Hybrid Relays

RMD1H Series:
Compact One Pole up to 20A
Up to 77°F (25°C)
Up to 6 cycles per minute

RMD2/3H Series:
Two and Three Pole up to 40A
For up to 140°F (60°C)
Up to 20 cycles per minute
Making both ends meet...

Using the 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
- Switch up to 4 million electrical cycles at up to 20 cycles per minute
- For demanding applications, up to 140°F (60°C)
- Drastically reduce system downtimes

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, at 6 cycles per minute, 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 heaters, at 20 cycles per minute, 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 40 AAC, at 20 cycles per minute, in a surrounding temperature of 140°F (60°C).
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 from solid state and electromechanical switching technologies to offer solutions which can operate in excess of four million electrical 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).

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

<table>
<thead>
<tr>
<th>Rated Operational Voltage</th>
<th>Blocking Voltage</th>
<th>Control Voltage</th>
<th>Rated Operational Current at 25°C 20 Arms</th>
</tr>
</thead>
<tbody>
<tr>
<td>230 VAC</td>
<td>600 Vp</td>
<td>4-32 VDC</td>
<td>RMD1H23D20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24-275 VAC</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>24-190 VDC</td>
<td>RMD1H23A20</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Rated Operational Voltage</th>
<th>Blocking Voltage</th>
<th>Number of Switched Poles</th>
<th>Rated Control Voltage</th>
<th>Rated Operational Current at 60°C 30 Arms</th>
<th>Rated Operational Current at 60°C 40 Arms</th>
</tr>
</thead>
<tbody>
<tr>
<td>240Vrms (1phase loads)</td>
<td>600Vp</td>
<td>2</td>
<td>24 VAC/DC</td>
<td>RMD2H24LA30</td>
<td>RMD2H24LA40</td>
</tr>
<tr>
<td>(3phase delta)</td>
<td></td>
<td></td>
<td>120 VAC</td>
<td>RMD2H24MA30</td>
<td>RMD2H24MA40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>240 VAC</td>
<td>RMD2H24HA30</td>
<td>RMD2H24HA40</td>
</tr>
<tr>
<td>240Vrms (3phase delta)</td>
<td>600Vp</td>
<td>3</td>
<td>24 VAC/DC</td>
<td>RMD3H24LA30</td>
<td>RMD3H24LA40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>120 VAC</td>
<td>RMD3H24MA30</td>
<td>RMD3H24MA40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>240 VAC</td>
<td>RMD3H24HA30</td>
<td>RMD3H24HA40</td>
</tr>
<tr>
<td>480Vrms (3phase star + neutral)</td>
<td>600Vp</td>
<td>3</td>
<td>24 VAC/DC</td>
<td>RMD3H48LA30</td>
<td>RMD3H48LA40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>120 VAC</td>
<td>RMD3H48MA30</td>
<td>RMD3H48MA40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>240 VAC</td>
<td>RMD3H48HA30</td>
<td>RMD3H48HA40</td>
</tr>
</tbody>
</table>
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 Machines**
  Optimal duty cycle

- **Pizza Ovens**
  RMD1H slimline solution

**White Goods**

- **Heater Switching in Washing Machines**
  Decreased audible clicking noise
The Complete Product Package

Sense
- Inductive and Capacitive Sensors
- Photoelectric Sensors
- Ultrasonic Sensors
- Wind Sensors
- Radar Sensors
- Motion/Presence Vision Sensors
- Conductive Level Sensors
- Limit Switches
- Magnetic Switches
- Safety Interlocks and Light Curtains

Switch
- Solid State Relays
- Contactors and Overloads
- Manual Motor Starters/Protectors
- Soft Starters
- Variable Frequency Drives
- Hybrid Relays
- Electromechanical Relays
- Push Buttons and Pilot Lights

Control
- Energy Management
- Switching Power Supplies
- Digital Panel Meters
- Timers and Counters
- Monitoring Controls
- Current Transformers/Shunts
- PID Controllers
- Surge Arresters
- Safety Control Modules

Fieldbus
- Dupline® Field and Installation Bus
- Building Automation Systems
- Parking Guidance Systems
- Elevator Systems
- DuplineSafe Mining Systems
- Irrigation Systems

EcoEnergy Equipment
- Solar Monitoring and Control
- Solar Battery Chargers

A Global Force in Automation and Energy Solutions

CARLO GAVAZZI has a multitude of sales offices spanning North America (not to mention our hundreds of distributors). Therefore, we can be viewed as “your local automation resource” - assisting you every step of the way in finding the proper solution for your various application requirements. Naturally, our job is greatly simplified as we have such a vast range of solutions to offer you via our comprehensive product package.

Our worldwide sales offices make us an ideal business partner, especially for manufacturers of exported machinery, as our products are available locally and they are RoHS and CE marked.

Argentina • Australia • Austria • Bahrain • Belgium • Bolivia • Bosnia • Brazil • Brunei • Bulgaria • Canada
Chile • China • Colombia • Croatia • Cyprus • Czech • Denmark • Dominican Republic • Egypt • Estonia
Finland • France • Germany • Greece • Hungary • Hong Kong • Iceland • India • Indonesia • Iran • Ireland
Italy • Japan • Jordan • Kenya • Korea • Kuwait • Lebanon • Malaysia • Malta • Morocco • Mauritius • Mexico
Netherlands • New Zealand • Norway • Pakistan • Papua New Guinea • Paraguay • Peru • Philippines
Poland • Portugal • Qatar • Romania • Russia • Saudi Arabia • Serbia • Singapore • Slovakia • Slovenia
South Africa • Spain • Sultanate of Oman • Sweden • Switzerland • Taiwan • Thailand • Tunisia • Turkey
Ukraine • United Arab Emirates • United Kingdom • Uruguay • United States • Venezuela • Vietnam • and many more countries

Your Authorized Distributor:

USA
CARLO GAVAZZI INC.
750 Hastings Lane
Buffalo Grove, IL 60089
Tel: 847.465.6100
Fax: 800.222.2659
Sales@CarloGavazzi.com

CANADA
CARLO GAVAZZI (CANADA) INC.
2660 Meadowvale Boulevard
Mississauga, ON L5N 6M6
Tel: 888.575.2275
Fax: 905.542.2248
Gavazzi@CarloGavazzi.com

MEXICO
CARLO GAVAZZI MEXICO S.A. de C.V.
Calle La Montaña no. 18, Fracc. Los Pastores
Naucalpan de Juárez, EDOMEX CP 53340
Tel & Fax: 52.55.5373.7042
MexicoSales@CarloGavazzi.com

Visit our website for downloadable data sheets, brochures and pricing: www.GavazziOnline.com