RW Series - Bi-Metallic

Thermal Overload Relays



An extended operational service life is one of the main features you can find in RW overload relays. WEG's RW Thermal Overload Relays are designed for use with, and as perfect complement to, WEG contactors. Effectively, RW overload relays can be mounted directly under WEG contactors, assuring electrical and mechanical operation as an open across-the-line starter. Accessories are also available for separate mounting.

Standard Features

- 2 and 3 pole versions available
- Direct mounting to WEG contactors with no accessory. (Accessories also available for separate mounting)
- Phase loss & current unbalance sensitivity protection
- Class 10 Trip characteristics
- Selectable RESET button (auto or manual)
- Isolated 1NO & 1NC auxiliary contacts

RW Series Catalog Number Sequence

RW	27-1D	3	-	U004

Overload Relay Series
RW: Thermal Overload Relay

Power Pole
3: 3NO Power Poles
2: 2NO Power Poles

Frame, Size and Terminal Type
17-1D: to use with CWC07…016
17-2D: to use with CWC025
27-1D: to use with CWM9…25
27-2D: to use with CWB9...38
27-2D: to use with CWB9...38
67-1D: to use with CWM32…40
117-1D: to use with CWM95…105
117-2D: to use with CWM112…150
317-1D: to use with CWM112…300
407-1D: to use with CWM400…800

Overload Setting Current

RW17	RW117
D004: 0,28…0,40A	U080: 63…80A
U032: 11…32A	U112: 90…112A
RW27	**RW317**
DOO4: 0,28…0,40A	U150: 100…150A
U032: 11…32A	U420: 275…420A
RW67	**RW407**
U040: 25…40A	U600: 400…600A
U080: 63…80A	U840: 560…840A

For more details refer to selection table

Chart intended for reference only and not to create part numbers.

Data is subject to change without notice.

Multifunction Reset / Test Button

The thermal overload relay has a multifunction ***RESET / TEST*** button that can be set in four different positions:
A - Automatic ***RESET*** only;
AUTO - Automatic ***RESET / TEST***;
HAND - Manual ***RESET / TEST***;
H - Manual ***RESET*** only.
In ***HAND*** and **AUTO** positions, when ***RESET*** button is pressed, both NO (97-98) and NC (95-96) contacts change states.



Operation description:

In H (manual RESET only) or A (automatic RESET only) position, the test function is blocked. However in the positions HAND (manual RESET / TEST) or AUTO (automatic RESET / TEST) it is possible to simulate the test and the trip functions by pressing the RESET button.
When set in the H or HAND position the RESET button must be pressed manually to reset the overload relay after a tripping event. On the other hand, when set in A or AUTO position, the overload relay will reset automatically after a tripping event.
The H, HAND, AUTO and A function setting is carried out by rotating without pressing the red button and placing it on the desired position of the RESET button.
When changing from HAND to AUTO, the RESET button must be slightly pressed while the red button is rotated.

Functions	H	HAND	AUTO	A
Relay reset	Manual1)	Manual1)	Automatic	Automatic
Auxiliary contact trip test 95-96 (NC)	Function is disabled	Test is allowed	Test is allowed	Function is disabled
Auxiliary contact trip test 97-98 (NO)	Function is disabled	Test is allowed	Test is allowed	Function is disabled

Note: 1) A recovery time of a few minutes is necessary before resetting the thermal overload relay.

Recovery Time

The RW thermal overload relays have thermal memory.
After tripping due to an overload, the relay requires a certain period of time for the bimetal strips to cool down. This period of time is so-called recovery time. The relay can only be reset once it has cooled down. The recovery time depends on the characteristic tripping curves and the level of the tripping current. After tripping due to overload, the recovery time allows the load to cool down.

Operation in the Output Side of Frequency Inverters

The RW27-2D thermal overload relays are designed for operation on 50/60 Hz up to 400 Hz and the tripping values are related to the heating by currents within this frequency range. Depending on the design of the frequency inverter, the switching frequency can reach several kHz and generate harmonic currents at the output that result in additional temperature rise in the bimetal strips. In such applications, the temperature rise not only depends on the rms value of the current, but on the induction effects of the higher frequency currents in the metal parts of the device (skin effect caused by eddy currents).
Due to these effects, the current settings on the overload relay should be higher than the motor rated current.

Dial FLA Setting

The trip-current is set via an infinitely adjustable dial designed with the motor‘s full load current (FLA) in mind.

Temperature Compensation

Because RW overload relays include a forth bimetallic strip in addition to the three that are directly heated by the motor current, ambient temperature variations in the range of -4°F to +140°F are no obstacle for accurate protection of your motors even in the toughest conditions.

