RW_E - SOLID-STATE OVERLOAD RELAYS

Precision and reliability in the protection of electric motors





Motors | Automation | Energy | Transmission & Distribution | Coatings



Solid-State Overload Relays RW_E

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PRECISION AND RELIABILITY IN ELECTRIC MOTOR PROTECTION

The growing concern with productivity in industrial processes and with control of production costs has demanded higher precision from industrial automation systems to protect electric motors in order to guarantee the shortest possible downtime through less corrective interventions in the process. To that end, WEG offers the market the RW_E electronic overload relays, ensuring suitable protection for low voltage three-phase electric motors.

Using state-of-the-art microprocessors developed in compliance with IEC/EN 60947-4-1 and UL 60947-4-1A, the RW_E electronic relays guarantee higher precision in the protection of electric motors.

While conventional thermal overload relays indirectly monitor the motor operating current through the heating of its bimetals, the RW_E electronic overload relays, using digital circuits with microprocessors, direct and effectively measure the motor operating current, ensuring higher accuracy in the protection against overload and phase loss. The digital electronic circuit of the RW_E relays monitors each of the phases that supplies the motor and guarantees a shorter trip time in phase loss events (trip time shorter than five seconds), which contributes to greater reliability and efficiency in the protection of electric motors.





Certifications

The RW_E electronic relays follow strict manufacturing and quality standards and have CE and cULus certifications, which enable their application worldwide.



European Community

Available Protections

Overload







Flexibility and Versatility

In an increasingly globalized and competitive market, it has become commonplace for machine manufacturers to offer their customers a greater variety of models and consequently a wider range of motor power, available for several countries with different operating voltages. With a wide adjustment range between the minimum and maximum pick-up current (ratio of up to 5:1), the same RW_E relay can be used to protect electric motors with different powers or with different supply voltage and frequency, ensuring greater versatility and flexibility for machine manufacturers and contributing to the standardization of machine control panels. Another great advantage of the RW_E electronic overload relays for motor protection is the reduction of up to 67% in inventory. While in the case of thermal relays it is necessary to purchase or keep in stock 28 items to protect motors from 0.4 A to 840 A, only nine items of the RW_E electronic relays are required to protect the same motors.





The RW_E electronic relays can be easily combined with WEG contactors (CWB and CWM lines) to form motor starters with great flexibility. An additional advantage is that the RW_E electronic overload relays are self-powered, that is, they do not require external power and thus can be applied directly to the contactor in the same way that thermal overload relays are applied. Those characteristics also allow replacing thermal relays by RW_E electronic relays without changing the WEG contactor or even the control circuit connections.

Available on the front side of the relay, the test and reset functions provide easy access for users and ensure flexibility to perform operation tests and to set the most convenient reset option for the application. The entire line also has versions with remote reset, which is done by applying a 24 V dc signal between terminals -A3 and +A4. Also located on the front side is a trip signal window that allows the user to easily see the relay status. In addition to that visual indication, the relay also has two independent and highly reliable auxiliary contacts (12 V, 10 mA) for signaling the status and performing functions in the control circuit.





RESET type selector



TEST function and TRIP status



Input for REMOTE RESET



Auxiliary contacts

Selectable Trip Class

Using modern microprocessors and specially designed electronic circuits, the RW_E electronic relays can be used in a wide range of industrial applications, including more demanding applications with greater inertia at the start and consequently longer starting times.

Therefore, the same relay can be used with low, medium or high inertia loads just by selecting the Trip Class (10, 20 or 30 according to IEC/EN 60947-4-1) depending on the required starting time.

The RW_E overload relays have a dedicated electronic circuit and software to compensate for the ambient temperature in accordance with IEC/EN 60947-4-1, which ensures safe operation from -20 °C to +60 °C, preventing undesirable trips.



Trip close	Overload over the rated current of the overload relay x Ir					
mp class	Trip class	1.2 x lr	1.5 x lr	7.2 x lr		
10	-	Tp < 2h	Tp < 4min	$4 < Tp \le 10s$		
20	-	Tp < 2h	Tp < 8min	$6 < Tp \le 20s$		
30	-	Tp < 2h	Tp < 12min	9 < Tp ≤ 30s		

IEC/EN 60947-4-1



Remote Reset Function

Models with remote reset (RW_E-3-R_) allow resetting the electronic overload relay remotely (long distance operation) without having to be in front of the panel where the product is installed. That is possible by applying a 24 V dc signal between the relay terminals – A3 and +A4, which can be done, for example, by pressing a pushbutton or via digital output of a PLC.



