CARLO GAVAZZI
Automation Components

DISAI
Automatic Systems
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CARLO GAVAZZI

Hybrid Relays

RMD1H Series:
Compact One Pole up to 20A

RMD2/3H Series:
Two Pole up to 40A
Three Pole up to 30A

Switches

Switches

Making both ends meet ...

Using **RMD** merges the benefits of the longevity of solid state technology with the power of electro-mechanical technology and aims to:

- replace Mercury Displacement relays;
- be compliant with the mercury ban and to the RoHS directive, thus using an environmental friendly switching solution;
- cut down on long term costs related to mechanical contactor replacements and related maintenance;
- drastically reduce system downtimes

Long Term Reliability

Cost Saving

Space Optimization

Diagnostic Warning

The RMD Series

Three versions of hybrid relays are offered:

RMD1H

A one pole hybrid relay with one switching pole, constructed in a 17.5mm housing capable of switching up to 20 AAC heaters in a surrounding temperature of 77°F (25°C).

RMD2H

A three-phase hybrid relay with two switched poles and one live pole connecting the supply directly to the load. This version can switch loads up to 40 AAC in a surrounding temperature of 140°F (60°C). It is a more economical version of the **RMD3H**.

RMD3H

A three-phase hybrid relay with all three poles being switched. Three pole switching eliminates any phase imbalance and provides a safer switching solution. This option can switch loads up to 30 AAC in a surrounding temperature of 140°F (60°C).

Switches

RMD Series of Hybrid Relays

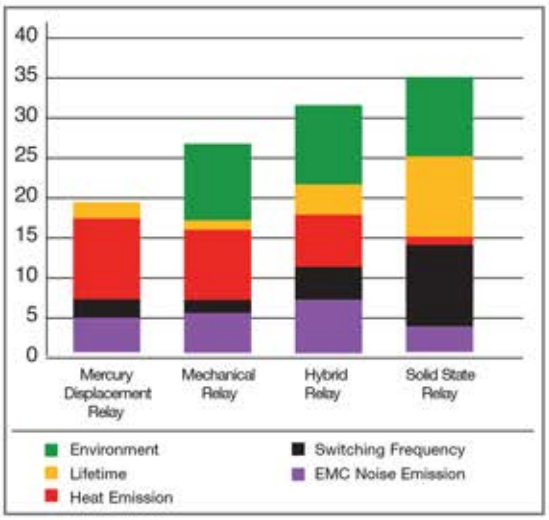
The combination of solid state and mechanical relay technologies has long been used by Carlo Gavazzi in other products.

The **RMD Series** takes the best out of the solid state and electromechanical switching technologies to offer solutions which can live up to 4 million electrical operating cycles in extreme conditions. From the chart, this can easily be seen through the shortcomings as a result of: heat emissions during operation, shorter operating lifetime, compromised switching frequency and electromagnetic noise emission.

The most evident difference between mercury displacement and the other technologies is the absence of an environmental-friendly solution. This is attributed to the presence of mercury in its construction, as well as the often overlooked issues of handling and disposal of the mercury displacement relays.

The **RMD Series** is constructed without the use of mercury or any other hazardous substances, thus making the product compliant to the directive outlining the Restriction of Hazardous Substances (RoHS).

Benefit Scores for Different Technologies



Best of Both Worlds

- Replacement for Mercury Displacement Relays
- Environmental-friendly solution with no mercury included in the construction
- Decreases long term costs related to mechanical contactor replacements and related maintenance

Selection Guide - RMD1: One Pole Hybrid Relays

Rated Operational Voltage	Blocking Voltage	Control Voltage	Rated Operational Current 20 AACrms
230 VAC	600 Vp	4-32 VDC	RMD1H23D20
		24-275 VAC 24-190 VDC	RMD1H23A20