Phase Failure Sensitivity

WEG overload relays include phase failure sensitivity protection as a standard. This feature ensures fast tripping in case of phase loss, protecting your motor and avoiding expensive repairs/corrective maintenance.

Overloads

RW Series - Bi-Metallic

For use with CWC and CWM Contactors

Three-pole Thermal Overload Relay Class 10

- Adjustable tripping current
- Phase-loss sensitivity
- Tripping class 10
- Auxiliary contacts 1NO + 1NC
- Temperature compensation from -40F to +140F
- Hand/Auto/Reset button

Matching Contactor	Setting Range [A]		Max. Fuse [A]	Catalog Number	List Price	Multiplier
	Min.	Max.				
CWC07…CWC016 CWCA0 (Mini-contactor)	0.28	0.40	15	RW17-1D3-D004	$46	
	0.40	0.63	15	RW17-1D3-C063	$46	
	0.56	0.80	15	RW17-1D3-D008	$46	
	0.80	1.20	15	RW17-1D3-D012	$46	
	1.20	1.80	15	RW17-1D3-D018	$46	
	1.80	2.80	15	RW17-1D3-D028	$46	
	2.80	4.00	15	RW17-1D3-U004	$46	
	4.00	6.30	25	RW17-1D3-D063	$46	
	5.60	8.00	30	RW17-1D3-U008	$46	
	7.00	10.0	40	RW17-1D3-U010	$46	
	8.00	12.5	50	RW17-1D3-D125	$46	
	10.0	15.0	60	RW17-1D3-U015	$46	
	11.0	17.0	60	RW17-1D3-U017	$46	
CWC025 (Mini-contactor)	15.0	23.0	90	RW17-2D3-U023	$46	
	22.0	32.0	100	RW17-2D3-U032	$46	
CWM9...CWM40 CWM9N...CWM32N	0.28	0.40	15	RW27-1D3-D004	$50	Z2
	0.40	0.63	15	RW27-1D3-C063	$50	
	0.56	0.80	15	RW27-1D3-D008	$50	
	0.80	1.20	15	RW27-1D3-D012	$50	
	1.20	1.80	15	RW27-1D3-D018	$50	
	1.80	2.80	15	RW27-1D3-D028	$50	
	2.80	4.00	15	RW27-1D3-U004	$50	
	4.00	6.30	25	RW27-1D3-D063	$50	
	5.60	8.00	30	RW27-1D3-U008	$50	
	7.00	10.0	40	RW27-1D3-U010	$50	
	8.00	12.5	50	RW27-1D3-D125	$50	
	10.0	15.0	60	RW27-1D3-U015	$50	
	11.0	17.0	60	RW27-1D3-U017	$50	
	15.0	23.0	90	RW27-1D3-U023	$50	
	22.0	32.0	90	RW27-1D3-U032	$50	
CWM32...CWM40 CWM32N	25.0	40.0	90	RW67-1D3-U040	$87	
	32.0	50.0	125	RW67-1D3-U050	$94	
CWM50...CWM80 CWM50N	25.0	40.0	90	RW67-2D3-U040	$95	
	32.0	50.0	125	RW67-2D3-U050	$95	
	40.0	57.0	150	RW67-2D3-U057	$95	
	50.0	63.0	150	RW67-2D3-U063	$95	
	57.0	70.0	175	RW67-2D3-U070	$112	
	63.0	80.0	175	RW67-2D3-U080	$112	
CWM95...CWM105 CWM95N	63.0	80.0	200	RW117-1D3-U080	$150	
	75.0	97.0	225	RW117-1D3-U097	$192	
	90.0	112	250	RW117-1D3-U112	$192	
CWM112...CWM150 CWM150N	75.0	97	225	RW117-2D3-U097	$232	
	90.0	112	250	RW117-2D3-U112	$232	
CWM112…CWM300 CWM300N	100	150	300	RW317-1D3-U150	$285	
	140	215	350	RW317-1D3-U215	$285	
	200	310	500	RW317-1D3-U310	$320	
CWM400...CWM800	275	420	700	RW317-1D3-U420	$320	
	400	600	1000	RW407-1D3-U600	$690	
	560	840	1250	RW407-1D3-U840	$690	

Note: RW117-2D, RW317-1D and RW407-1D are for separate mounting -
Connector links for contactors CWM112...CWM300 are available as an accessory on page B-59.

Data is subject to change without notice.