Note: the duration of the reset pulse must be greater than 0.25 seconds and not exceed 5 seconds (typical = 1s).



Applications













Metallurgy







Energy Saving

Due to their design and technology, the electronic circuits of RW_E relays lead to very low power dissipation (less than 0.38 W up to 25 A) and consequently may contribute to the reduction of need for ventilation of control cabinets.





Coding







Overview



- **1** RWM40E overload relay (direct mounting on CWM9...40 miniature contactors)
- 2 RWM112E overload relay (direct mounting on CWM50...105 contactors)
- 3 RWM420E overload relay (CWM112...560 contactors)
- 4 RWM840E overload relay (CWM400...800 contactors)
- 5 Individual mounting base with screws or on DIN rail 35 mm BF27 (RWM40E)
- 6 Individual mounting base with screws or on DIN rail 35 mm BF112 (RWM112E)
- 7 GA Connector Links for direct mounting of overload relay on contactor
- 8 IBRW317 phase barriers (for RWM420E)
- 9 RWB40E solid-state overload relay (direct mounting on CWB9...38 contactors)
- 10 Individual mounting base with screws or on DIN rail 35 mm BF27-2D (RWB40E)

Wen

Overview

- 3-pole solid state overload relays with adjustable trip class: 10, 20 and 30
- Phase loss protection (less than 5 seconds)
- Phase unbalance protection (>40% between phases)
- Automatic temperature compensation
- Versions with local reset only and versions with remote/local reset
- Direct mounting on CWB9...38 and CWM9...105 contactors
- Individual mounting is possible with accessories
- Auxiliary contacts 1NO + 1NC









For direct mounting	Current range	Max fuse	Local rese	Local reset		Remote res	set
on contactors	А	(gt/gg)" A	Reference	Code	(kg)	Reference	Code
CWB938	0.42	16	RWB40E-3-A4U002	12786062		RWB40E-3-R4U002	14773637
CWB938	1.68	32	RWB40E-3-A4U008	12786061	0.050	RWB40E-3-R4U008	14773635
CWB938	525	63	RWB40E-3-A4U025	12786060	0.250	RWB40E-3-R4U025	14773632
CWB938	840	125	RWB40E-3-A4U040	12786059		RWB40E-3-R4U040	14773631
CWM940	0.42	16	RWM40E-3-A4U002	11454460		RWM40E-3-R4U002	14773683
CWM940	1.68	32	RWM40E-3-A4U008	11454459	0.050	RWM40E-3-R4U008	14773682
CWM940	525	63	RWM40E-3-A4U025	11454417	0.250	RWM40E-3-R4U025	14773680
CWM940	840	125	RWM40E-3-A4U040	11373597		RWM40E-3-R4U040	14773678
CWM50105	1456	160	RWM112E-3-A4U056	11114728	0.019	RWM112E-3-R4U056	14773686
CWM50105	28112	250	RWM112E-3-A4U112	11114729	0.916	RWM112E-3-R4U112	14773718





For separate mounting or by Current range		Max fuse	Local reset		Weight	Remote reset	
connector links	A	(gĽ/gů) A	Reference	Code	(kg)	Reference	Code
CWM112 500	50250	500	RWM420E-3-A4U250	12802652	0.500	RWM420E-3-R4U250	14773721
GWIVI112500	85420	710	RWM420E-3-A4U420	11455846	2,320	RWM420E-3-R4U420	14773720
CWM150800	170840	1,250	RWM840E-3-A4U8401)	11455847	4,150	RWM840E-3-R4U840	14773723

Note: 1) Model RWM840E allows connection via power terminals or using the relay Ø32 mm passage window, thus connecting the cables directly to the contactor.

Accessories

Individual Mounting Base

Illustrative picture	For use with relays	Description	Reference	Code	Weight kg
	RWM40E		BF27D	10410085	0.050
	RWB40E	Enables the overload relay to be mounted directly to a panel via screws or 35 mm DIN rail	BF27-2D	13598034	0.050
Det	RWM112E		BF112	10806502	0.230

Connector Links for Direct Mounting on the Contactor

Illustrative picture	For use with relays	For use with contactors	Reference	Code	Weight kg
	RWM112E	CWM112/150	GA117D	10185899	0.135
		CWM112/150	GA317-1D	10185904	0.250
	RWM420E	CWM180/215	GA317-2D	10185900	0.270
		CWM250/300	GA317-3D	10185901	0.630
		CWM400	GA317-10D	10187159	0.500
Bar -	RWM420E	CWM450/560	GA317-11D	14313668	0.250
	RWM840E	CWM450/560	GA407-1D	14313709	0.450

