Technical data

TYPE GR/MOD

DESCRIPTION							
Technology type	Alloy Type	Cabinet Model	R at 20 Degrees	Mains type	P perm. (KW)	P max (KW)	Braking time (sec)
GRID	Stainless Steel	GR/MOD4/L	3R2	Single phase	130	1300	10

INSULATION and CONNECTION	
Insulating Raw material	Steatite
Insulating Voltage	3 KV
Internal connection raw material	Copper
Connection type	Direct
CABINET	
Number of Cabinet	1
Material	Galvanised Steel
Paint	**
Protection Level	IP 23
Accessories	Eye bolt
Cooling	Natural air convection

ELECTRICAL DATA	
Connection terminal for power cable	M12 Terminal
Recommended section cable for power	According to Amp. (Not supplied)
Temperature switch (Open 150ºC / Close 140ºC (both +/- 5ºC)	OPTIONAL
Maximum input voltage for the temperature switch	250V AC
Maximum input current for the temperature switch	10A AC
Recommended cable for temperature switch	$2mm^2$ (Not supplied)
Connection type	Internal

Dynamic braking resistors

TYPE GR/MOD

ELECTRICAL CHARACTERISTICS		**Note**: *Data indicated can be subject to technical modifications*
1.0.0	**Temperature coefficient**	250 ppm /ºC
1.0.1	**Maximum load pic**	5xPn. 10 sec.
1.0.2	**Maximum Operating voltage**	3000 DC or VC rms
1.0.3	**Protection enclosure**	Galvanised / Stainless steel
1.0.4	**Protection level**	IP23 correspond to safety class I
1.0.5	**Standard Resistor Tolerance**	±10 %
1.0.6	**Inductance values**	Less than 20 µH
10.0.7	**Ohm Value**	From 0,5 to 50Ω
10.0.8	**Insulation resistance @1000 Vdc x 60 sec**	> 10 MΩ
10.0.9	**Compliant with and previous releases.**	ROHS (EU 2002/95/CE) and REACH (CE low voltage directive) IEC 60634
10.0.10	**Connection type**	M12 grounding screw.
10.0.11	**Temperature superficie**	exceed 80ºC
10.0.12	**Dielectric Strength @50Hz x 60 sec**	3500 Vrms
10.0.13	**Thermal switch protection (KL)**	On request : Normally closed contact, opens at ~160ºC +/-5ºC, re-closes at ~140ºC +/-5ºC. Voltage: 250V AC rms. / Current: 10A AC rms / 6.35mm male faston connection
10.0.14	**Cooling**	Natural Air convection
10.0.15	**Customized protection enclosure**	On request (IP45 or IP54)
10.0.16	**Accessories**	Eye bolt, Thermal switch, bottom protection grid

Standard power & protection enclosures

TYPE GR/MOD

ECOMSA Resistor Model	WATTS (in continuous)	DIMENSIONS in mm. (Approx.)		
External connection	**Up to**	**L**	**P**	**H**
GR/MOD1/P	30KW	650	500	420
GR/MOD2/P	50KW	650	500	780
GR/MOD3/P	75KW	650	500	1030
GR/MOD4/P	130KW	650	500	1280
GR/MOD5/P	140KW	650	500	1530
GR/MOD6/P	150 KW	650	500	1780

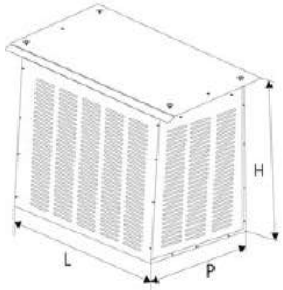
Internal connection	**Up to**	**L**	**P**	**H**
GR/MOD1/L	30KW	870	500	420
GR/MOD2/L	50KW	870	500	780
GR/MOD3/L	64KW	870	500	1030
GR/MOD4/L	130KW	870	500	1280
GR/MOD5/L	140KW	870	500	1530
GR/MOD6/L	150 KW	870	500	1780

Available offer provided using the following standards:
- DIN EN 60529 (degrees of protection provided by enclosures)
- DIN EN 50178 (electronic equipment for use in power installations)

GR/MOD2

GR/MOD1

GR/MOD3



GR/MOD4

GR/MOD6

GR/MOD5

Description

Our GR/MOD Hi-Power resistors models are resistors composed by AISI 304 stainless steel grids , to ensures high dissipation capacity and excellent resistance to thermal shock and overload. Low inductance element.

The resistance value is calculated on 20ºC basis and it may change with a high temperature.

The construction allows high power dissipation in a small space. This set, with lateral supports and galvanized enclosure perforated to insure correct ventilation, is in accordance with the IP23 (according to the model resistor) protection requirement. They can be supplied with a thermal protector and with the ohmic value required by the customer.

GR/MOD power resistors are designed to meet low cost requirements of industrial users and to have, at the same time, good quality and reliability, joined with high power dissipation, mechanical strength and excellent endurance.
The resistive element is a grid which can be deformed in the presence of high temperature, to the point to be short-circuited.
Due to the peculiar form of the grid, the air turbulence will be favored and consequently an excellent thermal exchange with the cooling air is assured.