For use with CWB Contactors

Three-pole Thermal Overload Relay Class 10

- Adjustable Trip Current
- Phase Loss Sensitivity
- Trip Class 10
- Built-In Auxiliary Contacts: 1NO + 1NC
- Ambient Temperature Compensation: -4°F to +140°F
- Multi-Function Button: Hand/Auto/Reset

Matching Contactor	Setting Range [A]		Max. Fuse [A]	Catalog Number	List Price	Multiplier
	Min.	Max.				
CWB9 - CWB38	0.28	0.40	15	RW27-2D3-D004	$50	Z2
	0.40	0.63	15	RW27-2D3-C063	$50	
	0.56	0.80	15	RW27-2D3-D008	$50	
	0.80	1.20	15	RW27-2D3-D012	$50	
	1.20	1.80	15	RW27-2D3-D018	$50	
	1.80	2.80	15	RW27-2D3-D028	$50	
	2.80	4.00	15	RW27-2D3-U004	$50	
	4.00	6.30	25	RW27-2D3-D063	$50	
	5.60	8.00	30	RW27-2D3-U008	$50	
	7.00	10.0	40	RW27-2D3-U010	$50	
	8.00	12.5	50	RW27-2D3-D125	$50	
	10.0	15.0	60	RW27-2D3-U015	$50	
	11.0	17.0	60	RW27-2D3-U017	$50	
	15.0	23.0	90	RW27-2D3-U023	$50	
	22.0	32.0	90	RW27-2D3-U032	$50	
	32.0	40.0	90	RW27-2D3-U040	$60	

Overloads

RW Series - Bi-Metallic

For use with CWC and CWM Contactors

Two-pole Thermal Overload Relays Class 10 (used for single phase applications)

- Adjustable tripping current
- Phase-loss sensitivity
- Tripping class 10
- Auxiliary contacts 1NO + 1NC
- Temperature compensation from -40F to +1400F
- Hand/Auto/Reset button

Matching Contactor	Setting Range [A]		Max. Fuse [A]	Catalog Number	List Price	Multiplier
	Min.	Max.				
CWM9...CWM40	0.28	0.40	15	RW27-1D2-D004	$40	Z2
	0.40	0.63	15	RW27-1D2-C063	$40	
	0.56	0.80	15	RW27-1D2-D008	$40	
	0.80	1.20	15	RW27-1D2-D012	$40	
	1.20	1.80	15	RW27-1D2-D018	$40	
	1.80	2.80	15	RW27-1D2-D028	$40	
	2.80	4.00	15	RW27-1D2-U004	$40	
	4.00	6.30	25	RW27-1D2-D063	$40	
	5.60	8.00	30	RW27-1D2-U008	$50	
	7.00	10.0	40	RW27-1D2-U010	$50	
	8.00	12.5	50	RW27-1D2-D125	$50	
	10.0	15.0	60	RW27-1D2-U015	$50	
	11.0	17.0	60	RW27-1D2-U017	$50	
	15.0	23.0	90	RW27-1D2-U023	$50	
	22.0	32.0	90	RW27-1D2-U032	$50	
CWM32...CWM40	25.0	40.0	90	RW67-1D2-U040	$81	
	32.0	50.0	125	RW67-1D2-U050	$88	
CWM50...CWM80	25.0	40.0	90	RW67-2D2-U040	$95	
	32.0	50.0	125	RW67-2D2-U050	$95	
	40.0	57.0	150	RW67-2D2-U057	$95	
	50.0	63.0	150	RW67-2D2-U063	$95	
	57.0	70.0	175	RW67-2D2-U070	$105	
	63.0	80.0	175	RW67-2D2-U080	$105	

Note: 1 Availability upon request.

Data is subject to change without notice.

For use with CWB Contactors

Two-pole Thermal Overload Relays Class 10 (used for single phase applications)

- Adjustable tripping current
- Phase-loss sensitivity
- Tripping class 10
- Auxiliary contacts 1NO + 1NC
- Temperature compensation from -40F to +1400F
- Hand/Auto/Reset button

2 POLE THERMAL OVERLOAD RELAYS - CLASS 10

Matching Contactor	Setting Range [A]		Max. Fuse [A]	Catalog Number	List Price	Multiplier
	Min.	Max.				
CWB9 - CWB38	0.28	0.40	15	RW27-2D2-D004	$50	Z2
	0.40	0.63	15	RW27-2D2-C063	$50	
	0.56	0.80	15	RW27-2D2-D008	$50	
	0.80	1.20	15	RW27-2D2-D012	$50	
	1.20	1.80	15	RW27-2D2-D018	$50	
	1.80	2.80	15	RW27-2D2-D028	$50	
	2.80	4	15	RW27-2D2-U004	$50	
	4	6.30	25	RW27-2D2-D063	$50	
	5.60	8.00	30	RW27-2D2-U008	$50	
	7.00	10.0	40	RW27-2D2-U010	$50	
	8.00	12.5	50	RW27-2D2-D125	$50	
	10.0	15.0	60	RW27-2D2-U015	$50	
	11.0	17.0	60	RW27-2D2-U017	$50	
	15.0	23.0	90	RW27-2D2-U023	$50	
	22.0	32.0	90	RW27-2D2-U032	$50	
	32.0	40.0	90	RW27-2D2-U040	$50	