Phase Barriers

Illustrative picture	For use with relays	Description	Reference	Code	Weight kg
T	RWM420E	Plastic insulator and fixing screws for use where the external connections of the power terminals exceed the side dimension of the connection busbar. It can be installed both at the top and at the bottom of the relay	IBRW317	11558425	0.044

Reset Pushbutton with Shaft

Illustrative picture	For use with relays	Description	Reference	Code	Weight kg
RW_E	RW F	Blue RESET flush pushbutton with shaft Adjustable length: 250 to 22.5 mm	CSW-BHF437	12471376	0.032
		Blue RESET extended pushbutton with shaft Adjustable length: 250 to 22.5 mm	CSW-BHS437	12471409	0.032

Technical Data

General Data

Models		RWM40E / RWB40E	RWM112E	RWM420E	RWM840E	
Compliance with the standards		IEC/EN 60947-4-1, IEC/EN 60947-5-1, IEC/EN 60947-1, UL 60947-1, UL 60947-4-1A and UL 508				
Rated insulation voltage U _i (pollution degree 3)	IEC/EN 60947-4-1 (V)	69	0	1,	000	
Rated impulse withstand voltage $\mathrm{U}_{\mathrm{imp}}$ (IEC/EN	l 60947-1) (kV)	6			8	
Frequency limits	(Hz)		50	/60		
	Three phase loads		Y	es		
Suitable for use	Single phase / two phase Loads		Ν	lo		
	DC current loads		Ν	lo		
Trip class (IEC/EN 60947-4-1)			10, 20 or 30	- selectable		
Protection functions	Phase loss		Yes / trip	time < 5s		
	Phase unbalance		Yes / :	> 40%		
Popot time Popot function	Manual mode		Immediate ¹⁾			
Reset unie - Reset function	Automatic mode	≥120 seconds				
Maximum frequency of operation cycles	(ops./h)	30				
Protection degree (IEC/EN 60520)	Main contacts	IP10		IP00		
FIOLECTION degree (IEC/EN 00329)	Auxiliary contacts		IP20			
Mounting		Direct mounting on contactors or mounting plate using accessory (individual mounting base) Direct mounting on conta means of accessories (conne on mounting plate		g on contactors by es (connector links) or nting plate		
	Contact opening 97-98	15 g / 11ms				
(IEC/EN 60068-2-27 - 1/2 sine wave)	Contact opening 95-96		5 g /	11ms		
(Contact closing 95-96		15 g /	11ms		
	Contact opening 97-98		6 g / 30	300 Hz		
Vibration resistance	Contact opening 95-96		3 g / 30	300 Hz		
	Contact closing 95-96		6 g / 30	300 Hz		
	Transport and storage		-50 °C.	+80 °C		
Ambient temperature	Operating		-20 °C.	+60 °C		
	Temperature compensation		-20 °C.	+60 °C		
Maximum operation altitude without modifica	ation in the rated values	2,000 m				

Note: 1) Before performing a manual reset, it is recommended to wait at least 180 seconds for the load to cool down and the system to recover after the overload event. The activation of the reset (on the front side or via remote reset input) before this minimum time will not ensure the reactivation of the system and may also produce damages to the protected equipment.

Main Contacts

Models		RWM40E / RWB40E	RWM112E	RWM420E	RWM840E
Rated operational voltage U _e	EC/EN 60947-4-1 (V)	6	90	1,0	000
Current setting / max fuse (gL/gG)	(A)	0.42 / 16 1.68 / 32 525 / 63 840 / 125	1456 / 160 28112 / 250	50250 / 500 85420 / 710	170840 / 1,250
Setting current / average power dissipation per p	pole (W	0.42 / 0.07 1.68 / 0.06 525 / 0.38 840 / 1.5	1456 / 2 28112 / 2.6	50250 / 12 85420 / 12	170840 / 14.5



Technical Data

Auxiliary Contacts

Models		RWM40840E / RWB40E
Compliance with the standards		IEC/EN 60947-5-1
Rated insulation voltage U _i (pollution degree 3)	IEC/EN (V)	250
Rated impulse withstand voltage $\mathrm{U}_{\mathrm{imp}}$ (IEC/EN 60947-1)	(kV)	4
Rated operational voltage U _e	IEC/EN (V)	250
Rated thermal current I _{th} ($\theta \le 55$ °C)	(A)	5
Rated operational current I _e		
	24 V (A)	3
AC-14/AC-15 (IEC/EN 60947-5-1)	120 V (A)	3
	250 V (A)	1.5
	24 V (A)	2
	60 V (A)	0.4
DC-13 (IEC/EN 60947-5-1)	110 V (A)	0.22
	125 V (A)	0.22
	250 V (A)	0.1
Short circuit protection with fuse (gL/gG)	(A)	6
Minimum voltage / admissible current (IEC/EN 60947-5-4)		12 V / 10 mA

