

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

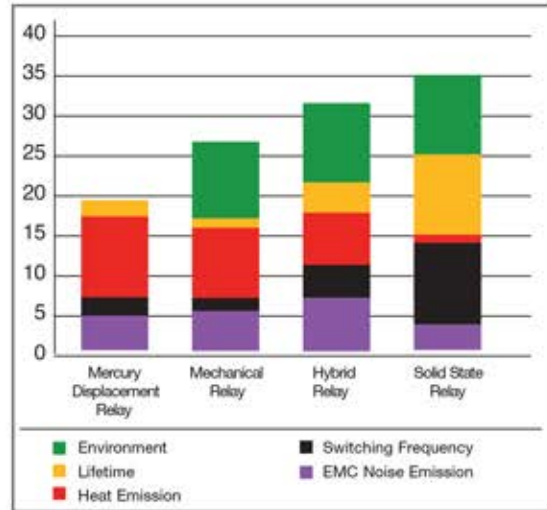
The combination of solid state and mechanical relay technologies has long been used by Carlo Gavazzi in other products.

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.



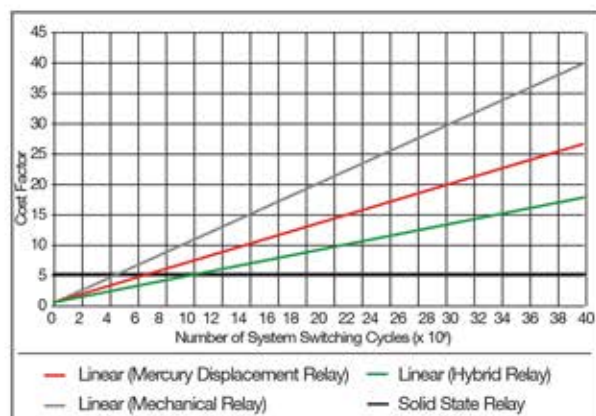
Long Term Reliability

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 where 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



OUR SALES NETWORK IN EUROPE

AUSTRIA - Carlo Gavazzi GmbH
Ketzergrasse 374, A-1230 Wien
Tel: +43 1 888 4112
Fax: +43 1 889 10 53
office@carlogavazzi.at

BELGIUM - Carlo Gavazzi NV/SA
Schaarbeeklei 213/3, B-1800 Vilvoorde
Tel: +32 2 257 4120
Fax: +32 2 257 41 25
sales@carlogavazzi.be

DENMARK - Carlo Gavazzi Handel A/S
Over Hadstenvej 40, DK-8370 Hadsten
Tel: +45 89 60 6100
Fax: +45 86 98 15 30
handel@gavazzi.dk

FINLAND - Carlo Gavazzi OY AB
Petaksentie 2-4, FI-00661 Helsinki
Tel: +358 9 756 2000
Fax: +358 9 756 20010
myynti@carlogavazzi.fi

FRANCE - Carlo Gavazzi Sarl
Zac de Paris Nord II, 69, rue de la Belle
Etoile, F-95956 Roissy CDG Cedex
Tel: +33 1 49 38 98 60
Fax: +33 1 48 63 27 43
french.team@carlogavazzi.fr

GERMANY - Carlo Gavazzi GmbH
Pfnorstr. 10-14
D-64293 Darmstadt
Tel: +49 6151 81000
Fax: +49 6151 81 00 40
info@gavazzi.de

GREAT BRITAIN - Carlo Gavazzi UK Ltd
7 Springlakes Industrial Estate,
Deadbrook Lane, Hants GU12 4UH,
GB-Aldershot
Tel: +44 1 252 339600
Fax: +44 1 252 326 799
sales@carlogavazzi.co.uk

ITALY - Carlo Gavazzi SpA
Via Milano 13, I-20020 Lainate
Tel: +39 02 931 761
Fax: +39 02 931 763 01
info@gavazziacbu.it

NETHERLANDS - Carlo Gavazzi BV
Wijkermeerweg 23,
NL-1948 NT Beverwijk
Tel: +31 251 22 9345
Fax: +31 251 22 60 55
info@carlogavazzi.nl