Overloads

RW Series - Bi-Metallic

Separate Mounting Bracket (not for use with RW27-2D)



Description	Mounting on Overload Relays (2 or 3 pole)	Catalog Number	List Price	Multiplier
Enables overload relay to be directly mounted to a back panel via screws or DIN rail	RW27-1D	BF27D	$14	Z2
	RW27-2D	BF27-2D	$14	
	RW67-1D and RW67-2D	BF67.1D	$23	
	RW117-1D	BF117D	$30	

External Reset Button



Description	Mounting in Cover of Control Panel	Catalog Number	List Price	Multiplier
Enables overload relay to be Reset from control panel, without opening the cover	22 MM Flush Reset PB Blue 'R'	CSW-RSBF4R	$20	Z5
	30 MM Flush Reset PB Black 'Reset'	CSW30-RSBW	$22	

Connector links (3 per package)



Description	Contactor	Overload Relay	Catalog Number	List Price	Multiplier
Link connectors for easier CWM contactors and RW overload relays assembly	CWM112	RW117-2D3	GA117D	$41	Z2
	CWM150	RW317-1D3	GA317-1D	$68	
	CWM180	RW317-1D3	GA317-2D	$70	
	CWM250 / CWM300	RW317-1D3	GA317-3D	$118	
	CWM400	RW317-1D3	GA317-10D	$118	

Lugs for RW Series (Overload Relay) (3 units per package)



Description / Wire Range	Mounting on Overloads	Catalog Number	List Price	Multiplier
(2) 600 MCM...2AWG	RW407-2D (400A-840A)	LW1-2S600-B	$230	Z2
600 MCM…4AWG	RW317-1D (200A-420A)	LW2-S600	$75	
300 MCM...6AWG	RW317-1D (100A-215A)	LW3-S300	$35	

Data is subject to change without notice.

General Data and Main Contacts

Catalog Number			RW17	RW27	RW67	RW117	RW317	RW407
Standards		Units	IEC 60947 / UL 508					
Setting current		(A)	0.28...17	0.28...32	25...80	75...112	100...420	400...840
Tripping class			10					
Temperature compensation			Continuous					
Rated insulation voltage Ui (pollution degree 3)	IEC 60947	(V)	690				1,000	
	UL/CSA	(V)	600					
Rated impulse withstand voltage Uimp		(kV)	6				8	
Rated operational frequency		(Hz)	0...400					
Degree of protection Protection against direct contact from the front when actuated by a perpendicular test finger (IEC 536)			IP 20 Finger and back-of-hand proof					
Ambient temperature Operating temperature Storage temperature			-25 oC to +60 oC -40 oC to +70 oC					
Climating proof IEC 60 068-2-3 IEC 60 068-2-30			Damp heat. constant Damp heat. constant					
Current heat loss Lower value of setting range Higher value of setting range		(W) (W)	0.9 1.4	0.9 1.7	1.5 4.7	2.3 4.7	1 1.9	

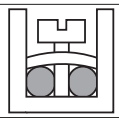
Auxiliary Contacts

Models			RW17	RW27	RW67	RW117	RW317	RW407
Standards			IEC 60 947-4-1 and UL 508					
Rated insulation voltage Ui (pollution degree 3)	IEC	(V)	690					
	UL, CSA	(V)	600					
Rated operational voltage Ue	IEC	(V)	690					
	UL, CSA	(V)	600					
Rated thermal current Ith (**θ** ≤55 ºC)		(A)	6					
Rated operational current Ie								
AC-14 / AC-15 (IEC 60947-5-1)	24 V	(A)	4					
	60 V	(A)	3.5					
	125 V	(A)	3					
	230 V	(A)	2					
	400 V	(A)	1.5					
	500 V	(A)	0.5					
	690 V	(A)	0.3					
UL, CSA			C600					
DC-13 / DC-14 (IEC 60947-5-1)	24 V	(A)	1					
	60 V	(A)	0.5					
	110 V	(A)	0.25					
	220 V	(A)	0.1					
UL, CSA			R300					
Short-circuit protection with fuse (gL/gG)		(A)	6					
Minimum voltage / admissible current (IEC 60947-5-4)			17 V / 5 mA					