Terminal Capacity and Tightening Torque - Power Circuit

Models		BF27D	RWM40E / RWB40E	RWM112E	BF112
Mounting system scrow type		M4	M3.5	M10	M10
Mounting system screw type		Flat / Phillips #2	Flat / Phillips #2	Allen #4	Allen #4
Conductor cross-section		 			
Flexible cable	(mm²)	1.510	-	-	-
Cable with terminal / rigid cable	(mm²)	1.56	-	-	-
Torque	(Nm)	2.3	-	-	-
Flexible cable	(mm²)	-	110	2.535	2.535
Cable with terminal / rigid cable	(mm²)	-	110	2.535	2.535
Torque	(Nm)	-	1.7	6	6
Models		RWM	1420E	RWM	840E
Mounting system screw type		M Hexago	10 on head	M ⁻ Hexago	12 in head
Cable with terminal	(mm²)	2 x (25	5150)	2 x (60) x 10)
Busbar (A x B x C)	(mm)	25 x 18	5 x 12.5	31.7 x 2	8.3 x 15
Torque	(Nm)	2	6	2	6

Terminal Capacity and Tightening Torque - Auxiliary Contacts

Models	RWM40840E / RWB40E				
Mounting system screw type	Flat / Phillips № 1				
Conductor cross-section					
Wire / conductor with or without terminal (mm ²)	1 x 12.5				
Torque (Nm)	1				

Technical Data

Wiring Diagrams

Alternating Current Motor Protection

3-pole





Suggestion for Connecting the Control Circuit of the Overload Relay + Contactor

Direct On Line Starter (1 Direction of Rotation)





Note: the RW_E electronic overload relays cannot be used to protect single-phase motors or direct current motors.

Direct On Line Starter (2 Directions of Rotation)



RWM40E



RWB40E



RWM40E + BF27 RWB40E + BF27-2D







RWM112E





RWM112E + BF112







RWM420E





RWM840E





RWM420E + IBRW317





RWM40...840E / RWB40E



Mounting Position

CWM9...105 + RWM40...112E e CWB9...38 + RWB40E





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Models	Coil	А	В	С	
CWB918	AC	89.5	162.1	- 45	
	DC	98.7	105.1		
CWB2538	AC	93	166 5		
	DC	102.2	100.5		
CWM918	AC	94.3	150	45	
	DC	125.1	100		
CWM25	AC	94.9	150.0	45	
	DC	124.8	109.0		
CWM32/40	AC	98.6	166 5	55	
	DC	118.6	100.5		
CWM5080	AC	100.6	202.7	66	
	DC	122.0	202.7		
CWM95/105	AC	106	201.1	75.4	
	DC	120	201.1		

CWM112 + RWM112E + BF112



B	C
	D

-121.8-

1



CWM112	А	В		
Conventional coil	-	318.5		
Electronic coil	326.5	318.5		



CWM112...300 + RWM112/420E







Contactor	Connector links	Overload relay	А	В	C	D	E	F	G
CWM112/150	GA117D	RWM112E	147	325	121.5	106	64	120	100
CWM112/150	GA317-1D	RWM420E	166	343			60.5	130	100
CWM180/215	GA317-2D	RWM420E	172	358	139	110	52.5	160	110
CWM250/300	GA317-3D	RWM420E	181	380	148.4		55	180	120

CWM400 + RWM420E









CWM450/560 + RWM420E







CWM450/560 + RWM840E



ATTENTION: Read the user manual carefully before installing, inspecting, servicing and/or disposing of the product. Keep the user manual for future reference.

Note: Those procedures must always be performed by qualified personnel.

Global presence is essential, as much as understanding your needs.

Global Presence

With more than 30.000 employees worldwide, WEG is one of the largest electric motors, electronic equipments and systems manufacturers. We are constantly expanding our portfolio of products and services with expertise and market knowledge. We create integrated and customized solutions ranging from innovative products to complete after-sales service.

WEG's know-how guarantees our **Solid-State Overload Relays** - **RW_E** is the right choice for your application and business, assuring safety, efficiency and reliability.



Availability is to have a global support network



Partnership is to create solutions that suit your needs



Know More

High performance and reliable products to improve your production process.

Excelence is to provide a whole solution in industrial automation that improves our customers productivity.





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