Higher braking powers can be absorbed by a braking resistor connected across the DC link.
Power resistors being passive electronical or electrical units are not affected by the specific EMC standards. They do not produce any interfering radiations nor are they affected.
The characteristics of the GR/MOD resistors make them particularly suitable for limiting strong currents, battery discharge, starting motors, power generators, etc.

Main Characteristics

- **Flammability:** All materials are inorganic and inherently no-burning.

Material Used

- **External protection:** IP23 Galvanized steel
- **Resistive element:** AISI 304 Stainless Steel, according to DIN 17470
- **Substrate:** Steatite
- **Connection bar :** Copper
- **Terminals connection :** M10 Terminal screws

Cabinet Options

Upon request, Stainless steel (AISI 304 or AISI 316 for general, industrial and marine applications) are also available, which allow to withstand higher temperatures, have a high resistance to hot oxidation and corrosion in various aggressive environments.
IP45 and IP54 model is also available for outdoor application.
A forced ventilation can also be added.

Connection Terminal

It is possible to reach the M10 terminal screw to connect the resistor. Any variations/ customizations must be requested in order. For the versions with optional thermostat (Klixon) there is also a cable gland for connecting the thermostat

Installation

Unit is designed for mounting horizontally with the largest open face up.
Other orientations may result in increased element temperatures.
The resistor should be protected by appropriate safety measures against overloading.
Do not mount the resistor with any obstruction in the air inlet or air outlet area.
Mount the resistor on a plane area.
The resistor has to be grounded.

Warning

Units must never be situated so that the terminal box is the highest point of the resistor. Units must never be situated so that the largest open face is at the bottom.
In cases of insufficient cooling or false mounting the resistor or the surrounding devices could be overheated or ruined

GR/MOD Dynamic Braking Resistor

Safety Information

Please read carefully these instructions to correctly install and maintain this item as well as to guarantee a safety work and an efficient life.
Only technically qualified and competent persons should install this GR/MOD. This resistor must be installed in accordance with these instructions. Disconnect and isolate all electrical connections before installation or maintenance.

Materials

Materials that are combustible or that may be affected by the heat must not placed close to the enclosure. This is especially important above the enclosure. Such materials include most plastics and other non-metals.

Hazards

The GR/MOD contains hazardously high voltages when it is connected.
The surfaces of the GR/MOD may be hazardously hot during operation.

Factory Testing

Every GR/MOD satisfies the following requirements:

- Resistor tolerance on nominal value at room temperature is: +/- 10%, (measurement uncertainty ±0.1%)
- Voltage withstand capability (between resistor element and enclosure): 3kV for 1 second.
- The enclosure gets hot. Do not use it to support any cables.
- If required, connect the over temperature sensor.
- Ensure that all connections (including the earth) are tight before refitting the cover
- Isolate and check that the electrical supply is disconnected before working on the resistor.
- Check the ventilation holes in the enclosure are not obstructed.
- The GR/MOD is supplied with an indication specifying its power rating and ohm value.

Maintenance

The only maintenance required is to ensure that the GR/MOD is undamaged and reasonably clean.
The frequency of maintenance checks will depend on the working environment.
Initially checks should be made at least annually.

- Isolate and check that the electrical supply is disconnected before working on the resistor.
- Check the ventilation holes in the enclosure are not obstructed.
- Using a soft brush clean away any build up of dust and dirt on the cover.
- Check all connections are tight.
- Check warning labels are clean and undamaged.

Environmental Considerations

GR/MOD model convert electricity into heat to produce an essential braking effect. They have no other environmental impact. GR/MOD models contain no hazardous materials.
At the end of their useful life all the metallic parts are recyclable and can be reprocessed.

Installation Requirements

Free airflow

- It is essential to allow a free flow of air around the GR/MOD enclosure because the air leaving the resistor and the enclosure surface temperature can exceed 100°C.
- The minimum recommended clearance to other equipment is 250mm
- Do not obstruct the ventilation holes in the enclosure.
- The GR/MOD cabinet must be well ventilated.
- Forced cooling should be used where there is insufficient natural ventilation.
- The GR/MOD should be mounted as high as possible within the cabinet.

Installation Procedure

- Isolate and check that the electrical supply is not live before beginning.
- Remove the cover if necessary to reach the mounting holes.
- Fix to mounting surface.
- Cable access is through protective gland or removing the lateral panel.
- Connect the resistor using suitably rated cable. The resistor is not polarity sensitive.
- Connect the cable earth to the earthing point in the enclosure.
- If required, connect the over temperature sensor.
- Ensure that all connections (including the earth) are tight before refitting the cover.
- Before operation ensure there are no obstructions to prevent proper ventilation.

Positioning Requirements

The enclosure must be mounted on a flat surface, ideally horizontally with the solid plate at base

CORRECT POSITIONING ✓
UNCORRECT POSITIONING ✗

Correct installation ✓

Installed on the side ✗

Installed up side down ✗