Terminal Capacity and Tightening Torque - Main Contacts

Reference			RW17	RW27	RW67	RW117	RW317		RW407
Current setting	(A)		0.28...17	0.28...32	25...80	75...112	100...215	200...420	400...840
Cable size (75 ºC / Cu cable)									
Flexible cable	1 cable	(mm²)	1,5...10		6,0...35	25...35	35...120	95...150	-
	2 cables	(mm²)			-	-			
Cable with terminal or rigid cable	1 cable	(mm²)	1,5...6,0		6,0...35	25...35	35...120	95...150	-
	2 cables	(mm²)			-	-			
Busbar		(mm²)	-				Max 2x (25x5)		Max 2x (60x10)
Tightening torque		(N.m)	2,3		4,0	6,0	16,0	26,0	26,0
UL cable size (75 ºC - Cu cable)		AWG	16...8		10...3	6...1/0	3–300 kc-mil	3/0 – 600 kcmil	2x 600 kcmil 2x (1/4"x2")
Tightening torque (UL)		(lb.in)	20		35	53	141	230	230

Terminal Capacity and Tightening Torque - Auxiliary Contacts

Models			RW17	RW27	RW67	RW117	RW317	RW407
Type of screws			M3.5 x 10 Philips					
Cable size (75 ºC / Cu cable)								
Cable with or without terminal	(mm²)		2 x 1...2.5					
AWG-wire			16...12					
Tightening torque	(N.m / lb.in)		1.5 / 13					

Overloads

RW Series - Bi-Metallic

Technical Data

Main Data

Models			RW27
Standards			IEC 60947-1 and UL 508
Rated insulation voltage Ui (pollution degree 3)	IEC 60947-4-1	(V)	690
	UL, CSA	(V)	600
Rated impulse withstand voltage Uimp (IEC 60947-1)		(kV)	6
Rated operational frequency		(Hz)	25...400
Use with direct current			Yes
Maximum operation per hour		(ops./h)	15
Protection degree (IEC 60529)	Main contacts		IP10
	Auxiliary contacts		IP20
	Frontal		IP20
Mounting			Direct on the contactor
Resistance to impact (IEC 60068-2-27 - 1/2 sinusoid)		(g/ms)	10/11
Ambient temperature	Transport and storage		-50 ºC...+80 ºC
	Operating		-20 ºC...+70 ºC
	Temperature compensation		-20 ºC...+60 ºC
Altitude		(m)	2000

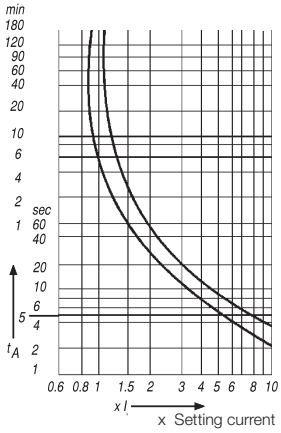
Main Contacts

Models			RW27
Rated operational voltage Ue	IEC 60947-4-1	(V)	690
	UL, CSA	(V)	600
Setting current / max fuse (gL/gG)1)		(A)	0.28...0.4 / 2
			0.43...0.63 /2
			0.56...0.8 / 2
			0.8...1.2 / 4
			1.2...1.8 / 6
			1.8...2.8 / 6
			2.8...4 / 10
			4...6.3 / 16
			5.6... 8 / 20
			7...10 / 25
			8...12.5 / 25
			10...15 / 35
			11...17 / 40
			15...23 / 50
			22...32 / 63
			32...40 / 90
Average power dissipation per pole		(W)	≤3

Data is subject to change without notice.

RW Tripping Characteristics

These tripping characteristics show the tripping of RW in relation to the current. They show the mean values of the tolerance ranges at on ambient temperature of 68°F (20°C), starting from cold stats. The tripping time of the overload releases at operational temperature is reduced to approximately 25% of the values shown. Under normal operational conditions, all three phases of the RWs should be loaded.



Altitude & Temperature Derating

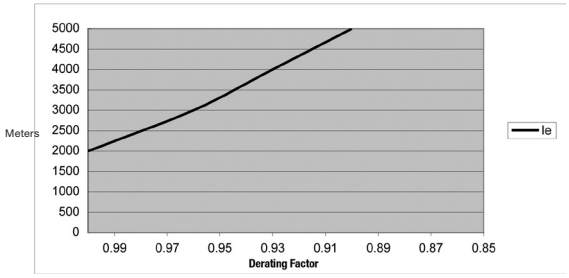
The derating of a RW overload relay has two possible factors:

1) Ambient temperature
   - Temperature compensation considers a factor according to which the rated current must be reduced when ambient temperature is higher than 60°C (140°F).

