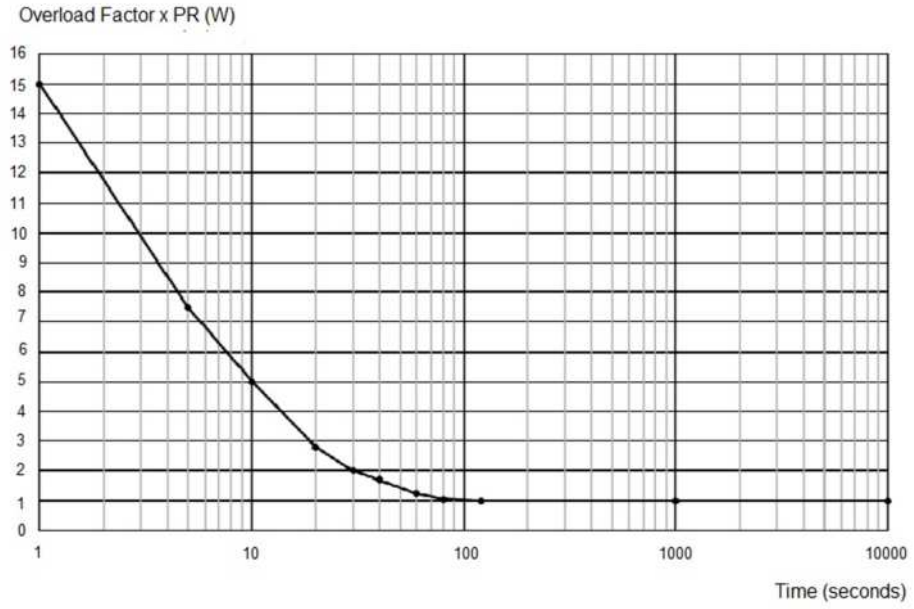
The energy level and rated power are maximized in the resistor with low to medium Ohmic values, whereas for high Ohmic values, the energy level and rated power must be reduced proportionally.

OVERLOAD

The resistors can withstand high overload during relative short time (on-time). During overload the active material reaches maximum temperature. During the rest period (off-time) the energy is further released into the air. The cycle time is the on-time plus the off-time and taken here as 120 seconds.

Note: Continuous power rating (PR) was measured under laboratory conditions with resistor mounted in free air under optimal heat exchange conditions.

The curve below shows the overload capability in multiples of the nominal power for pulse loads at given duration with a cycle time of 120 seconds.



PRODUCT CODE STRUCTURE

Part Number					
CFH	_	1100	A	220R	J

Common Part

CFH	

Option

Blank	Standard
/S	Special
C	Thermo-switch
T	Thermostat
C/T	Thermo- Switch & Thermostat

Type

350	330W
500	410W
750	700W
1100	1000W
1200	1350W

Tolerance

J	5%

Resistance Value

1R0	1.0Ω
100R	100Ω
1K0	1KΩ (1000Ω)

Lead Length (mm)

A	300
B	1000

PRODUCT INFORMATION

TCPN	Part Description	Alias	Part Status
2-1623821-0	CFH 350 4R7 5% 300MM Leads	CFH350A4R7J	Production
1-1623821-8	CFH 350 2R2 5% 300MM Leads	CFH350A2R2J	Production
1623821-4	CFH 350 43R 5% 300MM Leads	CFH350A43RJ	Discontinued
2-1623821-1	CFH 350 10R 5% 300MM Leads	CFH350A10RJ	Production
1-1623821-5	CFH 350 50R 5% 300MM Leads	CFH350A50RJ	Discontinued
1-1623821-7	CFH 350 22R 5% 300MM Leads	CFH350A22RJ	Production
1-1623821-9	CFH 350 3R3 5% 300MM Leads	CFH350A3R3J	Production
2-1623821-7	CFH350 620R 5% 1000MM Leads	CFH350B620RJ	Production
1-1623821-4	CFH 500 56R 5% 300MM Leads	CFH500A56RJ	Production
2-1623821-2	CFH 500 2R2 5% 300MM Leads	CFH500A2R2J	Production
1623821-1	CFH 500 3R0 5% 1M Leads	CFH500B3R0J	Discontinued
1623821-6	CFH 500 3R0 5% 300MM Leads	CFH500A3R0J	Discontinued
1623821-2	CFH 750 120R 5% 300MM Leads	CFH750A120RJ	Production
1-1623821-6	CFH 1100 56R 5% 300MM Leads	CFH1100A56RJ	Production
2-1623821-3	CFH 1100 71R5 5% 300MM Leads	CFH1100A71R5J	Production
1623821-8	CFH 1100 680R 5% 300mm Leads	CFH1100A680RJ	Production
1-1623821-2	CFH 1100 3R9 5% 300mm Leads	CFH1100A3R9J	Discontinued
1-1623821-0	CFH 1100 1R6 5% 300mm Leads	CFH1100A1R6J	Production
2-1623821-8	CFH 1100 120R 5% 300MM Leads	CFH1100A120RJ	Production
2-1623821-9	CFH 1100 5R6 5% 1000MM Leads	CFH1100B5R6J	Production
1623821-7	CFH 1100 220R 5% 300mm Leads	CFH1100A220RJ	Production
1623821-9	CFH 1100 2R7 5% 300mm Leads	CFH1100A2R7J	Production
2-1623821-5	CFH 1100 22R 5% 300MM Leads	CFH1100A22RJ	Production
1-1623821-1	CFH 1100 5R6 5% 300mm Leads	CFH1100A5R6J	Production
2-1623821-4	CFH 1100 17R3 5% 300MM Leads	CFH1100A17R3J	Production

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