NORWAY - Carlo Gavazzi AS
Melkeveien 13, N-3919 Porsgrunn
Tel: +47 35 93 0800
Fax: +47 35 93 08 01
gavazzi@carlogavazzi.no

PORTUGAL - Carlo Gavazzi Lda
Rua dos Jerónimos 38-B,
P-1400-212 Lisboa
Tel: +351 21 361 7060
Fax: +351 21 362 13 73
carlogavazzi@carlogavazzi.pt

SPAIN - Carlo Gavazzi SA
Avda. Iparraguirre, 80-82,
E-48940 Leioa (Bizkaia)
Tel: +34 94 480 4037
Fax: +34 94 480 10 61
gavazzi@gavazzi.es

SWEDEN - Carlo Gavazzi AB
V:a Kyrkogatan 1,
S-652 24 Karlstad
Tel: +46 54 85 1125
Fax: +46 54 85 11 77
info@carlogavazzi.se

SWITZERLAND - Carlo Gavazzi AG
Verkauf Schweiz/Vente Suisse
Sumpfstrasse 32,
CH-632 Steinhausen
Tel: +41 41 747 4535
Fax: +41 41 740 45 40
info@carlogavazzi.ch

OUR SALES NETWORK IN NORTH AMERICA

USA - Carlo Gavazzi Inc.
750 Hastings Lane,
USA-Buffalo Grove, IL 60089,
Tel: +1 847 465 6100
Fax: +1 847 465 7373
sales@carlogavazzi.com

CANADA - Carlo Gavazzi Inc.
2660 Meadowvale Boulevard,
CDN-Mississauga Ontario L5N 6M6,
Tel: +1 905 542 0979
Fax: +1 905 542 22 48
gavazzi@carlogavazzi.com

MEXICO - Carlo Gavazzi Mexico S.A. de C.V.
Calle La Montaña no. 28, Fracc. Los Pastores
Naucalpan de Juárez, EDOMEX CP 53340
Tel & Fax: +52.55.5373.7042
mexicosales@carlogavazzi.com

OUR SALES NETWORK IN ASIA AND PACIFIC

SINGAPORE - Carlo Gavazzi Automation
Singapore Pte. Ltd.
61 Tai Seng Avenue #05-06
UE Print Media Hub
Singapore 534167
Tel: +65 67 466 990
Fax: +65 67 461 980

MALAYSIA - Carlo Gavazzi Automation
(M) SDN. BHD.
D12-06G, Block D12,
Pusat Perdagangan Dana 1,
Jalan PJU 1A/46, 47301 Petaling Jaya,
Selangor, Malaysia.
Tel: +60 3 7842 7299
Fax: +60 3 7842 7399

CHINA - Carlo Gavazzi Automation
[China] Co. Ltd.
Rm. 2308 - 2310, 23/F.,
News Building, Block 1,
1002 Shennan Zhong Road,
Shenzhen, China
Tel: +86 755 83699500
Fax: +86 755 83699300

HONG KONG - Carlo Gavazzi
Automation Hong Kong Ltd.
Unit 3 12/F Crown Industrial Bldg.,
106 How Ming St., Kowloon,
Hong Kong
Tel: +852 23041228
Fax: +852 23443689

OUR PRODUCTION SITES

Carlo Gavazzi Industri A/S
Hadsten - **DENMARK**

Carlo Gavazzi Ltd
Zejtun - **MALTA**

Carlo Gavazzi Controls SpA
Belluno - **ITALY**

Uab Carlo Gavazzi Industri Kaunas
Kaunas - **LITHUANIA**

Carlo Gavazzi Automation
(Kunshan) Co., Ltd.
Kunshan - **CHINA**

HEADQUARTERS

Carlo Gavazzi Automation SpA
Via Milano, 13 - I-20020
Lainate (MI) - **ITALY**
Tel: +39 02 931 761
info@gavazzi-automation.com

CARLO GAVAZZI
Automation Components

Further information on
www.gavazziautomation.com - www.carlogavazzi.com



BRO RMD3H ENG 12/09
Specifications are subject to change without notice. Pictures are just an example.