2) Altitude
   - Altitude compensation involves both, rated current and voltage.
   - Current compensation considers a factor according to the rated current must be reduced.
   - For voltage, altitude limits the higher operating voltage the overload relay can be used.

Temperature Compensation		Current Correction ffactor
149°F	(65°C)	0.94
158°F	(70°C)	0.87
167°F	(75°C)	0.81
176°F	(80°C)	0.73

Altitude	Voltage Correction [Ue]
Up to 2,000m (6,667ft)	690
Up to 3,000m (10,000ft)	550
Up to 4,000m (13,333ft)	480
Up to 5,000m (16,667ft)	420



The derating of the permissible operating current for installation altitudes above 2,000m (6,667 ft) and ambient temperatures over 60°C (140°F) is calculated according to:

Total derating = Derating altitude x Derating ambient temperature

Example;
Altitude: 3,000 m (10,000 ft)
K1 = 0.96
Ambient temperature: 70°C (158°F)
K2 = 0.87

Total current derating = 0.96 x 0.87 = 0.84 x Ie
In this case, the maximum rated voltage we can connect to our RW overload relay is 550V.

In order to select the proper overload relay, you have to choose a device with a current range that accommodates:
Overload Setting Point = FLA motor / (K1 x K2)

As in the example above, K1 x K2 = 0.84
For a motor with FLA = 20Amps

Overload Setting Point = 20 / 0.84 = 23.8Amps

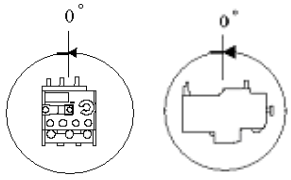
RW Series - Bi-Metallic

Operating Positions[1]

RW17D, RW27D, RW67D, RW117D, RW317D, RW407D

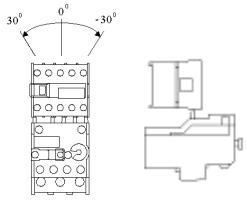
Mounting without contactor

The overload relays can be mounted at any position.



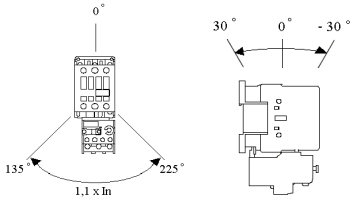
RW17D with CWC Series

As showed at the left figure below, the inclination can not exceed ± 30° degrees for a perfectly functioning of the contactor. Laterally, as showed at the right figure below, the mounting position is equivalent to 0° degrees - not requiring a correction factor on the dial of the relay. The assembly can work with mounting variations of 0° to 180°



RW27D, RW67D, RW117D, RW317D, RW407

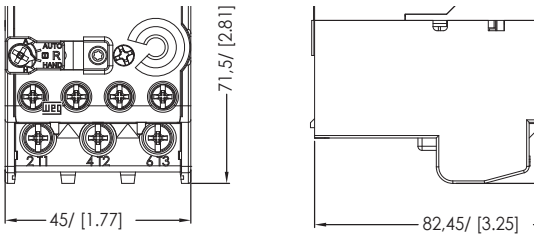
The mounting position showed at the left figure below is equivalent to 0° degrees - not requiring a correction factor on the dial of the relay. The assembly can work with mounting variations of 0° to 135° for each side, however the mounting with the relay above the contactor, position between 135° and 225°, is required a correction factor of +10% on the dial of the relay. Laterally, as showed at the right figure below, the inclination can not exceed ± 30° for a perfect functioning of the contactor. D with CWM/CWM Series



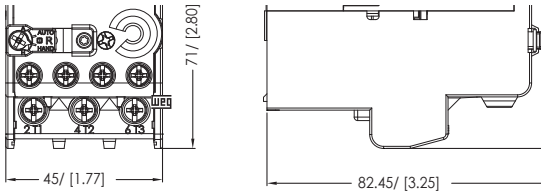
Note: 1)Please consult WEG for different mounting positions.

Data is subject to change without notice.