Selection Guide - RMD2 and RMD3: Two and Three Pole Hybrid Relays

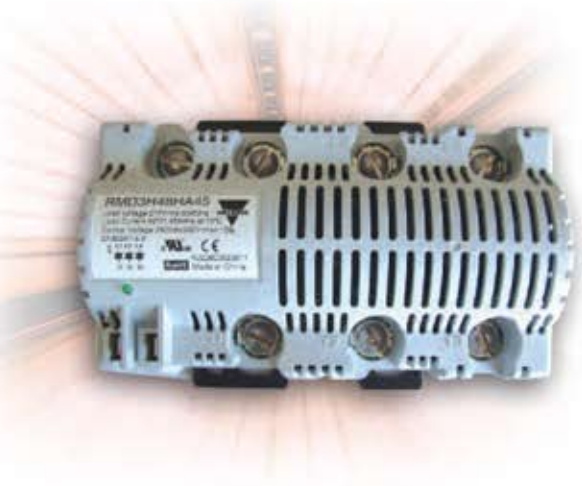
Rated Operational Voltage	Blocking Voltage	Number of Switched Poles	Rated Control Voltage	Rated Operational Current at 60°C	Surrounding Temperature
				30 Arms	40 Arms
240Vrms (1phase loads) (3phase delta)	600Vp	2	24 VAC/DC	RMD2H24LA30	RMD2H24LA40
			120 VAC	RMD2H24MA30	RMD2H24MA40
			240 VAC	RMD2H24HA30	RMD2H24HA40
240Vrms (3phase delta)	600Vp	3	24 VAC/ DC	RMD3H24LA30	RMD3H24LA40
			120 VAC	RMD3H24MA30	RMD3H24MA40
			240 VAC	RMD3H24HA30	RMD3H24HA40
480Vrms (3phase star + Neutral)	600Vp	3	24 VAC/ DC	RMD3H48LA30	RMD3H48LA40
			120 VAC	RMD3H48MA30	RMD3H48MA40
			240 VAC	RMD3H48HA30	RMD3H48HA40

System Durability

Upon application of the control voltage, the **RMD Series** output semiconductors switch the output after the load voltage's sinusoidal sine wave crosses the zero crossing point. This ensures that the switching current is kept at the lowest possible levels. Milliseconds later, the bypass mechanical relays close across the power semiconductors. The switching-off procedure is a mirror image of this and occurs as soon as control voltage is removed from the input terminals of the hybrid relay. Since the mechanical relay is switching on/off with a low voltage across the contacts, no electrical arcing occurs and this prevents contact migration, degradation and a longer operating lifetime.

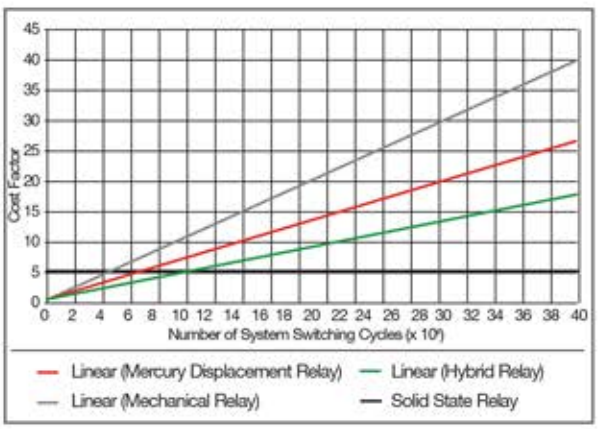
Long Term Reliability

Unlike contactors, the bypass relays used in the **RMD2/3H Series** are hermetically sealed. This makes them capable of operating in humid environments and in areas were oil vapors are present around the product. There are no issues with clogging or sticking of moving mechanisms and no impurities can be deposited onto the switching contacts. Apart from the ability of withstanding four million electrical cycles, the **RMD2H** and **RMD3H** are also tested by UL with the 150,000 cycle test according to UL508 requirements.



Cost Effective

Further comparison between the starting and running costs of the mercury relay, mechanical relay and hybrid relay technologies, the latter emerges as the ideal option for the best benefit-to-cost ratio. Only solid state technology offers a better package and is suitable where high frequency of switching is needed.



Applications

HVAC

- Switching of Auxiliary Heaters in Geothermal Heat Pumps
  Low electromagnetic noise emission
- Electric Water Boiler
  Increased electrical lifetime
- Baseboard Heaters
  Minimal heat emission
- Duct Heaters
  Galvanic isolation between input and output connections

Food & Beverage

- Electric Grills and Ovens
  Free of hazardous substances
- Coffee Urns
  Optimal duty cycle
- Pizza Ovens
  RMD1H slimline solution

White Goods

- Heater Switching in Washing Machines
  Decreased audible clicking noise

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Zejtun - **MALTA**

Carlo Gavazzi Controls SpA
Belluno - **ITALY**

Uab Carlo Gavazzi Industri Kaunas
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BRO RMD3H ENG 12/09