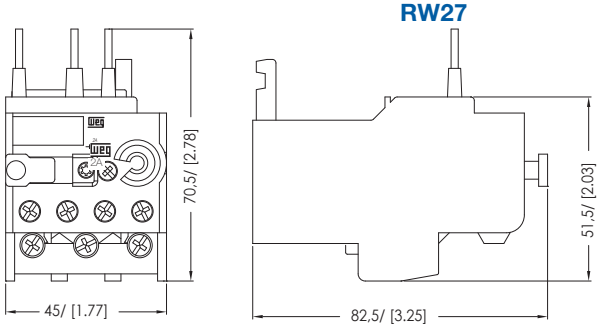
RW17-1D



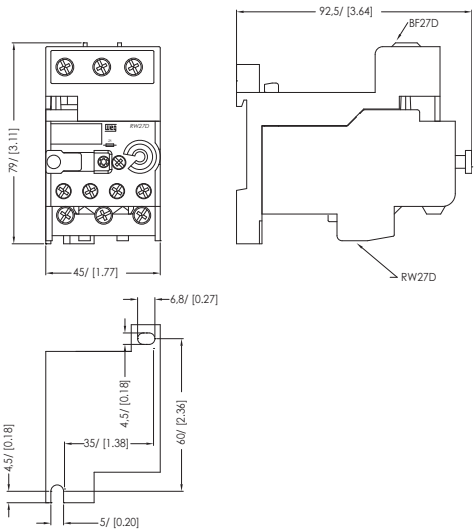
RW17-2D



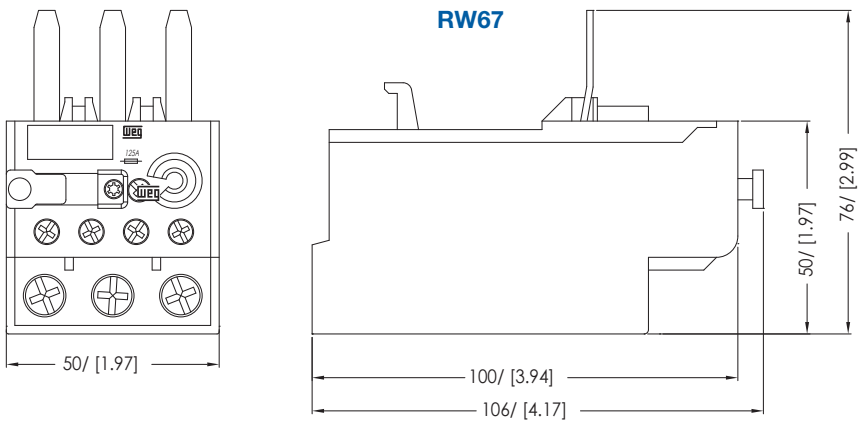
RW27



RW27 + BF27



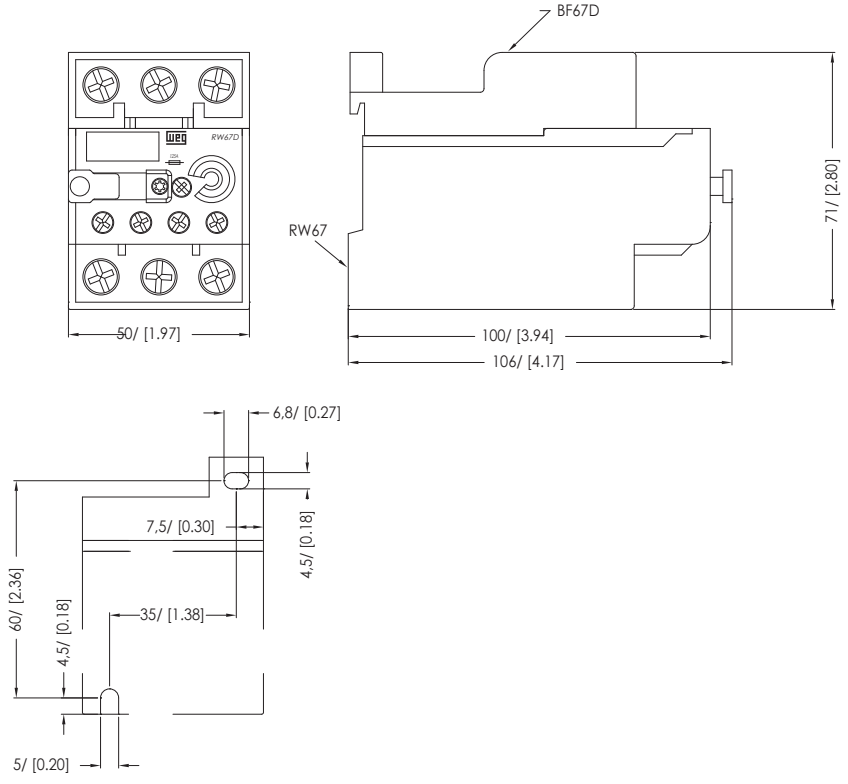
RW67



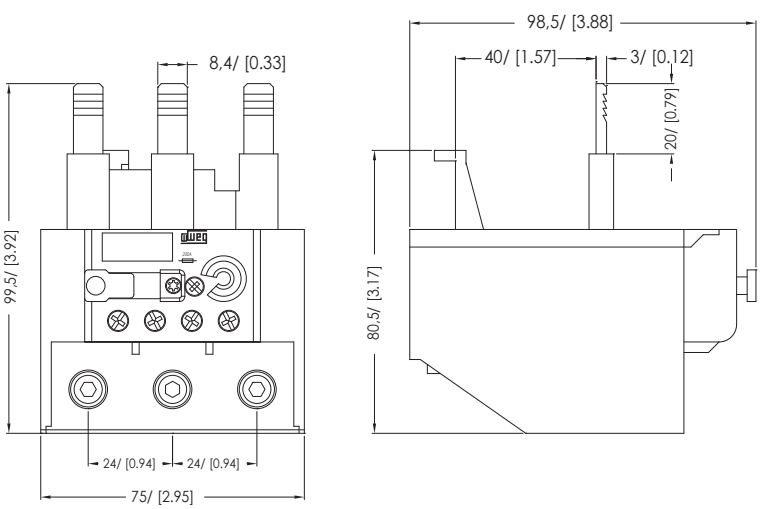
Overloads

RW Series - Bi-Metallic

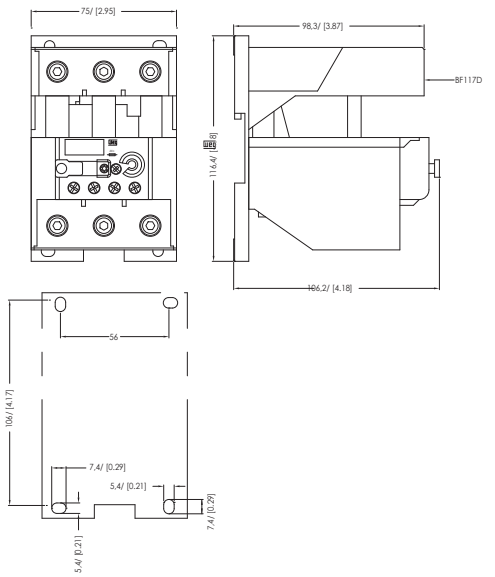
RW67 + BF67



RW117-1D

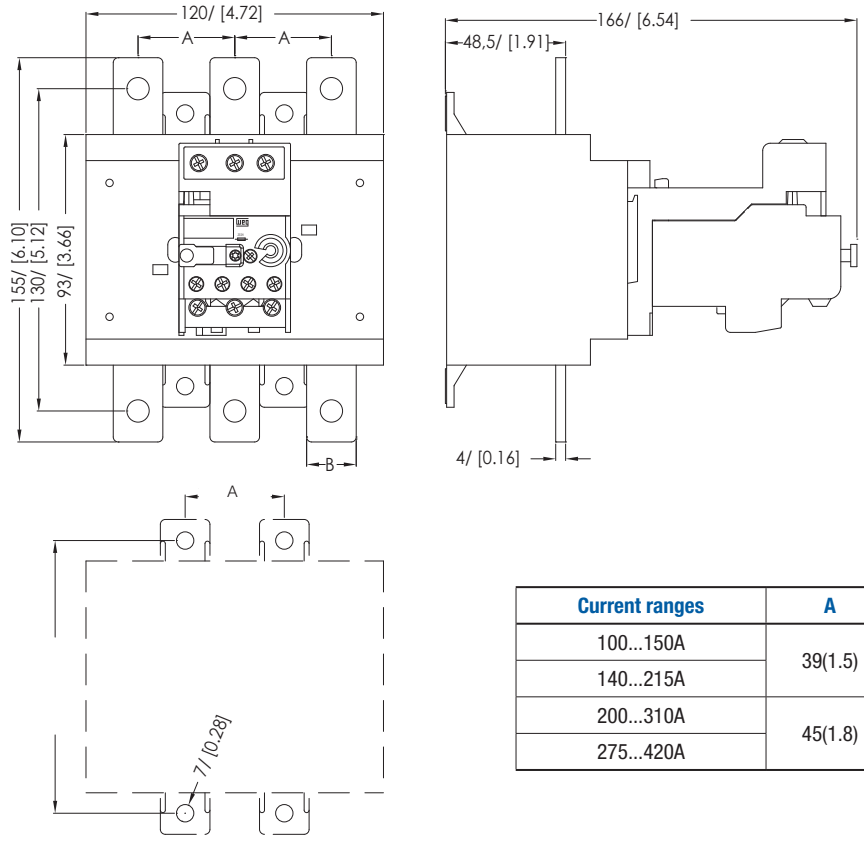


RW117-2D



Data is subject to change without notice.

RW317



Current ranges	A	B
100...150A	39(1.5)	20(0.8)
140...215A		
200...310A	45(1.8)	25(1.0)
275...420A		

RW407

